

ENGINEERING INVENTIONS.

A traction cable grip has been patented by Mr. William Martin, of San Francisco, Cal. The invention provides for a frame with grooves in which planks are fitted to slide, rollers mounted on the planks, brakes for the rollers, and means for forcing the rollers upon a cable, and the brakes upon the rollers, with various novel features, so that the running cable will be taken hold of gradually without wear thereto or shock on the car.

A balanced slide valve has been patented by Mr. Daniel A. Woodbury, of Rochester, N. Y. This invention provides for such construction as relieves the sliding faces of both the main and cut-off valves to any desired extent, a relief plate being so adjustable as to bear the entire pressure of the steam, by means under the control of the engineer, and so contrived as to accomplish the same by one movement of the adjusting device.

A car seal has been patented by Mr. Thos. P. Wentworth, of Elroy, Wis. The car having a vertical slot for receiving a seal key, a grooved block is held on the inner surface of the car and a latch held to slide in the groove, the latch adapted to engage and lock in place a seal key inserted through the slot, and having one beveled end and a head on the opposite end, making a simple and effective car door seal, the seal key having to be broken or destroyed to be removed from the outside.

MECHANICAL INVENTIONS.

A plowshare tongs has been patented by Mr. George M. Sebastian, of Arkansas City, Kansas. The tongs are composed of three members pivoted together, with a brace clamp adapted to be attached to the tongs and to the object held therein, the jaws and handles being arranged to grasp both the plowshare and the bar, holding the edges thereof to be welded together in close contact, so that a true and perfect weld may always be effected.

AGRICULTURAL INVENTIONS.

A soil pulverizer has been patented by Mr. Benjamin Deem, of Spring Hill, Kansas. In this invention the roller comprising the cylinder or drum is fitted with a core upon the axle of the carrying frame, the drum having a series of rows of slots, combined with segmental cutters, and their inner surfaces having projections or tenons fitted into sockets or mortises.

A plow has been patented by Mr. William L. Quick, of Molino, Tenn. The invention provides for such construction that plows can be readily adjusted for various kinds of plowing; a small plow can be attached to one end of the foot for cultivating close to rows of plants, and a larger plow attached to the other end for opening the furrow between the rows, etc.

A hand corn husker has been patented by Mr. Robert C. McMinn, of Golden City, Mo. The invention consists of a metal plate forked at the outer end in the form of hollow bent claws, and in means for adjusting the strap to suit different sized hands, or to pass over a mitten, so a better hold is taken on the ear of corn, and the husker is made to act more efficiently and with greater ease.

MISCELLANEOUS INVENTIONS.

A fastener for knob spindles has been patented by Mr. Le Grand Terry, of Horseheads, N. Y. This invention consists in a novel construction and arrangement of parts of knob shank, notched escutcheon, etc., making a door knob which can be locked so it cannot be turned, thus locking the door.

A neck yoke has been patented by Mr. Cyrus R. Furey, of Logansport, Ind. This invention provides a new and improved attachment for neck yokes for holding the neck yoke ring and the martingale strap, and consists in a neck yoke having a spring snap at each end.

A fireproof hanging ceiling has been patented by Mr. Louis Lafond, of New York city. This invention consists in a ceiling constructed with iron bars placed edgewise on the flanges of the iron girders, and carrying the iron hangers that support the ceiling tiles, whereby the latter will be firmly supported.

The art of treating cigars is the subject of a patent issued to Mr. James D. Culp, of San Felipe, Cal. The invention consists in applying to cigars a coat or dressing of paraffine dissolved in naphtha, to improve both their flavor and burning quality, render the wrapper more flexible and tough, and prevent drying out of the filler.

An inkstand has been patented by Mr. William O. Rastetter, of Dalton, Ohio. It is surrounded by a removable casing, on which tubes are formed, in the lower ends of which are corks or other stoppers to form feet, making a soft and yielding support for the inkstand, and preventing injury to the points of the pens passed into the tubes.

A fire escape has been patented by Mr. Eli Frazier, of North Lawrence, Kansas. This invention relates to that class of fire escapes in which an endless rope or chain is used for lowering persons, each one descending by his own weight, the friction of the rope on pulleys preventing the descent from being too rapid.

A cash carrier has been patented by Mr. George H. Spring, of Le Mars, Iowa. This invention relates to devices used in large stores for carrying the cash from the counters of the clerks to the cashier and returning the change, and involves the use of a car on a horizontal wire, being designed to simplify this system of cash carriers and expedite their action.

A cream can gauge has been patented by Mr. Charles E. De Long, of Vermillion, Dakota Ter. The can has a longitudinal slot with lateral notches at one end, and a strip creased to form pockets along the side edges, into which pockets the side edges of the slot in the can are passed, whereby the creased slip is held in the slot, a strip of glass being held in the creased strip and numerals or other characters produced thereon.

A method of hardening or improving resins of all kinds has been patented by Mr. Albert Kissel, of Frankfort-on-the-Main, Germany. This invention provides for the conversion of the acids in balsams, resins, and their compounds, by means of lime or other alkaline earths, into their respective salts, in order to harden the resins, resinous by-products, or resin preparations.

A wheel scraper has been patented by Mr. John W. Whipp, of Van Alstyne, Texas. The invention consists in a frame adapted to partly embrace the wheel and carrying longitudinal and transverse scraping wires, with means for adjusting their tension, the transverse wire having means for adjusting it vertically, and the frame being held adjustably on an arm or bar on the axle.

A door knob has been patented by Mr. Edwin A. Johnson, of Allegheny City, Pa. This invention relates to that class of knob attachments in which a serrated spindle is engaged by the edge of a key inserted through an aperture in the knob shank, and its object is to facilitate the adjustment and securing of a door knob on the knob spindle according to the thickness of the door.

An oil lamp feeder has been patented by Mr. William H. Dillon, of Glasgow, Ky. This invention consists of a special construction and combination of parts having for its object to use oil conducted like gas in pipes, to raise the lamp wick and to open the valve which admits oil thereto at the same movement; also to raise or lower the wick without operating the valve.

A bow hook for neck ties has been patented by Mr. Julius Schlesinger, of Hoboken, N. J. It is self-adjusting, formed of a piece of wire bent to form a prong, from the upper end of which two parts are inclined downward and outward on opposite sides, these parts having hooks on their free ends for receiving the shield of the bow, and the prong having a bend at its upper end.

A lock joint for fishing rods has been patented by Mr. Justice Webb, of Georgetown, Ky. With a sleeve having an annular ridge or collar and two studs is an additional sleeve fitting on the front end carrying a sliding sleeve with two L-shaped slots for receiving the stud on the other sleeve, making an improved lock joint for firmly holding together the sections of a fishing rod.

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.

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Wanted.—The address of manufacturers of best Wrought Iron Pipes. E. Baumgarten, Schulerburg, Texas.

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The Cyclone Steam Flue Cleaner on 30 days' trial to reliable parties. Crescent Mfg. Co., Cleveland, O.

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Quinn's device for stopping leaks in boiler tubes. Address S. M. Co., South Newmarket, N. H.

Hercules Water Wheel—most power for its size and highest average percentage from full to half Gate of any wheel. Every size tested and tables guaranteed. Send for catalogue, Holyoke Machine Co., Holyoke and Worcester, Mass.

Mills, Engines, and Boilers for all purposes and of every description. Send for circulars. Newell Universal Mill Co., 10 Barclay Street, N. Y.

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Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 45 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

For Freight and Passenger Elevators send to L. S. Graves & Son, Rochester, N. Y., or 46 Cortlandt St., N. Y.

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The Hyatt filters and methods guaranteed to render all kinds of turbid water pure and sparkling, at economical cost. The Newark Filtering Co., Newark, N. J.

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

Steam Boilers, Rotary Bleachers, Wrought Iron Turn Tables, Plate Iron Work. Tippet & Wood, Easton, Pa. "The Sweetland Chuck." See ad. p. 124.

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

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Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

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Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 133 Center St., N. Y. Curtis Pressure Regulator and Steam Trap. See p. 78.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 77.

Drop Forgings. Billings & Spencer Co., Hartford, Conn.

Brass & Copper in sheets, wire & blanks. See ad. p. 125.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 20,000 Crank Shafts and 15,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

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Knurling Tool, self-centering, for lathe use. Pratt & Whitney Co., Hartford, Conn.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Name 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 mail, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service 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) S. B. G. asks the rule to find the dominical letter for any year in any century. A Rule: Divide the number of centuries and the years of the given century each by 4, and the years again by 7; multiply the remainders respectively by 2, 2, and 4; add together the three products, and increase their sum by 1; then divide the whole sum by 7, and the remainder will be the ordinal number of the dominical letter required. If 0 remain, it will be the 7th, or G. In bissextile years two dominical letters are used. Example: 1884.

$$\begin{aligned} \frac{1}{4} &= 4 \text{ and } 2 \text{ rem. } 2 \times 2 = 4 \\ \frac{2}{7} &= 21 \text{ and } 0 \text{ rem. } 0 \times 2 = 0 \\ \frac{1}{7} &= 12 \text{ and } 0 \text{ rem. } 0 \times 4 = 0 \\ & \qquad \qquad \qquad 4 \\ & \qquad \qquad \qquad \text{Add } 1 \\ & \qquad \qquad \qquad \hline & \qquad \qquad \qquad 5 \end{aligned}$$

which, being less than 7, is the ordinal number for E; it being a bissextile year, F precedes E until the 1st of March, the order of the letters being reversed as applied to the succeeding years.

(2) E. H.—The disintegrating properties of steam heat at 60 pounds pressure are well known to engineers and the steam heating trade. Paper is never used except as outside covering for low pressure steam pipes, and then only as a makeshift.

(3) A. S.—You are right. Brakes should never be strongly applied to a moving train on a bridge of any size, and the best railroads prohibit such practice; when necessary to reduce speed in crossing, the brakes are applied before reaching the bridge and then released when crossing. Very likely many bridges have had their lives much shortened, and many accidents have happened, from neglect of this rule.

(4) P. B. asks how large a carbureter, or how many feet of evaporating surface, with gasoline of 87 or 88 gravity, would be required to get gas enough for eight burners of five feet an hour each. A. About 12 square feet. Less will do when the carbureter is freshly charged. 2. Suppose a ball of 25 miles in diameter could be placed 500 miles on this side of the full moon, would it not appear to be a spot on the moon to our naked eye? A. You would scarcely be able to discern a spot or shadow of a ball 25 miles diameter between the full moon and the sun at the distance named with the unaided eye. A telescope would easily show it.

(5) E. J. R. asks for a receipt of a cheap glazing for common earth ware, such as is used for common gray or brown ware. A. A brown cottage glaze consists of litharge 60 parts, flint 32 parts, brown slip 8 parts. This must be used of about the same consistency as cream color glaze, and will stand the highest temperature of heat in a common glazing oven. See also glazes for pottery, SCIENTIFIC AMERICAN SUPPLEMENT, No. 313.

(6) D. J. P. asks how the birch beer sold in saloons is made. A. A very excellent sparkling beer can be made from the sap of the birch by adding to it from 8 to 10 per cent of its weight of sugar and 0.2 to 0.3 per cent of tartaric acid. According to another

authority, the best product is made by adding to 100 pounds of the sap about 6 ounces of tartaric acid and 8 to 10 (or if a stronger product is wanted, 16 to 24) pounds of sugar and 3 ounces of a strong almond milk. The mixture is fermented in the usual manner, put in bottles with a little more sugar, and securely sealed. Several formulas for similar effervescent beverages are given on page 4308 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 270.

(7) W. R. wishes to know what is the right temperature to raise family bread at. A. The raising of the bread should take place at a temperature of from 90° to 100° F., and the heat in the oven should be from 400° to 440° F. We suggest as interesting in this connection, Mr. George M. Whitaker's article on 'Theory and Practice of Bread Making,' in SCIENTIFIC AMERICAN SUPPLEMENT, No. 170, and also Dr. Graham's paper on the Chemistry of Bread Making, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 222.

(8) L. H. F. asks: 1. What is the *modus operandi* to cook raw meats, especially corned beef, economically and with the least shrinkage, looking to its preservation? A. Each packer has his own special *modus operandi*, which is kept "strictly secret." In a general way the meat is first cooked in the ordinary way, then put into the can and sealed, boiled in this condition for some time longer, when it is removed and a vent opened in the can in order to allow all gases, etc., to escape, again hermetically sealed, boiled for a few minutes and the operation is completed. 2. Why cannot cooked corned beef and animal soups be kept from becoming rancid after being put up in air tight (so called) cans? And if deleterious gases are generated, say how caused and how prevented. A. By the foregoing process all deleterious gases are driven off, and once sealed the articles remain good for years. Deleterious gases are only induced by decomposition resulting from access to the air.

(9) F. P. H. desires to know how aluminum is taken from the ground. A. The aluminum in the ground is in the form of aluminum oxide; this is treated so as to form the double chloride of aluminum and sodium. The latter is then decomposed by heating it with metallic sodium, fluorspar or cryolite being added as a flux. SCIENTIFIC AMERICAN SUPPLEMENT, No. 50, gives in more detail the method of manufacture. Recently improved methods have been introduced, but they are essentially the same as the foregoing outline.

(10) H. M. B. asks how to make cup grease for lubricating machinery, something light colored. A. In a small boiler dissolve from 56 to 60 pounds of soda in about 3 gallons of water. In a 60 gallon boiler melt tallow, and to it add palm oil, each in quantity according to season. In summer weather, tallow, 1 cwt. 3 qrs.; palm oil, 1 cwt. 1 qr. In winter, tallow, 1 cwt. 1 qr.; palm oil 1 cwt. 3 qrs. In spring or autumn, tallow, 1 cwt. 2 qrs., palm oil, a similar quantity. As soon as the mixture boils, put out the fire and let the mixture cool down gradually, frequently stirring while cooling. When reduced to blood heat, run it off through a sieve into the solution of soda, stirring it well to insure a perfect mixture of the ingredients.

(11) S. G. writes: I keep a boarding house to make a living. For several years I have put up my own jellies and preserves, and in order to make them cheap have used apple juice to make jelly; but I find it will ferment in a few weeks' time. Can you tell me of an anti-ferment that will stop fermentation, and in what proportion is it used to a gallon of juice? A. ¼ to ½ per cent of formic acid is said to possess powerful preservative properties and to be particularly suitable for adding to fruit juices. Add it to the boiling mass. Salicylic acid is likewise used.

(12) D. D. L. desires to obtain, at a moderate cost, a compound by mixing two or more ingredients which will harden in a few minutes after being united. To answer the purpose it should become quite firm. A. If equal parts of common calcined plaster of Paris and of potassium sulphate be mixed together, they will harden in a moment with less than an equivalent weight of water; so much so indeed that the mixture cannot be poured out of the vessel. The rapidity of hardening therefore can be made to vary with the percentage of water, the mass solidifying even if 6 parts of water be used.

(13) M. B. T. writes: 1. Pure water at 60° temperature has specific gravity of 1. What is its specific gravity at 70°, 80°, and 90°? A. At 70° the specific gravity would be 0.99897, at 80° 0.99768, at 90° 0.99599. 2. Is the expansion of water regular from freezing to boiling? A. The expansion is not regular. It first contracts up to 39.2° Fah., and then expands. 3. Would sirup or honey having specific gravity of 1.4 at 60° expand the same as water with each additional 10° or 20° of heat? A. It is not likely that it would; we have no information on this subject, however. 4. What per cent of sweet has sirup that has a specific gravity of 1.4? A. About 86.5 per cent of sugar.

(14) E. J. G. asks for a recipe to prepare paper for the "blue process" of copying. A. Use two separate solutions of:

- Iron and ammonium citrate.....1 oz.
- Water.....4 oz.
- Potassium ferricyanide.....1 oz.
- Water.....4 oz.

For use, mix equal quantities and float paper for two minutes.

(15) J. B. H. asks the ingredients impregnating the "indelible copyable ribbon" used on type writers. A. The ink which has generally been used for the ribbons consists of:

- Aniline black..... ½ oz.
- Pure alcohol......15 "
- Concentrated glycerine.....15 "

Dissolve the aniline black in alcohol and add the glycerine. Recently however an ink has been prepared by using printing ink and diluting it with boiled linseed oil and adding an iron salt. We cannot vouch for the following formula, but it is similar to what is