

shortest time by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is out little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is \$15. Other changes in the fees are also made as follows:—

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.....	\$30
On application for Extension of Patent.....	\$50
On granting the Extension.....	\$50
On filing a Discharge.....	\$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).....	\$20

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery Lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

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 (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for \$1.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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

UNCLAIMED MODELS.

Parties sending models to this 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 engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model, is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.



F. S. C., of Mass.—Simple as the rule for nominal horse-power of an engine is, it seems that many persons get very much befogged on it. The number of inches of area in the piston is to be multiplied by the steam pressure on each inch of said area, which will give the total pressure on the piston. The sum thus obtained is multiplied by the feet per minute which the piston travels; divide the sum by 33,000, the mechanical expression of one horse-power, and we have what purports to be the force of the engine. We can't make the matter any simpler, and we have answered this question about once a week for the last five years.

H. H., of Wis.—We cannot tell you the exact quantity of glycerine to put in plaster to keep it soft, but it would be a very simple matter to try a little, and thus ascertain by experiment.

J. G. P., of Pa.—Your cast-iron pulley can be turned with a chilled iron tool. Make an iron mold of a tool, in shape like a fence picket—flat on top, a little round on the end, and with but little rake; cast a tool of white iron, face down, in this mold, and you will succeed without taking off the scale. Run the pulley very slow, and take light cuts. Do not grind the tool but very little.

F. A. Y., of Ohio.—If you examine the SCIENTIFIC AMERICAN you will find many boilers illustrated therein; perhaps some of them will suit your purpose.

E. P. A., of Conn.—India-rubber is insoluble in alcohol. One part of rubber dissolved in sixty-four of chloroform will make a transparent cement, and resist alcohol and linseed oil.

J. K. L., of Kansas.—You say you sent us a year ago a query and a drawing, with a request to work out an elaborate calculation of the power of a certain windmill, and what weight it would require to run a set of mill-stones by a tram of gears, and you complain that you have never seen any answer thereto. We answered you at that time that we cannot engage to make calculations of the power of windmills or other machinery for individuals; all that we do in that line is furnished for general reading.

W. D., of Ill.—We can recommend the *Tinman's Manual and Mechanic's Handbook* for your purpose. J. K. Butts & Co., publishers, Washington street, Boston, Mass.

C. T. G., of Ill.—You will find it cheaper to buy malleable iron castings from those who have works erected to make them than to erect works for a small quantity. We cannot give a description of the process in a few lines, but malleable iron is simply annealed cast-iron. It requires time—nearly three weeks—and experience to conduct the operation.

G. B. D., of Md.—There is no ground to write an article upon the manufacture of seamless brass tubes. They are cast in a short, thick ingot or cylinder, and drawn through dies, and annealed after every drawing.

F. S. C., of Mass.—According to the laws regulating the velocities of falling bodies, all substances fall through an equal space in the same time.

C. D. W., of Mass.—To charge a bar of steel with magnetism, place the end of a magnet upon the side of the bar at one end and draw it to the other end, then return the magnet through the air and repeat the stroke, making the passes always in the same direction. Soft iron loses its magnetism instantly.

J. L. G., of N. Y.—If one pound of sulphur be thoroughly mixed with six or eight pounds of India-rubber and pressed in a mold, at a temperature of 300°, it will be vulcanized by the operation, and will afterward retain its form.

D. H. W., of N. Y.—The easiest way for you to divide a circle into any given number of equal parts, we presume, would be by simply trying it with your dividers. In plane geometry, however, you will find the relations of the diameter of a circle to the sides of inscribed polygons. You will probably find the meaning of all those words in any large dictionary.

R. D. R., of Tenn.—The gnomon of a sun-dial must point to the pole of the heavens, and to do this it must be inclined at an angle from the horizon corresponding to the latitude of the place where the dial is located, and set due north. Perhaps the needle in your locality deviates from the north.

NOTICE TO SUBSCRIBERS.

The first five numbers of the present volume of the SCIENTIFIC AMERICAN being out of print, we shall commence the time of each new subscriber from the date of receipt of the order, unless the writer states specifically that he wishes such back numbers as can be furnished.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement; they may deem objectionable.

PERSONS WISHING TO SAVE FUEL BY A SIMPLE attachment to their steam engines, please apply to Box 641, P. O., Newburgh, N. Y.

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 743 Broadway, New York. Platinum Scrap of any sort purchased. 19 4\*

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office 74 Beekman street, New York), are always prepared to furnish Gun and Pistol Screws to sample, Screws to fit U. S. Musket, Sewing-machine Screws, and Metal Screws generally, of the best quality, at short notice. 211 19 20\*

WINSLOW, GRISWOLD & HOLLEY, MAKERS OF BESSEMER CAST-STEEL.—Troy, N. Y.; April 15, 1865.—Having commenced the manufacture of Cast-steel, under the Bessemer Patents, we are now prepared to furnish Railway Tires without welds, Rails, Axles, Piston and Connecting Rods, Crank Pins, Boiler and Ship Plates, Shafts, Cannon and Projectiles, Bars and Rods, Spring Steel, Forgings to shape, Ingots, and Machinery Castings to pattern, of this material, up to 5,000 pounds weight. Preparations are making to produce masses of 25,000 pounds weight.

This manufacture, developed by Mr. Bessemer in 1856, has already reached a production of about 100,000 tons per year in England and on the Continent, and is largely superseding wrought iron for the purposes named above. Railway companies, like the London and North-Western, and Iron Works like the Ebbw Vale and Downhills, have erected a apparatus to produce 300 to 500 tons each per week. Bessemer Steel has more recently been used in the United States in the form of Axles, Rails and Plates.

The grand advantage of this material over wrought iron, especially in large masses, is its perfect homogeneity—the absence of welds and consequent imperfections, such as the lamination of rails, blisters in boiler plates, and cold-shuts in heavy forgings. Its tensile strength is double that of wrought iron, considering the above-mentioned and unavoidable defects of wrought iron in welded masses. In the bar, it is one-half greater than that of wrought iron, or from 80,000 to 1,000,000 pounds per square inch, according to the degree of carbonization required for different purposes.

The nature of the Bessemer process renders the product more uniform than wrought iron can be, in all its qualities. The stiffness of this steel, proportionate to its elasticity, adapts it to girder and ship building, and peculiarly fits it to resist compressive as well as tensile strains, as in piston rods.

While the elasticity, and hence the safe working load of the lowest steel is much greater than that of wrought iron, its ductility is equal to that of the best wrought iron. Two-inch bars may be bent double when cold under the steam hammer. This property insures its safety in the form of axles and tires.

The hardness of the material, as well as its homogeneity, increases its durability in the form of rails, guns, and parts subjected to abrasion. This steel is peculiarly adapted to plates requiring intricate flangings, and subject to the immediate contact of fire. For a given strength it is thinner than wrought iron; it does not blister, and the carbon in it protects it against corrosion.

We are also prepared to grant licenses, upon reasonable terms, for the manufacture of Bessemer Steel in the United States, and to furnish working drawings for the necessary plans and machinery.

We are aware that there are other claimants for this process of making steel, but we have purchased the Bessemer Patents and erected works, after a legal investigation, which satisfies us that these other claims are not well founded, and that both the process and the machinery necessary to practice the process successfully, are the inventions of Mr. Bessemer.

And we take this opportunity to caution all persons who are desirous of entering upon the manufacture of steel by this process, that should they employ it under cover of alleged rights of any parties, other than ourselves as the signers in the United States of Mr. Bessemer, we shall hold them legally responsible to us in damages. [1] WINSLOW, GRISWOLD & HOLLEY.

ANDREWS' PATENT CENTRIFUGAL PUMPS.—CAPACITY from 90 to 40,000 gallons per minute. For draining and irrigating lands, wrecking, coffer dams, condensers, cotton, wool and starch factories, paper mills, tanneries and all places where a large and constant supply of water is required, these pumps are unequalled. They require little power, and are not liable to get out of order. For descriptive pamphlet address 19 4 WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

WAIT'S IMPROVED JONVAL TURBINE WATER Wheel is the most powerful, durable and economical wheel ever offered. It is the only one who contemplates putting in a new wheel to drive any kind of machinery should become acquainted with these wheels before purchasing any other. Circulars sent on application. Address P. H. WAIT, Hydraulic Engineer, Sandy Hill, N. Y. 19 3\*

FOR SALE—STATE RIGHTS OF MY PATENT Portable Musket Bar. It is easy to manufacture and requires but little capital. The patent was issued last year, and a large quantity of them have been sold in this State. They weigh but two ounces and are better than any others in use. Any one introducing them in the South can realize a fortune. Address JOHN ZENGER, Chicago, Ill. P. O. Box 2,662. 19 2\*

PORTABLE ENGINES, SUITABLE FOR THE OIL regions, from 8 to 20-horse power, with large fire-place, independent steam feed pump, steam gage and improved water heater. The most complete and simple engines in the market. For particulars address WM. D. ANDREWS & BRO. No. 414 Water street, N. Y. 19 4

SPECIAL NOTICE TO METAL WORKERS.—THE drills made by us are standard tools, and are sold at lower prices than they can be made by individuals. They are of all sizes from a knitting needle up to 1 1/2 inches, and drill a hole that needs no reaming. Used in the U. S. Navy Yards and by machinists and metal workers generally. Can be seen in daily use in this city at CHAS. BROMBACHER'S, No. 77 Ann street, and at this office. Every metal worker needs them. Address MANHATTAN FIRE ARMS CO., Newark, N. J. 19 4

FOR SALE—A MACHINE SHOP, AND TOOLS FOR Manufacturing Carriage Bolts, Nuts and Washers together or separately. No competition, and large trade already established. A rare opportunity is offered. Address CHAS. H. RICE & CO., Chicago. 1\*

TRAVELING AGENTS WANTED.—LARGE PROFITS and little capital required. A new invention. Samples free by mail for 50 cents. Inclose stamps for particulars to W. B. DIVON, No. 108 William street, N. Y. 1\*

ONE MILLION DOLLARS.—VALUABLE RUBBER Patent and other inventions for sale. I am a cripple, and cannot get out to show my inventions, but if you wish to invest in a really valuable patent, I can secure a monopoly in the use of Vulcanized Rubber, call and see my models and samples. I have a better Knob Door Latch than there is in market, and other things in the Hazardous Line that will please you. Also a patent for Sash, Door and Blind makers. Call and see me or address GEO. J. COLBY, No. 15 Lighthouse, N. Y. 1\*

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED LYE—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Original, Genuine and Patented article is put up in one-pound iron cans all others being counterfeits. Manufactured by PENNSYLVANIA SALT MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa. 1

MILLING MACHINE WANTED—OF LARGE SIZE and modern construction. Also a small Index Milling Machine. Address UNION VISE CO., No. 57 Haverhill street, Boston, Mass. 1\*

INCORUSTATION.—W. E. RUTER, ERIE R. R., Elmira, says of Winans's Powder: Have used it six years and find no injury, exceeding in efficiency anything I have seen tried in my forty years' experience. H. N. WINANS, N. Y. 19 3\*

WANTED—A SITUATION TO LEARN THE MACHINIST TRADE. Address J. P. ANDERSON, Rockford, Ill., Drawer 981. 1\*

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from 1/2 to 125-horse power, finished at short notice. These engines leave the shop ready for use, require no special foundation, are compact, light and simple, and economical of power. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO., No. 414 Water street, N. Y. 19 4

FOR SALE—COUNTY RIGHTS OF THE PATENT Registering Funnel. This is a new invention, and commands a ready sale. J. T. MOORE, No. 36 Maiden Lane, N. Y. 19 2\*