

Fourth, The racks, I and slides, I, in combination with the pawls, H, as and for the purpose specified.

Fifth, The standards, F, F, and cross beam, G, in combination with the rod, h, and pawls, H, arranged to operate substantially as described.

Sixth, The detent rod, F, in combination with the projections, f, and standards, F, F, substantially as and for the purpose hereinbefore described.

Seventh, The cam, J, in combination with the traveling slides, E, and post, A, substantially as and for the purpose herein specified.

2,102.—Harvester.—Reuben Hoffheins, Dover, Pa. Patented Nov. 3, 1863.
I claim, First, The combination in a two-wheeled, hinged joint machine, of a driver's seat mounted upon the main frame, with a raking mechanism mounted upon the finger-beam, and rotating on a vertical axis, or one nearly so, substantially in the manner described, for the purpose of enabling the driver to ride upon the machine while the rake is in operation.

Second, The combination in a two-wheeled, hinged joint machine, of a shoe with a hinged joint in it, with a rake and platform having an extension, J2, and with a draft frame which sustains the weight of the cutting apparatus and raking apparatus, with platform attached at a point between the two drive wheels.

Third, The combination with a hinged joint machine of the inner shoe and raking apparatus, substantially as described.

Fourth, The combination of a revolving or turning rake, extensible tumbling shaft, and driving shaft or axle of the main frame, substantially as described.

Fifth, The combination of a two-wheeled, hinged joint machine, a raking apparatus, and a driver's seat mounted on the main frame, substantially as described and for the purpose set forth.

DESIGNS.

2,215.—Standard and Treadle of a Sewing Machine.—Joseph W. Bartlett, New York City.

2,216.—Drawer Pull.—Pietro Cinquini (assignor to John E. Parker and H. J. P. Whipple), Meriden, Conn.

2,217.—Army Badge.—Isaac T. Hooton and J. H. Cummings, Boston, Mass.

2,218.—Monument to the Memory of Abraham Lincoln.—William H. Machew, Toledo, Ohio.

2,219.—Parlor Stove.—Charles Williams, Manchester, N. H.



PATENTS
GRANTED
FOR SEVENTEEN YEARS.
MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for new inventions in the United States and in all foreign countries during the past seventeen years. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after eighteen years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from ex-Commissioners of Patents.

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

[See Judge Holt's letter on another page.]

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 obedient servant,
Wm. D. Bishop.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of \$5 accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, etc., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO. corner of a and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No. 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861, are in full force and prove to be of great benefit to all parties who concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the 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.

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.

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.

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, etc.

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

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.

Pamphlets 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, etc., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

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 assignment of patents. Fees moderate.

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 enniers, 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.

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.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if 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 or Postal Order 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 but little risk in sending bank bills by mail having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

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



HINTS AND QUERIES.

G. S. B. & Co., of Vt.—Mr. L. L. Smith, of this city, one of our largest electro-platers, says that in depositing copper on iron he should use an alkaline solution, and should prefer to employ a magneto-electric machine, driven by power, to make the deposit. Smees' Electro-metallurgy was published by John Wiley of this city, in 1852, but we should advise you to learn the art from some practical electro-plater.

L. L. V., of C. E., whose query was answered on page 20, Vol. XIII.—Lieut. John A. Winebrenner, U. S. A., of Scott Foundry, Reading, Pa., would like to communicate with you.

J. M. A., of Pa.—It is possible that you might make an engine work by creating a vacuum through the agency of a stream of water rushing through a pipe. You say you dreamed of it. Did you dream that any power was derived from it?

C. W., of Pa.—The power of an engine is obtained by squaring the diameter of the cylinder in inches, and multiplying by 7854. The sum so obtained, multiplied by the pressure of steam will give the pressure on the piston in pounds. This last is to be multiplied by the length of the stroke in feet, and again by the number of revolutions per minute, and this sum divided by 33,000. This will give the horse-power, for a horse is capable of raising 33,000 pounds one foot high per minute.

B. B. C. of N. Y., asks:—"Can you tell me the best field for an inventor to work? I think if I knew I would devote my whole time and energies to that particular object." Ans.—The best field is, of course, that in which you are best qualified. For example, an ingenious man who is thoroughly acquainted with cotton and woolen manufacture would be more likely to succeed in making inventions pertaining to such mechanism than if he were to attempt improvements in a direction where he had had no experience. For further hints study the SCIENTIFIC AMERICAN.

J. K., of Ill.—Fairbairn gives the tensile strength of single-riveted boiler plate at 56,000 lbs. to the square inch. To get the strain upon the plate of a spherical boiler multiply the square of the diameter by 7854, and this by the pressure per square inch. Your plan of securing the joints would give increased strength, but how much it is impossible to say, as it depends on so many circumstances.

C. D. R., of Tenn.—It is not new to stamp the exterior of lead pencils with measuring figures and marks, to indicate inches, and parts thereof.

G. W. R., of Mo.—You ask, "Is air a component part of a drum?" The reply is, it depends on the meaning of the word drum; and the meanings of words are to be determined by lexicographers. Webster defines drum, "A martial instrument of music, in form of a hollow cylinder, and covered at the ends with vellum, which is stretched or slackened at pleasure." It does not seem that air is a component part of the drum.

W. B., of N. J.—Gum shellac, dissolved in alcohol, will probably render your pine boards impervious to water; or you might line your tank with lime cement.

F. D., of Ky.—An india-rubber cement is made by dissolving pure india-rubber—not vulcanized—in spirits of turpentine. With this cement two pieces of india-rubber may be fastened together by coating their surfaces with the cement, and subjecting them to long-continued pressure. An india-rubber foot-ball might be patched in this way.

T. C. T., of N. Y., asks:—"Do you know of any good patent of which I can get an agency that will pay?" If our correspondent will read the SCIENTIFIC AMERICAN with regularity he will become cognizant of many valuable inventions for which doubtless he could get an agency. Or, if he chooses to advertise in our columns for an agency, probably he would receive a number of suitable replies.

A. F., of Mich.—We do not know where a complete modern model engine, low pressure, and fitted with every detail, could be had cheap. It depends greatly on the meaning people attach to words. Such an engine, with boiler, would be worth \$150, and could not now be built for that.

A., of Conn.—One good way of encouraging your boys to take an interest in their work will be to supply them each with a copy of the SCIENTIFIC AMERICAN. Boys take pride in a paper which comes addressed to their names, and generally read its pages with care. A large engineering firm at the West lately wrote us that they are accustomed to make a Christmas gift of the SCIENTIFIC AMERICAN to their best boys. We know of other establishments where the proprietors voluntarily supply their workmen with this journal, and find that it pays a hundred fold and more.

L. P., of N. Y.—Your plan for an aerial car, with an elevating gas bag, to be drawn through the air by birds, may have advantages over the contrivance illustrated in the SCIENTIFIC AMERICAN a short time ago, in which the car was put on and moved by bird power only. Our friend Will Brighteye prefers to drive with birds exclusively.

T. H. B., of N. Y.—We are not sure that we understand your question. To raise water fourteen feet requires a pressure of about seven pounds, and if it takes 20 pounds to draw the water through your nozzle, the power requisite for that would manifestly be nearly three times greater than that required to lift the same water fourteen feet. If, on the other hand, you obtain twenty pounds pressure from the hydrant, it will require less power to work from that.

H. C. P., of N. Y.—We have no doubt that our correspondent was able to understand that the explanation of the motion of a projectile varying from its north or south direction applied to the hemisphere in which we live; it is very plain that in the southern hemisphere the directions would be reversed. Are you not in error in supposing that 761 bears a larger proportion to 597 than 262 does to 747?