

the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row New York.

It would require many columns to detail all the ways in which inventors or patentees 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.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our 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 us on the subject, giving a brief story of the case, inclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

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 our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.



T. R. V., of Conn.—The use of bismuth in an alloy is to make it melt at a very low temperature.

"Old Subscriber."—You are right in one of your surmises about lightning rods. Paint is a non-conductor, but does not detract from the value of the rod as a protection. All non-conductors of electricity are insulators and confine the fluid in its passage to the earth to the rod itself. The lightning will not leave the rod and enter the building. The rod is painted to preserve it from oxidizing. Rust is a non-conductor also, but it wastes the iron, and is, therefore undesirable. If the conductor is of sufficient size and as direct as possible in its passage your building is safe enough. The paint will not injure it.

F. R., of Mass.—Your letter must have been mislaid, as we have not received it. We are obliged to you for your gratuitous advice as to the best manner of conducting our business. Gutta-percha cement is made by dissolving that substance in turpentine or naphtha. We cannot inform you how pipe stems are made from it.

J. F., of N. Y.—You had better call at our office and show us a sample of your proposed method of using rubber for protecting walls of rooms. We cannot understand its peculiarity from the statement you have made respecting it.

B. W. K., of Wis.—The hollow wrought-iron cylinders, 6 feet long, 36 inches bore, with sides 8 inches thick, can be made at our iron-works. They can also be fitted with threads internally of any desired pitch, but unless you have a gold mine in your own right, you had better defer the construction of one at present, as it would involve the production of special machinery to make such a cylinder, at a vast outlay. We are obliged for your compliments respecting the SCIENTIFIC AMERICAN.

W. S. D., of Pa.—There is no sense in your question as you state it. "If the piston of a steam engine of 60 horse-power, traveling at the rate of 3 feet per second, with a weight of two tons attached to the piston, what would be the weight of the blow it would strike?" As you left out all the essential points—the distance passed over before the blow is struck, whether vertical or horizontal and the pressure of steam—"60 horse-power" conveys no meaning whatever.

J. W. P., of Maine.—Address Reynolds, Pratt & Devoe, 106 Fulton street, New York, for the kind of varnish you require for tool handles.

J. D., Jr., of Del.—Blanchard's eccentric lathe for turning irregular forms is capable of turning an ox-yoke from a pattern, but we cannot refer you to any one who manufactures them for sale.

A. M., of Ohio.—The packages of earth which you have sent us appears to be mostly silicious sand mixed with a little lime colored with iron. It is impossible to tell you its exact composition without analyzing it.

J. G. P., of Pa.—You state that the spindle of your 3-foot saw becomes heated, and that you have not been able to remedy the evil by any lubricant which you have tried. Perhaps it is a little out of line, but as you run it at the rate of 850 revolutions per minute, this great speed may be the cause. A high circumferential velocity in a saw generates a great amount of friction in the journal-boxes.

N. C. D., of D. C.—We are obliged for your continued attention to us. We receive many suggestions every week from disinterested persons which we are unable to give attention to. You and others interested are referred to Bernoulli's essay on the

spinning of tops, for all phenomena connected with the matter. The subject is quite ancient, as the book referred to is itself at least a century and a half old. In Dr. Thompson's "History of Science" you will doubtless find a condensation of the subject.

J. M. Jr., of Ill.—We think there is no air in the feed water of marine engines which use surface condensers. You state that no locomotive has ever exploded while running. This is not so—several have exploded. In February, 1849, the boiler of a locomotive exploded on the Boston and Providence Railroad, while running with its train; and two explosions of locomotive boilers have occurred on the New York Central Railroad under similar circumstances.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, April 22, to Wednesday, April 29, 1863.—

- W. L. F., of N. J., \$31; T. J. P., of Ill., \$50; W. J. S., of N. J., \$45; J. C., of Mich., \$20; J. P., of N. Y., \$16; B. W. S., of Mass., \$20; P. M. R., of Cal., \$12; J. W. G., of Mass., \$22; R. P. P., of N. Y., \$41; W. F., of Mo., \$15; R. T. H., of Ill., \$25; C. M. J., of Ill., \$15; McD. & R., of N. Y., \$16; J. D., of Ill., \$10; L. & H., of Pa., \$25; D. C. W., of Ill., \$26; J. H., of Iowa, \$25; S. R. J., of Conn., \$15; W. J., of N. H., \$15; G. T. L., of Pa., \$20; N. S., of Mich., \$20; N. & D., of N. Y., \$16; W. C. O., of N. Y., \$20; T. S. D., of N. J., \$15; H. & B., of Conn., \$20; E. D., of Mich., \$45; C. F. H., of N. Y., \$10; T. B. V., of N. Y., \$20; J. C., of U. S. A., \$16; J. M., of Mass., \$25; W. P., of Minn., \$30; C. H. M., of N. Y., \$450; J. D., of N. J., \$33; L. D. G., of N. Y., \$16; W. D., of Ohio, \$25; J. V. D., of N. J., \$20; E. H. J., of Ill., \$15; A. C. T., of N. Y., \$16; H. B. M., of N. Y., \$25; G. E. S., of Iowa, \$25; F. A. De M., of N. Y., \$16; M. H., of N. T., \$15; S. & P., of N. Y., \$20; A. A., of N. Y., \$16; A. B., of N. Y., \$40; F. R. B., of Ill., \$20; B. T., of Mass., \$25; J. H. H., of N. Y., \$32; L. B., of N. Y., \$15; F. M. R., of Pa., \$30; J. S., of Mich., \$25; S. L. F., of Mich., \$31; J. C. W., of N. Y., \$15; S. F. G., of N. Y., \$16; A. M. B., of Mich., \$26; J. B. E., & Co., of Iowa, \$25; J. A. A., of Conn., \$16; S. S., of Pa., \$26; A. J. H., of Pa., \$15; C. C., of Cal., \$15; A. H., of Ohio, \$15; J. E. D., of Mass., \$26; T. W., of Ill., \$30; B. & B., of N. Y., \$56; J. H., of Ill., \$20; H. & D., of N. Y., \$20; E. F. C., of Kansas, \$16; J. S. K., of Ill., \$30; P. L., of Cal., \$15; A. & F., of Wis., \$16; J. C., of Mass., \$25; N. D. L., of Ill., \$30; D. C. G., of Pa., \$20; W. G. P., of Del., \$23; L. B., of N. Y., \$25; W. S. of Pa., \$31; B. & B., of Mo., \$15; T. S., of Ill., \$15; W. W., of N. H., \$15; L. & B., of Ohio, \$16; J. N. P., of N. Y., \$16; E. K. B., of Conn., \$20; H. W., of N. J., \$41; E. M., of N. Y., \$20; S. D. B., of Pa., \$30.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, April 22, to Wednesday, April 29, 1863.—

- W. L. F., of N. J.; C. M. J., of Ill.; R. S. H., of Ill.; J. W. P., of Mich.; D. C. W., of Ill.; M. H., of N. T.; J. M., of Mass.; S. L., of Mass.; A. M. B., of Mich.; W. D., of Ohio; Y. & T., of N. Y.; J. D., of N. J.; J. S., of Mich.; L. & H., of Pa.; J. V. D., of N. J.; H. W., of N. J.; W. G. P., of Del.; N. D. L., of Ill.; J. B. E., & Co., of Iowa; S. S., of Pa.; H. D. L., of Mass.; B. & B., of N. Y.; J. C., of Mass.; R. H., of N. Y.; C. F. T., of N. Y.; L. B., of N. Y.; T. W., of Ill.; J. H., of Iowa; J. E. D., of Mass.

TO OUR READERS.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of our reception of their funds.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known and inclosing \$1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1863, to accompany the claim, on receipt of \$2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of Instructions to Inventors, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York.

Back Numbers and Volumes of the Scientific American VOLUMES I., II., III., IV., V. AND VII. (NEW SERIES) complete (bound or unbound) may be had at this office and from periodical dealers. Price, bound, \$225 per volume, by mail, \$3—which include postage. Price, in sheets, \$1 50. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. Nearly all the numbers of VOL. VI. are out of print and cannot be supplied.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and every insertion, payable in advance. To enable all to understand how to compute the amount they must send in when they wish advertisements inserted, we will explain that ten 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.

MECHANICS WANTED.—GUN-MAKERS, MACHINISTS, Tool-smiths and Moulders may find constant employment, by applying to or addressing A. RHULMAN, Armorer, Trenton Arms Co., Trenton, N. J.

READER, IF YOU WANT EMPLOYMENT, OR WANT the best (two-threaded) Sewing Machine ever manufactured, send to ISAAC HALE, JR., & CO., Newburyport, Mass., for a descriptive circular of terms, &c. They pay a liberal salary, or allow commission, as the agent may choose. 19 6*

WANTED—A PARTNER, WITH A SMALL CAPITAL, to assist in manufacturing a new patent article of Printers' Ink Roller. For further particulars address the patentee (with stamp enclosed), G. LITTLETON, Cleveland, Ohio. Rights for sale. 1*

JACQUARD MACHINES, WITH APPURTENANCES manufactured and put up. Looms for narrow goods, from silk ribbon in cotton tape, built to order on the most approved principles. Wm. LITTLETON, No. 1, 621 North Second street, Philadelphia, Pa. 19 4*

MANUFACTURERS OF THE SPRINGFIELD MUSKET (1855) can obtain a few thousand each of Bands, Rear Leaf Sights and Side Screw Washers. Warranted to pass Government inspection. Apply to W. T. NICHOLSON & CO., Providence, R. I. 19 4*

\$10—FOR A COUNTY—WILL BUY THE RIGHT of a very useful invention for domestic use—extensively used—Pennsylvania, New York, Illinois and Missouri already sold—something new and good—send for a circular and judge for yourself. Enclose stamp to Post-office Box 169, Easton, Pa. 1*

PATENT OFFICE MODELS MADE OF WOOD OR Metal in the most skillful manner. Machinery made to order. Apply at No. 107 East 22d street, New York. 1*

THE CELEBRATED CRAIG MICROSCOPE WILL BE mailed, prepaid, for \$2 25; with 6 beautiful mounted objects for \$3; with 24 objects for \$5, by HENRY CRAIG, 180 Center street (3d floor), New York. Liberal discount to dealers. The Craig Microscopes are just what they claim to be, and those who wish for such an article will not be disappointed if they should obtain one of these.—N. Y. Methodist. 19 13*

BUREAU OF ORDNANCE.

NAVY DEPARTMENT. } Washington City, April 1, 1863. } This Bureau is desirous of ascertaining whether rifled cannon can be made of wrought iron of sufficient and uniform endurance and economy to warrant their being preferred to guns of cast iron only, or of cast iron strengthened with wrought iron. Proposals will therefore be received from any manufacturers of forged iron, to furnish a finished gun, or a block of metal from which the same may be finished. The said gun, when finished, to weigh about 10,000 pounds, to be made into a gun throwing a projectile of 100 pounds, as used in cast iron rifled cannon of the weight, to be fired 1,000 times with service charges of the same weight and kind of powder as used in the Parrott 100-pounder, viz: 10 pounds of No. 7, without bursting or wearing in such a manner as to cause apprehensions of bursting. The quality of metal, price, and other terms, are to be stated clearly in the proposals forwarded. The Bureau reserves the right to itself of accepting or rejecting any of the proposals. The time for receiving the proposals is limited to sixty days from date; and proposals will only be received from persons actually engaged in the fabrication of wrought iron. JOHN A. DAHLGREN, Chief of Bureau. 15 8

PROPOSALS FOR RIFLE CANNON.

ORDNANCE OFFICE, WAR DEPARTMENT. } Washington, April 16, 1863. } PROPOSALS will be received at this office until 4 o'clock P. M., on the 2d day of MAY next, for the manufacture and delivery of thirty CAST-IRON SIEGEL RIFLE CANNON of the caliber of four and a half inches, to be made in strict conformity to the drawing which will be furnished, and which may be seen at any United States Arsenal. They are to be cast hollow and cooled from the interior. They are to be subject to the regular United States inspection and proof, and none are to be received or paid for, but such as are accepted by the Inspector, whose decision as to the reception or rejection of any of them is to be final and conclusive. Bidders will state the time they propose to deliver the first cannon, and the number they will deliver, weekly, thereafter. They will also state where they propose to manufacture them, and the price, per pound, for the finished cannon, delivered at the place of shipment nearest to the foundry where cast. No bid will be entertained except from regular founders, evidence of which, and of their ability to fulfill a contract, if awarded to them, must accompany the bids, unless the bidder is known to this office. Any bidder obtaining a contract will be required to enter into bonds with no less than two sureties, in the penal sum of \$5,000 for the faithful fulfillment of his contract in all respects. The right is reserved to reject any or all bids if the prices are deemed too high, or for any cause, it is not thought for the public interest to accept them. Proposals will be sealed and addressed to "Brig-Gen. J. W. Ripley, Chief of Ordnance, Washington, D. C.," and will be indorsed "Proposals for 4 1/2-inch Rifle Cannon." JAMES W. RIPLEY, Brig-Gen. and Chief of Ordnance. 18 2

PAYE'S PATENT FORGE HAMMER.

This hammer is adapted to both heavy and light forgings; is the force of the blow being entirely at the will of the operator, and for all forgings under six inches, both round or square, is the best hammer now in use, and requires but one-half the power used by every other hammer to do the same work. For an engraving and description of this hammer see page 17, Vol. V. (new series) of the SCIENTIFIC AMERICAN; some valuable improvements have, however, been since made. All communications should be addressed to H. M. AMES, Box 422, New York, or Ames Iron Works, Oswego, N. Y. These hammers may be seen in operation at the Allaire, Neptune, Secor, Delamater, Fletcher & Harrison, Duncan & Crampton, Anderson & McLaren, Dohurst & Emerson, Charles T. Porter, Hudson River Road Car Shop, all in New York city; Joseph Colwell, Jersey City; Wm. White, Newark, N. J.; Providence (R. I.) Tool Co.; Whiting & Wicux, Kaighn's Point, Phila.; Malory & Cottrell, Mystic, Conn.; J. Dillhoe, Rondout; James H. Orner & Co., Sing Sing; Henry Esler & Co., Brooklyn; James B. Eads, St. Louis, Mo.; Franklin Iron Works, Central Railroad Shop, Albany; Burlington, Quincy & Chicago Railroad Shop, Ames Iron Works, Oswego; C. P. & A. Railroad Shop, Cleveland, Ohio. 1*

WOOD-WORKING MACHINERY, DESIGNED FOR the manufacture of cars, carriages, sash, blinds, doors, moldings, patterns, piano-forte and cabinet work, agricultural implements, packing boxes, lumber, &c. Made by RICHARDSON, MERRIAM & CO., Worcester, Mass. 18 5*

WOODWORTH PLANERS—IRON FRAMES TO PLANE 18 to 24 inches wide, at \$90 to \$110. For sale by S. C. HILLS, No. 12 Platt-street, New York. 18 5*

READY ROOFING.—THIS ARTICLE IS MADE OF the thickest woven fabric ever used for roofing; invented and manufactured expressly for our own use. (See page 176 of the current volume of the SCIENTIFIC AMERICAN for full description.) Needs no coating of cement to be spread upon the surface after being nailed upon the roof-boards, as every other kind of roofing does. It costs less than half the price of tin, is far more durable, and is easily applied by anyone. READY ROOFING COMPANY, 73 Maiden Lane, New York. 18 4*

GILLESPIE'S GOVERNOR AND REGULATOR.—THE attention of mill-owners and others is respectfully invited to this valuable improvement for regulating the speed of water wheels, for which purpose it has never been equaled. Unlike other regulators of water wheels, it is quick and very sensitive, while it works upon an entirely new principle. It is the most simple and durable governor ever used, and is therefore the cheapest. We warrant every machine to give satisfaction, or no sale. J. E. GILLESPIE & CO., Trenton, N. J. 18 4*

THE PRACTICAL DRAUGHTSMAN'S BOOK OF INDUSTRIAL DESIGN. Just published and now ready for delivery.

Among the contents are:—Linear Drawings, Definitions and Problems; Plate I.; Applications, Designs for Inlaid Pavements, Ceilings and Balconies; Plate II.; Sweeps, Sections and Moldings;

THE INTERSECTION AND DEVELOPMENT OF SURFACES, WITH APPLICATIONS.—The Intersections of Cylinders and Cones; Plate XIV.—The Development and Description of Helices, Spirals and Serpents; Plate XV.; Application of the helix—the construction of staircases; Plate XVI.;

THE STUDY AND CONSTRUCTION OF TOOTHED GEAR.—Involute, cycloid and epicycloidal wheels; Plate XVII. and XVIII.—Cycloid, described by a circle rolling about a fixed circle inside it; Fig. 3. Plate XIX. Internal epicycloid; Fig. 2, Plate XIX. Delineation of a rack and pinion in gear; Fig. 4, Plate XVIII. Gearing of a worm with a worm-wheel; Figs 5 and 6, Plate XVIII.; Cylindrical or Spur Gearing; Plate XX.

CONTINUATION OF THE STUDY OF TOOTHED GEAR.—Design for a pair of bevel-wheels in gear; Plate XXII. Construction of wooden patterns for a pair of bevel-wheels; Plate XXIII.; Involute and Helical Teeth; Plate XXIV.—Contrivances for obtaining Differential Movements, The delineation of eccentrics and cams; Plate XXV.; Rules and Practical Data; Mechanical work of effect, The simple machines, Center of gravity, On estimating the power of prime movers, Calculation for the brake, The fall of bodies, Momentum, Central forces.

APPLICATION OF SHADOWS TO TOOTHED GEAR: Plate XXX.—Application of Shadows to Screws; Plate XXXI.; Application of Shadows to a Boiler and its Furnace; Plate XXXII.; Shading in Black—Shading in Colors; Plate XXXIII.

THE CUTTING AND SHAPING OF MASONRY: Plate XXXIV.—Rules and Practical Data, Hydraulic motors, Undershot water wheels, with plane floats and a circular channel, Width, Diameter, Velocity, Number and capacity of the buckets, Useful effect of the water wheel, Overshot water wheels, Turbines, Remarks on Machine Tools.

THE STUDY OF MACHINERY AND SKETCHING.—Various applications and combinations; The Sketching of Machinery; Plate XXXV. and XXXVI.; Drilling Machine; Motive Machines; Water wheels, Construction and setting-up of water wheels, Delineation of water wheels, Design for a water wheel, Sketch of a water wheel; Overshot Water Wheels; Water Wheels with Horizontal Motors; Horizontal steam expansive engine; Plates XXXVII., XXXIX. and XL.; Details of Construction; Movements of the Distribution and Expansion Valves; Rules and Practical Data, Steam engines: low-pressure condensing engines without expansion valve, Diameter of piston, Velocities, Steam pipes and passages, Air-pump and condenser, Cold-water and feed-pumps, High-pressure expansive engines, Medium pressure condensing and expansive steam engine, Conical pendulum or centrifugal governor.

OBlique PROJECTIONS.—Application of rules to the delineation of an oscillating cylinder; Plate XL.

PARALLEL PERSPECTIVE.—Principles and applications; Plate XLII. TRUE PERSPECTIVE.—Elementary principles; Plate XLIII. Applications; Plate XLIV.

DRAWING INSTRUMENTS.—The above, or any other of my Practical and Scientific Books, sent free of postage to any part of the country; every reader of the Scientific American is particularly invited to send for a catalogue, which will be forwarded free of postage.

GUTTA-PERCHA CEMENT ROOFING.—THIS ROOFING is strong and water-proof, and is only about one-third as much as tin, and is far more durable. Can be applied by ordinary laborers—is adapted to old shingle roof as well as to new roofs, and answers equally well on steep or flat roofs.

LIQUID GUTTA-PERCHA CEMENT FOR COATING L and preserving metal roofs, and for repairing leaky roofs of all kinds. These materials are shipped ready for use (no heat required). Full descriptive circulars, prices, &c., furnished by the JOHNS & CROSLY MANUFACTURING COMPANY (sole manufacturers), 78 William street, corner of Liberty, New York.

FOUR PAIRS OF BURR STONES, FOUR FEET IN diameter. A choice selection made at the quarries in France in 1857 for a mill that has not been erected, and now sold to close the concern. Price, per pair in the shops, as imported, \$100. Delivered in New York, if desired. Address Post-office Box 87, Salem, Mass. 15 cent 4

EUROPEAN AND AMERICAN AGENCY.—OFFICES Gresham House, Old Broad Street, London, England. Mr. RAWLINGS, who has resided in New York over a quarter of a century, and has been actively engaged in business during that time, respectfully informs his numerous friends and the public in general that he has opened offices, as above, for the purpose of Negotiating Lands, Sales of Patents, Purchase of Railroad Iron and other American interests. Mr. R. flatters himself that his extensive knowledge of the various States on the continent of North America gives him great advantages, coupled as it is with the representation of the continent of Europe. An agency, such as the one now established, has for a long time been desired, especially the department for Negotiating Patents. A broker's commission merely is not sought, but in all cases, such an interest will be expected that will justify an energetic application to promote the ends desired by the owners of the patents. Mr. R. has made very extensive arrangements for the purchase of railroad iron, and the disposition of the same, represented by reliable and responsible parties. All letters must be prepaid. References, by permission, are made to Thomas Addis Emmett, Esq., 43 Pine street; George E. Townsend, Esq., 42 Pine street; William Cullen Bryant, Esq., Nassau street; R. A. Coodenough, Esq.; Barnum, Seelye & Co., Leonard street; Messrs. E. B. Litchfield & Co., 18 William street; Homer Morgan, Esq., Pine Street, W. H. Barrett, Esq., Broadway, New York; and George Ball, Esq., and Cyrus F. Smith, Esq., Brooklyn. 15 cent 7

A VALUABLE WORK FOR INVENTORS, PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared, with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors how to obtain Letters Patent, also about Models—Designs—Cavaliers—Trade-marks—Assignments—Revenue Tax—Extensions—Infringements—Appeals—Reissues—Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the Granting of a Patent—Patents in Europe—Patent Fees—Seeds of Patent Fees; also a variety of miscellaneous items on patent law questions. It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but also to answer a great variety of questions which have been put to them from time to time during their practice of upwards of 40 years, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps. Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row, New York.

TO PERSONS ENGAGED IN MANUFACTURING ARTICLES used in Woolen Mills.—I desire to obtain the address of all persons engaged in manufacturing articles used in Woolen Mills, such as Reed-makers, Shuttle-makers, Bobbin-makers, Picker-makers, Comb-makers, &c.; also manufacturers of Patent Oil-cans, Patent Tangles, Patent Knives, and all other patented articles used or connected with Woolen Mills. Parties interested please take notice and send their business card to THOMAS STIBBS, Dealer in Manufacturers' Supplies, Wooster, Ohio. 17 1/2

FISH'S LAMP-HEATING ATTACHMENTS.—FOR FAMILIARLY cooking purposes for nursery and sick rooms; for barber shops and restaurants. Adapted to kerosene or gas. A fully illustrated pamphlet will be sent by mail free. Agents wanted. W. M. D. RUSSELL, agent, 639 Broadway, New York. Will remove to 206 Pearl street on May 1st. 18 2

DEAF! DEAF! ARTIFICIAL EARS FOR THE DEAF. Send for a descriptive pamphlet to E. HASLAM, 32 John street, New York. 18 2

TO INVENTORS.—THE UNDERSIGNED HAS GOOD facilities at his place of business in this city to sell a really valuable and profitable article secured by patent. He might be proposed to advance some capital, and to manufacture the same, if necessary. Address HERMAN J. ROSENGRANZ (care of J. SCOTT), New York. 18 4

GUN SCREWS! GUN SCREWS!—THE SUBSCRIBERS have on hand and are manufacturing gun screws which they will warrant to fit "Springfield" Gages. They also solicit orders for gun screws to fit other gages. Samples can be seen at our store, No. 74 Beekman street, New York. FELLOWS, HOFFMAN & CO. 12 1/2

STEVENSON'S JONVAL TURBINE WATER WHEELS, which gave the greatest useful effect over all others, at the trials at Philadelphia, are manufactured by J. E. STEVENSON, at the Novelty Iron Works, New York. 15 cent 7

HOW TO GET THE NEW YORK DAILY SUN, WITH the postage paid, for one cent! Get your postmaster or storekeeper to receive 20 cents each from 15 persons, and remit it (\$3), and we will send him 15 copies of the Sun, postage paid, for 20 days. More money will pay for a longer time. M. O. S. S. BEACH, Proprietor of The Sun, corner of Fulton and Nassau streets, New York. N. B.—The Weekly Sun is only 50 cents a year. 16 4

DON'T FORGET SUPERIOR DOUBLE SAW-BENCHES, \$55. Circulars sent. C. P. S. WARDWELL, Lake Village, N. H. 18 4

PORTABLE STEAM ENGINES—6, 8 AND 10-HORSE at \$500, \$625 and \$750. For sale by S. C. HILLS, No. 12 Platt street, New York. c

10,000 GALLONS.—WANT TO BUY THREE or four large boilers, or tanks, to hold from 3,000 to 10,000 gallons each. Any one having such, which they will offer cheap, will find a purchaser by addressing P. C., Box 3, 488, New York Post Office. 18 2

FAN BLOWERS.—DIMPFEL'S, ALDEN'S, MCKENZIE'S and others, for Steamboats, Iron Works, Foundries, Smith Shops, Jewellers, &c. on hand for sale by LEACH BROTHERS, 86 Liberty street, New York. 15 1/2

FOR SALE.—STEAM ENGINE, 16-INCH BORE, TWO feet stroke, with Judson governor, boiler of sufficient capacity for same with fire-box, chimney pipes and pump complete, but little used. Also a large gear-cutting engine to cut bevel, spur or spiral gears; one compound planer, one shaping machine, a few engine lathes and planers, one slotting machine, all of excellent quality. Also, stationary engines, 6, 7 and 8-inch bore, 16-inch stroke; 10x20, 12x20, 12x24, and 16x36. Portable engines from 3 to 10 horse-power. Shafting, pulleys, &c. made promptly to order. Address CINCINNATI MACHINE WORKS, corner First and Lawrence streets, Cincinnati, Ohio. 16 4

TRIP HAMMERS.—WE ARE MANUFACTURING Howell's Patent Trip Hammers (illustrated in No. 2 Vol III, new series, SCIENTIFIC AMERICAN) to which the attention of those interested in the Descriptive Circular and references to those who have them in use mailed to all applicants JAMES L. HAVEN & CO., Nos. 173, 176 and 177 West Second street, Cincinnati, Ohio. 14 6

EXCELSIOR MOWER AND REAPER—THE BEST IN use—the patent for sale or lease. A fortune can be made by building these machines. Territories for sale. Send for a circular and you will get all the particulars. ROBERT BRYSON, Schenectady, N. Y. 17 5

GROVER & BAKER'S CELEBRATED FIRST PREMIUM Sewing Machines, 495 Broadway, New York. The Grover and Baker S. M. Co. are the only parties who manufacture and sell machines which both sew perfectly and embroider perfectly. 17 4

PLATINA! PLATINA!—FOR USES OF CHEMISTS, Dentists, Gunsmiths, Electro-platers, Telegraph Batteries, Acid Manufacturers, &c. SUTTON & RAYNOR, 748 Broadway, New York. 17 4

INVENTIONS AND THEIR RESULTS.—A NEW book just published. Send four stamps (12 cents), and procure a specimen copy, and agent. Agents wanted everywhere to solicit orders. Address HARRIS BROS., Box 302, Boston, Mass. 17 1/2

BOLTS, NUTS AND WASHERS OF ALL SIZES CONSTANTLY on hand for sale by LEACH BROTHERS, 86 Liberty street New York. 10 1/2

MESSIEURS LES INVENTEURS—AVIS IMPORTANT. Les Inventeurs non familiers avec la langue Anglaise et qui préfèrent à toute communication leurs inventions en Français, peuvent nous adresser dans leur langue nationale. Envoyez nous un dessin et une description de votre invention, nous l'examinerons avec communication et vous en donnerons un avis. MUNN & CO., SCIENTIFIC AMERICAN Office, No. 37 Park-row, New York.

THE CHEAPEST 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 secondhand 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.

For further particulars address—MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York City.

DAMPER REGULATORS.—GUARANTEED TO EFFECT a great saving in fuel, and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. Orders promptly attended to, or information given, by addressing CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, 229 Broadway, New York. Responsible agents wanted. 16 20

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, also three and four spindle Drills of superior quality, on hand and finishing, for sale low. For description and prices address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 17

OIL! OIL! OIL For Railroads, Steamers, and for Machinery and Burning. PEASE'S Improved Engine and Signal Oil, indorsed and recommended by the highest authority in the United States. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skilful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The SCIENTIFIC AMERICAN, after several tests, pronounces it "superior to any other they have ever used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 Main street, Buffalo, N. Y. N. B.—Reliable orders filled for any part of the United States and Europe. 9 13

VALUABLE DOCK PROPERTY FOR SALE.—THE subscriber offers for sale a valuable plot of ground on Newtown Creek, near Penny Bridge, in the city of Brooklyn. The property is very desirably situated in the Seventeenth Ward, Meeker avenue, a great thoroughfare, forming the southerly boundary of the premises. A valuable dock privilege of over 400 feet on Newtown Creek, renders the property very desirable for large manufacturing or storage purposes. Vessels of six or eight feet draft can navigate the creek at low tide, and of much greater capacity at high water. The upland and water privilege comprise about nineteen acres, and will be sold very cheap, and the terms of payment made liberal. For further particulars, address J. B. BULLOCK, attorney for the owners, No. 39 Nassau street, New York. 22 1/2

TO PHOTOGRAPHERS.—IMPROVED PHOTOGRAPHIC Camera, Patented March 25, 1852, by A. B. WILSON (Patentee of the Wheeler and Wilson Sewing Machine), adapted to all photographic work; such as Landscapes, Stereoscopic Views, Carte Vitrees, Ambrotypes, &c. Can be used by amateurs and others from printed directions. Send for a circular. Address A. B. WILSON, Waterbury, Conn. 16 1/2

SOLID EMERY VULCANITE.—WE ARE NOW MANUFACTURING wheels of this remarkable substance for cutting, grinding and polishing metals, that will outwear hundreds of the kind commonly used, and will do a much greater amount of work in the same time, and more efficiently. All interested can see them in operation at our warehouse, or circulars describing them will be furnished by mail. NEW YORK BELTING AND PACKING CO., Nos. 37 and 38 Park-row, New York. 14 13

GUILD & GARRISON'S CELEBRATED STEAM Pumps—Adapted to every variety of pumping. The principal styles are the Direct Action, Exhaust Steam Pump, the Improved Balance Wheel Pump, Duplex Vacuum and Steam Pumps, and the Water Propeller, an entirely new invention for pumping large quantities at a slight lift. For sale at Nos. 55 and 57 First street, Williamsburgh, and No. 74 Beekman street, New York. 17

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The Hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices &c. can be obtained by mail or otherwise at our warehouse, NEW YORK BELTING AND PACKING COMPANY, JOHN H. CHEEVER, Treasurer, Nos. 37 and 38 Park-row, New York. 14 13

BLACK DIAMOND STEEL WORKS, PITTSBURGH, Pa. PARK, BROTHER & CO., manufacturers of best quality Refined Cast Steel, square, flat and octagon, of all sizes. Warranted equal to any imported or manufactured in this country. Office and Warehouse, Nos. 149 and 151 First street, and 120 and 122 Second street, Pittsburgh, Pa. 11 1/2

PORTABLE STEAM ENGINES.—COMBINING THE maximum of efficiency, durability and economy with the minimum of weight and price. They are widely and favorably known, more than 200 being in use. All warranted satisfactory or no sale. A large stock on hand ready for immediate application. Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Mass. 14 13

Zur Beachtung für deutsche Erfinder. Die Unterzeichneten haben eine Anstalt, die Erfindern das Verhalten anzeigt, um sich ihre Patente zu sichern, herauszugeben, und verabfolten solche gratis an dieselben. Erfinder, welche nicht mit der englischen Sprache befannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Stiffen von Erfindungen mit kurzen, deutsch geschriebenen Beschreibungen beileben man zu adressiren an Munn & Co., 37 Park Row, New York.

Zuf der Office wird deutsch abgedruckt. Dasselbe ist in haben: Die Patent-Gesetze der Vereinigten Staaten. nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in drei Theilen. Ist überall in Europa, Ferner Wählige aus den Patent-Gesetzen fremder Länder und darauf bezügliche Nachrichten; ebenfalls auch die Patente für Erfinder aus jedem der Vereinigten Staaten. Preis 20 Cts., per Theil 25 Cts.

Improved Hay-elevating Fork.

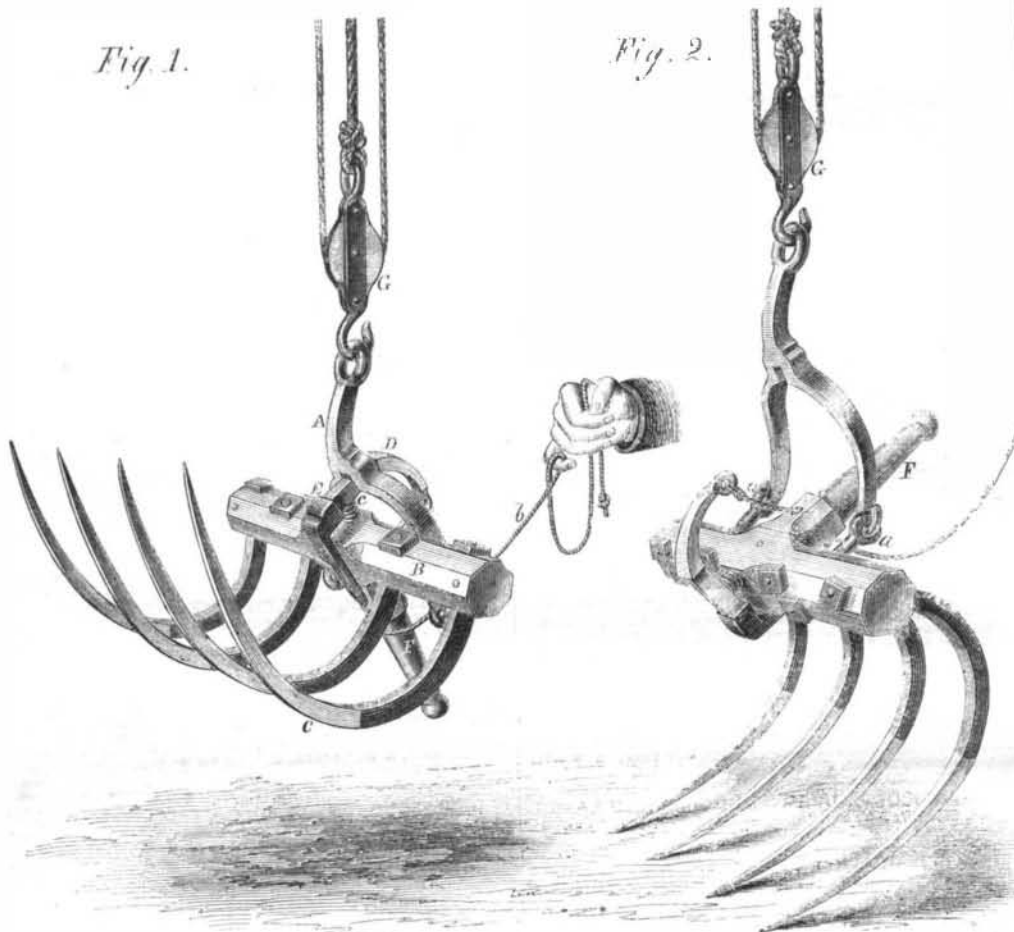
As the hot and toilsome haying season approaches, the muscles and physical energies of the farmer will be taxed to their utmost. Hurrying off at the early dawn of the day and working till late at night, he feels severely all the discomforts and inconveniences attending this onerous portion of his duties. A great part of his labor has been lightened by our ingenious inventors, who, knowing the practical wants of special departments, hasten to relieve them by substituting machines for human strength; and it is a source of the greatest wonder to us how any man can consent to wear himself out, physically and mentally, when he can very much facilitate his oper-

mend it to those seeking a simple and efficient hay fork. This invention was patented by L. Rundell, through the Scientific American Patent Agency, on April, 1862; further information can be had by addressing the inventor at Coxsackie, N. Y.

The Composition of Milk.

Milk has been so often analyzed that it would seem no further facts could be elicited in regard to this important liquid. Professor Boedecker, however, has just completed a series of experiments conducted on quite a new principle. The question he proposed to himself was whether milk obtained at any hour of the day always presented the same chemi-

charge, that the screw of the ramrod would not extract it. The English infantry were in as much despair as were the Belgian and Nassau squares a few hours afterwards, when attacked by the French cavalry. Their means of defense appeared to be gone. At length, a sergeant hit upon the expedient of swinging the musket around in a manner which dislodged the charge. The experiment was adopted with success along the whole line. Soon afterwards it appeared that the front ranks of the French infantry were in precisely the same difficulty. They had loaded over night for their intended attack. At the short distance which divided the front ranks of the two armies they witnessed our final experiment, and adopted it.—*Edinburgh Review.*

**RUNDELL'S HAY-ELEVATING FORK.**

ations by using the improved tools that are made and sold all over the country. Herewith we illustrate an improved hay-fork, which we will proceed to describe. Fig. 1, is a view of the fork in gear, and is supposed to be loaded with hay. The shank, A, is connected to the wooden bar, B, by the eye bolts, a, and has the tines, C, secured in it by nuts on each end of them. The catch, D, is jointed to the jaw, E, at one end, and has an eye at the other extremity to which the detaching cord, b, is fastened, a small spiral spring is shown at c, which keeps the catch up against the shank, A. The wooden handle, F, is grasped by the farmer when the fork is to be loaded. The block and fall, G, connected with the upper end of the shank is fastened to any point overhead in the barn, or to a temporary upright in the field.

The operation of the machine is as follows:—When the fork is loaded it is perfectly balanced by the position of the shank and the crook of the same. The hoisting power is then applied and the load elevated to the desired point; when this is achieved, the farmer pulls the disengaging cord, the catch is detached, and the fork swings on the eye bolts, and lets the load slide off. The position of the fork and the parts thereof is shown in Fig. 2. The apparatus can then be insinuated under another mass of hay, the shank lowered down by the fall so that the catch hooks over it, and the process repeated at will. The disengaging apparatus is quite secure, and has a square hold on the shank when hoisting, yet it works so easily that the operator, be he who he may, is able to disconnect it with one pull of the little finger. A child might work this part of the fork. The apparatus is simple and strong, and we com-

cal composition or not; and he has arrived at the result that the milk of the evening is richer by 3 per cent. than that of the morning; the latter containing 10 per cent of solid matter, and the former 13 per cent. On the other hand, the water contained in milk diminishes by 3 per cent. in the course of the day; in the morning it contains 89 per cent. of water, and only 86 per cent. in the evening. The fatty particles increase gradually as the day wears on. In the morning they amount to 2.17 per cent; at noon to 2.63 per cent; and in the evening to 4.32 per cent. This circumstance, if true, would be very important in a practical point of view. Let us suppose a kilogramme of milk to yield only the sixth part of its weight of butter, then the milk of the evening may yield double that quantity. The caseinous particles are also more abundant in the evening than in the morning; from 2.24 they increase to 2.27 per cent; but the quantity of albumen diminishes from 0.44 to 0.31. The serum is less abundant at midnight than at noon, being 4.19 per cent. in the former case, and 5.72 in the last.

Swelling of Cartridges by Rain.

On the evening of the 17th of June, 1815, the French infantry made a demonstration against the English lines, at Waterloo. This movement led the front ranks of the English to load their muskets; and when the enemy retired, arms were piled in the usual manner; but the charges were not withdrawn. From that moment the rain fell in torrents. When the troops unpiled arms in the morning, they found that they could neither withdraw the charges nor fire the muskets. The rain had soaked the cartridges, moistened the powder, and so swelled the

PROSPECTUS

OF THE

SCIENTIFIC AMERICAN.**THE BEST MECHANICAL PAPER IN THE WORLD.****NINETEENTH YEAR!****VOLUME VIII.—NEW SERIES.**

The publishers of this popular and cheap illustrated newspaper beg to announce that on the third day of January, 1863, a new volume commenced. The journal is still issued in the same form and size as heretofore, and it is the aim of the publishers to render the contents of each successive number more attractive and useful than any of its predecessors.

The SCIENTIFIC AMERICAN is devoted to the interests of Popular Science, the Mechanic Arts, Manufactures, Inventions, Agriculture, Commerce, and the Industrial pursuits generally, and is valuable and instructive not only in the Workshop and Manufactory, but also in the Household, the Library and the Reading Room.

The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly journal devoted to mechanical and industrial pursuits now published; and the proprietors are determined to keep up the reputation they have earned during the eighteen years they have been connected with its publication.

To the Mechanic and Manufacturer!

No person engaged in any of the mechanical pursuits should think of doing without the SCIENTIFIC AMERICAN. It costs but six cents per week; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but original engravings, and those of the first class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

Chemists, Architects, Millwrights and Farmers!

The SCIENTIFIC AMERICAN will be found a most useful journal to them. All the new discoveries in the science of chemistry are given in its columns, and the interests of the architect and carpenter are not overlooked; all the new inventions and discoveries appertaining to those pursuits being published from week to week. Useful and practical information pertaining to the interests of millwrights and mill-owners will be found published in the SCIENTIFIC AMERICAN, which information they cannot possibly obtain from any other source. Subjects in which planters and farmers are interested will be found discussed in the SCIENTIFIC AMERICAN; most of the improvements in agricultural implements being illustrated in its columns.

To the Inventor!

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in those old countries. We shall continue to transfer to our columns copious extracts from those journals of whatever we may deem of interest to our readers.

TERMS.

To mail subscribers:—Three Dollars a Year, or One Dollar for four months. One Dollar and Fifty Cents pay for one complete volume of 416 pages; two volumes comprise one year. A new volume commenced on the third of January, 1863.

CLUB RATES.

Five Copies, for Six Months.....	\$6
Ten Copies, for Six Months.....	12
Ten Copies, for Twelve Months.....	23
Fifteen Copies, for Twelve Months.....	34
Twenty Copies, for Twelve Months.....	40

For all clubs of Twenty and over the yearly subscription is only \$2 00. Names can be sent in at different times and from different Post-offices. Specimen copies will be sent gratis to any part of the country.

Western and Canadian money or Post-office stamps taken at par for subscriptions. Canadian subscribers will please to remit 25 cents extra on each year's subscription to pre-pay postage.

MUNN & CO., Publishers,
Park Row, New York.

FROM THE STEAM PRESS OF JOHN A. GRAY