

## ENGINEERING INVENTIONS.

A low water alarm and indicator for boilers has been patented by Mr. Charles Hults, of Torch Lake, Mich. In connection with a jointed frame and pivoted toggle levers is a properly connected float, so arranged that when the water in the boiler has fallen below a prescribed line, the fact will be made known by an indicator upon the boiler, together with an alarm from the whistle.

A car coupling has been patented by Mr. Vladimir S. Bekofsky, of New York City. It has a hooked drawhead held loosely in a hollow drawbar, a sliding plate with cam slot acting on the hooked drawhead, with other novel features, the design being such as to allow the cars to play in vertical and in horizontal planes without fear of casual uncoupling.

A car coupling forms the subject of a patent issued to Messrs. Henry Lehr and Charles Verch, of Albany, N. Y. Combined with a hook pivoted to the drawhead, and adapted to engage a stud of an opposing drawhead, is a rod with an arm adapted for movement in front of the hook to hold it raised, the coupling being intended to couple automatically, to be readily uncoupled, and to be adjusted at will to prevent coupling, without requiring train men to go between the cars.

## MISCELLANEOUS INVENTIONS.

Beveled glass forms the subject of a patent issued to Mr. Charles P. Oudin, of New York City. This invention consists in making the plate with an offset between the bevel and the face of the glass, whereby the face of the glass is made to stand out from the bevel in clearly defined lines.

A safety pocket has been patented by Mr. Eli Strouse, of Baltimore, Md. It is formed in the back of the vest, and located in the lower right or left corner, concealed and securely closed by the buckle or backstrap of the vest, which extends across the mouth of the pocket and forms the front side of the mouth.

A combined sewing machine cover and stool has been patented by Mr. Gaul O. Brager, of Osage, Iowa. The cover is adapted to inclose the head of a machine, and has a leg frame fitted within it, which lies within the cover when the latter is adjusted to the machine, and are adapted to support the cover as a stool when so desired.

An automatic elevator gate has been patented by Mr. George T. Fallis, of St. Joseph, Mo. It is a sliding gate hung on ropes having weights, with a device for locking the gate in an open or a closed position, controlled by the movement of the elevator carriage, together with a novel construction for securing the gate in the guides.

A spool holder has been patented by Mr. Canova T. Cagle, of Beersheba Springs, Tenn. It consists of a light base plate, easily held by its retaining pin to the front of a lady's dress, and carrying an arm and stud on which spools of thread of different size may be readily adjusted, the device also carrying a miniature pincushion and thimble clamp.

A wheel hub has been patented by Mr. Andrew J. Morrison, of Houghton, N. Y. This invention relates to the construction of the spoke tenons, the hub proper having improved spoke sockets, and an oil box and sand box, the combined hub and boxes, except the spoke ring, to be made of iron, steel, or brass, and the spoke ring to be made of wood or compressed paper.

A churn dasher has been patented by Mr. John L. Maxwell, of Bentonville, Ark. It is formed of a series of beveled rings, having between them openings which converge toward the top, making a form of dasher which can be readily forced through the cream and is very efficient in separating the butter, the invention being an improvement on a former patented invention of the same inventor.

A key operating device has been patented by Mr. David A. Childs, of Columbia, S. C. It is a split pulley adapted to be clamped upon the shank of a door key, and grooved in its periphery to receive a cord extending over one or more pulleys to a distant point, so that when the cord is pulled, it will turn the key to lock or unlock the door, according as the cord is wound.

A gas and air compressor and dry vacuum pump has been patented by Mr. August Osenbrück, of Hemelingen, Prussia, Germany. An ordinary slide valve gear is employed, with secondary cut off valve, and the cylinder has pressure relieving valves, so that, the secondary cut off being permanently adjusted for a certain difference between the exhaust and compression pressure, variations will be provided for by the relieving valves.

A mosquito canopy has been patented by Mr. William W. Barnum, of Indianapolis, Ind. It consists of an adjustable slatted rectangular frame, with pins and slotted standards adapted to receive them, pivoted supporting bars and other novel features, intended to make a cheap and efficient frame for supporting the ordinary fabric netting, and one that can be attached to any ordinary construction of bedstead without marring it.

A furnace for hothouses has been patented by Mr. William A. White, of Staatsburg, N. Y. Against two or more sides of a many sided shell or body are arranged independent coils of return or serpentine construction, to heat water, and thus transmit the heat, the coils being subject to separate control, and so arranged that the flow of hot water may be conveniently turned on or off from any part of the structure, and the supply in different directions readily regulated.

A hot water pipe arrangement for heating purposes forms the subject of another patent issued to the same inventor. The invention, while applicable to various heating purposes, is more especially designed for heating hothouses and similar structures, and provides separate hot water circulating coils above the heating coils, so connected that a rising circulation is obtained.

## NEW BOOKS AND PUBLICATIONS.

ONE THOUSAND AND ONE QUESTIONS AND ANSWERS IN UNITED STATES HISTORY. By B. A. Hathaway. Lebanon, O.: A. H. Hathaway. 1887. Pp. 99.

This is a convenient little manual, whose scope is sufficiently indicated by its title. It is dedicated especially to teachers, but one use for it would seem to be in the preparation for civil service examination. It is neatly printed, and is a good companion piece for other question and answer books by the same author.

STEAM BOILER EXPLOSIONS WHICH OCCURRED IN VICTORIA BETWEEN APRIL, 1884, AND MARCH, 1885. By A. C. Wannan. Melbourne: Edward J. Stephens. 1886. Pp. 30.

This is a reprint of a paper read before the Victorian Engineers' Association; with it is reprinted the report of the discussion that followed its reading. It contains one illustrative plate. The paper, it is stated, was inspired by the extraordinary number of explosions that occurred in the period designated in the colony. It is a useful contribution to the literature of boiler explosions, and the author shows much common sense in his treatment of the subject and remedies suggested.

\* \* Any of the above books may be purchased through this office. Address Munn & Co., 361 Broadway, New York.

## Business and Personal.

The charge for insertion under this head is One Dollar 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 late Mr. C. Shaler Smith wrote: "I find that a man who knows his Troutwine thoroughly is a good enough all-round assistant for me."

If you have facilities for manufacturing sewing machines in quantities, write G. A. Annett, Bothwell, Canada. (Something valuable.)

Wanted—Small engine, gas or other kind, to drive two or three small printing presses. Address Deseronto News Co., Deseronto, Ont.

Wanted—Second-hand bound volumes of Patent Office Gazette from 1870 to present; one or full. Address A. K. Mansfield, 177 La Salle St., Chicago.

Claremont Colony, in Virginia, is growing very rapidly. Send for free circulars and illustrated maps. J. F. Mancha, Raymond, Surry Co., Va.

For the latest improved diamond prospecting drills, address the M. C. Bullock Manfg. Co., 158 Lake St., Chicago, Ill.

Sample Fusible Plug. See illus. page 179. 12 in. brass postpaid for \$2. J. A. Grube, Beaver Creek, Ills.

Telescope Lenses. Lowest prices. Gardam, 36 Maiden Lane, N. Y.

Link Belting and Wheels. Link Belt M. Co., Chicago. The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

## Protection for Watches.

Anti-magnetic shields—an absolute protection from all electric and magnetic influences. Can be applied to any watch. Experimental exhibition and explanation at "Anti-Magnetic Shield & Watch Case Co.," 18 John St., New York. F. S. Giles, Agt., or Giles Bro. & Co., Chicago, where full assortment of Anti-Magnetic Watches can be had. Send for full descriptive circular.

Woodworking Machinery of all kinds. The Bentel & Margendant Co., 116 Fourth St., Hamilton, O.

Concrete patents for sale. E. L. Ransome, S. F., Cal. Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

The Knowles Steam Pump Works, 44 Washington St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Cutting-off Saw and Gaining Machine, and Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

60,000 Emerson's 1886 Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Hoisting Engines. D. Frisbie & Co., New York City.

"How to Keep Boilers Clean." Send your address for free 32 page book. Jas. C. Hotchkiss, 33 John St., N. Y.

The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

Niagara Steam Pump. 20 years before the public. Always first premium. Adapted for all purposes. Norman Hubbard, Manufacturer, Brooklyn, N. Y.

Manufacturers' Advertising Bureau, 8 Broad St., N. Y. Benj. R. Western, Treas. Managers of advertising for firms. 20 years' experience. Best references.

Double boring machines. Double spindle shaping machine. Rollstone Machine Co., Fitchburg, Mass.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

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

## Notes &amp; 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. 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.

(1) C. H. La P. wants a cheap method for melting rubber. A. Rubber can be melted by heating in a can over a water bath, that is, the heat must be hot enough to melt, but not burn.

(2) B. F. R. asks: Why is stale bread considered more wholesome than new? A. Presumably because it is more friable and porous, and not so tenacious.

(3) G. A. B. asks: Must the wire for armature and magnets in dynamos necessarily be all of one piece, or can several pieces be used, provided that they are very carefully spliced and of the same gauge? A. Joints in the coils of field magnet and armature should by all means be avoided. If it is necessary to join them, they should be soldered with resin flux, not with acid.

(4) J. N. W. writes: I want to construct a small dynamo, similar to the one illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161. 1. How many pounds of wire will it require to wind the magnets? A. Five or six pounds for the field, and a half pound for the armature. 2. If I increased the length of the magnets and armature, would it increase the power in anything like proportion? A. The power will increase in a more rapid ratio. 3. Will it give a sufficiently strong current to work a small incandescent lamp of four candle power, either with or without battery power, to excite the electro-magnets? A. Yes. 4. And will it answer to do electroplating on a small scale? A. It is not adapted for electroplating, but will answer on the small scale.

(5) E. A. S., Jr., says: In regard to an inquiry for a wash for preventing rabbits from gnawing fruit trees: A little tallow applied to the trees will preserve them from rabbits. Lard should not be used, as it is likely to strike into the wood. Some use a mixture of one part each of tallow and tar, but tallow alone is sufficient.

(6) G. O. K. asks how to make the composition that stove-pans makers use for ornamenting their wood patterns. A. The composition is the same as used in picture-frame work, and made of whiting and thin glue worked in a stiff putty, then pressed into moulds of wood or metal. Oil the mould with boiled linseed oil to prevent sticking, using a brush for this purpose.

(7) J. P. L. asks: 1. Is it known why the apses revolve? A. The revolution of the apses is due mainly to the unequal attraction of the sun on the moon and the earth. The sun being outside of the moon's orbit distorts its otherwise true elliptic orbit, and produces a swinging motion of the plane of the orbit, with a corresponding motion of the nodes and apses. 2. Is Kepler's observation of the radius vector, as laid down in his so-called second law, accurate? A. The second law of Kepler is accurate for elliptic motion of two bodies alone, but the perturbations of the planets among themselves produce deviations in the application of the law, which are well understood, and form some of the finest demonstrations of geometric astronomy. This is beautifully shown in the investigation of the center of gravity of the solar system, which is found to be moving in a set of very complex spirals, from near the center of the sun to as far as 800,000 miles from its center, or a half diameter beyond its surface, in a period of a little over 7,000 years for its completion.

## INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

March 1, 1887,

AND EACH BEARING THAT DATE.

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

Æolian harp, G. J. Holbrook..... 358,448  
Alarm. See Water alarm.  
Anvil, Statham & Price..... 358,756  
Apple corer, L. R. Simpson..... 358,792  
Arm rest for books, J. E. Schonacker..... 358,688  
Axle bearing, car, T. H. Stone..... 358,499  
Axle box, M. Hamlin..... 358,559  
Axle box, car, J. Timms..... 358,583  
Axle boxes, dust guard for car, F. Taylor..... 358,506  
Baking powder, A. W. Holway..... 358,612  
Bale tie, A. S. Hallidale..... 358,608  
Ball and cap snapper, combined return, C. Sellar..... 358,487  
Bar. See Grate bar.  
Battery. See Galvanic battery.  
Bedstead, folding, A. Iske..... 358,614  
Bell, extension table call, J. E. Johnson..... 358,614  
Belt, driving, C. A. Schieren..... 358,730  
Belt replacer, J. J. Rallsback..... 358,787  
Belt, apparatus for making laminated, M. Gandy..... 358,508  
Belts, forming endless laminated, M. Gandy..... 358,809

Binding post, G. Westinghouse, Jr..... 358,518  
Blind, sliding window, G. Popper..... 358,477  
Blower for stoves and fireplaces, J. F. Hees..... 358,447  
Board. See Ironing board. Wash board.  
Boiler. See Coiled tube boiler. Sectional boiler.  
Wash boiler.  
Boiler sections, machine for making, J. Windle..... 358,524  
Boilers, device for placing fusible plugs in, J. A. Grube..... 358,657  
Book holder and line indicator, noté, A. H. Merrill..... 358,814  
Boom for sailing yachts, F. C. Johnson..... 358,673  
Boots, etc., machine for rounding or beveling the insoles of, E. Raimond..... 358,738  
Bottle filling machine, H. E. Schrader..... 358,575  
Bottles, etc., safety attachment for, V. Doriot..... 358,684  
Box. See Axle box. Letter box. Paper box.  
Stop or emb box. Stuffing box. Wagon box.  
Bracelet catch, E. P. Beach..... 358,720  
Bracket. See Shelf bracket.  
Brake. See Car brake. Engine brake. Wagon brake.  
Bran cleaning machine, A. Hunter..... 358,670  
Breast form, J. J. Wells..... 358,711  
Bridles or halters, crown piece for, D. T. Chambers..... 358,541  
Bucket elevator, endless belt, W. G. Herbert..... 358,551  
Bung, L. E. Bowker..... 358,536  
Burner. See Gas burner.  
Bustle, A. H. Brinkmann..... 358,726  
Bustle, V. H. Buschmann..... 358,800  
Bustle, J. L. Wells..... 358,712  
Button, collar, H. S. De Solla..... 358,488  
Button fastener, G. W. Prentice..... 358,481  
Button fastener, J. F. Thayer..... 358,607  
Cabinet chair, C. S. F. Kirkeby..... 358,616  
Can. See Insulated can. Milk can. Oil can.  
Can feeding machine, H. R. Stickney, 2d..... 358,498  
Can testing machine, D. M. Monroe..... 358,582  
Car brake, automatic, W. F. Cummings..... 358,547  
Car, cable railway, H. W. McNeill..... 358,635  
Car coupling, V. S. Bekofsky..... 358,641  
Car coupling, S. D. Locke..... 358,635  
Car coupling, J. D. Miller..... 358,561  
Car coupling, Lehr & Verch..... 358,617  
Car seat, C. W. Johnson..... 358,454  
Car signal, street, C. F. Rogers..... 358,484  
Car spring, S. D. Tripp..... 358,539  
Car starter, Brady & McCanna..... 358,642  
Cars, bundle rack for railway, D. S. Page..... 358,600  
Cars, cable grip for, D. W. Smith..... 358,708  
Cars, street indicator for, C. H. Miller..... 358,467  
Carrier. See Package carrier.  
Cartridge, blasting, Heath & Frost..... 358,811  
Cartridge implement, Boyd & Hurlbutt..... 358,769  
Cartridge loading machine, W. E. Elam..... 358,440  
Cartridge shells, tool for interior shouldering, J. Smith..... 358,704  
Case. See Shipping case.  
Casting car wheels, W. Wilmington..... 358,765  
Casting printers' leads, mould for, H. F. Wellman..... 358,835  
Chain wheel, J. M. Dodge..... 358,771  
Chair. See Cabinet chair. Folding chair. Swing chair.  
Chair, J. Lueders..... 358,466  
Chenille ornament, S. Green..... 358,606  
Chimes frame, T. Brabson..... 358,725  
Churn dasher, J. L. Maxwell..... 358,684  
Churn motor, E. L. Prall..... 358,429  
Clasp for elastic straps, etc., C. Voorhis..... 358,624  
Clock or watch dial, J. Singleton..... 358,754  
Closet. See Dry closet.  
Clothes line support, T. E. D. Power..... 358,819  
Clothes washer, J. T. Campbell..... 358,646  
Coiled tube boiler, M. R. Clapp..... 358,490  
Converter, L. G. Landreau..... 358,559  
Conveyer machine, J. M. Dodge..... 358,652  
Cot, convertible, L. Banks..... 358,528  
Cotton packer, J. T. Dulany..... 358,805  
Countersink, H. Clark..... 358,781  
Counterweights, device for winding up, V. Poppe..... 358,623  
Coupling. See Car coupling. Thill coupling.  
Crusher. See Grape and apple crusher.  
Cultivator, H. Jelks..... 358,453  
Cultivator, W. A. Knowlton..... 358,557  
Cup. See Grease cup.  
Currycomb, L. W. Turner..... 358,510  
Cushion. See Spring cushion.  
Cuspidor holder, J. Nassauer..... 358,688  
Cut-off and strainer, rain water, E. Rowe..... 358,820  
Cutter. See Leather cutter. Wire cutter.  
Dining table, dressing case, work stand, etc., combined, G. Siebert..... 358,486  
Distilling alcohol and other volatile substances, apparatus for, G. Jordan..... 358,635  
Ditching machine, A. Burcham..... 358,526  
Door hanger, A. J. Ives..... 358,813  
Door mat fastener, L. King..... 358,678  
Draught equalizer, L. H. Jacoby..... 358,741  
Draught tube for effervescing drinks, W. P. Clark..... 358,680  
Dredging machine, W. H. Milliken..... 358,686  
Drill. See Mining drill.  
Drilling rails, girders, and the like, device for, A. L. Stanford..... 358,755  
Dry closet, E. C. Condit..... 358,546  
Ear muff, D. Basch..... 358,718  
Eggs, preserving, J. T. Gray..... 358,656  
Egg preserving device, O. W. Jones..... 358,486  
Egg tester, B. B. Gurley..... 358,444  
Electric conduit, R. L. Harris..... 358,609  
Electric motor, M. W. Long..... 358,682  
Electric station indicating apparatus, W. L. Bundy..... 358,645  
Electrical conductors, duct conduit for, Holt & McGinty..... 358,778  
Elevator. See Bucket elevator.  
Elevator gate, automatic, G. T. Fallis..... 358,654  
Engine. See Pressure engine. Steam engine.  
Engine brake, stationary, F. G. & J. R. Hulse..... 358,694  
Extractor. See Nail extractor.  
Fabric turning implement, R. L. Simons..... 358,490  
Fan, fly, W. R. Fowler..... 358,807  
Fanning mill, J. S. Constant..... 358,545  
Farm gate, J. Christensen..... 358,729  
Feed water heater, W. S. Rowe..... 358,881  
Feed water heater, H. Warden..... 358,514  
Fellies, manufacture of metal, Smith & Kelley..... 358,494  
Fence, C. O. Lee..... 358,461  
Fence, flood, A. Z. Sims..... 358,481  
Fence machine, H. Farmer..... 358,441  
Fence machine, wire, A. H. Gore..... 358,605  
Fence machines, tension device for wire, P. Kesling..... 358,489  
Fence making machine, T. B. Lecky..... 358,490  
Fences, metal picket for, J. E. Emerson..... 358,699  
Fertilizer distributor, W. W. Lowman..... 358,744  
Fifth wheel, S. Burdall..... 358,696  
Firearm sight, Orr & Holman..... 358,747  
Firearms, sight protector for, O. H. Deemibus..... 358,754  
Fire door, W. & W. E. Rose..... 358,739  
Fire escape, E. Brantigan..... 358,487  
Fire escape, H. S. Holland..... 358,488