ENGINEERING INVENTIONS.

An automatic car coupling has been patented by Mr. Joseph D. Majors, of Bragg's, Ala. In the drawbar is pivoted a spring-acted catch, having a rib adapted to engage the coupling link, and combined therewith are chains and levers for disengaging the catch from the link when desirable, this coupling being also readily used in coupling with other cars having the ordinary link and drawbar.

A steam engine has been patented by Mr. Desire F. A. Decaix, of Paris, France. The invention relates to the valve arrangement, a rotary or rocking plug or cock being employed in combination with a steam jacket surrounding the cylinder, and divided into two compartments or chambers by a central partition, the steam cylinder having at both ends holes or notches for the admission and exhaust of steam.

A feed water cleaner has been patented by Mr. James T. Bryant, of Richmond, Va. This invention covers an improvement on two former patented inventions of the same inventor, and provides a construction by which the sieve for stopping sediment may be cleaned by the steam from the injector when the latter is pulled back, and by which both the water inlet pipe and the injector feed pipe may be drained.

A car coupling has been patented by Mr. Albert H. Boies, of Hudson, Mich. In connection with a vertically slotted drawhead having a bridge is a combined hook and link mounted pivotally within the drawhead, a shaft with arms and crank arms, and a flexible connection between the arms and the pivotal shaft, whereby cars may be coupled or uncoupled without it being necessary for trainmen to enter the space between them.

A device for preventing the explosion of steam boilers has been patented by Mr. Bendix Meyer, of Geiwitz, Prussia, Germany. It consists in a plate of suitable yielding material, applied to an opening in the boiler, and adapted to be bent or flexed outward at a certain steam pressure, so the steam will escape before the bursting pressure is reached, a rubber or other elastic packing being used between the plate and the boiler shell.

MECHANICAL INVENTION.

A gib and key has been patented by Mr. John H. Robison, of St. Joe, Pa. The key has an eye at one edge of its wider end, and combined therewith is a gib having a threaded shank received in the eye of the key, with a nut and jam nut for forcing the key into its place, the object being to obviate the present disadvantages in adjusting connecting rod boxes and other parts of machinery by tapping them in one direction or the other with a hammer.

AGRICULTURAL INVENTIONS.

A cultivator has been patented by Mr. James B. Scantlin, of Fairview, Kansas. It is designed for plants planted in rows in fields, nurseries, and gardens, and, while simple in construction, is intended to cut up all the grass and weeds between the rows and leave them upon the top of the ground to be killed by the sun.

A combination plow has been patented by Mr. William H. Stanly, of Quitman, Ga. The construction is such that the plow can be readily adjusted to work as a single or double plow, and can be guided and controlled as easily as an ordinary single plow, whether working upon level ground or on ground planted in ridges, being fitted alike for preparing the land and cultivating the plants.

A gang hoe has been patented by Mr. Franklin T. Gilbert, of Walla Walla, Washington Ter. It is intended especially for use in destroying weeds, and its construction is such that the hoes may be run below the ground surface at any desired depth, which may be regulated by the mechanism, and that, as the weeds are cut off and killed, the soil is raised as it passes over the rear ends of the hoes, and is thus efficiently broken up and pulverized.

MISCELLANEOUS INVENTIONS.

A log bunk for saw mills has been patented by Mr. Philo B. Williams, of Butler, Ind. It is made to be used in connection with both ends of the log may be thereby, at the same time, thrown against the head blocks of the saw mill carriage.

A bicycle has been patented by Mr. Albert K. McMurray, of Brooklyn, N. Y. The main driving wheel is mounted in a peculiar manner, and arranged to be driven at an accelerated rate of speed by treadles, arranged in a novel manner, connected to the cross bar of the machine by elastic or spring bands.

A rein holder has been patented by Mr. William D. Taber, of Rockville, R. I. It is made of a single piece of wire bent to form loops by which the device is caught upon the dashboard, and loops in which the reins may be inserted and held to place by the tension of the wire, thus making a double automatic clamping device.

A cloth winder has been patented by Mr. Albert Brown, of Mendocino, Cal. The object of the invention is to improve the action or working of bolt-supporting devices, the spindle bearings having a sliding arrangement, and there being special provisions for measuring the cloth as it passes overthereel, with numerous other novel features.

A composition for tanning has been patented by Mary Sutherland, of Diamond, Mo. It consists of extract of cockle burr, terra japonica, and extract of hemlock, with commercial sulphuric acid, in water, the mixture being prepared and used in a manner specified, and designed to effect the tanning of all kinds of hides and skins quickly and thoroughly.

A revolving extension table has been patented by Messrs. David and W. H. Harry Fauber, of Marshfield, Ind. This invention covers a novel construction and combination of parts in a firm and easily adjusted table, in which the extension leaves can be readily pushed in and drawn out, and will be firmly supported and held securely in place in either position.

A dauber for blacking brushes has been patented by Mr. Moreland M. Dessau, of South Framingham, Mass. It consists of a brush formed of bristles clamped in an annular space, with an adjustable ferrule surrounding the body of the dauber or brush and adapted to sustain the bristles, the improvement being also applicable to stencil and other stiff brushes.

A platform for trucks has been patented by Mr. Thomas Wright, of Jersey City, N. J. This invention consists principally in the employment of double inverted arch bars, for holding and supporting the forward ends of the crosspieces of the platform, whereby the platform is made lighter and cheaper than ordinary platforms, while being stronger and less liable to sag.

A scaffold clamp has been patented by Mr. Charles Whittingham, of Toledo, Ohio. It has a roller and crosspin arranged in a slot of the clamp block, so that they are not likely to be damaged by rough handling of the clamp, the device being one supporting the lateral bearers for scaffold floors on the scaffold posts, and being especially calculated to be effective and safe.

A boiler for steaming food has been patented by Mr. Le Roy S. Bunker, of Valton, Wis. This invention provides a simple and convenient form of boiler for making steam, which can, by an outlet pipe, be supplied to a vessel containing food to be steamed, the water tank for the supply being connected by a pump with a coil which runs through the fire box and into the main water compartment of the boiler.

A car starter and brake has been patented by Messrs. Thomas Cox and Thomas Cox, Jr., of Charles Stratton, Pa. The mechanism employed to start and stop the car are controlled by a single lever, and the main object of the invention is to entirely dispense with the use of springs, the parts being so arranged that the starting mechanism may be employed time after time in quick succession, should the load upon the car be excessively heavy.

An automatic grain weighing and registering apparatus has been patented by Mr. Curtis L. Burgess, of Woodhull, Ill. Combined with a cylinder having two compartments and trunnions, with pivoted arms supporting the cylinder, is a weighing beam connected with the pivoted arms with a sprocket wheel having two pins on its face, and a lever operated by the pins on the sprocket wheel and connected with the registering device, with other novel features.

A cable grip has been patented by Mr. Thomas O. Cooper, of Wilmington, Del. This invention covers an improved construction, combination, and arrangement of parts of a grip for street cars moved by an endless cable, the arrangement being such that the cable can at any time be quickly dropped from the clamping jaws, or be as readily picked up thereby, the jaws being of soft metal, which can be readily removed and replaced when they become worn.

A hub attaching device has been patented by Mr. Walter A. Clark, of Chicago, Ill. The apparatus is so arranged that the wheel may be removed by imparting a simple turn to the hub cap, which will be returned to its normal position by the action of a spring, so that when the hub is slid upon the axle the parts will be in position to permit the automatic action of the retaining device, the construction being cheap, efficient, and durable.

A rack collar for the tempering wheels of pug mills has been patented by Messrs. George S. Adams, James Roach, and Elmer A. Sherwood, of Rondout, N. Y. The collar is made in two parts, hinged together and adapted to be held in place upon the bushing or hub of the wheel by a bolt or screw, so that, by removing the screw, the collar may be easily removed, and as easily replaced without removing the tempering wheel from its shaft or axle.

A shaking apparatus has been patented by Mr. Charles Collins, of Doctor Town, Ga. It is an apparatus for mixing liquids, and, in connection with a frame or plate having an opening, has a movable plunger rod, and other novel features, whereby a tray may be revolved to bring different receptacles holding sugar, lemon, cracked ice, etc., in convenient position for use in mixing drinks.

A tanning process has been patented by Mr. James T. Rhyne, of Durant, Miss. After preparation in much the usual way, the tanning is effected with a mixture of water, gambier, salt, sulphuric acid, and saltpeter, then beaming by hand or passing through pressure rollers, immersing in lye water, and again in fresh water; after the hides are dry, they are treated with boiling hot fish oil and beeswax on the grain side, and a boiling mixture of tar, tallow, fish oil, and beeswax on the flesh side.

A scavenger mechanism for spinning and drawing machines has been patented by Mr. William A. Delmage, of Lowell, Mass. It is a device for collecting the broken ends of the yarn, and the waste produced by the usual drawing rolls, and conducting them away, so that they do not become entangled with the other threads, a pair of rollers being arranged to receive the broken ends and a pneumatic tube to receive the waste from the auxiliary rollers, there being also a friction roller to generate electricity to draw the broken threads and waste.

A process of manufacturing colored relief impressions on sheet metal has been patented by Messrs. Friedmann Priester and Otto Weidemann, of Berlin, Germany. It consists in coating the sheet metal with a specified isolating coat, on which is painted an elastic background, capable of absorbing colors, on which the desired pattern is placed, whereby the metal plates can be pressed into reliefs without displacing the coloring matters, and the colors will not be afterward affected by chemical action of their constituents with the metal.

NEW BOOKS AND PUBLICATIONS.

THE THEORY AND PRACTICE OF SURVEYING. By J. B. Johnson. New York: John Wiley & Sons.

This work, while practically adapted for the use of surveyors and engineers generally, is especially designed for the use of students in engineering. It treats very elaborately of the adjustment, use, and care of instruments, of topographical surveying by the transit and stadia, hydrographic, mining, and city surveying the measurement of volumes, geodetic surveying and projection of maps, map lettering, and topographical symbols. The book is profusely illustrated, and has numerous valuable tables.

THE SURVEYOR'S GIUDE AND POCKET TABLE BOOK. By B. F. Dorr. New York: D. Van Nostrand.

This little hand book quotes very liberally of United States law and the decisions of the Supreme Court on points touching surveying, and gives in very plain style a good deal of practical information on matters not usually treated of in books on surveying.

TOPOGRAPHICAL DRAWING AND SKETCHING, INCLUDING APPLICATIONS OF PHOTOGRAPHY. By Lieutenant Henry A. Reed, U. S. A. New York: John Wiley & Sons.

The author of this work is assistant professor of drawing at the United States Military Academy, West Point, and here gives the best methods of drawing and sketching as practiced there and in the principal topographical schools of the country, commencing with the most elementary details. The book is a handsome quarto, illustrated with many plates.

THE CIVIL ENGINEER'S FIELD BOOK. By Edward Butts. New York: John Wiley & Sons.

This is a handbook principally of tables, intended to save the time of the engineer in making mathematical field calculations. The formulæ are comparatively arranged in a systematic manner, and it has been sought to make the problems general, so they will cover any case that may arise in ordinary practice.

A Forthcoming Book on Aluminum. Messrs. Henry Carey Baird & Co., of Philadelphia, have in press a volume exclusively devoted to aluminum, its history, occurrence, properties, metallurgy, and applications, including its alloys. The work will be a 12mo volume of over 300 pages, and is edited by Mr. Joseph W. Richards. The cheapening of the production of this metal that has been already effected, by the use of electricity, and the possibility of still further lessening its cost, cause great public interest to attach to every addition to our knowledge of the subject, and this book will undoubtedly be welcomed by a large number of chemists and metallurgists.

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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. N. M. asks: Would you kindly inform me what would be the lightest, smallest, and most economical battery which would produce a permanent white incandescence in an exceedingly fine platinum wire, two to three inches in length? Please say at same time if there is any danger of fusion of the wire. A. Two or three good bichromate cells would answer for heating the wire. There would hardly be any danger of fusion, unless with more battery than the above. It all depends on the thickness of the wire and on its length.

(2) F. F. asks: 1. Is the film of the soap bubble air-tight or full of holes like a sieve? Does the bubble grow smaller just before breaking? A. It is air-tight, except as regards its power of dissolving the gases of the air and giving them off again. It does not grow smaller before bursting. 2. What good does it do to wash oxygen gas for use in the lime light? A. It washes out any particles of chloride of potassium that might be carried over and would tend to deteriorate [illegible]. 3. Can I arrange a simple device to burn gasoline vapor for illumination by having it forced through pipes, the same as house gas? Please tell me how to carburet the vapor, and give a simple blower. A. We advise you to correspond with L. J. Marcy, 1340 Chestnut Street, Philadelphia, who has experimented in this direction, and is an authority on lantern work. The vapor is the carbureting agent; you do not carburet it. 4. Is there a work devoted to physical experiments projected by the magic lantern, such as tank projections, etc.? Would you suggest a list of them for the benefit of lecturers? A. Dalbear's Art of Projection, which we can supply for $1.50. The list of experiments is endless. Queen & Co., of 924 Chestnut Street, Philadelphia, show such apparatus in their illustrated catalogue. Correspond with them. 5. How can I condense the oxhydrogen flame to the smallest possible point for the microscope? What condensers do I need, and how shall I arrange them? A. You want strong light, not necessarily the smallest. Use 4½ inch plano-convex condensers, placed flat sides outward, determining their distance from light by trial.

(3) C. W. M. asks what the coils, I, are wound on, in the apparatus for demagnetization of watches, given in SCIENTIFIC AMERICAN of October 2, 1886? A. Pasteboard, wood, or any non-metallic substance may be used to construct the hollow core.

(4) J. E. Z. asks the best material for making a mould, and what metal will run the finest for a large button with a very fine engraving, regardless of color, one that will not frost or blister. A. Use steel, copper, or brass for the mould, and type metal for the button.

(5) G. F. C. asks what effect common brown sugar, mixed in a compound in the proportion of 10 pounds to 50 gallons of water, will have on the steel in boilers. A. It will have no effect on the steel of the boilers, but will collect the sediment in cakes,

which are liable to settle upon the fire sheet, and cause it to burn or bulge from overheating. See Davis' work on boiler incrustation, which we can furnish for $2.00.

(6) J. L. D. asks the best method of raising a large quantity of water by windmill a short distance, say 6 or 8 feet, for irrigation. A. A common lift pump with a cylinder equal in capacity to the power of the windmill is the most economical.

(7) T. J. T. asks whether the ordinary photograph camera will answer for taking tin types. A. Yes, but y u require a special plate holder. 2. How are tin types made? A. The prepared plate, which may be purchased from dealers in photo materials, is coated with collodion, then immersed in a sensitizing nitrate of silver bath, and while wet exposed in the camera. Development is made by flowing the plate with a solution of sulphate of iron and acetic acid. It proceeds rapidly. The plate is next washed, and the unacted upon silver is dissolved off by immersing the plate in a bath of cyanide of potassium. After fixing it is slightly washed, rapidly dried over a spirit lamp, slightly colored with dry colors, varnished by flowing, and is ready for delivery. Tin types can be made out of doors. The position of the picture is always reversed.

(8) M. W.—There are always openings for persevering, energetic men in every branch of engineering in the United States, as well as in Great Britain. We do not know that there is a choice among the many branches. The name apprentice is now scarcely known in the United States. The English system is not practiced here. Young men enter engineering establishments on a business basis of usefulness. Our technical schools manufacture theoretical engineers by scores, who then have to travel the practical road by business employment with engineering firms.

(9) J. S. M. asks the cause of a bird gun leading. How does it affect the shooting, and what is the simplest receipt for removing and preventing it, by one in the country? A. The leading is caused by the friction of the shot on a dry barrel. A greasy wad will prevent it. A fine steel scratch brush with oil will remove the lead. Such a brush may be purchased of any gunsmith.

(10) W. B. D.—Scouring brick may be made by mixing sand with a small percentage of clay and baking. The quantity and heat required may be easily ascertained by trial. Mucilage and gums may be used, but they are not equal to clay as a cement for scouring brick. A very small portion of Portland cement might be made available, to avoid the baking process.

(11) A. H. B. asks how to make a paper mould for stereotyping, and how to make it so that it will stand heat without breaking apart. A. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 310, 191. Also Wilson's book on stereotyping, $2.00, which we can furnish.

(12) C. W. B. asks if it is possible to cut through the casehardening on a casehardened axle with a diamond cutter; if not, can it be done by any other method without drawing the temper? A. It can be done with an emery wheel or with a piece of copper charged with emery.

(13) R. B. says: I have some ground glass which I wish to bring to a very high polish; what am I to use, and how? A. You cannot polish glass that has been ground on an emery wheel or grindstone. It should have a dead finish with the finest washed flour emery on a lap of metal, zinc or lead; or if the glass is large, use a rubber of metal. Then half polish with ground pumicestone on a leather rubber. Then polish with rouge on a buckskin rubber, moist. 2. Which is the best to use for grinding glass on—emery wheel or grindstone? A. Use either one, wet; the emery wheel cuts fastest.

(14) W. A. R. writes: In conducting the exhaust from a steam engine into a large tank of water for the purpose of warming the same, should the pipe used for that purpose increase or diminish in size, or remain the same for the entire distance (about 150 feet)? Should the pipe rise, fall, or remain horizontal? And at what point in the tank should it enter, to obtain the best results? A. The exhaust pipe should be in the form of a coil suited to the size of the tank, with a descent in its course to enable the water to flow off in the same direction of the steam. A decrease in size would be proper if the water should remain cold enough to gradually condense the steam. Sometimes the water in the tank may become very hot from not being used, when the decreased size of the pipe would throttle the exhaust and make a back pressure in the engine.

(15) G. E. D.—The Great Eastern is composed of two continuous shells, an outside one and an inside one, about 3 feet apart, divided by bulkheads into compartments for safety. These compartments can be entered by manholes in the inner shell, which are closed by plates. The interior is also divided into compartments by decks and bulkheads like other iron ships. As a ship, the hull is one piece.

(16) T. P. B. asks how zinc amalgam is made for milling purposes; how the zinc is made to unite with the quicksilver and form a solid amalgam which may be broken when cold and added to quicksilver. A. Melt the zinc, and pour with a small spill from a height of 2 feet into a pail of water. This will chill it in shot and thin particles. Then dry and mix with the quantity of mercury desired for the amalgam in an iron ladle. Heat the ladle until the zinc is dissolved. Do not allow the heat to rise to the evaporating point for mercury.

(17) F. F. asks how the sound of the voice is transmitted over the telephone wire. A. In the electric telephone the transmitter transfers the vibrations of the air caused by the act of speaking, through the medium of the electro-magnet, into electric transmissions pulsating in harmony with the diaphragm of the transmitter. The electric transmissions reproduce through the electro-magnet of the receiver precisely the same pulsations as were uttered to the transmitter. There is no other physical connection of the equivalent pulsations between the terminals.

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