

ENGINEERING INVENTIONS.

Mr. James Mallen, of Wellsville, O., has patented an improved pulley for driving light machinery. A pulley made in skeleton form is keyed to the shaft, and a loose pulley consisting of a tire like band surrounds it and revolves in the same plane. On the inside of the band are notches that are right angled on one side and inclined on the other, into which radial arms are forced by means of levers, and a sliding collar on the shaft to attach it to the fixed pulleys. Lateral displacement is prevented by lugs on the fast pulley.

An improved device for heating cars has been patented by **Mr. James M. Thayer, of Randolph, Mass.** A furnace is held in a box suspended from the bottom of the car, and in the top of the box are registers through which the heat passes into the car. Around the furnace is a water space with which hot water heating pipes are connected that pass around the car and are connected with a supply tank that also serves as a condenser.

A device for holding car coupling links in such a manner that the links can be passed into the drawhead without endangering the hands of the brakeman has been patented by **Mr. Frank Sweetland, of Edwardsburg, Mich.** The device consists of a plate having a hand slot at its upper end, and below this a slot through which the coupling link is passed. A key fitting into part of the slot adapts it to be enlarged to admit a link having its sides pressed together at the middle, and decreased in size to retain the link. By this plate the link is guided into the drawhead.

An apparatus to prevent the accumulation of scale or sediment in boilers has been patented by **Mr. William Ord, of Brooklyn, O.** A brush of steel or other suitable material, shaped to conform to the interior surface of the boiler, is hung in the boiler on the ends of two wires that pass to the outside through opposite ends of the boiler, and connect to rollers, by which the brush is drawn backward and forward on the inner surface, to loosen the sediment and carry it to the mud drum. A heel attached to one side of the brush prevents its working when it is drawn to the front.

An apparatus for deepening the channels of rivers and removing sand bars where the tides are strong, has been patented by **Mr. Gustav Peterson, of Galveston, Texas.** The apparatus consists of a rotating drum provided on its periphery with spading devices. The ends of the shaft of the drum are journaled in bearers to each end of which a drag chain is secured. Behind the drum and connected to it by chains is a drag constructed similar to the ordinary square harrow. The apparatus is dragged over the surface to be removed, spading and loosening it, so that it may be removed by the current of the water.

Messrs. **Frank S. Anderson and Charles Sauer, of Easton, Md.,** have patented a combined feed water and low water alarm for steam boilers. The device is so constructed that when the water is above its proper height the injector is shut off, and when it falls again is let on to feed the boiler. If the injector should fail from any cause to work, and the water level is brought down below the safety point, a whistle valve is opened and the whistle blown.

Mr. Henry Webster, of Cassville, Wis., has patented an improved manner of feeding water to steam boilers, by which better circulation is obtained. The feed water pipe enters one side of the rear end of the boiler, and passes forward to the front end, thence across it and back part of the length of the boiler, thence again nearly to the front and vertically downward, terminating just above the bottom of the boiler at the portion over the furnace most highly heated. By discharging the water at this hottest point, the impurities become finely granulated and do not form scale.

Mr. James H. Gamble, of Nebo, Ill., has patented improvements in safety switches for railroads, adapted to be operated by hand or automatically. The rails of the switch are spring rails, each secured at one end to the sleepers of the main track, their opposite bevel ends resting on the track sleepers, but are free to vibrate, one of the switch rails forming a continuation of one of the main rails and the other of one of the switch rails. The switch rails are connected by a rod, and are thrown to switch by devices on the cow catcher of the locomotive, and are released by a device on the rear car of the train.

Mr. Charles M. Emeis, of Mount Joy, Ia., has patented improvements in traction wheels for road engines by which the slip of the wheels and consequent waste of power in the engine is prevented. In the tread of the wheel spiked arms are fitted so as to be adjusted by devices secured to the hub of the wheel to project more or less for varying the tractive effect, or withdrawn entirely as desired. By suitable devices the spiked arms may be fully projected or withdrawn, or in any intermediate position.

Improvements in rotary engines have been patented by **Mr. Thomas Hawkins, of San Francisco, Cal.** A revolving cylinder is formed with radial grooves in which are sliding pistons that are projected against the inner surface of the case by springs. The cylinder is smaller than the interior of the case, leaving a steam way around it that is uniform in width a part of the way, and from the steam port then increases in width to exhaust port, the steam being used under high pressure in the narrow chamber, and expansively in the large chamber.

A traction wheel for road and other analogous engines, having an elastic connection between the running wheel and the gear wheel, for overcoming the strain of vertical jolts, has been patented by **Mr. Abraham O. Frick, of Waynesborough, Pa.** The running wheel and the gear wheel each have separate axles or bearings, and springs are interposed between the axles and bearings, and the sides of the two wheels are connected by elastic links that permit both vertical and rotary play to the wheels and bearings.

An improvement in car couplings has recently been patented by **Mr. Charles E. Macarthy, of Forsyth, Ga.** This invention relates to an improvement in automatic car couplings, designed principally to hold the ordinary link in horizontal position favorable for automatic coupling.

An improvement in elevated railroad construction has been patented by **Mr. Norman Allen, of Rockaway Beach, N. Y.** This invention relates to the uprights or posts which support the superstructure of elevated railroads, and it consists in a walling for surrounding the ballast, made conical and adapted to be used with a lower sheet, also in a pedestal or base part of the post, formed with horizontal intermediate flanges and the vertical flanges.

An improved spark arrester has been patented by **Mr. John H. Optenberg, of Oshkosh, Wis.** This is an arrangement of a wire screen guard, deflectors, pockets, and draught-regulators, which effectually prevent the escape of sparks from the smoke-pipe of a locomotive or other boiler furnace, especially when artificial draught is employed to accelerate the combustion.

Mr. Clemens von Bechtolsheim, of Munich, Germany, has patented an improved direct-acting rotary engine for steam, compressed air, water, etc., devoid of the defects of the usual rotary engines, such as leakage, undue friction, overheating of the parts, and jerking movements. The engine is constructed with rotary cylinders having their inner ends resting against a valve trunnion or pivot.

A novel car brake and starter has been patented by **Mr. Isidore Gérard, of Newton, Kan.** This invention relates to improvements in devices for assisting the horses to start street cars; and it consists in the arrangement of a coil spring and two ratchets placed on the axle and contrived so that the stopping of the car by the resistance of the spring stores up power to be given out in starting the car.

An improved spark arrester has been patented by **Mr. George Green, of Toyah, Texas.** This invention consists of an inverted hollow cone suspended within a hollow and tapering receiver for the sparks, located in the upper and enlarged portion of the smoke pipe, to deflect the sparks against a conical annular cover to the receiver. By this means the sparks are broken and thrown against an arrester located over the hollow cone, and by the latter the sparks are again broken and then thrown down through the cone, to be returned as before, and continued in that course until extinguished and broken sufficiently to pass away with the smoke.

An improved car coupling has been patented by **Mr. Samuel A. V. Hartwell, of Valley Center, Kan.** The invention consists in a car coupling constructed with a bar hinged in the interior of the drawhead in such a position that its forward end will rest upon the rear end of the coupling link, and connected by a short bar with a lever hinged beneath the drawhead, and having a crossbar attached to its forward end, so that the link can be controlled from the side of the track.

MECHANICAL INVENTIONS.

Mr. George Dietzel, of New York city, has patented an improved machine for making beaded chenille, or chenille with a varying diameter. The invention consists in the combination of a laterally-reciprocating pile-cutting knife with a cam for reciprocating the knife as the pattern of the chenille may require, and means for operating the cam.

A novel saw sharpening machine has been patented by **Mr. Charles M. Elkins, of Matteawan, and Wilbur H. Weston, of Newburg, N. Y.** The device is adapted to be attached to a bench or other stationary object, and is composed mainly of two jaws for clamping the blade of the saw, and of a longitudinally-sliding and laterally-traveling or movable handle for holding and operating the file, the handle being axially adjustable for giving the proper stand to the file, and is pivoted so that it may be adjusted horizontally for filing both sides of the teeth of the saw, graduations being provided for setting the handle so that both sides of the teeth may be beveled alike.

An improved aligner for type-writers has been patented by **Mr. Charles J. Baker, of Topeka, Kan.** This invention consists of a gauge constructed and arranged for temporary attachment to the top of a type-writer, so as to occupy a position in such relation to the point where the type take effect on the paper in operation that the type may be successively raised up to said point and accurately and uniformly aligned in adjusting them, the gauge being essentially a bar of metal bridging over the type basket and resting on the type-writer case, with an opening at the type center, in which slides for the type, also having openings and being suitably cross-lined, are fitted to adjust the type by.

Mr. Charles J. Gibson, of Bergen Point, N. J., has patented an improvement in that class of lawn-mowers having spirally arranged cutters revolving about a horizontal axis. This machine possesses several points of novelty, which increase its effectiveness and durability.

A machine for making split keys has been patented by **Mr. Robert T. King, of Columbus, O.** This is an improvement on a machine for bending split metal keys, patented by the same inventor September 6, 1881, and it consists mainly in the substitution for hand levers of revolving cams which communicate power to the levers actuating the forming pin, and to a slide which operates the bending-levers.

MISCELLANEOUS INVENTIONS.

A new switch for grounding telephone or telegraph lines has been patented by Messrs. **Benjamin McCabe, Charles R. Swain, and James T. Sutton, of Peekskill, N. Y.** The object of this invention is to prevent telephone and telegraph instruments from being injured by electricity discharged from the clouds during thunder storms. It is constructed with a series of conductors and springs connected with the ground wire, a series of conductors and springs connected with the instrument wires, and a series of conductors attached to a sliding bar and connected with the line wires, so that the line wires can be connected with the ground wire or the instrument wires by a single movement.

A new and simple device for holding reins securely has been patented by **Mr. Leslie R. Hyde, of Montague, Tex.** Two uniform sleeves are mounted

loosely and eccentrically on two upright shafts that are inclined toward each other at the bottom and have spiral grooves into which pins in the sleeves pass. These parts engage with each other and move simultaneously. The reins are placed between the sleeves, and when drawn forward are grasped firmly.

Mr. James W. Patterson, of Philadelphia, Pa., has patented a trunk frame that combines lightness and durability. The frame is constructed of metal bars connected by diagonal rods, all held together by corner pieces. The frame and lid are covered with a layer of wire netting, and the netting is covered with an external layer of canvas oilcloth or other waterproof material. This frame will not be damaged as a wooden frame by rough handling.

An improvement in gang sawing machines, by which they are adapted to saw curved timbers, has been patented by **Mr. Charles S. King, of Houtzdale, Pa.** The saws and feed rollers are operated in the usual manner. A pattern made of the exact curve required in the timber is placed upon the feed rolls. The sides of log are slabbbed to the required thickness, and the timber is firmly secured upon the pattern. The pattern is guided in the required curve by rollers which rest against its concave and convex sides. By this means the timber is sawed accurately and as rapidly as the straight sides.

Improvements in door latches have been patented by **Mr. John Brownlee, of Evansville, Ind.** The latch slides and rotates in apertures in the forward end of the case, and in a partition near the rear end, and is held forward by a spring. The knob spindle passes through the case, and a cam block that is operated to move the latch back by turning the knob. Upon the side of the knob spindle are formed teeth, which mesh in teeth formed on the surface of the latch. A pin works against a spiral shoulder in the latch, and by pulling the knob spindle the latch is rotated and moved back.

Mr. James M. Harvey, of Palmyra, Tenn., has recently patented an improved shingle shaving machine. The shingles are cut from the shingle bolt by means of a riving knife placed in a vertical sliding frame operated by cam devices, the shingle block being turned a little at each cut to make the shingles thick at one end and thin at the other. After being cut the shingles are placed on a platform and held by suitable devices, while a shaving knife is drawn over them, the backward motion of the knife releasing the holding devices to free the shingle.

Mr. Henry C. Keeler, of Council Bluffs, Ia., has patented improvements in lifting jacks. The frame consists of parallel uprights placed on a support, and provided with slotted plates having notched projections on their edges, with which pendent pawls of a rocking lever engage to raise or lower a standard to which the rocking lever is pivoted. The pawls are held to the notched projections by means of springs attached to the lever. The standard carries the load to be raised.

Improvements in devices for packing dried fish have been patented by **Mr. James H. Baxter, of Portland, Me.** Moulds having a cylindrical contour on their interior are made in two longitudinal sections, and hinged together at one side. These sections have corresponding transverse internal grooves for the reception of binding cords. The fish are placed in the mould and the mould placed under a press. The mould is held together by hooks and removed from the press to tie the springs.

A faucet whereby ale or beer is so interrupted and agitated in its passage as to produce an increased amount of foam has been patented by **Mr. Joseph H. Dorgan, of Plattsburg, N. Y.** The outer end of the body is formed with a stuffing box through which the valve rod moves, the lower end of which is provided with a valve that is seated in the body. Below the valve seat the body is enlarged, forming an inward projection, against which the ale strikes, and also against the valve and valve seat, causing it to be agitated and form foam.

Mr. Charles B. Quick, of Penn Yan, N. Y., has patented a device for warming peanuts. A hollow cylindrical case is fitted in its lower portion to receive a lamp, and in its upper portion with a removable pan, upon which the nuts are placed. A perforated tube is fitted over an aperture in the center of the pan, and beneath the aperture and over the lamp is a deflecting plate that distributes the heat of the lamp over the surface of the pan to warm the nuts.

A machine for bending wooden stirrups has been patented by **Mr. John B. Chiles, of Kernstown, Va.** A former-block, over which the stirrup is to be bent, is provided, and the steamed block is pressed against the bottom of the former by a foot lever. By suitable devices operated by a crank shaft the block is pressed around the former-block to fit it, and it is secured by a clamp to retain it in shape, when it is removed to make place for another block.

Water boilers are usually fitted with rings in their ends for the attachment of pipes. **Mr. John Trageser** has patented a device by which they are attached in a quick and inexpensive manner. The aperture in the boiler is made slightly elliptical in form, and the ring fits closely across the shortest diameter. The ring is heated and placed in the aperture into which it is swaged to fill the aperture by means of a suitable mandrel and die. The shape of the aperture prevents the ring from turning in cutting the thread.

Mr. Justus M. Silliman, of Easton, Pa., has patented an improved instrument for projection drawing. A rectangular frame adapted to rest flat upon a drawing board is provided with graduated scales at its top and bottom edges, and has two quadrant-shaped graduated frames for crystallographic drawing. To the upper side of this frame two wires are attached that pass around a roller reduced at its center to receive a tension spring that holds the wires taut, so that the upper and lower edges of the drawing frame will be parallel with the winding roller.

Mr. Noble A. Boies, of East Palestine, O., has patented a device to be used with horses having vicious habits, to allow them to be successfully worked. The device consists of a safety bar attached to the bridle

of the horse, and hooked at the other end to an eye upon the pole or shaft a suitable distance from the forward end. For a single horse one bar is placed on each side.

Improvements in baggage checks and clasps have been patented by **Mr. James H. McLeary, of San Antonio, Tex.** The check consists of a shell having a circular chamber and an elliptical opening leading to the chamber. A destination plate of elliptical form is adapted to be inserted into the chamber through the opening, and turned to cross the opening, so that a wire that secures the check to the baggage, and passes through the check, also passes through the plate. A duplicate of the destination plate is given to the baggage owner.

Improvements in ironing boards upon which shirts are ironed have been patented by **Mr. David McArthur, of Oswego, Kan.** The body portion of the board is cut away at its upper end to form a head, and through the head an elastic cord is passed, the outer ends of which are attached to the shoulder portions of the board, the cord stretching the neck and upper part of the bosom, so as to be free of wrinkles. At the lower end of the board is a hinged tail piece, by which the lower end of the shirt is grasped to stretch the lower part of the bosom.

Mr. Alexander J. Young, of Atlanta, Ga., has patented an attachment for ordinary hand lanterns that enables it to be used for giving danger or other signals. A hollow cylinder, in the ends of which a winding shaft is journaled, is secured in an upright position on the frame of the lantern. A screen composed of any suitable translucent material, and of a color employed to indicate danger, is wound on the shaft, and when it is desired to give a signal the screen is drawn out through a slot in the cylinder and around the body of the lantern.

A barrel hoop, having an elastic connection between its ends, by which the hoop may expand when the barrel swells, and contract when it shrinks, has been patented by **Mr. Quincy King, of Colorado Springs, Col.** The connection consists of a rod of spring metal, bent forward and backward on itself to form a series of loops, and connected at its ends by hooking them through loops in the end of the hoop. Mr. King has also patented an elastic saddle girth. Between the strap that connects the girth to the saddle and the girth proper is an elastic section, formed by bending a spring rod or wire in a series of loops, the loops being properly formed for attaching to the girth a strap.

A sanitary steaming stove for destroying human parasites, with their eggs and larva, in clothing, and also to disinfect and destroy the germ-spores of infectious diseases, has been patented by **Mr. Henry Cartwright, of Portland, Or.** Over a furnace is placed an evaporating pan, which in turn is covered with a steam-tight caement provided with doors. A rack lining made of wood laths is provided with hooks from which the clothing is suspended. Water is supplied to the pan, and a charge of clothing is steamed for ten or fifteen minutes.

Mr. William McCaine, of St. Paul, Minn., has patented an improved pyroxyline compound. The pyroxyline is combined with the essential oil of cassia or cinnamon, and a portion of the oil always remains in the compound and acts as a solvent of the solidified collodion at any time when it is exposed to heat, making it possible to take separate pieces after they become hard, and under heat and pressure to form them into one solid homogeneous mass.

Mr. Elvearo Stout, of Ottumna, Ia., has patented improvements in refrigerators. The ice chamber is in the upper part of the case, and the bottom of the chamber is perforated to permit the water from the ice to fall into a pan which forms the top of the provision chamber. The water passes through a series of water spaces that form the shelves or chambers of the refrigerator, the shelves or spaces being a little inclined so that the water runs across them to vertical spaces that connect them at their ends, and passes out at the bottom of the refrigerator.

Improvements in portable fences have been patented by **Mr. William C. Gholson, of La Grange, Ga.** The fence panel is made of two or more longitudinal bars having at each end two upright bars, between which the other bars are placed. One of the uprights is wider than the other, and projects slightly beyond the panel, so that the panels when placed end to end form a worm fence. The panels rest on the ground, and are held together by means of wires that are long enough to connect four panels, and placed in the spaces between the upright bars. The wires are provided at each end with a block upon which they are wound to tighten them to stiffen the fence.

Mr. Nathaniel B. Sollers, of Cove Point, Md., has patented a knitting board for manufacturing nets. The board is nearly semicircular in form and is provided with a perforation near its lower end and a block on its under side by which it is steadily held in the hand. A loop holder is secured to the face of the board that is so formed that the loops or meshes are easily placed on it, and will not slip off in use. The net is secured to some stationary object, and the board holds the meshes taut while the shuttle is passed through them.

Mr. Cornelius Kunkel, of Oregon, Mo., has patented improvements in windmills, consisting of auxiliary vanes applied to the windmill in such a manner as to counterbalance the tendency of the wind to change the angle of the wings of the wind wheel, so that a governor employed to regulate the position of the wings will be relieved of the work of holding the wings to the wind.

A light and convenient device for gumming cross-cut saws has been patented by **Mr. Clarence A. Stafford, of Norwood, Mich.** Die blocks adapted to move between two plates are moved by two cam levers that are so pivoted to the die blocks and plates that when they are swung apart they act simultaneously to move the blocks. The saw plate is entered between the dies, and when the levers are pressed, the leverage being powerful, the cutters act with precision.