

Gas meters, automatic safety valve and seal lock for, M. Shea	224,736
Gate, W. Butterworth	224,643
Glassware, manufacture of, T. C. Pears	224,555
Glazed structure, W. E. Rendle	224,608
Grain binder, C. L. Travis	224,744
Grapes, etc., machine for expressing the juice from, P. M. J. Chavanette	224,648
Grinding mill, L. Durand	224,661
Harp, C. E. Holtz	224,536
Harrow, J. F. Munz	224,601
Harrow sulky, W. W. Cook	224,650
Harrow teeth, machine for making, H. J. Gage et al	224,526
Harrow tooth, P. A. Peer	224,722
Hat and other head coverings, celluloid, R. H. Trested	224,745
Hay loader, E. Bollinger	224,634
Hay press, B. Tompkins	224,743
Hay rake, revolving, J. S. Oberholtzer	224,718
Heating railway and other carriages, A. Ancelin	224,507
Heel trimming machine, H. A. Henderson	224,533
Hitching device, horse, R. Seiders	224,500
Honey extractor, centrifugal, J. W. & C. M. Cole	224,654
Honey protector, J. D. Lewis	224,704
Horse detacher, L. B. Shaw	224,644
Hose band, O. T. Earle	224,586
Hose connection and sprinkler, combined, G. R. Burden	224,513
Hose nozzle, I. W. McGaffey (r)	9,081
Hydraulic press attachment, J. V. Jones	224,696
Knitting machine needles, manufacture of, Jackman & Flinders	224,542
Knitting machine needles, manufacture of latches for, Jackman & Flinders	224,541
Lamp, J. Kintz	224,701
Lamp, hanging, T. D. Hotchkiss	224,538
Lamps, manufacture of, J. Dalzell	224,519
Lantern, T. Langston	224,703
Lead fumes, refining waste, G. T. Lewis	224,548
Lock nut, H. A. Harvey	224,591
Locomotive, coal burning, W. Buchanan et al	224,640
Loom pattern chain, M. Lindner	224,550
Magneto-electric machine, E. Burgin	224,642
Malt extract, J. Carnrick (r)	9,075
Malting apparatus, A. Marbeau	224,554
Mashing and mixing brewer's mash, machine for, C. Stoll (r)	9,080
Meat, curing and canning sausage, H. Verhage	224,563
Meat press, G. T. Bassett	224,629
Microphone, E. Berliner	224,573
Middlings purifier, J. M. Ludwig	224,705
Middlings purifier, T. B. Osborne	224,719
Moulding in sand, machine for, Aikin & Drummond	224,570
Moulding, picture frame, W. H. Grubbs	224,590
Motive power, production of, T. M. Fell	224,669
Mower, lawn, W. C. Farnum	224,533
Mower, lawn, T. D. Marsh	224,706
Music sheet for mechanical musical instruments, E. P. Needham	224,715
Music stand, portable, A. Hewes	224,687
Musical instrument, mechanical, E. P. & O. H. Needham	224,716
Nut lock, I. D. Beach, Jr	224,630
Packing, hydraulic piston, G. Johnson	224,695
Pantaloon garment, Schilling & Florsheim	224,559
Paper holder, L. J. Labounty	224,547
Paper pulp, wood grinder for making, S. M. Allen	224,623
Pawl and ratchet device, W. C. Farnum	224,524
Picker lag, J. N. Jones	224,545
Pigments from lead sulphurets, making white, G. T. Lewis	224,549
Pile, composite, H. Case	224,646
Pill making machine, J. A. Whitney	224,560
Pipe clamp for oil wells, etc., C. Heme	224,532
Planing machine, metal, S. E. Hildreth	224,534
Planter, corn, J. F. Hudson	224,594
Plow, G. Watt	224,750
Plow, R. W. Whitehurst	224,753
Plow, corn, P. Brannan	224,639
Plow, sulky, J. F. Munz	224,713
Pressure regulator, fluid, R. Boeklen	224,575
Printing machine beds, locking plate to, S. Crump	224,650
Printing machine, ribbon paper, T. G. Hooster	224,537
Printing, preparing autographic stencils for, T. A. Edison	224,665
Pulley, stop, A. S. Dickinson	224,662
Pump, G. H. Felt	224,668
Pump, lifting and force, E. Barnes	224,509
Railway column, elevated, F. A. Williams	224,567
Railway frogs, die for the manufacture of caps for, D. C. Pierce	224,607
Railway signaling apparatus, Ireland & McDonald	224,692
Refrigerating apparatus, T. C. Eastman	224,521
Rein holder, W. J. Morgan	224,711
Rest, self-adjusting anti-sparrow, T. B. Dougherty	224,520
Ribbon holder, L. M. Chipley	224,541
Rocking chair, folding, C. D. Hyde	224,690
Rolling chisels, machine for, G. Parr	224,720
Roof composition, D. D. Pennoyer	224,606
Saddle tree fork, G. A. Mittenhoff	224,769
Sash, window, A. Friedrick	224,675
Saw mill head block, J. Cain (r)	9,074
Saw mill head block, J. Hubbell (r)	9,078
Saw mills, feed and gig works for, J. H. Watson	224,749
Screw machines, cutting-off tool for metal, A. Johnston	224,543
Screws, machine for making machine, F. Curtis (r)	9,086
Sectional boiler, M. W. Hazeltan	224,685
Sewing machine S. M. Tyler (r)	9,079
Sewing machine band wheel bearing, Miller & Diehl	224,710
Sewing machine take-up, G. W. Baker	224,572
Sewing machines, device for guiding and feeding straw braid, H. Plummer (r)	9,082
Sewing machines, feeding device for straw braid, H. Plummer (r)	9,082
Shade roller, spring, D. E. Kempster	224,596
Shawl strap, J. Vooz	224,748
Shoe, I. Hall	224,528
Show case, T. Vaughan	224,562
Shutter bower and fastener, combined, Stewart & Price	224,618
Shutter fastener, Tefney & Walton	224,619
Sieve, E. J. McGurren	224,595
Sled brake, L. Sira	224,615
Snap hook, J. K. Wightman	224,622
Soap, apparatus for making, B. H. Chadbourn	224,514
Spinning machine, Keisling & Babb	224,700
Stamp, hand, G. E. Emerson	224,666
Stand pipe arier for shafts, C. Wright	224,756
Steam heater, W. C. Wren	224,569
Steam muffer, Campbell & Drake	224,644
Steam trap, T. B. & S. S. Davis	224,661
Steam trap, H. Mitchell	224,600
Stereotype and other plates, machine for shaving and cutting, W. A. Wright	224,755
Stone, artificial, J. P. Davis	224,660
Stone sawing machine, H. Young	224,760
Stone working, etc. boring tool for, W. Hasenzahl	224,530
Stove hay burner attachment, L. T. Harper	224,683
Stove lifter and carrier, L. K. Smith	224,617

Stove, steam, J. Ashcroft	224,625
Straining cover for milk pails, S. June	224,699
Stump puller, J. G. Trump	224,746
Sugar machine, centrifugal, R. Fremaux	224,674
Suppository mould, J. W. See	224,734
Swivel hook for tightening and connecting ropes, M. R. Skinner	224,738
Telegraph, underground, C. Linford	224,551
Telephone exchange switch, G. W. Coy	224,653
Telephone switch and connection, G. Westinghouse, Jr.	224,565
Tenoning machine, White & Kelley	224,752
Thill coupling, J. Fasig	224,667
Thimble blanks of celluloid and other materials, apparatus for and process of forming, W. H. Halsey	224,682
Ticket holder, S. Herzberg	224,696
Toasting iron, reversible, C. G. Stafford	224,740
Tobacco box, Balmer & Lottier	224,508
Toy, A. Dorn	224,585
Traction wheel, H. T. Stith	224,741
Truck, hand, M. Johnson	224,693
Valve, balanced slide, J. Fish	224,525
Vegetable slicer, P. Berzine	224,631
Vehicle sand band, I. F. Burdick	224,641
Vehicle spring, S. A. Bailey	224,627
Vessels, construction of freighting, F. Imhorst	224,691
Vise, circular saw, J. L. Glover	224,676
Wagon lock, J. L. Guinn	224,681
Wagon reach coupling, A. Heikes	224,531
Waiver, H. Berry	224,632
Wardrobe, bedstead, and table, combined, E. J. Green	224,679
Washing machine, Holloway & McCain	224,689
Watch case, E. C. Fitch	224,670
Water cooler, T. D. Mowlds	224,712
Water through pipes, apparatus for elevating and forcing, T. Tully	224,561
Whiffletree hook, W. Freeland	224,673
Windmill, J. O. Baird	224,628
Wood cutting machine, J. H. Phipps	224,556
Wooden bows, machine for bending, C. Wright	224,757
Zithern, C. E. Holtz	224,535

DESIGNS.

Carpet, T. J. Stearns	11,654
Glass tumblers, mugs, etc., R. J. Beatty	11,653
Spoon and fork handles, W. B. Durgin	11,655

TRADE MARKS.

Cigars, Krohn, Feiss & Co.	7,824, 7,825
Medicine for the cure of rheumatism and dyspepsia, J. Webb	7,826
Pencils for carpenters and draughtsmen, lead, C. H. Dudley	7,823
Pickles, Yarnall Brothers	7,831, 7,832
Stone crushers, Blake Crusher Company	7,827
Tobacco, cigars, cigarettes, cheroots, and snuff, smoking and chewing, F. W. Felgner & Son	7,828
Toilet preparations, certain, Lanman & Kemp	7,830
Whisky, C. Ledard	7,829

Advertisements.

Inside Page, each insertion --- 75 cents a line. Back Page, each insertion --- \$1.00 a line. (About eight words to a line.) Engravings may be had at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue. The publishers of this paper guarantee to advertise a circulation of not less than 50,000 copies every weekly issue.

A RARE OPPORTUNITY

Is offered an energetic man of experience in all the details of the stove foundry business and capable of conducting same, and having capital to take an interest in a long established concern, whose leading specialties have an extended reputation and sale throughout the country. The desire of senior partners to retire from active business on account of age, the remaining partner to retain at least half interest in the concern. Address "B. C.," Manufacturer, Box 773, New York City.

THE BEST ARE THE CHEAPEST. THE FLEETWOOD and DEXTER SCROLL SAWS. Warranted the most Accurate and Durable. The TRUMP Lathes CHUCK, for small drills 1/4 and under. 3 jaws, self-centering, strong and true. Price \$1.50 to \$2.25. Send for circular. TRUMP BROS. MACHINE CO., Wilmington, Del.

50 Perfumed Cards, best assortment ever offered, 10c. Agts. Outfit, 10c. CONN. CARD Co., Northford, Ct.

HANDLES.

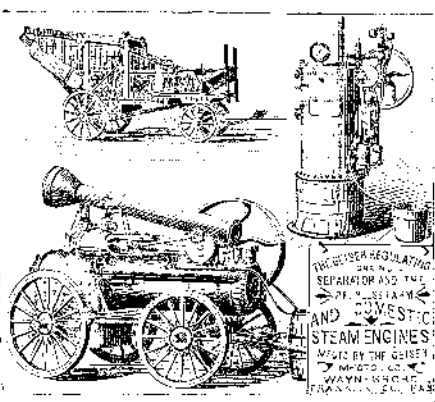
Axe, Railroad, and Miners' Pick and Sledge Handles. Manufactured from selected Hickory. S. MUSSELMAN & SON, Quakertown, Penna.

TRIUMPH MIDDINGS MILL. Under Runner, Iron Frame. Mills changed from old to new process. WILCOX, SHINKLE & MILLER, Mill Finishers, PITTSBURGH, PA. Established in 1849.

PERFECT NEWSPAPER FILE

The Koch Patent File, for preserving newspapers, magazines, and pamphlets, has been recently improved and price reduced. Subscribers to the SCIENTIFIC AMERICAN and SCIENTIFIC AMERICAN SUPPLEMENT can be supplied for the low price of \$1.50 by mail, or \$1.25 at the office of this paper. Heavy board sides; inscription "SCIENTIFIC AMERICAN," in gilt. Necessary for every one who wishes to preserve the paper. Address MUNN & CO., Publishers SCIENTIFIC AMERICAN

"RELIABLE" Engines a complete success. Prices still 40 per cent. below those of other makers. Unequaled for efficiency, simplicity, and durability. Prices from \$250 for 10 H. P., to \$400 for 30 H. P. All with Governor, Pump, and Heater. Address, for circular, HEALD, SISCO & CO., Baldwinsville, N. Y.



AN EASILY MADE SMALL, STRONG, AND CHEAP BOILER, for little Steamboats. By H. K. Stroud. With an engraving. This excellent little boiler is made of wrought iron mercury flasks, which may be readily obtained ready for use. Seven flasks are screwed together with ordinary gas fittings. This boiler has been used for a year past, with much success, in the steam Sharpie yacht Mandelita. Length of boat, 16 ft. 5 in.; beam, 4 ft. 6 in.; Propeller, 16 inches diameter. For further description of boiler, boat, and engine, with method of securing the propeller shaft in stern post, see SCIENTIFIC AMERICAN SUPPLEMENT, No. 1822. Price 10 cents. To be had at this office and of all newsdealers.



50 Chromo, Tortoise Shell, Cupid, Motto, Floral Cards, 10c. Outfit, 10c. HALL BROS., Northford, Ct.

CATARRH Successfully Treated and Permanently CURED in every case. No Pay Till Cured. DR. J. K. ROSS, CENTREVILLE, IND.

FISHERS & WATSON'S Patent Steel Hameless HORSE COLLAR. Is perfectly adjustable, widening either at the bottom or on the top, and lengthening at the same time to make a perfect fit. Will never scale, and is a complete healer of sore shoulders. Rights for sale. For further particulars send for circular. Address R. CARTER, 305 Quincy St., Brooklyn, N. Y.

To Business Men.

The value of the SCIENTIFIC AMERICAN as an advertising medium cannot be overestimated. Its circulation is ten times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. If it is worth 25 cents per line to advertise in a paper of three thousand circulation, it is worth \$4 per line to advertise in one of forty-eight thousand. The circulation of the SCIENTIFIC AMERICAN is guaranteed to exceed FIFTY THOUSAND every week. For advertising rates see top of first column of this page, or address

MUNN & CO., Publishers, 37 Park Row, New York.

MUNSON BROTHERS. BUSH MILL STONES, MILL MACHINERY, AND MILL FURNISHINGS. UTICA N. Y. U. S. A.

Cigar Box Lumber,

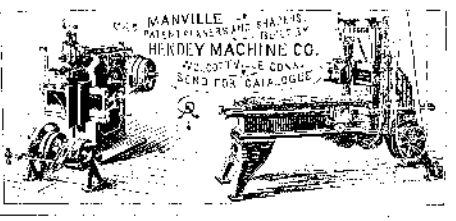
MANUFACTURED by our NEW PATENT PROCESS. The Best in the World. SPANISH CEDAR, MAHOGANY, POPLAR. Also thin lumber of all other kinds, 1/4 to 1/2 in., at corresponding prices. All qualities. Equal in all respects to any made, and at prices much under any to be obtained outside of our establishment. Send for price list. GEO. W. READ & CO., 156 to 200 Lewis Street, N. Y.

SAWS 40,000 SAWS EMERSON'S ILLUSTRATED SAWYERS HAND BOOKS (FREE) TO ANY PART OF THE WORLD. FULL PLANER SAW, CROSS CUT SAW, BEAVER FALLS, PA. EMERSON, SMITH & CO.

IMPLEMENTS, MACHINERY, ETC. Catalogues, prices, and Agency terms solicited. Unexceptional references. OSKAR NETZLER, Agent in Brisbane, Queensland, Australia.

50 Chromo, Glass, Scroll Wreath, and Lace Cards, 10c. Try us. CHROMO CARD Co., Northford, Ct.

THE NEW OTTO SILENT GAS ENGINE. Useful for all work of small stationary steam engine. Built in sizes of 2, 4, and 7 H. P. by SCHLEICHER, SCHUMM & CO., 3015 Chestnut Street, Phila., Pa. H. S. Manning & Co., 111 Liberty St., N. Y., Agents.



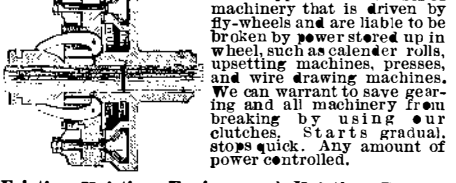
FOR SALE.—THE TWO VOLUMES OF The Natural History of New York on Paleontology, by Prof. Hall, in good order. Address F. B. R., cor. 15th and Angelique, St. Joseph, Mo.

ENORMOUS INCOME and free outfit to Agents. Apply at once. JENKINS' NOISELESS, VIRGINIA. 50 Pin-a-4, Chromo, Lily, Lace, Marble, etc., Cards, in case, 10c. GLOBE CARD Co., Northford, Ct.

RAIL ROAD DEPOTS, IRON BUILDINGS, WHARF SHEDS, SUGAR HOUSES, SELF-FITTING COTTON STORES, PUBLIC MARKETS, (CATALOGUES) RETORT HOUSES, WALTER C. BERGUIS & CO.—GLASGOW—SCOTLAND.

SALESMEN WANTED \$125 A Month and Expenses selling to DEALERS SAMPLES FREE. Send 3c. STAMP to CIGARS insure answer. S. FOSTER & CO., Cincinnati, O.

THE FRICTION CLUTCH CAPTAIN



Friction Hoisting Engines and Hoisting Drums, for line shaft and safety elevators. Can be run faster and stop quicker than any other friction. D. FRISBIE & CO., New Haven, Ct.

\$777 A YEAR and expenses to agents. Outfit Free. Address P. O. VICKERY, Augusta, Maine.

62 Gold, Crystal, Lace, Perfumed, and Chromo Cards, name in Gold & Jet. 10c. Clinton Bros., Clintonville, Ct.

TIGHT & SLACK BARREL MACHINERY A SPECIALTY JOHN GREENWOOD & CO. ROCHESTER, N. Y.

SPARE THE CROTON AND SAVE THE COST. Driven or Tube Wells

furnished to large consumers of Croton and Riegwood Water. W. M. D. ANDREWS & BROS., 235 Broadway, N. Y., who control the patent for Green's American Driven Well.

PATENTS

CAVEATS, COPYRIGHTS, LABEL REGISTRATION, ETC.

Messrs. Munn & Co., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine Improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had OVER THIRTY YEARS' EXPERIENCE, and now have unequalled facilities for the Preparation of Patent Drawings, Specifications, and the Prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Registration of Labels, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very moderate terms.

We send free of charge, on application, a pamphlet containing further information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Hints on the Sale of Patents, etc.

Foreign Patents.—We also send, free of charge, a Synopsis of Foreign Patent Laws, showing the cost and method of securing patents in all the principal countries of the world. American inventors should bear in mind that, as a general rule, any invention that is valuable to the patentee in this country is worth equally as much in England and some other foreign countries. Five patents—embracing Canadian, English, German, French, and Belgian—will secure to an inventor the exclusive monopoly to his discovery among about ONE HUNDRED AND FIFTY 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 expense to apply for an English patent is \$75; German, \$100; French, \$100; Belgian, \$100; Canadian, \$50.

Copies of Patents.—Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at reasonable cost, the price depending upon the extent of drawings and length of specifications.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1.

A copy of the claims of any patent issued since 1836 will be furnished for \$1.

When ordering copies, please remit for the same as above, and state name of patentee, title of invention, and date of patent.

A pamphlet, containing full directions for obtaining United States patents sent free. A handsomely bound Reference Book, gilt edges, contains 140 pages and many engravings and tables important to every patentee and mechanic, and is a useful hand book of reference for everybody. Price 25 cents, mailed free.

Address MUNN & CO., Publishers SCIENTIFIC AMERICAN, 37 Park Row, New York. BRANCH OFFICE—Corner of F and 7th Streets, Washington, D. C.