

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line.

11 Ton Compound Slotter for sale cheap. Slots 18 in.; radius 24 in. Address Fulton Iron and Engine Works, Detroit, Mich.

Patents for sale.—Excellent Garden Hand Pump, Well Pumps, Combined Sprinkler and Nozzle. See them work at No. 99 Gold St., Brooklyn, N. Y. N. Malmquist.

H. L. Ferrine, Mech. Draughtsman, 617 7th St., Washington, D.C. Drawings for inventors from sketches or models.

Wanted—A Machine for Straightening Wire. Address, with price, E. M. Chafee, Onondaga Valley, N. Y.

We understand that Baldwin the Clothier, of New York and Brooklyn, employs more salesmen in his Boys' Department than any other retail clothing store requires for both men and boys.

At the American Institute Fair, New York, 1879, the "MacKinnon Pen" was awarded the grand medal of superiority. The judges' report reads: An important feature of this pen is that its point is a circle of iridium.

For Power Paper, Lard, Cider Presses, see adv. p. 252.

The Asbestos Roofing is the only reliable substitute for tin; it costs only about one-half as much, is fully as durable, is fireproof, and can be easily applied by any one.

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

Catalogue of Useful Books on Applied Science sent free. E. & F. N. Spon, 446 Broome St., New York.

Blake Lion and Eagle Imp'd Crusher. See adv. p. 236.

For manufacturing sites, coke and gas coal lands, their qualities and prices, address Mellon Brothers, Pittsburg, Pa.

Foundry and Machine Shops for sale. Established in 1846. Write for description to E. J. Hoen, Addison, Steuben Co., N. Y.

4 to 40 H. P. Steam Engines. See adv. p. 220.

Boiler Feed Pump, with tight and loose pulleys; sure to work. Price \$32. York & Smith, Cleveland, O.

Corrugated Traction Tire for Portable Engines, etc. Sole manufacturers, H. Lloyd, Son & Co., Pittsburg, Pa. Penfield (Pulley) Block Works. See illus. adv. p. 232.

Spokes and Rims, white oak and hickory, best quality, to any pattern, and Hammer Handles of best hickory. John Fitz, Martinsburg, West Va.

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

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, corners, borders, etc., sent on receipt of \$2. Palm & Fechteler, 403 Broadway, New York city.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 381 Jefferson St., Philadelphia, Pa.

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

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

Stave, Barrel, Keg, and Hogshead Machinery a specialty, 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 Packing Company, 37 and 38 Park Row, N. Y.

Twenty-five per cent saved by the use of H. W. Johns' Asbestos Liquid Paints.

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

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.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y. Bradley's cushioned helve hammers. See illus. ad. p. 238.

Forsyth & Co., Manchester, N. H., & 213 Centre St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs only \$20. Attached to any instrument. T. Shaw, 915 Ridge Ave. Phila.

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.

Portable Forges, \$12. Roberts, 107 Liberty St., N. Y.

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

Eclipse Portable Engine. See illustrated adv., p. 222.

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

Peck's Patent Drop Press. See adv., page 236.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 238.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y. For Standard Turbine, see last or next number.

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

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

Wanted—The address of 40,000 Sawyers and Lumbermen for a copy of Emerson's Hand Book of Saws. New edition 1880. Over 100 illustrations and pages of valuable information. Emerson, Smith & Co., Beaver Falls, Pa.

Eagle Anvils, 9 cents per pound. Fully warranted.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 252.

For Wood-Working Machinery, see illus. adv. p. 252.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 252.

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

For Separators, Farm & Vertical Engines, see adv. p. 251.

The Horton Lathe Chucks; prices reduced 25 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn. \$400 Vertical Engine, 30 H. P. See page 254.

For Patent Shapers and Planers, see illus. adv. p. 251.

Emery Wheels of all kinds, and Machines at reduced prices. Lehigh Valley Emery Wheel Co., Weissport, Pa. Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 17.

The 1880 Pennsylvania Lawn Mower.—Light draught and easily adjusted. Machines warranted. See illus. adv. last week. Lloyd, Supple & Walton, Philadelphia, Pa.

For Sale.—Two Windmill Patents, and set of patterns for same. None better. F. C. Maxwell, Columbus, O.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 254.

Patent Steam Cranes. See illus. adv. page 252.

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable; and easily worked. Tensile strength not less than 65,000 lbs. to square in. Pittsburg Steel Casting Co., Pittsburg, Pa.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423. Pottsville, Pa. See p. 253.

Self-feeding Upright Hand Drilling Machines of superior construction. Pratt & Whitney Co., Hartford, Ct. Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs.

Rue Manufacturing Co., Philadelphia, 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. 254.

Mackenzie Cupola and Blower. The very best apparatus for melting iron; and with water bath for smelting lead, silver, or copper ores. Send for pamphlet. Smith & Sayre Manuf. Co., 21 Courtlandt St., New York.

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.

For Middlings, Mill and Mill Furnishing, see adv. p. 222.



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) S. H. H. asks how two minerals in powdered form, one specific gravity of 2.5 and the other of 3.5, can be separated. A. Both substances being insoluble in water, a part at least of the former might be obtained by aqueous suspension and defecation, as in the purification of kaolin, especially if the lighter is also the softer and finer. The difference is almost too slight for even this, however. Perhaps some marked difference in solubility, fusibility, or polarity (magnetic) exists and may be availed of.

(2) C. C. H. asks for a cheap method of determining the presence of zinc in old pewter and britannia ware. A. Digest a fragment of the metal in a test tube with hot dilute muriatic acid, decant the liquid, and add to it sulphureted hydrogen water in excess; filter off the precipitate, and to the filtered liquid add ammonia water. A white precipitate indicates zinc.

(3) G. A. W. asks: 1. Is the presence of air in steam boilers injurious? A. No. 2. How is air expelled from boilers? A. Generally, when getting up steam, by leaving the safety valve open until the steam blows freely from it. 3. What will restore nickel silver that has been heated to a bluish color? A. Dip momentarily in strong nitric acid, rinse immediately in running water. Polish with crocus or rouge.

(4) W. and B. write: As to the per cent of power produced by overshot water wheels, we know of no tests having been made in this country. And presume there are but few persons competent to make such a test, we have overshot wheels 20 1/2 feet high, which are about worn out, and have been urged to use turbines instead, but would like to learn what per cent overshot wheels of our height will give before changing. The turbine claim over 80 per cent. A. As a general result, a good overshot wheel driving machinery not requiring high speeds gives a better percentage than the turbine; for machinery requiring high speeds, a good turbine is to be preferred. A well proportioned overshot wheel

should give 65 to 80 per cent; the average turbine will give 60 to 70 per cent.

(5) J. A. M. asks as to the proper size of cylinders for double engine (diameter and stroke); ample size for boiler for same, size of propeller and pitch of same, for fast steam yacht, 55 feet over all, 11 feet beam, 4 feet 3 inches draught at stern, to steam 15 knots at best speed in smooth water. A. For yacht 55 feet long and 11 feet beam, 2 engines, 9 inches cylinder by 8 or 9 inches stroke; propeller 3 feet 10. to 4 feet 2 inches diameter, and 6 feet to 6 feet 3 inches pitch; return tubular boiler about 5 feet 4 inches diameter and 8 feet 6 inches long, with 2 inch tubes.

(6) E. W. T. asks (1) how to stop leaks in boilers, especially at ends of (expanded) tubes. A. If the tubes are not too much wasted away, they can be made tight with a calking or expanding tool. 2. How to prevent foaming in boilers. A. Foaming proceeds from various causes, and until we know the cause, we cannot prescribe a remedy. The design may be faulty, or the circulation bad; too little steam room, or bad water.

(7) J. F. asks: Is there anything that will remove scales from steam boilers without injury to the boiler? A. There are many compounds used for the removal of boiler scale; they are nearly all effective with some kinds of water and useless with others. See our advertising columns for address of makers of boiler compounds. Tannate of soda, sal soda, petroleum, crude or refined, pieces of oak or hemlock bark or oak timber, soda ash, and gum gambier are often used. If the water is muddy, or contains much organic matter, it should be filtered before use.

(8) J. J. H. asks: 1. What is the best means of preventing scale in boilers where hard water is used and boiler inaccessible? A. See reply to J. F. on this page. 2. Ordinarily what horse power is produced on an engine of 8 inches diameter, 12 inches stroke, with 80 lb. steam pressure? A. At 100 revolutions per minute, 16 horse power, and for any other speed in proportion to the speed.

(9) J. J. W. writes: I am compelled to use in my boilers the water from a stream that is muddied by the washing of iron ore. It causes them to foam. Can you suggest any remedy, or manner by which I could use it without said result? A. See reply to J. F. on this page.

(10) H. L. C. asks: About what is the relative temperature of the water and the steam in a steam boiler when under pressure of 40 to 100 lb. per square inch? A. After a boiler has been in operation long enough for a thorough circulation, the temperature of the water is the same as the steam, and the latter determined by its pressure, if there be no superheating.

(11) J. H. J. asks (1) for the proper mode of adjusting the slides of an engine in working position. A. A line is drawn through the center of the cylinder, and the slides set parallel to it in both directions. 2. To keep the rod the proper length in packing brasses. A. Have the draught of the key at one end of the rod in one direction, and of the other end in the opposite direction. 3. To obtain the half stroke of piston. A. The half stroke of the piston is the length of the crank.

(12) J. D. asks: 1. Can water be heated to a higher temperature than 212° Fah.? A. Yes. 2. How much greater percentage can I get from a copper heating surface than iron surface in a boiler, built locomotive style? A. Practically there is little or no difference between copper and iron.

(13) E. R. M. asks: Would a young mechanic make a locomotive runner with practice on the road with a good engineer that has had four years' experience with different kinds of steam engines, and have studied both Forney's and Roper's Catechisms of the Locomotive? A. Yes, with self-reliance, close observation, and industry.

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

N. G. Co.—It is a variety of serpentine resembling corallite, a hydrosilicate of magnesia, (see p. 465, Dana's Mineralogy.)—A. G. S.—It is fool's gold, iron pyrites, sulphide of iron.

[OFFICIAL.]

INDEX OF INVENTIONS.

FOR WHICH

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

March 23, 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.

Table listing inventions such as Agricultural boiler, Agricultural implement, Animal trap, Animal trap, Annunciators, Bag tie, Baling press, Barrel dumper, Basin, wash, Bed and bolster, Bed, wardrobe, Beer, etc., with corresponding patent numbers.

Table listing inventions such as Binder, temporary, Bisulphide of carbon engine, Bit brace, Boiler and heater, Bonds, notes, and other evidences of value, Boot and shoe calk plate, Boot and shoe lasting device, Brush, galvanic, Bugs from potato vines, Bung, vent, Button for cuffs, Button, separable, Cabinet, exhibiting, Canister, Car brake, automatic, Car coupling, Cars, sand distributor for street, Carpet lining, Carriage bows, S. S. Page, Cart, coal, V. D. P. J. Slattery, Caster, pickle, Chains, manufacture of jewelry, Change and delivering tickets in street cars, Charm and similar articles of jewelry, Chuck, drill, R. E. Wilcox, Churn, J. D. Hobbs, Churn power, J. S. Smith, Churn power, V. H. Winchell, Cigar box for preventing revenue frauds, P. McAleer, Clock, calendar, W. H. Stewart, Coffee roaster stirrer, R. J. Morton, Collar, standing, Goldsmith & Merrill, Coloring matter, artificial, F. Z. Roussin, Colter, rolling, L. Chapman, Cooker, steam, W. B. Wood, Cornice, window, J. R. Shackleton, Corset clasp, W. McCabe, Cotton chopper, J. T. Suetalre, Cotton chopper and cultivator, J. B. Nichols, Counter stiffeners, machinery for shaping, G. L. Roth, Crayon sharpener, J. Suter, Cultivator, T. C. Darby, Curtain bracket, H. T. Warner, Curtain fixture, F. B. Scott, Curtain roller, W. B. Noyes, Cuspadore, J. M. Wheeler, Cut-off, steam engine, W. Redmond, Cutting blade handle, extension, W. Webster, Dental disk, felt, W. W. Smith, Disinfecting device for urinals, etc., E. J. Mallett, Jr., Dog iron mould, J. McDermott, Door, J. F. Martin, Door, screen, J. Barkheimer, Draught equalizer, F. Marsh, Draught regulator for barrows, P. H. Nelson, Dress stiffener, N. Jenkins, Drill and bit stock, combined, S. A. Bostwick, Eave trough hanger, A. H. Braunlich, Egg beater, J. Emmert, Electric motor, L. M. Sabin, Electrical conductor, E. U. Parod, Elevator and scales, combined, G. Van Winkle, End gate, W. Culbertson, Engraving machine, J. Hope, Envelope, H. & L. Planché, Evaporating apparatus, steam, D. K. Allington, Excavator, S. W. Rohn, Exercising machine, E. A. Tuttle, Expanding drill, L. F. Pond, Farm gate, I. Bush, Fence, barbed, T. G. Orwig, Filter, W. A. Pitt, Firearm, magazine, W. H. Elliot, Fluting machine, H. Albrecht, Forging wrench heads, die for, L. Chapman, Fruit jar, Grieswold & Moran, Fuel, combustion of, E. J. Brooks, Gas engine, Wittig & Hees, Gas, manufacture of nitrogen, T. B. Stillman, Gas producer, A. Faber du Faur, Gate, B. F. Luce, Glass stones to metallic frames, securing moulded, J. Fischer, Glass, wood, rubber, etc., ornamenting smooth surfaces of, R. Cunningham, Grain and seed separator, D. Geiser, Grain, etc., apparatus for purifying, O. Oexle, Grain crushing roll, J. Stevens, Grain meter, C. H. Horton, Harness, J. Hebel, Harrow, A. C. Evans, Harvester reel, J. M. Moore, Hat brims, machinery for stretching, A. Alexander, Hat pounding machine, W. Keenan, Hoisting apparatus, C. R. & N. P. Otis, Hoisting jack, D. W. Smith, Horse rake, B. Owen, Horse rake, G. H. Smith, Horses, apparatus for holding, D. E. Middleton, Hose, fire, J. E. Gillespie, Hose nozzle, adjustable, A. B. Prouty, Hub attaching device, S. A. Fuller, Jr., Hub attaching device, Z. Huggins, Ice plow, I. Boone, Injector, J. R. Eberman, Ink, manufacture of printing, J. Kircher, Insecticide compound, J. E. Gibson, Insulating telegraph wires, A. K. Eaton, Iron skelping machine, J. Hoooven, Jacquard machine, J. Miesch, Jewelry, F. E. Gilbert, Jewel case, W. C. Beattie, Ladder, step, J. Hill, Lamp and swing brush, device for supporting a, M. A. Dees, Lamps, decorating glass, J. W. Hains, Lantern, E. J. Brooks, Lantern burner, G. A. Beidler, Lantern, signal, Smith & Murdock, Latch, T. S. Livermore, Latch, C. H. Smith, Leather, finishing, Tice & O'Connell, Lock, A. E. Deitz, Matting, straw, W. H. Townsend, Measure and funnel, combined, G. A. Keene, Mechanical movement, C. Hammelmann, Metal surfaces, machine for ornamenting, Hewitson & Tolman.

**Advertisements.**

Inside Page, each insertion --- 75 cents a line.  
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 Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

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

Metal surfaces, tool for ornamenting, J. Hewitson	225,928
Microphone, E. Berliner	225,790
Middlings purifier, T. D. Isbell	225,753
Milk and cream cooler, B. H. Reynolds	225,764
Milk, etc., jar, L. P. Whiteman	225,900
Mower, lawn, F. Hanson	225,703
Non-conducting covering, B. F. Smith	225,767
Nut lock, E. A. Mercer	225,713
Oil burner, A. T. Jones	225,398
Oil can, C. F. Heath	225,825
Organ pedal, H. R. Moore	225,855
Paper bag machine, E. Stanley	225,887
Paper cutter, J. T. Robinson	225,871
Paper hanger, automatic, R. R. Pattison	225,860
Paper, manufacture of non-inflammable, C. H. O'Connor	225,858
Pen, stylographic fountain, A. T. Cross	225,691
Pen, stylographic fountain, C. H. Downes	225,810
Pianoforte key, J. W. Haines	225,700
Planter attachment, corn, J. A. Werner	225,899
Planter, corn, B. Phelps	225,719
Planting machine, seed, A. Dart	225,804
Plow, F. Stanley	225,769
Plow, wheel, L. Chapman	225,744
Poles or posts, socket for wooden, A. Brady	225,683
Pressure regulator, fluid, G. Westinghouse, Jr.	225,898
Printing machines, supplement introducing mechanism for, L. C. Crowell	225,746
Pruning implement, G. J. Cline	225,798
Railway and farm gate, C. A. Daniels	225,805
Railway switch stand and lock, B. B. De Vout	225,747
Ratchet regulator for transoms, etc., J. T. O'Donoghue	225,761
Refrigerator, J. D. Richardson	225,869
Register border, A. H. Tingley	225,907
Rein holder, J. D. Bentley	225,739
Road engine, F. L. Fairchild	225,695
Roof, sheet metal, R. G. Sykes	225,733
Roofing plate, illuminating, J. Jacobs	225,837
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Scarf, W. W. Fichtenberg	225,815
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Sewage transportation tank, R. A. McCauley	225,850
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Sewing machine, C. M. Banks	225,784
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Shafting hanger, A. Loehner	225,757
Sheet metal, machinery for cleaning and polishing, W. H. Camp	225,796
Ships in port, ballasting, P. Corvaja	225,803
Shoe sole trimming and channeling machine, J. Smith	225,729
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Snap hook, F. Kortick	225,756
Spark arrester, D. B. Stalker	225,886
Spirometer, J. P. Marsh	225,710
Spoon, G. P. Benjamin	225,789
Spout, sap, S. A. Pierce	225,762
Steam and hydraulic elevator, combined, J. R. McPherson	225,851
Steamboiler, L. Rivet	225,722
Steamer, feed, O. Van Tassel	225,892
Stove, D. L. Ervin	225,812
Stove burner, gas, W. Blesner	225,740
Stove grate, J. W. Kilmeline	225,706
Stove, parlor cooking, T. B. Baldwin	225,783
Stove, portable, B. E. Agard	225,750
Strainer, tea and coffee pot, G. N. Root	225,766
Suspenders, J. Hayden	225,824
Target, W. A. Tangeman	225,734
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Tobacco rolling and cutting machine, H. W. Holley	225,833
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Truck, car, W. T. Browne	225,741
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They beg to refer, (D. de Castro & Co., 54 William St. by permission, Camacho & Vengoechea, 42 Pine St. to C. Carranza & Co., 60 St. Louis St. For conditions, etc., address A. UCROZ, P. O. Box 1609, New York City, or their Agent in U. S., AUGUSTO LEWY, 54 William St., P. O. Box 2638, New York City.

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