

Business and Personal.

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

J. H. Longstreet, Manufacturer of Electrical Apparatus. No. 9 Barclay St., New York. Telegraph Instruments, Hotel Annunciators, Burglar Alarms, etc. Experimental work. Orders by mail receive prompt attention.

A great change in Feeding Locomotives. Eighty locomotives are now being built without pumps. Each has two "Little Giant" injectors, having by use proved very reliable. Better than pumps, saving their repairs Rue Manufacturing Co., Phila., are furnishing them.

The Twiss Automatic Cut-off; also Vertical and Yacht Engines. N. W. Twiss, New Haven, Conn.

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

Emery Wheels of all kinds, and Machines at reduced prices. Lehigh Valley Emery Wheel Co., Weisport, Pa.

For Sale or Rent.—Foundry and Machine Shop. Good location. Address Aledo M'Pg Co., Aledo, Ill.

A first-class Electric Instrument Maker can find permanent employment. Address, with references, P. O. Box 1880, Denver, Col.

Launches and Engines. S. E. Harthan, Worcester, Mass. Inventors' Institute, Cooper Union. A permanent exhibition of inventions. Prospectus on application. 733 Broadway, N. Y.

Brick Presses for Fire and Red Brick. 309 S. Fifth St., Phila., Pa. S. P. Miller & Son.

Fire on the Hearth.—Open grate and warm air furnace combined. Circulars by O.S. & V. Co., 78 Beekman St., N. Y.

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

The Friction Clutch Captain will start calendar rolls for rubber, brass, or paper without shock; stop quick, and will save machinery from breaking. D. Frisbie & Co., New Haven, Conn.

The Baker Blower ventilates silver mines 2,000 feet deep. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa.

To stop leaks in boiler tubes, use Quinn's Patent Ferrules. Address S. M. Co., So. Newmarket, N. H.

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.

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

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

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

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

Bradley's cushioned helve hammers. See illus. ad. p. 13.

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

Noise-quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

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

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

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 39 Park Row, N. Y.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. page 405.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 349.

Forges, for Hand or Power, for all kinds of work. Address Keystone Portable Forge Co., Phila., Pa.

Latest improved methods for working hard or soft metals, grinding long knives, tools, etc. Portable Chuck Jaws and Diamond Tools. Address American Twist Drill Co., Woonsocket, R. I.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y.

Light and Fine Machinery contracted for. Foot Lathe Catalogue for stamp. Chase & Woodman, Newark, N. J. Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Sawyer's Own Book, Illustrated. Over 100 pages of valuable information. How to straighten saws, etc. Sent free by mail to any part of the world. Send your full address to Emerson, Smith & Co., Beaver Falls, Pa.

Eagle Anvils, 9 cents per pound. Fully warranted.

Eclipse Portable Engine. See illustrated adv., p. 389.

Special Tools for Railway Repair Shops. L. B. Flanders Machine Works, Philadelphia, Pa.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus'd adv. p. 30.

Elevators, Freight and Passenger, Shafting, Pulleys, and Hangers. J. S. Graves & Son, Rochester, N. Y.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn. \$275 Horizontal Engine, 20 H. P. See page 390.

Pat. Steam Hoisting Mach'y. See illus. adv., p. 318.

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.

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

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

Elevators.—Stokes & Parrish, Phila., Pa. See p. 20.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Large knife work a specialty. Also manufacturers of Solomon's Parallel Vise. Taylor, Stiles & Co., Riegelsville N. J.



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) E. H. B. asks: How much bichromate of potash should be added to a given quantity of Indian ink for drawing purposes? A. Reduce a small quantity of the bichromate to powder and dissolve in a limited quantity of boiling water. There should be an excess of the salt beyond what is taken up by the water. When the solution has cooled, pour it off from the residue, and bottle. When required for use, dilute the solution with about one third its volume of water, and it is ready for use.

(2) A. R. asks: How can I prepare porous silica for polishing metals? A. An article similar to porous silica may be prepared by treating a strong solution of water glass (silicate of soda) with a small quantity of strong oil of vitriol. If the solution has been sufficiently strong, after standing a few hours in a warm place it will completely gelatinize. Wash this well with cold water, decant or filter off the washwater from the gelatinous silica (hydrated silicic acid), place the latter in a suitable vessel, and dry over a good fire.

(3) C. D. W. writes: 1. I am constructing an electric machine, from directions given in SUPPLEMENT 161. In making the patterns, divided the cross piece on top in the middle, to save making two patterns. Is there any objection to that? A. No. 2. Must the electro-magnets be finished? I pickled mine, and rubbed them up pretty well with an old file. A. The contact surfaces of the two parts should be well fitted to each other. Otherwise no finish is required. 3. On making the armature, I have got seven layers of wire, where there are but five in the engraving. Is this a fault? A. You can determine by experiment. Put a loop at the end of the fifth, sixth, and seventh layers, and vary the length of wire used until you get the best effect. 4. In making the commutator, I could not get vulcanite, so took a piece of apple wood and gave it several coats of shellac varnish. Will that do? A. Yes.

(4) W. W. N. writes: A dispute arose between two parties, they agreeing to leave the decision to your paper. A argues that the Pacific Ocean is higher than the Atlantic. Proof being the currents running from the Pacific to the Atlantic; and that if a canal be built through the Isthmus of Panama an immense current from Pacific to Atlantic will be the result, which will have to be counteracted by immense locks. B argues that the theory, "water seeks its own level," holds good for the oceans, and no such current will result. A. There is no difference at mean tide. The tides on the Pacific side are about three feet; on the Atlantic side they are five or six times as great.

(5) J. M. S. asks for a rule to figure the resistance caused by surface friction to a boat passing through the water. I don't mean displacement, but the friction of the water against the sides and bottom of the boat. A. There are no rules determined, suitable for practical application. The amount of resistance in each particular case depends upon: 1. The character and smoothness of the surface. 2. The length of body over which the water glides. 3. The velocity of the water over the surface of the body.

(6) C. C. writes: Having often heard the word "spiling" used by shipwrights in the phrase "taking a spiling," meaning the taking of the shape of any irregular surface as measured from a straight line by ordinates, will you please inform me if the word has any sanction of authority, as I am unable to find it in Webster? A. In "Knight's Mechanical Dictionary" for Spiling: the edge curve of a plank or strake. Spilings: dimensions taken from a straight edge or rule, to different points on a curve.

(7) E. C. B. asks: Has an alphabet of sound figures been established, so that speech may be readily read off from the phonograph or phonoscope, with or without a magnifying glass? A. No, the impressions vary too much with different voices.

(8) K. asks for a preparation to touch up black baked japanned goods which have been marred. The varnish should be applied with a brush. What black preparation can be applied to iron with a brush, which will have the appearance of black japan and will not wear off? A. Finely ground bone black mixed with a good quality of furniture varnish answers very well for these purposes.

(9) J. S. inquires how to make rouge for polishing purposes. A. Take crystals of sulphate of iron (green vitriol or copperas), have them as clean as possible; and put them into crucibles or cast iron pots and expose them to heat, without suffering the smallest particles of dust to get in, which would have a tendency to scratch the articles to be polished. Those portions which are least calcined, and are of scarlet color, are fit to make rouge for polishing gold or silver; while those which are more calcined, or have become red, purple, or bluish purple, form crocus fit for polishing brass or steel.

COMMUNICATIONS RECEIVED.

- On the Figure 9. By G. C.
A Suggestion to inventors. By L. N. D.
On a New System of Weights and Measures. By D. B.
On the Telephone Under Water. By S. B.
On Boiler Explosions. By S. B.

[OFFICIAL.]

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 16, 1879, 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, or any patent issued since 1867, 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 names and dates, such as Axle box press, Andrews & Ball, Bed, cot, O. Howe, Beer from casks, apparatus for forcing, J. A. O'Connor, Bell, nautical alarm, H. Brown, Binder, folio, G. Wedel, Binder for books, temporary, J. P. W. Von Laer, Bolt, H. B. Ives, Bottle, J. H. Earle, Bottle stoppers, device for, T. Malcomson, Box fastener, A. J. Simpson, Bracelet, A. Vester, Bricks, enameling, D. W. Clark (r), Buckle and snap, combined, G. Iveson, Buckle shield, D. Mosman, Buckle, stocking suspender, J. H. Goldstein, Bush for barrels, J. Hartzheim, Button, curtain, T. J. Graham, Button, separable, N. P. Maker, Cabinet for holding and exhibiting engravings, A. K. Potter, Can casing, F. C. Wilson, Cans, frame or support for swinging, F. C. Wilson, Car wheel chiller, W. Wilmington, Carpet exhibitor, A. Peterson, Carpet pad, H. M. Small, Carriage top, D. G. Beers, Casks, apparatus for pitching beer, A. Grosmann, Cheese press, gang, J. Naylor, Jr., Churn, M. Caisse, Churn power and table, C. W. Patton, Circles, G. Richards, Clothes line stretcher, W. G. Eddy, Cock, cylinder, J. A. Robinson, Cock for soda fountains, draught, G. D. Dows, Collar, horse, F. Martens, Colter, Wheel, J. Lane, Copper, manufacture of tinned sheet, G. Salmon, Cord adjuster, W. W. Batchelder, Corn sheller, J. M. Hawley, Corset, J. S. Crotty, Cream of tartar, manufacture of, E. Muller, Cultivator, W. S. Moon, Cultivator, wheel, E. A. Wright, Damper, stove, J. M. Read, Damper, stovepipe, G. J. Cline, Domestic boiler attachment, G. Conover, Door and window guard, W. H. Huston, Earth closet, F. Fowler, Egg carrier, A. J. Millard, Elevator, J. Ney, Elevator bucket, W. H. & W. J. Clark, Fence, barbed wire, S. M. Stevens, Fence machine, wire, S. M. Stevens, Fence, portable, F. M. Snook, Filter, water, A. H. Peterson, Firearm, magazine, F. W. Tiesing, Fire escape, Johnson & Jackson, Fireplace damper plate and arch bar, combined, C. Hanes, Fishing rod, E. Earle, Fluting machine, J. E. Donovan, Game apparatus, W. Kightlinger, Gas engine, F. Burger, Gas, purifying illuminating, Lugo & Lees, Grain binder, J. W. Clover, Grain binder, S. Johnston, Grain, disintegrating, L. J. Cox, Grain separator, A. Fugel, Grain separator, magnetic, D. D. Hardy, Grate bar, W. H. Dougherty, Handcuff lock, Tower & Kahle, Harrow and seed sower, W. H. Traylor, Harvester, R. S. Gilbert, Harvester, grain binding, S. Johnston, Harvester rake, Jones & Emerson, Harvester rake, J. L. Owens (r), Hat racks, fastening device for, J. Wagner, Hay and straw stacker, P. F. Fleming, Hay loading machine, S. B. Castle, Hay pitcher and stacker, Gilliland & Wayland, Heel protector, G. Z. Whitney, Heel stiffeners, machine for making, A. E. Carvil, Hinge, adjustable roller, B. T. Murphy, Hog singeing apparatus, T. L. Boyd, Hog singeing furnace, T. L. Boyd, Hoisting machine, T. N. Davey, Hook and button, combined, W. H. Shurtleff (r), Horse rake, G. R. Williams, Horseshoe, H. W. Fletcher, Horseshoe, C. S. Hill, Hose and pipe coupling, W. K. Lawson, Hub, vehicle wheel, L. S. Edleblute.

Table listing inventions with names and dates, such as Husking peg, J. V. Guy, Insects by fumigation, apparatus for destroying, F. C. Cook, Intestines, machine for cleaning, L. & J. Baumle, Jewelry, relief, C. Fest, Jug, stone, S. A. Conrad, Knit fabric for mattresses, etc., M. Townsend, Knitting machine, straight, C. H. Young, Lamp, A. Rincklake, Lantern, Cash & Baron, Lathe, double reversible, J. H. Wilson (r), Lathing, metallic, A. Knisely, Letter box indicator, E. P. Murphy, Lifting jack, I. Hogeland, Lubricator, O. A. Rollins, Mail bags, machine for riveting, M. Bray, Matrices, machine for making stereotype, J. W. Schuckers, Meal chest, S. W. Brooke, Medicated band or belt, Vaughan & Thom, Milk can, F. J. Seymour, Milk cooler, A. C. Clark, Millstone dressing device, G. W. Jones, Mower, lawn, C. Gates, Necktie tip, H. H. Thayer, Nut lock, G. H. Roth, Organ pedals, lid for, Justi & Maud, Oven, baker's, E. W. Dittmann, Overalls, C. A. Jones, Packing engines, device for, D. Webbert, Packing, piston, R. W. Peck, Pail, B. Goodman, Peg float, P. Lowentraut, Pegging machine, boot and shoe, W. G. Budlong, Pencil and line measurer, combined, J. A. Fresco, Photographic negatives, device for retouching, White & Snyder, Pile fabrics, machinery for cutting, R. H. Plass, Pipe and tubing, galvanizing, W. P. Breeding, Pipes, etc., stock and die for screw threading, H. O. Choles, Planter and cultivator, combined, J. H. Tanner, Planters, check row attachment for corn, E. W. Quincy, Plates and dishes, device for securing ornamental designs to, F. A. Marra, Plow, W. Coppage, Plow and pulverizing harrow, combined, C. E. Sackett, Portable furnace, A. B. Dembrun, Pressing iron, E. A. Russell, Railway and car therefor, elevated, E. Andrews, Railway, elevated cable, F. M. Raeger, Railway frog and crossing, W. C. Quigley, Railway gate, H. D. Kahler, Railway switch, street, A. Whittemore, Rake, L. A. Powers, Refrigerator, S. Scott, Rock crusher, E. Coleman, Safety elevator, A. D. Hoffman, Sash fastener, W. Riker, Saw mill dog, I. Springer, Saw tables, adjustable gauge for, B. S. Constant, Scales or rule, measuring, L. Sharpe, Scarf, neck, W. A. Laverty, Scissors and shears, G. Conover, Scraper, C. McEntee, Screw clamp and lifting jack, J. Church, Seaming machine, W. J. Gordon, Seed crusher, oleaginous, A. B. Jawther, Sewing machine, revolving shuttle, J. Tripp, Sewing machine ruffing attachment, D. Snitjer, Sheave for pulley blocks, etc., anti-friction, Edson & Haynes (r), Sheep, curing foot rot in, J. Myers, Shoe fastening, W. F. Osborne, Show case, T. Vaughan, Smoke and gas consuming furnace, K. M. Jarvis, Snap hook, B. A. Lewis, Sole channelling and prickling machine, M. A. C. Holmes, Spading fork, E. N. Griffith, Speed accelerator, J. Schofield, Spoons, manufacture of, J. M. Perkins, Steam boilers, water front for horizontal, G. H. Rheutan, Stone, compound for artificial, J. A. Greer, Stove, gas, W. A. Turner, Stove, heating, L. W. Leeds, Stove leg, C. M. Morris, Straw goods, manufacture of, J. L. Marvin, Surgical bandage, S. Goldschmidt, Surgical spint, C. F. Stillman, Teeth, apparatus for treating celluloid bases for artificial, L. D. Dobbins, Telephone, electrical contact, E. Berliner, Thill coupling, W. V. R. Blighton, Thimble, M. D. Chipley, Toe calks, machine for forming, W. D. Young, Torpedo, marine, J. H. McLean, Torpedo, projectile, M. Coloney, Toy, C. A. Bailey, Toy dancer, W. Carlin, Trunk fastener, W. B. Coulter, Truss, G. W. Ellis, Valve, R. W. Peck, Valve or faucet, F. Woodward, Vehicle spring, I. V. Hicks, Vehicle spring, C. J. Holman, Vehicle spring brace, W. S. Widger, Vehicle wheel, W. W. Valentine, Ventilator, P. H. Viets, Washing machine, R. Campbell, Washing machine, W. F. Wilkins, Watch dial, D. A. A. Buck, Watch stem winding attachment, D. A. A. Buck, Water closets, etc., seal joint for, A. Edwards, Water meter, M. Stannard et al., Water spout, M. Wieand, Water wheel, W. B. Alred, Wheatheater, M. L. Mowrer, Whiffletree hook, W. L. Belt, Wire barbing machine, J. S. Hayne, Wire, machine for feeding, W. N. Woodruff, Wire stretcher, Garver & Hemenway, Woodwork, machine for making framed, Gresty & Mills, Wrapper or packet, J. H. Weaver.

TRADE MARKS.

Table listing trade marks with names and dates, such as Medicinal preparations, J. W. Osborne, Toilet preparations, J. W. Osborne, Smoking tobacco, W. Duke, Sons & Co.

DESIGNS.

Table listing designs with names and dates, such as Oil cloth, C. T. & V. E. Meyer, Speaking tubes, W. R. Ostrander, Watch chain charm, J. U. Gerow.