tween the two rows is a stationary annular abutment which separates them. The steam is fed in at the top of the casing against opposite sides of the disk, but acts on only one half of the circumference at a time. In operation the steam first impinges on the vanes, whence it is deflected into ducts in the casing, only to be redirected against the vanes a little farther down, and deflected into lower ducts. Thus the steam threads its way in and out until the exhaust port at the bottom of the casing is reached. The ducts are made successively larger to allow for expansion of the steam. To reverse the engine the steam is conducted against the opposite half circumference of the disk.

INJECTOR.—G. H. Boetcher, Cambridge, Ohio. This injector comprises a nozzle, a conduit into which the nozzle extends and which is provided with an opening beside the nozzle into the outer air, a casing adapted to contain a body of liquid and having a liquid-discharge opening and an air-discharge opening and into which the conduit extends, and a sleeve surrounding the end of the conduit within the casing and flaring outwardly into close proximity with the casing and being provided with an opening at the side of the conduit end.

CURRENT-MOTOR.—A. A. Morton, Walla Walla, Wash. The invention refers to improvements in motors operated by steam-currents; the object being to provide a motor simple in construction, having no parts liable to get out of order, and that will be operated by currents of any force and regulated as to the throw of its transmission-rod leading to machinery on shore.

CARBURETER FOR HYDROCARBON-ENGINES.—J. H. Johnston, 145 Rue de la Pompe, Paris, France. This invention pertains to improvements in carbureters for hydrocarbon-engines or motors, and has for its object to provide a carbureter in which the admission of the air for the formation of the explosive mixture shall be automatically regulated according to the extent of aspiration of the engine or motor, and consequently according to the speed of the latter, in such a manner that the richness of the mixture will always remain at the most suitable point for the proper working of the motor.

STEAM-BOILER.—J. P. Karr, Monticello, Ind. Mr. Karr's improvement pertains more particularly to an attachment to steam-boilers, the object being to provide means whereby the boiler capacity may be increased over steam-boilers as heretofore constructed and without corresponding increase of fuel consumption. Broadly stated, it consists of a portable independent section adapted to be placed at the rear end of return-flue boilers or the smoke-box end of direct-draft boilers.

Railways and Their Accessories.

RAILWAY-TIE AND HEATING DEVICE THEREFOR.—C. S. Chapman, Ridgewood, N. J. The invention comprehends a railway-tie possessing in itself certain valuable characteristics, but has reference more especially to means for heating simultaneously any desired number or all the ties of a line or section of railway and incidentally or indirectly the rails supported thereon by which to effect the melting of snow and ice accumulating on the rails during the cold seasons.

CAR.—T. H. Proske, Denver, Col. This invention relates to the removal of material loosened by blasting operations carried on in mines, tunnels, and like work. Its object is to provide a car more especially designed for directly receiving the material resulting from the blasting operations and for allowing quick and convenient removal of the material from the breast of the mine or tunnel and to permit dumping of the material outside of the tunnel or mine from either end or side of the car.

Pertaining to Vehicles.

SANDING DEVICE.—A. L. Moss, Sandusky, Ohio. The object of the inventor is to provide a device, more especially designed for use on automobiles and like vehicles and arranged to permit the chauffeur to throw the device quickly into action to sprinkle the road-bed with sand whenever required with a view to prevent the vehicle-wheels from slipping, especially when the road-bed is wet or otherwise rendered slippery.

SPRING BOLSTER. W. J. Foster, Myrtle-point, Ore. Provision is made in this case for novel details of construction for the bolsters employed whereby springs are associated with the bolsters and adapted for absorbing shocks sustained by the loaded wagon in moving over a rough road-bed. The invention relates to springs employed for cushioning the impact of a load on a vehicle, such as a freight-hauling wagon.

Designs.

DESIGN FOR A COLOR-EXHIBITING STAND.—W. H. Reese, Milwaukee, Wis. The designer's claim is for an ornamental design consisting of a color-exhibiting stand. The invention comprises an upright frame on two posts connected by cross pieces in which pivotally turns revolving portion containing two rows of places for the exposition of materials of different colors.

Note.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**
MUNN & CO.

Marine Iron Works. Chicago. Catalogue free.

Inquiry No. 7459.—Wanted, importers of gum amber and copalite.

For mining engines. J. S. Mundy, Newark, N. J.

Inquiry No. 7460.—Wanted, a metallic or mineral powder of the color of silver or aluminium.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 7461.—Wanted, machinery to manufacture an article similar to a round nail or pin.

Drying Machinery and Presses. Biles, Louisville, Ky.

Inquiry No. 7462.—For makers of or dealers in spray pump nozzles.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 7463.—For makers of slot machines for selling cigars.

I sell patents. To buy, or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

Inquiry No. 7464.—Wanted, makers of a roaster for coffee and peanuts.

WANTED.—Patented specialties of merit, to manufacture and market. Power Specialty Co., Detroit, Mich.

Inquiry No. 7465.—Wanted, German-made paper, litho or oliograph front picture frames for cabinets.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Machine Company, Foot of East 138th Street, New York.

Inquiry No. 7466.—For makers of a practical milking machine.

WANTED.—Ideas regarding patentable device for water well paste or mucilage bottle. Address Adhesive, P. O. Box 773, New York.

Inquiry No. 7467.—Wanted, for shipment to Bombay, kerosene, paraffine and other heavy oils for motors.

LATEST ADVERTISING NOVELTIES.—High-grade Illustrating, Designing and Printing. Catalogues a Specialty. Smith & Berkley, Holland Bldg., St. Louis, Mo.

Inquiry No. 7468.—For makers of street railway supplies.

FOR SALE.—Six horse-power kerosene engine, Mietz & Weiss make. No dealers. For price and particulars address Geo. F. Lufbery, Jr., P. O. Box 174, Elizabeth, N. J.

Inquiry No. 7469.—For dealers in sand, such as used in hour glasses.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machinery tools and wood fibre products. Quadriga Manufacturing Company, 18 South Canal St., Chicago.

Inquiry No. 7470.—For makers of embossing machines for name plates.

FOR SALE.—A small manufacturing plant in operation, well equipped for manufacturing wrought specialties. Reason for selling, other interests. Address Box 1163, Hartford, Conn.

Inquiry No. 7471.—For dealers in ornamental and plain iron, brass and copper and supplies used in making bent iron articles.

Absolute privacy for inventors and experimenting. A well-equipped private laboratory can be rented on moderate terms from the Electrical Testing Laboratories, 548 East 80th St., New York. Write to-day.

Inquiry No. 7472.—Wanted, addresses of makers of large alarm clocks with dial from 8 to 12 inches or more.

INVENTIONS WANTED.—Undersigned will consider one or two good patented or patentable inventions to manufacture on royalty. Something in popular demand preferred. Honest treatment guaranteed. F. Raniville Company, Grand Rapids, Mich.

Inquiry No. 7473.—For makers of aerial wheels or propellers.

Inquiry No. 7474.—Wanted, a machine which will wire and seal wooden boxes mechanically and automatically; boxes are 8 inches by 8 by 12½ inches.

Inquiry No. 7475.—Wanted, an electric machine for welding cotton ties.

Inquiry No. 7476.—Wanted, a plan for a 16-foot torpedo stern power boat.

Inquiry No. 7477.—Wanted, powdered metal called "thermit."

Inquiry No. 7478.—For manufacturers of up-to-date machinery and apparatus for a canning factory.

Inquiry No. 7479.—For manufacturers of safety matches, i. e., those which have a specially prepared igniting surface.

Inquiry No. 7480.—Wanted, case-hardened steel or other metal cylinders, 20, 30 and 40 inches long, 10¼ or 10 3-16 inches outside diameter, surface to be perfectly true and smooth longitudinally and circumferentially; walls ¼ inch thick, or less.

Inquiry No. 7481.—For manufacturers of machines and appliances for a quarry.

Inquiry No. 7482.—For manufacturers of electrical process for smelting iron.

Inquiry No. 7483.—For manufacturers of small combination locks.

Inquiry No. 7484.—For parties making or selling ⅛ or 3-16 inch flexible wire rope.

Inquiry No. 7485.—For manufacturers of marine gasoline engine of about 15 h. p., and who would be willing to sell the necessary castings and working drawings.

Inquiry No. 7486.—For manufacturers of pickering-drawing machines.

Inquiry No. 7487.—For dealers in aluminum and makers of aluminum goods.

Inquiry No. 7488.—For manufacturers of wireless telegraph apparatus.

Inquiry No. 7489.—For manufacturers of celluloid in sheets.

Inquiry No. 7490.—For manufacturers of machines for digging ditches for tile drains.

Inquiry No. 7491.—For manufacturers of "Ransom Mixer" for concrete work; also "White's Improved Road Oiler" for hot or cold oil.

Inquiry No. 7492.—For manufacturers of hand circular saws.

Inquiry No. 7493.—For manufacturers of thin woods and veneers for scroll work; also imported hard woods.

Inquiry No. 7494.—For manufacturers of machines for making pins, needles, pencils, nails, hinges, screws, etc.

Inquiry No. 7495.—For manufacturers of non-reusable bottles.

Notes and Queries.

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(9835) C. J. H. asks: Please answer through your Notes and Queries the following: How many watts will ten sixteen-candle-power electric lamps consume in one hour? A. Ten 16-candle lamps consume about 550 watts. Now watts have no dependence upon time. In one hour these lamps will consume 550 watt-hours. A watt-hour is one watt exerted for one hour, and is the basis for rating electric current in making bill for its service.

(9836) P. asks: When did the words "In God We Trust," appear on our coins? A. The phrase "In God We Trust" was first used on the half-eagle or five-dollar gold piece in 1866. In 1878 it appeared on the silver trade dollar piece. In 1876 it appeared on the silver half-dollar, and on the silver quarter-dollar and the nickel five-cent pieces of 1876. The two-cent bronze piece of 1864 had it. It appeared on the coinage by authority of Congress.

(9837) C. H. W. asks: 1. If an electro-magnet will lift ten times its weight, what will be the result if it is mounted on about the center of a four-wheeled vehicle that does not weigh any more than the magnet, and just behind the magnet is mounted a flat piece of the same kind of iron, which weighs just as much as that used in the magnet, and is so fixed that it can be made to all but touch the magnet? Now we have ten times the weight of the magnet less the weight of the vehicle, the iron plate, and the loss of magnetism in the air space. Will the magnet pull the vehicle or will it not? A. From your description of the arrangement of a magnet, a vehicle and a piece of iron we are not able to see why there should be any motion produced. A magnet rests on a vehicle and near it in the same vehicle is a piece of iron. Why should the vehicle move? There seems something lacking in the description, and we can only suggest that you try your own arrangement and see what results. 2. In nickel-plating small articles of brass by electroplating, about how long is it necessary for them to hang in the solution? A. A coating of nickel can gain a thickness sufficient to cover in three or four minutes. To deposit a thick coat will require much longer.

(9838) X. asks: Could you let me know through your paper if electricity can be taken out of the human body, and if so by what means; also if it can be put in the body, and how? A. If the meaning of your inquiry is, "Can all the electricity be taken out of the human body?" we answer: No. Electricity can be put into the human body in the sense in which you seem to use the expression by placing the person upon an insulated platform and connecting him to a source of electricity. He will be electrified to the potential of the current he is connected with.

(9839) E. B. C. asks: 1. Will you kindly tell me how much and what kind of wire (size and covering) will be suitable for winding a magnet on a soft iron core 8½ inches long, for use with Edison 110 or 115-volt contact current? A. We do not know what you wish to do with an electro-magnet, and it is not possible to give very good advice upon winding an unknown quantity. Still we may say that you should not wind the magnet with wire enough to put it directly upon a 110-volt circuit. The amount of wire required is too great. Five pounds of No. 24 single cotton-covered copper magnet wire will allow one ampere to flow; so also will 12 pounds of No. 22. These quantities seem to us quite out of the question. The heating in the interior of such a winding must soon char the insulation and injure the magnet. It is far better to wind six layers of No. 14 copper magnet wire on your core, and then use the magnet with an external resistance, a rheostat, which need not cost much, and can be bought from dealers in lanterns. The wire will carry a good current to magnetize the core, and the rheostat will dissipate the larger part of the heat from the larger current used. 2. Is there any device for recording the keys or notes struck by a piano player? A. An attachment has been used for recording the notes struck on a musical instrument, such as an organ or piano. We do not know whether it is in existence now or not. It did not seem to attract musicians to any great extent.

NEW BOOKS, ETC.

CEMENTS, LIMES, AND PLASTERS. By Edwin C. Eckel, C.E. New York: John Wiley & Sons, 1905. 8vo.; pp. 710. Price, $6.

This work is a very complete summary of the composition and character of raw materials, method of manufacture, and properties of the various cementing materials used for building and engineering to-day. It is divided into seven parts as follows: Plasters; Limes; Magnesia and Oxychloride Cements; Hydraulic Limes, Selenitic Limes, and Grappier Cements; Natural Cements; Portland Cement; and Puzzolan Cements. The book is illustrated with no less with 165 figures, diagrams, and half-tones. There are several maps of the United States, showing the locations of natural and Portland cement plants, gypsum mills, etc. The book contains 254 tables, giving all possible information regarding the various cements, both natural and artificial, and also regarding cement machinery, and the cost of operating the same. The book is exceedingly comprehensive in character, and will be found valuable by all engineers.

HANDBOOK OF LITHOGRAPHY. By David Cumming. New York: The Macmillan Company, 1905. 12mo.; pp. 243. Price, $2.

This book is a practical treatise for all who are interested in the process of lithography. Lithographic stones—their properties, defects, and preparation; transfer inks and papers, and the various kinds of transfers, as well as arranging and patching up work for transferring; drawing on stone for black and color work, and transferring work to the stone; the preparation of stones for printing; hand-press and machine printing; the principles of chromo-lithographic drawing and printing; and paper of various kinds, qualities, and printing conditions, are some of the subjects discussed. The book has a number of colored plates, showing the different tints used in ordinary lithography. It is a very complete and interesting handbook, and a book which will be found useful to all lithographers.

TRAZIONE A VAPORE SULLE FERROVIE ORDINARIE. By G. Ottone. Milan: Ulrico Hoepli, 1905. 32mo.; pp. 469.

MANUALE DELL' INGEGNERE ELETTRICISTA. By Attilio Marro. Milan: Ulrico Hoepli, 1905. 32mo.; pp. 689.

LE ABITAZIONI POPOLARI. By Effren Magrini. Milan: Ulrico Hoepli, 1905. 32mo.; pp. 309.

RESISTENZA DEI MATERIALI E STABILITA DELLE CONSTRUZIONI. Dr. Guido Sandrinelli. Milan: Ulrico Hoepli, 1905. 32mo.; pp. 471.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending October 31, 1905

AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

Accumulator, R. W. Wilson	803,383
Acid, etc., making oxalic, F. A. Feldkamp	802,980
Adjustable stroke mechanism, parallel, E. S. Clark	803,149
Advertising device, M. S. Alexander	803,084
Advertising device, G. G. Allen	803,386
Amalgamator, H. J. Horstmann	802,987
Amusement device, W. H. Logan	803,119
Amusement device, S. Koppel	803,171
Amusement device, W. F. Bernheisel	803,465
Annunciator, C. W. Lebeis	803,348
Armature coils, apparatus for short circuiting turns in, J. F. Shoemaker	803,442
Atomizer or nebulizer, O. C. Knight	803,170
Auger, expansion, T. F. Gayner	803,223
Automobile rear axle, F. C. Miller	803,121
Ax rack and locker, C. A. Swanson	803,255
Axle, R. Mulholland	803,012
Axle box lid, car, W. G. Dunham	803,155
Baby jumper, E. M. Monroe	803,427
Baggage, S. Christie	803,094
Bale tie machine, J. W. Miller	803,499
Baling press, S. P. Northcutt	803,126
Band saws, machine for setting, J. C. Reckweg	803,432
Bank, combination coin, F. Smith	803,249
Bank or other box, G. R. Hill	803,059
Bearing, elastic collar, D. W. Jordan	803,235
Bearing, gravity roller side, J. F. O'Conner	803,241
Bed spring, J. Janes	803,419
Bed spring tightener, G. S. Willett	803,144
Beds, appliance for surgical, E. H. Richards	803,193
Bedstead, A. H. Davis	803,049
Belt splicing implement, J. & P. B. Landgraf	803,492
Bicycles, wheels, and the like, stand for holding, A. Shearman	803,196
Billiard cue tip, F. E. Joselin	802,990
Billiard cue tip holder, H. J. Koegel	803,420
Bin, J. Minchin	803,184
Bit. See Center bit.	
Blotters, etc., support for, A. Webster	803,039
Boat, J. F. Conkling	803,272
Book and paper holder, D. Weaver	803,083
Book, memorandum, order, diary, account, sample, or similar, E. M. Goldsmith	803,480
Books, pamphlets, pads, etc., applying strips to, J. Hren	803,488
Boot cleaner, R. T. Cummings	803,471
Bore sight, G. N. Saegmuller	803,435
Boring tool, C. Smith	803,368
Bottle losure, E. C. Fowke	803,334
Bottle corking machine, J. B. Davis	803,329
Bottle washing machine, F. N. Young	803,043
Box fastener, L. M. Gilbreath	803,101
Brake beam and making the same, J. P. Streib	803,313
Brake shoe holder, E. Wilson	803,205
Bread to crumbs, appliance for reducing, E. F. B. Kenyon	803,061
Breeder, W. A. Sumner	803,140
Bucket, clam shell, J. Lindstrom	803,118
Building block, J. Wickre	803,380
Building block and wall construction, O. Johnson	803,290