

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line for each insertion. If the Notice exceeds Four Lines, One Dollar and a Half per Line will be charged.

Agricultural Implements and Industrial Machinery for Export and Domestic Use. R. H. Allen & Co., N. Y.

Wanted—A second hand Ferris & Miles Hammer, about 1,000 lbs. ram. John R. Cameron, Halifax, N. S.

Celebrated John Scott Scroll and Jig Saws made to order, of Jessup's superior cast steel, by J. Roberts, 108 Hester Street, New York. Send for circular.

Split-Pulleys and Split-Collars of same price, strength, and appearance as Whole-Pulleys and Whole-Collars. Yocom & son, Drinker St., below 147 North Second St., Philadelphia, Pa.

Gear Cutter—Baldwin's—for Sale. Chas. for Cash. Address W. E. Lewis, Cleveland, Ohio.

Foot Lathe, \$14; Scroll Saw attachment, \$3. Samuel Harris, Lind Block, Chicago, Ills.

For Sale—No. 3 Fowler Punch, with large assortment dies and punches. Cost \$300. Price \$225. Heavy iron bars, capable of cutting 3 in. square iron. Cost \$300. Price \$100. Forwath & Co., Manchester, N. H.

Now Ready—New and enlarged edition of the Catechism of the Steam Engine. Free by mail for \$2. Send stamp for descriptive Circular. F. Keppy, Bridgeport, Ct.

To Inventors—Owners of Practical Patents can and buyers through us. Penn. Pat. Agency, Philadelphia.

Centennial Pumps for Hand Power—All sizes, for exhausting or compressing air. H. Weindel, 460 Dillwyn St., Philadelphia, Pa.

Scientific American—The early Volumes for Sale—very cheap—either bound or in numbers. Address A. F. R., Box 773, New York City.

Hydrant Hose, Pipes, and Couplings. Send for prices to Bailey, Farrell & Co., Pittsburgh, Pa.

Snyder's Little Giant One Horse Power Steam Engine, complete with Tubular Boiler, only \$450. Ward B. Snyder, Manufacturer, 84 Fulton St., New York.

For 2d Hand Portable and Stationary Boilers and Engines, address Junius Harris, Titusville, Pa.

Centennial Exhibition, Philadelphia.—Examine the Allen Governors, Machinery Hall, D. 8, Par. 71.

Machine-cut brass gear wheels, for models, &c. List free. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.

"Dead Stroke" Power Hammers—recently greatly improved, increasing cost over 10 per cent. Prices reduced over 20 per cent. Hull & Belden Co., Danbury, Ct.

Power & Foot Presses & All Fruit-can Tools. Ferracute Wks., Bridgeton, N. J. & C. 37, Mch. Hall, Cent. l.

The French Files of Limet & Co. have the endorsement of many of the leading machine makers of America. Notice samples in Machinery Hall, French Department, Centennial Exposition. Homer Foot & Co., Sole Agents, 22 Platt St., New York.

Shingles and Heading Sawing Machine. See advertisement of Trevor & Co., Lockport, 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 Packing Company, 37 and 38 Park Row, New York.

See Boulton's Paneling, Moulding, and Dovetailing Machine at Centennial, B. 8-55. Send for pamphlet and sample of work. B. C. Machy Co., Battle Creek, Mich.

Deafness Relieved—No Medicine. Book free. G. J. Wood, Madison, Ind.

Steel Castings, from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay, Brooklyn, N. Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, &c.

Hotchkiss & Ball, Meriden, Conn., Foundrymen and workers of sheet metal. Fine Gray Iron Castings to order. Job work solicited.

For Solid Emery Wheels and Machinery, send to the Union Stone Co., Boston, Mass., for circular.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Bunting Metals. E. Lyon, 470 Grand Street, New York.

Spinning Rings of a Superior Quality.—Whitinsville Spinning Ring Co., Whitinsville, Mass.

Diamond Tools—J. Dickinson, 64 Naseau St., N. Y. Temples and Oilcans. Draper, Hopedale, Mass.



C. C. P. will find on p. 203, vol. 34, recipes for colored fires.—H. J. C. should line his vinegar casks with the material described on p. 11, vol. 24.—G. W. S. and other pisciculturists should address Seth Green, Esq., Rochester, N. Y.—S. H. D. will find a recipe for removing warts on p. 97, vol. 32.—R. G. B. will find directions for bronzing iron castings on p. 283, vol. 31.—C. W., Jr., can proportion the change wheels of his compound gears by the rule given on p. 107, vol. 34.—W. B. can paste paper labels on tin if he mixes a tablespoonful of coarse sugar with a quart of flour paste.—F. F., G. M. C. & B., J. M., C. C., J. H. G., and many others who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) F. M. J. says: I want to convey water 1,000 feet from a hydrant before it can be used. Which is the most practicable way, to lay 1,000 feet of pipe and connect an engine to the end, or connect the engine close to the hydrant, and the hose to the end of the pipe and play through the pipe and hose? A. The first method would be best, if you wish to throw a stream.

(2) A. S. asks: How are photographs put upon glass and made transparent, so as to be colored on the back with oil colors? A. The face of the picture is covered liberally with starch paste and laid upon clean glass. Then, with a smooth, hard edge, the paper is rubbed upon the back from the center to the edge until all of the starch is pressed out from between the picture and glass that can be. After it is dry, castor oil is applied to make it transparent.

(3) E. V. J. asks: What is the difference between sweet oil and olive oil? A. They are different names for the same thing.

(4) A. F. I. asks: How high can water be raised with an ordinary well pump by using check valves, say 10 or 12 feet apart? A. If, as we understand you, you mean to force the water up, the height is only limited by the power applied, and the strength of the apparatus.

(5) W. L. P. asks: 1. In what proportion should the best Portland cement be mixed with clean sharp sand, for coating the outside of a stone or brick building? A. One measure of cement powder to three measures of dry sand. 2. How many square feet will a barrel of cement mixed with sand cover? A. One barrel of cement and three of sand will make 3½ barrels of mortar, which will cover about 4,000 square feet of brick wall, or about 40 squares, to a thickness of ¾ of an inch. 3. Should it be put on in one or two coats? A. Use one primary coat and a finishing coat put on immediately after it, before the first coat has set. The permanence of stucco on the exterior walls of a building depends generally more upon the stability of the surface that receives it than upon the stucco itself. The latter can absorb water and give it off without injury; but if the water finds its way through the stucco into the brick, it is apt to freeze in winter and fracture the face of the wall. Harden and fill the pores of the brick, spread a thin wash of cement over the wall and scrape it off first, before putting on the principal coat. 4. Could an ordinary house plasterer put it on satisfactorily? A. Yes, if an intelligent man.

(6) F. M. B. asks: Will a pump do work as easily with a 12 inch column as with a 5 inch, the size of water valve being the same in both cases? The lift is 150 feet. A. Other things being similar, the pump should force water more easily through the 12 inch pipe.

(7) J. V. N. asks: The following is a 2 x 4 inches engine, large enough to drive a boat 20 feet long and 40 inches beam, with a propeller? A. A somewhat larger cylinder would be advisable.

(8) R. B. H. says: I have a small iron cylinder, that will hold, compressed, 100 gallons nitrous oxide gas. I have also a regular dental gasometer that will hold a similar quantity. How can I compress this nitrous oxide gas into the iron cylinder, taking it from the gasometer? A. You will need a compressing pump. Considerable apparatus is required for producing such a high degree of compression.

(9) J. R. McC. says: 1. I saw in the SCIENTIFIC AMERICAN a recipe to make a wash of cement and oil to put on a brick wall, to keep out the moisture. Would water do as well as oil to mix with the cement, or would the brick being previously painted be a detriment to the cement adhering to the brick wall? A. A wash of cement and oil is simply a paint, and you can apply it like any other paint, with a brush; if your wall has been already painted, you should use oil and not water. 2. After the cement is applied, can I paint over the wall with any ordinary paint? A. Yes.

(10) J. T. C. asks: A. and B. have an argument about names of floors in a building two or more stories high. A. says the floor on a level with the street is the ground floor, and not the first floor, but the floor up one flight of stairs from this ground floor is the first floor, and up two flights the second. B. contends that the floor level with street is the first floor, and may also be called the ground floor, but the floor up one flight is the second floor, and so on. Which is right? A. B. is right, according to the practice followed in this country; but A. would be right in Europe. The ground floor in London and the *rez de chaussée* in Paris correspond to our first floor; and the first story in London and *premier étage* in Paris are equivalent to our second floor. In London they sometimes say "up one pair," that is, one pair of stairs, and in Paris *au premier*, which means the same thing.

(11) J. J. asks: A. says that glue can be dissolved in alcohol without applying heat, providing the spirit be of the proper strength? B. says it cannot be done with alcohol alone. A. B. is right.

(12) G. H. W. asks: Is carbonic acid beneficial to the stomach? A. In many cases it is.

(13) C. E. R. says: I have seen articles made from some composition pressed in molds, to represent carved wood, and intended for ornamentation on furniture. Can you tell me how they are made? A. The composition you mention is probably that made from sawdust and glue.

You state that paper pulp can be hardened by treatment with chloride of zinc. Can you give me fuller directions? A. We believe the anhydrous chloride of zinc is employed, together with the alumina salt, in the sizing.

(14) J. H. S. asks: How much zinc, used as a preventive of scale, is required for a 30 horse power boiler? A. A piece weighing 2 or 3 lbs. will be sufficient to experiment with.

(15) C. W. N. asks: Why is it that gunners are afraid to depress their guns below a certain angle in firing from a height? A. For fear that the gun may become unmanageable, and more disastrous to friend than to foe.

(16) A. A. H. asks: How is the material used by dentists for filling teeth prepared? A. Gold leaf is principally employed for this purpose, also other foils. An amalgam of copper and mercury has also been used with good results. You should have stated more explicitly what particular variety of cement you had reference to. Plaster of Paris is not used for this purpose.

(17) T. P. H. asks: Can marsh grass be utilized in the manufacture of paper? A. The material, we believe, has been used for this purpose before. If it can be economically harvested, dried, and freighted, and occurs in sufficiently large quantities, it might prove of some value.

(18) C. W. J. asks: The statement that, in the case of mill rocks, the upper stone may be more easily raised when in motion than at rest (the upper stone being the runner) by the regulating screw, is not credited. Can you explain? A. A simple test could be made by attaching a spring balance to the wheel or lever by which the stone is raised.

Of what material must a barometer be made in order to be entirely reliable? A. Mercury barometers are regarded as the most accurate.

The circumference and area being given, how do you find the diameter of a ring? A. Divide 4 times the area by the circumference.

(19) W. M. says: I have a gummy fluid which contains by the test considerable iron in solution. The density is about 15° Baumé. Can I get rid of the iron so as to avoid the color it gives? A. Iron in solution may be precipitated by heating it with nitric acid, and then adding ammonia.

(20) L. H. E. asks: How can I make a dressing that will keep a leather buggy top soft and pliable? A. A good mixture for making and keeping leather flexible consists of 1 pint boiled linseed oil, 2 ozs. beeswax, 1 oz. Burgundy pitch, and 2 ozs. turpentine, melted together over a slow fire.

(21) H. C. S. asks: How can I make gold size? A. For use on oil colors, take boiled oil and thicken with calcined red ochre, and reduce to the utmost smoothness by grinding. Thin with oil of turpentine. On water color or distemper work, use isinglass size, mixed with finely ground yellow ochre.

(22) H. B. asks: If a bottle be partly filled with water and an air pump applied to the top (the pump not reaching the water), can the water be pumped out, leaving a perfect vacuum in the bottle? It is understood that the bottle shall be closed airtight. A. No.

(23) C. S. says: When I drop a large stone into a stream of water, it will sink to the bottom; but if I break that stone into small particles and drop it into the current, it will move down the stream. My friend says it is because the particles are lighter. I say it is because the particles have a larger surface in proportion to their weight, to be acted upon by the water. Which is right? A. You are.

(24) U. H. asks: 1. Would an engine with two oscillating cylinders, ½ inch in diameter and of 1¼ inch stroke, be powerful enough to run a scroll sawing machine to saw pine 1 inch thick? A. The engines will answer. 2. Of what size should the boiler be, to run with spirit lamp, and at what pressure should I run it? A. You might use a boiler 10 or 12 inches in diameter, and 18 or 20 inches high. You will find alcohol a very expensive form of fuel, even if you succeed in using it at all.

(25) C. J. L. asks: Is it possible for a gas meter to register more gas than really goes through it? A. It would be very easy to make a meter that would do this.

(26) F. C. R. Jr. asks: 1. If a ball is thrown into the air vertically, will it, on coming down, strike the hand with the same force that it left it with? A. No. 2. Why not? A. On account of the resistance of the air.

(27) S. G. asks: How many feet of water per second is required when passing over an overshot water wheel 24 feet in diameter, utilizing 70 per cent of its effective force, to produce 100 horse power? A. Find how many horse power would be developed, if there were no losses, multiply this by 550, and divide the product by the product of the velocity of the water in feet per second multiplied by the weight of a cubic foot in lbs.

(28) F. O. R. says: I have steel springs from No. 18 to No. 0 in thickness in a vessel containing steam, sometimes up to 100 lbs. pressure. For what length of time do you think the springs will maintain their elasticity? Do you think that the heat of the steam will injure the temper? Will it corrode them? A. If the springs are kept bright, they will prove quite durable. To prevent their corrosion, they might be plated with nickel or silver.

(29) J. W. N. asks: Which wheel, of a pair of ordinary carriage wheels, would lift from the ground in rounding a curve, with nothing on the axle, the wheels being drawn rapidly? A. We are not sure that either would, if the ground were level.

(30) J. J. asks: 1. What power is gained on every additional inch on the face of an 15 inches diameter pulley, say from 6 inches to 7, 8, etc.? A. As we understand your question, if you double the face, you can expect to transmit about double the power. 2. What is the best thing to put on a rubber belt to keep it from slipping? A. If it is tightly stretched, it would be advisable to use a wider belt. 3. Is a six ply belt as liable to slip as a four ply? A. Yes, other things being the same.

(31) D. P. A. asks: What weight will a 2 inch jack screw raise and sustain? The screw has 2 threads to the inch, single thread, and length of nut is 4 inches. A. If you do not take friction into account, the weight raised will be to the pressure applied, as the distance passed over in a given time by the point of application of the pressure is to the distance passed over in the same time by the point of application of the weight. Practically, this result will be considerably modified by friction: how much can best be ascertained by experiment.

(32) O. R. M. asks: What power would be required to run a fan with 30 blades, each 5 feet long x 1 foot wide, set at an angle of 30°, at a speed of 500 per minute? A. So much depends on form and construction of fan blowers that it is safer to answer such questions by experiment.

Have you ever published any articles on flying machines? A. We think that everything of importance in reference to the subject has at least been noticed in our columns, and on p. 112, vol. 32, you will find a pretty thorough review of the question.

(33) H. M. W. says: I see it stated that anticipating a crowd at a new church, they tested the strength thereof (by piling pig iron on it) to 50 lbs. to the square inch. To what height would they have to pile to accomplish it? A. About 18 feet. We think, however, that you did not read the statement rightly. At all events, we are confident that no such test was applied in the case mentioned.

(34) C. T. V. asks: I have a ram for forcing water to my barn, and it will not run. It has always performed its duty well until this spring. The pipe into flume is tight, and no part broken. The valves are in good order; the shut-off comes up and will not go back. Can you tell what will start it? A. You should endeavor to find out why the waste valve will not shut. It must be obvious that a thorough examination would be more valuable than our opinion.

(35) J. W. C. asks: In No. 13 of the SCIENTIFIC AMERICAN SUPPLEMENT, first page, you give an illustration of the steam yacht Black Hawk, and say that salt water is now substituted to avoid carrying the weight of the fresh water. How is this done, and foaming prevented? A. In changing from fresh to salt water, and vice versa, foaming is apt to take place; and until the water in the boiler is changed, it is well to throttle the steam and check combustion somewhat.

(36) A. H. S. asks: What size of boiler will I need for a 1½ x 3 inches engine? What should be the thickness of iron? With such a boiler, what horse power could I develop, running at a high speed? A. Your questions are rather indefinite, as the size of boiler and thickness of iron will depend upon the number of revolutions, the pressure of steam, and the design and construction of the engine. We have published some general rules on pp. 33, 25, vol. 33.

(37) J. F. S. says: I wish to make a small propeller to draw a small boat to carry 10 persons, on flat water about 1½ feet deep. How can I build it best? A. Build it on the model of a good rowboat that has the required capacity and draft.

(38) F. M. says: I want to make a cast iron gun of 3½ inches bore and 4 feet long. How much metal must I have around the bore at the breech? A. Make the thickness at breech about 4 inches. Make the diameter of vent ½ inch, and bore it so as to enter breech about 1 inch from the bottom. But you will be safer if you buy a gun ready made.

(39) C. W. M. says: In your reply to E. L., you say that if, from a point without the ellipse, lines be drawn to the foci, the line bisecting the angle thus formed will be normal to the curve. So it will if the point is on the line of the major or of the minor axis, but not otherwise. In what treatise on the conic sections can be found the method of constructing the normal from a point not on the curve, in the case of either the ellipse, the parabola, or the hyperbola? A. We are obliged to our correspondent for calling attention to this matter. By an oversight, we gave the directions for drawing a normal on the assumption that the given point was on the curve. We have never seen a graphical solution of the problem for a point outside the curve. Nearly all treatises on conic sections, however, give methods by which the equation of the required normal can be obtained, and perhaps some of our mathematical readers will be interested in working out a simple graphical solution.

(40) J. H. H. asks: 1. What is the greatest depth from which a siphon can draw water, from an inclined shaft or a straight shaft, or is there any difference? A. In an inclined shaft, the pipe being longer, there would be more friction in the pipe, and the discharge would not be so great. You will reach the practical limit at a height of 28 or 30 feet. 2. How much longer should the external end be than the internal end? A. A slight difference of level between the two ends will insure working, provided the discharge is the lower, but of course, in practice, it is well to have a considerable difference, if possible.

(41) J. W. B. says: In regard to thickness of iron for a boiler of 14 inches diameter, 30 inches long, you say that iron will stand 85 lbs. to the square inch safely. I have a cylinder of 18 gage, 16 inches in diameter and 30 inches long, that I have had tested to 270 lbs. pressure. A. In our answers to correspondents in relation to the pressure a boiler will stand, we generally give working pressure, with a large factor of safety. In practice, it is usual to find boilers carrying much higher pressures than would be allowed by our proportions; but we think it best to give values which are sanctioned by the highest engineering authorities in this country and Europe.

(42) C. W. J. says: It is contended by some that to clear the foliage from muck beds, so that the sunlight and heat may have free access thereto, the fertilizing properties of the muck are lost by evaporation and absorption of nitrates from the muck. But to allow the shade to remain over the muck, and to haul therefrom as required, is better, and, in fact, the only salvation of the muck bed as a fertilizer; and it is contended that the evaporation and absorption goes on after the muck is deposited on the required lands, and that the plants designed to be improved thereby have to grab, so to speak, for their share, entering into direct conflict or contest with the sun. It is also contended that rain is a deposit of nitrates, previously taken up as vapor, and, therefore, after a shower, the nitrates are then taken up as rapidly as the plant can do it; and upon the reappearance of sunshine and heat, they are reabsorbed.

Are these things so? A. If the muck beds be well covered, there is practically little danger of loss, liable to arise from exposure to direct sunlight.

(43) W. E. E. says: I have a lot of black rubber chains, and they have all turned to a grayish color. How can I get the color back? A. We could not suggest a remedy without examining the material or learning more precisely under what conditions the change had occurred.

(44) E. P. B. asks: Is oil made from fresh butter good for oiling farm machinery? Can the salt be taken out of salt butter so as to make an oil fit for oiling harness? A. No. Such oil is not suitable for either purpose.

(45) W. J. R. says: By what means can I take iron rust out of marble? A. It is impossible to do this, without injury to the marble, by purely chemical means.

(46) C. T. G. says: Please give me a recipe for cleaning baryta crystals and stalactites. A. If the crystals are really sulphate of baryta, try steeping them for some hours in hot muriatic acid, containing a very little nitric acid.

(47) C. H. W. says: In soldering tinware without a soldering iron, with a candle or lamp, the place to be repaired is first covered with an acid. Can you tell me how that acid is prepared? A. Digest zinc in strong muriatic acid until the acid will dissolve no more of the metal.

(48) H. M. asks: 1. How many strokes should a fret saw give, to one turn of the crank, to give the best results? A. About 25 or 30. 2. Would a friction wheel covered with india rubber of about 2 inches diameter, to be driven by a larger wheel, have power enough to drive the above saw? The 2 inch wheel is to be connected to the under part of the saw, by a crank pin run in a slot in the lower arm of the saw.

(49) E. A. F. says, in reply to J. W. O., who asks whether a horse can draw a vehicle more easily if hitched close to it: Several friends say that the closer a horse is to his load, the easier it is to pull, and vice versa. You say that you cannot see why the draft increases with the distance except by the additional weight of chain or rope and friction on the ground, if the rope touches the ground.

(50) D. M. says: As many of your readers seem to take an interest in the baroscope of Babinet, of which I sent you a description which has been published in Wrinkles and Recipes, allow me to suggest a change which experience has taught me.

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

S—The powder consists of oxide of zinc together with finely ground resin. It would be necessary to make a quantitative analysis in order to determine the proportions of each ingredient.

COMMUNICATIONS RECEIVED.

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

- On the Calcification of Tubercles. By C. B.
On the Water Grate. By F. G. W.
On a Small Engine. By T. B. R.
On the Vicksburg Cut-Off. By C. G. D.
On Voracious Fishes. By L. S.
On an Indelible Ink. By A. J. F.

Also inquiries and answers from the following: S. & S.—J. R.—J. G. S.—I. W. H.—E. L. R.—C. S.—G. S.—J. D. T.—P. K.—R. E. M.—W. H. E.—C. M.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells electric bells? Who is the best parlor organ? Who makes diving apparatus? Who is the best engine-turning lathe?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column.

[OFFICIAL]

INDEX OF INVENTIONS

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

June 20, 1876,

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.

Table listing inventions with patent numbers and names of inventors. Includes items like Alarm, burglar, H. F. Green; Alarm, burglar, A. P. Norman; Alarm, bu glar, W. H. Reiff; Atomizer, D. J. Tapley; Bag holder, L. H. Bristol; Bands and ropes, making, L. Binns; Barrel-making machine, Hodgen & Yelton; Basins, valve for, Doyle & Bayles; Bed bottom, spring, G. H. Evans; Bed book support, etc., G. B. Norgrove; Bedstead, cabinet, D. A. Green; Bee hive, H. H. Koush; Blackboard rubber, J. Haggerty; Boller, agricultural, W. K. Stevens; Boller, rotary steam, C. W. Pierce (r); Boller, furnace, G. Morrison; Bolt-heading die, F. Muttler; Boot stiffeners, making, J. R. Motitt; Boot sole edges, setting, C. A. Lake; Boot sole protector, S. Y. McNair; Boot, rubber, J. A. Bates; Boots, abrasive paper for finishing, J. G. Buzzell; Bracket, ornamental wall, E. A. Hale; Brick, hollow partition, J. Borie; Bridle bit, J. Letchworth; Brush, sponge, H. S. Kerr (r); Bucket ear, J. G. Krichbaum (r); Buggy top, G. Gabriel, Sr.; Buoy, automatic signal, J. M. Courtenay; Burner, gas, V. Zels; Burner, lamp, H. A. Chapin; Butcher worker, E. M. Pike; Can and box, sheet metal, H. C. Leland; Can jacket, J. G. Low; Can, sheet metal, G. H. Chinnock; Cans, sheet metal, E. A. Leland; Car coupling, Bases & Borgersrode; Car starter, F. A. Hull; Cars, tube for propulsion of, A. S. Hallidie; Carburizer, J. T. Stewart; Card playing, I. Levy; Carpet rag looper, C. F. Gronquist; Carpet stretcher, S. Thompson; Carriage pole, adjustable, F. W. Bishop; Ca lags top setter, W. H. Nogle; Caster, furniture, S. Konz; Chair back, W. W. Marshall; Chandeller, drop, H. Prescott; Coat patterns, laying out, J. H. Nichols; Coffee holder, S. C. Johnson; Colds, etc., remedy for, A. M. DeWitt; Cooler, air, W. E. Richardson; Cork extractor, J. L. Hyde; Crib, child's, H. Ocorr; Crimping machine, L. P. Lum; Cultivator, J. M. Crabtree; Cui lator, J. G. Dards; Cup holder, J. Scherer; Curry comb, G. Nolin; Curtain fixture, A. H. Knapp (r); Cutter head, P. G. Finn; Cattle fish holder, A. H. Alverson; Cattle fish holder, C. H. Rentz; Detonating compound, J. D. & W. C. Schooley; Door check, J. H. Swift; Door securer, G. M. Lindsey; Dredging apparatus, F. C. Prindle; Dredging machine, J. Howe, Jr.; Drilling machine, rock, Clarke & Utter; Dyeing woven fabrics, G. C. Gibbs; Engine, explosive, C. Hardy; Engine, reversible valve, F. Murgatroyd; Eraser and pencil protector, C. B. Sheldon; Excavator, J. P. Bonnell; Faucet, beer, T. C. Perkins; Fence, O. D. Beebe; Fence barb tool, wire, H. W. Prindle; Fever and ague remedy, A. M. De Witt; Filter, liquid, R. Stewart; Firearms, stock for, G. Smith; Fire escape, H. L. Holmes; Fireproof construction, L. Hornblower; Flower stand, bracket, W. H. Shirley; Fruit, etc., preserving, C. A. Dards; Fruit, etc., drying, W. Brown; Funnel tongs, G. B. Clarke; Furnace-feeding mechanism, T. Henderson; Furnace for steam boilers, G. Morrison; Furnace, heating, J. Reynolds; Furnace, metallurgical, Silvester & Kirk; Furnace, soldering iron, E. G. Adams; Furnace damper regulator, A. C. Norcross; Furnaces, heating air for, C. Thonger; Gas, making, A. Duchesne; Gas, making hydrogen, J. M. Hirsh; Gas tar, separating ammonia, J. J. Thomas; Gasaliers, smoke bell for, J. Fox; Generator, steam, J. A. Miller; Glass panel, J. Budd; Grain binder, J. E. Buxton; Grain binder, Randall & Rayment; Grain sheaves, tie for, R. Richeson; Grinding machine, C. Majer; Harrow tooth, H. B. Fargo (r); Harvester rake, J. Garrard; Heater and filter, feed water, G. F. Jasper; Hog cholera, remedy for, C. B. Lake; Horse protector, W. S. Marsh; Horseshoe, E. Murraine; Horseshoe, Rattray & Robertson; Horseshoe pad, D. W. Horne; Hose coupling, C. L. Martin; Hydraulic drawback, C. Sellers; Indicator, station, J. R. Balsley; Indicator, Goddard et al.; Indicator, station, C. M. Sexton; Iron, holding bars of, W. Sellers; Iron, etc., welding and shaping, G. H. Sellers; Ironing apparatus, Ashton & Metz; Jack, lifting, H. H. Sherwood; Journal bearings, etc., metal for, S. Doubleday; Kiln, charcoal, B. Kane; Kiln for burning brick, gas, Seger et al.; Labeling mineral specimens, C. W. Cannon; Lamp, C. Godfrey; Lamp lighter, F. W. Rentsch; Lamp-lighting device, R. S. King; Lamp work, G. K. Osborn; Latch, door, S. Oppenheimer; Latch for doors, thumb, H. C. Hill; Latch, reversible knob, W. M. Griscom; Latch, thumb, C. S. Jennings; Leather straps, etc., cutting, C. Gahr; Ledger, mechanical, O. Sallbach; Leech, surgical, F. Klee; Lock, combination, T. M. Seaton; Lock, time and combination, F. McDuffee; Lock, seal, Slack & Fisher; Lock, time, T. W. Spencer; Mail pouch tag holder, Metz et al.; Marquetry, making, W. E. Brock; Mats, etc., protector, G. H. Bliss; Mechanical movement, C. Sandermann; Mechanical movement, R. Swarbrick; Motion, multiplying, Corlett et al.; Nail-plate feeder, J. Newell; Nut lock, A. E. Brown; Oil cloths, printing, Randall et al.; Ovals, cutting, H. McDadame; Oven, domestic, S. P. Whitcomb; Paddle wheel, feathering, J. H. Clow; Paint composition, C. Dubois; Pan, cake, A. Lang; Paper-cutting machine, J. P. Dunwald; Paper binder, temporary, E. W. Stiles; Paper, puncturing, A. N. Lewis; Paving block, S. J. Whiting; Pen, fountain, R. Douglass; Pen holder, C. C. Hart; Pen, writing, H. D. J. Pratt; Piano action, upright, F. Koth; Pipe cutter, Jacob & Jamer; Pipe, waste and overflow, G. E. Waring, Jr.; Plow, F. R. Bell; Plow, S. W. Pope; Plow, J. Shickel; Plow and cultivator, sulky, E. W. & J. N. Russell; Plow, shovel, M. Schlessman; Plow, sulky, J. W. Grimes; Plow, tile-laying mole, S. H. Reynolds; Plows, land skimmer for, G. & J. Thomson; Pneumatic switch lock, etc., W. E. Prall; Press, hay and cotton, F. M. Nash; Printer's galley, H. E. Hanna; Printing oil cloths, Randall et al.; Projectile, J. M. Pollard; Propellers, etc., raising screw, E. Ralph; Pump, air, R. H. Holbrook; Pump, double-acting, J. D. Carr; Pump, oil and liquor, W. L. Carlson; Puzzle, picture, Hyatt & Pruyn; Radiator, steam, J. T. Kelly; Railway, endless traction, A. S. Hallidie; Railway electric signaling, Rousseau & Smith; Rake, horse hay, W. S. Archer (r); Rake, horse hay, E. E. Leach; Rattan veneer, S. H. Penley; Reflector, C. Cothren; Revolver cartridge ejector, R. White; Revolver cartridge extractor, O. Jones; Rolling axles, machine for, G. K. Dearborn; Sad iron, F. Perrier; Sash fastener, S. Brown; Sash fastener, W. H. Taylor; Saw file and set, combined, E. M. Boynton; Saw filing machine, W. S. Newton; Saw fane, E. C. Atkins; Scraper, earth, E. Atkinson; Scraper, road, W. Patterson; Separator, grain, L. C. Royer; Sewing machine hemmer, E. T. Thomas; Sewing machine offer, A. M. Leslie; Sewing machine treadle, W. H. Stewart (r); Sewing machine feed, T. S. Huntington; Shade cord retainer, R. W. Fitzell; Shingle machine, P. T. Burgher; Shingle sawing machine, F. A. Huntington; Shoes, making, C. H. Krippendorf; Shrimps, etc., preserving, G. W. Dunbar et al.; Sign, illuminated, F. McLewee; Sleigh draft bar, J. P. Thompson; Soap holder, J. L. Stackhouse; Soldering iron, W. H. & W. J. Clark; Soldering iron furnace, E. G. Adams; Speed regulator, N. U. Metz; Spice box, G. W. Putnam; Spinning stop motion, O'Donnell & Walker; Spinning wheel, J. W. Mullins; Spool cabinet, S. Schmittner; Stair rod, G. W. Hill; Stalk-cutting machine, E. E. Leach; Staves and laths, sawing, G. W. Herring; Stereotyping machine, S. V. Essick; Stock gallows, W. G. Hyder; Stone and glass, polishing, Purdy & Blue; Stool, camp, W. A. Graham; Stool, camp, L. Sauter; Stove, heating, A. T. Lanphere; Stove or furnace, D. N. Allen; Stove platform, J. W. Elliot; Stud or button, W. R. Dupleme; Sugar safe, L. C. Parker.

Table listing inventions with patent numbers and names of inventors. Includes items like Tag, C. H. Clark; Tanks, constructing wooden, E. M. Morgan; Tannin juices, treating, J. Foley; Tea and coffee pot, E. B. Manning; Telegraph, dial, E. Van Hoebenbergh; Thill and pole attachment, E. E. Leach; Top, spinning, C. E. Vetter; Torpedo, oil well, E. E. Swett; Track clearer, M. Pluck; Traction wheel, W. H. Laubach; Truck and bag holder, combined, L. Tandy; Turning handles, Seely & Chilcote; Twine holder, Gardner & Hill; Typecasting machine, J. M. Conner; Valve, balanced slide, J. J. De Lancey; Vehicle spring, J. Kauffman; Vehicle wheel, L. Dorman (r); Vehicles, propelling, H. W. F. Carstens; Vessels, swinging berth for, H. C. Smith; Wagon brake, M. Schlessman; Wash board, G. R. Wright; Washing machine, E. J. Robinson; Washing machine, H. L. Vestal; Washing machine, G. S. Walker; Watch cases, calendar for, C. K. Pevey; Watch escapement, J. R. Hopkins; Watches, safety pinion for, M. C. Smith; Water wheel, turbine, I. Sherek; Welland cistern top, J. M. Bull; Well torpedo, oil, E. E. Swett; Windlass, R. D. Thayer; Wire-appling tool, R. L. Taylor; Wrench, W. Britton; Wrench, pipe, T. Booth; Wringer, G. S. Walker; Zinc from its ores, extracting, F. L. Clerc.

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DESIGNS PATENTED.

- 9,345.—MEDAL.—W. Conn, Philadelphia, Pa.
9,346.—STOVE.—J. A. Lawson, Troy, N. Y.
9,347.—STOVES.—A. Richmond, Brooklyn, Conn

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