ENGINEERING INVENTIONS.

A railroad supply tank has been patented by Mr. John Stone, of Plattsburg, Mo. This invention covers improvements in a style of apparatus by which the train wheels act to elevate water into a tank from which the locomotives can take their supply, the work being done automatically.

A passenger car has been patented by Mr. Bruce Price, of New York city. This invention consists principally in forming bay windows at the sides of the car, and in forming recesses or coves above the windows, to which fenders or brackets are applied for receiving and holding parcels.

An electric motor has been patented by Mr. Joseph Weis, of Jersey City, N. J. Combined with the brush holders and their frames are springs, slides with inclined shoulders, and a slide operating lever, whereby the brushes can be readily adjusted to regulate the direction of the current, and any desired amount of resistance can be thrown into the current.

A steam actuated valve has been patented by Mr. John T. Tooley, of East Saginaw, Mich. Between the steam chest and the cylinder is an auxiliary steam chest with an auxiliary valve, with other novel features, whereby stumps will work with regularity, and will not be left on the dead center at starting or stopping.

A mining drill has been patented by Mr. William H. Jenkins, of Irwin, Col. The cam is made to operate singly instead of in pairs, thus dispensing with the need of a shaft running through its face, and the lifting pin is of semi-cylindrical shape, to utilize the entire face of the cam for compressing the spring, and enable its force to be fully realized, with other novel features.

AGRICULTURAL INVENTIONS.

A band cutter has been patented by Mr. John Henry, of Ardoch, Dakota Ter. It has knives with serrated edges to cut either wire or twine bands, with which grain bundles are tied, as they are fed to a thrasher, with fingers to hold them firmly and do the work automatically.

A combined hay rake and cocker has been patented by Mr. Samuel Olson, of Cyrus, Minn. This invention covers a novel construction and combination of parts for a machine to gather hay from a meadow, form it into cocks, and deposit the cocks upon the ground automatically.

MISCELLANEOUS INVENTIONS.

Parturition shears form the subject of a patent issued to Mr. Alexander Cullon, of Lindsay, Ont., Canada. They are for the use of veterinary surgeons, and intended to be effective in operation, while not liable to cause accidental injury.

A dovetailing machine has been patented by Mr. John G. Oetzel, of Brooklyn, N. Y. It is designed especially for use in making furniture, cutting grooves in lumber, or other woodworking, and embraces various novel features of construction and combination of parts.

A necktie fastener has been patented by Mr. John F. Pope, of Ottumwa, Iowa. It is a slotted plate adapted to be attached to the collar button, with a frame for the scarf adjustably attached to the plate, bands being provided with metal stiffening, whereby the tie may be held in place or easily removed.

A honey extractor has been patented by Mr. William B. Treadwell, of New York city. It is operated by centrifugal action, and in combination with the swinging comb pockets is a device for connecting together their spindles, so that the entire series of pockets may be reversed simultaneously.

A buckle has been patented by Mr. Samuel Bretzfield, of New York city. It consists of a plate with flange and slot, making a simple construction by means of which the belt can be adjusted to fit waists of different sizes, while the buckle may be made very handsome in appearance.

A box fastener has been patented by Mr. Edward Harris, of Cambria, Wis. It consists of a U-shaped wire or key held in one end piece of the cover and adapted to be passed through a slot in the corresponding end piece of the box, to hold the cover securely while being easily fastened or unfastened.

A bustle has been patented by Mr. Aaron Stern, of New York city. It is made of plaited or braided straw, reed, rattan, or other suitable fiber, with a stiffening strip sewed along the bottom edge, and independent stiffening strips from the top edge to the bottom edge.

A washing machine has been patented by Mr. John W. Overman, of Fort Fetterman, Wyoming Ter. Combined with a revolving tub on a spindle is a ribbed fixed cylinder in the middle of the tub, and a curved washboard in the tub, so constructed that large or small articles may be washed easily and rapidly thereby.

A plotter for draughting has been patented by Mr. Milton E. Thompson, of Bartow, Fla. It consists of a novel combination of straight edges, pivots, and connecting rods, for making perspectives and like drawings, and the instrument can also be used for drawing parallel lines.

A machine for washing phosphate rock has been patented by Mr. Earle C. Bacon, of New York city. It has pipes with swiveled or ball-shaped jointed nozzles, in combination with inclined screening bars, with frame supporting the bars, and an inclined floor, the pipes being located on the four sides of the frame.

A thill coupling has been patented by Messrs. Abijah L. Romans and John M. Peregrine, of Jamestown, N. Y. It consists of a special construction of an anti-rattler and bolt-holder, combined with a thill coupling and bolt, and which may be applied to common thill couplings and bolts without any change.

A cutter head has been patented by Mr. William G. Rendall, of Portland, Oregon. It is a novel construction of spiral rotatable cutter head, to be operated from any suitable frame having pulleys and belts, for rotating it as it is pressed to the work, and is more particularly adapted for use in felling trees and for cutting off driven piles while building wharves or other structures.

An ore separator has been patented by Mr. Alonzo C. Campbell, of Nashville, Tenn. The construction is such that the pan is vibrated during the whole operation, the pulverized ore being introduced on a covering of duck or other suitable material with meshes of the desired fineness, a current of air or water raising this covering in curved form, and the tailings being discharged at one place and the concentrates at another.

A siding for buildings has been patented by Mr. Albert C. Daugherty, of North Belle Vernon, Pa. The tongue and groove of the sidings are peculiarly formed to present an inclined edge to conduct water from the joints, and they are chamfered so the edges present the appearance of blocks of stone, an illusion which may be heightened by sanding the boards for the kind of stone to be imitated.

A design for a sash fastener has been patented by Messrs. William Huttig, Sr., and Nicklas Bart, of Muscatine, Iowa. It presents a novel configuration of a window sash fastener, having generally a flat appearance, the head portion having a circular outline ornamented by angular projections and an eccentric eye, and the tail being tapering, with approximately straight and curved outlines.

NEW BOOKS AND PUBLICATIONS.

CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHER'S DIRECTORY. Milwaukee: Riverside Printing Company, 1886.

This convenient little pocket volume of 137 pages gives the names and post office addresses of the flour mill owners in the United States and Canada, together with a list of American millwrights and brokers and European flour importers. Where possible, information has been added respecting the amount of capital invested; the system of grinding employed; the daily capacity of the mill in barrels of flour; and the nature of the power in use. The directory is neatly bound in imitation alligator. It will be found of much value to mill furnishers and others desiring to reach the flour industry.

THE CONSTRUCTION OF TRUSSED ROOFS. By N. Clifford Ricker. New York: William T. Comstock.

The author, Professor of Architecture in the University of Illinois, has prepared this work as a manual of instruction, as well as for private study or for reference. The first chapter is a treatise on elementary graphic statics, so far as necessary to understand their application to trussed roofs, and the formulæ and tables presented are intended to be of great convenience to architects.

A MANUAL OF INDUSTRIAL DRAWING FOR CARPENTERS AND OTHER WOOD WORKERS. By W. F. Decker. New York: William T. Comstock.

This is a manual adapted for practical mechanics as well as students. It not only shows how to make working drawings, but explains their advantages, and how to follow them in carrying out the ideas of architects and others. It includes a full set of working drawings of a modern house, built under the supervision of the writer, the drawings having been made from the architect's plans.

JAPANESE HOUSES AND THEIR SURROUNDINGS. By Edward S. Morse. Boston: Ticknor & Company.

For cultivated people of small means, desiring to build for themselves, and having tastes which lead them to take pleasure in beautifying their homes and surroundings, where this can be done in an inexpensive way, we know of no other publication so brimful of suggestion and valuable information as this handsome and profusely illustrated volume. We do not mean in saying this to have any one infer that the book is not equally well worth the attention of those who can build brownstone houses, or of the architects who design the most costly residences, for of the latter structures too many are wanting in many of the essentials to comfortable living that are generally found in less pretentious buildings; but the conditions of life in Japan, and the genius of its people, are such that we often find in their work the development of an exquisite taste that makes the commonest articles they produce a source of constant pleasure. How this taste and Japanese constructive ingenuity are manifested in their residences, in those of the humblest as well as those of the higher classes, the work of Professor Morse points out in ample detail and in most attractive style. Commencing with the appearance of the city and the village, there follows a description of leading types of houses, their materials of construction, the workmen and their tools; and then more than 200 pages are given to "interiors," from which we fancy many of our professional "decorators," who make "studies" of private residences, churches, etc., in order to obtain pleasing and harmonious effects, can easily obtain some most valuable lessons. The entrances and approaches of the house, its gardens, and a wide variety of other matters naturally connected with the subject, receive their due proportion of attention, and one lays down the volume with an impression that he has, during its perusal, got upon terms of rather intimate acquaintance with our far away neighbors off the Asian coast.

A Portfolio of Rare and Beautiful Flowers is the title of a well edited and exquisitely printed description, accompanied by six colored plates, of roses and pansies, the passion flower, pitcher plants, and three varieties of orchids. The plates are on heavy paper, 11½ by 14½ inches in size, and are from original work by Mr. John Walton, a flower painter of admittedly high merit. The portfolio is well worth a place on any parlor or drawing room table. James Vick, publisher, Rochester, N. Y.

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.

Are You Making Money?
There is no reason why you should not make large sums of money if you are able to work. All you need is the right kind of employment or business. Write to Hallett & Co., Portland, Maine, and they will send you free full information about work that you can do and live at home, earning thereby from $5 to $25 per day and upward. Capital not required; you are started free. Either sex; all ages. Better not delay.

"Shortness of breath
Caused my death,"

is inscribed on a tombstone in an English graveyard. In all probability it would never have been necessary, if only the poor unfortunate victim of some disease of the respiratory organs had known of Dr. Pierce's "Golden Medical Discovery," which is a panacea for all diseases of the throat and lungs. For consumption, it is believed to be the only real specific yet known. For all scrofulous and blood diseases it is unfailing.

Wanted.—A few first class workmen on mathematical, electrical, and philosophical instruments; good wages and steady work to competent men. Address, with reference, James W. Queen & Co., 924 Chestnut St., Philadelphia.

Pat. Geared Scroll Chucks, with 3 pinions, sold at same prices as common chucks by Cushman Chuck Co., Hartford, Conn.

Tools, Hardware, and other specialties made under contract. American Machine Co., Philadelphia.

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

Tunneling Under the Hudson River. Giving full particulars of the prosecution of the work thus far. With working drawings, in 27 handsome plates, showing all details. By S. D. V. Burr. $2.50. For sale by Munn & Co., 361 Broadway, New York.

Catarrh, Catarrhal Deafness, and Hay Fever. Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result is that a simple remedy has been formulated whereby catarrh, catarrhal deafness, and hay fever are cured in from one to three simple applications made at home. A pamphlet explaining this new treatment is sent free on receipt of stamp by A. H. Dixon & Son, 305 King Street West, Toronto, Canada.—*Christian Standard.*

Modern M'ch. Tools a specialty. Abbe Bolt Forgers, Power Hammers, Lathes, Planers, Drills, and Shapers. Send for estimates. Forsaith M. Co., Manchester, N. H.

Order our elegant Keyless Locks for your fine doors. Circular free. Lexington Mfg. Co., Lexington, Ky.

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.

The Windmill as a Prime Mover. Comprehending everything of value relating to windmills, their use, design, construction, etc. By A. R. Wolff. With many fine illustrations. (Shortly.) 8vo, cloth. Price, $5.00. For sale by Munn & Co., 361 Broadway, New York.

Woodw'kg. Mch'y, Engines, and Boilers. Most complete stock in U. S. Prices to meet times. Send stamps for catalogues. Forsaith M. Co., Manchester, N. H.

Shafting, Couplings, Hangers, Pulleys. Edison Shafting Mfg. Co., 86 Goerck St., N.Y. Send for catalogue and prices.

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.

Haswell'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.

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

Send for Monthly Machinery List
to the George Place Machinery Company,
121 Chambers and 103 Reade Streets, New York.

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.

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.

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

Wood Working Machinery. Full line. Williamsport Machine Co., "Limited," 110 W. 3d St., Williamsport, Pa.

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

Curtis Pressure Regulator and Steam Trap. See p. 350.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 46.

Hercules Lacing and Superior Leather Belting made by Page Belting Co., Concord, N. H. See adv. page 46.

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

Iron, Steel, and Copper Drop Forgings of every description. Billings & Spencer Co., Hartford, Conn.

Bradley's improved Cushioned Helve Hammer. New design. Sizes, 25 to 500 lb. Bradley & Co., Syracuse, N. Y.

Cyclone Steam Flue Cleaners are the best. Crescent Mfg. Co., Cleveland, O.

Curtis Damper Regulator for draught and steam pressure in boilers. Curtis Regulator Works, Boston, Mass.

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

Hoisting Engines. D. Frisbie & Co., Philadelphia, Pa.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N.Y. See illus. adv., p. 93.

Metallic Pattern Letters and Figures to put on patterns of castings. H. W. Knight, Seneca Falls, N. Y.

Manufacture of Soaps, Candles, Lubricants, and Glycerine. Illustrated. Price, $4.00. E. & F. N. Spon, New York.

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

Notes & 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.
Minerals sent for examination should be distinctly marked or labeled.

(1) A. P. W. asks: In a set of bevel gear cog wheels, the largest 5¾ feet in diameter, and the smallest 2 feet in diameter, how many revolutions will the small wheel make while the large one is making one revolution? A. 2⅞ revolutions of small wheel to one of the large. Better count the teeth of the wheels and divide the larger by the smaller. We have no data relative to the horse power of a spring.

(2) C. W. O.—There are a few tall chimneys in England and Scotland that were built too slender, and are affected by high winds. Brick and mortar are elastic to a certain degree, like glass or stone, and the tall chimneys sway within the limits of elasticity. The amount of deflection you state is probably overrated. You may safely divide it by 3 for a 400 foot chimney.

(3) D. H. asks: 1. What would cause gas to consume in a stove, and explode every few minutes? A. Carbonic oxide gas from coal coming in contact with air while hot takes fire. Sometimes the air mixes with the gas before ignition takes place, when an explosion follows. This often occurs when the door is slightly open. 2. While crossing a pond, I dropped my knife in the water, and after fishing it out, it was covered with a fine black sand. What kind of sand was this? What did it contain? A. The black sand was probably magnetic oxide of iron, which is often found as fine sand. Several attempts have been made to use it as iron ore, but without profit. 3. Does smoke contain iron? A. Smoke contains no iron.

(4) W. L. H.—It is customary and proper to connect valves to close against the source of the steam so as to allow of the stuffing box of the spindle to be packed at any time.

(5) G. R. D. writes: In regard to bichromate battery, I have six 1 gallon cells and eight half gallon cells. In the gallon cells I use carbons and zincs 6x3 inches; in the half gallon cells, carbons and zincs 4½x2½ inches. Now, suppose I want to use all these in one circuit, what arrangement will generate the most electricity in proportion to the amount of electropoion fluid required? Would the outfit be equal only to 14 half gallon cells? Would filling the gallon cells half full and using 6x3 carbons and zincs make them equal to the half gallon cells? A. You should connect your 1 gallon cells in series, and your half gallon cells in pairs, arranged in parallel circuit, two of your half gallon cells arranged in this way being about equal to one 1 gallon cell. Your battery arranged in this way would be equal to ten 1 gallon cells. We do not think that half filling the larger cells would answer the same purpose.

(6) R. M. asks: 1. Would the cell of battery illustrated in issue of April 11, 1885, do for an electric medical apparatus? A. Yes. 2. What is meant by interrupter in answer to query 3, issue January 11, 1886? A. Anything that will rapidly break and complete the circuit will answer the purpose. Commonly, a vibrating spring carrying at one end an armature, which is placed in front of the core of the coil, and having on the back thereof a contact point, is employed for this purpose. The attraction of the core of the coil for the armature carried by the spring holds the spring away from its electrical contact and breaks the circuit, when the core of the coil immediately loses its magnetism, and the retractile force of the spring carries it back to the contact point, again completing its circuit, when the current again flows through the primary wire of the induction coil, the armature is again attracted, and the circuit is again broken. This operation is rapidly repeated.

(7) G. W. C. writes: I wish to light a store with electricity, if it does not cost too much, and I know of no other source to obtain the information, and you will favor me greatly by answering the following questions: Can a store 60 feet by 24 feet be lighted, with a battery for generator? What will be the probable cost of each lamp? Also, what will be the cost to maintain? Please refer me to the builder of such lamps. A. It can be done, but it would be far more expensive than to employ a steam engine and dynamo. Any of the principal manufacturers of electric lamps can supply you. Consult our advertising columns.

(8) A. V. P.—The milkiness of the glass of your aquarium is probably caused by the decomposition of the surface by long contact with water and the vegetable growth on its surface. It may be repolished with rouge on a piece of soft leather, wet with water. Otherwise you must use new glass.

(9) S. D. writes: I have a basement which I use in making ice cream; have a good deal of water and ice about, and heavy tubs and barrels, and I wish to put in a floor of cement or asphalt, or something of the kind. A. Asphalt, coal tar, and sand makes the best floor for such purposes. Melt the asphalt and coal tar equal parts in a large kettle. Heat the sand on a large iron pan, and mix 1 part asphalt and tar to 4 parts sand, hot, and spread quickly.

(10) W. C. M. writes: I built a dynamo machine three times larger than the one explained in SUPPLEMENT, No. 161. I wound the fields in 8 layers of No. 16 double wound cotton wire, the armature with No. 18 single wound. By connecting a brush and a field together, and running the remaining brush and field to the lamp, I cannot get a current strong enough to get the carbon in a 16 candle power incandescent lamp red. By connecting a brush and field and the other brush and field together, and then running two lines from them to the lamp, the current is just sufficient to get the carbon red in the lamp; but by connecting the brushes and fields together in this way produces too much sparking, and that burns the brushes and commutator up. Would it do to wind the field and armature with smaller wire? If so, what number would you recommend? Would it make any difference in decreasing the width of the commutator from 1⅛ to ⅝ inch? Should I not get one 16 candle power incandescent lamp out of the machine described? What is the trouble with my machine? A. Have you tried connecting two lamps in parallel circuit, so as to reduce the resistance of your external circuit, and cause some of the current to pass through the lamps, and less through the field magnet? Probably your machine would run two or three lamps connected in parallel circuit better than it could run one lamp, as your machine is probably incapable of producing a current which will overcome the resistance of a single 16 candle power lamp. We would not advise you to wind your machine with finer wire. If you should not succeed in operating two 16 candle power lamps with your machine, try a larger number of smaller lamps connected in parallel circuit. From your description we think there is no trouble with your machine.

(11) E. N. H. says: Metallic railway ties are about to be experimented with on the Maine Central Railway, and the Boston and Maine Railroad has had a section laid with steel ties in use for the past six months.

(12) H. L. G. asks if a simple and practical apparatus for detecting and showing the degree of vitiation of air contained in apartments has ever been presented to the public. A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 259, illustrated.

(13) N. T. asks how to put up matches to stand a damp climate. A. In moist climates, like England, less phosphorus and more chlorate is used, which imparts a snapping and flaming quality. The following is an illustration of the English composition for tipping:

Fine glue	2	parts.
Water	4	"
Phosphorus	1½ to 2	"
Potassium chlorate	4 to 5	"
Powdered glass	3 to 4	"

Red or white lead or smalt, sufficient to color. The glue, broken in small pieces, is soaked in water till soft, added to the water, and dissolved by means of a water bath. The vessel is removed from the fire and the phosphorus is gradually added, the mixture being constantly agitated with a suitable stirrer. When a uniform emulsion is obtained, the other substances are mixed in one after the other, in the order in which they are named above, and the stirring is continued until the mixture is nearly cold. The best qualities of matches have their tips protected by a thin coat of copal varnish.

(14) G. S.—People losing their hearing generally lose the faculty of intelligent speech, though many retain considerable facility of expression from their memory of lingual effort and observation of the lips of others.

(15) D. McK. writes: I have a small coal-burning stove in my dining room in which I burn coke. I am told that it is dangerous without the best of ventilation, as the deadliest of gases are generated from the coke. A. Your coke stove is all right if you have a stovepipe as used for burning coal. Good coke is healthier than poor coal.

(16) J. F.—The slight variation in the tables as given by different authors in stating the latent and sensible heat of steam arises from the use of original formulas of different investigators on the properties of steam. The tables of any one author are sufficient for all practical purposes. We recommend Nystrom's Mechanics' and Engineers' Pocket Book, last revised edition, 1885, $3.50, which we can furnish.

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February 9, 1886,

AND EACH BEARING THAT DATE.

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