

## ENGINEERING INVENTIONS.

A car axle has been patented by Mr. George W. Bedbury, of Portland, Oregon. This invention relates to divided car axles, and consists in a novel construction of the hub for connecting and holding the ends of the two axles, the hub having also an oil groove recess and radial oil holes.

A car coupling has been patented by Mr. A. Judson Chapel, of Arkansas City, Kansas. This invention covers an improvement on a former patented invention of the same inventor, being more particularly adapted for triple headed couplers, and the coupling pins being designed to operate automatically for coupling cars provided with the ordinary slot link.

A car truck has been patented by Mr. John McEwen, of New York city. The object is to promote simplicity of construction and durability of railway car trucks, the peculiar arrangement of springs not only carrying the downward pressure, but at the same time holding the top frame from forward, backward, and lateral movement, and causing the frame to move up and down vertically.

A rotary excavator for removing snow, etc., has been patented by Mr. Edward Leslie, of Orangeville, Ont., Canada. It is designed for removing snow from railway tracks, or make sand and earth cuts, having a revolving head in the form of a wheel or disk, fitted with radial cutting heads that are reversible, and with this revolving head is combined a fan wheel, to discharge material at the side of the track.

The propulsion of vessels forms the subject of a patent issued to Mr. Daniel S. Troy, of Montgomery, Ala. This invention covers a novel construction of air reservoirs in the hull of a vessel, and in air tubes between the inner and outer walls of the hull, for the use of compressed air for propulsion, through an engine, the reservoirs of the vessel to be charged from an air compressing apparatus at any convenient shore station.

A locomotive driving box has been patented by Mr. William J. Healy, of Susquehanna, Pa. This invention covers a box made with grooves on its sides for wedges, to keep it in place, with a cellar of such construction that it can be inserted in the open bottom without planing or finishing, but will be especially firm and adapted to receive the oil and cotton waste used to keep the driving wheel journal lubricated.

A compressed air and gas locomotive engine has been patented by Mr. Daniel S. Troy, of Montgomery, Ala. In place of the boilers usually employed in locomotives, a strong cylindrical vessel with double walls rests longitudinally upon the frame, the vessel being divided into two compartments for holding compressed air and compressed gas; there are devices for controlling the admission of air and gas to the cylinders, regulating the amount of expansion and time of explosion, and numerous details of construction intended to render the machine a practical working motor.

A gas engine has been patented by Mr. Daniel S. Troy, of Montgomery, Ala. It has two cylinders, each with separate piston connected with the same crank shaft, and after the compressed gas is expanded in one cylinder it is mixed with air and conducted to the second cylinder, in which the mixture is exploded, thereby driving the piston forward, the piston in the other cylinder being driven forward by the expansion of the compressed gas, there being a mixing chamber in which the gas and air are mixed, an automatic valve for admitting the mixture, and an automatic spark producing device.

A combined steam and hot air engine has been patented by Mr. David Lyle, of Manchester, Jamaica, West Indies. This invention covers numerous peculiarities of construction and arrangement providing that the steam and hot air are produced by one fireplace, and the exhaust steam and hot air serve to heat the feed water and the air to be used in the engine; the two cylinders are single acting, and each moves in opposite directions; the diameter of the steam cylinder is much smaller than that of the hot air cylinder, and the pistons are carried upward by the impetus of the driving shaft, while there is a valve cylinder between the hot air cylinder and the steam cylinder.

## MECHANICAL INVENTIONS.

A mortising and boring machine has been patented by Mr. Edmond N. Camp, of Puckett, Ga. This invention covers a novel arrangement of two or more boring and mortising mandrels on reciprocating carriages, adapted for making a series of mortises or boring a series of holes at any predetermined place, and particularly for doing the same in curved bars of wood, as in the back parts of chairs, etc.

## AGRICULTURAL INVENTIONS.

A hay stacker has been patented by Mr. Thomas S. Adkins, of Fredonia, Kan. This invention covers a novel construction of base frame, standards, inclined hinged platform, pulleys, rake, back frame, and other novel features, whereby a loaded rake can be readily elevated and its load dumped upon a stack.

A hay ricking device has been patented by Mr. Rees O. Davis, of Milan, Mo. This invention covers improvements on two former patented inventions of the same inventor, the balancing ropes being so connected with the rack, inclined top bar, and weight, by means of pulleys, that the rack will be balanced through all parts of its movement.

A thrashing machine has been patented by Mr. Martin Williams, of St. Johnsville, N. Y. The machine is in general of the usual character, but the straw is made to pass from the thrashing cylinder upon a grate of tines, where arms or beaters raise and toss it while moving backward, the movement being assisted by an ordinary beater above, these operations thoroughly opening the straw for the ready separation of the grain.

## MISCELLANEOUS INVENTIONS.

A water wheel has been patented by William W. Dunn, of Fort Worth, Tex. This invention provides a good and simple form of water wheel, but its construction is of iron, and it is made in sections which may be readily taken apart for transportation.

An extension table has been patented by Mr. George McLagan, of Stratford, Ont., Canada. This invention combines a pawl and ratchet, pulleys, and sliding bars, etc., with novel features of construction, to facilitate the lengthening and shortening of extension tables.

A self-inking pocket stamp has been patented by Mr. Edwin M. Richford, of 44 Snowhill, London, Eng. This invention relates to the construction of the folding frame or holder in which the die and inking pad are contained, whereby a better impression may be obtained than with other self-inking pocket stamps.

A stove board has been patented by Mr. William P. Cole, of Montreal, Canada. This invention provides for a stove board with an upper external layer of asbestos, and a board or frame with an intermediate layer of woven fabric, edge binders, and corner caps, the object being to protect floors and carpets.

A bag holder has been patented by Mr. Martin Williams, of St. Johnsville, N. Y. It is intended specially as a convenient attachment for trashing machines, to hold the bags that receive the grain from the screens, a stretcher with two arms attached to a bracket, making a device which can be readily applied and removed, and conveniently adjusted at the desired height.

A suspender buckle has been patented by Mr. Frederick B. Spooner, of Brooklyn, N. Y. This invention consists in the combination, with a plate having lugs on its back, of a latch plate pivoted on the said plate and resting on the lugs, to facilitate detaching the buckle of a suspender from the ring on the suspender end.

An earth and coal loader has been patented by Mr. Daniel J. Gilchrist, of Newark, N. J. This invention covers a combination of swinging and sliding bars with a scoop held to the same, ropes and pulleys for moving the scoop in the direction of the length of the bars into a heap of coal or earth, and ropes and pulleys for raising the scoop.

A fence post has been patented by Messrs. Milton Foreman and Samuel E. Foreman, of Randolph, Kansas. Combined with a fence post are ringstheon, each ring having two lugs at right angles to each other for holding the fence and brace wires, the object being to facilitate making a simple, strong, and durable wire fence.

A combination tool has been patented by Mr. Adon D. Crosby, of Cuba, N. Y. It comprises two limbs, one having a screw driver at one end, a tack claw and a wrench jaw at the other end, serrated surfaces upon opposite edges, a hammer head, etc., making a convenient tool for working on machinery, wagons, and for various other purposes.

A float valve for water closets has been patented by Mr. August F. Blesch, of Columbus, Ohio. This invention covers a peculiar construction and arrangement of parts whereby the float lifts the valve to its seat easily, positively, and noiselessly, without thumping or water hammer, and the device is also applicable as a ball valve for water tanks.

A corset steel fastening has been patented by Messrs. David Alcorn, Jr., and Robert A. Blake, of New York city. Hook plates are combined with and pivoted to the eye plates, with lips for engaging the upper edges of the eye plates, to limit their downward movement, and prevent corset steels from becoming accidentally disconnected.

A level has been patented by Messrs. James Walsh, Thomas F. Murphy, and Everett A. Clark, of North Adams, Mass. Combined with a hand and dial, a pivot is secured to a float resting upon mercury, so the mercury will cause the hand to turn more or less as the level is inclined, making an improved level which can also be used as an inclinometer.

An automatic vehicle brake has been patented by Mr. Richard R. Pace, of Lineville, Ala. It is so devised that when the horses pull on the chains or straps they pull the outer ends of levers to keep the brake shoes from the wheels, but when the horses hold back, as in going down hill, they so operate the levers as to press the brake shoes against the wheels.

A food steamer has been patented by Olive Nelson, of Houghton Lake, Mich. It consists of a box with vertical partition, perforated transverse portion, and perforated bottom, with doors and a flange on the under side of the box, and a removable water vessel into which the flange fits, being especially adapted for steaming meat and vegetables.

A garment hook has been patented by Mr. George R. Grimes, of Terre Haute, Ind. It is formed of an arm from which a series of hooks project downward, on the prong of each of which hooks a curved transverse piece is held, on which the garments are hung, the device being adapted to hold a number of garments, and also tags bearing the numbers of arms and hooks.

A shoe has been patented by Mr. William D. Hall, of Beloit, Wis. This invention covers a congress gaiter with its front and back extended upward, flaps formed on or secured to the front extension with their lower edges disconnected from the gaiter or its gore, and a fastening for securing the rear edges of the flaps, the object being to provide means for holding the top of the shoe snugly against the leg.

An ale and beer pump has been patented by Mr. Edward Schlimbach, of Long Island City, N. Y. With the pump discharge pipe is connected a cylinder with a valve, the stem of which is connected with the pump lever by a lever and connecting rod, so the valve will be opened and closed by operating the pump lever, the object being also to promote convenience and reliability in packing piston rods and valve stems.

A sleeping car seat has been patented by Mr. Alexander L. Kean, of Elizabeth, N. J. The seat is held to slide on a frame pivoted on a base on the floor, and combined with these is a board held to slide on the back in the direction of its length, a back rest

hinged to the upper end of the board, and means for holding the back vertically on the board, making a seat which can be easily converted into a bed.

A spring brace for vehicles has been patented by Mr. Edwin J. Strong, of Beresford, Dakota Ter. The braces are hinged together at a point centrally between hinge eyes fixed on the body of the vehicle and upon the gear which supports the springs, to relieve the springs of the carriage from the strain consequent to endwise motion, and too much upward motion of the carriage body relative to the supporting gear.

A sash fastener has been patented by Mr. James Walsh, of North Adams, Mass. Combined with a vertically swinging sash lift or handle provided with cams are sash locking rods extending from the handle to the side edges of the sash, heads secured on the rods being adapted to be acted on by the cams, making an improved handle for raising and lowering sashes as well as a sash lock.

A roller roughing machine has been patented by Mr. Archibald Mitchell, of New Orleans, La. This invention covers a hardened steel milling tool and a mechanism for pressing it against the surface of a canemill roller while being revolved, to roughen the surface of roller so they will bite and hold the cane, thus drawing it in more effectually than can be the case when the rollers are worn smooth by the cane.

A holder for ornamental and fly paper has been patented by Mr. Vurlin G. Tansey, of Ashland, Neb. This invention consists of a frame formed of a series of spokes secured to a central plate, and having their ends united by a ring to hold paper on the ceiling of a room, at the middle or corners, so as not to deface the ceiling, and allow the paper to be conveniently arranged.

An improved beehive has been patented by Mr. Henry S. Gideon, of Crescent City, Iowa. This invention consists in the peculiar construction and arrangement of parts, which is such that side boxes can be opened at any time to take out honey, or the side and front entrances so closed as to secure the honey from mice and insects, with other novel features promoting the healthfulness of the bees.

A sheet metal vessel has been patented by Mr. Isaac S. Lauback, of Boston, Mass. This invention relates to securing bottoms on such vessels, and consists principally in forming the bottom integral with the flange that supports the base, and securing the bottom to the open end of the body by a lap or folded joint that clinches the body and bottom together.

A wind wheel has been patented by Mr. Jarvis M. Flint, of Thayer, Kan. This invention covers a peculiar construction and arrangement of parts for an easy running wind mill, the wings being automatically so changed during a strong wind that they will offer less surface and a greater angle to the wind, so that the machine will then run as slow and steady as in a light wind.

Refrigerator barrels and other like receptacles form the subject of a patent issued to Mr. James W. Weston, of New York city. This invention covers an internal structure, with uprights and diaphragms, to make a series of compartments for holding separate articles, so the sizes of the compartments may be varied, and so there may be a central tube for holding ice for cooling.

A bridge indicator for billiard tables has been patented by Mr. Charles F. Spaulding, of Elizabeth, N. J. Sliding bars, hooks, and a connecting mechanism are so arranged that the weight of a bridge handle is made to raise the ends of the bars slightly like little buttons above the tops of the rails, and thus indicate where the bridges are without the player taking his eyes off the table.

Watchmakers' pliers form the subject of a patent issued to Mr. Henry A. R. Horton, of Cleburne, Tex. This invention more especially consists in a certain construction of the jaw end portions of the pliers, whereby the utility of the implement will be improved for removing the hands from a watch or for holding new hands when they are to be filed and otherwise fitted.

A baby carriage has been patented by Messrs. Harry M. Ribble and John W. Sannis, of Dover, N. J. This invention is designed to facilitate turning and steering the carriage, an arm projecting rearwardly from the pivoted front axle, and a bent rod connecting the arm to the handle, the rod and arm being so arranged that the front axle can be turned more or less thereby.

A bottle stopper has been patented by Mr. William Beardley, of Beacon, Iowa. With an apertured cap fitted upon the bottle neck is an apertured packing interposed directly between the cap and the upper edge of the bottle neck, having upon its inner surface, around its aperture, a flange and ball valve, making an improved stopper for bottles containing soda water or other aerated liquids.

A combined fire box, grate, and sifter for stoves has been patented by Mr. Isaac J. Wells, of Nanuet, N. Y. The grate bars have their rear parts extended upward and in contact, and are held in place by a hooked plate forming the rear wall of the fire box, there being a bar with alternating lugs for agitating the grate bars, while beneath the bars is placed a sifter to be jarred by the movements of the grate bars.

A mechanical and electrical alarm clock has been patented by Messrs. Isaac S. Moser and Francis Magee, of New York city. With a mechanical alarm clock this invention combines tongues connected with electric circuit wires, and a circuit closing piece on the end of the spring for releasing the alarm mechanism, so that when the circuit is closed an electrical bell is sounded until the circuit is broken.

A screw threading machine has been patented by Mr. Charles E. Coe, of Leesburg, Kansas. This invention covers a specially constructed machine for turning metals, intended to turn and square up shoulders and to cut new screw threads by hand to supply the place of old ones which have become worn in use, and particularly for forming new screw heads on carriage axles, and to extend the screw head on pipes, bolts, etc.

An electric glass cutting machine has been patented by Messrs. Philipp Lange and Ernest Lindner, of New York city. Combined with a stand suitably arranged for holding the article to be cut is an electric generator, which may be so connected with a platinum wire adjustably maintained on the surface of the glass that the platinum wire will be made red hot, thus heating the glass on the line of desired fracture, after which the glass is plunged into cold water, causing the separation.

A velocipede has been patented by Mr. Daniel S. Troy, of Montgomery, Ala. This invention covers a velocipede propelled by a motor operated by the explosion of compressed gas and air; it has a light and very strong metal frame in which are carried three cylindrical receptacles for the compressed gas, an explosion cylinder with valves for regulating admission of compressed gas and air, and other novel features, to form a vehicle which will travel rapidly and can be easily steered.

A combined shutter and diaphragm for photographic cameras has been patented by Mr. DeWitt C. Hoover, of Buffalo, N. Y. Two shutters are fitted to slide one on the other in opposite directions, operated by toggle bars and springs, adjustable so that the openings shall coincide to a greater or less extent, with means for holding the shutters fixed, thus providing cameras with shutters for instantaneous work, while they may be also arranged to serve as adjustable diaphragms to form a permanent attachment to the lens tube.

## NEW BOOKS AND PUBLICATIONS.

TENANTS OF AN OLD FARM. Leaves from the Note-Book of a Naturalist. By Henry C. McCook, D.D. New York: Ford, Howard & Hulbert, 1885.

Dr. McCook has gained for himself a very enviable position among entomologists; by his careful and diligent study of insect life, particularly of ants and spiders, he has become a recognized authority on these subjects. His previous works, and especially his account of the agricultural ants of Texas, excited so much interest that the present book has raised large expectations. The "Tenants" is a simple and pleasant account of how a naturalist spent a year in search of health among the fields and meadows of an old farm near Philadelphia, and of how his search was rewarded not only with its object, but with much else in addition. The narrative form makes the book more attractive to young people, who will, as a rule, swallow a large amount of information if it be properly baited with a story, though the assimilation under these circumstances is still an open question. To the general reader, however, we think that the book would be much more acceptable, could it be filtered of some of its long conversations, and could the highly interesting facts they contain be separated from the very mild form of fiction diluting them, and be gathered into short, straightforward sketches of nature. There are several characters introduced, and even a couple of lovers, but it is the naturalist always who speaks, and one's attention is somewhat distracted by the ingenuity shown in framing the questions assigned them to bring forth the fullest answers. But it is withal a deeply engaging book, and the charming accounts of moths, bees, ants, spiders, and other native-born tenants of the old farm will clothe the humble members of the insect world with a new interest. The illustrations, taken largely from nature, are admirable from their clearness, and often from their humor and artistic merit.

A TREATISE ON FRICTION AND LOST WORK IN MACHINERY AND MILLWORK. By Robert H. Thurston. New York: John Wiley & Sons, 1885.

The subject of friction losses, which is usually treated rather incidentally in works on mechanism, has been elaborated by Prof. Thurston into an interesting and exhaustive volume. It is intended, as stated in the preface, to be used either as a text-book or as a work of reference. Since in all properly designed machinery friction is the only cause of lost work, the consideration of the laws of its generation and prevention is second in importance only to the study of pure mechanics. The contents of the work are drawn largely from the author's personal experience, and will have an additional value on this account. They contribute a considerable amount of new information, and detract somewhat from our old store by showing the unreliability of certain laws and values hitherto accepted in practice. In the logical development of the subject the general action and efficiency of machinery form a very suitable introduction. The laws and theory of friction are naturally discussed at some length. The different kinds of lubricants and the apparatus for their application are fully described, and are followed by practical methods for the chemical and physical tests of oils. The quantitative determination of friction is developed under testing machines, and the theoretical consideration of the coefficient of friction. The final chapter, on the finance of lost work of friction, sums up the practical results of the book. The conclusions reached will be of true value to the manufacturer and engineer.

PHOTO-MICROGRAPHY, including a description of the Wet Collodion and Gelatino-Bromide Processes, etc. By A. Cowley Malley. London: H. K. Lewis, 1885.

Within the past few years Science has brought a great many agents into her active service, but none, perhaps, have better vindicated the wisdom of her choice than the microscope and the camera. Of late, they have been used in combination, and photo-micrography has become an acknowledged and valuable means of investigation. It has already accomplished much, and promises more for the future. Mr. Malley's book gives a brief description of the instruments employed, and an outline of the best methods for preparing the sections and attaining a clear, sharp impression. Though it is far from exhaustive, it has the merit of being practical, and contains many useful hints which will save the experimenter much time and labor.