

## RECENTLY PATENTED INVENTIONS. Engineering.

**ROTARY STEAM ENGINE.**—Edward H. McDonald, Wytheville, Va. This is an engine of the double piston pattern, in which the casing is composed of a series of sections, and having a steam chamber in which epicycloidal pistons are arranged, while there are inlet and exhaust pipes communicating with steam and water passages, levers being attached to the plugs and pitmen connecting the levers. The parts of the engine are also so made that it may be used as a pump for forcing feed water to the boiler, and so that the exhaust steam may be employed to heat the feed water.

## Railway Appliances.

**CABLE GRIP MECHANISM.**—George Muller, Hoboken, N. J. This invention provides an improvement specially designed to enable the operator in charge of the car to quickly and conveniently throw off the cable after it is released by the gripping jaws, or to pick up a cable traveling in the same or a different direction or at a different rate of speed, and place the picked-up cable between the jaws of the grip. The invention consists of an angular arm or arms connected with a pivoted guiding arm, and a link pivotally connected with a sliding bar, and facilitates the picking up or throwing off of the cable at will whenever desired.

**SLIDING RAILWAY.**—Charles A. Barre, Paris, France. This invention relates to hydraulic propulsion railways of the S. D. Girard type, in which the rails are on an elevated structure with a main carrying water under great pressure, from which there are upwardly projecting branch pipes termed propellers having discharge nozzles, automatically operated by shifting levers on the car, the water being turned into chambered slides or skates which slide on the track, and which when the train is at rest have a metallic contact with the rails. The slides or shoes constructed according to this invention are designed to have several important advantages, being arranged for an oscillatory and vibratory movement on the support and bearing axle, and having a water-receiving chamber open at the bottom, with contact or slide faces surrounding the opening, and other novel features.

## Mechanical Appliances.

**ROCK BREAKER.**—John H. Bloomer, Jersey City, N. J. A derrick having a laterally swinging boom has a hammer or weight freely suspended by a cord or cable from the free end of the derrick boom, while in connection with the derrick is a winding and releasing mechanism for the cable. It is designed to use with the device a heavy, steel-faced hammer, which is to be raised by the cable as high as the boom will permit and then dropped upon the rock or stone to be broken.

**BELT SHIPPER.**—James R. Balsley, Connellsville, Pa. This device comprises a hanger on which is pivoted an arm terminating at one end in a depending bend opposite which is a shoulder, a dog being pivoted on the shoulder to impinge against the arm, while a lever is pivoted to the lower end of the dog and to the hammer, with means for operating the lever. By this means the belt may be conveniently shifted from the tight to the loose pulley or *vice versa*, and will be started in the right direction when shifted to the tight pulley.

**SET SCREW.**—Lycurgus A. Geisinger, Center Valley, Penn. Combined with a punch is a headless screw formed with a central aperture adapted to be engaged by the punch, with a plug adapted to be driven by the punch passing through the screw and adapted to be engaged by the latter to hold the plug in place. This set screw can be readily applied, and is designed to very securely fasten parts together, while presenting no outside projections when in place. The same punch can be used for driving a large number of set screws.

**GLAZIER'S HAMMER.**—Thomas C. Grimshaw, Pittsfield, Ill. This is an improved form of hammer, of simple and durable construction, for conveniently driving the points to hold the pane of glass in place in the frame. It has one head on which is pivoted a triangular face, the face thus being movable, while the other head has a ring of soft material, preferably rubber, to deaden noise when moving the hammer over the pane of glass when driving the points.

## Agricultural.

**ENSILAGE HARVESTER AND CHOPPER.**—William J. Conroy, Aylmer, Canada. By drawing this machine over a field of standing fodder, it is designed to harvest or mow the fodder, cut it up into pieces of the right size, and deliver the chopped material to a receptacle on a cart following. A conveyer is located at the rear of the harvester knives, and at the rear of the conveyer is a downwardly extending chute, above which spirally arranged revolvable knives are journaled, while there is a second conveyer at the base of the chute, there being a driving connection between the driving mechanism of the harvester, the conveyer shafts, and the knife shafts.

**GUANO DISTRIBUTER AND SEED PLANTER.**—Hezekiah Vickery, Willacoochee, Ga. This invention relates generally to agricultural implements and especially to a combined fertilizer distributor and corn and cotton planter. A corn hopper is secured to the central beams, and in an aperture on the lower end of the hopper is a spring rod on which is a disk forming the bottom of the hopper, there being a transverse shaft on which is an arm intermittently engaging the rod to move the disk to one side, to discharge a measured quantity of the contents of the hopper.

Different hoppers are provided for the fertilizer, corn, cotton, seed, etc.

**HAY STACKER.**—Oliver H. Buck, McLean, Ill. This is a portable structure, consisting of an open frame tower mounted on runners, and having two central cross pieces or platforms through which extends a mast, adapted to be raised and lowered by a rope, there being on top of the mast a swinging arm with a pulley and hoisting rope. The hay is elevated by tongs connected with the rope from the arm, which may be swung around to place the hay where desired, and the mast is readily raised in the tower as the stack increases in height.

## Miscellaneous.

**VENDING APPARATUS.**—Oscar T. Smith, Buena Vista, Va. Upon a track which is preferably endless and circular, a goods receiver in the form of a locomotive and tender is adapted to run, there being in the track a stop device and a tripping readjusting device, the locomotive having a motor mechanism and stop devices to be operated through the aid of a coin. The motor is preferably a clock mechanism, and the goods receiver has a pin which operates the discharge devices, the receiver traveling through a passage where it receives a portion or quantity of goods, and then passes out to deliver the goods to a purchaser. The device is automatically operated by the insertion of a nickel or other coin in the coin chute.

**MONEY DRAWER.**—Frank Mahannah, Omaha, Neb. A cover is hinged to the top of the drawer near its rear end, the cover closing when the drawer is shut, and flanges or guards closing the spaces between the sides of the drawer and cover when the latter is raised. The improvement is designed for adoption in sliding money drawers used on counters in stores, offices, banks, etc., to prevent exposure and abstraction of the contents of the drawer when open, by parties standing in front of the counter.

**KNOCKDOWN SAFE.**—Henry J. Moyer, Frackville, Pa. This is a safe for fruits, vegetables, and other food products, designed to be convenient, inexpensive, and afford through ventilation, while being so made as to be readily taken apart and quickly and easily set up. It has two pairs of detachable end standards, a sectional and folding bottom, a central folding shelf, a sectional and folding top, a back formed of two vertically swinging doors and a front formed of two horizontally swinging doors, while the four sides of the safe have openings covered by screen cloth.

**RUCHING MACHINE.**—William H. Holeywell, New York City. In this machine a traveling chain composed of a series of tubular dies pivoted together is operated in combination with a reciprocating plunger, a spring-actuated presser foot bearing and sliding on the open ends of the traveling dies. When a strip of material is fed to the machine it automatically forms therefrom a ruffle or ruching, flat or puffed, and integral with the body of the trimming is a continuous strip to be used for the attachment of a band. The machine makes a grouping or chain of figures, each simulating a complete ribbed shell, all of the shell-like figures apparently forming a portion of a common base.

**WICK TRIMMER.**—Chauncey R. Burr, Boston, Mass. This is a device designed to facilitate the accurate and convenient trimming of circular wicks on a burner, without the operator soiling his hands or the lamp. It consists of a ring to engage the outside of the wick, and a knife mounted to turn in the opening of the ring to engage and cut the wick from the inside. Any desired length of the wick can be trimmed off, the cutting being accurately and evenly effected.

**CLOTHES PIN.**—John A. Johnson, Trempealeau, Wis. This device is made of wire, and has at one end a spring clip to receive the clothes line, while at the opposite end is an oblong loop having a narrow tapering portion, a spring tongue extending through the loop. The pins are attached to the clothes in the house, or where it is most convenient, the attachment of the pin to the clothes line being readily effected by the spring clip.

**OVERSHOE ATTACHMENT.**—Joseph H. Morison, Centralia, Kansas. This is a clamping device for attachment to the heel end of rubber or other like overshoes, and having opposite lateral clamping wings in hinged connection at their inner ends with a central plate on the shoe, a cam lever being pivoted on the plate to bear on the backs of the wings. The improvement is designed to insure the quick, easy and firm fastening of overshoes upon the feet, so that they can not slip or be accidentally drawn off.

**ELEVATOR AND DUMP.**—William H. Enos, Chebanse, Ill. This invention relates to devices used for unloading grain from farm wagons, and provides means by which wagon body may be raised from the running gear and the grain quickly dumped in suitable bins, the wagon body being quickly returned to place. A rope from a windlass is passed over guide pulleys, pulley blocks being mounted in loops in the rope, while there is a shaft between the loops around which one member of the rope is wound, with means for operating the shaft. The improvement may also be used for dumping coal or other articles.

**LAWN SPRINKLER.**—William A. Russell, Los Angeles, Cal. The head of this device is made in two sections fastened together and mounted to turn on a fixed tapering discharge pipe opening into the head, the latter having discharge chambers with an inclined end formed with openings. A high pressure is not required to revolve the head, which is designed to distribute the water quickly over the entire area covered by the sprinkler, and the device is simple and durable in construction and not liable to get out of order.

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## Notes & Queries

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(3802) D. D. asks: What will stick glass to cast iron or brass frames so that it will not let go in rough handling? A. Try gelatine dissolved in acetic acid, with a small percentage of glycerine (about 1 part to 10 parts of the dry gelatine) added.

(3803) A. D. F. writes: I have a bichromate battery, and after I have used it and let it stand a while, it will not work at all. I take out the carbons and zinc every time, but it won't work. Can you tell me the reason why? A. Your trouble may arise from one of several causes. Your carbon surfaces may be too small; your solution may be too weak; possibly you have not paid sufficient attention to the amalgamation of your zincs. Your binding screw connections may be imperfect. 2. I have eight permanent magnets. How can I have them remagnetized? A. You can recharge your magnets by drawing them across the poles of a strong electro-magnet, or inserting their poles in coils and sending a current through the coil.

(3804) O. C. W. asks: Does an electric car generate any current while running down a grade with the current from power plant shut out? A. It does if the motors are run in series. Thus one car going down a hill may help to pull another distant car up a hill. As on the usual system of working in parallel the circuit of the motor of an electric car is open while the car is on a down grade no current is generated. The motor is capable of generating a current when driven in the manner described.

(3805) L. K. asks: What is good to clean tombstones the quickest way, where they have been discolored by the weather? A. The tombstones that have become weatherbeaten and dusty should be thoroughly washed with soap, water and fine beach sand applied with a stiff scrubbing brush. Then if stains require to be removed, a solution of oxalic acid in water may be applied with the brush, and after standing a few hours, should be washed off with clean water. Marble can be much improved by rubbing the surface with fine sandstone. Keep oxalic acid off the

hands, as it is poisonous. Or apply a mixture of  $\frac{1}{4}$  lb. soft soap,  $\frac{1}{4}$  lb. whiting and 1 oz. washing soda, and a small lump of copper sulphate. Leave on the marble for a day and then wash off and polish.

(3806) O. M. W. writes: 1. I would like to know what solution jewelers use in which to dip plated silverware to take off the oxidation; and how is it prepared? A. Any solution which will remove the oxidation of silver-plated ware will tend to remove the silver itself, and should therefore be used with great care. A solution of hypo-sulphite of soda will remove the tarnish; a solution of cyanide of potassium is more efficient, but exceedingly poisonous, and should be used with great care. 2. I have a medal about the size of a \$5 gold piece, but lighter gold color, having on one side a head of Queen Victoria and "Victoria Regina, 1837;" on the other, "To Hanover," with a king on horseback and a dragon underneath. It is in good preservation. Is it of any value? A. In regard to the value of your medal, we advise you to write to some reliable numismatist.

(3807) P. K. asks: Is there any good and practical method known to make drawings on paper temporarily translucent, in order to take blue copies directly therefrom, kind of blue print paper mounted on cloth which answers well for use as working drawing. It would save much time if the original drawing could at once be rendered translucent and fit for blue copying. The generally used transparent paper or cloth is unfit for original drawings, as it soon gets dirty, and does not permit the use of India rubber. A. Drawings made on cardboard drawing paper are made temporarily translucent by flooding the paper with purified benzene. The latter must be of the best quality. This liquid soon evaporates without injuring the drawing. While in the translucent state, the blue print may be taken.

(3808) E. B. K. asks: 1. In the analysis of illuminating water gas, to get at the per cent of hydrogen and marsh gas, by burning with pure oxygen through heated platinum tube, what amount of oxygen should be admitted to burette for burning the H and CH<sub>4</sub> (say the analysis showed 1.8 CO<sub>2</sub>; 15.8 of CH<sub>4</sub>; 2.4 of O; 2.9 of CO; having a volume of 51 per cent in burette). A. Enough oxygen must be added to completely burn all the marsh gas and hydrogen present. If it were pure marsh gas, then 51 cubic centimeters would require 102 cubic centimeters of oxygen. If it were pure hydrogen, then 26 cubic centimeters would suffice. If no nitrogen is present, simply add a good excess of oxygen, as any excess, within reasonable limits, does no harm. If nitrogen is present, the combustion can be effected with pure air, as oxygen combustion in the presence of small quantities of nitrogen is liable to give oxidation products of nitrogen, which would invalidate the analysis. 2. Also what is the rule for calculating height of barometer from certain heights above sea level? A. La Place's barometric formula is  $X$  (height in feet) =  $60,346 (1 + 0.00256 \cos \phi)$

$(1 + \frac{2(T + T')}{1,000}) \log \frac{H}{H'}$  In this  $T$  indicates temperature

at the upper station and  $T'$  temperature at the lower station in degrees Centigrade.  $H$  and  $H'$  denote the height of the barometer in inches at upper and lower stations respectively reduced to 0° C. To effect the

last reduction, apply the formula  $H = h (1 - \frac{t^2}{6,500})$  in

which  $h$  is the observed height and  $t^2$  the temperature in degrees Centigrade. For heights under 2,000 feet the following formula may be used:

$$X = 52,500 \left( 1 - \frac{2(T + T')}{1,000} \right) \times \frac{H - H'}{H + H'}$$

(3809) E. C. L. asks what is used to give the luster to artificial diamonds, and how is it made? A. They are sometimes backed with bright foil or with mercury or looking glass or amalgam. See queries 3717 and 3793. Foils are described in the "Techno-Chemical Receipt Book," \$2 by mail.

(3810) W. M. asks (1) how to make aldehyde-ammonia. A. Evolve ammoniacal gas in any convenient way, such as treatment of ammonium sulphate dissolved in water, with caustic soda or potash. This should be done in a flask or retort. The gas evolved is dried by bubbling it through concentrated sulphuric acid, or by passing it over dry calcium chloride. It is then passed into a solution of aldehyde in ether. The aldehyde-ammonia will crystallize in large rhombohedrons. 2. How to make crystallized nitrate of silver. A. Dissolve silver in a little nitric acid as possible and evaporate, best on a water bath, until it crystallizes. If the silver is not pure, the crystals should be fused at a gentle heat until quite liquid, and then redissolved, exposed to the sun for a day, filtered, and recrystallized.

(3811) W. E. B. says: The recent severe gale started in Texas and moved northeast into Canada. Why was it not accompanied by northeast winds, the same as when a storm starts in the Gulf of Mexico, and moves up the Atlantic coast? A. The great storms that come up the eastern coast of the United States are generally of the cyclone type and have their origin in the tropics. The winds on the northerly side of this class generally blow from the northeast. The storms that are generated in the southwestern States are often of the same order, and have their northwest winds in the Western States, while the Atlantic States will have easterly to southeasterly winds, the winds on the opposite sides of a great storm of this type generally blowing in opposite directions. 2. Will the wet and dry bulb thermometers work when placed inside, so that you can depend upon their readings? A. The wet bulb (Mason's) hygrometer must have a good exposure to the outside air and shaded from the sun and wind. It will not give reliable results inside of a house. 3. I have a record of my mercury barometer falling to 29.32 on June 16, 1891, and the thermometer was 92. Why did it fall so low when no storm appeared? A. A considerable fall of the barometer without a storm is a frequent occurrence. There are dry storm waves, the moisture of the atmosphere being too far below the point of saturation to produce rain or snow by the change in pressure. High temperature also increases the hygrometric capacity of the air, which may prevent rain during a barometric depression.