Business and Personal.

The Charge for Insertion under this head is One Dolla 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 quarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

CHATTANOOGA, TENN., June 19, 1880. H. W. Johns M'j'g Co., 87 Maiden Lane, New York; GENTLEMEN: The (asbestos) paint I got of you las fall is entirely satisfactory. I want nothing better.

Yours respectfully. D. T. CLIPPINGER, Druggist. (Signed)

We keep a full assortment of Esterbrook's, Gillott's Spencerian, Perry's, and Lamar's Pens. Send for price list to J. Leach, 86 Nassau St., New York.

Wanted-Situation as Foreman, with a live Brass Finishing Firm, who wish to make a specialty of globe valves and compression work. Address "H," P. O. Box 351, Brookline, Mass.

Carré's French Cylindric Carbons, for Electric Light and Experiments, imported and for sale by C. Raoux. 296 Pearl St., New York. Price list sent to all applicants

State Rights of a Useful Article for sale, Theo, W. Clute, Washington, D. C.

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

Lubricene, Gear Grease, Cylinder and Machinery Oils R. J. Chard, 6 Burling Slip, New York.

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

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.

Shaw's U.S. Standard of Pressure. Mercury Gauges all pressures, Steam, Hydraulic, and Vacuum. Best for pumping stations and pipe lines. 915 Ridge Ave., Philadelphia, Pa.

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

For Sale.-A Baltimore City Fire Department Steam Fire Engine, in complete working order. Address P.O Box 676, Baltimore, Md.

Metallic Piston Rod Packing Company, 773 Broad St. Newark, N. J. Agents wanted; terms liberal

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

Asbestos Board on Chimneys prevents their heat from affecting the temperature of rooms through which they pass. Asbestos Pat. Fiber Co., lim., 194 Broadway, N. Y.

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. Corrugated Traction Tire for Portable Engines, etc.

Sole manufacturers, H. Lloyd, Sou & Co., Pittsburg, Pa. For the best Stave, Barrel, Keg, and Hogshead Ma chinery, address H. A. Crossley, Cleveland, Ohio.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros. 531 Jefferson St., Philadelphia, Pa. National Steel Tube Cleaner for boiler tubes. Adjust-

able, 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 spe

cialty, by E. & B. Holmes, Buffalo, 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 .- Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus 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.

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 Machin-Send stamp for illus, cat. State just

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. 13.

Linen Hose for Warehouses and Hotels as protection from fire. Greene, Tweed & Co., 118 Chambers St., N. Y. Silent Injector, Blower, and Exhauster. See adv. p. 13.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 13. Holly System of Water Supply and Fire Protection

for Cities and Villages. See advertisement in SCIEN-TIFIC AMERICAN of last week.

4 to 40 H. P. Steam Engines. See adv. p. 413.

The best Truss ever used. Send for descriptive circuar to N. Y. Elastic Truss Co., 683 Broadway, New York. Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 413. Air Compressors. Clayton Stm. PumpW'ks, Bk'lyn, N.Y. Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Circulars on application. Pittsburg Steel Casting Company, Pittsburg, Pa.

New Economizer Portable Engine. See illus. adv. p. 13. Catechism of the Locomotive, 625 pages, 250 engrav ings. The most accurate, complete, and easily und stood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Bailroad Gazette, 73 Broadway, New York.

Valve Refitting Machine. See adv., page 13.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. For Superior Steam Heat. Appar., see adv., page 13. Hand Fire Engines, Lift and Force Pumps, for fire

and all other purposes. Address Rumsey & Co., Seneca Falls, N.Y., and 93 Liberty St., N. Y. city, U.S.A. Diamond Tools. J. Dickinson, 64 Nassau St., N.Y.

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.

Sheet Metal Presses, Ferracute Co., Bridgeton, 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 SUPPLE-MENT referred to in these columns may be had at this office. Price 10 cents each.

(1) R. C. writes: In finishing colored gold and gilt work with a scratch brush, electro-platers generally use sour beer, letting it flow freely on to the brush and work. The beer is dirty and bad smelling. Is there any cleanfluid which would answer the same purpose? A. Try thin starch water to which has been added a trace of sulphuric acid,

(2) W. H. C. asks: How shall I clean old copper coins without injury to them? A. Dip in strong hot solution of potash or soda, rinse and dip for a moment in nitricacid, after which rinse quickly in running water

(3) H. P. B. asks how to recover the siler that is contained in a solution of cyanide potassium. A. Place in the open air or under a hood with a good draught; add a small quantity of salt, then dilute sulphuric acid until no further precipitate forms; allow to settle, wash the precipitate with clean hot water: mix it with a small quantity of water acidified with sulphuric acid, and a few fragments of pure zinc; collect and wash the reduced silver, separate the remaining fragments of zinc; dry and melt with a little borax glass

(4) S. S. writes: 1. A has a mill, the machinery of which is propelled by an overshot wheel with a veut or aperture of 144 inches under a head of mg hot? The cylinder is 10 inches bore, about 11/4 inches water of 21/2 feet, or 30 inches; he wishes to remove the overshot wheel and put in a turbine wheel, having 34 | can get a good reliable book, at a moderate cost, giving inches vent under a bead of 20 feet water. Which of the two will discharge the greater amount of water in a good article on the subject on p. 259, Vol. 36, SCIENTIFIC given time, and how much, say, in one minute? A The AMERICAN. opening for the overshot wheel with a coefficient of discharge of 0.68, the overshot 318 gallons per minute, and the turbine 234 gallons per minute, 2. I have no work which treats of such questions. Please commend one, if you know of one such. A. D'Aubisson on Hydrau lics. (5) W. & D. ask: What is the best comosition to renew the worn surface of gum belts? A. Manufacturers of rubber belts recommend "a compo sition of equal parts of black lead and litharge mixed with boiled linseed oil, and japan enough to make it dry quick." It is to be put on with a painter's brush. (6) W. B. asks: Does it make any difference where the exhaust pipe enters the cylinder of an engine? If so, where is the right place? A. If a horizontal engine, it is generally preferred to have it enter as near the lower side as possible, as it will then drain the cylinder of any water of condensation. (7) W. P. L. writes: I have a stream of the amount of pull on the end of the lever, less about water which will supply 20 cubic feet a minute, with a | thirty percent for friction.

fall of six feet. Could I obtain sufficient power from it with any kind of wheel, to run a wood-turning lathe for turning small stuff without damming the water? What power would it supply? A. Your fal. of water, if pro-perly applied to a good water wheel, would give you about one-fifth of one horse power, which would do your work, but not without some kind of adam, or its equivalent, to control the water.

in laundrying new-made shirts, how applied, and how ironed? A. Use corn starch, boil to smooth paste, cool, and starch the goods; dry quickly. Before ironing, dampen down in thin, raw (unboiled) starch water little gum arabic or pure white wax is often added to the boiled starch to afford fine gloss. Iron in the usual way, with a common sad iron; then dampen slightly with a clean cloth and the starch (raw) water. and polish briskly with a polishing iron. 2. Where can I apply for information in regard to unclaimed estates in Germany? A. Probably GermanConsul General U. S. could assist you.

(9) "Fax" asks: What will effectually keep off mosquitoes? A. Try an infusion of pennyroyal in water, or an infusion of quassia chips.

(10) O. L. W. asks: 1. How is a vacuum in steam engine produced? A. By condensing the steam in the containing vessel. 2. How to line up a cross head and shaft of an engine? A. To explain this would require too much of our space. Consult "Roper's Hand Book of Land and Marine Engines," page 127. 3. The rule for figuring the horse power of an engine? A. Square the diameter (in inches) of the cylinder, multiply the result by 0.7854, then multiply this product by the average pressure of steam per square inch on the piston, and this product by the number of feet the piston travels per minute, and divide by 33,000. The quotient is the nominal horse Power, from which deduct 20 per cent for friction. 4. How can we tell when the center of the piston is in the center of the cylinder? A. By measuring with proper gauges.

(11) O. N. B. writes: 1. A while ago, having found several scratches on my window, I wished to get them out; so taking some flour of emery and rubbing it down, I succeeded in getting out the scratches, but did not succeed in leaving the window as I wished. Now, the thing I wish to know is, what will restore the glass to its former polish? Have tried rotten stone and oil, but no effect was produced. A. Use finest rouge or putty powder, moistened with water. 2. Wishing to make some mucilage, and make it as cheaply as possible, I write to you to find out how to do it. A. Dissolve a sufficient quantity of gum dextrine or gum arabic in hot water, and add a few drops of clove oil to prevent mouldiness.

(12) J. V. R. asks: Would an electro-maget wound with two smaller wires be as efficient as one wound with one wire just equal in weight of metal to the two smaller-in each case the magnets to be of the same size and contain the same relative weight of metal? A. No. as it would be impossible to wind the two wires as compactly as the one larger one; however, there would not be a great deal of difference.

(13) J. S. P. asks for a composition for rendering light canvas waterproof, which will not crack the canvas. A. Saturate the fibers with soap by boiling in strong soapsuds (castile or curd soap); press out the excess of liquid, and steep for twenty-four hours in a strong aqueous solution of alum; rinse in water, and repeat if necessary.

(14) J. B. M. writes: 1. Suppose in a cylinder, with two pistons at liberty freely to move, we interpose a block between the two pistons and exhaust the atmosphere between the pistons, what is the pressure on the block as compared with what it would be if the block be placed between a stationary cylinder head and one movable piston and the air exhausted? A. There is no difference. 2. And in each case how is the amount of pressure to be estimated, taking no account of friction, weight, or inertia of the piston? A. In either case multiply the area of one piston in square inches by 1475, the result is total pressure in pounds.

(15) B. W. M. writes: I wish to do my own insurance, and want to know what machinery I would need to throw an eighty foot stream of water, what size hose and nozzle, how much horse power, etc.? I have a twenty-five foot deep well, and my buildings will be seventy-five feet deep, fifty feet front, and about twenty-five feet high. A. Use one nozzle, 11% inches diameter, or two of % inch diameter: hose 216 inches diameter. A steam pump, with 10 inches diameter steam cylinder, and 6 inches water cylinder, by 12 inches stroke, would suit; or if you use a "hand" fire engine, get one of the largest class, with 8 inches diameter pumps. When in fullwork they require about fortymenon the brakes.

(16) R. E. M. asks: 1. Does a cylinder become smaller in the bore by the expansion upon becomin thickness. A. No. 2. Can you inform me where I

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

C.-The samples probably contain no gold; a fire assay is the only way of settling this point beyond doubt. -A. A. R.-It is a ferruginous (iron impregnated). silicious clay, containing a small quantity of carbona-(8) S. L. Z. asks: 1. What starch is used | ceous matters, Of little value.-A. M. C.-They consist chiefly of iron sulphuret (pyrites). Of littlevalue .-H. F. C., Jr.-quartz and mica.

[OFFICIAL.]

INDEX OF INVENTIONS

Letters Patent of the United States were Granted in the Week Ending June 8, 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.

	Adjustable bracket, C. E. Kells, Jr	
	Air cylinders, relief valve for, J. Hoyt	
	Air engine, J. A. Woodbury et al	
1	Air engine heater, J. A. Woodbury et al	
ļ	Album, J. W. H. Doubler Alloy, metallic, C. J. A. & G. A. Dick	228,451
l	Animal trap, J. L. Symonds	
	Annunciator drop, J. M. Wheeler.	
	Ax, A. K. Roberson	
·	Axle box, car, T. L. Luders	228,657
	Bale tie, D. A. Kilmer 228,648,	228,649
	Baling press, J. Cook	228,515
	Barbing machine, T. J. & P. F. Howe	
	Bed lounge, G. Snyder	
·	Beehive, S. Moore	228,666
	Beveled gears, machine for trimming, Smith & Course	990 607
	Binder for books, metallic self, C. M. Jelliff	
ł	Binder, temporary, S. R. Hopkins	
1	Binder, temporary, G. F. Willis	
	Bird cage, H. Bishop	
ļ	Blast furnace, J. M. Hartman	228,528
į	Bol or strap fastener, N. Thompson	228,697
	Boot and shoe heel linings, device for repairing,	
	C. E. Whittlesey	228,709
	Boot and shoe soles, machine for shaping, J. B.	0.045
Į	Johnson (r) Boot, India-rubber, G. Watkinson	9,245 228 495
ĺ	Bottle stopper, A. Albertson 228,433,	
	Bottle stopper, J. J. Allison	
	Bottle stopper, J. G. Krieger	228,650
	Bottling machine, Gillman & Spencer	228,625
	Bracket hook, J. S. Lash	
	Bridge gate, safety, A. Hunt	228,640
	Bridle binder, G. D. Smith	220,564
	Brush holding cap for mucilage bottles, etc., M. W Carr	998 cue
	W. Carr Buckle, W. T. Reaser	
	Burglar alarm, K. E. Timmermann	228.490
	Burial case, Reese & Zell	
	Button, separable, E Shrier	
	Calculator, B. L. Davis	228,448
	Caloricengine, J. Jenkins	
	Can opener, W. E. Brock Car basket rack, railway, W. G. Creamer (r)	228,595
	Car brake, C. Ammarell	
	Car coupling, J. H. Bull Car coupling, E. H. Moorman	228,469
	Car coupling, G. W. Putman	228,675
	Car, stock, C. H. & W. G. Webster Carpet stretcher, J. M. Miller	
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	Carriage clips, die for swaging, S. M. Hoye	
	Carriage curtain fastener, H. P. Hunt	
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	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis. Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chairs est and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Clock case, H. J. Davies. Clock case, Davies & Somers. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow	228,474 228,575 228,483 228,444 228,494 228,494 228,689 228,652 228,527 228,652 228,652 228,614 228,614 228,652 228,652 228,652 228,652 228,653
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churn, J. M. Keen Clock case, H. J. Davies Clock case, H. J. Davies Clock case, Envies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder. Coffee pot attachment, M. P. Hathaway Cooliar and cuff, G. K. Snow Cooking apparatus, D. M. Small	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,652 228,652 228,652 228,613 228,614 228,514 228,612 228,465 228,465 228,465 228,465 228,482
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden. Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine. Cartridge crimping machines, feed attachment too metallic, Day & Lewis. Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel. Chair seat and back, M. Merklen Chamber muffler, T. H. Lane. Chart, dressmaker's, C. H. Griffin. Cheese safe, W. H. Gordon. Churn, J. M. Keen Clock case, H. J. Davies. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coolking apparatus, D. M. Small Cooking apparatus, D. M. Small	228,474 228,575 228,453 228,444 228,494 228,494 228,494 228,639 228,652 228,530 228,530 228,530 228,530 228,530 228,652 228,652 228,653 228,653 228,653 228,453 228,453
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, Davies & Somers. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,662 228,530 228,530 228,530 228,530 228,530 228,613 228,613 228,613 228,613 228,613 228,613 228,652 228,652 228,652 228,653
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coolar and cuff, G. K. Snow Cooling apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r)	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,649 228,652 228,652 228,652 228,613 228,614 228,613 228,614 228,613 228,613 228,613 228,652 228,465 228,482 228,482 228,482 228,482 228,653 9,224
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coolar and cuff, G. K. Snow Cooling apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r)	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,649 228,652 228,652 228,652 228,613 228,614 228,613 228,614 228,613 228,613 228,613 228,652 228,465 228,482 228,482 228,482 228,482 228,653 9,224
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churn, J. M. Keen Clock case, H. J. Davies. Clock case, H. J. Davies. Clock case, Davies & Somers. Clotk case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Cooking apparatus, D. M. Small Coton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's. F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons.	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,662 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,613 228,613 228,613 228,652 228,652 228,652 228,652 228,653 9,234 228,659 228,596 228,596 228,596 228,700
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden. Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine. Cartridge crimping machines, feed attachment to metallic, Day & Lewis. Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel. Chair seat and back, M. Merklen Chamber muffier, T. H. Lane. Chart, dreasmaker's, C. H. Griffin. Cheese safe, W. H. Gordon. Churn, J. M. Keen Clock case, H. J. Davies. Clock case, Bavies & Somers. Clock case, Davies & Somers. Clock case, Davies & Somers. Clock case, Davies, D. M. Small. Cooling apparatus, D. M. Small. Cooking apparatus, D. M. Small. Cotton chopper, rotary, J. C. Lee Cotton chonger, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib. child's. F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons.	228,474 228,575 228,483 228,444 228,494 228,444 228,494 228,639 228,652 228,652 228,652 228,652 228,614 228,455 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment too metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, H. J. Davies. Clock case, Davies & Somers. Clutch, friction, W. Oesterletn Coal washing machine, G. Lauder Coolar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r) Crib, child's, F. H. Brown Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson	228,474 228,575 228,483 228,444 228,494 228,494 228,447 228,639 228,652 228,530 228,652 228,530 228,652 228,653 228,653 9,224 228,653 9,224 228,653 9,224 228,653 9,224 228,659 228,659 228,659 228,659 228,659 228,659 228,659 228,659 228,659 228,659 228,550 228,570 228,570 228,570 228,570 228,570 228,570 228,570 228,570 228,570 228,570 200 200 200 200 200 200 200 2
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Clock case, H. J. Davies. Clock case, H. J. Davies. Clock case, Davies & Somers. Clotck case, Davies & Somers. Clottch, friction, W. Oesterlein Colar washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Colar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's, F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson	228,474 228,575 228,575 228,483 228,444 228,494 228,494 228,639 228,662 228,652 228,652 228,652 228,653 228,556 228,559 228,559 228,559 228,559 228,557 228,559 228,559 228,559 228,557 228,559 228,557 228,559 228,557 228,552 228,552 228,552 228,555 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, H. J. Davies. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r) Crib, child's, F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn	228,474 228,575 228,483 228,444 228,494 228,494 228,447 228,639 228,652 228,557 228,652 228,652 228,652 228,652 228,651 228,651 228,653 9,224 228,556 228,557 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,557 228,556 228,5576 228,556 228,5576 228,5576 228,5577 228,5577 228,5577 228,5577
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin. Cheese safe, W. H. Gordon Clock case, H. J. Davies. Clock case, Davies & Somers. Clock case, Davies & Somers. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein. Coal washing machine, G. Lauder Coofee pot attachment, M. P. Hathaway Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's, F. H. Brown Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn.	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,662 228,530 228,662 228,530 228,627 228,613 228,613 228,613 228,613 228,613 228,652 228,465 228,465 228,465 228,465 228,465 228,465 228,596 228,596 228,596 228,596 228,596 228,596 228,598 228,698 228,692
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chamber muffler, T. H. Lane Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churn, J. M. Keen Clock case, H. J. Davies. Clock case, H. J. Davies. Clock case, H. J. Davies. Clock case, H. J. Davies. Clotk case, H. J. Davies. Clotk case, B. J. Davies. Clotk case, B. Snowers. Clutch, friction, W. Oesterlein. Cooling apparatus, D. M. Small Cooking apparatus, D. M. Small Cotton condenser, T. Camp (r) Crib, child's, F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door hanger, J. W. Coburn Door hanger, J. W. Coburn Dust pan, W. H. Stichter	228,474 228,575 228,483 228,444 228,494 228,444 228,494 228,639 228,652 228,652 228,652 228,652 228,652 228,652 228,652 228,652 228,455 228,459 228,459 228,459 228,459 228,596 228,598 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r) Crib, child's. F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Door hanger, J. W. Coburn Bust pan, W. H. Stichter Easel, A. R. Beal Edge trimming tool, Gooding & Taylor	228,474 228,575 228,483 228,484 228,494 228,444 228,494 228,447 228,639 228,652 228,557 228,652 228,652 228,652 228,651 228,652 228,653 9,244 228,556 228,557 228,556 228,5576 228,556 228,5576 228,5576 228,5576 2
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, H. J. Davies. Clock case, Davies & Somers. Clutch, friction, W. Oesterletn Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow Coton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's, F. H. Brown Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Door hanger, J. W. Coburn Door hanger, J. W. Coburn Data Part of the stock for the stock of the	228,474 228,575 228,483 228,444 228,494 228,447 228,639 228,639 228,632 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,613 228,613 228,613 228,613 228,613 228,613 228,652 228,465 228,465 228,455 228,455 228,455 228,455 228,556 228,556 228,556 228,556 228,659 228,659 228,659 228,556 228,556 228,659 228,659 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,659 228,659 228,556 228,556 228,659 228,659 228,556 228,557 228,556 228,556 228,556 228,557 228,556 228,556 228,557 228,557 228,556 228,557 228,556 228,557 228,556 228,557 228,557 228,556 228,557 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, Davies & Somers. Clutch, friction, W. Oesterlein Coal washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Collar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r) Crib, child's. F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Door hanger, J. W. Coburn Bust pan, W. H. Stichter Easel, A. R. Beal Edge trimming tool, Gooding & Taylor	228,474 228,575 228,483 228,444 228,494 228,447 228,639 228,639 228,632 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,613 228,613 228,613 228,613 228,613 228,613 228,652 228,465 228,465 228,455 228,455 228,455 228,455 228,556 228,556 228,556 228,556 228,659 228,659 228,659 228,556 228,556 228,659 228,659 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,556 228,659 228,659 228,556 228,556 228,659 228,659 228,556 228,557 228,556 228,556 228,556 228,557 228,556 228,556 228,557 228,557 228,556 228,557 228,556 228,557 228,556 228,557 228,557 228,556 228,557 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Clock case, H. J. Davies Clock case, H. J. Davies Clock case, B. J. Davies Clock case, B. J. Davies Clotk case, B. J. Bavies Clotk case, B. J. Bavies Colar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cothon chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's, F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Dust pan, W. H. Stichter Easel, A. R. Beal Edget rinming tool, Gooding & Taylor Electric machines, brush for magneto, H.S. Maxim 226,543.	228,474 228,575 228,483 228,444 228,494 228,444 228,494 228,447 228,639 228,662 228,530 228,530 228,520 228,530 228,614 228,614 228,465 228,465 228,465 228,465 228,465 228,506 228,506 228,507 228,507 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chair seat and back, M. Merklen Chart, dressmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churn, J. M. Keen Clock case, H. J. Davies. Clock case, H. J. Davies. Clock case, Davies & Somers. Clutch, friction, W. Oesterlein. Colar washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Colar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r). Crib, child's. F. H. Brown Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Dust pan, W. H. Stichter Easel, A. R Beal. Edge trimming tool, Gooding & Taylor Easel, A. R Beal. Edge trimming tool, Gooding & Taylor Electric machine, brush for magneto, H.S. Maxim Electrice machine, sommutator for magneto, H.S. Maxim Electrice machine, sommutator for magneto, H.S. Maxim	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,652 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,532 228,432 228,535 228,432 228,556 228,556 228,569 228,556 228,569 228,569 228,556 228,569 228,556 228,569 228,569 228,556 228,556 228,556 228,556 228,545 228
	Carriage dash frame, G. M. Peters Carriage dashes, fastening attachment for, B. J. Warden Carriage seat iron for shifting rails, G. E. Spare Carriage top, O. C. Coggins Cartridge, B. E. Valentine Cartridge crimping machines, feed attachment to metallic, Day & Lewis Casks and bottles under pressure, apparatus for filling, J. C. G. Hupfel Chart seat and back, M. Merklen Chart areasmaker's, C. H. Griffin Cheese safe, W. H. Gordon Churt, J. M. Keen Clock case, H. J. Davies Clock case, B. J. Davies Clock case, Davies & Somers. Clock case, Davies & Somers. Clock case, Davies & Somers. Clotck case, Davies, C. Lauder Coaf washing machine, G. Lauder Coffee pot attachment, M. P. Hathaway Colfar and cuff, G. K. Snow Cooking apparatus, D. M. Small Cotton chopper, rotary, J. C. Lee Cotton chopper, rotary, J. C. Lee Cotton condenser, T. Camp (r) Crib. child's, F. H. Brown Curbing and guttering for sidewalks, etc., F. Tim- mons. Dental plugger, G. B. Snow (r) Desk, table, D. M. Stevenson Diving bells, arm and attachment for, C. F. Pike. Door and window fastening, N. Thompson Door hanger, J. W. Coburn Door hanger, J. W. Coburn Betectric machines, brush for magneto, H.S. Maxim Electrical machines, brush for magneto, H.S. Maxim Elector Elector Elector Elector Elector Elector Smarin Elector Elector Cording to magnetor Cording to magnetor Charter to magnetic motor brake, T. A. Edison Elevator, W. I. Page	228,474 228,575 228,483 228,444 228,494 228,494 228,494 228,639 228,652 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,530 228,532 228,432 228,535 228,432 228,556 228,556 228,569 228,556 228,569 228,569 228,556 228,569 228,556 228,569 228,569 228,556 228,556 228,556 228,556 228,545 228
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(17) W. L. I. writes: I have an engine cylinder, 9%x18 inches, and 7 foot drive wheel. Is a 1% inch steam pipe large enough to give full power to engine? A. No, it should be at least 21/4 inches diameter.

(18) E. J. O. writes: Having read your article on elevators in the SCIENTIFIC AMERICAN of June 5, it occurs to me that the differential block and chain might be applied to hoisting and descending; it would doubtless be safer than anything now used. and would require but a small engine to work at. I presume if some one or more of our elevator makers had the matter brought before them through proper channels they might be induced to try the experiment. A. We have no doubt such an application of the differential block might be made successfully.

(19) E. S. M. asks: How much pressure can one man give with a jack screw, lever four feet long, and screwfour threads to the inch? A. 192 times