#### TO INVENTORS.

An experience of more than thirty years, and the preparation of not less than one hundred thousand applica-tions for patents at home and abroad, enable us to understand the laws and practice on both continents, and ossess unequaled facilities for procuring patents everywhere. In addition to our facilities for preparing drawings and specifications quickly, the applicant can rest assured that his case will be filed in the Patent Office without delay Every application, in which the rees have been paid, is sent complete—including the model to the Patent Office the same day the papers are signed at our office, or received by mail, so there is no delay in filing the case, a complaint we often hear from other ources. Another advantage to the inventor in securing is patent through the Scientific American l'atent his patent through the Scientific American Agency, it insures a special notice of the invention in the SCIENTIFIC AMERICAN, which publication often opens negotiations for the sale of the natent or manufacture of the article. A synopsis of the patent laws in foreign countries may be found on another page, and persons contemplating the securing of patents abroad are invited to write to this office for prices, which have been reduced in accordance with the times, and our perfected facilities for conducting the business Address MUNN & CO., office Scientific American.

## Business and Lersonal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Jarvis Patent Boiler Setting, same principle as the Siemens process for making steel: burns screenings without blower, and all kinds of waste fuel. A. F Upton, Agent, 48 Congress St., Boston, Mass.

Valves and Hydrants, warranted to give perfect satis faction. Chapman Valve Manuf. Co., Boston, Mass.

New York, December 25, 1878. To the patrons of Ln bricene: In wishing you the compliments of the season, we believe the most acceptable offering we can make will be lower prices for the coming year. The unprecedented success which has attended the introduction and sale of Lubricene, together with our increased facilities for manufacturing, warrants us in reducing the price, or the 1st January, 1879, to 30c. per 1b. on quantities over 100 lbs., and 35c. per lb. on less quantities. We shall also be prepared to furnish Machinery and Cylinder Oils Gear Grease, etc., at lowest market prices. Thankfu for favors of past years, and soliciting a continuance of same, we remain, yours respectfully, R. J. Chard, 184 Maiden Lane.

Wanted.-Partner with \$15,000 to \$25,000, to take one third to one half interest in an established Mill Machineryand Engine Works located in Central Ohio. Tools patterns, buildings, and location first-class. A good opening for a good man. Address, with full name and references, Ohio Manufacturer, Box 1059, Mt. Vernon, O.

Wanted .- A Foreman for an Iron Foundry, experienced in fine machinery castings, with references as to energy and ability. Apply to Lock Box 795, Worcester, Mass.

Nickel Plating.-A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N.J. The Lambertville Iron Works, Lambertville, N. J. build superior Engines and Boilers at bottom prices

Empire Gum Core Packing, Soap Stone Packing, Pis ton Packing; all kinds. Greene, Tweed & Co., 18 Park Place, N. Y.

1,000 2d hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

Bevins & Co.'s Hydraulic Elevator. Great power, simplicity, safety, economy, durability. 94 Liberty St.N.Y. Hydraulic Elevators for private houses, hotels, and public buildings. Burdon Iron Works, Brooklyn, N. Y. Galland & Co.'s improved Hydraulic Elevators. Office 206 Broadway, N.Y., (Evening Post Building, room 22.)

Iron, Brass, and Steel Wire. Needle pointed English Steel Wire, for all purposes, W. Crabb, Newark, N. J. For Fire or Power Pumps, address the Gould's Manf Co., Seneca Falls, N. Y., or 15 Park Pl., N. Y. city.

Brush Electric Light .- 20 lights from one machine Latest & best light. Telegraph Supply Co., Cleveland, O. The Hancock Inspirator received a gold medal at Paris, as being the best boiler feeder ever made, and the Old Colony Railroad (who have twenty-three machines in constant use) have just given it their fled indorsement, as the cheapest and most effective feeder ever used on their locomotives. Those interested are referred to their letter of recommendation,

J. C. Hoadley, Consulting Engineer and Mechanical and Scientific Expert, Lawrence, Mass.

which may be found in our advertising columns.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are to be sold out very low by the George Place Machinery Agency, 121 Chambers St., New York.

For the best advertising at lowest prices in Scientific, Mechanical, and other Newspapers, write to E. N. Freshman & Bros., Advertising Agents, 186 W. 4th St., Cin., O.

H. Prentiss & Co., 14 Dey St., N. Y., Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

Presses, Dies, and Toolsfor working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1878.

Rubber Hose, Suction Hose, Steam Hose, and Linen Hose: all sizes. Greene, Tweed & Co., 18 Park Pl., N. Y. Solid Emery Vulcanite Wheels-The Solid Original Emery Wheel - other kinds imitations and inferior. Caution.-Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only.
The best is the cheapest. New York Belting and Pack-

ing Company, 37 and 38 Park Row, N. Y. Nickel Plating.-Wenzel's Patent Perforated Carbon Box Anode for holding Grain Nickel. A. C. Wenzel, 114 Center St., New York City.

Bolt Forging Machine & Power Hammers a specialty. Send for circulars. Forsaith & Co., Manchester, N. H. For Solid Wrought Iron Beams, etc., see advertise. ment. Address Union Iron Mills, Pittsburgh, Pa., for

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign

rst-class English maker, cheap. I. Ramsden, Phila.

Gold Chronometer Watch, by first-class English ma-

Hand Fire Engines, Lift and Force Pumps, for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., and 73 Liberty St., N. Y. city, U S. A.

For Town and Village use, comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N. H.

Women's Hospital, 49th St. and 4th Ave., New York, March 6, 1877. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York. Sir:—The Hair Felt Covering, with Asbestos Lining, which you put on the steam pipes and boiler domes of the Women's Hospital, and the Asbestos Cement Felting on the three hot water boilers, are giving great satisfaction, and the result is a great saving of fuel. The temperature of the engine and firerooms is very much reduced, so much so that in cold weather we are rather cold. The saving of coal is \$3 1-8 per cent by actual measurement. The Cement Covering is put on in a superior manner, and is the neatest boiler orpipe covering I have yet seen. Respectfully, Duncan McIntyre, Engineer.

Punching Presses, Drop Hammers, and Dies for working Metals, etc. The Stiles & Parker Press Co., Middletown, Conn

Hydraulic Presses and Jacks, new and second hand, athes and Machinery for Polishing and Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

24 x 48 in. Wright's Automatic Engine, with 16 foot band wheel, 30 in. face, for sale. Price low. Atlas Works, Indianapolis, Ind.

Inventors' Models. John Ruthven, Cincinnati, O.

The Lawrence Engine is the best. See ad. page 29. Sheet Metal Presses, Ferracute Co., Bridgeton, N. J. Special Planers for Jointing and Surfacing, Band and Scroll Saws, Universal Wood-workers, etc., manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

Boston Blower Co., Boston, Mass. Blowers, Exhaust material and workmanship warranted the best. Write volume 39, of the Scientific American. for particulars.

Diamond Tools. J. Dickinson, 64 Nassau St., N. Y. Elevators, Freight and Passenger, Shafting, Pulleys, nd Hangers. L. S. Graves & Son, Rochester, N. Y.

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in Scientific American of this week.

Diamond Self-clamp Paper Cutter and Bookbinders Machinery. Howard Iron Works, Buffalo, N. Y.

Mellen, Williams & Co., 57 Kilby St., Boston, Mass. Wieand Sectional Steam Boiler. Ætna Rocking Grate Bar.

Fine Taps and Dies for Jewelers, Dentists, and Machinists, in cases, Pratt & Whitney Co., Hartford, Conn. Improved Steel Castings: stiff and durable: as soft easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburg Steel Casting Company, Pittsburg, Pa.

Sir Henry Halford says Vanity Fair Smoking Tobacco has no equal. Received highest award at Paris, 1878.

Wm. Sellers & Co., Phila., have introduced a new Injector, worked by a single motion of a lever.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St. Wm. Sellers & Co.

The Scientific American Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the Scientific American, with appropriate contents, business announcem It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts



(1) F. H. asks: 1. Does painting the trunk or stem of fruit or shade trees with coal tar harm A. Daubing the bark with tar will often kill or seriously injure the tree. It is a common practice, however, to bind the lower part of the trunk, from 10 to 12 inches below the surface of the ground to 3 or 4 feet above, with well dried, tarred paper, to prevent the encroachments of mice and insects. 2. How, and on what part of the grapevine, is grafting or budding done, and which is the easiest and best, also the best time therefor? A. The grapevine may be grafted in the cleft mar.ner if treated as follows: cut the scions during the winter or early spring, keeping them partially buried in a cool damp cellar till wanted. As soon as the leaves of the old vine or stock are fully expanded, and all danger of bleeding is past, cut it off smoothly below the surface of the ground, and split the stock and insert one or two scions in the usual manner, binding the cleft well together if it does not close firmly. Draw the soil care fully over the whole, leaving two or three buds of the scion above the surface. If the root of the stock is a strong native grape, the graft will frequently grow 10 or 15 feet during the first sesson and viold a fair gron the second year. The vine may also be grafted with good success at the usual season if grafted below the ground, but above ground it should not be attempted, on account of bleeding, until the leaves are nearly expanded. 3. Is it permitted for any person in the United States to make for his own use (strictly), without paying taxes thereon, whisky, wine, or beer, in the same way that we make our own coffee or tea? A Yes. 4. What is a good book, pamphlet, or paper, treating on insects? A One of the best works on this subject is "A Treatise on Insects Injurious to Vegetation," by T. W. Harris.

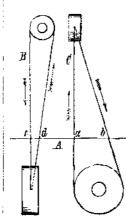
(2) J. R. C. writes: I want to rework stale butter on a large scale, to remove the bad odor and give it a desirable or natural color, if in so doing I will not line, D A, and on this line are erected the various membe under the necessity of using anything injurious to bers of the roll. Now, it follows that if the distance, health. 'A. The following mode of treating rancid butter has been recommended: The butter is first well agi- true length of the finished roll, namely. 6 feet, then tated with hot water, whereby the salt is extracted. On every intersection of the line, D A, will be proportionstanding it soon separates from the water, when it is again agitated for some time with an equal volume of fresh hot water and a few onness to the pound of fresh, sweep will, when east, be the exact length from each animal charcoal in coarse powder and free from dust. distinctive point to the other, as well as the exact length It is freed from charcoal by straining through a fine over all.

Two fine Astronomical Telescopes, 3 in. and 7 in., by cloth while still hot, and from the water by the difference in specific gravity. The butter when cold is well washed with fresh milk to which a little sulphite of lime ker: cost \$250, price \$135; latest patented improvements. has been added, and then reworked, salted, and colored I Ramsden, 21 Christian St., Philadelphia, Pa. with a small quantity of annatto. As the latter is not infrequently adulterated with iron oxide and vermilion, it is well to test it for these before using it in butter,

> (3) C. D. asks: 1. What is the significance of the picture, which appears in most almanacs, of a man surrounded by the constellations and signs of the zodiac, and lines drawn from the signs to different members of his body? A. It has no significance now. In the days of astrology the several parts of the human body were thought to be influenced by or under the control of the portions of the zodiac designated by the signs with which the members are connected. This with special reference to life, death, health, and disease, 2. What is the best non-conductor of sound? A. A

(4) D. V. writes: 1. I have a quantity of chemical writing fluid; have had it two years and it has How can I make it darker? A. You may try the addition of small quantities of tannic acid or extract of nutgalls, and logwood extract. 2. I am in a country place apart from machine shops. How can I draw copper wire No. 22 finer and make my own tools? A. Take a well annealed piece of good tool steel 1/8 inch thick, drill in it several holes of the size of the smallest wire to be drawn, make them all tapering, and enlarge with a reamer so that the holes will vary regularly from the size of No. 22 wire down to that of the smallest wire to be drawn. Harden the plate, polish the holes, reduce the size of the end of the wire, and draw it through the several holes in succession, greasing it before each drawing, and annealing it whenever it becomes stiff. 3. I have made a pair of telephones, mouthpiece as per your engravings, diaphragm of very thin tin. My neighbor wants me to put it up for his use between house and store. Shall I do it, that is, am I infringing on any patent Fans, Hot Blast Apparatus. All parts interchangeable; by so doing? A. See "Rights of Investigators" p. 128,

> (5) A. W. D. asks how to lay out and cut gold. belt holes for a quarter turn belt, said belt to run from one shaft through floor on to another shaft, at right angles with the first, both supposed to be level. A. To make holes through the floors for the belts, lay out on

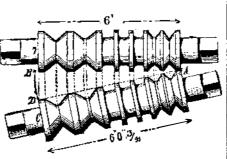


line and train two views of the pulley. or by scale o npaper as shown in the engraving. B is the belt running in the direction of the arrow on the lower pulley, and C is the belt running in the opposite direction. Drop a plumb line representing the В perpendiculars, and C, and draw diagonals governed by the diameters of the pulleys, marking he distances. a b, and c d, on the floor; now drop a

plumb line from each side of the center of face of upper pulley to the floor, and from the point, c, thus found, lay off the distance, a b, in a line parallel with the upper shaft, and from the point, a, in the distance, cd, parallel with the lower shaft. These points indicate the places where the holes should be cut.

(6) W. C. H., Jr., asks: 1. How far will a telephone like that described in the Scientific Ameri-CAN SUPPLEMENT, No. 142, p. 2260, Fig. 4, carry? A. With a good line, 20 miles. 2. What amount of No. 38 covered wire will give the bestresults? A. 34 ounce. 3. How can I make a cheap and simple electric lamp, one or two burners? A. See Scientific American Supple-MENT, No. 149.

(7) J. A. C. writes: The following method of laying off the sweep for a pair of rolling mill rolls may be of interest to your readers, the object being to give the proper proportion of shrinkage to each member of the roll pattern. The exact configuration of the roll when finished is laid off on a piece of flat wood, and if the working part of the roll is 6 feet long, as in the sketch, the shrinkage, being usually % of an inch to a foot, would amount to 34 of an inch in all; this being the case, a pair of trams are set to 6 feet and 1/4 of an inch, and one leg placed at A, and the other at B, and the arc of a circle, B D, described. From the point where this arc intersects a line drawn down from F to C, a



line is drawn to A, making the line, D A, which way represent the edge of the sweep to be made. Similarly with the line, F C, all the other lines which give shape to the roll are brought down until they intersect the DA, is the amount of the shrinkage longer than the ally wider apart on the sweep than on the roll itself; consequently the roll swept up by such a template or

(8) C. H. H. asks: 1. How shall I fix a short length-1/2 inch-of platinum wire between the ends of my battery wires? I wish to heat it. A. Wind it two or three times around each wire, or split the ends of the battery wires, and after inserting the platinum, press the ends together. 2. How many ½ pint bichromate of potash (bottle) batteries will be necessary to heat such a piece of platinum wire? A. If you use a Grenet battery, and a fine platinum, one cell will answer. 8. How can I insulate a brass ring, so that a current can be sent through it without loss to an electromagnet? A. Glass, scaling wax, rubber, ivory, and hard woodaregood insulators. 4. Would it be possible to run a dynamo-electric machine for electric light, by bringing the current from the light back to an engine like Edison's "Harmonic" engine? A. No.

(9) G. H. I. asks: Would heat or sound pass through a vacuum, that is, assuming a perfect vacuum? A. Heat would, sound would not.

(10) E. O. C.—For a definition of sound see p. 347, vol. 39, reply to F. H. P.

(11) M. A. G. asks: 1. What is the meaning of the word anthracite? A. Literally a burning coal stone. 2. Is anthracite coal found in any other place but Pennsylvania? A. Anthracite is found in Pennsylvania, Rhode Island, and South Wales. It is used for the production of iron chiefly in Pennsylvania, Scotland, and Wales. 8. Where was iron first made with anthracite coal, and who was patentee of the process? A. In 1838 and 1839 Thomas made the first experiment on melting iron with anthracite in Pittsville, Pa.

MINERALS, ETC. - Specimens have been received from the following correspondents, and examined, with the results stated:

C. E. B.—It is a shale containing much iron sulphide and a little organic matter.—C. A. R.—No. 1 contains hornblende and tourmaline. No. 2 was not received. C. & H.—It is a dolerite or trap rock, of little value.—S. L. C.—It is an impure chrysocolla—a silicate of copper. It contains about 9.5 per cent of copper-no silver or

Any numbers of the Scientific American Supple-MENT referred to in these columns may be had at this office. Price 10 cents each

#### COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects:

On United States Postal Service. By H. A. S.

[OFFICIAL.

# INDEX OF INVENTIONS

FOR WHICH
Letters Patent of the United States were Granted in the Week Ending November 12, 1878.

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired. and remit to Munn & Co., 37 Park Row, New York city.

 Barrel stave, F. G. Atkinson.
 209,744

 Barrel, etc., counter swinger, J. A. Westlake.
 209,949

 Bird cage, A. E. Mook (r).
 8,486

 Boiler covering, F. B. Stevens
 209,937

 Boiler, steam, T. C. Joy
 209,835

 Boiler, steam, L. Knight
 209,899

 Boot and shoe, pulling off, Peckham & McKitrick 209,919 Boot and shoe heel stiffener former, J. R. Moffitt. 209,826 Bottle stopper fastener, J. Bryan 209,857 Bracelet, spring, Young & Keer 209,847 Bricks and tiles, manufacture of, M. Poletti..... 209,920 Buckles to straps, securing, C.W. White (r). 8,484
Cabinet, kitchen, W. H. Stewart. 209,936
Car coupling, H. H. Potter. 209,835 Cartridge weigher, M. McBride...... 209,824 Casting cranks, E. A. L. Roberts.. 

 Casting cranks, E. A. L. Roberts.
 209,836

 Casting stove leg attachments, H. H. Huntley.
 209,811

 Cement, etc., for walls, etc., E. Meyer.
 209,770

 Centrifugal machine, D. M. Weston (r)
 8,489

 8,489
 8,489

 Chain machine, Fitznatrick & Schinneller (r)..... 8,485 Chair and treadle power, J. B. Underwood. 209,842 Chair, rocking, A. A. Halladay. 209,886 Churn and washing machine, G. B. Richards ..... 209,922 

 Cloaks, stand for showing, P. H. O'Hara
 209,917

 Clock dial, H. J. & W. D. Davies
 209,869

 Clothes line stretcher, W. T. Keefer
 209,814

 Clothes inte stretcher, W. I. Keeler
 205,816

 Cock, gauge, E. B. Kunkle
 209,816

 Coffee, cocoa, etc., drier, S. Beaven
 209,837

 Coin holder, O. S. Harmon
 209,887, 209,888

 Copy holder, H. A. Peabody
 209,918

 Crocheter for making looped fabrics, C. Young
 209,788

 Desk, school, E. Kimball
 299,861

 Dish, fruit venders', G. O. Cole
 209,864

 Drills, gearing for grain, C. Perrin
 299,833

 Fencing strip, T. V. Allis. 209,790
Filter, reversible, E. C. Houghton 209,809 Filtering apparatus, L. A. Enzinger 209,874
Firearm, breech-loading, J. Rupertus 209,925 

28		<b>S</b> c.
Flour, manufacturing, S. M. Brua Flower pot, J. A. Conway	209,795 209,798	Ventilating greenhouses, L. Brecht Ventilator, car. H. S. Newberry
Fluting machine, Shepard & P. Adams, Jr Furnace, tire heating, A. Doll	209,930 209,758	Wagon, dumping, H. Bailey Warps, machine for tying in, Shack
Furnace smoke consumer W. M. Kirby	209,942	Washing machine, S. Byrne
Gas burner, electric, C. H. Hinds	209,891	Water wheel, W. H. Elmer
Gate, water, Giovannini & Bennerscheldt	209,882 209,851	Wheel, vehicle, T. Brown
Grain separator, Harvey & Mitchell	209,772	Window, D. E. ooke
Grave shield and body protector, S. S. Smick Gun, magazine, T. G. Bennett	209,748	TRADE MARK Bottled birch or fermented beer, M.
Hams, preparing boned, A. Warner	209,948 209,761	Cartridges and percussion caps, Eley Clgars, C. Brewer & Sons
Harrow, C. B. Tompkins	209,823	Cigars, B. A. Shotwell
Harvester rake, A. A. Miller	209,788	Cigars, cigarettes, etc., T. H. Hall Cleaner and polishing preparation, N.
Hat sweat leather, G. H. Dimond	209,872	Cotton sheetings and shirtings, B. E Cosmet cs. J. T. Burtis
Hog cholera compound, D. S. French	209,903	Drawing paper, Keuffel & Esser Glassware, Corning Glass Works
Horse collar former, L. Long	209,834	Lamp wickings, Fletcher Manuf. Co. Oiled clothing, A. J. Tower
Horseshoe nail maker, Whysail, Jr., & Merrick Hose, attaching handles to, C. Callahan	209,845	Perfumery, H. B. Slaven
Hose pipe, textile fabric, C. Callahan	209,800 209,825	Still and sparkling wines, R. Henkel Writing paper. Blanchel Freres & K
Ice cream measure and mould, W. Clewell  Jelly glass, J. J. Johnston  Jewel box, E. H. Zoepfel	209,813	DESIGNS.
Lamp reservoir air vent, street, I. Stead Lantern, E. B. Requa	209,935	Font of printing type, P. Grey Font of printing type, W. Murray
Lasting machine, H. G. Thompson (r) Latch, F. Kell	8,487 209,815	Inkstand holders, A. Patitz Oil cloth, C. T. & V. E. Meyer
Leather stuffing composition, Dewees & Green	209,800	Pattern for hand wheels for valves, Toy money banks, A. Seligsberg
Letter and number for signs, J. A. Bruce Life boats, etc., launching, J. A. Stockwell Lighting device, pocket, P. B. Tyler <i>et al.</i> (r)	209,938	Writing paper, H. C. Bainbridge English Patents Issued 1
Liquiddrawer and measurer, A. F. Lapham	209,904	From December 3 to December Base fastener.—T. Cleary, N. Y. city.
Log turner, S. W. & M. L. Gatts Loom harness. J. H. Crowell	209,881 209,799	Book binding machinery.—J. S. Leve Boots.—J. Bond, Jr., N. Y. city.
Loom shuttle box motion, L. J. Masterson Mail bag fastener and label holder, H. B. Ferren.	209,878	Boots.—W. R. Milier et al., Baltimor Electric light.—Weston Dynamo-Ele
Mail crane clamp, A. V. Lunger	209,838	pany, Newark, N. J. Electro-plating.—E. Weston, Newar Flower holder.—J. H. Plummer, Bro
Mill, paint, W. R. Axe  Mower, Yost & Warn:	209,792	Iron, manufacture of.—E. Wheeler, Kilns for drying malt.—C. W. Boynt
Nap or plush goods, T. Goodall	209,805	Pencil holders.—J. Reckendorfer, N Pipe joints.—G. Matheson, McKeesp
Ore roaster, revolving, J. Manes	209,789	Pipe machinery.—G. Matheson, Mcl. Railway signal.—J. S. Williams, Rive Service machines. J. Hobertine Vo.
Overshoe, sandal, or boot, C. E. Town	8,491	Sewing machines.—J. Heberling, Ios Spinning machinery.—J. Birkenhead Torpedoes.—J. H. McLean et al., N.
Palette for testing oils, H. Rouaix	209,924	Tubing, metal.—W. McKenzie et al., Water meter.—C. C. Barton et al., R
Paper tube machine, A. G. Batchelder Peg float, A. Whittemore	209,784	Weaver's harness.—Kendrick Loom Providence, R. I.
Pen and pencil clasp, G. C. Rickly	209,791	Wire coating,—A. B. Brown et al., V
Pianoforte pedal, A. A. Rheutan	209.775	The Scientific A
Picture frame, H. Pattberg	209,902	EXPORT ED
Planter, corn, J. H. Woodgate	209,929	PUBLISHED MON
Plow, J. A. Smith	209,779 209,885	THE SCIENTIFIC AMERICAN Expo
Plow, ditching, Fudge, Holmes & McDonald Post hole digger and transplanter, W. M. Ryan	209,837	and SPLENDID PERIODICAL, is forming a complete and interestin
Printer and recorder, ticket, Moss, Smith & Hill  Printing press, ticket, T. B. Jeffery  Railway rail, L. Leypoldt	209,762	of all Progress in Science and the U
Rake, horse hay, D. P. Sharp	209,928	HUNDRED LARGE QUARTO
Refrigerator and air cooler, Holden & Byrn	209,875	illustrated, embracing:
Refrigerator, A. Axt	209,892 209,852	(1.) Most of the plates and page ceding weekly issues of the Scri
Refrigerator, A. Axt	209,892 209,852 209,934 209,941	(1.) Most of the plates and page ceding weekly issues of the SCIE with its SPLENDID ENGRAVIN ABLE INFORMATION.
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