ENGINEERING INVENTIONS.

A railroad switch has been patented by Mr. John J. Peetz, of Galveston, Texas. It is designed for operation by trip bars on a locomotive or car to open or close the switch, and without injury to the rails or actuating mechanism, or danger of derailing the cars, the invention covering various novel details and combinations of parts.

A car coupling has been patented by Mr. James F. Thornton, of Nicholas Court House, West Va. Combined with a drawhead having a link mortise and a vertical slide bar with a crosshead is a coupling pin, so arranged that the pin may be elevated for the insertion of the link by the contact of the crosshead with grapple hooks or bars, and cars may be coupled or uncoupled without the operator going between them.

AGRICULTURAL INVENTIONS.

A corn planter has been patented by Mr. Anderson Bussey, of Columbia County, Ark. Combined with a frame, plow, and covering shovel is a corn-dropping box rotating on a shaft held on the frame, the box having supplemental boxes communicating with openings in the sides of the dropping box, and being provided with slides to regulate the outflow of the dropping box.

A check row corn planter has been patented by Mr. August F. Tiede, of Deep Creek, Iowa. It is designed to drop hills of seed in accurate check row irrespective of the contour of the ground surface, while the seed-dropping mechanism may be set independently of the mechanism which drives it, to correct irregular dropping and to assure proper starting of the machine at the end of a field.

MISCELLANEOUS INVENTIONS.

An inkstand has been patented by Mr. Frederick Mitchell, of Brooklyn, N. Y. It is double, one inkstand serving as a cover for another beneath, the parts being detachable, so that they may be used singly.

A rafter gauge has been patented by Mr. John N. Cruson, of Elizabethtown, Ill. It has adjustable and sliding beveis, and is intended especially for aiding in determining the length and bevels of hip and jack rafters commonly used in hip roofs.

A weather strip has been patented by Mr. Franklin P. Burcaw, of Hazleton, Pa. This invention covers a novel construction and arrangement of parts and details, including flanged strips fitting into channels in moulding all around the door, whereby all bottom, side and top draughts are effectually precluded.

A sign has been patented by Mr. Andrew F. Foans, of New York City. The letters are each attached to a bent and counterweighted rod journaled in a board or other support, so that the motion or jar of a car, stage, or other conveyance will set the letters in motion to attract public attention.

A folding coop has been patented by Mr. William E. Tate, of Weatherford, Tex. The side, end, and top sections and partition are formed of wire or metal frames, with wire netting, making a coop which is strong and rigid in use, and which may be folded in a very compact form for transportation or storage.

A churn cover has been patented by Mr. Anderson B. Cosby, of Richmond, Va. The top edge of the churn body has a marginal metal ring, with upwardly projecting hook-shaped lugs cast upon it, its inner edge being slightly raised to form a bead upon which a wooden cover fits and makes a tight joint, the invention covering various other novel features.

A trotting harness has been patented by Mr. John H. Whitaker, of Davenport, Iowa. It has a shackle strap or collar inclosing the hind leg above the hock, with a yielding connection between the collar and the shaft, which will not impede the travel of the animal, but will act as a restraint causing him to travel with his hind legs wide apart.

A sash fastener has been patented by Mr. Jerome B. Kester, of Clarksburg, West Va. It consists of a gravitating latch pivoted to the sash and adapted to a notch or detent at the window frame, provided at its pendent part with a shoulder, a gravitating lock being pivoted to the window sash and adapted to overlie the latch shoulder, with other novel features.

A display box for neckties has been patented by Mr. John W. M. Uhrig, of New York City. It has side walls provided with longitudinally and inwardly extending wings, designed to support bow portions of the neckties for display, and permit a disposition of the tying strips beneath as a shield from view and also from dust.

A gate hinge has been patented by Mr. Oscar M. Hawley, of Church's Corners, Mich. It is an improvement in that class of hinges in which the gate may be slid back in the hinge, and the hinge turned upon its vertical axis, carrying the gate with it, the device being equally adapted to rail, picket, or wire gates.

A hospital transfer bed has been patented by Elizabeth D. Staples, of West New Brighton, and Hugh E. Ashcraft, of Goshen, N. Y. It consists essentially of an endless carrier belt or mattress, mounted on drums or rollers journaled in the bed frame, for easily transferring patients from one cot or bed to another.

A bridle bit has been patented by Mr. Oscar R. Gleason, of New York City. It has a mouth piece square in cross section, and side rings with downwardly projecting arms, these rings having upwardly projecting loops or eyes, the latter serving for use with a curb strap passing under the jaw for vicious or unruly horses.

A hay carrier has been patented by Messrs. Lindley and Ellwood Clark, of Cuba, Ohio. The invention covers a novel construction and arrangement of parts in an inexpensive device for carrying hay into hay mows and over the tops of hay stacks, and depositing it in any desired point within the range of the apparatus.

A trace detacher has been patented by Mr. John D. Blakeman, of Smith's Grove, Ky. The whiffletree has a projecting stud, on which loosely fits a collar with a guard arm and an inwardly projecting arm and loosely pivoted lever, which may be operated by the driver to detach the trace in case of accident or if the animal should run away.

A horse detacher has been patented by Mr. Noah Crim, of Galton, Ill. On each end of the whiffletree is a ferrule with spiral spring, socketed eye, and passage for trace-holding bolt spindle, from which flexible connections are guided to a common point, and by drawing upon which all the bolt spindles will be withdrawn at the same time and the traces released.

A grading and ditching machine has been patented by Mr. John C. Sage, of Atlanta, Ga. Combined with a main frame carrying plows is an adjustably connected conveyor to receive the earth from the plows, with power wheels and pulleys, and other novel features, the machine being adapted to be operated by hand power or a traction engine.

A hay press has been patented by Mr. George Ertel, of Quincy, Ill. The invention covers improvements on a former patented invention of the same inventor, whereby the cost of the press is reduced and its length and weight materially lessened, for increased facility in drawing over rough roads, and time and labor are saved in pressing the bales.

A mould for casting loose pulleys has been patented by Mr. John McCaffrey, of Lawrence, Mass. The invention consists in the combination of an internal disk core, an external ring core, with lugs on one of such parts, in a novel manner, whereby each pulley is formed in one piece, provided with a central oil chamber, radial ribs, and lateral openings for the admission of oil to the central opening.

A fastener or holder for paper or other materials has been patented by Mr. Cecil M. Durnil, of Fayette, Mo. It consists of a piece of spring wire bent to form a spring clamping arm, having an inner bent front holding-end portion and rear stiffening coil, the latter terminating beneath the clamping arm in a forwardly extending arm, to be attached to a board or other surface for clamping or holding articles.

A sweat pad fastener has been patented by Mr. Albert Hobt, of Wellston, Ohio. Combined with the collar and collar pad is a cotter-shaped fastening of malleable metal passed through the pad and through the hames crease of the collar, and folded down at its perforating ends within the crease, snugly fitting within the crease, and holding the collar and pad securely together.

A seat or back fastening for furniture has been patented by Mr. John M. Sander, of Bloomsburg, Pa. This invention relates especially to fastenings adapted to secure seats or backs of school furniture to the arms or irons connecting them to the seat arms or standards, dispensing with key or wedge fastenings, and covering novel features of construction and combinations of parts.

A head rest for coffins has been patented by Mr. John McGrath, of New York City. It consists of a base to which is attached a longitudinally curved plate adapted to the contour of the neck or head, a concave plate being transversely attached to the curved plate, with means for vertically adjusting the combined plates over the base, in connection with a detachable chin strap.

A spark arrester has been patented by Messrs. Frederick Bruhn and Jerome Raum, of Fort Shaw, Montana Ter. It consists of a series of spaced and graduated parallel screens and retaining standards, with outwardly projecting upper ends and knobs, to prevent sparks and cinders passing from the chimney stack, and throw them downward to the base of the chimney or stack.

A telephone receiver has been patented by Mr. Alonzo W. Brown, of Evanston, Wyoming Ter. A box is secured between the poles of a permanent magnet, and in the extremities of the magnet are threaded holes into which are screwed inwardly extending polar extensions, the usual diaphragm being replaced by a tongue arranged to vibrate between these extensions in unison with the vibrations of the current.

A safety appliance for elevators has been patented by Mr. Augusto Stigler, of Milan, Italy. It consists of wings pivoted at their outer sides beneath the floor of the cage, and having hook levers, in connection with levers pivoted beneath the end beams of the floor of the cage, with other novel features, whereby, when the elevator descends too rapidly, or the attendant loses control of it, the cage, will be automatically retarded or stopped.

NEW BOOKS AND PUBLICATIONS.

JOURNAL AND PROCEEDINGS OF THE ROYAL SOCIETY OF NEW SOUTH WALES FOR 1886. Sydney: Charles Potter. 1887. Pp. liii, 396.

Mineralogy, meteorology, language, anthropology, and similar subjects, form the matter of this volume, testifying to the wide range of the society's work. The book is well printed, and is a valuable record of the scientific life of the antipodes.

THE AMERICAN ANTHROPOLOGIST. Published under the auspices of the Anthropological Society of Washington. Vol. I., No. 1. January, 1888. Pp. 96.

In this very elegantly printed publication, various topics of anthropology are treated by different essayists. We welcome the appearance of the new journal, and wish it every success in its important field.

NEW APPROVED METHOD OF ZINC ETCHING OR PHOTO-ZINC ENGRAVING. By John Gast, 297 Adelphi Street, Brooklyn, N. Y. Price $1.

In a few pages this little work gives practical instructions how to make zinc relief plates. The method is said to be especially adapted for half tone reproductions or photo-nature engraving. It gives a concise and clear statement of the author's process.

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MARCH NUMBER.—(No. 29.)

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2. Plate in colors of a handsome suburban residence, costing about Twelve Thousand Five Hundred Dollars, with floor plans, specifications, sheet of details, etc.
3. Elevations and floor plans of two dwellings of moderate cost.
4. Perspective view and floor plans of a house for Six Thousand Dollars.
5. Floor plans and elevations of a substantial residence at Tuxedo Park.—James Brown Lord, architect.
6. Perspective and two plans of a Cape Cod cottage of moderate cost.
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8. Elevation and plans of an alteration of a dwelling on Long Island.
9. Sketch of a one story residence erected at Birmingham, Ala., at a cost of Four Thousand Five Hundred Dollars.
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14. Designs of two substantial churches, costing about Four Thousand Dollars each.
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Notes & Queries

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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) G. C. asks: 1. Is there any way to find the length of belt by figuring? A. You can only compute the length of belts by knowing the distance of centers and adding to twice the distance the amount of lap for both pulleys. When both are alike, add 3·141 times the diameter of one pulley. If they are unlike, add to twice the distance of centers 1·57 of the diameter of each pulley. This will cost you more labor than to take the measure around the course of the belt with a tape line. 2. How to calculate speed of planer, revolutions of main shaft given, to find pulleys to make planer run any required number of feet per minute. A. For computing speeds of machines, multiply the diameter of the driving pulley in feet and decimals of a foot by its speed in revolutions per minute, and divide the product by the diameter of the driven pulley in feet and decimals of a foot, and so on to the last pulley or pinion, which will give the speed in feet per minute. 3. How to divide a given diameter and a given circumference into any number of equal parts in the lathe. A. By making a scratch on the edge of the large cone pulley and dividing the circle, with a pair of dividers, into the number of parts desired. 4. How to mark and chip key seat in pulley true with face, the hub not being faced off. A. Lay a straight edge across the rim of the pulley, and square the key seat from the straight edge. If the hub is higher than the rim, place two blocks of exactly equal thickness on opposite sides of rim, upon which the straight edge can rest.

(2) B. A. H. asks: 1. Is there any method of cutting and polishing petrified wood? A. Petrified wood and minerals can be cut and polished in the manner of lapidary work. See answers in back numbers notes and queries, No. 4, May 28, 1887; No. 22, September 3, 1887; No. 17, March 12, 1887. 2. Has the power obtained in a hydrostatic press been used to propel machines? A. Hydrostatic power is used in various ways through accumulators for saving time in running hydraulic presses. Such power may be also distributed to any number of hydraulic jacks, and is so used in India rubber works for raising large bedplates for pressing belting. 3. Can it be used in the place of jack screws for raising large buildings? A. Separate hydraulic jacks can be so used.

(3) G. S.—A solder made of equal parts of tin and lead melts at 368° Fah. You can burn the vapor of gasoline by saturating air with the vapor and passing it through a Bunsen burner. The arrangement for vaporizing should be similar to the air gas machines for lighting so much in vogue where there are no gas works. Unless you are familiar with gasoline and its explosive nature, when mixed with air, we do not recommend you to play with it. A good kerosene lamp will do all that you can accomplish with the gasoline. You will find samples of the kerosene stoves in the trade, which you can utilize or copy with a safer result.

(4) J. V. D. asks: How many cells of carbon battery, small size, will be required to light one Edison 6 candle power light? A. About 27 cells, arranged 9 in series and 3 in parallel.

(5) W. L. asks (1) how to remove the apparent greasiness on a wood blackboard. I have tried soap and hot water several times without any effect. A. Make a strong lye of pearl ashes and soft water, and add as much unslaked lime as it will take up. Stir it together and let it settle a few minutes, bottle it and stopper close. Have ready some water to dilute it when used, and scour the part with it. The liquor must not remain long on the board, as it will draw the color with it. Hence use it with care and expedition. 2. How can I remove old ink spots from the floor? A. By scouring with water and oxalic acid mixed. Then rinse with strong saleratus water.

(6) Old Reader asks: Please give formula for making photographer's paste. A. Mix thoroughly 630 grains of the finest Bermuda arrowroot with 375 grains of cold water in a capsule with a spoon or brush, then add 10½ ounces of water and 60 grains of gelatine in fine shreds. Boil with stirring for 5 minutes, or until the liquid becomes quite clear, and when cold, stir in well 375 grains of alcohol and 5 or 6 drops of pure carbolic acid. Keep in well closed vessels, and, before using it, work up a portion with a brush in a dish.

(7) H. M.—The money made at the various mints goes into circulation on the order of the United States Treasurer, as called for by the different banks and financial institutions, in settlement of balances, the Treasurer filling orders for different coin according to the quantities being coined, and with regard also to date of application.

(8) J. D. M. asks: 1. Why did the moon during the late eclipse have a brown or smoky look rather than a black? A. We do not know that the moon ever looked black during its total eclipse. It is illuminated by diffused light. 2. Having reason to suspect sewer gas in a cellar, what will be simplest method of proving its presence? A. For the detection of sewer gas we know of nothing better than the sense of smell. There are valuable articles in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 67 and 418, on sewer gas.

(9) S. R. T. asks a composition of a cement which will join glass plates to brass, and which will not be soluble in bisulphide of carbon. A. Use silicate of soda.

(10) S. D. W. asks: 1. If gold was as cheaply obtained and as plentiful as brass, which, for its commercial and mechanical uses, would be of the greater value? A. The less oxidizable metal—gold. 2. We have a steam launch whose best speed is only four miles per hour in eddy water. If we desired to ascend a river, the current of which flows at the rate of five miles, could it be done with this launch? A. The boat would not ascend, but would descend at the rate of a mile an hour.

(11) J. H. K. asks: 1. What is the best method of filling and darkening ash and oak for antique finish? A. Spons' "Workshop Receipts," first series, which we can furnish for $2, gives very full information on the staining and finishing of woodwork. 2. Exclusive of burnishing, what is the best method and what materials should be employed for giving the highest possible to finish to brass? A. For brass work, the lathe, brush, and buff are the most effective means of giving a high polish. The materials are pulverized pumice, tripoli, and rouge. The last finish may be made with a cotton wheel and rouge wet with alcohol. Any dealer in jewelers' supplies in your city should give you the details with the materials. 3. What is the best lacquer for ornamental brasswork—one that will not alter the natural color of the metal? A. The best lacquer is pure shellac dissolved in 95 per cent alcohol. Let it stand in a close bottle for a few days, and decant the pure tincture. Use but ½ ounce shellac to 1 pint pure alcohol. When settled, it should look clear like wine. Thin, if required, by adding alcohol. Thin lacquer makes the best finish.

(12) W. W. asks the distance from the center span of the Forth bridge to the shore, in England. A. There are two central spans, of 1,700 feet each, with central pier on the Scotch island of Inchgarvie, in the middle of the Forth. There are 2,200 feet of viaduct and bridge from the South Queensferry shore in England to the main pier from which the 1,700 foot span springs.

(13) R.—For articles on curved ball in ball playing see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 410, 423, 410.

(14) W. W. has a petroleum engine, and wants to know how to burn off soot on the flues. A. It cannot be burned off. Open the rear end by taking off the plate, and scrape or brush off the soot. Catch it in a pan underneath.

(15) N. S. C.—Hard water is not always due to the same chemical element. You will find an interesting article on the Softening of Water in SCIENTIFIC AMERICAN SUPPLEMENT, 270, 187.

(16) H. W. W. writes: I have trouble in brazing my band resaws. I use brass and borax as a flux, but the heat required is so great that it burns out my irons and damages the saws. What I wish to learn is, is there a grade of brass that will melt at a temperature anywhere near that of silver and still have tenacity enough to answer for brazing the saws? A. The best material to braze with is the silver solder used by jewelers. Small coin will answer if you cannot get the other. If the saw is not too large, use a blowpipe and oil or alcohol lamp, the same as jewelers use, or a Bunsen burner. Bind the scarfed ends together with a small wire, and pin the saw upon a piece of charcoal or pumice stone, rubbed down flat on one side, with a depression under the place to be brazed to let the flame pass under freely; apply borax ground to a cream in water, place the solder at the edge of the scarf, and throw the blue point of the flame strongly upon the under side, so that the solder may draw through when it melts. This will make a clean joint, and heat no more than is necessary to accomplish the work.

(17) D. L. desires a cement for amber. A. Two surfaces of amber may be united by smearing them with boiled linseed oil, pressing them strongly together, and heating them over a clear charcoal fire. To keep the parts in firm contact, it may be well to tie them with soft iron wire.

(18) A. C. C. J. writes: I upset a jug of ink (the blackest copying ink, at that) on the end of a closed volume of Blackstone. Of course the ink ran quickly through the leaves and completely saturated it. It didn't, however, touch the printing, but has disfigured the book completely. How can I remove the ink? A. You might try dipping it in a warm solution of dilute oxalic acid and then washing the acid away quickly, but at best the job is a difficult one.

(19) Bath Tub writes: I want to paint a zinc bath tub white. Can it be painted so it will hold and be durable, and if so, how should the paint be prepared? I am informed there are no prepared paints for such purpose. A. Brush the zinc over with the following: 1 part copper nitrate, 1 part copper chloride, 1 part ammonium chloride, dissolved in 64 parts of water to which 1 part of commercial hydrochloric acid is added. When the zinc dries, in the course of 12 to 24 hours, a coat of any oil color will adhere firmly to the dirty gray surface of the zinc.

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