

HINTS TO INVENTORS,  
CONCERNING THE

**Procuring of Patents,**

EITHER

AMERICAN OR FOREIGN,

WITH

SUGGESTIONS AND VALUABLE INFORMATION

TO

**PATENTEES.**

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MUNN & CO., PATENT SOLICITORS,  
SCIENTIFIC AMERICAN OFFICE.

No. 37 PARK ROW, NEW YORK.

1861.

E. O. JENKINS, Printer, 26 Frankfort St.

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THE  
UNITED STATES  
**PATENT LAW.**

INSTRUCTIONS  
How to Obtain Letters Patent  
**FOR NEW INVENTIONS:**

INCLUDING A VARIETY OF USEFUL INFORMATION CONCERNING THE  
RULES AND PRACTICE OF THE PATENT-OFFICE; HOW TO SELL  
PATENTS; HOW TO SECURE FOREIGN PATENTS; FORMS FOR  
ASSIGNMENTS AND LICENSES; TOGETHER WITH EN-  
GRAVINGS AND DESCRIPTIONS OF THE CON-  
DENSING STEAM-ENGINE, AND THE  
PRINCIPAL MECHANICAL MOVE-  
MENTS, VALUABLE TABLES,  
CALCULATIONS, PROB-  
LEMS, ETC., ETC.

BY

**MUNN & CO., SOLICITORS OF PATENTS,**  
No. 37 Park Row, New-York.

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New-York:

PUBLISHED BY MUNN & CO., AT THE OFFICE OF THE  
SCIENTIFIC AMERICAN,  
**No. 37 PARK ROW.**

1867.

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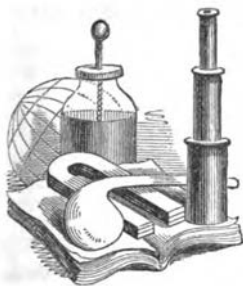
JOHN A. GRAY & GREEN,

PRINTERS,

16 AND 18 JACOB STREET, NEW-YORK.

# HOW TO INVENT.

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If we were asked to point out the course of life, business, or enterprise upon which any man of ordinary gifts might enter, with the best prospects of speedy success, we should unhesitatingly direct him to *invention*. Many and wonderful have been the achievements of modern genius. But the realm of invention is absolutely exhaustless, and only its outer edges have been explored. The world has yet to witness the

most astounding triumphs of mind over matter.

It is a popular error to suppose that much knowledge, painful effort, constant disappointment, and many wearisome failures are the necessary preliminaries to an inventor's success. True, there are individual examples of this kind; they are exceptions.

It may be affirmed as the general rule, that inventors make money more quickly, more easily, and with less expenditure of thought, capital, or labor, than any other class of men.

It may also be affirmed that industrial enterprises and speculations which are connected with the development and introduction of new inventions are among the most sure and *profitable* investments that can be made.

The readiest way to invent is to *keep thinking*. In order to supply the mind with a constant succession of subjects, the inventor should cultivate habits of *observation*. Keep your eyes and ears open. Examine things about you, and seek to know how they are made, and how improved.

The young inventor should acquire a knowledge of the general laws and principles of natural philosophy, chemistry, and all of the sciences.

Leisure hours might be occupied with drawing and with books suggestive of improvements. To avoid waste of time in reproducing old devices, the inventor should be well posted in regard to inventions that have already been patented. For this purpose, an attentive study of *The Scientific American* will be almost indispensable.

The *Boston Journal* makes the following useful remarks: "Of course, in order to succeed, a new invention must be superior to any thing that has preceded it, and must be sold at a price that will enable it to be brought into general use.

People cannot afford to throw away old implements unless the new ones are enough better to make up for the loss. Let inventors produce a good article, at a moderate price, and they will be sure of success."

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#### SMALL INVENTIONS MOST PROFITABLE.

In an official report of a Chief Examiner of the United States Patent Office, we find the following: "A patent, if it is worth any thing, when properly managed, is worth and can easily be sold for from ten to fifty thousand dollars. These remarks only apply to patents of minor or ordinary value. They do not include such as the telegraph, the planing-machine, and the rubber patents, which are worth millions each. A few cases of the first kind will better illustrate my meaning.

"A man obtained a patent for a slight improvement in straw-cutters, took a model of his invention through the Western States, and after a tour of eight months, returned with forty thousand dollars in cash, or its equivalent.

"Another inventor obtained extension of a patent for a machine to thresh and clean grain, and sold it, in about fifteen months, for sixty thousand dollars. A third obtained a patent for a printer's ink, and refused fifty thousand dollars, and finally sold it for about sixty thousand dollars.

"These are ordinary cases of minor invention, embracing no very considerable inventive powers, and of which hundreds go out from the Patent Office every year. Experience shows that the most profitable patents are those which contain very little real invention, and are to a superficial observer of little value."

## HOW TO OBTAIN PATENTS.



THE first inquiry that presents itself to one who has made any improvement or discovery is: "Can I obtain a Patent?" A *positive* answer can only be had by presenting a complete application for a Patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After a season of great perplexity and delay, he is usually glad to seek

the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning.

If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

We (MUNN & Co.) have been actively engaged in the business of obtaining patents for about twenty years. Many thousands of inventors have had benefit from our counsels. More than one third of all patents granted are obtained by us.

Those who have made inventions and desire to consult with us, are cordially invited to do so. We shall be happy to see them in person at our office, or to advise them by letter or through THE SCIENTIFIC AMERICAN. In all cases they may expect from us an *honest opinion*. For such consultations, opinion, and advice, *we make no charge*. A pen-and-ink sketch and a description of the invention should be sent, together with stamps for return postage. Write plain; do not use pencil nor pale ink; be brief.

All business committed to our care, and all consultations, are kept by us *secret and strictly confidential*. Address MUNN & Co., 37 Park Row, New-York.

## SPECIAL EXAMINATIONS.

FEE \$5.



N many cases it will be advisable, as a measure of prudence, to order a **PRELIMINARY EXAMINATION**. This consists of a *special search*, made at the U. S. Patent Office, Washington, through the medium of our house in that city, to ascertain whether, among all the thousands of patents and models there stored, any invention can be found which is similar in character to that of

the applicant. On the completion of this special search we send a *written report* of the result to the party concerned, with suitable advice. Our charge for this service is \$5.

If the device has been patented, the time and expense of constructing models, preparing documents, etc., will, in most cases, be saved by means of this search; if the invention has been in part patented, the applicant will be enabled to modify his claims and expectations accordingly.

Many other obvious advantages attend Preliminary Examination, although the strictest search does not always enable the applicant to know absolutely, whether a patent will be granted.

For example, applications for patents are sometimes rejected because the Examining Officer finds a description of the alleged invention in some foreign publication; or some other person has been previously rejected on an analogous device; or some other invention, for a similar purpose, partially resembles the applicant's in its construction; or the Government makes an unjust or uncommon decision. Against none of these contingencies does the Preliminary Examination provide.

It will, however, generally inform the applicant whether an improvement similar to his, and used for the same purpose, *has ever been patented in this country*.

Parties desiring the Preliminary Examination are requested to remit the fee, (\$5,) and furnish us with a sketch or photograph, and a brief description of the invention.



Where examination is wanted upon more than one invention, \$5 for each must be sent; as each device requires a separate, careful search. Address MUNN & Co., 37 Park Row, N. Y.

### OTHER INFORMATION.



If you wish for *general information* as to the rules and law of Infringements, Reissues, Claims, etc., state your inquiries clearly, and remit \$5. Opinions in special cases of Infringement cost more. See page 16.

If you wish for advice in regard to assignments, or upon the rights of parties under assignments, joint ownership in patents, contracts, or licenses, state the points clearly upon which information is wanted, and remit \$5.

If you desire to know in whose name the title to a Patent is officially recorded, at Washington; or if you wish for an abstract of all the deeds of transfer connected with a Patent, send us the name of the patentee, date of patent, etc., and remit \$5.

If you desire a sketch from the drawings of any Patent, and a description from the specification, give the patentee's name, date of the patent, and remit \$5.

If you desire to have an assignment of a Patent, or any share thereof, or a license, made out in the proper manner, and placed on record, give us the full names of the parties, residences, title of the invention, etc., and remit \$5. This includes record fee.

Inventions or shares thereof may be assigned either before or after the grant of a patent. Agreements and contracts in regard to inventions need to be recorded, like assignments, at Washington. For any agreement or contract that you wish prepared, remit \$5.

Remember that we (MUNN & Co.) have branch-offices in Washington, and have constant access to all the public records. We can therefore make for you *any kind of search*, or look up for you *any sort of information* in regard to Patents, or Inventions, or Applications for Patents, either pending or rejected, that you may desire.

## CAVEATS.



of the notice.

A Caveat consists of a Specification, Drawing, Oath, and Petition. To be of any value, these papers should be carefully drawn up, and the official rules scrupulously complied with. No model is required. Our facilities enable us to prepare Caveat-papers with great dispatch.

When specially desired, we can have them ready to send to the applicant, for signature and affidavit, by return mail, or at an hour's notice. The official fee for a Caveat is \$10, and we generally charge \$10 or \$15 to prepare the accompanying papers and attend to the business—making \$20 or \$25 in all.

A Caveat runs for a year, and can be extended by paying \$10 a year.

Caveats can only be filed by citizens of the United States, and aliens who have resided here one year and have declared their intention to become citizens.

To enable us to prepare Caveat papers, all that we need is a sketch, drawing, or photograph, and description of the invention, with which remit fees as above. Model not required.

## PATENTS.



UNDER the present American law, all persons pay the same official fees, *without distinction as to nationality*. Patents are also granted to women and minors. The only discrimination is against inhabitants of countries that discriminate against inhabitants of the United States.

The first government fee on filing an application for a patent is \$15; stamps, \$1. Add to this the attorney's charge for drawings, specification, and attendance to the business of the case before the Patent Office. Our charge for these services is, for simple cases, \$25; and from that price upward to \$35 or more, according to the time and labor required. If the patent is "allowed," a second government fee of \$20 is then to be paid.

## RECAPITULATION OF COSTS.

First Government fee and stamps, - - -	\$16
Munn & Co., Specifications, Drawings, and Business, -	25

*Cost of making the application, - - -	\$41
Second Government fee, payable if allowed, - -	20

†Whole cost of Patent, (if a simple case,) -	\$61
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The application for a patent must be made in the name of the inventor, who alone can sign the papers. An attorney cannot sign the papers for the inventor.

Joint inventors are entitled to a joint patent.

An agreement or partnership between two persons, one of whom is the inventor, and the other only a partner or part owner, does not make them joint applicants for a patent.

In case of the death of an inventor, his heirs may obtain a patent.

\*If a patent is not granted, the applicant loses the cost of making the application.

†When an appeal is required there are additional expenses. See next page.

## AMENDMENTS AND APPEALS.



WE, Munn & Co., have an extensive Branch House in Washington, employing a corps of skilled assistants, and we make it our special duty to watch over the cases of our clients while they are before the Patent Office. If the examining officer objects to the grant of the claims, or gives references, or requires amendments, we examine the references, and make the amendments, if we deem them proper, so as to secure the allowance of our client's patent as soon as possible. When the examiner refuses to allow a patent, and rejects the case, we report the fact to our client, and inform him as to the probabilities of obtaining a reversal of the examiner's decision by an appeal to the Examiners-in-Chief.

*First Appeal.*—The government fee payable by the applicant on making an appeal to the Examiners-in-Chief, is \$10. Our charges for preparing and conducting this appeal are very moderate, and generally contingent upon success.

*Second Appeal.*—From the decision of the Examiners-in-Chief an appeal may be taken to the Commissioner of Patents. Government fee, \$20.

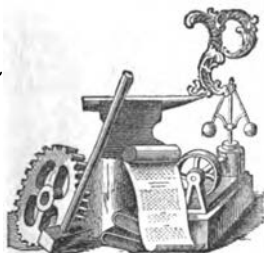
*Third Appeal.*—From the decision of the Commissioner of Patents an appeal may be taken to one of the Judges of the U. S. District Court at Washington. Government fee, \$25.

## REJECTED CASES.

We shall be happy to take up REJECTED CASES, or to remodel defective papers for parties who have made application for themselves or through other agents. Terms moderate. Address Munn & Co., stating the particulars.

## FORFEITED CASES.

By a recent change in the Patent Law, all inventors whose right to a patent has been forfeited by delay in the payment of the second Government fee, may now renew their rights by filing a new application. The original model may be used.

**MODELS, REMITTANCES, ETC.**

PERSONS who apply for patents are by law required to furnish a model, in all cases where the invention can be illustrated or partly illustrated by a model. The model must not exceed twelve inches in any of its dimensions; it should be neatly made, of hard wood or metal, or other substantial material; the name of

the inventor should be engraved or painted upon it conspicuously. Where the invention consists of an improvement on some known machine, or part of a machine, a full working model of the whole will not be necessary. It should be sufficiently perfect, however, to show, with clearness, the nature and operation of the invention. More than one patent cannot be taken out on one model.

When the invention consists of a new article of manufacture or a new composition, samples of the article must be furnished.

New medicines or medical compounds, and useful mixtures of all kinds, are patentable. Samples must be furnished, and a very minute statement must be made of the exact proportions and ingredients used.

As soon as the model or specimen is ready, it should be carefully boxed and shipped, by express or otherwise, to our address, namely, MUNN & Co., No. 37 Park Row, New-York City. Prepay the expense, and send the express receipt to us by mail.

Simultaneously with the model or specimens, the inventor should also send us the first instalment of the Government fee and stamps, \$16. The money may be forwarded either by express, with the model, or by mail. The safest way to remit is by draft on New-York, payable to our order, or by Post-Office order. Always send a letter with the model, and also with the remittance, stating the name and

address of the sender. We sometimes receive envelopes containing money, but without any name or explanation; models are also frequently sent us from equally unknown sources.

A full written description should also be sent with the model, embodying *all the ideas of the inventor respecting the operation and merits of the improvement*. This statement is often of assistance to us in preparing the specification.

On the reception of the model and Government fee, the case is duly registered upon our books, and the application proceeded with as fast as possible. When the documents are ready, we send them to the inventor by mail, for his examination, signature and affidavit, with a letter of instruction, etc. *Our fee for preparing the case is then due*, and will be called for. Immediately on its return, the case will be presented to the Patent Office, and as soon as the patent is allowed, the applicant will be notified to remit the last instalment of the Government fee, namely, \$20, and the patent will then be issued.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so. We do not require the personal attendance of the inventor, unless the invention is one of great complication; the business can be done as well by correspondence.

The average time required to procure a patent is six weeks. We frequently get them through in less time; but in other cases, owing to delay on the part of the officials, the period is sometimes extended to two or three months, and even more. We make a special point to forward our cases *as rapidly as possible*.

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Be neither lavish nor niggardly; of the two, avoid the latter. A mean man is universally despised, but public favor is a stepping-stone to preferment; therefore, generous feelings should be cultivated.

Never, under any circumstances, assume a responsibility you can avoid consistently with your duty to yourself and others.

## QUICK APPLICATIONS.



WHEN, from any reason, parties are desirous of applying for Patents or Caveats *in great haste*, without a moment's loss of time, they have only to write or telegraph us specially to that effect, and we will make special exertions. We can prepare and mail the necessary papers at less than an hour's notice, if required.

## THE INVENTOR MUST APPLY FOR THE PATENT.

It is necessary, in all cases, that an application for a patent should be made in the name of the inventor, and the petition and specification must be signed by him. An inventor may appoint an attorney, or may sell and assign all his interest in an invention; still the patent papers, on making the application, must be signed and sworn by the inventor; otherwise they will not be received by the Commissioner of Patents. Canadians, and other foreign inventors, have erroneously supposed that by transferring their full rights to an American citizen, preliminary to an application, they could thereby obtain the patent for the same small fee required of a citizen. But this is impossible; for the applicant is required to swear that he believes himself to be the first inventor.

Remember that self-interest is more likely to warp your judgment than all other circumstances combined; therefore, look well to your duty when your interest is concerned.

Wine-drinking, chewing, and smoking are bad habits; they impair the mind and pocket, and lead to a waste of time.

**PATENTS FOR DESIGNS, ETC.**

DESIGN-PATENTS may be taken out for *any new form of any article*; also for new tools, patterns, ornamental castings of machine-frames, stove-plates, borders, fringes; all new designs for printing, weaving, or stamping upon silks, calicoes, carpets, oil-cloth prints, paper-hangings, and other articles. New forms for trade-marks, labels, envelopes, boxes and bottles for goods, may also be patented; likewise all works of art, including prints, paintings, busts, statues, bas-reliefs, or compositions in alto, or basso-relievo, new dies, impressions, ornaments to be placed or used upon

any article of manufacture, architectural work, etc. [See page 76, section 11.]

The term for which Design-Patents are granted varies according to the fee paid by the applicant, as follows:

Patent for three and one-half years, \$10; patent for seven years, \$15; patent for fourteen years, \$30. Add to the above the cost of preparing the specifications, etc., for which we usually charge \$25.

*No models for designs are required.* But duplicate drawings must be furnished, together with the usual specification, petition, and affidavit, which, to render the patent of value, should be prepared with the utmost care. In many cases, two good photographs of the Design which it is desired to patent, may be used in lieu of drawings. The negative must accompany the photographs. Address,

MUNN & Co., 37 Park Row, New York City.

**COPYRIGHTS.**

COPYRIGHTS may be obtained for Trade-Marks, Labels, Stamps, Books, Drawings, Photographs, etc. The whole business of obtaining such copyrights is done by Munn & Co., 37 Park Row, for \$5. Remit that sum, and send three *printed copies of the title* of whatever you desire to have secured.



## GOING TO WASHINGTON IN PERSON.



SOME inventors suppose, very naturally, that if personally present in Washington, they can get their cases through more expeditiously, or command other important facilities. But this is not so. The journey to Washington is usually a mere waste of time and money. A good agent must be employed after the inventor gets there. *No inventor can possibly have facilities or influence superior to our own*; more than

ONE THIRD of the entire business of the Patent Office passes through our hands; and we have an office in Washington, charged with the especial duty of watching over and pressing forward the interests of our clients.

The Patent Office does not prepare patent papers, or make models. These must be provided by the applicant or his attorney, according to law, *otherwise his claim will not be considered.*

The law especially requires that all documents deposited in the Patent Office shall be correctly, legibly, and clearly written, and that the drawings shall be of a specified size, and executed in an artistic manner.

Persons who visit Washington in person, can have all their patent business *promptly attended to*, by calling at MUNN & Co.'s BRANCH SCIENTIFIC AMERICAN OFFICE, corner of 7th and F streets, opposite the Patent Office.

## COPIES OF PATENTS, ASSIGNMENTS, ETC.

WE furnish full copies of specifications or drawings of any existing patent, or open rejected case, official letter, assignment, etc., etc. The expense varies from \$5 to \$10 and over, according to the amount of work on the drawings. See page 7. For \$1 we can send a copy of the *claims only*, of any existing patent.

## INFRINGEMENTS.



THE general rule of law is, that the prior patentee is entitled to a broad interpretation of his claims. The scope of any patent is therefore governed by the inventions of prior date. To determine whether

the use of a patent is an infringement of another, generally requires a most careful study of all analogous prior patents and rejected applications. An opinion based upon such study requires for its preparation much time and labor.

Having access to all the patents, models, public records, drawings, and other documents pertaining to the Patent Office, we are prepared to make examinations, and give opinions upon all infringement questions, advice as to the scope and ground covered by patents, and direct with vigor any legal proceedings therewith connected. Address, MUNN & Co., 37 Park Row, N. Y.

The expense of these examinations, with written opinion, varies from \$25 to \$100 or more, according to the labor involved. See page 7.

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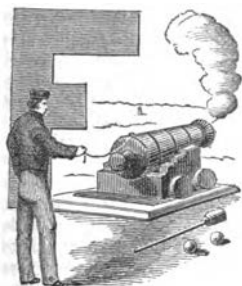
*To the Editors of The Scientific American :*

Let me encourage you, gentlemen, in your great enterprise. Perhaps we need light and elegant literature ; we may even need " chess columns ;" but let THE SCIENTIFIC AMERICAN continue to teach the people how to realize Dean Swift's prayer—" Make two blades of grass grow on the spot where only one grew before." Let it still increase the mechanical and agricultural knowledge of our artisans and farmers, by publishing the latest discoveries in science and improvements in the arts. And then its editors will have the noblest reward—that of being considered the guardian angels of genius, the champions of inventors, and the " prime motors" employed in developing the highest physical and intellectual resources of this great country.

*Camden, Ark.*

W. A. SHAW, M.D.

## GENERAL REMARKS.



OR over *twenty years* Messrs. MUNN & Co. have been personally familiar with the progress of invention and discovery. As an evidence of the confidence reposed in them, they may with propriety refer to the extraordinary fact that nearly TWENTY THOUSAND PATENTS have been obtained by them; and through their efficient Branch Office in Washington they have examined into the novelty of *many thousand inventions*, thus affording to them a knowledge of the contents of the Patent Office unrivalled by any existing agency.

Not only this, but a large majority of all the patents secured by American citizens in European countries are taken through MUNN & CO.'S AGENCIES IN LONDON, PARIS, BRUSSELS, BERLIN, AND VIENNA.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment are noticed, *at the proper time*, in THE SCIENTIFIC AMERICAN. This paper is read by more than one hundred thousand persons every week, and has the most extensive and influential circulation of all the journals of its kind in the world.

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No individual in the country can possibly have so good an opportunity of knowing and judging as to the extent of business and the qualification of patent attorneys as the *Commissioner of Patents*. Judge MASON, upon retiring from the office of the Commissioner of Patents, sent us the following very flattering written testimonial:

## COMMISSIONER MASON'S LETTER.

MESSRS. MUNN &amp; Co. :

I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been FULLY DESERVED, as I have always observed, in all your intercourse with the office, a MARKED DEGREE of *promptness, skill, and fidelity* to the interests of your employers.

Yours, very truly,

CHAS. MASON.

Judge MASON was succeeded by that eminent patriot and statesman, Hon. JOSEPH HOLT, whose administration of the Patent Office was so distinguished that he was appointed Postmaster-General of the U. S. Hon. Mr. HOLT was subsequently appointed Judge-Advocate-General. He addressed us the following very gratifying communication :

## COMMISSIONER HOLT'S LETTER.

MESSRS. MUNN &amp; Co. :

It affords me much pleasure to bear testimony to the *able and efficient manner* in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was VERY LARGE, and you sustained (and I doubt not justly deserved) the reputation of *energy, MARKED ABILITY, and uncompromising fidelity* in performing your professional engagements.

Very respectfully, your obedient servant,      J. HOLT.

Hon. WM. D. BISHOP, late Member of Congress from Connecticut, succeeded Mr. HOLT as Commissioner of Patents. Upon resigning the office, he wrote to us as follows :

## COMMISSIONER BISHOP'S LETTER.

MESSRS. MUNN &amp; Co. :

It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very

large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as **EMINENTLY QUALIFIED** to perform the duties of Patent Attorneys with skill and accuracy.

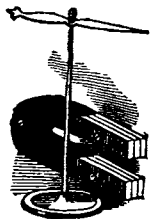
Very respectfully, your obedient servant,

WM. D. BISHOP.

One great reason for our unrivalled success is, that our affairs are so systematized and arranged under our personal direction, that every patent case submitted to our care receives the most careful study during its preparation, the most prompt dispatch, and the most thorough attention at every stage of its subsequent progress.

## HOW TO CONVERT PAPER INTO GOLD.

SEND a subscription in paper money to Munn & Co., and enjoy a year's reading of **THE SCIENTIFIC AMERICAN**. Ten to one that the information thus obtained will result in bringing into your coffers, before the year is out, a hundred times more money in gold, than the original investment.



THE speed of an electric spark travelling over a copper wire, has been ascertained by Wheatstone to be two hundred and eighty-eight thousand miles in a second.

PARTIES sending models to the **SCIENTIFIC AMERICAN** office, on which they decide not to apply for Letters Patent, and which they wish preserved, will please to order them returned as early as possible.

We cannot undertake to store such models, and if not called for within a reasonable time, we are obliged to destroy them, to make room for new arrivals.

**EFFECTS OF HEAT UPON BODIES.**

	Fahrenheit. Deg.		Fahrenheit Deg.
Cast-iron melts.....	2786	Cadmium.....	460
Gold ".....	2016	Tin melts.....	442
Copper ".....	1996	Tin and bismuth, equal	
Brass ".....	1900	parts, melts.....	288
Silver ".....	1873	Tin 8 parts, bismuth 5 parts,	
Red heat visible by day, ..	1077	lead 2 parts, melt.....	212
Iron red hot in twilight,...	884	Sodium.....	190
Common fire,.....	790	Alcohol boils.....	174
Zinc melts.....	773	Potassium.....	186
Iron, bright red in dark,...	752	Ether ".....	98
Mercury boils.....	680	Human blood, (heat of,)...	98
Lead melts.....	612	Strong wines freeze.....	20
Linseed oil boils.....	600	Brandy freezes.....	7
Bismuth melts.....	497	Mercury freezes.....	-89½

**SOUND**

is the effect produced upon the ear when air is set in motion within certain limits of rapidity. Audible sound begins when about thirty-two vibrations per second are made, and ceases when about 8000 vibrations per second are reached.

The number of vibrations corresponding with the middle C of a musical instrument is 522 per second. An octave below, half the number; an octave above, twice the number.

Sound travels at the rate of 1100 feet per second in a still atmosphere. The distance in feet between an observer and the point where a stroke of lightening falls, may be known by multiplying 1100 by the number of seconds that elapse after the flash is seen until the sound is heard.

**A MESSIEURS LES INVENTEURS FRANÇAIS.**

LES inventeurs français non familiers avec la langue anglaise et qui préféreraient nous communiquer leurs inventions en français, peuvent nous adresser dans leur langue natale. Envoyez nous un dessein et une description concise pour notre examen. Toutes communications seront reçues en confidence. Chaque personne, soit native ou étrangère, une seule exception, peut obtenir une patente dans les États Unis sous les mêmes conditions que les citoyens. On parle français dans nôtre bureau.

MUNN & Co.,

37 Park Row, New-York, Scientific American Office.

# OFFICIAL

## RULES AND DIRECTIONS

FOR

### PROCEEDINGS IN THE PATENT OFFICE.

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[THE following embrace the principal official rules under which the business at the Patent Office is now conducted.]

*What will prevent the granting of a Patent.*

Although an applicant may have actually made an invention, a patent therefor will not be granted him if the whole or any part of what he claims as new has been patented, or described in any printed publication in this or any foreign country, or been invented or discovered in this country; nor if he has once abandoned his invention to the public, or for more than two years consented and allowed it to be in public use or on sale.

The mere fact of prior invention or discovery abroad will not prevent the issue of the patent, unless the invention has been there patented, or described in some printed publication.

Merely conceiving the idea of an improvement or machine in this country is not such an "invention" or "discovery" as is above contemplated. The invention must have been reduced to a practical form, either by the construction of the machine itself or of a model thereof, or at least by making a full drawing of it, or in some other manner equally descriptive of its exact character, so that a mechanic would be enabled, from the description given, to construct a model thereof, before it will prevent a subsequent inventor from obtaining a patent.

*The Specification.*

Two or more distinct inventions may not be claimed under one application for letters patent. No positive rules for guidance can be laid down on this point; but in general, where there are several parts or elements of a machine, art, process, manufacture, or composition of matter, having no necessary or dependent connection with each other, and each susceptible of separate and distinct use or application, either by itself or in other connections, all set forth and claimed under one application for letters patent, the office requires the party to divide the application and confine the claim to whichever invention he may elect.

Where a principle of operation or construction is invented or discovered, the party is allowed to claim the principle broadly, and one mode of carrying it into operation.

The specification must be signed by the inventor, (or by his executor or administrator, if the inventor be dead.) It should describe the sections of the drawings, (where there are drawings,) and refer by letters and figures to the different parts.

The oath may be taken (in this country) before any person authorized by law to administer oaths.

The oath may be taken in a foreign country before any minister plenipotentiary, *chargé d'affaires*, consul, or commercial agent, holding commission under the government of the United States, or before any notary public of the country in which the oath is taken, being attested in all cases by the proper official seal of such notary.

*Drawings.*

The applicant for a patent is required by law to furnish duplicate drawings, where the nature of the case admits of drawings, the office reference copy of which must be signed by the applicant, and attested by two witnesses. These should be sent with the specification. The drawings must be neatly and artistically executed in fast colors, on one or more sheets separate from the specification, the size of the sheets to be twenty inches from top to bottom, and fifteen across, this being the size of the patent. One of these



drawings, to be kept in the office for reference, must be on thick drawing-paper, sufficiently stiff to support itself upright in the portfolios. Tracings upon cloth, pasted upon thick paper, will not be admitted. The other drawing, which is to be attached to the patent, must have a margin of one inch at least for that purpose on the right-hand side, and should be on tracing-muslin, which will bear folding and transportation, and not on paper. The drawings should generally be in perspective, with such detached sectional and plane views as to clearly show what is the invention, its construction and operation. All thick drawings should be colored and shaded, and when different materials are united in a machine, as steel and iron, or wood and metal, the distinction should be indicated by different colors on the drawings. Each part must be distinguished by the same number or letter, whenever that part is delineated in the drawings.

Applicants are advised to employ competent artists to make the drawings, which will be returned if not executed in conformity with these rules. Thick drawings should never be folded for transmission.

#### *Of the Examination.*

All cases in the Patent Office are arranged in classes, which are taken up for examination in regular rotation; those in the same class being examined and disposed of, as far as practicable, in the order in which the respective applications are completed. When, however, the applicant has a foreign patent for his invention, or when such invention is deemed of peculiar importance to some branch of the public service, and when, for that reason, the head of some department of the government specially requests immediate action, the case will be taken up out of its order. These, with applications for reissues, are the only exceptions to the rule above stated in relation to the order of examination.

All amendments of the model, drawings, or specification must relate to the subject-matter originally embraced in at least one of them at the time of the filing of the application.

The personal attendance of the applicant at the Patent

Office is unnecessary. The business can be done by correspondence or by attorney.

When an application has been finally decided, the office will retain the original papers, furnishing the applicant copies—if he desires them—at the usual expense.

When a patent is granted, it will be transmitted to the patentee, or to his agent having a full power of attorney authorizing him to receive it.

#### *Protests.*

The Patent Office cannot stay the regular proceedings on applications for letters patent in consequence of protests founded upon *ex parte* statements, or upon affidavits from parties claiming to be aggrieved.

#### *Retaining Patents in the Secret Archives.*

An application upon which a patent has been allowed may, at the request of the applicant, or of his assignee, made before the patent has been recorded, be retained in the secret archives of the office for a period not exceeding six months from the date of the order to issue

#### *Of Appeals.*

After an application for a patent has been twice rejected by the examiner having it in charge, it may, at the option of the applicant, be brought before the board of examiners-in-chief.

For this purpose a petition in writing must be filed, signed by the party or his authorized agent or attorney, setting forth in general terms that the said applicant believes the rejection of his application to have been improper.

All cases which have been acted on by the board of examiners-in-chief may be brought before the Commissioner in person, upon a written request to that effect, and upon the payment of the fee required by law. A decision deliberately made and approved by one Commissioner will not be disturbed by his successor.

[The official fee for an appeal from the Examiners-in-Chief to the Commissioner in person, is \$20. A further ap-

peal may be taken from the decision of the Commissioner to the U. S. Court of the District of Columbia. Official fee, \$25. MUNN & Co. have had much successful experience in conducting these appeals. . Charges moderate.]

The mode of appeal from the decision of the office to the Supreme Court of the District of Columbia is by giving written notice thereof to the Commissioner, filing in the Patent Office, within such time as the Commissioner shall appoint, reasons of appeal, and paying to him the sum of twenty-five dollars.

### *Of Interferences.*

When each of two or more persons claims to be the first inventor of the same thing, an "interference" is declared between them, and a trial is had before the Commissioner. Nor does the fact that one of the parties has already obtained a patent prevent such an interference; for, although the Commissioner has no power to cancel a patent already issued, he may, if he finds that another person was the prior inventor, give him also a patent, and thus place them on an equal footing before the courts and the public.

When an application is found to conflict with a caveat, the caveator is allowed a period of three months within which to present an application, when an interference may be declared.

In cases of interference, patentees have the same remedies by appeal as applicants in pending applications.

In contested cases, whether of interference or of extension, parties may have access to the testimony on file, prior to the hearing, in presence of the officer in charge; or, when practicable, copies may be obtained by them at the usual charges.

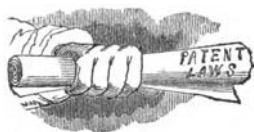
Upon the declaration of an interference, a day will be fixed for closing the testimony, and a further day fixed for the hearing of the cause. The arguments of counsel must be in the office on the day of hearing.

If either party wishes a postponement, either of the day for closing the testimony or of the day of hearing, he must, before the day he thus seeks to postpone is past, show by affidavit a sufficient reason for such postponement.

When an interference has been declared between two or more parties, and testimony has been taken by either of them, it will not be dissolved to admit a subsequent applicant; but when an interference is pending, and a new application claiming the invention in controversy comes into the Office before any ruling shall have been taken, the interference will be dissolved and a new one declared, which shall embrace all the claimants to the same invention.

[The management of Interferences is one of the most important duties in connection with Patent Office business. Our terms for attention to Interferences are moderate, and dependent upon the time required. Address all letters to MUNN & Co., No. 37 Park Row, New-York.]

#### *Of Reissues.*



A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when by reason of an insufficient or defective specification the original patent is invalid, provided the

error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

An assignee or assignees making application for a reissue must own the entire interest in the patent, and must specify the date of the assignment.

The general rule is, that whatever is really embraced in the original invention, and so described or shown that it might have been embraced in the original patent, may be the subject of a reissue.

Reissued patents expire at the same time that the original patent would have done. For this reason, applications for reissue will be acted upon immediately after they are completed.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application, by paying the required fee in each case, and complying with the other requirements of the law, as in original applications.

Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts.

One or more divisions of a reissue may be granted, though other divisions shall have been postponed or rejected.

In all cases of applications for reissues, the original claim is subject to reexamination, and may be revised and restricted in the same manner as in original applications.

But in all such cases, after the action of the Patent Office has been made known to the applicant, if he prefers the patent originally granted to that which will be allowed by the decision of the Office, he has the privilege of abandoning the latter and retaining the old patent.

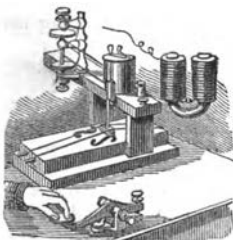
[The documents required for a Reissue are a Statement, Petition, Oath, Specification, Drawings. The official fee is \$30. Our charge, in simple cases, is \$25 for preparing and attending to the case. Total ordinary expense, \$55. Reissues may be applied for by the owners of the patent.

By means of Reissue, a patent may sometimes be divided into several separate patents. Many of the most valuable patents have been several times reissued and subdivided. Where a patent is infringed and the claims are doubtful or defective, it is common to apply for a Reissue with new claims which shall specially meet the infringers.

On making application for Reissue, the old or original patent must be surrendered to the Patent Office, in order that a new patent may be issued in its place. If the original patent has been lost, a certified copy of the patent must be furnished, with affidavit as to the loss. To enable us to prepare a Reissue, the applicant should send to us the original patent, remit as stated, and give a clear statement of the points which he wishes to have corrected. We can then immediately proceed with the case. Address MUNN & Co., 37 Park Row, New-York. We have had great experience in obtaining Reissues.]

#### *Of Disclaimers.*

Where, by inadvertence, accident, or mistake, the original patent is too broad, a disclaimer may be filed either by the original patentee or by any of his assignees.

*Of Extensions.*

The applicant for an extension must file his petition and pay in the requisite fee at least ninety days prior to the expiration of his patent. There is no power in the Patent Office to renew a patent after it has once expired.

The questions which arise on each application for an extension are :

1. Is the invention *novel* ?
2. Is it *useful* ?
3. Is it *valuable* and *important* to the public ?
4. Has the inventor been *adequately remunerated* for his time and expense in originating and perfecting it ?
5. Has he used due diligence in introducing his invention into general use ?

The first two questions will be determined upon the result of an examination in the Patent Office ; as will also the third, to some extent.

To enable the Commissioner to come to a correct conclusion in regard to the third point of inquiry, the applicant should, if possible, procure the testimony of persons disinterested in the invention, which testimony should be taken under oath.

In regard to the fourth and fifth points of inquiry, in addition to his own oath showing his receipts and expenditures on account of the invention, by which its value is to be ascertained, the applicant should show, by the testimony of witnesses on oath, that he has taken all reasonable measures to introduce his invention into general use ; and that, without default or neglect on his part, he has failed to obtain from the use and sale of the invention a reasonable remuneration for the time, ingenuity, and expense bestowed on the same, and the introduction thereof into use.

In case of opposition by any person to the extension of a patent, both parties may take testimony, each giving rea-

sonable notice to the other of the time and place of taking said testimony, which shall be taken according to the rules prescribed by the Commissioner of Patents in cases of interference.

All arguments submitted must be in writing.

[NOTE.—Only patents issued prior to March 4, 1861, can be extended.

Many valuable patents are annually expiring which might readily be extended, and, if extended, might prove the source of wealth to their fortunate possessors.

All the documents connected with extensions require to be carefully drawn up and attended to, as any failure, discrepancy, or untruth in the proceedings or papers is liable to defeat the application.

In case of the decease of the inventor, his administrator may apply for and receive the extension; but no extension can be applied for or granted to an assignee of an inventor. Parties desiring extensions will address MUNN & Co., 37 Park Row, N. Y.]

#### *Of Foreign Patents.*

The taking out of a patent in a foreign country does not prejudice a patent previously obtained here; nor does it prevent obtaining a patent here subsequently.

When the patent is granted here, after being obtained abroad, it will extend only seventeen years from the date of the foreign patent.

#### *Of Assignments and Grants.*

The assignee of any invention may have the patent issue to him directly; but this is held to apply only to assignees of entire interests.

Although when the inventor assigns his *entire* interest to two or more, a patent will issue to them jointly, still, if he yet retain a portion in himself, a joint patent will not be issued to him and them; the inventor, however, may make himself an assignee of a part interest of his invention.

An inventor can assign his entire right before a patent is obtained, so as to enable the assignee to take out a patent in his own name; but the assignment must first be recorded and the specification sworn to by the inventor.

After a patent is obtained, the patentee may grant the right to make or use the thing patented in any specified portion of the United States.

Every assignment or grant should be recorded within three months from its date; but if recorded after that time, it will protect the assignee or grantee against any one purchasing after the assignment or grant is placed on record.

When the patent is to issue in the name of the assignee, the entire correspondence should be in his name.

The receipt of assignments is not generally acknowledged by the office. They will be recorded in their turn within a few days after their reception, and then transmitted to persons entitled to them. A five-cent stamp, cancelled, is required on every assignment, and on every oath and every certificate attached thereto.

*Form of Assignment of the entire Interest in Letters Patent before obtaining the same, and to be recorded preparatory thereto.*

Whereas I, Jethro Wood, of Scipio, in the county of Cayuga, and State of New-York, have invented certain new and useful improvements in ploughs, for which I am about to make application for letters patent of the United States; and whereas David Peacock, of Burlington, New-Jersey, has agreed to purchase from me all the right, title, and interest which I have, or may have, in and to the said invention, in consequence of the grant of letters patent therefor, and has paid to me, the said Wood, the sum of five thousand dollars, the receipt of which is hereby acknowledged: Now this indenture witnesseth, that, for and in consideration of the said sum to me paid, I have assigned and transferred, and do hereby assign and transfer, to the said David Peacock, the full and exclusive right to all the improvements made by me, as fully set forth and described in the specification which I have prepared and executed preparatory to the obtaining of letters patent therefor. And I do hereby authorize and request the Commissioner of Patents to issue the said letters patent to the said David Peacock, as the assignee of my whole right and title thereto, for the



sole use and behoof of the said David Peacock and his legal representatives.

In testimony whereof, I have hereunto set my hand and affixed my seal this 16th day of February, 1856.

JETHRO WOOD. [SEAL.]

Sealed and delivered in presence of—

GEORGE CLYMER,  
DAVID RITTENHOUSE.

*Form of a Grant of a Partial Right in a Patent.*

Whereas I, Jethro Wood, of Scipio, in the county of Cayuga, and State of New-York, did obtain letters patent of the United States for certain improvements in ploughs, which letters patent bear date the 1st day of March, 1855; and whereas David Peacock, of Burlington, New-Jersey, is desirous of acquiring an interest therein: Now this indenture witnesseth, that for and in consideration of the sum of two thousand dollars, to me in hand paid, the receipt of which is hereby acknowledged, I have granted, sold, and set over, and do hereby grant, sell, and set over, unto the said David Peacock, all the right, title, and interest which I have in the said invention, as secured to me by said letters patent, for, to, and in the several States of New-York, New-Jersey, and Pennsylvania, and in no other place or places; the same to be held and enjoyed by the said David Peacock, for his own use and behoof, and for the use and behoof of his legal representatives, to the full end of the term for which said letters patent are granted, (if it is intended to grant for any extended term, then add—and for the term of any extension thereof,) as fully and entirely as the same would have been held and enjoyed by me had this grant and sale not been made.

In testimony whereof, I hereunto set my hand and affix my seal this sixteenth day of February, 1856.

JETHRO WOOD. [SEAL.]

Sealed and delivered in presence of—

JACOB PERKINS,  
BENJAMIN FRANKLIN.

[Records of the title or ownership in patents are kept at Washington. Persons who wish to have searches made should address MUNN & Co., 37 Park Row. See "Other Information," page 7.]

### *Stamps.*

Revenue stamps must be attached as follows :

A stamp of the value of *fifty cents* is required upon each power of attorney authorizing an attorney or agent to transact business with this office relative to an application for a patent.

No assignment directing a patent to issue to an assignee or assignees will be recognized by the Patent Office unless every sheet or piece of paper upon which such an assignment shall be written shall have affixed thereto a stamp of the value of *five cents*.

A stamp of the value of five cents is required upon each certificate of a magistrate.

### *Rules of Correspondence.*

All correspondence must be in the name of the Commissioner of Patents ; and all letters and other communications intended for the office must be addressed to him. If addressed to any of the other officers, they will not be noticed, unless it should be seen that the mistake was owing to inadvertence. A separate letter should in every case be written in relation to each distinct subject of inquiry or application, the subject of the invention and the date of filing being always carefully noted.

When an agent has filed his power of attorney, duly executed, the correspondence will, in ordinary cases, be held with him only. A double correspondence with him and his principal, if generally allowed, would largely enhance the labor of the office. For the same reason, the assignee of the entire interest in an invention is alone entitled to hold correspondence with the Office, to the exclusion of the inventor. If the principal becomes dissatisfied, he must revoke his power of attorney, and notify the Office, which will then communicate with him.

*Of the Filing and Preservation of Papers.*

All claims and specifications filed in the office (including amendments) must be written in a fair, legible hand, without interlineations or erasures, except such as are clearly stated in a marginal or foot-note written on the same sheet of paper ; or, failing in which, the office may require them to be printed.

All papers filed in the office will be regarded as permanent records of the office, and must never, on any account, be changed, further than to correct mere clerical mistakes.

*Of giving or withholding Information.*

Aside from the caveats, which are required by law to be kept secret, all pending applications are, as far as practicable, preserved in like secrecy. No information will therefore be given those inquiring whether any particular case is before the office, or whether any particular person has applied for a patent.

But if a party whose application has been rejected allows the matter to rest for two years without taking any further steps therein, he will be regarded as having abandoned his application, so far at least that it will no longer be protected by any rule of secrecy. The specification, drawings, and model will then be subject to inspection in the same manner as those of patented or withdrawn applications.

Information in relation to pending cases is given so far as it becomes necessary in conducting the business of the Office, but no further. Thus, when an interference is declared between two pending applications, each of the contestants is entitled to a knowledge of so much of his antagonist's case as to enable him to conduct his own understandingly.

Where the rejection of an application is founded upon another case previously rejected, but not withdrawn or abandoned, the rejected applicant will be furnished with all information in relation to the previously rejected case which is necessary for the proper understanding and management of his own.


When an applicant claims a certain device, and the same device is found *described* but not *claimed* in another pending application which was previously filed, information of the

filing of such second application is always given to the prior applicant, with a suggestion that if he desires to claim a patent for that device, he should forthwith modify his specification accordingly.

But where the application, which thus describes a device without claiming it, is subsequent in date to that wherein such device is claimed, the general rule is, that no notice of the claim in the previous application is given to the subsequent applicant. But where there are any special reasons to doubt whether the prior applicant is really the inventor of the device claimed, or where there are any other peculiar and sufficient reasons for departing from the rule above stated, the Office reserves to itself the right of so doing without its being regarded as a departure from the established rule.

The Office cannot respond to inquiries as to the novelty of an alleged invention, in advance of an application for a patent, nor to inquiries founded upon brief and imperfect descriptions propounded with a view of ascertaining whether such alleged improvements have been patented, and if so, to whom; nor can it act as an expounder of the patent law, nor as counsellor for individuals.

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 The reader will bear in mind that the foregoing are the official rules for doing business at the Patent Office.

Inquiries as to the novelty of inventions may be addressed to **MUNN & Co.**, 37 Park Row, N. Y. See pages 5 and 6.

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Base all your actions upon a principle of right; preserve your integrity of character, and in doing this never reckon on the cost.

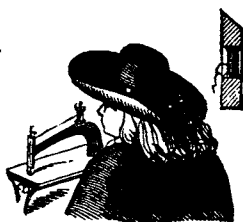
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THE world estimates men by their success in life, and, by general consent, success is evidence of superiority.

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Arsenic volatilizes before it fuses, and antimony melts a little below redness. Professor Draper thinks he has shown that all substances become red at the same point—1005 degrees Fahrenheit.

MODELS.



It is always better for inventors to have their models constructed under their own supervision, even at an increased cost in money or time. During the making of the model, the inventor often perceives points where important changes can be made, or where the invention may be rendered more perfect than was at first con-

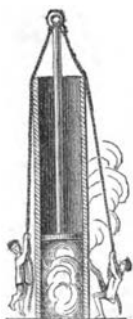
templated. But in some instances, owing to residence in distant parts or other causes, it is impossible for the inventor to furnish a model. In such cases, we (MUNN & Co.) can have proper models built by experienced and trusty makers, at moderate charges.

TRACING PAPER.

OPEN a quire of double crown tissue-paper, and brush the first sheet with a mixture of mastic varnish and oil of turpentine, equal parts; proceed with each sheet similarly, and dry them on lines by hanging them up singly. As the process goes on, the under sheets absorb a portion of the varnish, and require less than if single sheets were brushed separately. The inventor of this varnish for tracing-paper received a medal and premium from the Royal Society. It leaves the paper quite light and transparent, it may readily be written on, and drawings traced with a pen are permanently visible. Used by learners to draw out lines. The paper is placed on the drawing, which is clearly seen, and an outline is made, taking care to hold the tracing-paper steady. In this way, elaborate drawings are easily copied.

ALCOHOL has more than double the expansive force of water of the same temperature. The steam of alcohol at  $174^{\circ}$  is equal to that of water at  $212^{\circ}$ . When proper means can be invented for saving the fluid from being lost, it is supposed that alcohol can be employed with advantage as the moving power for engines.

## VOICE OF THE PEOPLE.



WE might fill several volumes with flattering testimonials from all parts of the world, certifying to the great value of *THE SCIENTIFIC AMERICAN*, but the limits of this little book only permit us to make a few selections. Read the following :

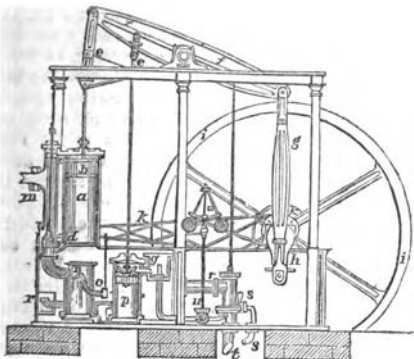
MESSRS. EDITORS: Since I had the pleasure of receiving the back numbers of your interesting and instructive journal, I have shown specimens to several influential manufacturers and intelligent mechanics in this vicinity. One man told me that he had *twice* obtained five dollars for a *single* *re-  
cipe* that he copied out of *THE SCIENTIFIC AMERICAN*, which he has taken regularly for several years ; and I presume this is not an isolated case, by many hundreds. It is just such journals as yours that are annually condensed into encyclopedias, the compilers of which roughly scoop off the cream of all the new discoveries in science and art that have been recorded in the columns of various periodicals during the year ; but the facts set forth in such annual works are often so mutilated or distorted in the condensation, and so meagre in outline, as to be practically of no value. Every mechanic and farmer in the land should subscribe for *THE SCIENTIFIC AMERICAN*, not only for his own benefit, but also that of his children ; he may have a Franklin or a Fulton, a West or a Watt, in that little marble-player whom he pets in his leisure hours ; and the natural bias of the child's mind toward mechanical or agricultural pursuits requires to be confirmed or further developed by intellectual nourishment of such a quality and quantity as can be derived only from a journal like your own.

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Never make money at the expense of your reputation.  
Say but little—think much and do more.  
Avoid borrowing and lending.

## THE STEAM-ENGINE.

EVERY mechanic and inventor should make himself generally familiar with the construction and operation of the steam-engine. To assist them in gaining this knowledge, we subjoin for reference a diagram of the common Condensing Engine, with letters of reference to the names of the various parts :



*a*, steam cylinder ; *b*, piston ; *c*, upper steam port or passage ; *d*, lower steam port ; *e e*, parallel motion ; *f f*, beam ; *g*, connecting rod ; *h*, crank ; *i i*, fly-wheel ; *k k*, eccentric and its rod for working the steam-valve ; *l*, steam-valve and casing ; *m*, throttle-valve ; *n*, condenser ; *o*, injection-cock ; *p*, air-pump ; *q*, hot well ; *r*, shifting-valve to create vacuum in condenser previous to starting the engine ; *s*, feed-pump to supply boilers ; *t*, cold-water pump to supply condenser ; *u*, governor. A study of the above diagram and description, in connection with attentive observation of engines in motion, will be of much assistance in acquiring a general understanding of the machine. We recommend the follow-

ing standard works for careful study by all who desire to become thoroughly posted: Bourne's Catechism of the Steam-Engine, Main & Brown's Marine Steam-Engine.

[From The Scientific American.]

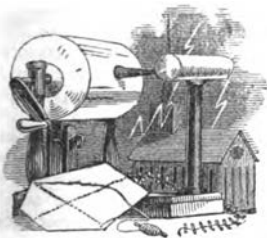
### A HINT TO LETTER-WRITING BORES.



WE consider, as a general thing, that our correspondents are a fair and high-minded set of men, such as we are most happy to accommodate by answering, so far as it is in our power, all their inquiries; but there are a few of whom we can very justly complain. They put to us all sorts of questions, to answer which might require a half-day of our valuable time; and if we snub them off with a short answer, they are likely to reply back in complaining terms. It cannot be reasonably expected of us, that we shall spend our time in such—to us—profitless letter-writing. We mean to be accommodating, but cannot consent to waste all our time in getting information for correspondents who seem not to know how to appreciate either our forbearance or the value of our time. As an example of what we mean, we have a case before us. A correspondent wants us to hunt through our files for a notice of some book which appeared in THE SCIENTIFIC AMERICAN some years ago, and to help him to find the book. He also wants us to find for him an English book which we do not believe can be had in this market. Another correspondent wants us to send to England without delay to get something which would require time and money to procure for him, but in regard to which he don't even inclose a three-cent stamp to pre-pay our letter. Another incloses three cents, and wants a calculation made which would cost us two hours' hard study. It is well enough for such correspondents to know that our time is worth to us more than a cent and a half per hour. Treat us fairly, and you will have no cause of complaint.



## VOICE OF THE PRESS.



In examining the pages of our journal, we find them so covered with brilliant gems of commendation that it is difficult to select one which is more sparkling than another. We therefore take the following at random:

"The distinction achieved by the world-renowned firm of Munn & Co., as Solicitors of Patents, is alike *deserved* and commanding—deserved, because they have spared no effort nor expense since they entered upon their responsible vocation—commanding, because it is a distinction supported and upheld by all the scientific appliances within the reach of modern enterprise, and carries along with it a *prestige* which we in vain look for in the history of any similar firm. To the scores of inventors who are to be met with in this State—and especially to those among them whose diffidence may have hitherto restrained them from giving their discoveries to the world—we would say, by all means consult the firm of Messrs. Munn & Co., 37 Park Row, New-York, confident, as we feel, that by so doing (should your inventions possess merit) you will not only put yourself in the way of securing a patent for the same, but at the same time reap the satisfaction of knowing that you have committed your claims to hands emphatically qualified successfully to carry them out. We have deemed it a *duty*, in this mode, to 'say our say' in regard to an Agency which, while, we trust, it has been able to make its highly important business *pay*, has, at the same time, nobly upheld the true principles of scientific investigation, scorning to make the latter in the least degree subservient to merely pecuniary considerations."—*Rahway (N. J.) Times and Register*.

A CUBIC foot of air weighs 523 grains—a little more than an ounce. A cubic foot of water weighs 1000 ounces.

## FOREIGN PATENTS.



AMERICAN INVENTORS should bear in mind that, as a general rule, any invention which is valuable to the patentee in this country, is worth equally as much in England and some other foreign countries. Four patents—American, English, French, and Belgian—will secure an inventor exclusive monopoly to his discovery among *one hundred millions* of the most intelligent people in the world. The facilities of business and steam communication are such, that patents can be obtained abroad by our citizens almost as easily as at home.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of the specifications and drawings. A variety of small tax duties and other fees must be paid; many official formalities are also to be observed in obtaining foreign patents. It is therefore important that the applicant should place his business in the hands of established and reliable agents.

For the past twenty years, the majority of all patents taken out by Americans in foreign countries have been obtained through MUNN & Co.'s SCIENTIFIC AMERICAN PATENT AGENCY, and nearly all of this foreign patent business is still done by us. Our experience and success in this branch is very great.

The following summary will give a general idea of the expenses and duration of European Patents:

*Great Britain.*—Patents are granted for fourteen years to any person who is the inventor or the first importer. If a patent has been previously obtained in any other country, the British patent expires with it. The British patent extends over Great Britain and Ireland, but does not include

the Colonies. Separate patents are issued by the Colonies. The cost of a British patent is generally about \$350, of which \$100, for Provisional Protection, are payable at the time of making application, and the remainder in four months. Three years from the date of the patent a further sum of £50 must be paid, and a final sum of £100 at the end of seven years.

British Patents for designs, having reference to articles of utility, intended to protect the shape or configuration of the article, are granted for three years; expense, \$100.

*France.*—Term of the patent, fifteen years. Annual fees, \$20. Total expenses of obtaining, about \$150.

*Belgium.*—Term of the patent, twenty years. Small annual fees. Expense of obtaining, about \$150.

EXPENSE OF FOREIGN PATENTS — INCLUSIVE OF ALL FEES.

Austria, .....	\$250	Italy, .....	\$200
Australia, .....	250	Kingdom Two Sicilies, .....	200
Bavaria, .....	150	Netherlands, .....	150
Belgium, .....	150	Poland, .....	150
Brazil, .....	250	Portugal, .....	150
British West-Indies, .....	250	Prussia, .....	200
France, .....	150	Russia, .....	500
Great Britain, .....	850	Saxony, .....	100
Holland, .....	150	Spain, .....	400
Spain, .....	400	Sweden, .....	300

Parties intending to secure patents abroad will please address MUNN & Co., 37 Park Row, New-York, and obtain their *pamphlet* (free) relating exclusively to Foreign Patents.

CAUTION.—Pay no attention to the solicitation of foreign agents of unknown responsibility, who send circulars to parties whose names they copy from the patent lists of THE SCIENTIFIC AMERICAN.

CLEAR, dry, cold air contains more oxygen, is more bracing to the human system, and is heavier than moist air. People are accustomed to say that the air on damp days feels heavy; but the truth is, the air is lighter, and therefore the blood is less oxydized, and the feelings consequently depressed.

## HOW TO SELL PATENTS.



IN the prefatory portion of this little work, we have presented hints upon the general success of inventors, and the great value of even the simplest inventions. But it must not be supposed, because a patent is granted, that the world will run after an unknown man to buy from him an unknown patent. In order to sell a patent, judicious effort is required on the part of the inventor or his agent. Indeed, his final success will depend, to a considerable extent, upon his business tact and energy. He should make himself thoroughly conversant with the merits of his invention, and should prepare specimens or model machines thereof, made in the most perfect manner, so as readily to exhibit the operations of the improvement to others.

After obtaining a patent, the first grand requisite in effecting its sale is to make the merits and importance of the improvement *publicly known*. This may be done in various ways: by advertisements in newspapers, by cards, circulars, pamphlets, etc., by local and travelling agents. Some persons appoint agents in each town or county, giving them a liberal portion of the net proceeds for the sale of rights, or a handsome per cent upon the receipts for machines sold. In estimating the value of patent rights for different States, counties, etc., one very common method is to fix the price with reference to the amount of population.

One of the most comprehensive and powerful methods of bringing the merits of an invention before the public, is to have it noticed and engraved in *THE SCIENTIFIC AMERICAN*. This paper, published weekly, has a large circulation. It is seen by probably not less than one or two hundred thousand readers, who comprise all of the most intelligent persons of scientific and mechanical acquirements in the country. The fact of publication in *THE SCIENTIFIC AMER-*

ICAN is a passport to their attention and favor. It is upon the judgment and advice of scientific and mechanical persons that the purchasers of patent rights and new inventions are apt to rely. "Yes, that is a good invention. It has been well illustrated in THE SCIENTIFIC AMERICAN, and I fully understand its construction. I advise you to purchase the right." We suppose that more patents are sold upon such advice than by all other agencies and means put together.

To assist the sale, it is always advisable to have the patent taken out through the SCIENTIFIC AMERICAN AGENCY. The study necessary to the preparation of the specification and drawings familiarizes our minds with the merits of the invention, and as all worthy inventions patented by us are noticed in THE SCIENTIFIC AMERICAN, we are enabled to speak of them with some degree of authority.

We keep artists constantly employed in preparing engravings for THE SCIENTIFIC AMERICAN. All our engravings are original. We never print old cuts. Parties who desire to have engravings inserted in THE SCIENTIFIC AMERICAN will please address MUNN & Co., 37 Park Row, New-York. After publication, the engravings will be returned to the owner, who can then use them for other papers, circulars, etc.

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### AGENTS TO SELL.

WE are often asked to give the names of parties who make it a business to sell patents. We are rarely enabled to do so. Such concerns are generally quite fugitive in their character. An office is opened, signs displayed, a few customers engaged, and then suddenly the shop is closed. The truth is, that the profit upon the sales of a single good patent is equivalent to a fortune, and the business it furnishes is enough to fully engage the attention of many persons. Our advice to patentees is: Take hold of the business of selling yourselves. If you want assistance, search for agents among your friends, and interest them specially in your invention.

### ROYALTY.

ONE very profitable source of income from patents is *royalty*. This, in effect, involves a sort of contract between a patentee and a manufacturer, by which the latter, in consideration of license to make the thing, agrees to pay to the patentee a specified sum upon each article when sold. The patentee of the chimney-spring, now so commonly used to fasten chimneys upon lamps, was accustomed to grant licenses to manufacturers on receiving a royalty of a few cents per dozen. His income was at one time reported to be fifty thousand dollars a year from this source. Howe, the inventor of the sewing-machine, is said to receive a royalty of from five to ten dollars on each machine, and his annual income has been estimated at five hundred thousand dollars. We might give many examples of success. The license and royalty plan is oftentimes the most profitable method of employing patents.



A CIRCLE is the most capacious of all plain figures, or contains the greatest area within the same outline or perimeter.

To find the circumference of a circle, multiply the diameter by 3.1416, and the product will be the circumference.

To find the diameter of a circle, divide the circumference by 3.1416, and the quotient will be the diam-

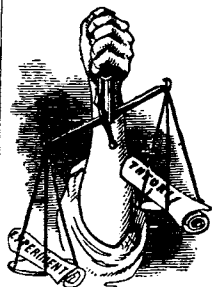
eter.

Any circle whose diameter is double that of another, contains four times the area of the other.

Some employers think themselves entitled to the ownership of all inventions made by their workmen. But this is not so. Employers have no claim to the inventions of their workmen unless it can be shown that the latter was specially employed to bring out such inventions.

[From The Scientific American.]

## PATENTS ON SMALL THINGS.



AN English firm has lately patented a peculiar shape for candle-ends. By making them conical, or tapering, they will fit any candle-stick without being papered or tinkered up in other ways. Now, a very small royalty on each pound of candles will give a large annual revenue to the inventors, and the pecuniary value of their idea is seen at once. Similar instances might be given from cases at home, where inventors have originated some simple article in daily use and secured it, they have received large rewards. "Despise not the day of small things," says the proverb, and we may say, in addition, deride no idea as useless that tends to advance the arts and sciences, merely because it seems simple.

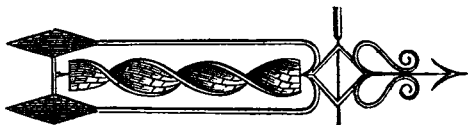
A very great misconception prevails in the minds of many persons in respect to patents. They are regarded chiefly as stepping-stones to fame or passports to future notoriety. This is a huge delusion. An invention is first and principally an investment, just as an artist's picture, although an inspiration, is a commercial venture. The glory and renown attaching to either picture or invention is the afterpart, the dessert to the solid feast on dollars and cents. The natural result of the mistake alluded to is to lead persons to underrate the value of their ideas. It is not at all uncommon to hear individuals exclaim, "What! get a patent on that thing!" in alluding to some little affair that can be carried in the pocket. That very despised "thing" will doubtless be the foundation of a good fortune, as many a similar article has been before it.

The improvement in some art or manufacture suggests itself to an individual, and he straightway applies it to his own use with very great advantage. Now, what shall he do? Patent it and secure the fruit of his genius to him-

self, or give it to the world without price? The business man would say the former; because if notoriety be the object, great patents confer not only means, but distinction, and where the first is attained, the second follows.

[From The Scientific American.]

### A SPARKLING VANE.



A VERY curious and elegant vane for buildings may be made by placing in the centre a spiral or twisted spindle, as shown in the above cut. This spindle should be hung on delicate pivots, and the spaces between the spiral flanches nearly covered with small pieces of looking-glass or thin pieces of mica. The least breeze will put it in motion, and as the reflectors will assume every possible position, several of them will be sure to present the reflection of the sun at every revolution, from whatever point it may be viewed, thus producing a constant and very brilliant sparkling.

### ELECTRICAL CONDUCTING POWER OF METALS.

THE effect of the electrical discharge on metallic bodies is to raise their temperature to a less or greater degree, according to their conducting power. The best conductors are silver and copper; the poorest, lead; as will be seen from the subjoined table:

	Heat evolved.	Conducting Power.
Silver,.....	6.....	120
Copper,.....	6.....	120
Gold,.....	9.....	80
Zinc,.....	18.....	40
Platinum,.....	30.....	24
Iron,.....	30.....	24
Tin,.....	36.....	20
Lead,.....	72.....	12



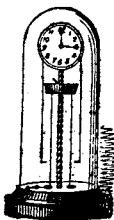
[From The Scientific American.]

### IMPORTANT TO INVENTORS.

THE United States Patent Office at Washington contains nearly 50,000 models pertaining to patented inventions, all of which are open to public inspection and examination, together with the drawings and specifications relating thereto. But the distance of the Capital and the time and expense involved in a journey thither deter, in fact, the majority of inventors from reaping the advantages which a personal examination of previously patented inventions might oftentimes give them. To obviate this difficulty we (Munn & Co.) are in the habit of making these examinations at the Patent Office for inventors. When it is desired to ascertain definitely whether an invention, believed to be new, has been previously made, or to what extent, if any, it has been anticipated, the applicant sends to us a rough sketch and description of the device. We then make a thorough examination in the Patent Office at Washington, and report the result to the applicant. The charge for this service is only \$5, and it is frequently the means of saving the applicant the entire expense of preparing a model, paying Government fees, etc., by revealing the fact that the whole or material portion of his improvement was previously known. This preliminary examination is sometimes also of importance in assisting to properly prepare the papers, so as to avoid conflicting with other inventions in the same class. The reader should carefully note the distinction made between this preliminary examination at the Patent Office and the examination and opinion given at our office, either orally or by letter, for which no fee is expected. It is only when a special search is made at the Patent Office that the fee of \$5 is required. We are able, in a vast number of cases submitted to us, to decide the question of patentability without this special search. See page 6 of this little work.

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WHEN the air is exhausted from a pump-tube, (usually done by means of a piston,) the pressure of the atmosphere will cause the water to rise in the tube to a height of thirty feet.



"THE SCIENTIFIC AMERICAN.—We are sure that if a few words of seasonable commendation should induce any of that large class of intelligent readers who can appreciate true merit, to subscribe for this excellent publication, we shall be abundantly rewarded in the conviction of having earned their gratitude. It is only recently that we have looked into its columns with any degree of regularity, and we take an early opportunity to express the extreme satisfaction and interest which we have experienced in doing so. To condense our idea of its most valuable characteristic into one sentence, we consider THE SCIENTIFIC AMERICAN as embodying the highest function of all science, namely, its application to the practical, every-day concerns of life, in clear, pure, agreeable language. It will prove a pleasant guest and a useful companion at any fireside it may enter."—*Watchman, Greenport, L. I.*

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THE SCIENTIFIC AMERICAN ought to be taken, read, and studied by every intelligent man, young or old, worker or idler, rich or poor, in the country. It commends itself to every one, and is useful and interesting to all. The most scientific may learn from it, and the unscientific understand it. It has a peculiar charm about it that interests and affects every person with a grain of sense in his head. We are in the habit of sending our copy, after a thorough perusal, to the army, and the friend who receives it writes us, that he likes it better than any other paper; that it is longingly waited for, and eagerly read by his comrades, and never ceases its circulation until so bethumbed that its columns are no longer readable.—*Westchester County Journal.*

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Remember that, by subscribing to THE SCIENTIFIC AMERICAN, you receive, in the course of the year, an amount of reading matter nearly equal to *four thousand ordinary book pages.*

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THE light of lightning and its reflections, will penetrate from 150 to 200 miles.

## HORSE-POWER.

WHEN Watt began to introduce his steam-engines he wished to be able to state their power as compared with that of horses, which were then generally employed for driving mills. He accordingly made a series of experiments, which led him to the conclusion that the average power of a horse was sufficient to raise about 33,000 lbs. one foot in vertical height per minute, and this has been adopted in England and this country as the general measure of power.

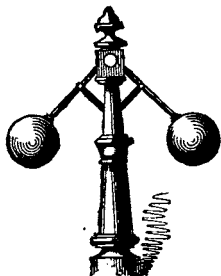
A waterfall has one horse-power for every 33,000 lbs. of water flowing in the stream per minute, for each foot of fall. To compute the power of a stream, therefore, multiply the area of its cross section in feet by the velocity in feet per minute, and we have the number of cubic feet flowing along the stream per minute. Multiply this by  $62\frac{1}{2}$ , the number of pounds in a cubic foot of water, and this by the vertical fall in feet, and we have the foot-pounds per minute of the fall; dividing by 33,000 gives us the horse-power.

For example: A stream flows through a flume 10 feet wide, and the depth of the water is 4 feet; the area of the cross section will be 40 feet. The velocity is 150 feet per minute— $40 \times 150 = 6000$ —the cubic feet of water flowing per minute.  $6000 \times 62\frac{1}{2} = 375,000$ —the pounds of water flowing per minute. The fall is 10 feet;  $10 \times 375,000 = 3,750,000$ —the foot-pounds of the water-fall. Divide 3,750,000 by 33,000, and we have  $113\frac{1}{3}$  as the horse-power of the fall.

The power of a steam-engine is calculated by multiplying together the area of the piston in inches, the mean pressure in pounds per square inch, the length of the stroke in feet, and the number of strokes per minute; and dividing by 33,000.

Water-wheels yield from 50 to 91 per cent of the water. The actual power of a steam-engine is less than the indicated power, owing to a loss from friction; the amount of this loss varies with the arrangement of the engine and the perfection of the workmanship.

### ZUR BEACHTUNG FÜR DEUTSCHE ER- FINDER.



Die Unterzeichneten haben eine Anleitung herausgegeben, welche anzeigt was zu befolgen ist um ein Patent zu sichern, und selbige wird auf portofreie Anfrage gratis abgegeben.

Nach dem neuen Patent-Gesetz können Bürger aller Länder, mit einer einzigen Ausnahme, Patente in den Vereinigten Staaten zu denselben Bedingungen erlangen, wie die Bürger der Vereinigten Staaten selbst.

**Munn & Co.,**

No. 37 Park Row, New-York.  
Scientific American Office.

### SOMETHING TO BE REMEMBERED.

AMERICAN Patents, granted to foreigners, become invalid, if the patent is not put and continued on sale, on reasonable terms, within eighteen months from the date of the patent. Law of 1836, section 15, page 61.

### HEAT-CONDUCTING POWER OF DIFFER- ENT BODIES.

Gold,.....	1000	Tin,.....	304
Platinum,.....	981	Lead,.....	180
Silver,.....	973	Marble,.....	94
Copper,.....	898	Porcelain,.....	12
Iron,.....	874	Fire Clay,.....	11
Zinc,.....	868	Fire Brick,.....	11

### RELATIVE CONDUCTING POWER OF FLUIDS.

Mercury,.....	1000	Proof Spirit,.....	812
Water,.....	357	Alcohol, (pure,).....	293

[From the Scientific American.]

## FIELD FOR CHEMICAL INVENTION.

LESS than five per cent of all the patents issued are for chemical inventions. The first impression which this fact leaves is that the chemists are not so wide awake as the mechanics. And it seems, too, as if the chemists have the best chance, for they have the range of all the combinations, almost infinite in number, of all the sixty or more simple substances or elements, while the mechanic is limited in all his inventions to the use of only five mechanical elements. But this course of reasoning is a little unfair for the chemist, if we wish to determine his real merit as a benefactor of mankind. Thus far the introduction of new substances has been too slow and too much the result of chance. Illuminating gas was known as a chemical product for centuries before any use of it was made; iodine, chromine, chloroform, aniline, and a hundred other things, now common, were for a very long time only rare specimens on the shelves of the chemist's curiosity-shop, before they were found to be of the greatest value to men, and we cannot have a doubt that much more of the same kind of wealth is soon to be developed. May we not reasonably expect that virtues may be discovered in things now neglected, which will directly lead to the invention of arts more wonderful and more useful than photography or electro-telegraphing?

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A correspondent, writing from Buffalo, says, in speaking of the value of THE SCIENTIFIC AMERICAN to its host of readers: "I would as soon think of going without supper on Thursday night as to neglect to call at the book-store for the *Paper of papers*; and I am proud to say that I have influenced many others to 'go and do likewise.' I have my volumes complete and nicely bound from volume five; and should poverty ever compel me to sell my library, my *Bible* and my SCIENTIFIC AMERICAN should remain to grace the otherwise empty shelves."

## A WORD TO INQUIRERS.



WE frequently receive letters containing long strings of trifling questions, relative to all sorts of things, without any fee to pay us for our time in obtaining the information, nor even stamps for postage or stationery. Many of these correspondents close their letters with the comforting assurance that "I would remit for your trouble, but do not know how much to send." To relieve the consciences of all such doubters, we would recommend them to send a dollar or more, according to the value to them of the desired information. If the latter is of no value, they ought not to trouble us with their fly-tracks.

To certain other classes of inquirers the following hints may be useful: The best washing-machines, the best straw-cutters, the best churns, the best brick-machines, the best engines, the best sewing-machines, the best of every thing in the mechanical line, is advertised and illustrated in *THE SCIENTIFIC AMERICAN*, and the address of the parties having such things on sale is there given. Write directly to them for the information you want, and spare us. If you cannot at first find what you desire, read the back numbers of *THE SCIENTIFIC AMERICAN*. Do not expect us to do the work for you unless you send a small remittance.

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To find the area of an ellipsis, multiply the long diameter by the short diameter and by .7854; the product will be the area.

Never relate your misfortunes, and never grieve over what you cannot prevent.

To find the area of a circle, multiply the square of the diameter by the decimal .7854. Or multiply the circumference by the radius, and divide the product by 2.

THE  
PATENT LAWS  
OF THE  
UNITED STATES OF AMERICA.

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 THE following are the existing Laws under which American Patents are granted and supported by the courts.

To save space we omit such portions as have been repealed, or that relate to salaries of officials, and other unimportant details not pertaining to patents.

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**PATENT LAW OF 1836.**

AN ACT to promote the progress of Useful Arts, and to repeal all acts and parts of acts heretofore made for that purpose.

ESTABLISHMENT OF THE PATENT OFFICE.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:* That there shall be established and attached to the Department of State,\* an office, to be denominated the Patent Office, the chief officer of which shall be called the Commissioner of Patents, to be appointed by the President, by and with the advice and consent of the Senate, whose duty it shall be, under the direction of the Secretary of State, to superintend, execute, and perform all such acts and things touching and respecting the granting and issuing of patents for new and useful discoveries, inventions, and improvements,

\* Now attached to Department of Interior.

as are herein provided for, or shall hereafter be, by law, directed to be done and performed, and shall have charge and custody of all the books, records, papers, models, and machines, and all other things belonging to said office, \* \* \* and shall be entitled to send and receive letters and packages by mail, relating to the business of the office, free of postage.

SEC. 2. [Relates to the appointment of clerks and other officials.]

PATENT OFFICE EMPLOYEES MUST NOT BE INTERESTED IN  
PATENTS.

\* \* \* And said Commissioner, clerks, and every other person appointed and employed in said office, shall be disqualified and interdicted from acquiring or taking, except by inheritance, during the period for which they shall hold their appointments respectively, any right or interest, directly or indirectly, in any patent for an invention or discovery which has been, or may hereafter be, granted.

SEC. 3. [Relates to oaths and sureties of clerks.]

SEAL OF OFFICE, COPYING, ETC.

SEC. 4. *And be it further enacted*, That the said Commissioner shall cause a seal to be made and provided for the said office, with such devices as the President of the United States shall approve; and copies of any records, books, papers, or drawings, belonging to the said office, under the signature of the said Commissioner, or, when the office shall be vacant, under the signature of the chief clerk, with the said seal affixed, shall be competent evidence in all cases in which the original records, books, papers, or drawings could be evidence. And any person making application therefor may have certified copies of the records, drawings, and other papers deposited in said office, on paying for the written copies the sum of ten cents for every page of one hundred words; and for copies of drawings, the reasonable expenses of making the same.

RECORD OF PATENTS, ETC.

SEC. 5. *And be it further enacted*, That all patents issuing from said office shall be issued in the name of the



United States, and under the seal of said office, and be signed by the Secretary of State,\* and countersigned by the Commissioner of said office, and shall be recorded, together with the descriptions, specifications, and drawings, in the said office, in books to be kept for that purpose. Every such patent shall contain a short description or title of the invention or discovery, correctly indicating its nature and design, and in its terms grant to the applicant or applicants, his or their heirs, administrators, executors, or assigns, for a term not exceeding fourteen years, [changed to seventeen years,] the full and exclusive right and liberty of making, using, and vending to others to be used, the said invention or discovery, referring to the specifications for the particulars thereof, a copy of which shall be annexed to the patent, specifying what the patentee claims as his invention or discovery.

#### WHO MAY OBTAIN PATENTS, AND HOW.

SEC. 6. *And be it further enacted,* That any person or persons having discovered or invented any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement on any art, machine, manufacture, or composition of matter, not known or used by others before his or their discovery or invention thereof, and not at the time of his application for a patent in public use or on sale, with his consent or allowance, as the inventor or discoverer, and shall desire to obtain an exclusive property therein, may make application, in writing, to the Commissioner of Patents, expressing such desire; and the Commissioner, on due proceedings had, may grant a patent therefor. But before any inventor shall receive a patent for any such new invention or discovery, he shall deliver a written description of his invention or discovery, and of the manner and process of making, constructing, using, and compounding the same, in such full clear, and exact terms, avoiding unnecessary prolixity, as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same; and in case of

\* Secretary of the Interior. See Section Law of 1849, page 72.

any machine, he shall fully explain the principle, and the several modes in which he has contemplated the application of that principle or character by which it may be distinguished from other inventions; and shall particularly specify and point out the part, improvement, or combination which he claims as his own invention or discovery. He shall, furthermore, accompany the whole with a drawing or drawings, and written references, where the nature of the case admits of drawings; or with specimens of ingredients, and of the composition of matter, sufficient in quantity for the purpose of experiment, where the invention or discovery is of a composition of matter; which descriptions and drawings, signed by the inventor, and attested by two witnesses, shall be filed in the Patent Office; and he shall, moreover, furnish a model of his invention, in all cases which admit of a representation by model, of a convenient size to exhibit advantageously its several parts. The applicant shall make oath or affirmation that he does verily believe that he is the original and first inventor or discoverer of the art, machine, composition, or improvement for which he solicits a patent; and that he does not know or believe that the same was ever before known or used; and also of what country he is a citizen; which oath or affirmation may be made before any person authorized by law to administer oaths.

#### OFFICIAL EXAMINATIONS.

SEC. 7. *And be it further enacted,* That on the filing of any such application, description, and specification, and the payment of the duty hereinafter provided,\* the Commissioner shall make, or cause to be made, an examination of the alleged new invention or discovery; and if, on any such examination, it shall not appear to the Commissioner that the same had been invented or discovered by any other person in this country, prior to the alleged invention or discovery thereof by the applicant, or that it had been patented or described in any printed publication in this or any foreign country, or had been in public use or on sale, with the ap-

\* See Section 10, page 76.

plicant's consent or allowance, prior to the application, if the Commissioner shall deem it to be sufficiently useful and important, it shall be his duty to issue a patent therefor. But whenever, on such examination, it shall appear to the Commissioner that the applicant was not the original and first inventor or discoverer thereof, or that any part of that which is claimed as new had before been invented or discovered, or patented or described in any printed publication in this or any foreign country as aforesaid, or that the description is defective and insufficient, he shall notify the applicant thereof, giving him briefly such information and references as may be useful in judging of the propriety of renewing his application, or of altering his specification to embrace only that part of the invention or discovery which is new. \* \* \*

#### INTERFERENCES.

SEC. 8. *And be it further enacted*, That whenever an application shall be made for a patent, which, in the opinion of the Commissioner, would interfere with any other patent for which an application may be pending, or with any unexpired patent which shall have been granted, it shall be the duty of the Commissioner to give notice thereof to such applicants or patentees, as the case may be; and if either shall be dissatisfied with the decision of the Commissioner on the question of priority of right or invention, on a hearing thereof, he may appeal from such decision, on the like terms and conditions as are provided in the preceding section of this act, and the like proceedings shall be had, to determine which, or whether either, of the applicants is entitled to receive a patent as prayed for. But nothing in this act contained shall be construed to deprive an original and true inventor of the right to a patent for his invention by reason of his having previously taken out letters patent therefor in a foreign country, and the same having been published at any time within six months next preceding the filing of his specification and drawings. \* \* \*

SEC. 9. [Relates to patent fees. This section fixed the fee for American citizens at thirty dollars; subjects of Great Britain five hundred dollars, and all other persons three

hundred dollars. This was changed by the law of 1861, (see Section 10, page 76.) All persons, without distinction as to nationality, now pay thirty-five dollars, except the inhabitants of those countries that discriminate against American citizens. In Canada, an American cannot obtain patents. Hence Canadians are charged five hundred dollars for an American patent. It is expected that the Canadian law will be changed so as to remove this discrimination.]

THE HEIRS OF AN INVENTOR MAY OBTAIN A PATENT.

SEC. 10. *And be it further enacted*, That where any person hath made, or shall have made, any new invention, discovery, or improvement, on account of which a patent might by virtue of this act be granted, and such person shall die before any patent shall be granted therefor, the right of applying for and obtaining such patent shall devolve on the executor or administrator of such person, in trust for the heirs-at-law of the deceased, in case he shall have died intestate; but if otherwise, then in trust for his devisees, in as full and ample manner, and under the same conditions, limitations, and restrictions as the same was held, or might have been claimed or enjoyed, by such person in his or her lifetime; and when application for a patent shall be made by such legal representatives, the oath or affirmation provided in the 6th section of this act shall be so varied as to be applicable to them.

PATENTS MAY BE ASSIGNED.

SEC. 11. *And be it further enacted*, That every patent shall be assigned in law, either as to the whole interest or any undivided part thereof, by any instrument in writing; which assignment, and also every grant and conveyance of the exclusive right, under any patent, to make and use, and to grant to others to make and use, the thing patented within and throughout any specified part or portion of the United States, shall be recorded in the Patent Office within three months from the execution thereof. \* \* \*

## CAVEATS.

SEC. 12. *And be it further enacted*, That any citizen of the United States, or alien who shall have been a resident of the United States one year next preceding, and shall have made oath of his intention to become a citizen thereof, who shall have invented any new art, machine, or improvement thereof, and shall desire further time to mature the same, may \* \* \* file in the Patent Office a caveat setting forth the design and purpose thereof, and its principal and distinguishing characteristics, and praying protection of his right till he shall have matured his invention. \* \* \* And such caveat shall be filed in the confidential archives of the office, and preserved in secrecy. And if application shall be made by any other person, within one year from the time of filing such caveat, for a patent of any invention with which it may in any respect interfere, it shall be the duty of the Commissioner to deposit the description, specifications, drawings, and model, in the confidential archives of the office, and to give notice (by mail) to the person filing the caveat of such application, *who shall within three months* after receiving the notice, if he would avail himself of the benefit of his caveat, file his description, specifications, drawings, and model; and if, in the opinion of the Commissioner, the specifications of claim interfere with each other, like proceedings may be had in all respects as are in this act provided in the case of interfering applications; *Provided, however*, That no opinion or decision \* \* \* under the provisions of this act, shall preclude any person interested in favor of or against the validity of any patent which has been or may hereafter be granted, from the right to contest the same in any judicial court, in any action in which its validity may come in question.

## RE-ISSUES.

SEC. 13. *And be it further enacted*, That whenever any patent which has heretofore been granted, or which shall hereafter be granted, shall be inoperative or invalid, by reason of a defective or insufficient description or specification, or by reason of the patentee claiming in his specification, as his own invention, more than he had or shall have a

right to claim as new, if the error has or shall have arisen by inadvertency, accident, or mistake, and without any fraudulent or deceptive intention, it shall be lawful for the Commissioner, upon the surrender to him of such patent, \* \* \* to cause a new patent to be issued to the said inventor for the same invention, for the residue of the period then unexpired for which the original patent was granted, in accordance with the patentee's corrected description and specification.\* And in case of his death or any assignment by him made of the original patent, a similar right shall vest in his executors, administrators, or assignees. And the patent so reissued, together with the corrected description and specifications, shall have the same effect and operation in law, on the trial of all actions hereafter commenced for causes subsequently accruing, as though the same had been originally filed in such corrected form, before the issuing of the original patent.\* \* \* \*

#### SUITS AT LAW.

SEC. 14. *And be it further enacted*, That whenever, in any action for damages [for] making, using, or selling the thing whereof the exclusive right is secured by any patent heretofore granted, or by any patent which may hereafter be granted, a verdict shall be rendered for the plaintiff in such action, it shall be in the power of the court to render judgment of any sum above the amount found by such verdict as the actual damages sustained by the plaintiff, not exceeding three times the amount thereof, according to the circumstances of the case, with costs; and such damages may be recovered by action on the case, in any court of competent jurisdiction, to be brought in the name or names of the person or persons interested, whether as patentee, assignee, or as grantees of the exclusive right within and throughout a specified part of the United States.

SUITS AT LAW.—FOREIGN PATENTS INVALID IF THE INVENTION IS NOT PUT ON SALE WITHIN EIGHTEEN MONTHS FROM THE DATE OF PATENT.

SEC. 15. *And be it further enacted*, That the defendant in any such action shall be permitted to plead the general

\* See Section 5, page 65.

States, granting or confirming to inventors the exclusive right to their inventions or discoveries, shall be originally cognizable, as well in equity as at law, by the circuit courts of the United States, or any district court having the powers and jurisdiction of a circuit court; which courts shall have power, upon a bill in equity filed by any party aggrieved, in any such case, to grant injunctions according to the course and principles of courts of equity, to prevent the violation of the rights of any inventor as secured to him by any law of the United States, on such terms and conditions as said courts may deem reasonable: *Provided, however,* That from all judgments and decrees from any such court rendered in the premises, a writ of error or appeal, as the case may require, shall lie to the Supreme Court of the United States, in the same manner and under the same circumstances as is now provided by law in other judgments and decrees of circuit courts, and in all other cases in which the court shall deem it reasonable to allow the same.

#### EXTENSION OF PATENTS.

SEC. 18. *And be it further enacted,* That whenever any patentee of an invention or discovery shall desire an extension of his patent beyond the term of its limitation,\* he may make application therefor, in writing, to the Commissioner of the Patent Office, setting forth the grounds thereof; and the Commissioner shall \* \* \* cause to be published in one or more of the principal newspapers in the City of Washington, and in such other paper or papers as he may deem proper, published in the section of country most interested adversely to the extension of the patent, a notice of such application, and of the time and place when and where the same will be considered, that any person may appear and show cause why the extension should not be granted. And the Secretary of State, the Commissioner of the Patent Office, and the Solicitor of the Treasury shall constitute a board † to hear and decide upon the evidence

\* See Section 11, page 76, and Section 16, page 79.

† Repealed—See Section 1, page 71.

produced before them, both for and against the extension, and shall sit for that purpose at the time and place designated in the published notice thereof. The patentee shall furnish a statement, in writing, under oath, of the ascertained value of the invention, and of his receipts and expenditures, sufficiently in detail to exhibit a true and faithful account of loss and profit in any manner accruing to him from and by reason of said invention. And if, upon a hearing of the matter, it shall appear to the full and entire satisfaction of said [Commissioner], having due regard to the public interest therein, that it is just and proper that the term of the patent should be extended, by reason of the patentee, without neglect or fault on his part, having failed to obtain, from the use and sale of his invention, a reasonable remuneration for the time, ingenuity, and expense bestowed upon the same, and the introduction thereof into use, it shall be the duty of the Commissioner to renew and extend the patent, by making a certificate thereon of such extension, for the term of seven years from and after the expiration of the first term; \* \* \* and thereupon the said patent shall have the same effect in law as though it had been originally granted for the term of twenty-one years; and the benefit of such renewal shall extend to assignees and grantees of the right to use the thing patented, to the extent of their respective interests therein: *Provided, however,* That no extension of a patent shall be granted after the expiration of the term for which it was originally issued.

SEC. 19. [Relates to books, etc., for a library.]

SEC. 20. [Relates to the classification, and public exhibition of models, etc., in the Patent Office.]

SEC. 21. [Relates to actions and cases sued or pending under previous laws.]

Approved July 4, 1836.



## PATENT LAW OF 1837.

[Sections 1, 2, 3, 4, relate to means for obtaining new copies of the patents, records, and models, which were destroyed by the burning of the Patent Office in December, 1836. Only a small portion of the old patents and models were ever obtained under this act.]

### A PATENT MAY BE DIVIDED INTO SEVERAL SEPARATE PATENTS.

SEC. 5. *And be it further enacted*, That whenever a patent shall be returned for correction and reissue, under the thirteenth section of the act [of 1836] to which this is additional, and the patentee shall desire several patents to be issued for distinct and separate parts of the thing patented, he shall first pay, in manner and in addition to the sum provided by that act, the sum of thirty dollars for each additional patent so to be issued.

### ASSIGNMENTS, DRAWINGS, ETC.

SEC. 6. *And be it further enacted*, That any patent hereafter to be issued may be made and issued to the assignee or assignees of the inventor or discoverer, the assignment thereof being first entered of record, and the application therefor being duly made, and the specification duly sworn to by the inventor. And in all cases hereafter the applicant for a patent shall be held to furnish duplicate drawings, whenever the case admits of drawings, one of which to be deposited in the office, and the other to be annexed to the patent, and considered a part of the specification.

### DISCLAIMERS.

SEC. 7. *And be it further enacted*, That whenever any patentee shall have, through inadvertence, accident, or mistake, made his specification of claim too broad, claiming more than that of which he was the original or first inventor, some material and substantial part of the thing patented being truly and justly his own, any such patentee, his administrators, executors, and assigns, whether of the whole or of a sectional interest therein, may make disclaimer of such parts of the thing patented as the disclaimant shall not

claim to hold by virtue of the patent or assignment, stating therein the extent of his interest in such patent ; which disclaimer shall be in writing, attested by one or more witnesses, and recorded in the Patent Office, on payment by the person disclaiming, in manner as other patent duties are required by law to be paid, of the sum of ten dollars. And such disclaimer shall thereafter be taken and considered as part of the original specification, to the extent of the interest which shall be possessed in the patent or right secured thereby, by the disclaimant, and by those claiming by or under him, subsequent to the record thereof. But no such disclaimer shall affect any action pending at the time of its being filed, except so far as may relate to the question of unreasonable neglect or delay in filing the same.

#### REISSUES

SEC. 8. *And be it further enacted*, That whenever application shall be made to the Commissioner for any addition of a newly discovered improvement to be made to an existing patent, or whenever a patent shall be returned for correction and reissue, the specification of claim annexed to every such patent shall be subject to revision and restriction, in the same manner as are original applications for patents ; the Commissioner shall not add any such improvement to the patent in the one case, nor grant the reissue in the other case, until the applicant shall have entered a disclaimer, or altered his specification of claim in accordance with the decision of the Commissioner ; and in all such cases the applicant, if dissatisfied with such decision, shall have the same remedy, and be entitled to the benefit of the same privileges and proceedings as are provided by law in the case of original applications for patents. [See change as to additional improvements, law of 1861, page 75, section 9.]

#### VALIDITY OF PARTS OF THE PATENT.

SEC. 9. *And be it further enacted*, (any thing in the fifteenth section of the act to which this is additional to the contrary notwithstanding,) That whenever, by mistake, accident, or inadvertence, and without any wilful default or intent to defraud or mislead the public, any patentee shall

have, in his specification, claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was not the first and original inventor, and shall have no legal or just right to claim the same, in every such case the patent shall be deemed good and valid for so much of the invention or discovery as shall be truly and *bona fide* his own: *Provided*, It shall be a material and substantial part of the thing patented, and be definitely distinguishable from the other parts so claimed without right as aforesaid. And every such patentee, his executors, administrators, and assigns, whether of a whole or of a sectional interest therein, shall be entitled to maintain a suit at law or in equity on such patent for any infringement of such part of the invention or discovery as shall be *bona fide* his own as aforesaid, notwithstanding the specification may embrace more than he shall have any legal right to claim. But in every such case in which a judgment or verdict shall be rendered for the plaintiff, he shall not be entitled to recover costs against the defendant, unless he shall have entered at the Patent Office, prior to the commencement of the suit, a disclaimer of all that part of the thing patented which was so claimed without right: *Provided, however*, That no person bringing any such suit shall be entitled to the benefits of the provisions contained in this section who shall have unreasonably neglected or delayed to enter at the Patent Office a disclaimer as aforesaid.

SEC. 10. [Repealed. Related to model agents.]

SEC. 11. [Relates to clerks and copying.]

SEC. 12. [Relates to refunding of money in rejeected cases, which by the law of 1861, section 9, is forbidden.]

#### OATH OR AFFIRMATION.

SEC. 13. *And be it further enacted*, That in all cases in which an oath is required by this act, or by the act to which this is additional, if the person of whom it is required shall be conscientiously scrupulous of taking an oath, affirmation may be substituted therefor.

SEC. 14. [Relates to salaries and expenses of the Patent Office, Commissioner's report, etc.]

Approved March 3, 1837.

## PATENT LAW OF 1839.

SEC. 1, 2, 3, 4, 5, relate to employes at the Patent Office, expenses thereof, patent lists, and books.

FOREIGN INVENTIONS MAY BE PATENTED IF NOT PUBLICLY INTRODUCED PRIOR TO THE APPLICATION.

SEC. 6. *And be it further enacted*, That no person shall be debarred from receiving a patent for any invention or discovery, as provided in the act approved on the fourth day of July, one thousand eight hundred and thirty-six, to which this is additional, by reason of the same having been patented in a foreign country more than six months prior to his application: *Provided*, That the same shall not have been introduced into public and common use in the United States prior to the application for such patent: *And provided, also*, That in all cases every such patent shall be limited to the term of fourteen\* years from the date or publication of such foreign letters patent.

MACHINES, ETC., MADE PRIOR TO THE PATENT MAY BE CONTINUED IN USE AFTER ISSUE OF THE PATENT.

SEC. 7. *And be it further enacted*, That every person or corporation who has, or shall have, purchased or constructed any newly invented machine, manufacture, or composition of matter, prior to the application by the inventor or discoverer for a patent, shall be held to possess the right to use, and vend to others to be used, the specific machine, manufacture, or composition of matter so made or purchased, without liability therefor to the inventor, or any other person interested in such invention; and no patent shall be held to be invalid by reason of such purchase, sale, or use, prior to the application for a patent as aforesaid, except on proof of abandonment of such invention to the public, or that such purchase, sale, or prior use, has been for more than two years prior to such application for a patent.

SEC. 8. [Relates to fees for recording, since changed.]

SEC. 9. [Relates to agricultural statistics.]

\* Changed to seventeen years by the law of 1861. See page 79, section 16.

## CONTESTED CASES.

SEC. 10. *And be it further enacted,* That the provisions of the sixteenth section of the before-recited act (law of 1836) shall extend to all cases where patents are refused for any reason whatever, either by the Commissioner of Patents or by the Chief-Justice of the District of Columbia, upon appeals from the decision of said Commissioner, as well as where the same shall have been refused on account of, or by reason of, interference with a previously existing patent; and in all cases where there is no opposing party a copy of the bill shall be served upon the Commissioner of Patents, when the whole of the expenses of the proceeding shall be paid by the applicant, whether the final decision shall be in his favor or otherwise.

## APPEALS.

SEC. 11. *And be it further enacted,* That in cases where an appeal is now allowed by law from the decision of the Commissioner of Patents \* \* \* the party, \* \* \* shall have right to appeal to the Chief-Justice of the District Court of the United States for the District of Columbia, by giving notice thereof to the Commissioner, and filing in the Patent Office, within such time as the Commissioner shall appoint, his reasons of appeal, specifically set forth in writing, and also paying into the Patent Office, to the credit of the patent fund, the sum of twenty-five dollars. And it shall be the duty of said Chief-Justice, on petition, to hear and determine all such appeals, and to revise such decisions in a summary way, on the evidence produced before the Commissioner, at such early and convenient time as he may appoint, first notifying the Commissioner of the time and place of hearing, whose duty it shall be to give notice thereof to all parties who appear to be interested therein, in such manner as said judge shall prescribe. The Commissioner shall also lay before the said judge all the original papers and evidence in the case, together with the grounds of his decision, fully set forth in writing, touching all the points involved by the reasons of appeal, to which the revision shall be confined. And at the request of any party interested, or at the desire of the judge, the Commissioner

and the examiners in the Patent Office may be examined, under oath, in explanation of the principles of the machine, or other thing, for which a patent in such case is prayed for. And it shall be the duty of the said judge, after a hearing of any such case, to return all the papers to the Commissioner, with a certificate of his proceedings and decision, which shall be entered of record in the Patent Office; and such decision, so certified, shall govern the further proceedings of the Commissioner in such case: *Provided, however,* That no opinion or decision of the judge in any such case shall preclude any person interested in favor or against the validity of any patent which has been, or may hereafter be, granted, from the right to contest the same in any judicial court, in any action in which its validity may come in question.

SEC. 12. [Relates to rules in contested cases, and to examiners, but has been changed.]

SEC. 13. [Relates to fees to the justice.]

Approved March 3, 1839.

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## PATENT LAW OF 1842.

SECTION 1. [Authorizes the refunding of money paid by mistake in certain cases.]

SEC. 2. [Relates to patent records that were destroyed by fire in 1836.]

SEC. 3. [Repealed.]

### TAKING THE OATH IN FOREIGN COUNTRIES.

SEC. 4. *And be it further enacted,* That the oath required for applicants for patents may be taken, when the applicant is not, for the time being, residing in the United States, before any minister plenipotentiary, chargé d'affaires, consul, or commercial agent holding commission under the government of the United States, or before any notary public of the foreign country in which such applicant may be.

### PENALTY FOR STAMPING UNPATENTED ARTICLES.

SEC. 5. *And be it further enacted,* That if any person or persons shall paint, or print, or mould, cast, carve, or en-

issue, and to give this act and any special matter in evidence, of which notice in writing may have been given to the plaintiff or his attorney, thirty days before trial, tending to prove that the description and specification filed by the plaintiff does not contain the whole truth relative to his invention or discovery, or that it contains more than is necessary to produce the described effect; which concealment or addition shall fully appear to have been made for the purpose of deceiving the public, or that the patentee was not the original and first inventor or discoverer of the thing patented, or of a substantial and material part thereof claimed as new, or that it has been described in some public work anterior to the supposed discovery thereof by the patentee, or had been in public use or on sale with the consent and allowance of the patentee before his application for a patent, or that he had surreptitiously or unjustly obtained the patent for that which was in fact invented or discovered by another, who was using reasonable diligence in adapting and perfecting the same; or that the patentee, if an alien at the time the patent was granted, had failed and neglected, for the space of eighteen months from the date of the patent, to put and continue on sale to the public, on reasonable terms, the invention or discovery for which the patent issued; and whenever the defendant relies in his defence on the fact of a previous invention, knowledge, or use of the thing patented, he shall state, in his notice of special matters, the names and places of residence of those whom he intends to prove to have possessed a prior knowledge of the thing, and where the same had been used; in either of which cases judgment shall be rendered for the defendant with costs: *Provided, however,* That whenever it shall satisfactorily appear that the patentee, at the time of making his application for the patent, believing himself to be the first inventor or discoverer of the thing patented, the same shall not be held to be void on account of the invention or discovery, or any part thereof, having been before known or used in any foreign country; it not appearing that the same or any substantial part thereof had before been patented or described in any printed publication: *And provided, also,* That whenever the plaintiff shall fail to sustain his action on the ground that in his specification or claim is

embraced more than that of which he was the first inventor, if it shall appear that the defendant had used or violated any part of the invention justly and truly specified and claimed as new, it shall be in the power of the court to adjudge and award, as to costs, as may appear to be just and equitable.\* \* \* \*

#### PATENTS MAY BE DECLARED VOID.

SEC. 16. *And be it further enacted*, That whenever there shall be two interfering patents, or whenever a patent or application shall have been refused \* \* \* on the ground that that patent applied for would interfere with an unexpired patent previously granted, any person interested in any such patent, either by assignment or otherwise in the one case, and any such applicant in the other case, may have remedy by bill in equity; and the court having cognizance thereof, on notice to adverse parties, and other due proceedings had, may adjudge and declare either the patents void in the whole or in part, or inoperative and invalid in any particular part or portion of the United States, according to the interest which the parties to such suit may possess in the patent or the inventions patented; and may also adjudge that such applicant is entitled, according to the principles and provisions of this act, to have and receive a patent for his invention, as specified in his claim, or for any part thereof, as the fact of priority of right or invention shall, in any such case, be made to appear. And such adjudication, if it be in favor of the right of such applicant, shall authorize the Commissioner to issue such patent, on his filing a copy of the adjudication, and otherwise complying with the requisitions of this act: *Provided, however*, That no such judgment or adjudication shall affect the rights of any person, except the parties to the action, and those deriving title from or under them subsequent to the rendition of such judgment.\*

#### COURTS TO HAVE POWERS, ETC.

SEC. 17. *And be it further enacted*, That all actions, suits, controversies, and cases arising under any law of the United

\* See Section 9, page 66.



grave, or stamp upon any thing made, used, or sold by him, for the sole making or selling which he hath not, or shall not have, obtained letters patent, the name, or any imitation of the name of any other person who hath, or shall have, obtained letters patent for the sole making and vending of such thing, without consent of such patentee, or his assigns or legal representatives; or if any person, upon any such thing not having been purchased from the patentee, or some person who purchased it from or under such patentee, or not having the license or consent of such patentee, or his assigns or legal representatives, shall write, paint, print, mould, cast, carve, engrave, stamp, or otherwise make or affix the word "patent," or the words "letters patent," or the word "patentee," or any word or words of like kind, meaning, or import, with the view or intent of imitating or counterfeiting the stamp, mark, or other device of the patentee, or shall affix the same, or any word, stamp, or device of like import, on any unpatented article, for the purpose of deceiving the public, he, she, or they, so offending, shall be liable for such offence to a penalty of not less than one hundred dollars, with costs, to be recovered by action in any of the circuit courts of the United States, or in any of the district courts of the United States having the powers and jurisdiction of a circuit court; one half of which penalty, as recovered, shall be paid to the patent fund, and the other half to any person who shall sue for the same.

SEC. 6. [Repealed.]

Approved August 29, 1842.

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## PATENT LAW OF 1848.

### THE COMMISSIONER TO EXTEND PATENTS.

*Be it enacted, etc.,* \* \* \* That the power to extend patents, shall hereafter be vested solely in the Commissioner of Patents; and when an application is made to him for the extension of a patent, \* \* \* he shall refer the case to the principal examiner having charge of the class of inventions to which said case belongs, who shall make a full report to

said Commissioner of the said case, and particularly whether the invention or improvement secured in the patent was new and patentable when patented ; \* \* \* but no patent shall be extended for a longer term than seven years.

SEC. 2. [Relates to record fees—since changed.]

SEC. 3. [Relates to clerks and copying.]

SEC. 4. [Relates to Patent Reports, etc.]

Approved May 27, 1848.

## PATENT LAW OF 1849.

*And be it further enacted*, That the Secretary of the Interior shall exercise and perform all the acts of supervision and appeal in regard to the office of Commissioner of Patents, now exercised by the Secretary of State.

## PATENT LAW OF 1852.

### JUDGES TO HEAR APPEALS.

*Be it enacted, etc.*, That appeals provided for in the eleventh section of the act, (law of 1839,) \* \* \* may also be made to either of the assistant judges of the Circuit Court of the District of Columbia ; and all the powers, duties, and responsibilities imposed by the aforesaid act, and conferred upon the chief judge, are hereby imposed and conferred upon each of the said assistant judges.

SEC. 2. *And be it further enacted*, That in case appeal shall be made to the said chief judge, or to either of the said assistant judges, the Commissioner of Patents shall pay to such chief judge, or assistant judge, the sum of twenty-five dollars, required to be paid by the appellant into the Patent Office by the eleventh section of said act, on said appeal.

SEC. 3. [Repeals a former section relating to a fee to the justice.]

Approved August 30, 1852.

**PATENT LAW OF 1861.****COMMISSIONER TO ISSUE SUBPŒNAS, ETC.:**

*Be it enacted, etc.,* That the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the Patent Office, and such affidavits and depositions may be taken before any justice of the peace or other officer authorized by law to take depositions to be used in the courts of the United States, or in the State courts of any State where such officer shall reside; and in any contested case pending in the Patent Office it shall be lawful for the clerk of any court of the United States for any district or Territory, and he is hereby required, upon the application of any party to such contested case, or the agent or attorney of such party, to issue subpœnas for any witnesses residing or being within the said district or Territory, commanding such witnesses to appear and testify before any justice of the peace, or other officer as aforesaid, residing within the said district or Territory, at any time and place in the subpœna to be stated; and if any witness, after being duly served with such subpœna, shall refuse or neglect to appear, or, after appearing, shall refuse to testify, (not being privileged from giving testimony,) such refusal or neglect being proved to the satisfaction of any judge of the court whose clerk shall have issued such subpœna, said judge may thereupon proceed to enforce obedience to the process, or to punish the disobedience in like manner as any court of the United States may do in case of disobedience to process of *subpœna ad testificandum* issued by such court; and witnesses in such cases shall be allowed the same compensation as is allowed to witnesses attending the courts of the United States: *Provided*, That no witness shall be required to attend at any place more than forty miles from the place where the subpœna shall be served upon him to give a deposition under this law: *Provided also*, That no witness shall be deemed guilty of contempt for refusing to disclose any secret invention made or owned by him: *And provided, further*, That no witness shall be deemed guilty of contempt for disobeying any subpœna directed to him by virtue of this act, unless his fees for going to, returning

from, and one day's attendance at the place of examination shall be paid or tendered him at the time of the service of the subpcena.

#### EXAMINERS-IN-CHIEF.

SEC. 2. *And be it further enacted*, That for the purpose of securing greater uniformity of action in the grant and refusal of letters patent, there shall be appointed by the President, by and with the advice and consent of the Senate, three examiners-in-chief, at an annual salary of three thousand dollars each, to be composed of persons of competent legal knowledge and scientific ability, whose duty it shall be, on the written petition of the applicant for that purpose being filed, to revise and determine upon the validity of decisions made by examiners when adverse to the grant of letters patent; and also to revise and determine in like manner upon the validity of the decisions of examiners in interference cases, and when required by the Commissioner in applications for the extension of patents, and to perform such other duties as may be assigned to them by the Commissioner; that from their decisions appeals may be taken to the Commissioner of Patents in person, upon payment of the fee hereinafter prescribed; that the said examiners-in-chief shall be governed in their action by the rules to be prescribed by the Commissioner of Patents.

SEC. 3. *And be it further enacted*. That no appeal shall be allowed to the examiners-in-chief from the decisions of the primary examiners, except in interference cases, until after the application shall have been twice rejected. \* \* \*

SEC. 4. [Relates to salaries.]

#### RETURN OF MODELS.

SEC. 5. *And be it further enacted*, That the Commissioner of Patents is authorized to restore to the respective applicants, or when not removed by them, to otherwise dispose of such of the models belonging to rejected applications as he shall not think necessary to be preserved. The same authority is also given in relation to all models accompanying applications for designs. He is further authorized to

dispense in future with models of designs when the design can be sufficiently represented by a drawing.

SEC. 6. [Repeals agencies for models.]

SEC. 7. [Relates to clerks.]

PAPERS MUST BE PROPERLY PREPARED.

SEC. 8. *And be it further enacted*, That the Commissioner may require all papers filed in the Patent Office, if not correctly, legibly, and clearly written, to be printed at the cost of the parties filing such papers; and for gross misconduct he may refuse to recognize any person as a patent agent, either generally or in any particular case; but the reasons of the Commissioner for such refusal shall be duly recorded, and subject to the approval of the President of the United States.

NO MONEY RETURNED ON REJECTED CASES.

SEC. 9. *And be it further enacted*, That no money paid as a fee on any application for a patent after the passage of this act shall be withdrawn or refunded; nor shall the fee paid on filing a caveat be considered as part of the sum required to be paid on filing a subsequent application for a patent for the same invention.

That the three months' notice given to any caveator in pursuance of the requirements of the twelfth section of the act of July fourth, eighteen hundred and thirty-six, shall be computed from the day on which such notice is deposited in the post-office at Washington, with the regular time for the transmission of the same added thereto, which time shall be indorsed on the notice; and that so much of the thirteenth section of the act of Congress, approved July fourth, eighteen hundred and thirty-six, as authorizes the annexing to letters patent of the description and specification of additional improvements, is hereby repealed, and in all cases where additional improvements would now be admissible independent patents must be applied for.

SCHEDULE OF OFFICIAL FEES.

SEC. 10. *And be it further enacted*, That all laws now in force fixing the rates of the Patent Office fees to be paid,

and discriminating between the inhabitants of the United States and those of other countries which shall not discriminate against the inhabitants of the United States, are hereby repealed, and in their stead the following rates are established :

On filing each caveat, ten dollars.

On filing each original application for a patent, except for a design, fifteen dollars.

On issuing each original patent, twenty dollars.

On every appeal from the examiners-in-chief to the Commissioner, twenty dollars.

On every application for the reissue of a patent, thirty dollars.

On every application for the extension of a patent, fifty dollars ; and fifty dollars, in addition, on the granting of every extension.

On filing each disclaimer, ten dollars.

For certified copies of patents and other papers, ten cents per hundred words.

For recording every assignment, agreement, power of attorney, and other papers, of three hundred words or under, one dollar.

For recording every assignment and other papers over three hundred and under one thousand words, two dollars.

For recording every assignment or other writing, if over one thousand words, three dollars.

For copies of drawings, the reasonable cost of making the same.

#### PATENTS FOR DESIGNS.

SEC. 11. *And be it further enacted*, That any citizen or citizens, or alien or aliens, having resided one year in the United States, and taken the oath of his or their intention to become a citizen or citizens, who by his, her, or their own industry, genius, efforts, and expense, may have invented or produced any new and original design for a manufacture, whether of metal or other material or materials, and original design for a bust, statue, or bas-relief, or composition in alto or basso relievo, or any new and original impression or ornament, or to be placed on any article of

manufacture, the same being formed in marble or other material, or any new and useful pattern, or print, or picture, to be either worked into or worked on, or printed or painted or cast, or otherwise fixed on any article of manufacture, or any new and original shape or configuration of any article of manufacture, not known or used by others before his, her, or their invention or production thereof, and prior to the time of his, her, or their application for a patent therefor, and who shall desire to obtain an exclusive property or right therein to make, use, and sell, and vend the same, or copies of the same to others, by them to be made, used, and sold, may make application in writing to the Commissioner of Patents, expressing such desire; and the Commissioner, on due proceedings had, may grant a patent therefor, as in the case now of application for a patent, for for the term of three and one half years, or for the term of seven years, or for the term of fourteen years, as the said applicant may elect in his application: *Provided*, That the fee to be paid in such application shall be for the term of three years and six months, ten dollars; for seven years, fifteen dollars; and for fourteen years, thirty dollars: *And provided*, That the patentees of designs under this act shall be entitled to the extension of their respective patents, for the term of seven years from the day on which said patents shall expire, upon the same terms and restrictions as are now provided for the extension of letters patent.

APPLICATIONS MUST BE COMPLETED WITHIN TWO YEARS.

SEC. 12. *And be it further enacted*, That all applications for patents shall be completed and prepared for examination within two years after the filing of the petition, and in default thereof they shall be regarded as abandoned by the parties thereto, unless it be shown, to the satisfaction of the Commissioner of Patents, that such delay was unavoidable; and all applications now pending shall be treated as if filed after the passage of this act; and all applications for the extension of patents shall be filed at least ninety days before the expiration thereof, and notice of the day

set for the hearing of the case shall be published, as now required by law, for at least sixty days.

PATENTED ARTICLES TO BE STAMPED.

SEC. 13. *And be it further enacted*, That in all cases where an article is made or vended by any person under the protection of letters patent, it shall be the duty of such person to give sufficient notice to the public that said article is so patented, either by fixing thereon the word patented, together with the day and year the patent was granted, or when, from the character of the article patented, that may be impracticable, by enveloping one or more of the said articles, and affixing a label to the package, or otherwise attaching thereto a label, on which the notice, with the date, is printed; on failure of which, in any suit for the infringement of letters patent by the party failing so to mark the article the right to which is infringed upon, no damage shall be recovered by the plaintiff, except on proof that the defendant was duly notified of the infringement, and continued after such notice to make or vend the article patented. \* \* \*

PATENTS MAY BE PRINTED.

SEC. 14. *And be it further enacted*, That the Commissioner of Patents be, and he is hereby, authorized to print, or in his discretion to cause to be printed, ten copies of the description and claims of all patents which may hereafter be granted, and ten copies of the drawings of the same, when drawings shall accompany the patents: *Provided*, The cost of printing the text of said descriptions and claims shall not exceed, exclusive of stationery, the sum of two cents per hundred words for each of said copies, and the cost of the drawing shall not exceed fifty cents per copy; one copy of the above number shall be printed on parchment, to be affixed to the letters patent; the work shall be under the direction, and subject to the approval, of the Commissioner of Patents, and the expense of the said copies shall be paid for out of the patent fund.

SEC. 15. *And be it further enacted*, That printed copies



of the letters patent of the United States, with the seal of the Patent Office affixed thereto, and certified and signed by the Commissioner of Patents, shall be legal evidence of the contents of said letters patents in all cases.

**PATENTS GRANTED FOR SEVENTEEN YEARS. EXTENSIONS PROHIBITED.**

SEC. 16. *And be it further enacted*, That all patents hereafter granted shall remain in force for the term of seventeen years from the date of issue ; and all extension of such patents is hereby prohibited.

SEC. 17. *And be it further enacted*, That all acts and parts of acts heretofore passed, which are inconsistent with the provisions of this act, be, and the same are hereby, repealed.

Approved March 2, 1861.

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**PATENT LAW OF 1863.**

SEC. 1. [Repeals the renewal of oath.]

SEC. 2. [Relates to clerks, etc.]

**DATING OF PATENTS.**

SEC. 3. *And be it further enacted*, That every patent shall be dated as of a day not later than six months after the time at which it was passed and allowed, and notice thereof sent to the applicant or his agent. And if the final fee for such patent be not paid within the said six months the patent shall be withheld, and the invention therein described shall become public property as against the applicant therefor : \* *Provided*, That, in all cases where patents have been allowed previous to the passage of this act, the said six months shall be reckoned from the date of such passage.

Approved March 3, 1863.

\* Modified. See law of 1865.

## PATENT LAW OF 1865

### FORFEITED APPLICATIONS MAY BE REVIVED.

*Be it enacted*, That any person having an interest in an invention, whether as inventor or assignee, for which a patent was ordered to issue upon the payment of the final fee, as provided in section three of an act approved March third, eighteen hundred and sixty-three, but who failed to make payment of the final fee, as provided in said act, shall have the right to make an application for a patent for his invention, the same as in the case of an original application, provided such application be made within two years after the date of the allowance of the original application: *Provided*, that nothing herein shall be so construed as to hold responsible in damages any persons who have manufactured or used any article or thing for which a patent aforesaid was ordered to issue.

This act shall apply to all cases now in the Patent Office, and also to such as shall hereafter be filed; and all acts or parts of acts inconsistent with this act are hereby repealed.

Approved, March 3, 1865.

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## PATENT LAW OF 1866.

### APPEALS TO THE EXAMINERS-IN-CHIEF.

*Be it enacted*, That upon appealing for the first time from the decision of the primary examiner to the examiners-in-chief in the Patent Office, the appellant shall pay a fee of ten dollars into the Patent Office to the credit of the Patent fund; and no appeal from the primary examiner to the examiners-in-chief shall hereafter be allowed until the appellant shall pay said fee.

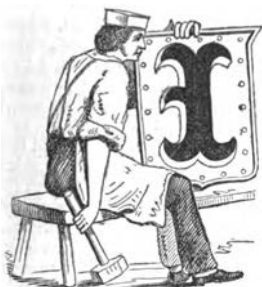
Approved, June 27, 1866.

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The yearly official Reports of the Patent Office are distributed gratuitously to the public, on application to members of Congress. The Reports are not sold by the government.

[From The Scientific American.]

## RELATING TO PATENTS.



It may be well for parties who are interested in new inventions to remember that our firm of Munn & Co. have taken out far more patents, and have, therefore, had much greater experience in the profession, than any other agency in the world. Those who confide their business to us may therefore rely upon having it done in the best manner on the most moderate terms.

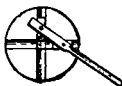
In addition to these advantages, we make it a general rule to assist the interest of our clients by giving publicity in the form of editorial notices, of all the new and meritorious inventions that are patented through our agency. The fact that we have carefully studied these improvements during the process of preparing the patent papers, enables us to speak knowingly in regard to their best features. The publicity thus given to inventions, owing to the immense circulation of THE SCIENTIFIC AMERICAN among intelligent readers, is often of the utmost benefit to patentees. In some cases it has engaged the active coöperation of enterprising capitalists and manufacturers, in patents which otherwise would have remained dead, and has resulted in the most important pecuniary advantages to inventors and patentees, as hundreds of them are ready to testify; although the sum total of our charges for preparing their patent papers has rarely exceeded the small amount of twenty-five dollars. Whatever carping, jealous, or envious persons, or little agents, may say to the contrary, we are justified in affirming that all who really wish to promote their own interests will do well to employ THE SCIENTIFIC AMERICAN PATENT AGENCY.

### PROPERTIES OF CHARCOAL.

ALTHOUGH charcoal is so combustible, it is, in some respects a very unchangeable substance, resisting the action of a great variety of other substances upon it. Hence posts are often charred before being put into the ground. Grain has been found in the excavations at Herculaneum, which was charred at the time of the destruction of that city, eighteen hundred years ago, and yet the shape is perfectly preserved, so that you can distinguish between the different kinds of grain. While charcoal is itself so unchangeable, it preserves other substances from change. Hence meat and vegetables are packed in charcoal for long voyages, and the water is kept in casks which are charred on the inside. Tainted meat can be made sweet by being covered with it. Foul and stagnant water can be deprived of its bad taste by being filtered through it. Charcoal is a great decolorizer. Ale and porter filtered through it are deprived of their color, and sugar-refiners decolorize their brown syrups by means of charcoal, and thus make white sugar. Animal charcoal, or bone-black, is the best for such purposes, although only one-tenth of it is really charcoal, the other nine-tenths being the mineral portion of the bone.

Charcoal will absorb, of some gases, from eighty to ninety times its own bulk. As every point of its surface is a point of attraction, it is supposed to account for the enormous accumulation of gases in the spaces of the charcoal. But this accounts for it only in part. There must be some peculiar power in the charcoal to change, in some way, the condition of a gas of which it absorbs ninety times its own bulk.—*Hooker.*

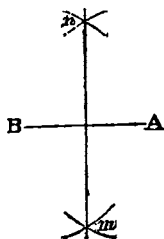
### SUBSTITUTE FOR THE CRANK.



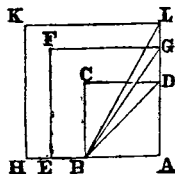
VARIOUS devices supposed to have advantages over the common crank, have been invented. Our diagram shows one of these forms, which has been re-invented many times, by different inventors. A grooved wheel is employed, and in the groove are two slides, attached respectively, by pivots, to the connecting rod of a piston rod. The reciprocating movement of the piston rod acting upon the connecting rod, causes the rotation of the wheel.

## PRACTICAL GEOMETRY.

A KNOWLEDGE of geometry, both practical and theoretical, is of importance to mechanics and inventors. It is promotive of truth and patience in mental habits, and leads to the exercise of nicety and exactness in the execution of mechanical labors. With a pair of dividers, a rule and pencil, any person may speedily acquire a considerable knowledge of practical geometry. We subjoin a few simple and generally useful problems for practice, in the hope of thus interesting some of our readers in the subject, so that they will continue the study. Complete works on geometry can be had at the book-stores.



*Problem 1.*—To divide a line into equal parts.—To draw a line perpendicular to another: With a pair of dividers from the extremities of the line  $A B$  as centres, with any distance exceeding the point where the line is to be intersected, describe arcs cutting each other as  $m n$ ; then a line drawn through  $m n$  will divide the line  $A B$  equally, and will also be perpendicular thereto.



*Problem 2.*—To find the side of a square that shall be any number of times the area of a given square: Let  $A B C D$  be the given square; then will the diagonal  $B D$  be the side of a square  $A E F G$ , double in area to the given square  $A B C D$ ; the diagonal  $B D$  is equal to the line  $A G$ ; if the diagonal be drawn from  $B$  to  $G$ , it will be the side of a square  $A H K L$ , three times the area of the square  $A B C D$ ; the diagonal  $B L$  will equal the size of a square four times the area of the square  $A B C D$ , etc.



tical philosophy, chemistry, and engineering. It is indispensable to every inventor. It is useful for every family and housewife. In short, it is the best scientific and mechanical journal in the world, and we cannot see how any chemist, architect, engineer, farmer, or mechanic can do without it. MUNN & Co., Publishers, 37 Park Row, New York."—*Cass County Republican*.

### MECHANICAL MOVEMENTS.

In the construction of models, or machinery, the skillful mechanic and inventor will study to avoid clumsiness in the arrangement of parts, and will naturally take pride in selecting, as far as possible, the simplest and best forms of mechanical movements.

To this end, we have thought that nothing could be more suggestive or useful than a comprehensive exhibition of many of the best mechanical forms already known.

After much labor and expense, we have brought together, condensed and engraved expressly for this work, one of the most extensive series of mechanical movements ever before published.

Here the mechanic may find at a glance the movement suited for his purpose, and may see the separate parts best adapted to any special combination of mechanism.

As these engravings are not readily to be found elsewhere, we recommend the careful preservation of this book.

### DESCRIPTION OF THE MECHANICAL MOVEMENTS BY NUMBERS.

1. Shaft coupling. 2. Claw coupling. 3, 4. Lever couplings. On the driving shaft, a disk with spurs is mounted, and to the shaft to be driven a lever is hinged. By causing this lever to catch in the spurs of the disk, the coupling is effected. 5. Knee or rose coupling, of which 26 is a side view.

6. Universal joint. 7, 8. Disk and spur coupling. 9. Prong and spur lever coupling.

10. Fast and loose pulley. 11. Sliding gear, the journal boxes of one of the wheels being moveable. 12. Friction clutch. By tightening or releasing a steel band, encircling a pulley on the shaft, the machinery is thrown in or out of

gear. 13, 14. Shoe and lever brakes. 15, 16. Change of motion by sheaves. 17. Spiral flanged shaft. 18. Connected with the rod are pawl links, catching into ratchet-teeth in the wheel to which rotary motion is to be imparted. When the rod moves in one direction, one of the pawls acts; and when the rod moves in the opposite direction, the other pawl acts in the same direction as the first. 19. The reciprocating motion of a rod is converted into rotary motion of the fly-wheel by a weight suspended from a cord, which passes over a small pulley that connects with a treadle, from which the motion is transmitted to the fly-wheel.

20. "Flying horse," used in fairs for amusement. By pulling the cords radiating from the crank, the persons occupying the seats or horses on the ends of the arms are enabled to keep the apparatus in motion. 21, 22. Bow string arrangements, to connect reciprocating into rotary motion. 23. Same purpose by differential screw. 24. The same by double rack and wheels. 25. Coupling for square shafts. 26. Side view of Fig. 5. 27. Sliding spur pulley coupling. 28. Lever with bearing roller to tighten pulley bands. 29. Chain wheel.

30. Reciprocating rectilinear into reciprocating rotary motion by two racks and cog wheel. 31. Oblique toothed wheels. 32. Worm and worm wheel. 33, 34. Claw coupling with hinged lever. 35, 36. Disk couplings, with lugs and cavities. 37. Disk coupling with screw bolts. 38, 39, 40. Shaft couplings.

41. Face view of Fig. 12. 42. Friction cones. 43. Friction pullies. 44. Self-releasing coupling. Disks with oblique teeth. If the resistance to the driven shaft increases beyond a certain point, the disks separate. 45. Hoisting blocks. 46. Elbow crank, for changing motion. 47. Reciprocating into rotary motion by zig-zag groove on cylinder. 48. Another form of Fig. 29. 49. Reciprocating into a rotary motion.

50. Same purpose. 51. Same purpose, by double rack and two ratchet pinions. When the double rack moves in one direction, one pinion is rigid with the shaft; when the rack moves in the opposite direction, the other pinion is rigid, and a continuous rotary motion is imparted to the fly-wheel shaft. 52. Reciprocating into oscillating. 53. Rotary into



reciprocating. By the action of the wheel pins, the carriage is moved in one direction, and by the action of said pins on an elbow-lever, it is moved in the opposite direction. 54. Stamp rod and lifting cam. 55. For giving reciprocating motion to rack. 56. Same motion to a bar with slot, by means of an eccentric pin projecting from a revolving disk, and catching in the slot. 57. Walking beam and fly-wheel. 58. Reciprocating motion to pump or other rod by means of eccentric disk and friction rollers. See 81 and 104. 59. Hoisting crane.

60. Friction gears. See 43. 61. Rotary into reciprocating by rising and falling pinion acting on endless rack. 62. By the revolving cam, a rising and falling or a reciprocating rectilinear motion is imparted to a drum. 63. Reciprocating motion to a frame by means of endless rack and pinion. 64. Reciprocating rectilinear motion to a toothed rack by a toothed segment on a lever-arm, which is subjected to the action of a weight, and of an eccentric wrist-pin, projecting from a revolving disk. 65. Reciprocating motion to a rod. The wheels are of different diameters, and consequently the rod has to rise and fall as the wheels revolve. (See 110.) 66. Cam and elbow lever. 67. Rod reciprocates by means of cam. 68. Revolving into reciprocating motion, by an endless segmental rack and pinion, the axle of which revolves and slides in a slot toward and from the rack. This rack is secured to a disk, and a rope round said disk extends to the body to which a reciprocating motion is to be imparted. 69. Elliptic gears.

70. Bevel gear. 71. Worm and worm wheel. 72. Transmitting motion from one axle to another, with three different velocities, by means of toothed segments of unequal diameters. 73. Continuous revolving into reciprocating, by a cam-disk acting on an oscillating lever. 74. Intermittent revolving motion to a shaft with two pinions, and segment gear wheel on end of shaft. 75. Oscillating lever, carrying pawls which engage teeth in the edges of a bar to which rectilinear motion is imparted. 76. Oscillating lever, connects by a link with a rod to which a rectilinear motion is imparted. 77. Oscillating lever and pawls, which gear in the ratchet-wheel. 78. Common treadle. 79. Describing on a revolving cylinder a spiral line of a certain given pitch.\*

which depends upon the comparative sizes of the pinion and bevel-wheels.

80. Marking a spiral line, the graver moved by a screw.

81. (See Fig. 58.) 82. Plunger and rods. 83. Cross head and rods. 84. Reciprocating rod guided by friction rollers.

85. Revolving into reciprocating motion, by means of roller-arms, extending from a revolving shaft, and acting on lugs projecting from a reciprocating frame. 86. Crank motion.

87. Reciprocating motion by toothed wheel and spring bar.

88. The shaft carries a tapper, which catches against a hook hinged to the drum, so as to carry said drum along and raise the weight on the rope. When the tappet has reached its highest position, the hook strikes a pin, the hook disengages from the tappet, and the weight drops. 89. Reciprocating motion to a rod by means of a groove in an oblique ring secured to a revolving shaft.

90. Double crank. 91. Cam groove in a drum, to produce reciprocating motion. 92. Belts and pulleys. 93.

Pulleys, belts, and internal gear. 94. As the rod moves up and down, the teeth of the cog-wheel come in contact with a pawl, and an intermittent rotary motion is imparted to said wheel. 95. By turning the horizontal axles with different velocities, the middle wheel is caused to revolve with the mean velocity. 96. Oscillating lever and cam groove in a disk. 97. Lazy tongs. 98. Oscillating segment and belt over pulleys. 99. Converting oscillating into a reciprocating motion by a cam-slot in the end of the oscillating lever which catches over a pin projecting from one of the sides of a parallelogram which is connected to the rod to which reciprocating motion is imparted.

100. Oscillating motion of a beam into rotary motion.

101. Motion of a treadle into rotary motion. 102. Double-acting beam. 103. Single-acting beam. 104. (See Figures

58 and 81.) 105. Device to steady a piston by a slotted guide-piece, operated by an eccentric on the driving-shaft.

106. Rod operated by two toothed segments. 107. Two cog-wheels of equal diameter, provided with a crank of the same length, and connected by links with a cross-bar to which the piston-rod is secured. 108. Device for a rectilinear motion of a piston-rod based on the hypocycloidal motion of a pinion in a stationary wheel with internal gear.

If the diameter of the pinion is exactly equal to one-half the diameter of the internal gear, the hypocycloid becomes a right line. 109. Same purpose as 56.

110. Action similar to 65. 111. Revolving motion by a circular sliding pinion gearing in an elliptical cog-wheel. 112. Similar to 96. 113. Carpenter's clamp. The jaws turn on their pivot-screws, and clamp the board. 114. An irregular vibratory motion is given to the arm carrying the wheel A, by the rotation of the pinion B. 115. Intermittent rotary motion of the pinion-shaft, by the continuous rotary motion of the large wheel. The part of the pinion shown next the wheel is cut on the same curve as the plain portion of the circumference, and, therefore, serves as a lock whilst the wheel makes a part of a revolution, and until the pin upon the wheel strikes the guide-piece upon the pinion, when the pinion-shaft commences another revolution. 116. Stop-motion used in watches to limit the number of revolutions in winding up. The convex curved part, a, b, of the wheel B, serving as the stop. 117. Several wheels, by connecting rods, driven from one pulley. 118. Intermittent circular motion is imparted to the toothed wheel by vibrating the arm B. When the arm, B, is lifted, the pawl is raised from between the teeth of the wheel, and traveling backward over the circumference again, drops between two teeth on lowering the arm, and draws with it the wheel. 119. Reciprocating rectilinear motion is given to the bar by the continuous motion of the cam. The cam is of equal diameter in every direction measured across its center.

120. Mechanism for revolving the cylinder in Colt's fire-arms. When the hammer is drawn back the dog, a, attached to the tumbler, acts on the ratchet, b, on the back of the cylinder, and is held up to the ratchet by a spring, c. 121. Alternate increasing and diminishing motion, by means of eccentric toothed wheel and toothed cylinder. 122. Oscillating or pendulum engine. The cylinder swings between trunnions like a pendulum. The piston-rod connects directly with crank. 123. Intermittent rotary motion. The small wheel is driven, and the friction rollers on its studs move the larger wheel by working against the faces of oblique grooves or projections across the face thereof. 124. Longitudinal and rotary motion of the rod is produced by

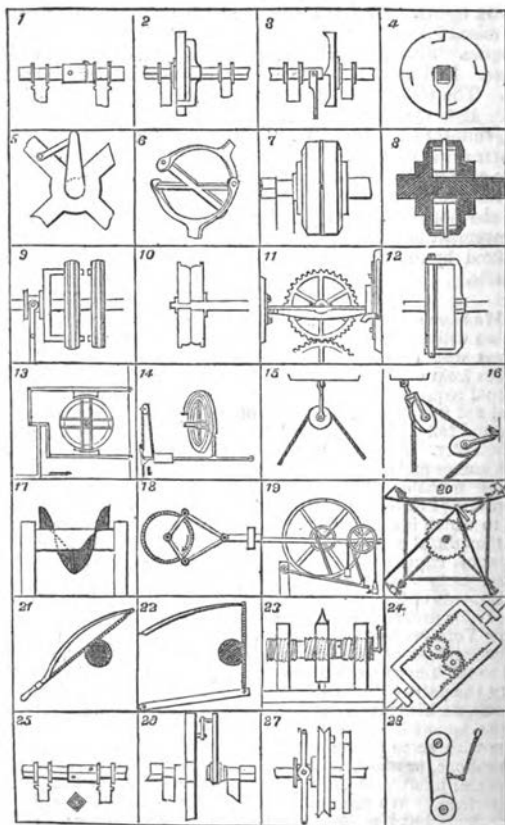
its arrangement between two rotating rollers, the axles of which are oblique to each other. 125. Friction indicator of Roberts. Upon the periphery of the belt-pulley a loaded carriage is placed, its tongue connected with an indicator. With a given load the indicating pointer remains in a given position, no matter what velocity is imparted to the pulley. When the load is changed the indicator changes, thus proving that the friction of wheels is in proportion to load, not velocity. 126. Circular intermittent rectilinear reciprocating motion. Used on sewing-machines for driving the shuttle; also on three-revolution cylinder printing-presses. 127. Continuous circular into intermittent circular motion. The cam is the driver. 128. Sewing-machine, four-motion feed. The bar, B, carries the feeding-points or spurs, and is pivoted to slide, A. B is lifted by a radial projection on cam C, which at the same time also carries A and B forward. A spring produces the return stroke, and the bar B, drops by gravity. 129. Patent crank motion, to obviate dead centers. Pressure on the treadle moves the slotted slide, A, forward until the wrist passes the center, when the spring, B, forces the slide against the stops until next forward movement.

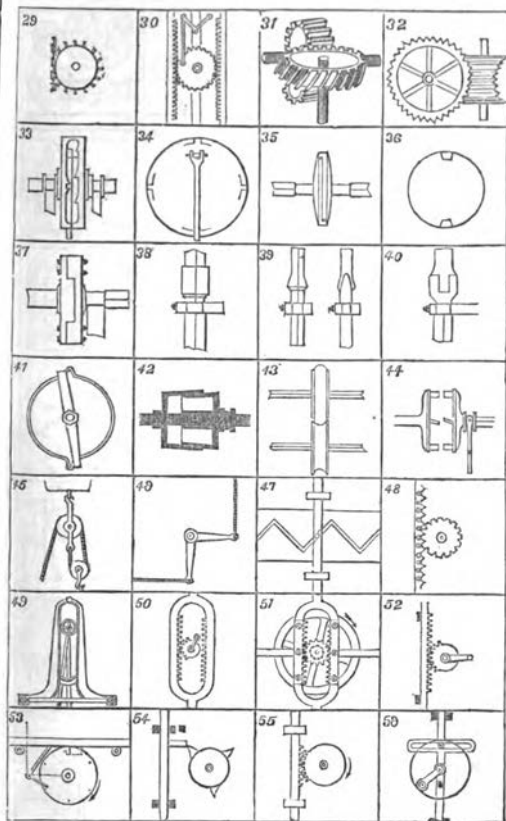
130. Four-way cock. 131. One stroke of the piston gives a complete revolution to the crank. 132. Rectilinear motion of variable velocity, is given to the vertical bar by rotation of the shaft of the curved arm. 133. Pantagraph for copying, enlarging, and reducing plans, etc. C, fixed point. B, ivory tracing point. A, pencil trace, the lines to be copied with, and B, the pencil, will re-produce it double size. Shift the slide to which C is attached, also the pencil slide, and size of the copy will be varied. 134. Ball and socket joint for tubing. 135. Numerical registering device. The teeth of the worm shaft gear with a pair of worm-wheels of equal diameter, one having one tooth more than the other. If the first wheel has 100 teeth and the second 101, the pointers will indicate respectively 101 and 10.100 revolutions. 136. Montgolfier's hydraulic ram. The right hand valve being kept open by a weight or spring, the current flowing through the pipe in the direction of the arrow, escapes thereby. When the pressure of the water current overcomes the weight of the right valve, the momentum of the water opens the other valve, and the water passes into the air-chamber. On

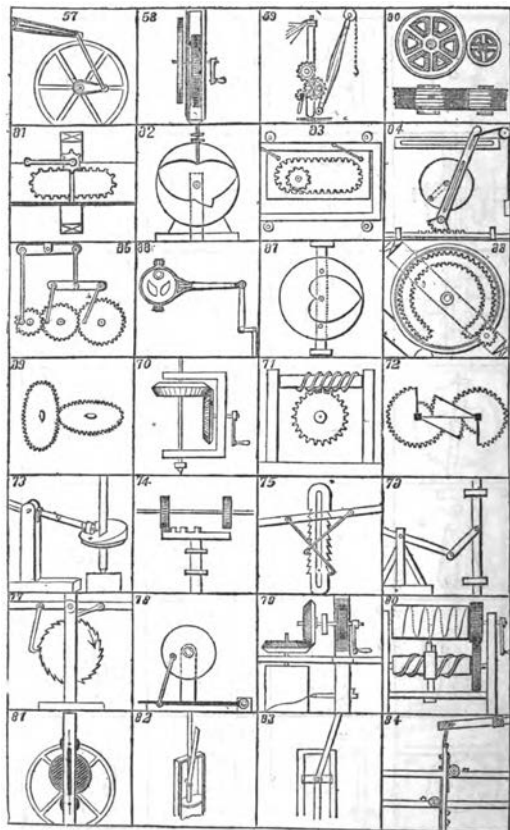
equilibrium taking place, the left valve shuts and the right valve opens. By this alternate action of the valves, water is raised into the air-chamber at every stroke. 137. Rotary engine. Shaft, B, and hub, C, are arranged eccentric to the case. Sliding radial pistons, a, a, move in and out of hub, C. The pistons slide through rolling packings in the hub, C. 138. Quadrant engine. Two single-acting pistons, B, B, connect with crank, D. Steam is admitted to act on the outer sides of the pistons alternately through valve a, and the exhaust is between the pistons. 139. Circular into rectilinear motion. The scalloped wheel communicates motion to the horizontal oscillating rod, and imparts rectilinear movement to the upright bar. 140. Rotary motion transmitted by rolling contact between two obliquely arranged shafts.

### MULTUM IN PARVO.

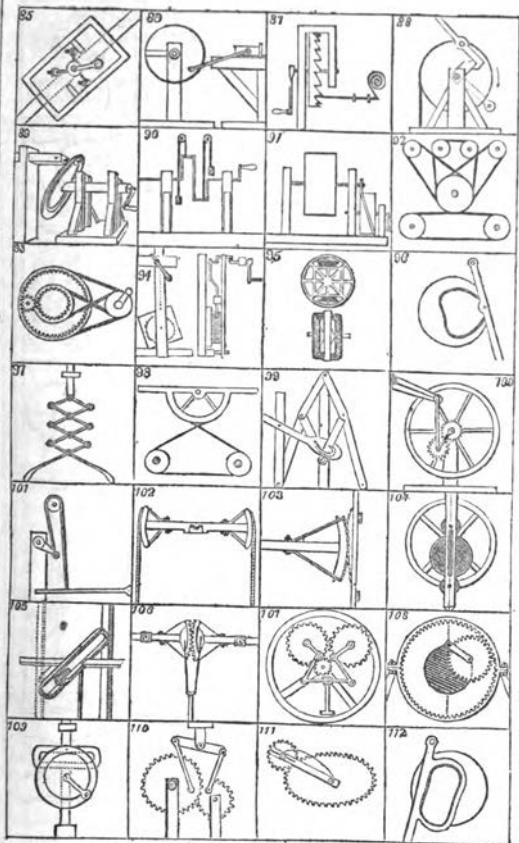
We have some queer correspondents: One writes to know if we will not be so good as to send a messenger to an address which he gives, up town—distance two and a half miles from our office—to make certain inquiries for him. It would require one and a half hours time to do the errand, and not a stamp inclosed. Another wants us to write a letter and tell him where to get a combined thermometer and barometer. Another, "will you be good enough to give me the names and addresses of several of the makers of the best brick machines;" another wants water wheels; another threshing machines; each writer desires our written opinion as to which is the best device, with our reasons, and not one is thoughtful enough to inclose a fee, or reflect that to answer his request will consume considerable of our time. Another party wishes us to write to him the recipe for making ornaments out of coal tar, where he can buy the mixture ready for use, and how much chequer-men will sell for in the New York market. For this information he sends us the generous sum of three cents in postage stamps. Mr. C. wants us to tell him of some valuable invention, of which he can buy the patent cheap, that would be suitable for him to take to sell, on his travels out West, by towns, counties, etc., three cents inclosed. Others want us to put them in communication with some person who will purchase an interest in their inventions, or manufacture for them, or furnish this or that personal information, our reply to be printed in the *Scientific American*. We are at all times happy to serve our correspondents, but if replies to purely personal errands are expected, a small fee, say from one to five dollars, should be sent.

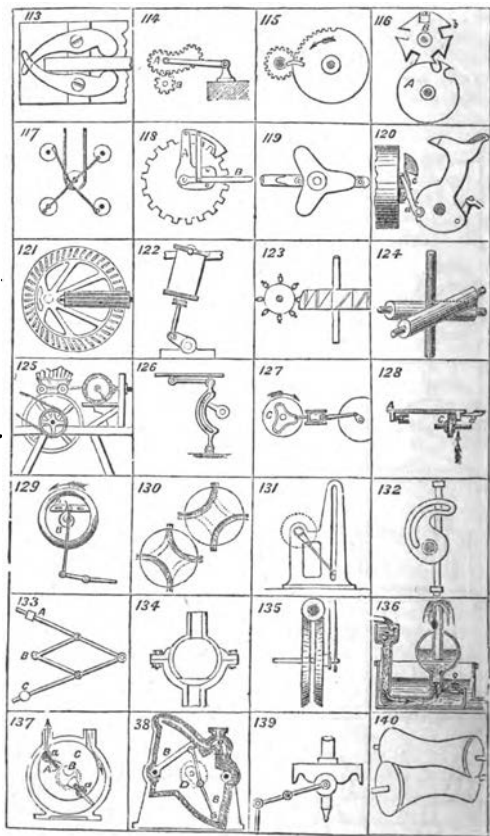












## WILL IT PAY?

On page 5, readers are informed that we are always happy to give them our opinion as to the novelty of their inventions, *without charge*. But some persons, when they send for such information, add many other inquiries, difficult to answer, and not included in our gratuitous invitation; as for example: "What is it worth? Who will buy? Will it pay? Does it infringe? Does it conflict with B's patent? If you will guarantee that it does not infringe, I will apply for a patent," etc.

It is impossible for us to answer all of these questions satisfactorily, but in special cases we might write out a reply if a fee were sent to compensate for our time. The following hints, however, may prove useful as a sort of general answer.

"What is it worth? Who will buy?" If a patent is refused, and cannot be obtained, the device is worth nothing, and no one will buy. Therefore the first thing to be considered, the first step to be taken, is to *obtain the Patent*. Do not count your chickens, nor anxiously seek a market for them, nor ask anybody to guarantee or insure their lives, before they are hatched.

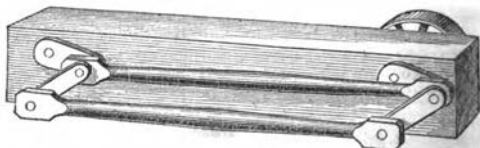
"Will it pay?" As a general rule, every patentable improvement will more than repay the small cost of taking out the patent. The sale of a single machine, or of a single right of use, will often bring back more than the whole outlay for the patent. The extent of profit frequently depends upon the business capacity of the inventor, or his agent. One man will make a fortune from an unpromising improvement, while another, possessing a brilliant invention, will realize little or nothing, owing to idleness and incompetence. [See remarks, page 42.]

"Does it infringe?" To answer this in each individual case, requires the special search mentioned at page 16. Infringement consists in the use, sale, or manufacture of the thing patented. It is not an infringement to take out or hold a patent for an improvement upon any other patent. It is not an infringement to sell rights under any patent, whether town, county or state rights, or licenses. The actual manufacture, sale, or use of an *article* may infringe; but the sale or purchase of *patent rights* is not infringement.

All good improvements are worth patenting, even if their use infringes a prior patent. Many an infringing device is worth more than the patent with which it conflicts. Patentees of conflicting inventions can usually make satisfactory arrangements with the owners of the prior patents; it is obviously to the interest of prior patentees to have their patents used as extensively as possible. The princely revenue of Howe, the inventor of the sewing machine, said to be five hundred thousand dollars annually, is derived from infringing patentees, who pay him a small royalty on each machine. The net profits divided among the owners of one of these infringing patents,—the celebrated Wheeler and Wilson—is reported to be more than one million dollars a year. We might give hundreds of analogous examples.

### SUBSTITUTE FOR BELTS AND GEARS.

The object of this device is to transmit motion from one shaft to another, without the use of belt or gear wheels, both of which are in some instances objectionable.



Continuous rotary motion of the pulley shaft, is imparted to the secondary shaft through the connecting rods

### STEAM PRESSURE AND TEMPERATURE.

Pressure in lbs. per sq. in.	Correspond'g Temperature, Fahrenheit.	Pressure in lbs. per sq. in.	Correspond'g Temperature, Fahrenheit.	Pressure in lbs. per sq. in.	Correspond'g Temperature, Fahrenheit.
10	192.4	65	301.3	140	357.9
15	212.8	70	306.4	150	363.2
20	228.5	75	311.2	160	368.5
25	241.0	80	315.8	170	373.8
30	251.6	85	320.1	180	378.4
35	260.9	90	324.3	190	382.9
40	269.1	95	328.2	200	387.5
45	276.4	100	332.0	210	391.5
50	283.2	110	339.2	220	395.5
55	289.3	120	345.8	230	399.4
60	295.6	130	352.1	240	403.1

[THIRD EDITION.]

# ABSTRACT

OF THE

## POPULATION OF THE UNITED STATES OF AMERICA.

### CENSUS OF 1860.

#### MAINE.—Area, 31,766 square miles.

Androsen...29,725	Hancock...37,758	Lincoln...27,484	Piscataqua...18,032	Valde....30,447
Aroostook...22,479	Kennebec...55,555	Oxford...36,698	Sagadahk...21,790	Wash'gton...2,555
Cumberland...75,592	Knox...31,716	Penobscot...72,731	Somerset...36,754	York.....62,107
Franklin...29,404	Total.....			629,276

#### NEW HAMPSHIRE.—Area, 9,280 square miles.

Belknap...14,548	Cheshire...27,434	Grafton...42,229	Merrimack...4,408	Stratford...31,494
Carroll...20,464	Cook...13,162	Hillsboro'...62,140	Rock'ham...50,122	Sullivan...19,041
Total.....				326,072

#### VERMONT.—Area, 10,212 square miles.

Addison...21,010	Chittenden...28,171	Grand Isle...4,296	Orleans...18,982	Windham...26,983
Bennington...19,433	Faerax...5,788	La Motte...12,311	Rutland...35,949	Windsor...37,195
Caledonia...21,708	Franklin...27,241	Orange...25,455	Wash'ton...27,614	Total...315,116

#### MASSACHUSETTS.—Area, 7,800 square miles.

Barnstable...35,990	Dukes...4,403	Hampden...57,365	Nantucket...8,091	Suffolk...192,701
Berkshire...55,120	Essex...165,810	Hampshire...87,824	Norfolk...109,950	Worcester...159,660
Bristol...93,793	Franklin...31,431	Middlesex...216,351	Plymouth...64,768	Total...1,231,065

#### RHODE ISLAND.—Area, 1,306 square miles.

Bristol...8,907	Kent...17,903	Newport...21,897	Providence...107,799	Washing'ton...18,718
Total.....				174,631

#### CONNECTICUT.—Area, 4,674 square miles.

Fairfield...77,476	Litchfield...47,317	N. Haven...97,347	Tolland...21,167	Windham...36,443
Hartford...89,904	Middlesex...32,993	N. London...57,422	Total.....	460,151

#### NEW YORK.—Area, 47,000 square miles.

Albany...113,919	Dutchess...64,939	Livingston...39,546	Olsego...50,166	Steuben...66,689
Alleghany...41,882	Erie...141,973	Madison...43,686	Potomac...14,002	Suffolk...43,276
Draome...30,910	Essex...28,214	Monroe...160,659	Queens...57,391	Sullivan...32,335
Cattaraugus...43,897	Franklin...30,636	Montgomery...30,967	Rensselaer...96,325	Tioga...28,739
Cayuga...55,769	Fulton...24,162	N. York...813,668	Richmond...25,493	Tampkins...31,411
Chautauqua...68,354	Genesee...32,189	Niagara...50,399	Rockland...22,492	Ulster...76,379
Chemung...26,917	Greene...31,930	Oneida...105,701	St. Lawrence...89,689	Warren...21,434
Chenango...40,936	Hamilton...8,034	Onondaga...90,687	Saratoga...51,732	Washington...45,906
Clinton...45,736	Herkimer...40,560	Ontario...44,566	Schenectady...20,002	Wayne...47,762
Columbia...47,250	Jefferson...69,628	Orange...63,814	Schoharie...34,469	Westchester...99,467
Cortland...26,296	Kings...279,125	Orleans...26,717	Schuyler...18,940	Wyoming...31,967
Delaware...42,457	Lewis...26,581	Oswego...75,960	Seneca...28,139	Yates...20,291
Total.....				3,880,735

#### NEW JERSEY.—Area, 3,320 square miles.

Atlantic...11,786	Cumberland...22,605	Hunterdon...33,654	Morris...34,679	Somerset...22,057
Bergen...21,616	Essex...98,875	Mercer...37,411	Ocean...11,176	Sussex...23,855
Burlington...49,730	Gloucester...18,444	Middlesex...34,610	Passaic...29,013	Warren...28,434
Camden...34,457	Hudson...62,717	Monmouth...39,345	Salem...22,468	Union...37,781
Cape May...7,130	Total.....			672,031

#### PENNSYLVANIA.—Area, 46,000 square miles.

Adams...28,012	Centre...27,100	Franklin...42,128	McKean...8,859	Snyder...15,033
Alleghany...178,835	Chester...74,578	Fulton...9,131	Mercer...36,557	Somerset...26,784
Armstrong...35,797	Clarion...24,994	Greene...24,343	Midway...16,311	Sullivan...6,637
Beaver...29,144	Clearfield...18,758	Hunt'gton...28,101	Monroe...16,769	Susqueh'a...36,207
Berks...26,737	Clinton...17,723	Indiana...53,587	Montgomery...70,500	Tioga...31,048
Berk...93,819	Columbia...25,065	Jefferson...18,299	Montour...13,063	Union...14,145
Blair...27,229	Crawford...48,756	Juniata...16,969	Northampton...47,904	Venango...23,044
Bradford...48,735	Cum'ber'ld...40,098	Lancaster...116,315	North'ld...28,892	Warren...19,190
Bucks...63,578	Dauphin...46,757	Lawrence...22,999	Perry...22,794	Washington...45,804
Butler...25,596	Delaware...80,597	Lebanon...21,631	Philad'a...565,531	Wayne...32,279
Cambria...20,156	Elk...49,616	Lehigh...43,764	Pike...7,155	Westm'ld...63,736
Cameron...21,033	Erie...49,431	Luzerne...90,243	Potter...11,470	Wyoming...12,540
Carbon...21,033	Fayette...39,909	Lycoming...37,398	Schuylkill...69,516	York...68,206
Kent...27,801	Forest...898	Total.....		2,906,370

#### DELAWARE.—Area, 2,120 square miles.

Kent...27,801	Newcastle...54,800	Sussex...29,517	Total...112,218
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**MARYLAND.—Area, 11,124 square miles.**

Alleghany, 26,348	Carroll.....24,592	Frederick, 40,578	Montgo'ry, 18,322	Somerset...24,992
Anne Arun, 23,901	Cecil.....23,863	Harford...23,416	Prince Geo, 22,327	Talbot.....14,798
Baltimore, 266,564	Charles...16,517	Howard...13,839	Qu. Anne, 16,961	Wash'ton, 31,414
Calvert...10,447	Dorchester, 20,461	Kent.....13,267	St. Mary's, 15,194	Worcester, 20,661
Caroline...11,129	Total.....			687,034

**DISTRICT OF COLUMBIA.—Area, 60 square miles.**

Washington.....	75,076
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**VIRGINIA.—Area, 61,352 square miles.**

Accomack, 18,586	Culpepper, 12,064	Isle of W't, 9,977	New Kent, 6,584	Rock'g'm, 23,406
Albemarle, 26,625	Cumberl'd, 9,961	Jackson... 8,306	Nicholas... 4,626	Russell... 10,180
Alexand'ria, 12,652	Dinwiddie, 30,198	Jas. City... 6,798	Norfolk... 36,188	Scott.....12,672
Alleghany, 6,765	Doddridge, 5,203	Jefferson... 14,575	North'pton, 7,832	Shenand'h, 13,696
Amelia...10,763	Eliz. City... 6,798	Kanawha, 10,150	North'land, 7,530	Smyth.....8,262
Amherst...13,742	Essex.....10,469	K'g & Q'n, 10,331	Nottoway, 8,836	South'pton, 12,614
Appomattox, 5,887	Fairfax...11,835	King Geo... 6,671	Ohio.....22,422	Spottay'l, 16,076
Augusta...27,780	Fauquier, 21,704	King Wm. 8,629	Orange....10,708	Stafford... 6,566
Barboor... 8,669	Fayette... 5,097	LANCASTER, 6,151	Page..... 8,109	Surry..... 8,133
Bath..... 3,676	Floyd..... 8,238	Lee.....11,032	Patrick... 9,359	Sussex...10,178
Bedford...26,068	Ft. Vauna, 10,363	Lewis..... 7,999	Pendleton, 6,166	Taylor... 7,463
Berkeley...12,523	Franklin...20,098	Logan..... 4,938	Pittay'l, 32,104	Taxwell... 9,920
Boone..... 4,840	Frederick, 16,547	London...21,772	Pleasant, 2,945	Tucker... 1,488
Botetourt, 11,516	Giles..... 6,683	Louisa...16,698	Pocahontas, 3,968	Tyler..... 6,617
Braxton... 4,992	Gilmere... 3,769	Lunenburg, 11,984	Powhatan, 8,391	Upshur... 7,292
Brooke.... 5,494	Gloucester, 10,956	McDowell... 1,636	Preston...13,312	Warren... 6,442
Brunswick, 14,311	Gooschland, 10,666	Madison... 8,864	Pr'ce Ed'd, 11,844	Warwick... 1,740
Buchanan... 2,793	Grayson... 5,262	Marion...12,721	Pr'ce Geo., 8,410	Wash'ton, 16,993
Buck'ham, 15,212	Greenbrier, 12,210	Marshall...13,001	Pr'ce Wm. 8,666	Wayne... 6,747
Cabell.... 8,020	Greene.... 5,025	Mason..... 9,186	Pr'ce A's, 7,714	Webster... 1,664
Calhoun... 2,502	Greenville, 6,374	Mathews... 7,091	Pulaski... 5,418	Westm'd, 8,282
Campbell, 26,197	Halifax...26,521	Meckl'b'g, 20,096	Putnam... 6,301	Westel... 6,766
Caroline...18,466	Hampsh'r, 13,913	Mercer.... 6,818	Raleigh... 3,967	Wirt..... 3,751
Carroll... 8,012	Hancock... 4,448	Middlesex, 4,364	Randolph, 4,090	Wise..... 4,506
Chas. City, 5,609	Hanover...17,228	Monong'a, 13,048	Rappah'k, 8,850	Wood.....11,046
Charlotte, 14,466	Hardy..... 9,864	Monroe...10,757	Richmond, 6,866	Wyoming, 2,825
Chester'd, 19,017	Harrison, 13,790	Montgo'ry, 10,615	Rithie.... 6,847	Wythe....13,305
Clarke.... 7,168	Henrico... 61,616	Morgan... 8,731	Rome..... 8,893	York..... 4,946
Clay..... 1,787	Henry.....12,105	Nansem'd, 13,593	Roanoke... 8,048	
Craig..... 3,583	Highland... 4,319	Nelson....13,016	Rock'b'dg, 17,260	Total...1,986,079

**NORTH CAROLINA.—Area, 50,704 square miles.**

Alamance, 11,853	Cherokee... 9,166	Halifax...19,441	McLen'g, 17,814	Rowan...14,664
Alexander, 6,022	Chowan... 8,842	Harnett... 8,039	Montgo'ry, 7,649	Rutherford, 11,573
Alleghany, 3,690	Cleveland, 12,348	Haywood... 5,801	Moore.....11,427	Sampson...16,623
Anson....18,664	Columbus, 8,697	Heuderson, 10,448	Nash.....11,688	Stanly.... 7,601
Ash.... 7,966	Craven...16,273	Hertford... 9,504	N. Han'p't, 16,430	Stokes...10,402
Beaufort...14,779	Cumberl'd, 16,369	Hyde..... 7,724	North'p't, 13,376	Surry.....10,379
Bertie....14,311	Currituck, 7,416	Iredell...16,347	Onslow... 8,856	Tyrrel... 4,943
Bladen....11,966	Davidson, 16,601	Jackson... 5,328	Orange....16,949	Union....11,202
Brunswick, 8,406	Davie..... 8,494	Johnson...16,667	Pasquotank, 8,940	Wake.... 26,627
Buncombe, 12,664	Duplin...16,786	Jones..... 5,730	Perquimans, 7,248	Warren...16,726
Burke.... 9,237	Edgecomb, 17,376	Lenoir...19,211	Person...11,221	Wash'ton, 8,367
Cabarrus...10,546	Forsyth...12,691	Lillington, 6,266	Pitt.....16,060	Watauga... 4,957
Caldwell... 7,492	Franklin...14,110	Lincoln... 8,195	Folk..... 4,043	Wilkes...14,906
Camden... 5,343	Gaston... 9,310	McDowell, 7,120	Randolph, 16,793	Wilkes...14,749
Carteret... 8,185	Gates..... 8,444	Macon..... 6,004	Richmond, 11,009	Wilson... 9,726
Caswell...16,215	Granville, 23,396	Madison... 5,906	Robeson...16,490	Yadkin...10,718
Catawba...10,730	Greene.... 7,926	Martin....10,189	Rock'gh'm, 16,748	Yancey... 8,666
Chatham...19,106	Gulford...20,056	Total.....		997,667

**SOUTH CAROLINA.—Area, 29,385 square miles.**

Abbeville...32,385	Chester'd, 11,634	Georgeto'n, 21,305	Lexington, 16,379	Richland...16,324
Anderson...22,673	Clarendon, 13,099	Greenville, 21,691	Marion...21,190	Spartanb'g, 26,320
Barnwell...30,743	Colleton...30,916	Horry..... 7,964	Marlboro', 12,434	Sumter...23,666
Beaufort...40,082	Darlington, 20,343	Kershaw...13,169	Newberry, 20,579	Union....19,826
Charleston, 61,106	Edgefield...39,587	Lancaster, 11,797	Orange'b', 24,896	Willms'b', 16,466
Chester...18,123	Fairfield...22,111	Laurens...23,868	Pickens...19,690	York.....21,603
Total.....				703,613

**GEORGIA.—Area, 58,000 square miles.**

Appling.... 4,190	Bulloch... 5,668	Catoosa... 5,662	Clayton... 4,406	Dade..... 2,069
Baker.... 4,966	Burke....17,166	Charlton...11,780	Clinch.... 3,663	Dawson... 3,857
Baldwin... 9,078	Butts.... 6,466	Chatham...31,443	Cobb.....14,341	Decatur...11,923
Banks.... 4,707	Calhoun... 4,913	Chattooga, 7,166	Coffee.... 2,879	De Kalb... 7,807
Berrie.... 3,471	Camden... 5,420	Chatth'le, 5,806	Colowitt... 1,316	Dooley.... 8,916
Bibb....16,291	Campbell... 8,301	Cherokee...11,291	Columbia, 11,860	Dougherty, 6,266
Brooks... 6,368	Carroll...11,991	Clarke....11,726	Coweta...14,708	Early.... 6,166
Bryan.... 4,013	Casa....13,724	Clay..... 4,893	Crawford... 7,693	Echols.... 1,491

Edinburgh...4,766	Harris....12,726	Madison...5,933	Pulaski...8,744	Towne....2,409
Elbert....10,433	Hart....6,137	Marion....7,390	Putnam...10,130	Troup....18,269
Emanuel...5,081	Heard....7,803	Meriwether...13,329	Quitman...3,499	Twigg....8,320
Faust....8,140	Henry....10,702	Miller....1,791	Rabus....3,271	Union....4,413
Fayette....7,047	Houston...15,612	Milton....4,602	Randolph...9,571	Upson....9,910
Floyd....15,196	Irwin....1,699	Mitchell...4,308	Richmond...21,284	Walker....10,062
Forsyth...7,749	Jackson...10,605	Monroe....15,933	Schley....4,633	Walton....11,072
Franklin...7,393	Jasper....10,743	Montgomery...2,907	Scriven....8,274	Ware....2,200
Fulton....14,427	Jefferson...10,210	Morgan....9,998	Spaulding...5,699	Warren....9,329
Gibson....6,722	Johnson...2,919	Murray....7,063	Stewart....13,423	Washington...12,096
Gilcock....2,437	Jones....9,107	Muscogee...16,384	Sumter....9,428	Wayne....2,269
Glynn....3,899	Laurens...6,998	Newton....14,323	Talbot....13,517	Webster....5,030
Gordon....10,148	Lee....7,178	Oglethorpe...11,549	Taliaferro...4,583	White....3,314
Greene....12,649	Liberty....8,369	Paulding...7,038	Tatnall....4,352	Whitfield...10,047
Gwinnett...12,910	Lincoln...5,249	Pickens....4,931	Taylor....8,000	Wilcox....2,115
Habersham...3,906	Lowndes...4,568	Pierce....1,913	Telfair....2,713	Wilkes....11,420
Hall....9,366	Lumpkin...4,026	Pike....10,068	Terrell....6,237	Wilkinson...9,376
Hancock...12,044	McIntosh...5,846	Polk....8,293	Thomas....10,767	Worth....2,763
Hardeeville...3,639	Marion....8,449	Total.....		1,057,329

**FLORIDA.—Area, 59,268 square miles.**

Alachua....8,234	Escambia...5,768	Jackson....10,199	Marion....8,510	Sumter....1,549
Brevard...246	Franklin...1,904	Jefferson...9,876	Monroe....2,912	Suwanee....1,398
(St. Lucia)	Gadsden...9,396	Lafayette...2,068	Nassau....3,034	Taylor....1,384
Calhoun....1,448	Hamilton...4,154	Leon....12,835	New River...4,055	Volusia....1,158
Clay....1,914	Hernando...1,200	Levy....1,782	Orange....987	Wakulla....2,836
Columbia...4,727	(Benton)	Liberty....2,712	Putnam....2,712	Walton....3,067
Dade....63	Hillsboro*...2,981	Madison....7,779	St. John's...3,039	Washington...2,154
Duval....5,095	Holmes....1,366	Manatee....834	Santa Rosa...4,481	Total....140,439

**ALABAMA.—Area, 50,722 square miles.**

Autauga...15,739	Clarke....15,049	Hauk's (dropped)	Marion....11,180	St. Clair...11,012
Baldwin...7,533	Coffee....8,629	Henry....14,917	Marshall...11,472	Shelby....12,618
Barbour...30,816	Conecuh...11,311	Jackson...18,284	Mobile....41,131	Sumter....24,033
Benton (dropped)	Cosa....19,272	Jefferson...11,744	Monroe....15,669	Taliaferro...23,520
Bibb....11,894	Covington...6,468	Lauderdale...17,420	Montgomery...35,905	Tallapoosa...22,827
Bloount...10,865	Dale....12,727	Lawrence...13,976	Morgan....11,331	Tallapoosa...23,201
Bullock....18,123	Dallas....33,626	Limestone...15,304	Perry....27,727	Walker....7,980
Calhoun....21,539	De Kalb...10,703	Lowndes...27,718	Pickens....22,319	Washington...4,689
Chambers...23,214	Fayette....12,650	Marion....26,834	Pike....24,436	Wilcox....24,618
Cherokee...18,360	Franklin...18,626	Madison....26,450	Randolph...20,059	Winston....3,676
Choctaw...18,977	Greene....30,859	Marengo...31,194	Russell....26,593	Total....964,296

**MISSISSIPPI.—Area, 47,156 square miles.**

Adams....20,165	Covington...4,406	Jefferson...15,349	Newbern....8,343	Sunflower...5,019
Amite....12,336	De Soto...23,338	Jones....3,323	Newton....9,661	Tallahatchie...7,892
Attala....14,168	Franklin...6,266	Kemper....11,662	Noxubee...20,066	Tippah....22,560
Bolivar....10,471	Greene....2,232	La Fayette...16,136	Oktibbeha...12,982	Tishomingo...24,149
Calhoun....9,518	Hancock...9,139	Lauderdale...15,313	Panola....13,794	Tunica....4,367
Carroll....22,038	Harrison...4,919	Lawrence...9,213	Perry....2,606	Warren....20,710
Chickasaw...16,426	Hinds....31,342	Leake....9,324	Pike....11,135	Washington...15,679
Choctaw...15,740	Holmes....17,794	Lowndes...23,623	Pontotoc...22,114	Wayne....3,691
Cibola....15,690	Iscuena....7,631	Madison....23,382	Rankin....13,637	Wilkinson...15,235
Clarke....10,771	Itawamba...17,693	Marion....4,666	Scott....8,140	Winnow....9,811
Coahoma...6,606	Jackson....4,122	Marshall...28,820	Simpsou....6,080	Yalobusha...15,080
Copiah....15,399	Jasper....11,007	Monroe....21,283	Smith....7,638	Yazoo....22,373
Total.....				791,396

**LOUISIANA.—Area, 41,255 square miles.**

Ascension...11,485	Carroll....18,053	Jefferson...15,372	Rapides....23,380	St. Tammy...5,406
Assumption...15,379	Catahoula...11,652	La Fayette...9,003	Sabine....6,828	Texas....18,060
Averyell...13,165	Claiborne...16,846	La Fourche...14,044	St. Bernard...4,078	Terre Boe...12,000
B. Rouge...16,016	Concordia...13,805	Livingston...4,431	St. Charles...5,297	Union....10,300
B. Rouge W...7,312	De Soto...13,299	Madison...14,133	St. Helena...7,130	Vermillion...4,394
Bienville...11,000	Felic's, E...14,696	Morehouse...10,367	St. James...11,604	Washita....4,727
Boesler....12,628	Felic's, W...11,671	Natchitoches...16,697	St. J'n Bapt...7,932	Washington...4,708
Caddo....12,140	Franklin...6,162	Orleans....174,288	St. Landry...23,100	Win...6,878
Calcasieu...5,928	Iberville...14,661	Piquemine...8,493	St. Martin...12,677	Opelousas...23,104
Caldwell...4,832	Jackson....9,812	P't Coupee...17,720	St. Mary's...10,812	Total....709,290

**TEXAS.—Area, 237,504 square miles.**

Anderson...10,397	Bell....4,800	Burleson...5,683	Clay....109	Culloch (not or.)
Angelina...4,771	Bexar....14,454	Burnett...2,488	Coleman (not or.)	Dallas....8,665
Archer (not or.)	Blanco....1,281	Calahan (not or.)	Collins....9,266	Dawson....281
Atascosa...1,660	Boesque...2,005	Caldwell...4,481	Colorado...7,885	DeWitt....3,030
Austin....10,139	Bowie....5,062	Calhoun....2,042	Comal....4,079	De Witt....3,107
Banders....390	Brazoria...7,143	Cameron....8,030	Comanche...709	Dimitt (not or.)
Bastrop....5,796	Brazos....2,776	Cass....8,411	Concho (not or.)	Duval.... (not or.)
Baylor (not or.)	Brown....244	Chambers...1,608	Cook....2,760	Eastland....99
Bee....910	Buchanan...230	Cherokee...12,098	Coryell....2,986	Edwar's (not or.)

Kills.....	8,246	Haskell (not or.)		La Salle (not or.)	2,807	Nueces.....	2,807	Throckmorn	1,934
El Paso.....	4,051	Hays.....	2,056	Lavaca.....	5,948	Orange.....	1,916	Titus.....	8,045
Encinal.....	43	Henderson.....	4,506	Leon.....	8,781	Palo Pinto.....	1,524	Travis.....	8,886
Erath.....	2,428	Hidalgo.....	1,193	Liberty.....	3,189	Panola.....	8,478	Trinity.....	4,392
Falls.....	3,614	Hill.....	3,663	Limestone.....	4,537	Parker.....	4,214	Tyler.....	4,836
Fannin.....	9,217	Hopkins.....	7,745	Liveoak.....	593	Polk.....	8,398	Upshur.....	10,845
Fayette.....	11,604	Houston.....	8,038	Llano.....	1,101	Presidio.....	880	Uvalde.....	806
Fort Bend.....	6,143	Hunt.....	6,634	McLennan.....	6,308	Red River.....	8,534	Van Zandt.....	3,778
Freestone.....	6,861	Jack.....	1,000	M'Mul'n (not or.)		Refugio.....	1,694	Victoria.....	8,576
Frio.....	400	Jackson.....	2,612	Madison.....	2,238	Robertson.....	4,997	Walker.....	8,191
Galveston.....	8,177	Jasper.....	4,041	Marion.....	3,979	Ru'nells (not or.)		Washing'gton	15,318
Gauleiters.....	5,444	Jefferson.....	1,994	Mason.....	630	Rusk.....	13,896	Webb.....	1,446
Gillespie.....	2,736	Johnson.....	4,306	Matagorda.....	2,910	Sabine.....	2,750	Wharton.....	3,369
Goliad.....	3,383	Jones..... (not or.)		Maverick.....	738	San Aug'e.....	4,094	Wichita (not or.)	
Gonzales.....	8,030	Karnes.....	2,171	Medina.....	1,838	San Patricio.....	820	Will'b'r (not or.)	
Grayson.....	8,187	Kaufman.....	3,938	McCaard (not or.)		San Saba.....	913	Williams'n	4,620
Grimes.....	10,307	Kemble (not or.)		Milam.....	8,175	Shackelford.....	44	Wise.....	2,160
Hamilton.....	498	Kerr.....	634	Montague.....	849	Shelby.....	5,363	Wood.....	4,988
Hard'an (not or.)		Kinney.....	61	Montg'ry.....	5,479	Smith.....	13,365	Young.....	892
Hardin.....	1,363	Knox..... (not or.)		Nacogdoe's.....	8,283	Starr.....	2,406	Za Patta.....	1,348
Harris.....	7,710	Lamar.....	10,138	Navarro.....	5,997	Tarrant.....	8,020	Zavalla.....	86
Harrison.....	15,001	Lampasas.....	1,028	Newton.....	3,123	Taylor. (not or.)		Total.....	602,432

**ARKANSAS.—Area, 52,198 square miles.**

Arkansas.....	8,644	Crawford.....	7,860	Izard.....	7,216	Newton.....	3,393	Saline.....	6,640
Ashley.....	8,690	Crittenden.....	4,919	Jackson.....	10,403	Perry.....	2,465	Scott.....	8,148
Benton.....	9,308	Dallas.....	8,287	Jefferson.....	14,977	Philips.....	14,878	Searcy.....	5,371
Bradley.....	8,388	Desha.....	6,484	Johnson.....	7,612	Pike.....	4,026	Sebastian.....	9,286
Calhoun.....	4,108	Drew.....	9,079	La Fayette.....	8,468	Polk.....	3,621	Sevier.....	10,416
Carroll.....	9,383	Franklin.....	7,309	Lawrence.....	9,349	Polk.....	4,392	Union.....	12,368
Chicot.....	9,231	Fulton.....	4,024	Madison.....	7,740	Polk.....	7,867	Van Buren.....	5,367
Clark.....	9,733	Greene.....	5,844	Marion.....	5,192	Polk.....	8,564	Washington	14,673
Columbia.....	2,461	Hempstead.....	13,991	Mississippi.....	3,898	Polk.....	11,700	Washington	12,936
Conway.....	6,896	Hot Spring.....	5,635	Monroe.....	8,657	Randolph.....	8,281	White.....	8,318
Craighead.....	8,006	Independ'ce.....	14,306	Montg'ry.....	3,633	St. Francis.....	8,673	Yell.....	8,333
Total.....									436,427

**TENNESSEE.—Area, 45,600 square miles.**

Anderson.....	7,068	De Kalb.....	10,573	Henderson.....	14,491	Marshall.....	14,592	Sevier.....	6,123
Bedford.....	21,584	Dickson.....	9,992	Henry.....	19,133	Maury.....	32,498	Shelby.....	48,091
Benton.....	8,463	Dyer.....	10,536	Hickman.....	9,312	Meigs.....	4,067	Smith.....	16,267
Bledsoe.....	4,459	Fayette.....	34,329	Humphreys.....	8,100	Monroe.....	12,607	Stewart.....	9,899
Blount.....	13,272	Fentress.....	5,654	Jackson.....	11,726	Montg'ry.....	20,896	Sullivan.....	13,563
Bradley.....	11,701	Franklin.....	13,448	Jefferson.....	18,042	Morgan.....	8,553	Sumner.....	22,099
Campbell.....	6,712	Gibson.....	21,763	Johnson.....	8,018	Oblon.....	12,817	Tipton.....	10,704
Cannon.....	9,909	Giles.....	26,166	Knox.....	22,612	Overtown.....	12,637	Union.....	6,117
Carroll.....	17,518	Granger.....	10,982	Lauderdale.....	7,692	Perry.....	8,042	Van Buren.....	2,881
Carter.....	7,124	Greene.....	18,964	Lawrence.....	9,319	Polk.....	8,726	Warren.....	11,167
Chatham.....	7,266	Grundy.....	8,094	Lewis.....	2,241	Putnam.....	8,568	Washington	14,648
Claiborne.....	9,644	Hamilton.....	13,259	Lincoln.....	22,828	Rhea.....	4,991	Waynes.....	9,118
Coeke.....	10,408	Hancock.....	7,021	McMinn.....	13,563	Roe.....	13,865	Weakley.....	10,318
Coffee.....	9,898	Hardeman.....	17,769	McNairy.....	14,732	Robertson.....	15,265	White.....	8,361
Cumberl'd.....	23,460	Hardin.....	11,214	Macon.....	7,290	Rutherford.....	27,918	Will'mson	23,527
Davidson.....	47,054	Hawkins.....	16,141	Madison.....	21,585	Scott.....	3,519	Wilson.....	26,572
Decatur.....	6,277	Haywood.....	19,232	Marion.....	6,190	Sequatchie.....	2,126	Total.....	1,199,467

**KENTUCKY.—Area, 37,680 square miles.**

Adair.....	9,609	Clark.....	11,484	Harlan.....	8,494	McCrack.....	210,390	Pike.....	7,384
Allen.....	9,187	Clay.....	6,662	Harrison.....	13,779	McLean.....	6,146	Powell.....	2,337
Anderson.....	7,404	Clinton.....	5,781	Hart.....	10,343	Madison.....	17,307	Radcliff.....	17,308
Ballard.....	8,693	Crittenden.....	8,798	Henderson.....	14,262	Magee.....	3,484	Rock Castle.....	3,485
Barren.....	10,965	Cumberl'd.....	7,340	Henry.....	11,960	Marion.....	12,605	Rowan.....	3,283
Bath.....	12,113	Daviess.....	15,549	Hickman.....	7,011	Marshall.....	6,964	Russell.....	4,624
Boone.....	11,197	Edmondson.....	4,647	Hopkins.....	11,876	Mason.....	18,223	Scott.....	14,417
Bourbon.....	14,899	Estill.....	6,896	Jackson.....	3,087	Meade.....	8,998	Shelby.....	16,436
Boyd.....	6,044	Fayette.....	22,699	Jefferson.....	89,405	Mercer.....	13,701	Simpson.....	8,146
Boyle.....	9,305	Fleming.....	12,468	Jessamine.....	4,466	Metcalf.....	6,743	Spencer.....	6,198
Bracken.....	11,921	Floyd.....	8,336	Johnson.....	8,308	Monroe.....	8,661	Taylor.....	7,691
Breathitt.....	4,860	Franklin.....	12,993	Kenton.....	28,467	Montg'ry.....	7,669	Todd.....	11,575
Breckin'r.....	13,237	Fulton.....	6,317	Knox.....	7,707	Morgan.....	9,288	Trigg.....	11,693
Bullitt.....	7,369	Gallatin.....	6,066	La Rue.....	8,891	Muhlenb'g.....	10,726	Trimble.....	4,899
Butler.....	7,927	Garrard.....	10,530	Laurel.....	5,488	Nelson.....	15,801	Union.....	12,771
Caldwell.....	9,318	Grant.....	8,366	Lawrence.....	7,601	Nicholas.....	11,630	Warren.....	17,386
Callaway.....	9,915	Graves.....	16,234	Letcher.....	3,904	Ohio.....	13,306	Washington	14,576
Campbell.....	20,909	Grayson.....	7,992	Lewis.....	8,361	Oldham.....	7,368	Waynes.....	10,939
Carroll.....	6,678	Green.....	8,805	Lincoln.....	10,646	Owen.....	13,721	Webster.....	7,630
Carter.....	8,616	Greenup.....	8,769	Livingston.....	7,302	Owsley.....	8,386	Whitley.....	7,763
Casey.....	8,486	Hancock.....	6,218	Logan.....	19,021	Pendleton.....	10,443	Woodford.....	11,326
Christian.....	21,628	Hardin.....	16,190	Lyon.....	5,309	Perry.....	3,966	Total.....	1,199,467



**OHIO.—Area, 39,964 square miles.**

Adams....26,309	Clarke....26,309	Hocking....17,068	Miami....29,909	Sandusky..31,147
Allen....19,186	DeLancey..11,892	Holmes....20,569	Monroe....20,743	Scioto....24,297
Ashland....22,961	Delaware..23,912	Huron....20,889	Montgo'ry..52,223	Seneca....30,869
Ashtabula..31,814	Erie....24,472	Jackson....17,941	Morgan....22,117	Shelby....17,493
Athens....21,384	Fairfield..30,538	Jefferson..26,117	Morrow....20,445	Stark....42,976
Auglaize...17,188	Fayette...18,936	Knox....27,723	Musking'm..44,417	Summit...27,340
Belmont....36,438	Franklin..50,573	Lake.....15,576	Noble.....20,781	Trumbull..30,656
Brow.....26,958	Fulton....14,044	Lawrence..25,254	Ottawa....7,017	Tuscar'wa..32,463
Batler....35,840	Gailla....22,045	Licking....37,011	Paulding...4,945	Union.....18,807
Carroll....15,738	Geauga....15,817	Logan....20,997	Perry....19,679	Van Wert..10,238
Champ'ign..22,696	Greene....26,197	Lorain....29,745	Pickaway..23,489	Vinton....13,631
Clark....35,301	Guernsey..24,474	Lucas....25,831	Pike.....15,843	Warren....26,098
Clermont..33,037	Hamilton..215,411	Madison...13,015	Portage....24,206	Washington..26,771
Cilutons...21,803	Hancock...22,885	Mahoning..25,893	Preble....31,820	Wayne....32,483
Columbi'a..32,838	Hardin....13,599	Marion....16,490	Putnam....12,808	Williams..16,693
Coshocton..36,032	Harrison..19,109	Medina....22,517	Richland..31,156	Wood.....17,898
Crawford..23,890	Henry....8,901	Meigs....26,534	Ross.....25,071	Wyandot's..15,586
Cuyahoga..78,035	Highland..27,774	Mercer....14,105	Total.....2,339,599	

**MICHIGAN.—Area, 56,243 square miles.**

Alcona....185	Delta....1,172	Kal'masoo..24,845	Miss'h'e(not or.)	Ottawa....13,215
Allegan....16,687	Kalamazoo..15,475	Kalam'ca(not or.)	Monroe....21,593	Presque Isle..26
Alpena....280	Emmett....1,149	Kent.....30,716	Montcalm..3,968	Rose'm'(not or.)
Antrim....179	Genesee....22,496	Lake....(not or.)	Mont'ey(not or.)	Saginaw...12,693
Barry....13,855	Gladwin...14	Leelanaw..2,158	Neosho....3,947	St. Clair...25,609
Bay.....2,164	GrandTrav..1,286	La Peer....14,754	Necosta....970	St. Joseph..21,262
Berrien...22,376	Griatiot....4,042	Lenawee..38,112	Newaygo..2,781	Sanilac....7,601
Branch....30,961	Hilledale..26,675	Livingston..18,862	Oakland...38,281	Schlaaws'e..12,349
Calhoun...29,563	Houghton..9,255	Macomb....22,843	Oceana....1,816	Schoolcraft..78
Cass....17,721	Huron....8,165	Manistee...975	Ogem'w(not or.)	Tuscola....4,886
Cheboygan..517	Ingham....17,435	Manitou...1,043	Ontonagon..4,568	Van Buren's..224
Chippewa..1,608	Ionia....16,693	Marquette..2,821	Oscoda....27	Was'h'aw's..26,688
Clare....(not or.)	Iscoco....175	Mason....831	Oscoda....(not or.)	Wayne....75,546
Clinton....13,916	Isabella....1,443	Michilim'e..1,938	Otsego....(not or.)	Was'h'd.(not or.)
Crawf'd(not or.)	Jackson...36,671	Midland....787	Total.....749,112	

**INDIANA.—Area, 33,809 square miles.**

Adams....9,574	Elkhart....20,991	Jefferson..25,039	Noble.....14,915	Stark....2,195
Allen....29,297	Fayette....10,188	Jennings..14,754	Ohio.....5,492	Steuben...10,374
Bartholo'w..17,945	Floyd....20,182	Johnson..14,655	Orange....12,076	Sullivan...15,063
Benton....2,810	Fountain..15,567	Knox.....16,056	Owen.....14,378	Switzer'ld..13,698
Blackford..4,122	Franklin..19,550	Kosciusko..17,424	Parke....15,538	Tippican'..28,756
Boone....16,754	Fulton....9,421	La Grange..11,365	Perry....11,840	Tipton....8,171
Brown....6,607	Gilbert....14,832	Lake.....9,143	Pike.....10,079	Union.....7,110
Carroll....13,489	Grant....15,779	La Porte..22,921	Porter....10,314	Vanderb'g..20,554
Cass....16,543	Greene....16,042	Lawrence..13,698	Posey....16,186	Vermillion..9,423
Clarke....20,506	Hamilton..17,310	Madison...16,514	Pulaski...5,711	Vigo.....22,519
Clay....12,160	Hancock..12,801	Marion....39,858	Putnam...20,681	Wabash....17,447
Clinton....14,505	Harrison..18,421	Marshall..12,722	Randolph..18,967	Warren....10,067
Crawford..8,205	Hendricks..16,963	Martin....8,976	Ripley....19,053	Warrick...13,263
Daviess...13,361	Henry....20,118	Miami....16,851	Rush.....16,192	Washington..17,929
Dearborn..24,406	Howard....12,524	Monroe....12,648	St. Joseph..18,456	Wayne....29,566
Decatur....17,294	Hunting'nl..4,868	Montgo'ry..20,989	Scott....7,304	Wells....10,984
De Kalb...15,880	Jackson...16,288	Morgan....16,110	Shelby....19,571	White....8,263
Delaware..15,758	Jasper....4,292	Newton....2,360	Spencer...14,586	Whitley...10,731
Dubois....10,394	Jay.....11,399	Total.....1,380,941		

**ILLINOIS.—Area, 55,405 square miles.**

Adams....41,323	De Witt....10,819	Jackson....9,589	Macoupin..24,602	Pulaski....3,950
Alexander..4,706	Douglas...7,140	Jasper....8,372	Madison...31,215	Putnam....5,587
Bond....8,813	Du Page....14,711	Jefferson..12,965	Marion....12,733	Randolph..17,285
Boone....11,678	Edgar....16,925	Jersey....12,053	Marshall..13,437	Richland...6,711
Bureau....9,938	Edwards...5,454	Jo Daviess..27,777	Mason....10,933	Rock Isl'..421,205
Bureau....26,429	Emm'gham..7,816	Johnson...9,342	Massac....6,214	St. Clair...37,694
Calhoun...5,145	Fayette....11,198	Kane.....30,058	Menard....9,598	Saline....8,331
Carroll....11,739	Ford.....1,979	Kankakee..15,415	Mercer....15,042	Sangamon..22,255
Cass....11,325	Franklin..9,363	Kendall....13,074	Monroe....12,892	Schuyler...14,685
Champ'ign..14,622	Fulton....33,299	Knox....28,663	Montgo'ry..13,892	Scott.....9,070
Christian..10,492	Gallatin...8,054	Lake.....18,266	Morgan....22,113	Shelby....14,635
Clarke....14,967	Greene....16,093	La Salle..48,332	Moultrie..6,386	Stark.....9,004
Clay....9,386	Grady....10,379	Lawrence..9,216	Ogle.....22,587	Stephens..23,118
Clinton....16,941	Hamilton..9,915	Leo.....17,651	Peoria....26,500	Tazewell..21,471
Coles....14,200	Hancock..39,061	Livingston..11,636	Perry....9,552	Union.....11,182
Cook....144,957	Hardin....3,748	Logan....14,276	Platt....6,127	Wabash....7,312
Crawford..11,551	Henderson..9,501	McDono'gh..20,089	Pike.....37,349	Warren....19,336
Cumber'ld..8,811	Henry....20,658	McHenry...22,088	Pope.....6,742	Washington..13,371
De Kalb...19,086	Iroquois...12,324	McLean....28,749		

Wayne....12,233	Whitesid's18,740	Will'mson12,205	Winneb'go24,492	Woodford..13,233
White....12,403	Will.....29,321	Total.....	.....1,711,743	

**WISCONSIN.—Area, 53,924 square miles.**

Adams....6,497	Dane.....43,992	Jefferson...28,771	Oconto....3,600	Shawano..5,339
Ashland....513	Dodge.....42,819	Juneau....8,704	Outagamie 5,588	Sheboygan26,848
Bad Ax....11,012	Door.....2,948	Kenosha...13,516	Ozaukee...15,674	St. Croix...5,393
Brown....11,797	Douglas...828	Kewaunee 5,630	Pepin.....2,397	Trempleau 2,556
Buffalo....3,865	Dunn.....2,723	La Crosse..12,194	Pierce....4,072	Walworth..26,506
Burnet....12	Eau Claire 3,164	La Fayette18,141	Polk.....1,412	Washington23,636
Catmet....7,896	F'd du Lac34,156	La Pointe...672	Portage...7,604	Waukesha26,849
Chippewa...1,895	Grant.....31,207	Manit'woo22,385	Racine....21,340	Waupaca 8,656
Clark....789	Green.....19,881	Marathon...2,934	Richland...9,737	Waubesa 8,772
Columbia...24,445	Gr'n Lake12,631	Marquette. 8,236	Rock.....36,692	Winneb'go23,760
Crawford...5,071	Iowa.....18,998	Milwaukee62,564	Sauk.....18,894	Wood.....2,429
Dallas....13	Jackson...4,171	Monroe....8,396	Total.....	775,673

**IOWA.—Area, 50,914 square miles.**

Adair....984	Clarke....5,427	Hamilton...1,099	Madison...7,358	Sac.....846
Adams....1,533	Clay....52	Hancock...179	Mahaaka..14,816	Scott....26,989
Alamakee12,236	Clayton...20,728	Hardin....5,440	Marion...16,815	Shelby....616
Appanoose11,933	Clinton...18,938	Harrison...3,623	Marshall..6,015	Sioux.....10
Audubon....464	Crawford...383	Henry....18,700	Mills.....4,460	Story....4,652
Benton....8,692	Dallas....5,244	Howard...3,163	Mitchell..3,409	Tama....5,296
Bl'k Hawk 8,244	Davis....13,764	Humboldt. 832	Monona....532	Taylor....2,699
Boone....4,251	Decatur...8,677	Ia.....43	Monroe...8,611	Union....2,612
Bremer....4,915	Delaware..11,028	Ida.....8,029	Montg'ry. 1,266	Van Buren17,083
Buchanan 7,908	D's Moines19,612	Jackson...18,494	Muscatine15,444	Wapello...14,518
Buena Vista 5	Dickinson. 180	Jasper....8,887	Oascola.(notor.)	Warren...10,293
Bunc'be(notor.)	Dubuque...31,163	Jefferson..15,037	O'Brien...8	Washington24,333
Butler....3,724	Emmett....106	Johnson...17,672	Page.....4,419	Wayne....6,411
Calhoun....281	Fayette...12,073	Jones.....13,305	Palo Alto..133	Webster...2,504
Carroll....281	Floyd....3,748	Keokuk....13,284	Plymouth. 148	Winnebago 168
Cass....1,612	Franklin..1,309	Kossuth....416	Pocahontas 163	Winnebush12,945
Cedar....12,949	Fremont...5,074	Lee.....20,232	Polk.....11,623	Woodbury 1,119
Cerro Gordo 940	Green....1,374	Linn.....18,900	Pottawat's 4,962	Worth....746
Cherokee...57	Grundy....793	Louisa....10,370	Poweshiek 5,670	Wright....653
Chickasaw 4,338	Guthrie...8,038	Lucas....5,766	Ringgold..2,023	Total.....

**MINNESOTA.—Area, 95,274 square miles.**

Alken....2	Dakotah...9,093	Kandiyoht. 76	Nicollet...3,773	Sherburne. 734
Anoka....2,106	Dodge....8,797	Lake.....36	Noble.....36	Shibley...2,606
Becker....386	Douglas...196	Le Sueur...6,316	Olmstead..5,527	Stearns...4,506
Benton....627	Faribault. 1,335	Mankatia..240	Otter Tail. 240	Steele....2,863
Blue Earth 4,802	Fillmore...13,543	Mapouin...136	Pembina...1,612	St. Louis...408
Bruckneridge 79	Freeborn...3,367	Martin....151	Pierce....10	Todd.....436
Brown....2,339	Goodhue...8,997	McLeod...1,286	Pine.....1,741	Toombs....49
Buchanan 26	Hennepin..12,849	Meeker....928	Pipestone. 28	Wabasha7,326
Carleton...81	Houston...6,645	Millie Lac. 73	Polk.....240	Wabnata..
Carver....5,106	Isanti....284	Monongalia 850	Ramsey...12,150	Waseca...2,661
Cass....180	Itasca....61	Morrison...618	Renville...246	Washington6,122
Chicago....91	Jackson...181	Mower....3,217	Rice.....7,543	Wiscosa...9,208
Cottonwood 12	Kanabao...30	Murray...29	Scott.....4,594	Wright....2,739
Crow Wing 269	Total.....			172,022

**MISSOURI.—Area, 67,380 square miles.**

Adair....8,531	Clay....13,025	Howell....3,169	Monroe...14,785	St. Charles16,825
Andrew...11,850	Clinton...7,846	Iron.....5,842	Montg'ry. 9,749	St. Clair...6,899
Atchison...4,649	Cole.....9,696	Jackson...22,014	Morgan...8,202	St. Francis 7,248
Audrain...8,074	Cooper...17,356	Jasper....8,883	N. Madrid. 8,653	St. Genev'ea7,079
Barry....7,704	Crawford...8,827	Jefferson..10,344	Newton...9,326	St. Louis190,536
Barton....1,817	Dade.....7,073	Johnson...14,844	Nodaway...5,253	Saline....14,709
Bates....7,216	Dallas....6,892	Knox.....8,726	Oregon....3,009	Schuyler...5,697
Benton....9,072	Davies...9,606	La Ciede...8,180	Osage....7,679	Scotland..8,973
Bollinger 7,386	De Kalb...5,224	La Fayette20,091	Ozark....2,447	Scott....3,247
Boone....19,487	Dent.....5,654	Lawrence. 8,847	Pemiscot. 2,961	Shannon 2,264
Buchanan23,961	Dodge....	Lewis....12,286	Perry....9,125	Shelby...7,301
Butler....2,961	Douglas...2,415	Lincoln...14,214	Pettis....9,492	Stoddard..7,877
Caldwell...6,034	Dunklin...8,026	Linn.....9,112	Phelps...5,914	Stacy....2,401
Callaway..17,445	Franklin..18,062	Livingston 7,417	Pike.....18,420	Sullivan...9,196
Camden....4,973	Gasconade 8,727	McDonald. 4,049	Platte....18,341	Taney....2,576
C. Gie'rd'ul5,475	Gentry....11,980	Marion...14,407	Polk.....9,906	Texas....6,026
Carroll...9,776	Greene...13,186	Madison...5,664	Pulaski...3,843	Vernon....4,779
Carter....1,234	Grundy...7,895	Marion...4,901	Putnam...6,206	Warren...8,533
Cass....9,793	Harrison..10,627	Marion...18,628	Ralls....8,692	Washington6,786
Cedar....6,639	Henry....9,894	Mercer....9,306	Randolph..11,406	Waynes...8,629
Chariton..12,689	Hickory...4,706	Miller....6,812	Ray.....14,091	Webster...7,000
Christian..5,491	Holt....6,580	Mississippi 4,859	Reynolds..3,173	Wright....4,066
Clark....11,684	Howard...16,949	Moniteau..10,064	Ripley...3,747	Total.....

**CALIFORNIA.—Area, 188,981 square miles.**

Alameda... 8,977	Humboldt... 2,694	Nevada... 16,447	San Fran... 66,808	Stanislaus... 2,546
Amador... 10,933	Klamath... 1,808	Placer... 12,270	San Joaquin... 9,434	Sutter... 2,369
Butte... 12,197	L's Angel's... 1,236	Plumas... 4,363	S'a L's Ob'ol... 7,733	Tehama... 4,044
Calaveras... 16,302	Mariposa... 3,234	Sacram'to... 24,148	San Mateo... 2,214	Triunty... 5,126
Colusa... 2,374	Mariposa... 3,234	St. Barbara... 3,343	Shasta... 4,360	Tulare... 4,638
Ctra Costa... 3,326	Mendocino... 2,967	St. Clara... 11,913	Sierra... 11,366	Tuolumna... 16,229
Del Norte... 1,992	Merced... 1,141	Santa Cruz... 4,948	Siskiyou... 7,029	Yolo... 4,716
El Dorado... 20,293	Monterey... 4,739	S. Bernard's... 6,654	Solano... 7,170	Yuba... 12,671
Fresno... 4,606	Napa... 5,615	San Diego... 4,326	Sonoma... 11,967	Total... 360,016

**OREGON.—Area, 102,606 square miles.**

Benton... 3,074	Coe... 384	Josephine... 1,692	Maltinmah... 4,150	Wasco... 1,689
Clackamas... 3,466	Curry... 393	Lane... 4,780	Polk... 3,625	Washington... 2,861
Clatsop... 496	Douglas... 3,264	Linn... 5,772	Tillamook... 96	Yam Hill... 3,246
Columbia... 632	Jackson... 3,736	Marion... 7,068	Umpqua... 1,260	Total... 52,464

**KANSAS.—Area, 78,418 square miles.**

Allen... 1,062	Clay... 163	Godfrey... 19	Lykens... 4,900	Pottawtaw's... 666
Anderson... 2,400	Coffey... 2,842	Greenwood... 759	McGee... 1,501	Riley... 1,226
Atchison... 7,720	Davis... 1,163	Hunter... 158	Marion... 74	Shawnee... 3,512
Bourbon... 6,102	Dickinson... 878	Jackson... 1,996	Marshall... 2,360	Wabaussee... 1,964
Brockton... 3,632	Doniphan... 5,094	Jefferson... 4,458	Morris... 770	Washington... 368
Brown... 2,609	Dora... 86	Johnson... 4,363	Nemaha... 2,437	Wilson... 27
Butler... 437	Douglas... 8,637	Leavenworth... 12,608	Ogawa... 1,112	Woodson... 1,468
Chase... 806	Franklin... 2,081	Linn... 6,336	Otoe... 336	Wyandott... 2,608
				Total... 107,110

The population of the Territories is rapidly increasing, and no reliable Census Report can be here presented.

**Population of the Principal Cities and Towns.****Census of 1860.**

Augusta, Me... 7,609	Baton Rouge, La... 5,428	Danville, Pa... 6,386	Haverat'w, N.Y... 5,461
Abington, Me... 5,577	Calais, Me... 5,621	Dayton, O... 20,482	Hoboken, N.J... 9,672
Adams, Me... 5,924	Concord, N.H... 10,896	Detroit, Mich... 45,619	Hudson, N.J... 7,239
Attleboro', Ma... 6,064	Cambridge, Ma... 26,060	Dubuque, Ia... 12,012	Hackensack, N.J... 5,468
Albany, N.Y... 62,368	Chattown, Ms... 26,063	Davenport, Ia... 11,268	Harrisburg, Pa... 12,406
Anbarn, N.Y... 10,966	Chelsea, Me... 12,398	Denver, Col... 4,947	Hempfield, Pa... 5,456
Arcadia, N.Y... 5,312	Chicopee, Ms... 7,261	Enfield, Ct... 4,969	Houston, Tex... 5,000
Amherst, N.Y... 5,086	Cumberl'd, E... 1,839	Elmira, N.Y... 8,692	Hamilton, O... 7,223
Alleghany, Pa... 28,703	Cranston, R.I... 7,500	Ellisburg, N.Y... 5,614	Hannibal, Mo... 6,565
Allentown, Pa... 6,026	Cortland, N.Y... 10,078	E. Chester, N.Y... 5,589	Ithaca, N.Y... 6,843
Alexandria, Va... 11,208	Cohoes, N.Y... 8,800	Elizabeth, N.J... 11,567	India'polis, Ind... 18,612
Angusta, Ga... 12,493	Canand't's, N.Y... 7,076	Erie, Pa... 9,419	Iowa City, Ia... 5,214
Atlanta, Ga... 9,564	Castleton, N.Y... 6,778	Easton, Pa... 8,944	Jamaica, N.Y... 8,811
Algiers, La... 5,616	Caston, N.Y... 8,379	Evansville, Ind... 11,466	Johnstown, N.Y... 6,516
Adrian, Mich... 5,213	Catskill, N.Y... 6,276	Fall River, Ma... 14,027	Jersey City, N.J... 29,228
Alton, Ill... 6,332	Corning, N.Y... 6,003	Fitchburg, Ma... 7,806	Jacksonville, Fla... 2,156
Aurora, Ill... 6,011	Champaign, N.Y... 5,867	Flushing, N.Y... 10,189	Jefferson, La... 8,167
Atchison, Kan... 2,616	Camden, N.J... 14,368	Fishkill, N.Y... 9,446	Janeville, Wis... 7,703
Bangor, Me... 16,407	Carlisle, Pa... 5,664	Frederick, Md... 5,143	Jefferson City, Mo... 1,500
Biddeford, Me... 9,349	Carbondale, Pa... 5,575	Frostburg, Md... 6,285	Key West, Fla... 2,833
Bath, Me... 6,076	Chambersburg, Pa... 5,287	Frederick'sburg, Va... 5,022	Kingston, N.Y... 16,646
Belfast, Me... 5,630	Columbia, Pa... 5,007	F't Wayne, Ind... 10,366	Kalamazoo, Mich... 6,076
Burlington, Vt... 7,713	Cumberl'nd, Md... 8,478	F'd du Lac, Wis... 5,450	Keokuk, Ia... 6,157
Boston, Ma... 177,481	Charleston, S.C... 51,210	Fort Smith, Ark... 1,629	Lawrence, Kan... 1,646
Beverly, Me... 6,154	Columbia, S.C... 8,063	Gloucester, Ma... 10,603	Leavenworth, Kan... 7,429
Blackstone, Ma... 5,463	Columbus, Ga... 9,621	Greenwich, Ct... 8,522	Lexington, Me... 4,116
Brookline, Ma... 5,164	Columbus, Miss... 2,306	Greenbush, N.Y... 8,320	Lowell, Ma... 30,827
Barnstable, Ma... 5,129	Camden, Ark... 1,343	Galen, N.Y... 5,949	Lynn, Ma... 19,088
Bristol, R.I... 5,271	Covington, Ky... 18,471	Georgetown, D.C... 8,733	Lawrence, Ma... 17,639
Bridgeport, Ct... 12,390	Cincinnati, O... 161,044	Galveston, Tex... 8,177	Lookport, N.Y... 13,523
B'ly'n, N.Y... 266,064	Cleveland, O... 36,084	G'd Rapids, Mich... 8,086	Lenox, N.Y... 8,024
Buffalo, N.Y... 81,131	Columbus, O... 18,555	Galea, Ill... 8,196	Little Falls, N.Y... 5,869
B'k Haven, N.Y... 9,923	Chillicothe, O... 7,687	Galesburg, Ill... 8,626	Lisbon, N.Y... 4,640
Blaght'm't'n, N.Y... 8,296	Chicago, Ill... 169,253	Golden City, Col... 1,614	Lansingb'g, N.Y... 5,677
Barre, N.Y... 7,227	Carson City, Nev... 708	G't Salt La. City... 8,218	Lyons, N.Y... 5,077
Bath, N.Y... 5,127	Dover, N.H... 8,692	Haverhill, Ma... 9,995	Lancaster, Pa... 17,603
Berger, N.J... 7,429	Dorchester, Ma... 3,799	Holyoke, Ma... 4,997	Lynchburg, Va... 5,868
Burlington, N.J... 5,174	Dedham, Ma... 6,330	Hartford, Ct... 20,152	Little Rock, Ark... 3,737
Birmingham, Pa... 6,046	Deavers, Ma... 5,110	Hempst'd, N.Y... 12,375	Louisville, Ky... 66,740
Baltimore, Md... 212,419	Danbury, Ct... 7,234	Hunt'gton, N.Y... 8,926	Lexington, Ky... 9,921
Bloomington, Ill... 7,076	Derby, Ct... 5,444	Hudson, N.Y... 7,263	Lafayette, Ind... 9,426
Burlington, Ia... 5,706	Deer Park, N.Y... 5,186	Hector, N.Y... 5,673	La Porte, Ind... 5,926

M'chester, N. H. 20,107	N. Bruns'k, N. J. 11,265	Peoria, Ill. .... 14,425	St. Louis, Mo. .... 151,780
Milford, Ma. .... 9,132	Norfolk, Va. .... 14,609	Quincy, Ma. .... 6,778	St. Joseph, Mo. .... 8,932
Marblehead, Ma. 7,846	Newbern, N. C. 5,434	Queensb'g, N. Y. 7,146	St. Paul, Minn. 10,401
Marlboro', Ma. .... 5,911	Natches, Miss. 13,553	Quincy, Ill. .... 13,718	St. Anth'y, Minn. 3,256
Malden, Ma. .... 5,868	N. Orleans, La. 168,472	Rockland, Me. .... 7,316	St. Franc'co, Cal. 56,806
Malden, Ct. .... 7,426	Nashville, Ten. 16,987	Rutland, Vt. .... 7,577	Sacramento, do. 13,786
Morrisania, N. Y. 9,245	Newport, Ky. .... 10,046	Roxbury, Ma. .... 25,137	Salem, Or. ....
Malone, N. Y. .... 8,666	N. Albany, Ind. 12,647	Randolph, Me. .... 5,760	Santa Fe, N. Mex. 4,635
Middleto'n, N. Y. 6,243	Nebraska City... 1,913	Rochester, N. Y. 48,243	Taunton, Ma. .... 15,376
Manlius, N. Y. .... 6,028	Oswego, N. Y. .... 16,817	Rome, N. Y. .... 6,245	Troy, N. Y. .... 39,236
Milton, N. Y. .... 5,235	Oyster Bay, N. Y. 9,168	Rahway, N. J. .... 7,130	Trenton, N. J. .... 17,221
Macou, Ga. .... 8,247	Ogdensb'g, N. Y. 7,410	Reading, Pa. .... 23,162	Tuscaloosa, Ala. 3,969
Mobile, Ala. .... 29,359	Or'getown, N. Y. 7,060	Richmond, Va. 37,916	Toledo, O. .... 13,708
Montgo'ry, Ala. .... 9,689	Onondaga, N. Y. 5,113	Richmond, Ind. 6,503	Terre Haute, Ind. 8,594
Madison, Ind. .... 8,133	Orange, N. J. .... 8,977	Rockford, Ill. .... 7,363	Utica, N. Y. .... 22,628
Milw'kee, Wis. 45,264	Oshkosh, Wis. .... 6,066	Rock Island, Ill. 5,130	Volney, N. Y. .... 8,045
Madison, Wis. .... 5,011	Oregon City, Or. ....	Racine, Wis. .... 7,822	Verona, N. Y. .... 5,966
Muscantine, Ia. .... 5,324	Ogden, Utah. .... 1,484	Saco, Me. .... 5,223	Vicksburg, Miss. 4,601
Minneapolis, Minn. 2,664	Omaha, Neb. .... 1,688	Salem, Me. .... 22,252	Virg. City, Nev. 2,345
Mesilla, N. Mex. 2,406	Pembina, Dak. .... 3,666	Springfield, Ma. 15,199	Westbrook, Me. .... 5,113
Memphis, Tenn. 22,628	Pt. To'n's'd, W. Ter. 264	Somerville, Ma. 8,025	Worcester, Ma. 24,960
Nashua, N. H. .... 10,065	Portland, Or. .... 1,371	S. Danvers, Ma. 6,549	Weymouth, Ma. .... 7,742
New Bedford, Ma. 22,300	Portland, Me. .... 26,343	Smithfield, R. I. 13,283	Woburn, Ma. .... 9,778
Newburyport, Ma. 13,401	Portam'th, N. H. 9,335	Stonington, Ct. .... 7,740	Waltham, Ma. .... 6,267
Newton, Ma. .... 8,382	Pittsfield, Ma. .... 8,045	Stamford, Ct. .... 7,185	W. Roxbury, Ma. 6,310
North'pton, Ma. .... 6,788	Plymouth, Ma. .... 8,272	Syracuse, N. Y. 28,199	Waterbury, Me. .... 5,054
N. Bridgew'r, Ma. 6,684	Providence, R. I. 50,666	Sche'ctady, N. Y. 9,579	Warwick, R. I. .... 5,918
Natick, Ma. .... 5,515	Pokespaic, N. Y. 14,726	Saugerties, N. Y. 9,636	Waterbury, Ct. 30,904
N. Providence, R. I. 11,818	Parish'le, N. Y. 9,033	Seneca, N. Y. .... 6,448	West Troy, N. Y. 8,820
Newport, R. I. .... 10,606	Paradise, N. Y. .... 6,737	Saratoga, N. Y. .... 6,521	Waterto'n, N. Y. 7,472
New Haven, Ct. 39,366	Plattsburg, N. Y. 6,690	Southold, N. Y. 5,732	Walkill, N. Y. .... 6,663
Norwich, Ct. .... 14,027	Phelps, N. Y. .... 5,586	Sullivan, N. Y. .... 5,233	Wilm'gton, Del. 21,360
N. London, Ct. .... 10,116	Parerson, N. J. .... 19,588	Scranton, Pa. .... 9,223	Wash'g'n, D. C. 61,118
Norwalk, Ct. .... 7,582	Philad'phia, Pa. 565,631	Staunton, Va. .... 14,124	Wheel'g, W. Va. 14,459
New Britain, Ct. 5,212	Pittsburg, Pa. .... 49,220	Savannah, Ga. .... 22,292	Wayneb'o', Va. 18,236
N. York, N. Y. 813,968	Pottsville, Pa. .... 9,444	S. Antonio, Tex. 5,274	Wilm'gton, N. C. 9,563
Newburg, N. Y. 15,196	Petersburg, Va. 18,266	Sandusky, O. .... 8,408	Wat'rtown, Wis. 5,303
Newtown, N. Y. 13,725	Portsmouth, Va. 9,487	Springfield, O. .... 7,202	Yonkers, N. Y. 11,848
Niagara, N. Y. .... 6,003	Pensacola, Fla. .... 4,680	Steubenville, O. 5,154	York, Pa. .... 8,065
N. Hamps'd, N. Y. 5,419	Prattville, Ala. .... 3,200	Springfield, Ill. .... 6,499	Zanesville, O. .... 9,320
Newark, N. J. .... 71,941	Portsmouth, O. .... 6,268		

### WHAT TO DO WITH IT.

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## NEW-YORK AND WASHINGTON.

THERE are perhaps no two cities in this country to which inventors and patentees are more frequently called, in the course of business, than New-York and Washington. For the convenience of our inventive friends, we subjoin a list of the principal objects and places of interest, which they should endeavor to see whenever they visit either place. Inventors will always be welcome at our offices in New-York or Washington; and we hope they will "walk in" without knocking. We shall be happy to give them any information. (See page 13.)

### WASHINGTON.—PLACES OF INTEREST.

Arsenal.  
Alexandria, Va.  
Aqueduct.  
Battle-Fields of Bull Run.  
Congressional Cemetery.  
Capitol and Grounds.  
Georgetown Heights.  
General Post-Office.  
Government Insane Asylum.  
Government Green-Houses.  
Jackson's Statue.  
Long Bridge.  
Mount Vernon.

National Observatory  
Navy Yard.  
Navy Department.  
Potomac Falls.  
Presidential Mansion and Gardens.  
Patent Office.  
Scientific American Office.  
Smithsonian Institute.  
Soldier's Home.  
Treasury Department.  
War Department.  
Washington Monument.  
Washington's Statues.

### NEW-YORK.—PLACES OF INTEREST.

Academy of Music.  
Academy of Design.  
Asylum for the Blind.  
Astor Library.  
Atlantic Docks.  
Battery.  
Bible House.  
Blackwell's Island.  
Central Park.  
City Hall.  
Cooper Institute.  
Croton Reservoir.  
Dry Dock.  
Fort Hamilton.  
Fort Lafayette.  
Governor's Island.

Greenwood Cemetery.  
High Bridge.  
Hoboken.  
Navy Yard.  
Post-Office.  
Scientific American Office.  
Sub-Treasury.  
South Street.  
Staten Island.  
Tombs.  
Trinity Church.  
United States Custom House.  
Washington Monument.  
Worth Monument.  
Wall Street.  
Washington Market.

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# UNITED STATES PATENT LAW

INSTRUCTIONS

## How to Obtain Letters Patent

### FOR NEW INVENTIONS,

TAKEN FROM THE OFFICIAL PUBLICATION CONCERNING  
THE PATENT LAW.

### MUNN & COMPANY, DIRECTORS OF PATENTS,

125 NASSAU ST., NEW YORK.

OF THE PATENT OFFICE, WASHINGTON, D. C.

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THE  
**United States Patent Law.**  
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INSTRUCTIONS  
**HOW TO OBTAIN LETTERS PATENT**  
**FOR NEW INVENTIONS,**

TOGETHER WITH A

**Variety of Useful Information concerning  
the Patent Law.**

**By MUNN & CO., SOLICITORS OF PATENTS,**

**No. 37 Park Row, New-York.**

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THE Patent Law Amendment Act, passed March 2, 1861, and now in force, introduced several important changes in our Patent System. The general practice of the Patent Office, however, in regard to the examination and issue of Letters Patent for new inventions, remains nearly the same as before the amendment.

There are a great variety of questions constantly arising under our Patent System that involve matters of great importance, not only to inventors and patentees, but to all who are in any way interested in patented inventions. We have endeavored, in the preparation of this pamphlet, to embrace all such points as are most important to those interests. The information is based upon our own experience of seventeen years as Solicitors of Patents, and upon decisions made by United States Courts in patent cases.

### THE FIRST INQUIRY.

The first question that presents itself to an inventor who desires to procure a patent, is: "*Can I obtain a patent?*" A *positive* answer to this question is only to be had by presenting a formal application for a patent to the Government, embracing a petition, specification, model, duplicate drawings, and the payment of the prescribed official fees. Aside from these steps, all that the inventor can do is, to submit his plans to persons experienced in the business of obtaining patents, and solicit their opinions and advice. If the parties consulted are honorable men, the inventor may safely confide his ideas to them, and they will inform him whether or not his invention is probably patentable.

Those who have made inventions, and desire to consult with us respecting the same, are *cordially invited to do so*. We shall be happy to see them in person at our office, or to advise them by mail, or through the **SCIENTIFIC AMERICAN**. In all cases they may expect from us an *honest opinion*. For such consultations, opinion, and advice, *we make no charge*. A pen-and-ink sketch and a description of the invention should be sent, together with a stamp for return postage. The inventor should also state, with as much distinctness as possible, what special point he considers novel and desires to claim as his invention. This will aid us in solving the question of novelty.

Remember that all business committed to our care, and all consultations, are kept by us *secret and strictly confidential*.

### PRELIMINARY EXAMINATIONS.

In many cases it will be advisable, as a measure of prudence, to order a **PRELIMINARY EXAMINATION**. This consists of a *special search*, made at the United States Patent Office, Washington, through the medium of our house in that city, to ascertain whether, among all the thousands of patents and models there stored, any invention can be found which is similar in character to that of the applicant. On the completion of this special search we send a *written re-*

port of the result to the party concerned, with suitable advice. Our charge for this service, including the report, is \$5. This search, though it involves the expense just named, will usually prove satisfactory. If the same device has been before patented, the time and expense of constructing models, preparing documents, etc., will, in most cases, be saved; if the invention has been in part patented, the applicant will be enabled to modify his claims and expectations accordingly. Many other obvious advantages attend the Preliminary Examination, although the strictest search does not always enable the applicant to know positively whether a patent can be had. Applications for patents are often rejected because the examining officer finds a description of the alleged invention in some foreign publication; or some other person has been previously rejected on an analogous device; or some other invention, for a similar purpose, that partially resembles the applicant's in its construction, exists; or the Government makes an unjust or uncommon decision. Against none of these contingencies does the Preliminary Examination provide; it will, however, generally inform the applicant whether an improvement similar to his, and used for the same purpose, *has ever been patented or not in this country.*

We have conducted many thousands of preliminary examinations, and, as a general rule, they have proved reliable and satisfactory; but we cannot, even with all these precautions, undertake to guarantee success. The examinations of the Patent Office usually take a wide range, which it is impossible for us to bestow on any single case for a fee of \$5. Our long experience, however, leads us to advise inventors, usually as a measure of prudence, to adopt this course before applying for a patent.

Parties desiring the Preliminary Examination are requested to remit the fee, (\$5,) and furnish us with a sketch or model and description of the invention.

### CAVEATS.

A Caveat is a *confidential communication* made to the Patent Office, and is, therefore, filed within its secret archives.

The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent filed during that time, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat; the caveator is then required to complete his application for a patent within three months from the date of such notice. Caveat-papers should be very carefully prepared. Our fee for this service varies from \$10 to \$15. The Government fee under the new law is reduced to \$10, but this sum does not apply, as heretofore, as part of the fee on presenting an application for a patent.

Inventors will oftentimes find it very important to take advantage of the caveat system, the expense being comparatively small.

To enable us to prepare caveat-papers, we require only a sketch and description of the invention; no model being necessary.

Under the security afforded by a caveat, inventors should bear in mind that they cannot prevent other parties from using their inventions. The mere filing of a caveat does not allow the caveator to sell exclusive rights, as in the case of the issue of Letters Patent. It entitles him only to the right to receive notice of an interfering application, but does not settle the question of novelty in his behalf. A caveat may be renewed from year to year upon the payment of the usual official fee.

Caveat-papers cannot be withdrawn from the office nor undergo alteration after they have once been filed; but additional papers relative to the invention may be appended to the caveat, (their date being noted,) provided they are merely amendatory of the original caveat.

The right to file a caveat extends only to citizens, or to aliens who have resided in the United States one year, and have made oath of their intention to become citizens.

#### **EXPENSE OF APPLYING FOR A PATENT, REJECTIONS, ETC.**

Under the new law, the Government fee, on filing an application for a patent, is \$15, besides \$1 revenue stamp-

tax on the power of attorney; and if the patent is allowed, \$20 additional is required. If rejected, the first fee of \$15 is all that is demanded. English, French, Prussian, Austrian, Spanish, and inventors of every nationality, may now obtain patents in the United States upon the same terms as our own citizens. The only discrimination made is against subjects of Governments that discriminate against the inhabitants of the United States.

To the foregoing official fees must be added the attorney's fee for preparing the various documents and drawings. Our charge for *preparing a case, presenting it to Government, and attending to all business connected with it, until a decision is given*, is generally \$25; but the charge is higher if unusual labor is involved. If the patent is granted, no further agency expense ensues.

If the application is rejected, we cause a *thorough investigation to be made*, at Washington, into the reasons presented by the Commissioner for refusing the patent. In making this examination we have access to all the drawings, models, books, and specifications cited in reference, and we report the result as early as possible to our client. *For this service we make no charge.*

If the rejection proves to be an unjust one—which sometimes happens—it can generally be reversed, and the patent obtained by contesting the case. *For this prosecution we charge a fee proportionate to the extra labor involved, payable only on the issue of the patent; but our demand will be reasonable and satisfactory to our clients, and will be arranged beforehand by special agreement, and no charge whatever will be made for this prosecution, unless we succeed in procuring the grant of* LETTERS PATENT.

GENERAL REMARKS.—For the information of applicants, we would state that some agents are in the habit of charging for the preparation of the case, and, having no further facilities, *decline all investigation or prosecution when rejected*. Others, also having no facilities of their own, advise their clients to go to the expense of procuring official copies of the drawings and specifications of all the references. Again, others are in the habit of charging a high price at the out-

set, in which they include the cost of prosecuting the case, if by them deemed necessary. Under this system, if the patent issues, or is justly rejected, no further prosecution is needed; but the inventor has paid full price for a service not wanted and never rendered.

Our object in making the above statement is, not to reflect upon the manner in which other agents conduct their affairs, but simply to have our own method of doing business clearly understood.

The system adopted by us works well, gives general satisfaction, and presents to all applicants, rich or poor, an equal opportunity of having their patent cases prepared, conducted and prosecuted *in the best manner*, by experienced attorneys, upon the most moderate terms. Inventors who have REJECTED CASES, prepared either by themselves or for them by other agents, and desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unequalled facilities in securing favorable results. We have been successful in securing Letters Patent in HUNDREDS OF SUCH CASES. Our terms for such services are very moderate.

### MODELS, REMITTANCES, ETC.

The law requires that the inventor shall, in all cases, furnish a model, which must not exceed twelve inches in any of its dimensions. It should be neatly made, of hard wood or metal, or both, varnished or painted. The name of the inventor and his place of residence should be attached to it, or painted upon it conspicuously. Where the invention consists of an improvement on some known machine, a full working model of the whole will not be necessary. It should be sufficiently perfect, however, to show, with clearness, the nature and operation of the invention.

As soon as the model is ready, it should be carefully boxed and shipped by express or otherwise, to our address, namely, MUNN & Co., No. 37 Park Row, New-York City. Prepay the expense, and send the express receipt to us by mail.

Simultaneously with the model, the inventor should also send us the first installment of the Government fee, \$15.

The money may be forwarded either by express, with the model, or by mail. The safest way to remit is by draft on New-York, payable to our order. Always send a letter with the model, and also with the remittance, stating the name and address of the sender. We sometimes receive envelopes containing money, but without any name or explanation; models are also frequently sent us from equally unknown sources.

A full written description should also be sent with the model, embodying *all the ideas of the inventor respecting the improvement.*

On the reception of the model and Government fee, the case is duly registered upon our books, and the application proceeded with as fast as possible. When the documents are ready, we send them to the inventor by mail, for his examination, signature, and affidavit, with a letter of instruction, etc. *Our fee for preparing the case is then due*, and will be called for. Immediately on its return the case will be presented to the Patent Office, and as soon as the patent is allowed, the applicant will be notified to remit the last installment of the Government fee, namely, \$20, and the patent will then be issued.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so. We do not require the personal attendance of the inventor, unless the invention is one of great complication; the business can be done as well by correspondence.

When the invention consists of a new article of manufacture, or a new composition, samples of the separate ingredients sufficient for the purpose of experiment, and also of the manufactured article itself, must be furnished.

The average time required to procure a patent, when the case is conducted at our Agency, is six weeks. We frequently get them through in less time; but in other cases, owing to delay on the part of the officials, the period is sometimes extended to two or three months, and even more. We make a special point to forward our cases *as rapidly as possible.*

Models in rejected cases are not returned by the Patent Office. The new law authorized their return, but the Patent Office has, as yet, made no provision in this respect, and the models are therefore, as formerly, kept in the archives for reference.

### DESIGNS, TRADE-MARKS, LABELS, ETC.

Under the new law, Design-patents may be taken out for *any new form of any article*, also for tools, patterns, castings, machine-frames, stove-plates, borders, fringes; all new designs for printing, weaving, or stamping upon silks, calicoes, carpets, oil-cloth prints, paper-hangings, and other articles. Trade-marks, labels, envelopes, boxes and bottles for goods, may also be patented; likewise all works of art, including prints, paintings, busts, statues, bas-reliefs or compositions in alto or basso relievo, new dies, impressions, ornaments to be placed or used upon any article of manufacture, architectural work, etc. The term for which Design-patents are granted varies according to the fee paid by the applicant, as follows:

|                                        |       |
|----------------------------------------|-------|
| Patent for $3\frac{1}{2}$ years, ..... | \$10. |
| “ 7 “ .....                            | 15.   |
| “ 14 “ .....                           | 30.   |

*No Design-models are required.* But duplicate drawings must be furnished, together with the usual specification, petition, and affidavit, which, to render the patent of value, should be prepared with the utmost care.

Our facilities for the prompt preparation and securing of Design-patents are of the most extensive character, and our charges are very moderate.

### GOING TO WASHINGTON IN PERSON.

Some inventors suppose, very naturally, that if personally present in Washington, they can get their cases through more expeditiously, or command other facilities which they



cannot enjoy by mere correspondence through an agency like ours. But this is not so. *No inventor can possibly have facilities or influence superior to our own*, for more than ONE THIRD of the entire business of the Patent Office passes through our hands; and we have an office in Washington charged with the especial duty of watching over and pressing forward the interests of our clients. The Patent Office does not prepare or amend imperfect patent-papers, or make models. These must be provided by the applicant or his attorney, according to law, *otherwise his claim will not be considered*. The new law especially requires that all papers filed in the Patent Office shall be correctly, legibly and clearly written. For the convenience of those who visit Washington in person, we will state that they can have all their patent business *promptly attended to*, by calling at our BRANCH "SCIENTIFIC AMERICAN" OFFICE, corner of Seventh and F streets, opposite the Patent Office.

### INFRINGEMENTS.

The manufacture, sale or use of a patented article, without consent of the owner of the patent, is an *infringement*, and subjects the infringer, by injunction from the Court, to an arrest or prohibition from the employment of his machinery, shop, works, factory, and men in the production of the article. In addition to injunction, the infringer is liable to be mulcted in treble the amount of damages awarded by the jury. The maker, the workman, the seller, and the purchaser (if a user) are all liable, either collectively or individually.

Having access to all the patents, models, public records, drawings, and other documents pertaining to the Patent Office, we are prepared to make examinations and give opinions upon all infringement questions, advise as to the scope and ground covered by patents, and direct with vigor any legal proceedings therewith connected. Our charges will be moderate, and proportionate to the labor involved.

Address all letters of inquiry to MUNN & Co., No. 37 Park Row, New-York.

### STAMPS ON POWERS OF ATTORNEY.

By the Act to provide Internal Revenue to support the Government, and to pay the interest on the Public Debt, it is required by the Commissioner of Patents that a stamp or stamps to the amount of *one dollar* must be attached to all powers of attorney authorizing an agent or attorney to act for the inventor relative to applications for Patents.

The same amount of stamps must also be affixed to all powers of attorney authorizing an agent to sell Patents.

### APPEALS.

In rejected and other cases, the new law provides for an appeal from the Examiners-in-chief to the Commissioner in person, on the payment of a fee of \$20. A further appeal may be taken from the decision of the Commissioner to the United States Court of the District of Columbia. These appeals are heard by any one of the judges before whom the applicant elects to bring the case; no jury. All the papers, models, etc., are sent by the Commissioner to the judge, who then reviews the case, and either sustains or reverses the Commissioner's decision. The party taking the appeal pays an official fee of \$25. The judge appoints a day of hearing. The applicant can appear in person or by counsel to state his case and file a written argument. Five days are allowed the opponent to put in an answer, and a similar period to the appellant for a closing reply.

Many important cases are brought before the judges on appeal, and the decisions of the Commissioner are not unfrequently reversed. We have had successful experience in conducting these appeals, and our services can be retained on moderate terms.

### INTERFERENCES.

If an inventor happens to apply for a patent when another application for a similar device is pending at the Patent Office, the two cases are declared by the Commissioner

to "interfere," and each party is notified to present evidence as to the date when he first invented the thing. He who proves priority of invention receives the patent, and the other applicant is rejected.

Even after a patent has been granted, another inventor may come forward and apply for a patent for the same device; and if he can prove priority of invention the Commissioner will issue a patent to him.

The management of Interferences is one of the most important in connection with Patent Office business. Our terms for attention to Interferences are moderate, and dependent upon the time required. Address all letters to MUNN & Co., No. 37 Park Row, New-York.

### EXTENSION OF PATENTS.

Under the new law, all patents issued after March 4, 1861, continue in force seventeen years instead of fourteen, as heretofore, and cannot be extended; but patents granted prior to the above date may be extended for a period of seven years.

Many valuable patents are annually expiring which might readily be extended, and, if extended, might prove the source of wealth to their fortunate possessors.

We are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives, or assigns, as to the current law and the mode of procedure in order to obtain a renewed grant.

The statute of 1836 provides that, when an inventor has failed to receive a sufficient reward for his invention, without fault on his part, during the existence of the original patent, he may apply to the Commissioner for an extension of the term; and the Commissioner, on the presentation of proper proofs touching the amounts received by the applicant, the value of the invention, etc., is empowered to extend the patent for seven years, so that it will run for a period of *twenty-one years* from its original date. Some of the most valuable grants now existing are *extended patents*.

All the documents connected with extensions require to be carefully drawn up and attended to, as any failure, discrepancy, or untruth in the proceedings or papers is liable to defeat the application. Applicants for extensions should always place the management of their cases, from first to last, in the hands of faithful and experienced patent attorneys. Ordinary lawyers or agents, who have had no experience in extension cases, should never undertake them.

Patentees or, if deceased, their heirs, may apply for the extension of patents, but must give ninety days' notice of their intention.

The assignees of a patent cannot obtain this extension—it must be done by the inventor, or, in case of his death, by his legal representatives. It must also appear to the Commissioner of Patents that the extension is to inure to the benefit of the original patentee, or he will not allow it.

Parties owning machines under the original patent will be entitled to use them after the date of extension, until these machines are worn out; but new machines cannot be built without the patentee's consent.

Patents may be extended, and preliminary advice obtained, by consulting or writing to MUNN & Co., No. 37 Park Row, New-York.

### ABANDONMENT OF AN INVENTION.

The papers and models pertaining to all patented inventions, and also of rejected cases that are two years old, are exposed to public view at the Patent Office in Washington. When any new application for a patent is filed, the Commissioner causes an examination to be made to ascertain whether the alleged improvement has before been patented or rejected. If the same invention is found to have been on public view at the Patent Office for more than two years, either in the patented or rejected departments, the new applicant is held to have *abandoned his invention to the public*; he has not used reasonable diligence in filing his application, and he cannot receive a patent even though he may have been the earliest inventor. Many inventors suffer the loss

of their rights to a patent by reason of delay. We cannot too urgently press upon them the importance of making their applications promptly; delays are dangerous and often fatal.

### **RE-ISSUE OF A DEFECTIVE PATENT.**

The law provides that whenever a patent, heretofore granted, is found to be inoperative or invalid by reason of a defective or imperfect description or claim, the error may be corrected by surrendering the original patent, and filing in new or amended papers, which are subject to examination the same as in the case of the original application. Under a re-issue the law does not allow an inventor to embrace different subject-matter than that shown in the original application. All the new features to be claimed must be fully shown either in the original papers or model.

A re-issue does not extend the term of the original patent. The matter of extension is treated of under another head. If the amended claims cannot be allowed, the original patent will be returned by the Commissioner upon the order of the applicant or his attorney. The patent fee on a re-issue is \$30, and the agency fee is usually \$25.

### **VALIDITY OF PATENTS.**

It often becomes an important question whether a patent is actually valid after it is issued. A patent to be valuable must be able to stand the test of legal investigation, though it seldom happens that decisions of Courts are rendered adverse to patents that come up for trial; but it frequently happens that, in the course of such investigations, the specifications and claims may exhibit serious defects.

Purchasers of patents, or those who engage in the manufacture of patented articles, are frequently annoyed by threats of prosecution for some alleged infringement of existing patents. They will usually save themselves trouble and expense by having the necessary searches made, to determine the validity of such claims as may be made against

them, and also of the patents they are about to purchase, or in which they are interested.

It is a part of our business to investigate into the validity of patents, which necessarily involves an extended and careful search. Our fees for such services are always very reasonable.

### COPIES OF PATENTS AND CLAIMS.

Having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, we can furnish the claims of any patent granted since that date, for \$1.

Persons wishing copies of claims should distinctly understand that for the fee of \$1 we do not engage to furnish a copy of the specification and drawing of the patent. All we undertake to do for this small charge is to supply a written copy of the claim. If parties wish for copies of the complete patent, we can supply them from the records of the Patent Office, at charges varying from \$3 to \$25, depending upon the length of the specification and amount of drawing in each case. The Commissioner fixes his own charges for copies of patents, and does not allow them to be made except by persons connected with the Patent Office.

### LEGAL INFORMATION ABOUT PATENTS.

There are a great variety of questions arising under the patent laws, in respect to patents, which are important to all owners of patents, manufacturers, venders, etc., upon which we are frequently addressed for information and advice. We are always happy to answer these inquiries whenever we can do so, and have sought to embody them in this pamphlet, which is freely given to all; but special inquiries frequently subject us to much trouble in searching the proper authorities. Parties who thus use our time should remit a small fee to compensate us for our services; or if they prefer to search for themselves, we refer them to the continuous files since 1844 of the *SCIENTIFIC AMERICAN*, which contain information upon every conceivable point relating to patents and the Patent Law.

## THE SALE OF PATENTS.

We are frequently receiving letters requesting us to act as agents for the sale of patents, or to procure capitalists to aid inventors in bringing out their discoveries. We are desirous of aiding inventors all that we possibly can, but we made it a rule at the outset of our professional career, not to engage in the sale of patents. We thus keep ourselves free from all suspicion of speculating in inventions. We devote our entire time to the interests of our clients, and to the publication of the *SCIENTIFIC AMERICAN*, leaving the introduction and sale of patents to others. We have no pecuniary interests whatever in any existing patent, though we are frequently offered favorable opportunities to take such interests. We offer the free use of the columns of the *SCIENTIFIC AMERICAN* to patentees to illustrate and describe their improvements, charging for the cost of the engravings, which will be given to the inventor after publication. This is undoubtedly the best medium in the world through which to bring out new and useful improvements.

## PATENTS IN CANADA.

Frequent inquiry is made of us respecting the taking-out of patents in Canada. Under the present colonial law, patents can only be secured by resident subjects, who must be the inventors of the thing for which the patent is sought. This effectually cuts off American citizens from that protection which, under the ordinary principles of reciprocity, ought to exist between ourselves and those colonies. This illiberal system is a disgrace to the statute-book, and we hope it will soon be repealed. Owing to this discrimination, all Canadians who apply for patents here have to pay a Government fee of \$500. As soon as the Canadian law is modified so as to allow our citizens to enjoy equal protection, Canadians will at once enjoy all the advantages afforded by our law.

## THE INVENTOR MUST APPLY FOR THE PATENT.

It is necessary in all cases that an application for a patent should be made by the *inventor*. He cannot transfer this by right to another, as he must make oath to the invention. The inventor can, by assignment at the time the application is made, transfer his rights, so that the patent may issue to assignees. Foreign inventors frequently labor under the misapprehension that, by means of a power-of-attorney, the application can be made by another party.

## RECORDING ASSIGNMENTS.

There are three classes of assignments that must be put upon record at the Patent Office, within three months from their date, in order to insure their validity against subsequent purchasers. These are, first, an assignment of the entire patent; second, an undivided portion of a patent; third, the sale of an exclusive right under a patent for a particular territory.

Under the Internal Revenue Act of July 1, 1862, all assignments of patents, whether stamped or not, will be recorded, and the fact whether or not the instrument recorded is stamped will be noted upon the record. In order to make these assignments operative in law, a stamp must be put upon them, either before or after their record, to the value of *five cents*, on every sheet or piece of paper. This refers only to assignments recorded after the first of January, 1863. No assignment *directing a patent to issue to an assignee or assignees*, dated after the first day of January, 1863, will be recognized by the Patent Office, unless every sheet or piece of paper, upon which such assignment shall be written, shall have affixed thereto a stamp of the value of *five cents*.

We attend to preparing and putting assignments on record.



**SUGGESTIONS ABOUT FOREIGN PATENTS.**

American inventors should bear in mind that, as a general rule, any invention which is valuable to the patentee in this country, is worth equally as much in England and some other foreign countries. Four patents—American, English, French and Belgian—will secure an inventor exclusive monopoly to his discovery among *one hundred millions* of the most intelligent people in the world. The facilities of business and steam communication are such that patents can be obtained abroad by our citizens almost as easily as at home. The majority of all patents taken out by Americans in foreign countries are obtained through the **SCIENTIFIC AMERICAN PATENT AGENCY**. Having established agencies at all the principal European seats of Government, we obtain patents in Great Britain, France, Belgium, Prussia, Austria, Spain, etc., with promptness and dispatch. *A Circular, containing further information and a synopsis of the Patent Laws of various countries, will be furnished on application to Messrs. MUNN & Co., No. 37 Park Row, New-York.*

It is generally much better to apply for foreign patents *simultaneously* with the application here; or, if this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of valid patents for their own inventions. Many valuable inventions are yearly introduced into Europe from the United States by parties ever on the alert to pick up whatever they can lay their hands upon that may seem useful.

Models are not required in any European country, but the utmost care and experience are necessary in the preparation of the specifications and drawings.

When parties intend to take out foreign patents, engravings should not be published until the foreign applications have been made.

**CAUTION.**—It has become a somewhat common practice for agents located in England to send out circulars solicit-

ing the patronage of American inventors. We caution the latter against heeding such solicitations, or they may otherwise fall into the hands of irresponsible parties, and thus be defrauded of their rights. It is much safer for inventors to intrust their cases to the care of a competent, reliable agent at home.

While it is true of most European countries that the system of examination is not so rigid as that practiced in this country, yet it is vastly important that inventors should have their papers prepared only by the most competent solicitors, in order that they may stand the test of a searching legal examination; as it is a common practice, when a pateutee finds a purchaser for his invention, for the latter to cause such examination to be made before he will accept the title.

It is also very unsafe to intrust a useful invention to any other than a solicitor of known integrity and ability. Inventors should beware of speculators, whether in the guise of Patent Agents or Patent Brokers, as they cannot ordinarily be trusted with valuable inventions.

Messrs. MUNN & Co. have been established *seventeen years* as American and Foreign Patent Attorneys, and Publishers of the SCIENTIFIC AMERICAN, and during this time they have been intrusted with some of the most important inventions of the age; and it is a matter of pardonable pride in them to state that not a single case can be adduced in which they have ever betrayed the important trust committed to their care. Their agents in London, Paris, and other Continental cities are among the oldest and most reliable Patent Solicitors in Europe; MUNN & Co. will have no connection with any other.

### GENERAL REMARKS.

MESSRS. MUNN & Co. have been personally familiar with the progress of invention and discovery during *seventeen years*. As an evidence of the confidence reposed in their ability and integrity, they may with propriety refer to the extraordinary fact that more than THREE THOUSAND PATENTS have been issued to their clients in the brief

space of only TWO YEARS; and during the same period they have examined, through their efficient Branch Office in Washington, into the novelty of over *four thousand inventions*; thus affording to them a knowledge of the contents of the Patent Office unrivaled by any existing agency. Not only this, but more than one half of all the patents secured by American citizens in European countries are taken through MUNN & CO.'S AGENCIES IN LONDON, PARIS, BRUSSELS, BERLIN, AND VIENNA.

During a single month in 1860, *one hundred and forty-four American Patents* were issued to our clients.

The convenient proximity of our Washington house to the Patent Office gives us rare facilities for the examination of all the official records, models, drawings, specifications, documents, etc. We can promptly furnish copies of any patent, assignment, etc. Searches made as to the sale or transfer of rights. Assignments and special agreements carefully prepared, etc.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by more than one hundred thousand persons every week, and has the most extensive and influential circulation of all the journals of its kind in the world.

We make these statements in order that parties who come to us for aid and information may feel, at the outset, that they are applying to men who are reliable, skillful, and successful in the business.

No individual in the country can possibly have so good an opportunity of knowing and judging as to the extent of business and the qualifications of patent attorneys as the *Commissioner of Patents*. That officer is charged with the entire administration of the U. S. Patent Office. All its records are under his keeping and supervision; all correspondence is signed by him; and all patents issued are laid before him for signature. A certificate from a source so high and authentic can not fail to command general respect

and attention. Judge MASON, upon retiring from the office of Commissioner of Patents, sent us the following very flattering written testimonial :

**MESSRS. MUNN & Co. :—**I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly,

CHAS. MASON.

Judge MASON was succeeded by that eminent patriot and statesman, Hon. JOSEPH HOLT, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed us the following very gratifying letter :

**MESSRS. MUNN & Co. :—**It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant, J. HOLT.

Hon. WM. D. BISHOP, late Member of Congress from Connecticut, succeeded Mr. HOLT as Commissioner of Patents. Upon resigning the office, he wrote to us as follows :

**MESSRS. MUNN & Co. :—**It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency ; and that I have ever found you faithful and

devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy.

Very respectfully, your ob't servant, WM. D. BISHOP.

One great reason for our unrivaled success is, that our affairs are so systematized and arranged, under our personal direction, that every patent case submitted to our care receives the most careful study during its preparation, the most prompt dispatch when all the patent-papers are completed, and the most thorough attention at every stage of its subsequent progress.

We employ, to assist us, the most experienced corps of examiners, specification-writers, and draughtsmen, that can be found. We have a branch house at Washington, supervised by one of our partners, and located directly opposite to the Patent Office, for the especial purpose of attending to the interests of our clients, making searches, examinations, etc. In sort, we believe that no other concern can present so great an array of talent, business facilities, influence, and practical experience, as that which we throw open to the service of our clients.

All communications should be addressed to MUNN & CO., No. 37 Park Row, New-York.

### MISCELLANEOUS ITEMS.

Employers have sometimes supposed that inventions made by persons while in their service properly belonged to them. The claim is presumptuous and unwarrantable, unless there exists a special agreement to the contrary. If the inventor under such circumstances was not especially employed to bring out the invention for his employer's benefit, the latter has no right to it.

Under a recent decision of the Attorney-General, it is held that all free native-born persons, without distinction as to age, sex or color, are *citizens*, within the meaning of the Constitution; consequently, all such may apply for patents.

Inventors may publicly use and sell their inventions for

two years *prior* to making application for a patent, but cannot hinder others from doing the same thing; and should any party put the invention into use before such application for a patent is made, they could continue to use the specific machine or composition of matter after the patent is issued to another.

Inventors ought to be reasonably careful about exposing their inventions, and are urged to apply for their patents with all reasonable dispatch.

Minors can take out patents without the consent of their natural or legal guardians; but in order to transfer their rights while in their minority, they would need to obtain an order from the Court authorizing such transfer of property.

The opinion prevails among Patent Lawyers that one of the owners of a joint patent may use and sell the invention for his own benefit, so long as he does not debar the other owners from the right to do the same. We know of no decision of the Courts on this point.

A patent is held subject to the laws of the United States, and cannot therefore be attached for debt by the ordinary process of attachment under the laws of the various States; a patented machine, however, can be attached the same as other material property. In case, however, of the bankruptcy of a patentee, his patent-right could be assigned, by operation of law, by his legal assignee or receiver.

The Commissioner of Patents has no power to annul an existing patent. He can order an interference to be declared between an existing patent and a pending application for a patent for the same invention, and then require testimony from each party in order to substantiate the question of priority of invention. If this is proved by the applicant for the pending case, the Commissioner exercises the right to grant the second patent. The evidence produced in the examination would confer a *prima facie* right upon the successful party.

Each State exercises the right to decide *what* shall be sold, and *how* it shall be sold, within its borders, under what are known as license laws; therefore peddlers of pat-

ented articles cannot sell them in any State where such laws exist, without obtaining a license from the proper authorities ; but an inventor, we think, may sell rights under his patent without regard to license laws.

### **STAMPING PATENTED ARTICLES.**

Under this head the reader will find the requirements of the Patent Law fully set forth in Section 13th of the Patent Law Amendment Act, printed on another page. No patentee should fail to stamp the date of the issuance of his patent on the article offered for sale, as otherwise his rights are liable to be infringed with impunity. Any one who stamps "Patent" on an article which is not patented, is guilty of fraud on the public and is liable to fine.

### **OF GIVING OR WITHHOLDING INFORMATION.**

Aside from the caveats, which are required by law to be kept secret, all pending applications at the Patent Office are, as far as practicable, preserved in like secrecy. No information will be given to those inquiring whether any particular application is before the office, or whether any particular person has applied for a patent.

In cases where two applications interfere, and a declaration to that effect is made by the Commissioner, each of the contestants is entitled to a knowledge of so much of his antagonist's case as is necessary for the proper management of his own.

The Patent Office does not answer inquiries as to the novelty of an alleged invention in advance of an application for a patent. Business with the Patent Office is conducted under prescribed rules, made in accordance with the laws, and the Commissioner cannot disregard them. Inventors ought always to act under the advice of competent attorneys.

### **THE IMPORTANCE OF THE SPECIFICATION.**

Too much importance cannot be attached, by an applicant for a patent, to the manner in which the specification

and drawings are prepared, as upon these will depend the *legal* value of the patent. Many inventors suppose that by taking the forms of specification, petition, and oath here prescribed by the Patent Office, they will have no trouble in getting an official decision upon their applications. This is an erroneous impression, and has led many applicants into great trouble and expense, much more than they would have incurred if they had employed, at the outset, a competent and experienced patent solicitor. This matter is so very important, that Curtis, in his celebrated Treatise on the Law of Patents, devotes eighty-one pages to its consideration.

The specification must describe in full, clear, and exact terms the nature and operation of the invention; and the claim on which the patent will be founded, when granted, must be very carefully drawn. While it is easy, comparatively, to prepare drawings for a patent, the specification should never be undertaken except by one who thoroughly understands the business.

### **RETAINING PATENTS IN THE SECRET ARCHIVES.**

No application upon which a patent has been ordered to issue shall be retained in the secret archives of the Office more than six months from the day on which the patent was ordered to issue. The request to have the application placed in the secret archives shall in all cases be made by the patentee, or the assignee of all the interest therein, in writing, and filed with the chief clerk, before the patent shall be ordered to issue.

### **OF FOREIGN PATENTS.**

The taking out of a patent in a foreign country does not prejudice a patent previously obtained here; nor does it prevent obtaining a patent here subsequently.

When the patent is applied for here after being obtained abroad, it will expire with the date of the foreign patent. For this reason such cases will be acted upon out of their order, and as soon as the application is completed.



If the applicant is an alien not residing in the United States, or if he has not taken the necessary steps to become naturalized, the oath must be modified accordingly.

The oath may be taken before any person authorized by law to administer oaths.

When the oath is taken *in a foreign country*, it must be taken before any minister plenipotentiary, chargé d'affaires, consul, or commercial agent, holding commission under the government of the United States, or before any notary public of the country in which the oath is taken, being attested in all cases by the proper official seal.

### WHO ARE ENTITLED TO PATENTS.

Any person, whether citizen or alien, may obtain a patent for any invention or improvement made by him, and not before known.

The assignee of any invention may have the patent issue to him directly, but this is held to apply only to assignees of entire interests; so that, although when the inventor assigns his *entire* interest to two or more, a patent will issue to them jointly, still if he yet retains an unequal portion in himself, a joint patent will not be issued to him and them.

In case of the death of the inventor, the patent will issue to his legal representatives.

Joint inventors are entitled to a joint patent; but neither can claim one separately.

### WHAT WILL PREVENT THE GRANTING OF A PATENT.

Even although the applicant has in good faith actually made an invention, a patent therefor will not be granted him if the whole or any part of *what he claims* as new had before been patented, or described in any printed publication, in this or any foreign country, or even if it had before been invented or discovered *in this country*, or if he has once abandoned his invention to the public; or if, with his consent and allowance, it has been for more than two years in public use or on sale.

The mere fact of prior invention or discovery abroad will not prevent the issue of the patent, unless the invention had been there patented, or described in some printed publication.

Merely conceiving the idea of an improvement or machine in this country, is not such an "invention" or "discovery" as is above contemplated. The invention must have been reduced to a practical form, either by the construction of the machine itself, or of a model thereof, or at least by making a drawing of it, or in some other manner equally descriptive of its character.

Inventions for which patents are solicited are duly classified in the Patent-Office, for examination, and are taken up in their order, in classes—and not, as some suppose, in regular rotation—on "the first come first served" principle. Cases can not be thus examined, as such a system would lead to confusion.

Whenever the class comes up to which the invention belongs, it will receive examination, even though the case may not have been on file more than one day, and it must wait till the class does come up, though it may be one, three, or six months.

### SCHEDULE OF PATENT FEES.

Under the new Patent Law, the following schedule of fees is established :

|                                                                  |      |
|------------------------------------------------------------------|------|
| On filing each Caveat,.....                                      | \$10 |
| On filing each application for a Patent, except for a design,... | 15   |
| On issuing each original Patent,.....                            | 20   |
| On appeal to Commissioner of Patents,.....                       | 20   |
| On application for Re-Issue,.....                                | 80   |
| On application for Extension of Patent,.....                     | 50   |
| On granting the Extension,.....                                  | 50   |
| On filing Disclaimer,.....                                       | 10   |
| On filing application for Design, three and a half years,.....   | 10   |
| On filing application for Design, seven years,.....              | 15   |
| On filing application for Design, fourteen years,.....           | 80   |

The duration of patents granted under the present law is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is reduced from

\$80 to \$15, and \$20 additional when the patent is ordered to issue.

### INVITATION TO INVENTORS.

Inventors who come to New-York should not fail to pay a visit to the extensive offices of MUNN & Co. They will find a large collection of models of various inventions, which will afford them much pleasure. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & Co. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances.

### THE BEST MODE OF INTRODUCING INVENTIONS.

Inventors and constructors of new and useful Contrivances or Machines, of whatever kind, can have their Inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

A patentee can not possibly adopt any other medium which is equal to this, in order to make known his improvement. The judicious use of the newspaper press is one of the surest roads to success in business.

Address

MUNN & CO.,

37 Park Row, N. Y.

## THE NEW PATENT LAW.

### AN ACT IN ADDITION TO "AN ACT TO PROMOTE THE PROGRESS OF THE USEFUL ARTS."

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the Patent Office, and such affidavits and depositions may be taken before any justice of the peace, or other officer authorized by law to take depositions to be used in the courts of the United States, or in the State courts of any State where such officer shall reside; and in any contested case pending in the Patent Office, it shall be lawful for the clerk of any court of the United States for any district or Territory, and he is hereby required, upon the application of any party to such contested case, or the agent or attorney of such party, to issue subpoenas for any witnesses residing or being within the said district or Territory, commanding such witnesses to appear and testify before any justice of the peace, or other officer as aforesaid, residing within the said district or Territory, at any time and place in the subpoena to be stated; and if any witness, after being duly served with such subpoena, shall refuse or neglect to appear, or, after appearing, shall refuse to testify, (not being privileged from giving testimony,) such refusal or neglect being proved to the satisfaction of any judge of the court whose clerk shall have issued such subpoena, said judge may thereupon proceed to enforce obedience to the process, or to punish the disobedience in like manner as any court of the United States may do in case of disobedience to process of *subpoena ad testificandum* issued by such court; and witnesses in such cases shall be allowed the same compensation as is allowed to witnesses attending the courts of the United States: *Provided*, That no witness shall be required to attend at any place more than forty miles from the place where the subpoena shall be served upon him to give a deposition under this law: *Provided, also*, That no witness shall be deemed guilty of contempt for refusing to disclose any secret invention made or owned by him: *And provided, further*, That no witness shall be deemed guilty of contempt for disobeying any subpoena directed to him by virtue of this act, unless his fees for going to, returning from, and one day's attendance at the place of examination shall be paid or tendered to him at the time of the service of the subpoena.

SEC. 2. *And be it further enacted*, That, for the purpose of secur-

ing greater uniformity of action in the grant and refusal of Letters Patent, there shall be appointed by the President, by and with the advice and consent of the Senate, three Examiners-in-Chief, at an annual salary of three thousand dollars each, to be composed of persons of competent legal knowledge and scientific ability, whose duty it shall be, on the written petition of the applicant for that purpose being filed, to revise and determine upon the validity of decisions made by Examiners when adverse to the grant of Letters Patent; and also to revise and determine in like manner upon the validity of the decisions of Examiners in interference cases, and when required by the Commissioner in application for the extension of patents, and to perform such other duties as may be assigned to them by the Commissioner; that from their decisions appeals may be taken to the Commissioner of Patents in person, upon payment of the fee hereinafter prescribed; that the said Examiners-in-Chief shall be governed in their action by the rules to be prescribed by the Commissioner of Patents.

SEC. 3. *And be it further enacted*, That no appeal shall be allowed to the Examiners-in-Chief from the decisions of the Primary Examiners, except in interference cases, until after the application shall have been twice rejected; and the second examination of the application by the Primary Examiner shall not be had until the applicant, in view of the references given on the first rejection, shall have renewed the oath of invention, as provided for in the seventh section of the act entitled, "An act to promote the progress of the useful arts, and to repeal all acts and parts of acts heretofore made for that purpose," approved July fourth, eighteen hundred and thirty-six.

SEC. 4. *And be it further enacted*, That the salary of the Commissioner of Patents, from and after the passage of this act, shall be four thousand five hundred dollars per annum, and the salary of the Chief Clerk of the Patent Office shall be two thousand five hundred dollars, and the salary of the Librarian of the Patent Office shall be eighteen hundred dollars.

SEC. 5. *And be it further enacted*, That the Commissioner of Patents is authorized to restore to the respective applicants, or, when not removed by them, to otherwise dispose of such of the models belonging to rejected applications as he shall not think necessary to be preserved. The same authority is also given in relation to all models accompanying applications for designs. He is further authorized to dispense in future with models of designs, when the design can be sufficiently represented by a drawing.

SEC. 6. *And be it further enacted*, That the tenth section of the act, approved the third of March, eighteen hundred and thirty-seven, authorizing the appointment of agents for the transportation of models and specimens to the Patent Office, is hereby repealed.

SEC. 7. *And be it further enacted*, That the Commissioner is further authorized, from time to time, to appoint, in the manner already provided for by law, such an additional number of principal Examiners, First Assistant Examiners, and Second Assistant Examiners as may be required to transact the current business of the Office with dispatch, provided the whole number of additional Examiners shall not

exceed four of each class, and that the total annual expenses of the Patent Office shall not exceed the annual receipts.

SEC. 8. *And be it further enacted*, That the Commissioner may require all papers filed in the Patent Office, if not correctly, legibly, and clearly written, to be printed at the cost of the parties filing such papers; and for gross misconduct he may refuse to recognize any person as a patent agent, either generally or in any particular case; but the reasons of the Commissioner for such refusal shall be duly recorded, and subject to the approval of the President of the United States.

SEC. 9. *And be it further enacted*, That no money paid as a fee on any application for a patent, after the passage of this act, shall be withdrawn or refunded, nor shall the fee paid on filing a caveat be considered as part of the sum required to be paid on filing a subsequent application for a patent for the same invention.

That the three months' notice given to any caveator, in pursuance of the requirements of the twelfth section of the act of July fourth, eighteen hundred and thirty-six, shall be computed from the day on which such notice is deposited in the Post-Office, at Washington, with the regular time for the transmission of the same added thereto, which time shall be indorsed on the notice; and that so much of the thirteenth section of the act of Congress, approved July fourth, eighteen hundred and thirty-six, as authorizes the annexing to Letters Patent of the description and specification of additional improvements, is hereby repealed, and in all cases where additional improvements would now be admissible, independent patents must be applied for.

SEC. 10. *And be it further enacted*, That all laws now in force fixing the rate of the Patent Office fees to be paid, and discriminating between the inhabitants of the United States and those of other countries which shall not discriminate against the inhabitants of the United States, are hereby repealed, and in their stead the following rates are established:

On filing each caveat, ten dollars.

On filing each original application for a patent, except for a design, fifteen dollars.

On issuing each original patent, twenty dollars.

On every appeal from the Examiners-in-Chief to the Commissioner, twenty dollars.

On every application for the re-issue of a patent, thirty dollars.

On every application for the extension of a patent, fifty dollars; and fifty dollars in addition on the granting of every extension.

On filing each disclaimer, ten dollars.

For certified copies of patents and other papers, ten cents per hundred words.

For recording every assignment, agreement, power of attorney, and other papers of three hundred words or under, one dollar.

For recording every assignment, and other papers, over three hundred and under one thousand words, two dollars.

For recording every assignment or other writing, if over one thousand words, three dollars.

For copies of drawings, the reasonable cost of making the same.

SEC. 11. *And be it further enacted*, That any citizen or citizens, or alien or aliens, having resided one year in the United States, and taken the oath of his, her, or their intention to become a citizen or citizens, who, by his, her, or their own industry, genius, efforts, and expense, may have invented or produced any new and original design for a manufacture, whether of metal or other material or materials, and original design for a bust, statue, or bas-relief, or composition in alto or basso rilievo, or any new and original impression or ornament, or to be placed on any article of manufacture, the same being formed in marble or other material, or any new and useful pattern, or print, or picture, to be either worked into or worked on, or printed, or painted, or cast, or otherwise fixed on any article of manufacture, or any new and original shape or configuration of any article of manufacture not known or used by others before his, her, or their invention or production thereof, and prior to the time of his, her, or their application for a patent therefor, and who shall desire to obtain an exclusive property or right therein to make, use, sell, and vend the same, or copies of the same to others, by them to be made, used, and sold, may make application in writing to the Commissioner of Patents, expressing such desire; and the Commissioner, on due proceedings had, may grant a patent therefor, as in the case now of application for a patent, for the term of three and one half years, or for the term of seven years, or for the term of fourteen years, as the said applicant may elect in his application: *Provided*, That the fee to be paid in such application shall be, for the term of three years and six months, ten dollars, for seven years fifteen dollars, and for fourteen years thirty dollars. *And provided*, That the patentees of designs under this act shall be entitled to the extension of their respective patents for the term of seven years from the day on which said patents shall expire, upon the same terms and restrictions as are now provided for the extension of Letters Patent.

SEC. 12. *And be it further enacted*, That all applications for patents shall be completed and prepared for examination within two years after the filing of the petition, and in default thereof, they shall be regarded as abandoned by the parties thereto, unless it be shown to the satisfaction of the Commissioner of Patents that such delay was unavoidable, and all applications now pending shall be treated as if filed after the passage of this act; and all applications for the extension of patents shall be filed at least ninety days before the expiration thereof; and notice of the day set for the hearing of the case shall be published, as now required by law, for at least sixty days.

SEC. 13. *And be it further enacted*, That in all cases where an article is made or vended by any person under the protection of Letters Patent, it shall be the duty of such person to give sufficient notice to the public that said article is so patented, either by fixing thereon the word patented, together with the day and year the patent was granted; or when, from the character of the article patented, that may be impracticable, by enveloping one or more of the said articles, and affixing a label to the package, or otherwise attaching thereto a label on which the notice, with the date, is printed; on failure of which, in any suit for the infringement of Letters Patent by the party failing so to mark the article, the right to which is infringed upon, no damage shall be recovered by

the plaintiff, except on proof that the defendant was duly notified of the infringement, and continued after such notice to make or vend the article patented. And the sixth section of the act, entitled, "An Act in addition to an act to promote the progress of the useful arts," and so forth, approved the twenty-ninth day of August, eighteen hundred and forty-two, be, and the same is hereby, repealed.

SEC. 14. *And be it further enacted*, That the Commissioner of Patents be, and he is hereby authorized to print, or, in his discretion, to cause to be printed, ten copies of the description and claims of all patents which may hereafter be granted, and ten copies of the drawings of the same, when drawings shall accompany the patents: *Provided*, The cost of printing the text of said descriptions and claims shall not exceed, exclusive of stationery, the sum of two cents per hundred words for each of said copies, and the cost of the drawings shall not exceed fifty cents per copy; one copy of the above number shall be printed on parchment, to be affixed to the Letters Patent. The work shall be under the direction, and subject to the approval, of the Commissioner of Patents, and the expense of the said copies shall be paid for out of the patent fund.

SEC. 15. *And be it further enacted*, That printed copies of the Letters Patent of the United States, with the seal of the Patent Office affixed thereto, and certified and signed by the Commissioner of Patents, shall be legal evidence of the contents of said Letters Patent in all cases.

SEC. 16. *And be it further enacted*, That all patents hereafter granted shall remain in force for the term of seventeen years from the date of issue, and all extensions of such patents are hereby prohibited.

SEC. 17. *And be it further enacted*, That all acts and parts of acts heretofore passed which are inconsistent with the provisions of this act, be, and the same are hereby, repealed.

Approved March 2, 1861.

NOTE.—Messrs. MUNN & Co. will undertake to advise patentees and assignees in respect to all questions arising under the law of patents, and will supply them with all necessary legal counsel in reference to the bringing of suits for infringements, and the defence of the same; also in interfering and extension cases.



**INTERESTING LETTERS FROM INVENTORS  
AND PATENTEEES.**

The accompanying correspondence is but a small portion of that which has been addressed to Messrs. MUNN & Co., testifying to their unparalleled success in prosecuting applications for patents. These letters are uniformly written in excellent taste, and reflect credit upon their authors. It is a mistake to suppose that inventors as a class are ignorant men; such letters as are herewith presented are a complete refutation of such an assertion.

Messrs. MUNN & Co. have received hundreds of such letters from their grateful clients from all sections of the country. If republics are ungrateful, inventors are not.

**MESSRS. MUNN & Co.:**—During the past three months I have employed you to prepare and presecute six applications for patents, and I take pleasure in stating that all these cases were granted without any essential alteration in the papers. In all my experience as an inventor, which covers a space of twenty-five years, (my first patent was granted in 1834,) I have never had applications so thoroughly and satisfactorily prepared. Any one contemplating to procure patents has but to visit your immense establishment, and watch the complete system which governs it throughout—as I have done from day to day—to be satisfied that it is the place, above all others, to apply for information and professional aid in all matters pertaining to Letters Patent for inventions. Tendering to you and your efficient corps of examiners my thanks for the courtesy and fidelity shown to me and to my business, I am, gentlemen,

Your obliged friend, JOHN W. COCHRAN.

*New-York.*

**MESSRS. MUNN & Co.:**—Noticing from time to time, in the columns of the **SCIENTIFIC AMERICAN**, extracts of letters from parties for whom you have acted as attorneys, complimentary to you, I beg to state my own experience in obtaining patents through your agency, as a testimonial of my appreciation of your ability in preparing patent-papers and

conducting cases before the Patent Office. Since 1855, I have made, through your office, eight applications for Letters Patent; six have been granted, (not one of which was even temporarily rejected,) and two are now pending before the Patent Office, on which I expect an equally good result. These facts you are at liberty to publish for the benefit of inventors who are about to apply for patents, and who are undecided as to whom to employ to do their business.

*Charlestown, Mass.*

WILLIAM FUZZARD.

**MESSRS. MUNN & Co.:**—It will be only the just dictate of gratitude should I express my high appreciation of yourselves for the liberality and promptness with which you have carried my late patent to a successful issue. I particularly admire your sagacity, as well as honesty, in discovering and securing an important claim, which I saw not; and I shall not be slow to recommend your patent *corps* to many inventors who need such assistance. Indeed, sirs, I have thus recommended you, and have secured several applications, and another important application, through my influence, will shortly be made to you.

I say it sincerely and honestly, *the interest of the inventor is yours.*

PHILANDER PERRY.

*Troy, N. Y.*

**MESSRS. MUNN & Co.:**—I have the great pleasure of acknowledging the receipt of my Letters Patent for reversing cultivator teeth. This case was presented to the Patent Office some six months ago; but owing to defects in my specification and claim, the application was rejected. No doubt many inventors, who have undertaken (as I did) to prosecute their own applications, have experienced the same results and abandoned their just rights in a valuable invention, when a patent might have been obtained had they employed competent attorneys. It is two things, to *invent* and to *secure a patent*. The energy with which you prosecuted my case to a successful termination, and the ability exhibited in framing my specification and claims, show your devotedness to the inventor's rights, and that you richly merit your extensive reputation.

*Bristolville, Ohio.*

HEMAN B. HAMMON.

**MESSRS. MUNN & Co.:**—Many thanks to you for the skill and energy which you have displayed in obtaining a patent for us. We had expected such a result, notwithstanding the case had been twice rejected; because we believed you to be above the too common trick of attorneys of holding out false hopes to their clients. We hope this is not the last patent we shall have the pleasure of obtaining through your agency, and wish you success both as patent attorneys and editors of the *SCIENTIFIC AMERICAN*.

*Birmingham, Ct.*

**CHURCH & ELLSWORTH.**

**MESSRS. MUNN & Co.:**—I have received your favor notifying me that my patent on a seed-sower (the third one on my combined machine) has been allowed. I am very thankful for your efforts to bring these three cases to a successful result. You have obtained all I had applied for, and more than I expected. I thankfully acknowledge the able and satisfactory manner in which you have transacted my business with the Patent Office, and whatever I may have again to do in obtaining patents I shall place with full confidence into your hands.

**C. E. STELLER.**

**MESSRS. MUNN & Co.:**—The Letters Patent for my invention have come to hand. I am very much gratified by the success of my first undertaking in producing something new in the mechanical arts; and I thank you for the prominent part you took in obtaining that result. I was asked, before I sent you the model, why I did not send direct to the Patent Office, so as to save extra cost. My reply was this: "I do not know how to prepare my case." I would not prepare my own application if I had a hundred designs; I possess no experience to make out patent documents properly. I would therefore recommend any and all who have occasion to make applications to the Patent Office, to do so through your agency. Your excellent and inestimable journal comes to hand very regularly. I intend soon to get up a club, which I can do without much trouble.

*Todd's Valley, Cal., 1862.*

**THOMAS N. HOSMER.**

# THE ILLUSTRATED SCIENTIFIC AMERICAN.

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This valuable Illustrated Mechanical Journal has been published seventeen years by its present proprietors, and is justly regarded as the Special Advocate of the rights and interests of

**Inventors, Mechanics, Engineers,**

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