## ENGINEERING INVENTIONS.

A self-acting car coupling, which is adapted to be attached to and used with the ordinary link and pin drawheads, has been patented by Mr. Joseph D. Wilson, of Kansas City, Mo. The coupling consists principally of collars attached to the drawheads by pins which pass through them and the ordinary pin holes in the drawheads. The collars are provided with suitable locking devices, and are so constructed as to be partially rotated upon the drawheads by means of pivoted weighted levers. The rotary movement of the collars on the drawheads serves to operate the locking devices, to couple or uncouple the cars, as may be desired. The weighted levers may be operated from the top or sides of car as desired.

An improved automatic car coupling has been patented by Mr. Charles E. McCarthy, of Forsyth, Ga. In a vertical recess, back of the throat of the drawhead, is a trigger bar pivoted at its lower end, and its upper is formed into a catch and extends through a slot in the drawhead back of the pin hole. A tubular projection above the pin hole sustains a short headless pin, and a latch that is pivoted in a slot in the rear wall of the projection projects across the pin hole and forms a support for the pin, when it is elevated, while the other end passes under the catch of the vertical trigger bar. The pin being sustained on the latch, whenever the link enters the drawhead, it pushes back the trigger bar, and the weight of the pin tips the latch, allowing it to drop through the link and couple the cars.

The object of an invention recently patented by Mr. John W. Crump, of West Point, Miss., is to increase the strength and durability or levees. The usual muck ditches are made along the line the levee is to occupy, and piles are driven along the back edges of the ditches. To these piles are secured horizontal boards, forming continuous fences, each fence being of less height than the one in its rear. The outer fence is at the crown of the levee, the adjacent fences diminishing toward the river front. The dirt is then thrown over the fences, and the levee formed in the usual manner. To the upper ends of the piles are pivoted arms to be swung up and held in a vertical position. In case of danger of a crevasse the arms are raised and serve as supports for planks for preventing the washing of the crown of the levee.

A novel automatic car coupling has been patented by Mr. William T. Van Dorn, of Lincoln, Neb. The drawhead of the car has the usual flaring mouth, and also has an opening on one side in which a retaining device for the coupling bar is arranged. The bar is pointed at one end, and has at this end a lateral catch having a straight bearing for the coupling pin. The pin presents an inclined surface to the front end of the bar, while its bearing surface corresponds with the bearing surface of the catch. When the end of the bar strikes the pin it is deflected against a retaining spring placed above the pin, the spring yielding sufficiently to allow the catch to pass behind the pin. The opposite end of the bar is perforated to receive the ordinary coupling pin.

## MECHANICAL INVENTIONS.

Improvements in devices for lasting the shanks of boots and shoes have been patented by Mr. Frank Beyerle, of North Branch, N. Y. The device consists of two clamps, each composed of a fixed and movable jaw pivoted to each other, their grasping ends being serrated, and the lower ends of the movable jaws being moved by means of a screw to close the jaws at their grasping ends. The fixed arms extend beyond the pivots and pass through apertures in a sliding plate, and at their lower ends grasp a nut through which a screw passes, which, when it is turned, rests against the sliding plate and presses it to move the grasping ends of the jaws toward each other, and stretch the shank tightly over the last.

A fifth wheel for vehicles, so constructed that it will not be liable to break or get out of place when exposed to a side strain, has been patented by Mr. George W. Smith, of Darlington, Wis. To the under side of the head block a plate is secured, and upon the lower side of the center of the plate is a projection, which is concaved upon its under side, to receive a convex projection formed on the upper side of a lower center plate secured to the axle. The king bolt passes through the centers of the two plates and the head block and holds them together. The sides of the lower circle of the fifth wheel are vertical and its top is oval, and this circle fits into a correspondingly shaped upper circle, the two circles being held firmly to their parts by clips and bolts. With this construction all breakage from side strain is prevented.

Mr. John D. Underhill, of Hoboken, N. J., and Elizabeth Underhill, of New Rochelle, N. Y., have patented devices for equalizing the driving power of a coiled spring, to adapt it to drive sewing machines at a uniform speed. A regulating wheel, driven by the coiled spring, has a spiral row of perforations on its face from near its center to its periphery. A spur wheel, whose teeth engage with the spiral perforations, slides upon a feather upon its shaft, and the outer end of the shaft is provided with a gear wheel which engages with a train of wheels, through which the power is applied to the machine to be driven, with a gradually increasing leverage as the force of the uncoiling spring decreases.

A windmill that automatically regulates itself has been patented by Mr. Benjamin J. Bragdon, of Beloit, Kan. The main shaft of the mill is pivoted vertically between adjustable bearings, and has fixed collars at each end that carry three or more radial arms that have at their outer ends curved side arms. The vanes are regularly curved in cross section, and are hinged at their centers to the ends of the radial arms, and the curved side arms act as stops to the windward sides of the vanes. The windward edge of one vane is connected by rods to the leeward edge of the opposite vane. Governors are suspended from the upper collar by rods that pass through eyes attached to the leeward edges of the vanes, and by their weight and the centrifugal force obtained by the revolution of the mill automatically open and close the windward edges of the vanes, and regulate the amount of wind admitted.

Mr. Alfred Marland, of Pittsburg, Pa., has patented improvements in that class of nut machines which cut the blanks from a bar or rod and compress them in a suitable forming die, and at the same time punch the blanks in the line of the length of the bar from which they are cut, and then automatically discharge them from the die. The machine consists of a forming die, two crossheads carrying hollow compressing mandrels through which the punches move, and a crosshead carrying the main punch and the cutting bar, all of which are operated through connecting rods, yokes, and levers from cams on a single main driving shaft. By this machine the nuts are more perfectly formed, and the machine is more efficient for its purpose than those before in use.

## ELECTRICAL INVENTION.

Mr. Charles A. Cooley, of New Britain, Conn., has patented a commutator constructed so that the wearing segments may be quickly renewed without disturbance of the armature wires or the removal of the commutator from its shaft. The armature shaft is made tubular to receive the wires from the armatures, and on this shaft are flanged metal hubs having at each side vulcanite washers for insulating the hubs. Rods extending through the flanged hubs and the washers are enlarged between the two hubs, and are insulated by sleeves of vulcanite. To these rods segments of copper are secured by screws to form the wearing surfaces of the commutator. The copper segments are of suitable thickness to sustain the wear of the commutator brushes for a reasonable length of time, and can be easily removed by taking out the screws and new segments put in place.

## AGRICULTURAL INVENTIONS.

An invention for removing the leaves from sugar cane stalks has been recently patented by Mr. William P. Gard, of Parsons, Kan. A frame has in its forward side a rectangular recess, in which are placed four triangular plates forming a square. Each triangular plate is held forward by a spring, and the plates and springs are secured in place in the recess by a frame secured to the face of the main frame, that is so cut away as to have the middle part of the plates uncovered. The adjacent angles of the plates are notched, forming a hole which flares toward the rear side of the plates. The stripper is placed in front of the rollers of a cane crusher, and the smaller ends of the stalks passed through the hole are grasped by the crushing rollers and drawn through the stripper into the mill.

An improved wheel cultivator has been patented by Mr. Alfred Messersmith, of Munster, Ill. The beam of the cultivator is secured in the usual manner to the axle of the wheels. The arms which carry the cultivator teeth are secured together at their front ends, and extend rearward and are bent to hold the teeth in a proper position in relation to each other. At their rear ends they are bent downward and are provided with a series of holes to receive hooks for securing the teeth to the arms. The cultivator tooth is of the usual construction, and is provided with a round shank around which the hooks pass and by which the teeth are held firmly to the bars. Suitable handles are provided for controlling the cultivator.

Mr. Stephen C. Smith, of Poole's Mill, Ky., has patented a device for pulling sprouts. To the plane surface of a segmental block having parallel sides is hinged a lever, which from its hinged point forward is beveled on its under side, and on its upper side has a notched metallic plate. The lower end of an arm, having at its upper end a right angle jaw, is secured to the side of the block. In use the lever is raised to a vertical position, and the sprout is placed between the angle jaw and the notched plate on top of the lever, the segment block resting on the ground. When the lever is depressed the sprout is pulled from the ground.

## MISCELLANEOUS INVENTIONS.

An improvement in shovels has been patented by Mr. Robert T. Pettibone, of Wyoming, Pa. In the usual construction the back strap projects from the surface of the blade and obstructs the use of the shovel, besides wearing the strap and rivets, or else when the back strap has been countersunk in a recess, the ridge on the face of the blade is open to the same objection. In this invention the back strap is shaped to fit the sides of the socket formed in the blade for the handle, so that the middle part of the strap forms the back of the socket, while the edges are bent backward, as straight flanges, which, being riveted to the sides of the handle socket, leaves the back strap flush, or nearly so, with the blade.

A device for cleaning fur robes rapidly and at little expense has been patented by Mr. Ferdinand Hosch, of Brooklyn, N. Y. The robe to be cleaned is secured to a large drum that rotates about forty times in a minute. A beater in the bottom of a box placed above the large drum rotates, in the same direction as the drum, about three hundred times in a minute and brushes against the robe. The box is filled with sand and sawdust, which is rubbed into the fur, and a cylindrical brush, that has the same diameter and rapidity of rotation as the beater, removes the greater part of sand and sawdust from the fur. A brush similar to the last, making five hundred revolutions in a minute, and rotating in a contrary direction, finishes the robe perfectly, as it brushes the hairs down as they naturally grow.

Mr. James M. Collier, of Gadsden, Ala., has patented a device by which the grinding stones of mills may be easily adjusted to their proper positions, and may also be easily placed in convenient position for dressing. The grinding mill consists of a lower stationary stone and an upper or runner stone placed in a suitable frame, and having proper devices for adjusting and shifting them. The runner stone is cylindrical, and is placed vertically over the under stone, which is concaved on its upper side to receive and fit upon the runner. This stone rests in a rack in which it is adjusted by set screws. By suitable devices, operated by a hand wheel, the lower stone may be adjusted closer to or farther from the runner, to grind the grain finer or coarser. The frame to which the bearings of the shaft of the runner are attached is so constructed that the frame and stone may be thrown forward to give convenient access to the face of the lower stone for dressing.

Mr. Joseph M. Jones, of Paris, Ky., has recently patented an improved handcart. The axle and wheels are of the ordinary construction. Upon the top of the side pieces of the frame of the cart are runner bars that are raised a short distance from the surface of the side bars by means of downward projections formed on their ends, and at the middle they are supported by eyebolts that screw into the side bars. The body or box of the cart is secured to the runner bars by clips, through which the bars pass, and within which friction rollers are journaled, and is secured in any desired position on the runners by chains, and the body is moved along the runners by handles secured to it.

Mr. John Johnston, of New York city, has patented an improvement in elevators and dumb-waiters which insures their perfect operation and places them under control at all times. A series of friction rollers, over which the suspension rope passes, are grooved for the rope, and work in contact with each other, so that there is sufficient holding friction to support the car or waiter. Grooved guide rollers are placed at the sides of the contact rollers, and below them all is a guide roller for holding the rope at the middle of the well. At this end of the suspension rope is the car, and at the opposite end is a balancing weight. The rollers are turned by their contact in the same direction as they are turned by the rope, and by making the upper roller of larger diameter a difference is obtained between the rotation by contact and the rotation by the amount of rope given, which increases the holding friction.

Mr. George A. Kingsland, of Brooklyn, N. Y., has patented an improvement in foundation curbs for wells. Timbers sawed upon the arc of the required curb, and about six inches wide and three inches thick, are laid in horizontal courses to a height of about four feet. To the outer and inner surfaces of this core are spiked a vertical tier of narrow two-inch planks as long as the curb is high. To these planks are spiked several thicknesses of horizontal boards, about one inch in thickness, care being taken to break joints horizontally and vertically between the boards. To the lower part of the outer tier of boards are spiked iron plates, projecting about four inches below the lower surface of the curb. With this construction the curb and the wall built upon it will descend horizontally, and as the curb descends the edge of the iron plate shaves off the sides of the excavation evenly.

Mr. Frederick B. Spooner, of Brooklyn, N. Y., has patented an improved device for detaching the ring at the upper end of a suspender strap from the suspender buckle. To the front end of an elastic suspender web is attached a fixed metal plate that has a central longitudinal slot, in the upper end of which is secured a spiral spring, having its lower end attached to the upper end of a frame sliding on the back of the fixed plate. A tongue on the sliding frame passes through an aperture on the fixed plate, the upper end of the tongue being bent out to form a hook that checks the downward movement of the sliding frame. The spiral spring holds the sliding frame and prevents the suspender ring from slipping out, and when the frame is pulled down the ring is free.

Messrs. John D. Hanbury and Charles H. Clifton, of New York city, have recently patented suspenders for pants or underskirts, which also serve as shoulder braces to keep the body erect and expand the chest. Two supporting bands pass over the shoulders, and at their ends have devices for fastening them to the pants or skirts, at the front and rear. Each band has secured to it transverse bands that pass under the arms of the wearer, forming arm loops with the upper parts of the supporting bands. A band provided with a buckle is attached at its outer ends to the supporting straps, at the same place to which the arm bands are attached, and a short distance below this point the arm bands are connected by a strap provided with an adjusting buckle.

Mr. Frederick L. Hemmer, of East Arlington, Vt., has patented an improved frame for buck-saws. The two end pieces of the saw frame are connected at their upper ends by a tie rod, and their lower ends are held together by the saw blade. Just below the tie rod is placed a downwardly curved crosspiece, and below this there are braces reaching from near the center, diagonally down, to about the center of the length of the end pieces of the frame. The adjacent ends of the braces are faced with curved metal plates formed with screw openings that engage with a right and left screw bolt; by this means the braces are moved apart to tighten the saw blade.

An improved fountain pen has been patented by Mr. Francois X. Poznanski, of Paris, France. The ink reservoir has at its upper end a shouldered tube, which supports an elastic tube that is closed at its top to form an air chamber. Above the air chamber is placed a piston head. In the lower end of the ink reservoir is a hollow plug, closed at its lower end, and near this end there is a side opening. The lower end of a rod, bent to form a right angle, projects into the side opening; its upper end extends to the top of the ink reservoir. A tube beveled at its end surrounds the lower part of the plug, and between the tube and the plug the pen is inserted. By a slight pressure of the piston on the air chamber the pen is supplied with ink.

A button that can be readily attached to garments without sewing, and readily removed without injury, has been patented by Anna K. Hawley, of Delhi, La. The button head may be of any suitable form or material. The fastener, which also forms the shank of the button, is a strip of spring metal, doubled upon itself to form a flanged head portion, and its ends are then bent outward to form projecting spring posts. The ends of the posts are again bent outward and backward to form claws. The fastener is secured to the back of the button in any suitable manner, and the posts are passed through an aperture in the cloth and through a slot in a washer back of the cloth, the elasticity of the spring posts retaining the claws over the edges of the washer. To remove the button the claws are pressed together, when the button is drawn off.

An improved gymnastic apparatus has been patented by Mr. William A. Smith, of Wilmington, Del. Two vertical bars, about an inch wide and one-fourth of an inch thick, are bent at their upper ends at right angles to their length, and each bar has a spur on the under side of its bent portion. Their lower ends are bent to form a half-round hook, and the bars are connected at their middle parts by a brace consisting of two bars pivoted to each other at one end, their outer ends being pivoted to the bars. A round bar fits into the hooks at the end of the vertical bars, and the upper portion of each of the bars is covered with rubber or other soft material. In use the upper ends of the bars are hooked over the top of a door frame, the spurs preventing the apparatus from slipping, and the device is used as an ordinary trapeze.

Improvements in washing machines have been patented by Mr. William F. Duvall, of Blanchard, Iowa. Two metallic cylinders are connected at their tops and bottoms by two tubes, and in the bottom of the cylinders are placed large wooden balls. In the cylinders above the balls are inverted sheet metal funnels, their greatest diameter being less than the diameters of cylinders. These funnels or beaters are reciprocated in the cylinders by any suitable means. In use the wooden balls are placed in the bottom of the cylinders. The water, soap, and clothing to be washed are then placed upon the balls, an equal amount of clothing being placed in each cylinder. The beaters are then to be placed in the cylinders and reciprocated, when by the peculiar action of the different parts the clothes are quickly and effectively cleansed.

Mr. William C. Siffken, of Victoria, British Columbia, has patented an artificial fuel that is made of cheap and otherwise useless materials. The invention is a composition consisting of ordinary coal screenings, clay which is free from sand, sawdust, and water. This composition is thoroughly mixed and pressed into moulds so formed that apertures are formed in the cakes to facilitate the passage of air and prevent smouldering. While this fuel may not be so well adapted for kindling as the artificial fuels heretofore employed, it has the advantage of utilizing waste materials in an inexpensive way, and at the same time serving the purposes of the cheapest natural fuels.

The object of an invention recently patented by Mr. Wesley H. Dunn, of Bellwood, Pa., is to provide a device to prevent lamp chimneys from being cracked by sudden changes of temperature. The device is formed of two curved metal strips pivoted to one end of a metal rod. The ends of these strips are secured to the top of a lamp chimney in such a manner that the metal rod projects downward. The strips and rod are heated by the flame of the lamp, and as they are of metal they retain heat much longer than the chimney. If the light is extinguished and the chimney tends to cool off rapidly the heat passes from the rod and strips to the chimney and prevents rapid cooling and consequent cracking.

An improvement in the class of carriage tops that fold back when not in use has been patented by Messrs. Conrad and Gottfried Gross, of Richmond, Va. The top is composed of two sections, the front section being connected to the posts in front of the door by hinges, and the rear section is connected to the rear posts in the same manner. The front posts have at their lower ends studs that are secured in sockets in the upper edge of the body. The rear posts are hinged to the body, and when the top is lowered they lie in recesses in the body. The front posts are hinged to the rear section of the top by a double hinge secured to the inner sides of the posts and top. To lower the top the studs of the front posts are released and the posts are raised up parallel with the front section of the top. This section is then raised until it is vertical, and the rear posts are pushed back and the top falls.

An invention that provides a substitute for telegraph poles and light towers has been patented by Mr. William Beeson, of Miles City, Montana, and consists in supporting telegraph wires, electric lights, etc., by means of gas-inflated metallic chambers or floats of sufficient size and buoyancy to float and sustain them in midair. The float is held by suitable stay wires or ropes, that lead to the ground or to some object on the ground. The float is pointed at one end, and has a vane to keep it headed to the wind at its opposite end, and is attached by wires to a swivel by which it is permitted to turn. Between the swivel and the ground supports is a coiled spring, which saves the supports in strong and sudden winds. Between the coiled spring and the ground crossheads are attached for holding the wires to be supported.

Mr. Benjamin F. Brown, of Houghton, Mich., has recently patented an improved sleigh knee, by which construction and repairing of sleighs are greatly facilitated. The knee is cast of malleable iron and made hollow, and has a horizontal projecting flange at a little distance from its upper end, the upper end of the knee being designed to enter a recess in the under side of the beam to relieve the fastening bolts from strain. The lower end of the knee rests upon a plate placed upon the runner, and is flared in front and rear, and has flanges that extend over each side of the runner to receive bolts that secure it to the runner and beam. The rave of the sleigh is bent downward in front and rear of the beam, and its ends are secured to the upper sides of the runner. Should the knee be broken it can be readily replaced with a new one without taking the sleigh to a mechanic.

Mr. William H. Williams, of Bristol, N. H., has patented an improved oiler, by which the loss of oil for lubricating the bearings of shafts is prevented. The oil vessel is suspended from the bottom of the bearing, and contains a tube carrying a wick which conducts the oil from the vessel to the lower part of the inner surface of the bearing. The bearing may be provided with a longitudinal slot to receive the wick if desired. The oil is drawn from the vessel up to the bearing by the wick, and there is no waste, as no more oil is fed than is required. The part of the wick immersed in the oil may be as small as a twine, and pass into an opening next to the bearing and be enlarged to give oiling surface, and the wick tube may be adjusted in the casing of the oil vessel by means of a set screw or other adjusting devices.