

## ENGINEERING INVENTIONS.

A car coupling designed for freight cars has been recently patented by Messrs. Thomas R. Morgan, Guy Ruf, and David Davis, of Jackson, O., in the use of which the drawhead has a slot in its lower side, to allow the link (in this case a hook) to drop out of position when cars are to be run together without coupling. The hook is pivoted and is attached to a bell crank lever by which it may be raised by a rod at the top of the car or by one at the side of the car.

Mr. Nathan M. George, of Danbury, Conn., has patented a device for preventing dust from entering the axle boxes of railroad car and engine axle bearings, and inducing heating and producing wear. The contrivance is composed of a gland of wood, and two of leather embracing a packing of felt. Vulcanized fiber or similar material may be used instead of leather; a spring is used to hold the protector in place. This device may be applied to any car and locomotive axle now in use.

Messrs. Henry W. Robie, of Portsmouth, Va., and William H. Lyons, of Berkeley, Va., have invented an apparatus for utilizing the exhaust steam of a steam pump by discharging the steam into the suction side of the pump, to utilize the atmospheric pressure gained by condensing the exhaust steam, and to condense the steam for returning the heat of it, or most of the heat, to the boiler, the said arrangement consisting of a branched exhaust pipe connecting with both ends of a double acting pump, and each branch having a check valve to prevent reaction on the steam engine when the compression of the pump takes place.

An automatic switch and crossing signal for railroads has been patented by Mr. Daniel H. Applegate, of Red Bank, N. J. It is intended to be worked by an electric battery, and also to use at night an electric light to be lighted and extinguished by a passing train. The covering of the light is made by two semicircular plates hinged so as to fall by their own weight and arranged to be raised when electrical contact is made by the wheels of the train. The outside surface of these disks are covered with illuminating paint to make them conspicuous, and to prevent the necessity of an artificial light when the signal itself is not exposed.

## MECHANICAL INVENTIONS.

An improved welding, swaging, and forming die for making chain links is the invention of Mr. Henry A. Iddings, of Warren, O. The invention is to form a longer lap weld than usual, and to thicken those portions of the link—the ends—which are exposed to the greatest amount of wear. These results are accomplished by means of divided dies, the parts being made movable.

Mr. Leonidas A. Roberts, of Monticello, Ga., has patented an improved method of securing the ends or joints of rubber belts by re-enforcing the ends at the point of jointure by a flap of leather cut so as to cover the face of the belt, and pass under it on each side. The entire joint is made either by lacing or rivets, or metallic books passed through, bent, and clinched. The method demands no skilled labor or engineering calculations.

Messrs. Stephen J. Swayze and John C. Lane, of Sag Harbor, N. Y., have invented an automatic railroad signal intended to provide a signal adapted to be automatically set by the tread or flange of the wheel of the locomotive or car, or any device attached to the engine or car, and to automatically and gradually recede into its inclosure in a given length of time; and this length of time may be governed so that the device may be used as a crossing signal for following trains.

Mr. William P. Badger, of Muscotah, Kas., has patented an improved wind wheel that by means of the reciprocating action of springs and the centrifugal velocity of the wheel, opens and closes automatically the fans or wings of the wheel, to produce a uniform velocity under all circumstances of the force of the wind. A wind chamber is also provided to increase the number of square feet of wind pressure on the wheel.

A machine for forming earthenware vessels has been invented by Mr. Cerbeleon Martinez Ribon, of Mompos, Bolivar, United States of Colombia, by which the clay is placed in a sectional mould which is secured to the plate of a potter's wheel, or a "jigger," and while being revolved a knife, the edge of which conforms to a vertical section of the interior of the vessel to be made, is inserted by foot or hand power, and the clay is rapidly made to the desired internal shape.

Mr. John D. Waldran, of Memphis, Tenn., has invented a handy valve grinder which consists of a contrivance for attachment to the wheel of a globe valve for rotating it backward and forward on its seat by means of a spiral shaft that is operated by means of a reciprocating nut, which is operated by one hand, while the guide for the nut and support is held by the other hand, making a simple contrivance by which such valves may be ground quickly and efficiently without being disconnected from the pipes.

Mr. Jackson Taylor, of Newberry, S. C., has patented an improved side spring for carriages by which the springs are resistant to side shocks and lateral movements. The springs are also re-enforced by bent U-shaped inner springs that make the central portion of the spring very rigid and yet give elasticity to their ends. The ends of the springs are connected to the carriage by eccentrically pivoted shackles, by which the action of the springs under a load is rendered uniform.

Mr. John Henry Nute, of New Glasgow, Nova Scotia, Canada, has invented a machine for serving rope which can be operated by hand to serve rope or other materials with yarn or twine, the operation being automatic, and the feed regulated to suit the size of the yarn used, so that by steadying the machine with one hand and turning the driving wheel with the other the spool frame is rotated around the rope to be served, the serving yarn unwinding from the spool and winding around the rope automatically and with accuracy and speed.

Mr. Brock Woodruff, of Albert Lea, Minn., has invented an improved process of treating iron in which ordinary wrought iron is first heated to near a welding heat, then rolled in sand, reheated to a somewhat higher temperature than before, again rolled in sand, and again reheated to a welding heat, when it is immediately immersed in water to which has been added common salt in the proportion of one gallon of salt to twelve or fifteen of water, more or less. Iron made by this process may be heated, worked, welded, and otherwise manipulated without destruction of the properties imparted to it in the process named. The iron is very hard and tough, and is far superior to ordinary rolled iron for any ordinary purpose.

Mr. Oswald Fachmon, of Lindsey, Ohio, has patented an improved drag saw, the invention consisting of a cam contrivance for working the saw, a lever device for raising and lowering the saw, a power apparatus for rolling the logs to the ways to be sawed, a lever contrivance to feed the logs to the saw, and a guide attachment for the saw, all contrived for the application of power to the driving of the saw, so as to have steadier motion of the saw, and so as to avoid the back thrust that the drag of the saw causes, which is very injurious, especially when horses are used; and the log rolling and feeding and saw adjusting devices are contrived with especial arrangement for convenience in manipulating them by the attendant.

## AGRICULTURAL INVENTIONS.

A cotton harvesting machine has been patented by Messrs. John Myers and John Edward Myers, of Palestine, Texas, the gathering being done by a series of long and short toothed belts arranged side by side alternately, and adapted to pass over and through the stands of cotton. By fixed appliances in front of the machine any bent or broken branches of the cotton plant are raised to connection with the toothed belts. Their load is relieved and deposited in the wagon by a toothed wheel as fast as it is gathered.

Mr. Knight K. Parker, of Circleville, O., has invented a straw stacker for removing the straw from a thrasher and stacking it into a longitudinal rick, making the rick of uniform sides and even height. The stacker is an appendage to the thrashing machine, and is run by the same power; when not in use it may be folded back on the top of the thrashing machine and be carried from place to place. One-half interest in the invention belongs to Mr. George Ludwig, also of Circleville.

Mr. Walter F. Drew, of Sacramento, Cal., has invented a rake head for rakes with wire teeth, by which a broken tooth may be readily removed and easily replaced by a new tooth. In this invention a single tooth is bent at right angles at its upper end, the bent portion resting in a groove; or, a double tooth is used that has its horizontal upper portion likewise embedded. When put in, the teeth are straight, but once in, they are bent to a curve, the offset thus made helping to keep them seated in place.

Mr. Charles T. Mason, Jr., of Sumter, S. C., has invented a cotton harvester which is intended to reduce the expense of the present method of picking cotton by hand. The picking is done by serrated disks of brass or other non-corrodible metal, protected by shields of wood from unnecessary wear and abrasion. The disks are suspended on vertical stems and are rotated by bevel gears on a frame carried by chains and pulleys, so that the pickers rise and lower without disturbing the plants or breaking off the hard wooded portions.

## MISCELLANEOUS INVENTIONS.

A handy folding table has been patented by Mr. Frederick Gesking, of Grand Rapids, Mich., that can be taken down and put up with little trouble and in little time. When folded it occupies scarcely any more space than the board top alone, and when erected for use it is not only firm, but may be made elegant.

An improved form of truss pad has recently been patented by Mr. Elias Thompson, of Commercial Point, O., the construction or rather the form of which is intended to give better protection to a rupture in the lower part of the abdomen than the pads now in use. For this form of pad the inventor claims that no annoyance is felt by different posturings and that the sac cannot possibly escape from its confinement.

Mr. William Klahr, of Myerstown, Pa., has patented an improved bicycle to be driven by pedals operating pawls on ratchet wheels in place of crank and lever. The small wheel is in front on this bicycle, and the rider sits in front of the top of the large wheel, a position that gives him unusual power over the driving mechanism, the pedals being considerably in advance of the hubs of the large wheel.

A clamp for dumb waiters and similar contrivances has been patented by Mr. Edward Lange, of Poughkeepsie, N. Y., which is intended to save the elevating rope from wear and to be self-releasing as soon as the pressure of the hand is removed. The jaws or clamps that embrace the rope are lined with rubber or leather or some other gradually resisting material, and cannot wear the rope or make any noise in operation.

A handy book rest for supporting the hand while writing, when a convenient table or desk is not at hand, has been patented by Mr. Charles B. Metz, of Utica, N. Y. It may be attached to any book, whatever its size, and may be instantly detached. The rest, proper, is a thin sheet of metal, a thin wood board, or a pasteboard hinged to a U-shaped clasp of wire that may embrace any portion of a book without injury to the book.

Mr. John Owen Kilroy, of Albany, N. Y., has invented an improved tobacco pipe which is so constructed that the nicotine cannot pass into the mouth and the smoke cannot burn or bite the mouth and tongue of the smoker, and thus renders smoking very agreeable. The several parts can easily be detached and removed for the purpose of cleaning them, so that the smoke will always taste fresh and sweet. The bowl can be made of any desired shape.

A combination railroad ticket, useful for routes by different roads, and containing in itself the particulars usually sought in railway guides, has been recently patented by Mr. James W. Womeldorf, of Middleport, O. The ticket may be used for more than one person simultaneously, and may be used, also for different roads and different stations, the conductors each having their distinctive stubs, and furnishing the basis for a final settlement between the different roads.

Messrs. Lorenzo D. C. Wood, of Newark, N. J., and Thomas B. Dorrell, of Brooklyn, N. Y., have patented a new package fire kindler, which comprises in one package a paper bag, box, or wrapper, which forms a component part of the kindler, kindling wood in detached pieces, and a highly combustible lighter. The paper wrapper and its contents constitute a cheap, convenient, and efficient fire kindler in compact package form, and makes a new article of manufacture, trade, or commerce, each package consisting of sufficient material to light a single fire.

Mr. John Walter, of Nashville, Tenn., has invented a convenient clasp, or coupling, for stove and heat pipes made of thin metal, that obviates the necessity of forming the ends, or joints so that they slip one within the other, or of permanently riveting sections together. The ends of the sections are beaded or corrugated and an open corrugated band fits around them, the ends being locked by a key of sheet metal, the edges of which are recurved to embrace the end corrugations on the band. By this device sections of pipe may readily be united and taken apart.

Mr. John C. Jessup, of New York city, has invented an improvement in color cans, the object of which is to facilitate the discharge of prepared color or paint from cans. The invention consists in a color can constructed with a central discharge opening and provided with a swiveled right and left screw and two pressure disks moving from the ends of the can toward its center, so that all the color can be discharged from the can, the disks gradually approaching each other, as the right and left hand screw is turned and a meeting at the center of the can, where the discharge opening is.

Mr. Moses Humber, of Calliope, Iowa, has invented a combined horse collar and hames with a view to prevent galling, chafing, pressure on the wind pipe of the horse, and to put the load of the draught on that portion of the animal most able to bear it. The collar proper is of wood worked to fit the horse's neck, and cushioned inside. On the outside it is covered by a steel plate connected at top and bottom by adjustable plates. The loops for the tugs are turned at right angles to the collar, by which a portion of the load is borne by the flat of the neck, permitting the shoulders of the animal to move freely.

Mr. George N. Buck, of Mattoon, Ill., has invented a tag fastener which consists of a single piece of wire or other suitable material, which is doubled up on itself like a staple and inserted through the tag, and then has its extreme ends, which are pointed, bent up in the same direction with each other, and in a direction at right angles with the plane of its body or prongs, to form catches for holding the fastener in place. The prongs, which incline outwardly at the ends, are thus adapted to be inserted between the folds of cloth in the roll until the back of the tag is in contact with the end of the roll; and as the ends are inclined toward the tag, any outward movement of the fastener will cause the said ends to sink into the adjacent fold or folds of the cloth and prevent its accidental withdrawal.

## NEW BOOKS AND PUBLICATIONS.

GAMES OF PATIENCE, OR SOLITAIRE WITH CARDS. By W. B. Dick. Illustrated. Dick & Fitzgerald, New York.

The book contains rules for playing forty-four games, and thirty-three full page illustrations.

DESIGN IN TEXTILE FABRICS. By Thomas R. Ashenurst, Head Master, Textile Department, Bradford Technical College, England. Published by Cassell & Co., London, Paris, and New York.

This admirable work contains, in a convenient form, a mass of useful facts about weaving, illustrated by several colored plates, and over one hundred diagrams. The author says: "The practice of paying little or no attention to the proper structure of the fabric, and its suitability for the purposes to which it is to be applied, is the cause of considerable waste in manufacture." The object of this manual is to suggest patterns and show means of producing new ones by modification, in the loom mechanism, and preparation of the warp or woof. The book will be of value to all who are interested in the progress and perfection of textile industries.

WORKSHOP RECEIPTS (SECOND SERIES). By Robert Haldane. E. & F. N. Spon, London; 35 Murray Street, New York. Price \$2.00.

The success of the original "Workshop Receipts" induced the author to produce this second series after the same pattern. There are many subjects in all branches of applied science which are not treated of in the great industrial encyclopedias, and yet are of considerable interest to scientific amateurs and manufacturers on a moderate scale. In the present work each subject is treated exhaustively and in such a manner that the information sought can be readily obtained. For instance, the topic of boiler incrustations is opened by numerous analyses of feed water from rivers, lakes, wells, town supply, rain, canals, pits, springs, and the sea, with analyses of the incrustations produced by them, and a critical examination of the various chemical, chemico-mechanical, and physical processes for preventing boiler corrosion. In this way are treated, among many others, alumen, bleaching, cements and lutes, cleansing, confectionery, copying, dyeing, staining and coloring, essences, extracts, gelatine, glue and size, glycerine, leather, paper, pigments, paint, and painting. The subdivisions of each head are arranged alphabetically. The language of the book is simple, accurate, and concise.

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Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 206.

Drop Forgings. Billings & Spencer Co. See adv., p. 189

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 222.

C. B. Rogers & Co., Norwich, Conn. Wood Working Machinery of every kind. See adv., page 221.

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Drop Forgings of Iron or Steel. See adv., page 238.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.