ENGINEERING INVENTIONS.

A car gate has been patented by Mr. Chas. H. Hughes, of St. Louis, Mo. A series of bars form the gate, and combined therewith are tubes inserted in the car wall and adapted to receive the bars, each bar having a roller on its free end to run on the inner surface of the pipe.

A car coupling has been patented by Mr. Ferdinand P. Fisher, of Numidia, Pa. This invention covers a novel construction and combination of parts for an automatic coupler, providing means to receive and catch the common link, whether carried by a special or by the common draw head, and to guard the link against being broken.

An injector has been patented by Mr. Silas W. Moreland, of Geneva, O. This invention provides for utilizing an auxiliary steam jet to re-enforce and accelerate the effect of a primary jet, so as to render the injector more effective with any pressure of the steam and more reliable with variable pressures, besides affording a simple and cheap construction.

A steam boiler has been patented by Mr. Jose Rosello, of Havana, Cuba. Its outer shell is formed of a fixed section and a vertically removable section, with a casing surrounding the outer shell, and with an opening in which the shell can fit closely, so that it can be cleaned readily, and scale and other deposits removed from the tubes and the inner surface of the sides of the boiler.

A snow plow has been patented by Mr. George A. Gunther, of New Utrecht, N. Y. This invention covers an improvement on a former patent of the same inventor, and provides for a snow plow with a cannon or firing block, with a branching longitudinal bore, a wheel for receiving cartridges or torpedoes, gearing for revolving the wheel, and other novel features, for loosening and scattering the snow.

A slide valve has been patented by Mr. Riley Doty, of Leonardsburg, O. This invention is an improvement on a former patented invention of the same inventor, the live steam supply pipe to the back of the exhaust wolve being connected with the live steam chest, so the water of condensation may escape back to the live steam chest and through cylinder and exhaust with the steam, so the exhaust valve will work better than when the chest is flooded with water.

MECHANICAL INVENTIONS.

A device for automatically breaking doubled yarns in spinning mules and jacks has been patented by Mr. Celestin P. Maillard, of Fismes, France. This invention covers a novel construction by which all doubled threads, coming from broken ends being entangled with and twisted upon sound threads, are automatically broken at each drawing.

A nut lock has been patented by Mr. William H. Rothermel, of Blandon, Pa. Combined with a washer having ratchet teeth in its periphery and means for engaging a nut is a flat spring pawl with a rigid support, which projects out over the ratchet teeth to support the pawl in proper position, with other novel features.

A nut lock has been patented by Messrs. Philip Thomas, James E. Morris, John H. Chattin, and James T. Fisher, of Brighton, W. Va. The nut has notches in its rim along the inner edge, with a washer disk having notches in its rim along the outer edge, and a semicircular spring held on one end on the nut or disk, having at the opposite end a tooth or prong adapted to be passed into a notch in the disk, and a notch in the nut for locking the nut and disk together.

AGRICULTURAL INVENTIONS.

A grass seed harvester has been patented by Mr. Jacob I. C. Naff, of Winchester, Ky. The invention consists in comb teeth of peculiar form, peculiar elevating devices, and novel guides and bearing blocks for the axle, so the comb may guard itself from being choked by large weeds, and quickly raised or depressed to follow the height of the grass.

A combined cotton planter fertilizer distributer has been patented by Mr. Frank L. White, of Lebanon, Tenn. It is constructed with wheels and axle and a frame carrying the hoppers, with discharge wheels connected with each other and the axle by chains and chain wheels, the frame having also a furrow opening plow and covering plows for bedding the soil with the fertilizer, a furrow opening spring runner with covering teeth, and a roller for planting the seed.

MISCELLANEOUS INVENTIONS.

A miner's drilling machine has been patented by Mr. John W. Keeney, of Coalburg, W. Va. This invention covers a novel construction and combination of parts to make a light, strong, and inexpensive machine for drilling holes to receive explosive charges in mining operations.

A trap for catching rats and mice or moles has been patented by Mr. Andrew J. Conway, of Belleville, Ill. The invention covers a special construction and combination of parts for making a trap that is very sensitive, which will kill the mouse, rat, or mole, and which can be folded very compactly when not in use.

A clip for hitching straps has been patented by Mr. Peter S. Eastman, of Osage, Iowa. This invention covers a novel holder, consisting of a plate with apertures and loop, with a double wire, so that the strap shall not become loose by accident, and the device saves the trouble of tying as usually practiced.

A saw gummer has been patented by Mr. John Stuempges, of Stevenson's Pier, Wis. The invention covers a combination, with a base block, of dies held therein, a plate held above the base block, means for pressing the plate on the base block and clamping the saw in place with gauges for holding the saw in proper position.

A mechanical telephone has been patented by Mr. John F. Sims, of Illiopolis, Ill. This invention covers a novel construction and combination of parts to facilitate the transmission of speech mechanically, and for properly adjusting the strain upon the transmitting wire, providing also a simple and effective means for giving a signal.

A cotton gin fire extinguisher has been patented by Mr. Thomas Renfroe, of Gainesville, Ga. This invention provides for a water distributing device held behind and between the brush and the saw, and connected with the water tank, so the water may be delivered on the revolving brush and saw, and thrown about in the lint room and on the gin.

A bird cage has been patented by Mr. William A. Coleman, of Rockville, Ind. There are side guides at the floor level, and a roll of paper extended over the floor of the cage and through the guides, so the soiled covering for the floor may be pulled out and torn off, and a new section from the roll unwound and made to take its place.

A combined lock and latch has been patented by Mr. Elijah Nyswonger, of Hanford, Cal. This invention covers an improvement on a former patented invention of the same inventor, whereby the construction of the lock is materially simplified, being operated without a spring, and capable of such adjustment that it cannot be opened from the outside.

A fifth wheel has been patented by Mr. Charles W. Allen, of Valentine, Neb. It is composed of a cup or semi-spherical socket adapted to be attached upon the upper side of the axle, and a hemispherical block or half ball fitting in the cup and adapted to be secured to the under side of the sand bar or forward spring of the vehicle.

A lamp bracket for musical instruments has been patented by Mr. James F. Conover, of New York city. This invention covers a bar held to slide into a piano casing at the end of the front, guided by suitable blocks, and having at its outer end a plate on which a lamp can be placed when the bar is withdrawn from the casing.

A plate holder for cameras has been patented by Mr. William H. Lewis, of New York city. This invention covers an improved catch for securing both shutters when closed, and also for holding the closed shutter when the other is withdrawn; also a fastening device for reliably holding the end covering or cap where the plates are inserted.

A sleigh has been patented by Mr. Charles A. Johnston, of Wall Lake, Iowa. This invention covers the making of the benches or beams and knees of sleds with T-bars placed side by side along the middle of the bench, with the heads of the bars upward and bent downward, and twisted in the knee portions, with other novel features.

A fence machine has been patented by Mr. Francis M. Comstock, of Keokuk, Iowa. The invention covers improved mechanism for corrugating wire and weaving it together with pickets of wood or iron, to make a cheap and substantial fence that may be put in rolls as delivered from the machine and transported to any desired place of use.

A chalice or communion cup for missionaries and traveling clergymen has been patented by Mr. Charles J. Curtis, of Washington, D. C. It is made in three separate parts, a bowl, a base, and an intermediate stem, so that it can be taken apart and the base and stem portion packed within the bowl, and thus be conveniently carried in the pocket.

A rowing apparatus or exercising machine has been patented by Mr. William Spelman, of Portland, Me. The apparatus provides for a continuous or endless track, with a boat or car on wheels and with oars, the act of rowing giving a forward movement to the boat or car, so the exercise will be more agreeable than the usual fixed machine.

A method of securing goods in the frames of embroidery machines has been patented by Mr. Benjamin F. Robinson, of New York city. This invention consists in plaiting the goods in the frame in such manner that nearly all the needles in the machine may be worked, notwithstanding the fact that the figures or patterns to be formed are a considerable distance apart.

A burglar alarm has been patented by Mr. Emil Baumbach, of New York city. It is made with a coiled spring inclosed in a case and carrying a swinging arm, levers, and pins for holding the arm while setting the alarm, a catch, and a nipple for holding a cap to be exploded, the contrivance promoting reliability and efficiency in the operation of burglar alarms.

A thill coupling has been patented by Mr. Edward H. Hollister, of Kenosha, Wis. The invention consists in a shackle of novel construction whereby increased convenience is afforded for shifting or exchanging the pole or shafts of the vehicle, which can be done without removing the eye piece from the clip of the shackle by simply unscrewing or taking off a nut.

A man trap for vaults has been patented by Mr. Samuel Cranston, of Philadelphia, Pa. It can be connected with a vault in such manner that when the vault door is opened the trap door drops and prevents the person that opened the vault door from escaping through the door at which he entered, and can be applied so as to entirely cover a vault or safe.

A silk and ribbon finishing machine has been patented by Honore Faisant, of Jersey City, N. J. This invention covers a special construction and arrangement of parts for watering and finishing silk with pressure rolls and steam heated rollers, with a corrugated roll for spreading the material laterally as it enters the machine, and other novel features.

A sash protector has been patented by Mr. Christopher C. Davis, of Flemingsburg, Ky. It consists of a metal strip to be attached on the upper face of the bottom rail of a sash, the strip having a ridge to be at the outer face of the glass, and with rests or stays for its inner face, and with drainage grooves, to allow any moisture which may collect on the inside of the glass to pass freely to the outside.

An apparatus for making composition flying targets and balls has been patented by Mr. Frank J. Moyer, of Lockport, N. Y. This invention covers a mould in two sections, the moulds being automatically filled with the molten mass, and after the balls have been cast, but before the entire contents are cooled, the mould is inverted and water sprinkled thereon, making the operation a very rapid one.

Business and Personal.

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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) W. C. S. writes: In your issue of 26th of July, in answer to question No. 2, you say "an inch pipe with an altitude of 25 feet (=10·85 pounds pressure) will deliver 5 gallons per minute, through a length of pipe=80 rods. Ellis' tables give 94 gallons per minute at 10 pounds pressure; this, of course is minus friction. Your estimate differs much from mine, and you will confer a favor if you will give me your formula for estimating friction. A. We use Haswell's Tabulated Numbers and Coefficients, $V = 2356\sqrt{\frac{h}{l}\times d^5}$ = V in cubic feet per minute, being the tabular formula for the variations in diameter. The tabular number for 1 inch being 4·71, the formula $V = \sqrt{\frac{4.71}{\frac{l}{h}}}$ = the discharge in cubic feet per minute; l = length, h = head or height. The computations for the various conditions of discharge are somewhat complicated. We recommend you to deduct from your pressure, as above given, the loss due to friction.

(2) R. T. sends us a specimen of a plant which he wishes us to name. A. It is Virginia snake root, or birth root (*Aristolochia Serpentaria*). The roots of this plant are well known in medicine and are kept in all drug stores.

(3) A. J. E. writes: The Water Works Company of this city propose to tap a creek one mile from the works with a pipe 14 or 16 inches at creek, decreasing to 8 inches at works, with a fall of ten feet in the mile. The water will be taken from a pond about four feet deep. This is all the force that it will have. What will be the discharge? It is to discharge into an open reservoir. A. The making of one-half or any part of the pipe line of different size is a mistake, as you will see by the following figures: A 16 inch pipe 2,500 feet long with half the fall, or 5 feet, will deliver about 2,300 gallons per minute. The 8 inch pipe for the balance of the line, or 2,500 feet, with a fall of 5 feet, will deliver only 285 gallons per minute. While a 12 inch pipe for the whole distance, say 5,000 feet, with 10 feet head, will deliver 795 gallons per minute. The cost of the 2,500 feet each of the 16 inch and 8 inch would be full as great as the cost of the 12 inch line through, and would deliver less than half the volume of water. A line of 16 inch pipe the whole distance will deliver 1,650 gallons per minute. A line of 8 inch pipe the whole distance will deliver 285 gallons per minute, or the same volume that the combined 16 inch and 8 inch pipes will deliver.

(4) H. P. C. asks: 1. I wish to make as nearly chemically pure sodium oleate as possible; what are the best and cheapest materials to use? A. Sodium oleate may be made by heating equal portions of soda and oleic acid with a small quantity of water; this forms a gelatinous mass, which can be purified by dissolving in alcohol. 2. Can commercial oleic acid be obtained pure? A. Purified oleic acid is sold in New York at 40 cents per pound, and a "C. P." oleic acid at $1.75 per ounce. The former is sufficiently pure for all practical purposes. 3. Is pure lard olein in the market? A. We do not know the article as you designate it, though fairly pure lard oil is plenty. 4. Is white caustic soda in sticks more than 98 per cent pure? A. It is not; the celebrated Greenbank alkali is of a guaranteed purity. 5. Is there a purer sodium oleate for sale in the market than Marseilles or Castile soap? A. The "Court de Payen" soap is considered the purest.

(5) J. C. H. desires directions for painting surfaces to imitate rosewood, the body color for the ground, and what colors are used in the grain and glazing or over graining. A. If you have the wood at present without paint, that is, the natural wood, the best plan will be to stain it with dragon's blood, carmine, English scarlet lake, and burnt sienna. A very bright shade is prepared by boiling well in water equal parts of logwood and red wood chips; this is applied to the wood while still hot, and from two to three coats are given according to the depth of color desired. You should stain your wood in streaks to imitate the natural wood, using, if you prefer, the materials first mentioned in varying proportions, always however with an excess of dragon's blood. Then varnish. If the wood is already painted and you desire to work over it, then it will be necessary to paint and grain with a mixture of English scarlet lake toned with burnt sienna (both ground in Japan) and finally varnished.

(6) E. M. & P. C. ask how a good scouring soap can be made; desire to make a tripoli soap, but would rather have it look white. A. Sand soap balls, which may be taken as a type of these sand soaps, are prepared by adding to the melted soap about half its weight of fine silicious sand. For the finer qualities finely powdered pumice stone is now usually employed. The best yellow soap, with or without the addition of one-third its weight of white soft soap, and a little sweet oil are considered the most desirable ingredients to use for the manufacture of these soaps. A description of the machinery used in forming cakes is illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 258.