Business and Personal.

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.

☞ *The publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.*

Alden Ore Crushers and Pulverizers, six sizes, $45 to $1,500. E. T. Copeland, 30 Courtlandt St., N. Y. city.

Wanted—A Chucking Lathe for general work. A. W. Gray's Sons, Middletown Springs, Vt.

Saw Mill Machinery. Stearns Mfg. Co. See p. 77.

Gear Wheels for Models (list free); experimental and model work, dies and punches, metal cutting, manufacturing, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Fresh air is indispensable; but when you need a fresh pen be sure it is one of Esterbrook's

State Rights for sale. Knife and Fork Scouring Box. Engraving in No. 16, vol. 41. SCIENTIFIC AMERICAN. Sylvester M. Button, 324 W. Dauphin St., Phila., Pa.

All Dealers sell the New $4 Drill Chuck; holds from 0 to 9-16. A F Cushman, Hartford, Conn.

See Stockwell Screw and Machine Co.'s adv., p. 76.

For Best Quality Brass and Composition Castings, address E. Stebbins Mfg. Co., Brightwood, Mass.

For Sale.—A N. Y. Steam Engine Co. 21 inch heavy Slotter, in good order. Address Southwark Fo. & M. Co., Phila., Pa.

Blake's Belt Studs. The best and cheapest fastening for all rubber and leather belts. Greene, Tweed & Co., 118 Chambers St., New York.

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

The novel Shading Pen. Sample writing and circular free. See notice and cut this paper, May 1. A set of three sizes by mail, $1. Address J. W. Stoakes, Milan, O.

Asbestos Board, Packing, Gaskets, Fibers, Asbestos Materials for Steam & Building Purposes. Boiler & Pipe Covering, Asbestos Pat. Fiber Co., limited, 194 B'way, N.Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole m'f'rs., H. Lloyd, Son & Co., Pittsb'g, Pa.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

Apply to J. H. Blaisdell for all kinds of Wood and Iron Working Machinery. 107 Liberty St., New York. Send for illustrated catalogue.

Eagle Anvils, 10 cents per pound. Fully warranted.

Our new Stylographic Pen (just patented), having the duplex interchangeable point section, is the very latest improvement. The Stylographic Pen Co., Room 13, 169 Broadway, N. Y.

Advertising of all kinds in all American Newspapers. Special lists free. Address E. N. Freshman & Bros., Cincinnati, O.

Valve Refitting Machine. See adv., page 77.

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, are full of orders, and withdraw their illustrated advertisement. Send for their new circulars.

Sweetland & Co., 126 Union St., New Haven, Conn., manufacture the Sweetland Combination Chuck.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N. Y.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

For the best Stave, Barrel, Keg, and Hogshead Machinery, address H. A. Crossley, Cleveland, Ohio.

Walrus and Sea Lion Leather for Silver and all Metal Polishing. Greene, Tweed & Co., 118 Chambers St., N.Y.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros. 531 Jefferson St., Philadelphia, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Stave, Barrel, Keg, and Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Condit, Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

For Alcott's Improved Turbine, see adv. p. 45.

Forsaith & Co., Manchester, N. H., & 207 Centre St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

4 to 40 H. P. Steam Engines. See adv. p. 63.

Air Compressors, Blowing Engines, Steam Pumping Machinery, Hydraulic Presses. Philadelphia Hydraulic Works, Philadelphia, Pa.

Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

Sheet Metal Presses. Ferracute Co., Bridgeton, N. J.

Burgess' Non-conductor for Heated Surfaces; easily applied, efficient, and inexpensive. Applicable to plain or curved surfaces, pipes, elbows, and valves. See p. 284.

Eclipse Portable Engine. See illustrated adv., p. 62.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

For Sale Cheap.—A Springfield Gas Machine, with 500 light capacity. D. L. E., 16 White St., New York.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 77. Totten & Co., Pittsburg.

Silent Injector, Blower, and Exhauster. See adv. p. 77.

Portable Railroads. Sugar Mills. Horizontal & Beam Steam Engines. Atlantic Steam Engine W'ks, B'klyn, N.Y.

Peck's Patent Drop Press. See adv., page 76.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

Brass & Copper in sheets, wire & blanks. See ad. p. 76.

Air Compressors. Clayton Stm. Pump W'ks, Bk'lyn, N.Y.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

For Superior Steam Heat. Appar., see adv., page 77.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 77.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 78.

Telephones.—Inventors of Improvements in Telephones and Telephonic Apparatus are requested to communicate with the Scottish Telephonic Exchange, Limited, 34 St. Andrew Square, Edinburgh, Scotland. J. G. Lorrain, General Manager.

Nellis' Cast Tool Steel, Castings from which our specialty is Plow Shares. Also all kinds agricultural steels and ornamental fencings. Nellis, Shriver & Co., Pittsburg, Pa.

Blake "Lion and Eagle" Imp'd Crusher. See p. 77.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburg Steel Casting Company, Pittsburg, Pa.

New Economizer Portable Engine. See illus. adv. p. 77.

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

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

NEW BOOKS AND PUBLICATIONS.

EL UNIVERSO Y LA PARALAXE. Por Francisco Gonzalez, Ingeniero Civil. Chilpancingo. 1879.

The desire of men of science to resolve the great problem of the solar parallax in order to determine, with that exactness required by the present state of science, the true dimensions of our planetary system; the diversity of the values that the history of astronomy has furnished us from the times of Encke and Lalande; and the ardor of the whole scientific world, as evinced by the careful observations that it made on the transit of Venus in 1874, all decided the author of this brochure to devote some months to a resolution of the great problem. This he believes that he has successfully effected—not by the aid of direct observations, however, for he believes that the value of gravity on the surface of the earth, plus the time of the latter's revolution, gives sufficient data for the resolution of the problem. The pamphlet, which is mostly taken up with mathematical calculations, is prefaced with a succinct theory as to the origin of the material universe. The author states that he does not consider universal gravitation as a property inherent to matter, but as an effect of undulation of the elastic and subtle fluid that fills the universe, and which causes every body, every particle of matter, to become a new center of vibration.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) W. R. C. asks how to make a bath to nickel plate about four gallons, and what kind of battery is the best, and about how large for four gallons. Can the bath be made too strong? Can plating be well done in fifteen minutes? A. You will find an article on nickel plating on p. 209, Vol. 38, SCIENTIFIC AMERICAN. Copper can be plated in fifteen minutes under favorable circumstances, but a longer exposure affords much better work

(2) A. L. L. asks for a receipt for making sticky fly paper such as is sold in the drug stores. A. See p. 171 (12), Vol. 39, SCIENTIFIC AMERICAN.

(3) R. C. S. writes: Do you know of any way to keep ants from building mounds in a lawn, or of destroying the ants without killing the grass? A. Try a little oil of turpentine, in very fine spray.

(4) F. G. W. asks how to manufacture carbolic acid. A. Phenol or carbolic acid is commonly obtained from light oil, one of the products of the distillation of coal tar, by rectification in a current of steam which removes cresol, etc. The tailings are agitated with caustic soda, and the alkaline mixture subsequently treated with an acid. This yields about 15 per cent of crude carbolic acid as a separate layer. This is rectified by distillation and dried by heating it to near its boiling point (368° to 370°) in a current of dry air. Otherwise by rectification over anhydrous sulphate of copper. It is still further purified by rectification over litharge. It boils between 368° and 370°.

(5) D. W. R. asks: What is the composition of phosphor bronze, such as is used in mining pumps to resist the action of sulphurous water; and how is this bronze mixed? A. An ordinary copper tin bronze to which has been added in the melting pot ½ to 1 per cent of phosphorus. See p. 409 (30), Vol. 39.

(6) A. B. asks: What is used by the ladies to bleach their hair? A. A strong aqueous solution of sodium sulphite, rendered slightly alkaline with carbonate of soda, constitutes one of the bleaches.

(7) C. O. M. asks: What cheap article can be used for thinning coal tar? A. Benzine or benzole, naphtha, oil of turpentine. 2. What thinning naphtha or light oil is made of? A. It is one of the products of the distillation of petroleum. 3. Where can it be obtained in great quantity? A. Of any dealer in oils.

(8) D. G. B. asks for a simple way of making carbonic acid water or soda water. A. Carbonic acid water is simply water charged with carbonic acid under pressure. The carbonic acid is generated by the action of dilute oil of vitriol (sulphuric acid 1, water 4 to 5) on marble dust in a lead-lined iron vessel capable of sustaining great pressure. This generator is provided with a pressure gauge. The gas at a pressure of 200 lb. or so per square inch is conveyed through a quantity of water in a second vessel to free it from impurities, and then to the bottom of a stout airtight, porcelain-lined, iron cylinder, partly filled with pure water. This is kept in agitation to facilitate the absorption or solution of the gas.

(9) F. H. M. writes: I have a marble mantel in my bedroom which has become discolored from smoke. I have tried several recipes to clean it, but they have all failed; Can you tell me what to use to clean it? A. Moisten powdered quicklime with a strong solution of washing soda in hot water; brush this over the stone and let it dry. Brush off, wash with plenty of water, and polish with a little tripoli.

(10) E. M. asks how to color or dye small pieces of ivory, black. At the same time the pieces must not be dipped into a solution. I desire to put the color on. How can I prepare such a paste? I suppose it must be such. A. Wash well with an aqueous solution of caustic soda, and then with a strong aqueous solution of neutral nitrate of silver. Expose to sunlight (under glass) until black. Repeat if necessary until the proper color is developed.

(11) F. B. asks what the process is for making very thin paper or any other substance insoluble or waterproof by means of ammonia cuprate, and the mode of making the solution. A. Pass ammonia gas into a saturated aqueous solution of cupric sulphate until the precipitate at first formed is completely redissolved. Concentrate over the water bath and pass the paper slowly through this. You will probably succeed better with a strong (sirupy) solution of zinc chloride. 2. Also the mode of making a very thin sheet of gelatine impervious to water. The mode or substance used for casing sausages by the Germans during the French war I think would answer my purpose, as I want something quite thin, impervious to water or nearly so, transparent if possible, and with a good degree of strength and capability of withstanding heat and cold. A. Pass through a strong solution of bichromate of potassa, then expose to sunlight. In preparing the covering for the pea sausages referred to, glue was mixed with a small quantity of bichromate of potash rolled out, formed into shape, exposed to the sunlight, and then thoroughly washed in water.

(12) F. S. P. asks how much calcium sulphate and carbonate a water can contain and be fit for boiler purposes. Also, what is the largest amount of solid matter a water can have dissolved in it and be fit for a boiler? A. Water containing 100 grains per gallon has been used. It should not be used if a purer water can be procured.

(13) D. F. M. asks: 1. How can I dissolve or melt sheet isinglass to mould it without losing its transparency? A. If you refer to mica, it cannot be so moulded or pressed. Glue isinglass (fish gelatine) may be softened by heating it in a vessel over a water bath. A trace of oil will prevent its adhesion to the moulds. 2. Does heat travel through a vacuum? A. Yes.

(14) S. W. W. asks: 1. Can gold be taken from the pounded ore (or rock) by the use of quicksilver? If it can, please tell me how it is done; and how do they get the gold from the quicksilver? I have about a half ton of some very fine rock, but not having much time I would like to know the cheapest and best way to get the gold. I can get plenty more of the rock if it will pay me to work it. A. The finely stamped auriferous ores are mixed with hot water and a few pounds of mercury in large iron pans provided with a stirring apparatus and mullers. The water is kept warm by a steam jacket, and the stirring is kept up until the mercury has absorbed or amalgamated all the gold. The amalgam is then drawn off and thrown upon a chamois skin filter; through this the excess of clean mercury runs, leaving the amalgam on the skin. This is placed in an iron retort and heated, when the mercury distills off (and is collected in water), while the gold remains in the retort. Consult Philip's "Mining and Metallurgy of Gold and Silver," or Percy's "Metallurgy of Gold, Silver and Mercury."

(15) W. P. K. asks for a recipe for coloring bright wire, black or blue, and perfectly smooth, the same as hair pins. A. Asphaltum, 3 oz.; boiled oil, 4 quarts; burnt umber, 8 oz.; mix by heat, and thin with turpentine (oil) before the mixture becomes cool. Dip the wire in this (not too thick) and harden in a japanner's oven at as high a heat as it will bear without blistering.

(16) K. & S. write: We have cast a lot of small plates of lead and antimony to be plated. After plating there remained on the plates a red or rusty appearing spot. What can we do with them so the spot will not show after plating? A. The spots may be due to imperfect alloying in the pot, or, what is more probable to imperfect cleansing preparatory to plating, or careless handling of the clean plates. If proper precaution is taken in these respects the spots will probably give no further trouble.

(17) F. L. B. asks: 1. Can I work a microphone with one telephone receiver? A. Yes. 2. Can I make a microphone out of the graphite in a carpenter's pencil? A. Graphite does not answer the purpose. 3. Would two Daniell's cells, with plates 3x7 inches, work it? A. One cell is sufficient for a microphone. 4. Could I insulate wire for an electro-magnet by varnishing it if I was careful in winding it? A. Yes. 5. Could I make a magnet for a telephone with a sounder magnet? A. No; use permanent magnets. 6. And what is the best way to magnetize it? A. For methods of magnetizing see p. 331 (13), Vol. 42, SCIENTIFIC AMERICAN.

(18) F. S. writes: I have a recipe for making Bengal lights composed of the following ingredients: 8 parts saltpeter, 4 parts sublimed sulphur, and 1 part antimony. The other day I made it up and it only made a common yellow flame. Will you please tell me what to put in it to make a red and blue light? A. Red may be produced by the addition of a small quantity of nitrate of strontium and sugar or charcoal; blue by zinc dust. The following compositions produce fine lights: Red.—1. Chlorate of potash, 32; nitrate of strontia, 48; calomel, 20; shellac, 12; Chertier's copper, 4; fine charcoal, 1. 2. Chlorate of potash, 84; nitrate of strontia, 80; calomel, 51; dextrine, 22; shellac, 18; Chertier's copper, 4. Purple.—1. Chlorate of potash, 28; Chertier's copper, 28; calomel, 13; shellac, 8; stearine, 1. 2. Chlorate of potash, 40; calomel, 28; Chertier's copper, 28; dextrine, 10; stearine, 3. These colored lights should never be burned indoors, as the vapors they give off are poisonous.

(19) A. L. F. asks: 1. How much working pressure will a cylindrical boiler, 12x20 inches, made of No. 26 galvanized iron, safely stand? A. From 20 to 23 lb. per square inch. 2. Dimensions of safety valve and adjustment to blow off at required pressure? A. ¾ inch diameter. You can put 8¾ lb. direct on valve. 3. How large a pump is required for same, and at what speed should it be run? A. About ½ inch diameter by 3 to 4 inch stroke. The speed will depend upon the rapidity of evaporation. You can control the supply to the pump by a valve.

(20) A. W. R. writes: What are the conditions necessary to success in the "blue photo process" of copying tracings? A. Use pure linen paper, free from chlorides (bleach). Keep it for some time, before sensitizing and after, until required for use, in darkness; use as soon after preparing as possible, and wash thoroughly after printing in running water. See p. 410 (14), Vol. 40.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

July 6, 1880,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, 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. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Acid, pulverulent preparation of phosphoric, E. N. Horsford 229,705
Addressing machine, R. Dick (r) 9,282
Aging liquors, process and apparatus for, J. L. Martin 229,542
Air cooling process and apparatus, Portner & Eils 229,750
Baking powder, acid phosphate for, C. A. Catlin. 229,518
Baking powder, preparation of potassium phosphate for, Wilson & Catlin 229,573
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Barrel hoop, E. Hale 229,699
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Bed, invalid, W. W. Snell 229,559
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Bird cage, F. T. Pinter 229,634
Blotter, rule, and paper cutter, comb'd, C. Sneider 229,763
Book binding, F. S. Hasbrouck (r) 9,275
Book mark, H. R. McCalmont 229,626
Book rack, J. Murphy 229,740
Boot and shoe edge setting machine, C. K. Bradford 229,517
Roots and shoes, making inner soles for, J. F. Ross 229,556
Bottle stopper, J. Erdmann 229,595
Bottles, etc., wrapper or envelope for, R. H. Thompson 229,775
Bougie, E. Pfarre 229,633
Brick, J. S. Smith 229,766
Brick linings, laying, Mann & Singer 229,724
Bridle, R. Arnold 229,792
Brush holder, blacking, H. B. Perham 229,748
Bucket, slop, G. W Knapp 229,714
Button attachment, F. J. Rosenberg 229,557
Calendar, A. R. Baker 229,578
Calendering paper, method and apparatus for, M. Newton 229,551
Can, L. Porter 229,749
Can top, R. Gillespie 229,531
Candy, manufacture of, C. G. Brommer 229,667
Car brake, G. D. Paul 229,747
Car, construction, G. F. Harris 229,702
Car coupling, C. J. Bell 229,660
Car coupling, Deamude & Cannon 229,679
Car coupling, C. H. Shippee 229,763
Car coupling, railway, A. Middleton 229,731
Car door, grain, Latta & Neall 229,716
Car doors, operating, W. W. Riley 229,755
Car, railway freight, E. B. Ward 229,778

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Car, stock, F. W. Becker 229,659
Cars, etc., ventilating railway, J. S. Lloyd 229,720
Carpet lining fabric, D. Hunt, Jr 229,535
Carriage and cradle, combined baby, A. J. Marsh 229,623
Cartridge loader, C. W. Corr 229,523
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Chair seating machine, J. C. Miller 229,734
Churn, J. Foreman 229,597
Churn, G. W. Freeman 229,599
Churn, A. Mearns 229,729
Churn dasher, H. W. White 229,784
Clamp, T. J. Carrick 229,670
Clasp knife, E. Jansen 229,706
Clock case, J. Scheina 229,643
Cloth shearing machine, D. C. Sumner 229,648
Clutch, J. D. Westgate 229,652
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Dental plugger, E. T. Starr 229,769
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Electric signal apparatus, H. G. Fiske 229,529
Electric switch board, J. S. Ross 229,757
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Elevators, electrical safety device for, W. E. Sawyer 229,658
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Fanning mill, G. Brooks 229,668
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Grain binder, J. H. Mudgett (r) 9,280
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Graphite from foreign substances, separating, H. Burgess 229,669
Grinding and reducing mill, B. F. Crabbs 229,589
Grinding mill mixing and feeding apparatus, J. P. Lowell 229,722
Halter trimming, E. G. Latta 229,717
Hand and foot motor, D. W. Mott 229,739
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Harrow tooth, F. G. Winnek 229,788
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Hay rake, horse, Galloway & Larsen 229,530
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Iron or other metals with tin, etc., machine for coating sheet, J. F. Duffy 229,527
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Lock washer for nuts, L. Garrigus 229,601
Loom, chair seat, J. C. Miller 229,732
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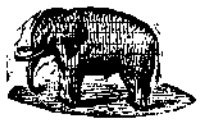

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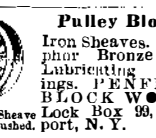

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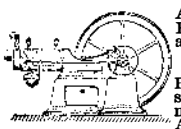

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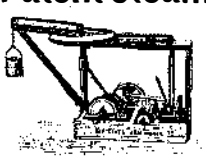

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