

ENGINEERING INVENTIONS.

A balanced piston for steam cylinders has been patented by Mr. Thomas Joyce, of Scranton, Pa. It has grooves in the lower sides of its ends, with perforations leading into the grooves, whereby the weight of the piston will be carried by the steam, and undue wear of the lower side of the piston will be prevented.

A car coupling has been patented by Mr. Michael Spelman, of Shreveport, La. This invention covers improvements on an automatic coupling heretofore patented by the same inventor, other parts being now employed instead of shouldered springs on the sides of the drawhead, to allow it to tilt downward when required.

A car coupling has been patented by Mr. William B. Little, of New York city. Combined with a drawhead having a cavity is a weight block sliding in the recess, and having a coupling pin and swinging tongue, with other novel features, to make a coupling that is cheap, durable, and automatic, and that will act whether the cars be on a straight or curved track.

A car coupling has been patented by Mr. John A. Craig, of Lauderdale, Mo. Its construction is such that when the link is raised the contact of a meeting drawhead will jar it down into coupled position, and to uncouple it is necessary to raise a lever, from either the side or top of the car, so that the moving parts of the coupling may be operated without going between the cars.

A railway ties has been patented by Messrs. Adam N. Warner and Thomas J. Deakin, of Williamsport, Pa. Cross ties are formed of metallic bed plates having a central groove open at the top, within which fit the shanks of T-shaped blocks, their upper flanged portions resting upon the upper marginal portions of the grooves, and these blocks form the bearers or sleepers for the rails.

MISCELLANEOUS INVENTIONS.

A musical cigar show box has been patented by Mr. Anthony Ward, of Brooklyn, N. Y. Combined with a show box and its cover and a music box escapement is a rod and arm and spiral spring, so arranged that the music will be started and stopped by the opening and closing of the show box cover.

A watch pouch has been patented by Mr. Michael Dooley, of North Adams, Mass. It is made with an edge opening having opposite wires or stiffenings at its margin, and with notches or bends adapted to inclose the stem of the watch, or having a clasp, being neat and inexpensive and calculated to exclude dust.

A wire stretcher has been patented by Mr. Henry Clemons, of Downing, Mo. It consists mainly of an oblong iron frame having a shaft journaled therein, and with a handle, ratchet, and pawl for rotating it, the frame being in two parts, enabling it to be folded in compact form, and so it can be used in angles or corners.

A wagon jack has been patented by Mr. William T. Easterday, of Watsonville, Cal. Combined with a standard formed of sections having teeth is a follower with looped arms, and a lever with a pin connected to the follower by a link or links, with other novel features, to make an improved construction of such device.

A zither attachment for music boxes has been patented by Mr. Alfred Sœur, of New York city. It is placed below the comb and provided with an adjusting device, the attachment consisting of a roll of paper on a strip of wood or metal, so that the roll can be brought in contact with the under sides of the teeth of the comb.

A nut lock has been patented by Mr. John Bare, of Mount Union, Pa. It consists of a carrier plate or support having a pair of bolt holes, and a pair of locking plates pivoted at one end centrally between the holes, their other ends movable in arcs between the holes, the device being adapted to take up the wear of the bolt.

A clothes rack has been patented by Mr. William H. Ertell, of New York city. Combined with back and end boards are hinged bats which can be turned down into and supported in a horizontal position, and held in place when turned up in a vertical position, being designed for use in bedrooms, and so made as to be compactly folded when not in use.

A perpetual dial calendar has been patented by Mr. Charles R. Talcott, of Valparaiso, Ind. It is composed of two tablets, one a revolving dial and the other a fixed or stationary tablet, by the combination of which the day of the week or month, and the day in any given year, may be quickly and accurately ascertained.

A leather rolling machine has been patented by Mr. Charles S. Ames, of Bishop, Ill. It has disk shaped formers on a shaft in connection with concave grooved rollers, the rollers and disks having their shafts geared for joint action, the machine being designed to roll flat leather strips to a U-form, to be used around a center filling to make round lines, etc.

A stall for handling vicious horses has been patented by Mr. Charles F. Shedd, of Fairfield, Neb. In the side walls are vertically sliding doors, the front and rear of the stalls likewise having doors, and there are leading ropes and crank shaft, with other novel features, whereby men may be able to work each side of the horse in the stall to harness or saddle him without danger, and there will be no liability of the horse getting cut in the stall.

A device for assorting animals has also been patented by the same inventor. It consists principally in a special manner of arranging the gates and compartments of an inclosure, whereby the gates may be easily operated from the outside, and stock cut out and worked into one or the other of the compartments, as may be desired.

A hose coupling has been patented by Messrs. Albert F. Symes, of Salem, and Joseph Buchtel, of Portland, Oregon. It consists of a section with a radial opening, on which is fitted a ring with a lug projected through and movable circumferentially in the opening, with other novel features, whereby the coupling may be easily effected and released, and a simple construction is provided.

A means for preventing disturbances on telephone lines has been patented by Messrs. John E. Dann and John Lapp, of Honeye Falls, N. Y. The device consists of a copper cylinder around the telephone wire, but insulated therefrom and connected with the earth, a rubber tube inclosing the copper cylinder to protect it from exposure to the atmosphere or moisture.

A churning device has been patented by Mr. John S. Dickey, of Payne, Texas. Its construction is such that a continuous rotary motion may be given to the churn body and a vertical reciprocating motion to the dasher, the churn body being adapted to serve as a drive or fly wheel, the device being simple and so made that no part is likely to get out of order or wear quickly.

A fastening for satchel frames, etc., has been patented by Mr. Louis B. Prahara, of Brooklyn, N. Y. With the case attached to one part of the frame and the catch to the other part, is a stationary stem and a sliding stem, with a spiral spring connecting them, and a sliding latch connected with the sliding stem and engaging with the catch.

A handle fastening for hand satchels has also been patented by the same inventor. Combined with the frame and its handle caps, having perforations in the opposite sides of their lower parts, are open rings with their ends bent inward and inserted in the perforations, hinging staples being attached to the frame and engaging with the open rings, the device being simply made, and yet such that the fastenings will not be liable to separate when subjected to a severe strain.

A stop watch has been patented by Mr. Eugene J. A. Dupuis, of New York city. There is a pinion on the arbor carrying the second hand, continually engaged with a wheel, loosely mounted on one of the arbors of the watch works, the loose wheel having a spring friction device, and there being other novel features, to simplify construction and provide a mechanism that can be operated rapidly and exactly.

A machine for caning chair bottoms has been patented by Mr. James S. Hodgson, of Brooklyn, N. Y. The invention consists principally of a suitable frame, combined with lifting devices for spreading the warp strands of cane, so that the warp strands may be easily and quickly passed between them, there being also a special form of shuttle for carrying the free end of the warp strand of the cane.

A drop light and chandelier has been patented by Mr. John Triggs, of Mount Vernon, N. Y. The extension of the chandelier has rack teeth engaging a cog wheel placed in a box on the chandelier, the cog wheel being connected with an automatic brake device, consisting of a disk having spring-pivoted cams and an adjustable brake band, to facilitate the adjustment of the drop light and prevent its sliding when once adjusted.

A combined clod crusher and land marker has been patented by Messrs. Abraham Bartmes, Clement V. Whallon, and David W. Frick, of Coldwater, O. The clod crusher is a rectangular frame with closed bottom, pivoted about its middle to accommodate itself to the undulations of the ground, and carrying a toothed roller to break up clods and lumps; the marker is a transverse bar, with shoes or runners, loosely attached to the crusher proper.

A windmill has been patented by Mr. John W. Currie, of Solomon City, Kansas. The mill head is a cross wrought iron coupling, its vertical arms lengthened by short tubes, the lower extension tube being stepped and journaled in the mill tower and the upper tube carrying the operating mechanism, with other novel features, designed to make a durable and inexpensive mill, which can be easily thrown into and out of gear.

A tobacco curing barn has been patented by Messrs. William B. Farrar and John J. Thornton, of Greensborough, N. C. It has an underground conduit, whose walls are composed of damp earth, for supplying damp, earthy air, the conduit having a cut-off, and the rack bars or tier poles have their strips set vertically, and there is a combined net and screen suspended horizontally beneath the racks of tobacco, with other novel features to facilitate the operation, avoid scorching the leaf, and secure uniform bright color and sweet taste.

A process of manufacturing ammonium bichromate and one for the manufacture of bichromate of potash form the subject of two patents issued to Mr. William Simon, of Baltimore, Md. The first consists in the conversion of sodium bichromate into ammonium sodium chromate and the decomposition of this salt into sodium chloride and ammonium bichromate by the addition of hydrochloric acid. In the other the potassium bichromate is manufactured by decomposing chromate of sodium by chloride of potassium and hydrochloric acid.

The stock and hay frame and stock loader recently patented by Mr. John T. Carrington, of Clay Center, Kansas, is designed to provide an improved frame or wagon box, for use for stock or hay and other like material, and the stock loader combined therewith can be used on railroad chutes.

NEW BOOKS AND PUBLICATIONS.

USEFUL THINGS TO KNOW ABOUT STEAM BOILERS. By G. B. N. Tower. New York: American Steam Boiler Insurance Co.

The primary object of this book is to teach owners and users of boilers how to use and care for them, in order to lessen the liability to accident, which it is the business of the company publishing the book to in-

sure against. The author is an eminent engineer, holding the position of supervising inspector of the company, and the great variety of useful information which the book affords is put in terms so plain as to be easily within the comprehension of the simplest fireman or apprentice boy.

A MANUAL OF CHEMISTRY.—ORGANIC. Watts' Revision of Fownes, revised by William A. Tilden. Philadelphia: P. Blakiston, Son & Co.

This is the latest revision of Fownes' Manual, in the department of organic chemistry. The main characteristics which distinguished the original work, orderly arrangement and clearness and conciseness of statement, are still maintained in the work as it is presented to-day, although the new matter successively added by Dr. Watts and Dr. Fisher often overshadows in importance that to be found in editions published before their work was added. Both volumes, physical and inorganic, and organic, are now published in uniform style, a large 12mo, of admirable typography.

PROTECTION OR FREE TRADE. By Henry George. New York: Henry George & Co.

The author of this book has risen rapidly to a considerable degree of public prominence, mainly on account of his radical ideas as to the unwisdom and injustice of the laws of all governments confirming and maintaining individual property in land. The present volume adds nothing to the intelligent discussion of protection vs. free trade, except as it seeks to connect the subject with these other ideas of the writer. In his view protection is a robber which may be driven off, but it is hardly worth while so long as there is a land owner left, for the latter is sure to take from labor all that it has but just sufficient to enable the continuance of work.

Received.

HOUSEHOLD REMEDIES. By Felix L. Oswald. New York: Fowler & Wells Company.

FORBORNAINED. A STORY OF HEREDITY. New York: Fowler & Wells Company.

CHEMICAL ARITHMETIC; WITH A SHORT SYSTEM OF ELEMENTARY QUALITATIVE ANALYSIS. By J. Minor Colt. New York: D. C. Heath & Co.

Sugar Machinery for Plantations and Refineries forms the subject matter of a handsome illustrated catalogue just issued by Messrs. Robert Deeley & Co., of New York, engineers, founders, and machinists, who have for years made a specialty of this business. This firm has furnished the equipment for some of our largest sugar refineries, and has for an extended period enjoyed a large foreign trade in the furnishing of apparatus for plantations as well as for sugar factories.

Rock Drills, Air Compressors, and the machinery and appliances usually employed in connection therewith, are shown at considerable length in a recently published catalogue of the Rand Drill Company, of New York. The book has some instructive views showing the use of the drill in recent important engineering operations, with three pictures of the explosion last summer at Flood Rock, in the tunneling for which the Rand drill was used.

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.

Wanted—Propositions from builders of ice machines, to erect a 25 ton machine for W. H. Howe, Nashville, Tenn.

Little and Lively.

The times change and we change with them. Hardly larger than mustard seeds, but composed of highly concentrated vegetable extracts, Dr. Pierce's "Pleasant Purgative Pellets" have caused the old style, large, drastic, cathartic pills to be abandoned by all sensible people. The little sugar-coated Pellets are a sure cure for constipation; for persons of sedentary habits they are invaluable. They are little and lively, pleasant and safe.

Veneer Machines, with latest improvements. Farrel Dry. & Mach. Co., Ansonia, Conn. Send for circular.

Hanson's Engineer's Pocket-Book. By Charles H. Haswell, Civil, Marine, and Mechanical Engineer. Giving Tables, Rules, and Formulas pertaining to Mechanics, Mathematics, and Physics, Architecture, Masonry, Steam Vessels, Mills, Limes, Mortars, Cements, etc. 900 pages, leather, pocket-book form, \$4.00. For sale by Munn & Co., 361 Broadway, New York.

Wanted—A capitalist to take a half interest in or to manage a valuable patent on Automatic Freight Car Brake. A splendid chance to the right man. For further particulars, address R. B. V., Box 607, Iowa Falls, Iowa.

Send to the Railroad Gazette, 73 Broadway, New York, for a catalogue of Locomotive, Track, and other railroad books.

Emery Wheels of unusually superior quality for wet grinding. The Tanite Co., Stroudsburg, Monroe Co., Pa.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

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Send for catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

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.

Machinery for Light Manufacturing on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Presses & Dies. Ferracuta Mach. Co., Bridgeton, N. J. Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

Curtis Pressure Regulator and Steam Trap. See p. 142. **Grimshaw.—Steam Engine Catechism.**—A series of thoroughly Practical Questions and Answers arranged so as to give to a Young Engineer just the information required to fit him for properly running an engine. By Robert Grimshaw. 18mo, cloth, \$1.00. For sale by Munn & Co., 361 Broadway, N. Y.

Timber Gaining Machine. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Packer Ratchet Drills are drop forged from Norway iron and bar steel. Billings & Spencer Co., Hartford, Conn.

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

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

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 350.

Hercules Lacing and Superior Leather Belting made by Page Belting Co., Concord, N. H. See adv. page 332.

Nyström's Mechanics.—A pocket book of mechanics and engineering; containing a memorandum of facts and connection of practice and theory, by J. W. Nyström, C. E., 18th edition, revised and greatly enlarged, plates, 12mo, roan tuck. Price, \$3.50. For sale by Munn & Co., 361 Broadway, New York city.

Iron and Steel Wire, Wire Rope, Wire Rope Tramways. Trenton Iron Company, Trenton, N. J.

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

Cushman's Chucks can be found in stock in all large cities. Send for catalogue. Cushman Chuck Co., Hartford, Conn.

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.



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. E. De P. asks: 1. How many Edison lamps will the dynamo described in SUPPLEMENT, No. 161, run? A. One or two very small incandescent lamps. 2. If I were to make a machine double the size of the one described, should I use the same sizes of wire, and how much, and would it supply as many lamps as the first one? A. In a general way, use wire of double diameter and six to eight times the weight. It would require three or four times the power to run it, and would supply three or four times as many lamps. 3. How large a machine would it take to run six 16 candle lamps, and how much power would it require? In making a machine for this purpose, is there some better form of armature and commutator which I might use, and would I want to use the same sizes of wire as on the other machines? A. It would take about 1 horse power. It would not be advisable to construct so large a machine on the plan given. The drum armature (Siemens) is preferable. We cannot prescribe the exact size of wire, as it varies with the proportions of the machine.

(2) J. D. asks: How is dynamite that is used in the present time made? A. By mixing infusorial earth with nitro-glycerine. A recent proportion is 1 of earth to 3 of nitro-glycerine.

(3) G. J. asks how he can find any number of points in a circle without going around the circle with compass. A. Using the radius of a circle as chord, the circumference can be divided into six parts. This gives three parts, and by halving the sides, twelve; then by taking three sides of the dodecagon at once, it gives four parts; by doubling the dodecagon it gives 24 parts, etc. But for most of the ordinary cases, the tentative method is most available.

(4) L. E. C. asks (1) why secondary wire (of induction coil described in SUPPLEMENT, No. 160) is wound in two sections, with insulated wire drum between them. A. To more perfectly insulate from each other members of the coil possessing great difference of potential. 2. If No. 28 wire would not be better for medical purposes? A. We would not advise you to depart from proportions given. They have proved very good. Almost any proportion of parts will answer for a medical coil.

(5) A. T. G. asks: 1. Is 16 pounds of ice placed in a refrigerator every other day more serviceable than 8 pounds placed in it daily? A. The sixteen pounds would be the better if the refrigerator was not to be opened; normally, there would be no difference between them.

(6) E. J.—To paint on glass, take clear resin 1 ounce; melt in an iron vessel, let cool a little, but not harden; then add oil of turpentine sufficient to keep it in a liquid state. When cold, use it with colors ground in oil.—The following is a receipt