ENGINEERING INVENTIONS.

A mechanism for driving hand cars has been patented by Mr. Ferdinand E. Canda, of New York city. It consists of a series of links united in the form of a lazy tongs, arranged to be extended and contracted to impart rotary movement to a crank shaft, by a double armed hand lever, so that the car may be driven at a high speed by ordinary hand power.

A cattle car has also been patented by the above inventor, which has an arrangement of food bins, feeding sack, and water trough of novel construction, so contrived that the car may be used to carry cattle in one direction, and freight or merchandise on the return trip, the feeding boxes being adapted to fold back out of the way.

A water tank for cattle cars forms the subject of another patent issued to the same inventor, the tank being arranged beneath the flooring of the car and provided with connections whereby it is filled and the water forced therefrom through a nozzle located above the roof of the car, the parts and their connections being so constructed as not to be injured by excessively cold weather.

A railroad tie has been patented by Mr. Thomas A. Davies, of New York city. This invention consists of friction plates to be driven into the tie beneath the bases of the rails, the plates being tapered and arranged, two near each side of the tie, inclined to the grain of the wood, to prevent the ties from being worn by the movement of the rails.

An ore conveyer has been patented by Mr. John Q. Day, of Red Cliff, Col. It consists of an endless wire cable carrying buckets, and arranged to run over grooved wheels, the motion of the cable being caused by the weight of the charged buckets, there being devices whereby the speed is automatically regulated, and the buckets filled and dumped automatically.

A throttle valve has been patented by Mr. James A. Stout, of Belleville, Ill. The valve casing is formed of two parts, one having a discharge passage near the middle of the casing, and the other having valve seats opposite the discharge passages, circular valves being connected in pairs by stems and carried by a forked cross arm secured to a spindle journaled axially in the valve casing, whereby the valves and valve seat will be evenly worn by use to a truebearingsurface.

MISCELLANEOUS INVENTIONS.

A damper attachment has been patented by Mr. Isaac A. Abbot, of Denver, Col. It consists of a hook-shaped spring clamp, made to be easily attached, and to grasp the damper shank, and by frictional contact therewith to hold the damper in any position to which it may be moved.

A saw guide has been patented by Mr. John F. East, of Tanner's Creek, Va. The invention consists in a support holding guide carrier arms, having their guide ends adjusted laterally, making a simple construction of top guides for circular saws, easily adjustable, so the guide may clear the saw teeth.

A cartridge holder has been patented by Mr. Milan S. Barker, of Wellington, Kan. It is composed of a single piece of spring wire bent to form a novel holder or clasp for paper and metal shell cartridges, to be carried about the person, in or on hunting vests or coats and in a belt around the body.

A cotton gin feeder has been patented by Mr. Jesse G. Wiley, of Lockhart, Texas. It consists of a rectangular inclined box with spiked feeding belts, a revolving fan blower at the upper end of the box and a screen at the opposite end and lower side, the device being simply made, taking up little room, and feeding rapidly.

A steering attachment for sleds has been patented by Mr. Orlando A. Thayer, of Paris, Me. Steering bars are pivoted to the forward parts of the runners, and held up by spiral springs, but in such way that by pulling upon a cord the lower part of either bar will be brought into contact with the snow or ice, turning the sled toward that side.

A bureau has been patented by Mr. Theodore J. Palmer, of New York city. This invention combines with a base and swinging case for drawers, representing a bureau, a back frame for a glass, so as to represent a bureau with a glass above it, or by swinging open the bureau part an elongated mirror is presented, to take in the whole figure of a person.

A sewer has been patented by Mr. Chas. Schlameister, of Brooklyn, N. Y. The sewer pipe has a valve pivoted in it, and a branch pipe formed around such valve, so that the discharge of waste water will not be prevented by a back flow of sewage in the sewer, and the back flow will not rise into the drain pipes and force sewer gas into the air or buildings.

A hopple has been patented by Mr. John T. Stoll, of Sacramento, Cal. It is of that class which consists of leg straps and a connecting chain with a swivel, but the arrangement and form of the loops connecting with the chain is such that they are not liable to bruise or cut the legs of the animal, either when walking or lying down.

A broom holder has been patented by Mr. Jacob J. Hiner, of Harvard, Ill. It consists of a wire bent at its ends to form two eyes in alignment, and looped between its ends to form a circular spring-holding side at each side of the eyes, connected by an integral inclined cross piece, the holder being made of a single piece of wire.

A machine for shrinking hat bodies and other articles has been patented by Mr. James Dunlap, of Boston, Mass. It has a revolving shaft carrying arms on which perforated drums are mounted, revolved by suitable gearing, pipes conducting steam to the drums, the machine having great capacity, being simple in construction, and working rapidly.

A band cutter and feeder for thrashers has been patented by Mr. William Tennison, of Mount Vernon, Ind. It has an endless feed apron and slotted feed table, with vibrating arms for feeding the bundles, and vibrating band cutter, with other novel features, the construction being such that it can be placed at either or both sides of the feed hopper of the thrashing machine.

A physician's buggy case has been patented by Mr. Joseph J. Stevens, of Coalesburg, Mo. This invention consists mainly in the manner of combining two opposite medicine or instrument boxes, and attaching to them a single lid, making a case convenient to carry in a buggy or in the hand, when the medicines and instruments will be easily accessible, and which is waterproof.

A straw burning attachment for stoves has been patented by Mr. Silas C. Purdy, of Atkinson, Neb. It consists of a fire box adapted to the front of an ordinary cook stove, on which a straw or fuel reservoir is adapted to be set when filled, and turned bottom upward, the construction being such that the draught can be readily regulated, while the attachment does not interfere with the ordinary uses of the stove.

A hoisting and lowering apparatus has been patented by Mr. Augustus Ilse, of Evanston, Wyoming Ter. This invention embraces a rectangular frame attached to a heavy base to support the apparatus on the floor of a building inside of a window opening, there being a cross piece carrying a swinging arm or boom hinged to the frame, making a device for hoisting and lowering furniture, goods, etc.

A horseshoe has been patented by Mr. Edwin A. Monroe, of Saratoga Springs, N. Y. It has a continuous calk, and inwardly and forwardly projecting lips at its heel, with upwardly projecting lugs, and other novel features, making a shoe which can be readily put on by an amateur after fitting by an expert, and also one which will not ball or pick up stones, and will give the horse an excellent foothold.

A process of casting car wheels has been patented by Mr. William Wilmington, of Toledo, Ohio. This invention covers an improvement on a former patent of the same inventor, to secure with certainty the melting of ferro-manganese or spiegeleisen before it has entered the mould of a car wheel, thus better attaining the gradual modification of the chill-hardening properties of the cast iron in varying degrees in different parts of the wheel.

A glass beveling machine has been patented by Mr. Thomas F. Gilroy, of New York city. Combined with a grindstone and its carriage, and means for moving the latter back and forth parallel with the axis of the grindstone, is an adjustably pivoted and spring pressed rod for holding the glass plate on the carriage against the grindstone, with other novel features for automatically shifting and pressing the edge of the glass against the stone.

A circular knitting machine has been patented by Messrs. Wm. Pearson, Wm. R. Brown, and HerbertPrice, of Salt Lake City, Utah Ter. This invention provides means for raising the needles when preparing for "ribbing" by means of a semicircular bar inserted in the inner portion of the tube, the bar having notches to raise the proper number of needles at once, and being moved from the outside by handles or hooks, to catch the needles by the shoulders.

A machine for waxing paper has been patented by Mr. Edward G. Sparks, of Brooklyn, N. Y. This invention consists in the novel use of one or two heated blankets charged with wax or paraffine, and so arranged that the web of the paper to be waxed may be drawn beneath or between these blankets, and so waxing the paper that it will not need any subsequent treatment, such as reheating, polishing, or scraping, to remove surplus wax.

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.

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.

Machinery, Tools, and Supplies of all kinds. Prices on application. Estimates furnished. C. L. Jackson & Co., successors to Jackson & Tyler, No. 54 German St., Baltimore, Md.

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

A Catechism on the Locomotive. By M. N. Forney. With 18 plates, 227 engravings, and 600 pages. $2.50. Sent on receipt of the price by Munn & Co., 361 Broadway, New York.

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

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.

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.

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

Go as you Please,

but if you are constipated, or have sick headache, bad taste in the mouth, rush of blood to the head, bilious complaint, or any similar difficulty, you should go at once to your druggist for Dr. Pierce's "Pleasant Purgative Pellets," the most efficient means for eradicating it, by correcting all disorders of the liver, stomach, and bowels. Small, sugar-coated, agreeable to take, and cause no pain or griping. By druggists.

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

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

Greene, Tweed & Co., Railroad and] Manufacturers' Supplies, have removed to 83 Chambers St., city.

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.

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

Curtis Pressure Regulator and Steam Trap. See p. 142.

Best Automatic Planer Knife Grinders. Pat. Face Plate Chuck Jaws. Am. Twist Drill Co., Meredith, N. H.

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

Steam Hammers, Improved Hydraulic Jacks, 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, Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., 112 Liberty St., 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.

Blake's Belt Studs are the strongest and best fastening for Leather and Rubber Belts. Greene, Tweed & Co., New York.

"How to Keep Boilers Clean." Send your address for free 88 page book. Jas. C. Hotchkiss, 93 John St., N. Y.

Barrel, Keg, Hogshead, StaveMach'y. See adv. p. 366.

Planing and Matching Machines. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Nystrom's Mechanics.—A pocket book of mechanics and engineering, containing a memorandum of facts and connection of practice and theory, by J. W. Nystrom, 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.

Cotton Belting, Rubber Belting, Hose, and Packing. All kinds. Greene, Tweed & Co., 83 Chambers St., N. Y.

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

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

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.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) S. L. M. asks (1) a recipe for making alcohol from acorns. A. Crush the acorns, winnow carefully free from shell and skin, mix about 10 per cent of malt and water, heat to 150° Fah. for a few hours, strain, mix the liquid with 1 per cent yeast, and keep at 63° Fah., until fermentation is complete, and then rectify by several distillations. Personal experience and technical skill are of the highest importance, and no success is possible without them. 2. A recipe for making a snare for insects? A. For nocturnal insects, such as moths and beetles, a lighted lamp; sugar or molasses will attract many. 3. How is hydraulic cement made? A. In various ways. Sometimes by calcining and grinding impure limestones. Sometimes by grinding limestones and clays together and then calcining the mixture. 4. Could a person who has good facilities make a good living out of trout culture? A. Trout culture seems not to be very remunerative at the present day. 5. Who was the first inventor of the cash railway for stores? A. It would require an extensive and costly search to determine who was the first inveutor of the invention in question. 6. Why does salt preserve meat? A. It resists the development of bacteria and low forms of life, as do many other metallic salts. 7. Four arc lamps, with a resistance of 6 ohms each, are joined in series 150 feet apart, the first lamp 1,500 feet and the last 1,350 feet from the dynamo. The line wire has a conductivity of 96 per cent that of pure copper. Its resistance must not exceed 8 per cent of that of the lamps. The resistance of a foot of pure copper wire 1 mm. in diameter being 9·94 ohms, what must be the diameter of the line wire? The total length of wire is 1,500+450+1,350= 3,300 feet. The resistance of the four lamps is 24 ohms. Eight per cent of this is 1·92 ohms. A foot of the 96 per cent wire 1 mm. diameter would have a resistance of 9·94÷0·96 ohm=10·35 ohms. With this as standard the line wire should be 133·38 mm. in diameter to give a resistance of 1·92 ohms. 8. What length of No. 0000 pure copper wire will have a resistance of one ohm? A. 19,605·69 feet.

(2) W. N. writes: I am using a mixture of some kind for soldering which is of a milky white color and smells of alcohol. What is it made of? A. Possibly it is a solution of lactic acid in alcohol, with perhaps other ingredients.

(3) E. J. N.—See the word asbestos in Webster. Lead pipe is made by forcing partially congealed molten lead by hydraulic pressure through dies in which a core is inserted.

(4) S. T. W.—The efflorescence on brick walls to which you refer is quite common. It consists, as a rule, of more or less of sulphate of magnesia (Epsom salts), contained either in the bricks or the mortar or in both. Unfortunately there is no cure, although it will often disappear of itself or will only be seen at long intervals. In some cases painting the walls with several coats of good oil color has been found effective. Read a paper on the subject by W. Trautwine, contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 123; also paper on preservation of building material in SCIENTIFIC AMERICAN SUPPLEMENT, No. 526.

(5) E. H. asks how near to New York sulphur springs have ever been discovered. A. While water containing slight traces of sulphur may be found within comparatively few miles of the city, the nearest springs, we believe, which contain a sufficient amount of sulphur (hydrogen sulphide) to make them of any medicinal importance are those at Sharon Springs, in Schoharie County, about 165 miles from New York.

(6) L. M. B. asks: 1. What horse power would a 3 cylinder engine 3×3 inch have at 300 revolutions, 80 pounds pressure? A. A three cylinder engine, 3 inches cylinder and 3 inches stroke, running at 80 pounds, no expansion, and at 300 revolutions, would give nearly 8 horse power. 2. What size wire would be necessary for a dynamo four times the size of the dynamo described in SUPPLEMENT, No. 161? A. Use No. 12 and 14 wire. 3. How many 16 candle power incandescent lamps should it be capable of running? A. About four such lights.

(7) W. H. M. and J. M. ask how and of what material the carbons for electric lights are made. A. Of finely powdered coke or some other form of carbon cemented together with coal tar, pitch, or sugar, and heated to a high heat to decompose the cementing material, and sometimes redipped several times into the tar or other liquid and reheated. This is the general method, but there are numerous variations.

(8) M. T. L. says: I am making an electric motor, like that described in SCIENTIFIC AMERICAN, vol. liv., No. 7, page 102, and I have a spool 2¾ inches between flanges, tube ¾ outside, ½ bore, diameter of flange 1¾. 1. What size wire shall I use to wind, and how many layers? A. Use No. 16–20 wire, winding the spool full. 2. Have I made my flanges too wide? A. Your flanges are a good width. 3. How wide an armature ¾ thick do I want? A. Make your armature about ¾ inch wide. 4. Would a counterweight on rear end help any? What length of stroke? A. Use no counterweight; it would reduce the power; give it ¾ inch stroke. 5. Approximately, how much gravity battery is needed to run it? A. Six to ten cells.

(9) G. E. C. asks: What are the chances for success in the profession of chemistry as a practical chemist? Is it possible for a young man with a good education but unable to take college course in chemistry to become a chemist, and what is necessary to be done? How can one get started, and while learning is it possible to earn a fair living by working at the business? Finally, is it an unhealthy business? A. Chemistry as a profession is quite healthy, but except for the few is rather unremunerative. You will earn little while in the learner's stage. Study at home supplemented by work in the laboratory would answer as an imperfect substitute for a regular course.

(10) W. W. R. asks whether railroads whose motive power is electricity are cheaper than those employing horse power. A. This depends on many factors. Where the dynamos can be worked by natural power, as by tidal or other mills, an electric railroad is the cheaper to run. 2. Also, if there is a description in any of your papers of an electric railroad in operation at Baltimore? A. No, but the New York electric railroad of the same constructor is described in SCIENTIFIC AMERICAN, vol. liii., No. 21.

(11) W. W. C. asks: 1. Will you please explain the construction of an annunciator on a burglar alarm, and how it operates? A. Annunciators are frequently worked by drop shutters, connected individually to the doors or windows of the different apartments. When the connection is made by opening a protected window or door, the shutter drops, and discloses the name of the apartment. 2. What is it that makes annunciators so expensive? A. General expensiveness of manufacture, royalties on patents, and similar causes. 3. Of what use is an induction coil in a circuit? A. In a telephone circuit it substitutes a high tension current for a low tension one, obviates the necessity for heavy batteries and large line wire, and by doing away to this extent with induction effects, makes the line more sensitive and less sluggish.

(12) W. S. H.—All steam launches on navigated waters have to pay a license fee of $5.00, be registered, and have a pilot's and an engineer's license, 50 cents each, which may be to one person. Launches on private waters or on waters having no traffic are free.

(13) H. B. asks how to make a boiler that will heat say about two gallons of water in the quickest time to 212°. A. By making the bottom with deep corrugations, so as to expose a large surface to the fire.

(14) H. A. B.—It is cheaper and more economical to carry steam to the distance of a hundred yards than to transmit power this distance by cable. Felt and protect the pipe thoroughly. The friction of the wire cable with its shafts and carrier wheels is greater than the loss of steam by condensation. Cable is not as good or cheap as shafting for the same power for a distance of 300 feet. The turning of a right angle on a cable need lose no more than 5