RECENTLY PATENTED INVENTIONS.

Railway Appliances.

SWITCH LEVER.—Gustave J. M. Van Neste, Brussels, Belgium. The invention covered by this patent is an improvement on a former invention of the same inventor, and provides for pivoting a weighted arm on the switch lever itself as its axis, the parts being so adjusted that the arc through which the switch lever moves to operate the switch shall be wholly on one side of a vertical plane if the return motion is to be automatic, or about equally divided by the vertical plane if the action is to be non-automatic, or indifferent in either direction, the change of relation with regard to the vertical plane being effected by varying the length of the switch-operating rod. The apparatus is thus readily rendered automatic or non-automatic as regards the return of the switch to a normal position.

RAILROAD TIE.—Benjamin Bradley, Sr., Bellefonte, Pa. This tie is formed of plates of angle iron or steel having near their ends offsets forming chambers in which are held bearing blocks. The ties are twelve to thirty inches wide, the wide ties for use where the road is straight, and each tie constitutes a metallic frame, between the ends of the side plates of which are wedged the bearing blocks. The rail locks fit the outer and inner sides of the rails, and are bolted to the side plates, spikes being dispensed with. The frame, when in position and properly ballasted, is designed to be practically indestructible.

RAILWAY CROSSING GATE.—Morris Sober, Oklahoma, Oklahoma Ter. According to this invention a spring-controlled shaft has attached trip rails arranged to engage the flanges of the wheels of a passing train, and these trip rails actuate guard bars to force the gate down to a horizontal position while the train is passing, the springs restoring the gate to its upper position after the train has passed. The arrangement is such that the pilot of the engine will operate to press the gate downward should the trip rails fail to operate.

Mechanical.

REVERSING MECHANISM.—Frank E. Gowen, Norrie, Pa. To impart a turning motion in either direction to a shaft, wheel, etc., this inventor has devised a mechanism comprising an arm mounted to swing loosely on the shaft of a ratchet wheel, while a lever fulcrumed on the arm carries a double pawl adapted to engage the ratchet to turn it in either direction, the lever and arm being adapted to be locked together. The patent shows the improvement applied on a sawmill carriage and head block, where the operator, by simply taking hold of the handle of a lever, can give the desired motion to the setting shaft, either forward or backward.

COMBINATION TOOL.—Robert Campbell, Elizabeth, N. J. This is a tool which may be used as a square, marking gage, miter, trammel, caliper, etc., the invention consisting principally of a stock with bearings standing at right angles to one another and in different planes and a blade adapted to engage and held adjustably in either bearing.

NUT LOCK.—Frank L. Shunk, Grantsdale, Montana. According to this invention the bolt has an angular extension beyond its threaded portion, and the nut has a recessed lug projecting from its outer face, a washer with an angular opening fitting on the angular extension of the bolt. Ratchet teeth project radially from the washer to enter the recess of the lug and lock the washer in contact with the nut and the nut on the bolt. The device may be quickly adjusted and operates efficiently to prevent the accidental displacement of nuts from bolts.

GANG SAW FOR MARBLE SLABS.—John J. Dimond, New York City. In this machine a reciprocating frame has in its end pieces adjustable bars with hooks attached to saw blades, permitting the latter to swing or turn laterally, there being on each side of the saw frame pattern guides and keepers to control its vertical movement, while a guide for the saw blades has transverse slots corresponding to the shape of the pattern guides, whereby the blades accommodate themselves to the shape of the cut to be made. The machine is designed to facilitate the sawing of slabs of marble of various forms by gang saws, employing the ordinary gang saws now in use.

SAW SHARPENING MACHINE.—Frank Parsons, Montgomery, Miss. This machine comprises a table on which is a chuck and a drive shaft carrying an eccentric driving a second and smaller eccentric, while a slide connected with the driven eccentric controls the movement of the table. After the saw has once been placed in proper position the operation of sharpening and feeding is automatically accomplished, and provision is made for the keeping of a record by which the same saw may be quickly and conveniently placed in position upon the machine at any time.

BEDSTEAD MAKING MECHANISM.—Augustus D. Newberry and William J. Melvin, Fayetteville, N. C. These inventors have devised a machine by which the locking plates and pins of a bedstead may be quickly secured to the bed rails and posts, and the work be better done by the machine than it is possible ordinarily to do it by hand. The machine comprises a combination of suitable holding devices, chutes for delivering the securing pins, punches and means for reciprocating them, guides, and a locking device for holding the punches intermediate of their stroke. The operator can be certain, with this machine, to have the locking pins accurately placed, without danger of injuring the wood portions of the bedstead.

Agricultural.

MILKING MACHINE.—Carl B. Stroyberg, Roskilde, Denmark. The pressure exerted by air cushions, according to this invention, is designed to facilitate the milking action. The teat receivers comprise inflatable sections, a casing receiving a supply of compressed air, and connections permitting the adjustment of the receivers relatively to the casing that supplies the air. The compressed air is supplied by means of an air pump, and the initial pressure is exerted on the teats at their bases and then along their length, the milk being received in any suitable pail or vessel placed beneath.

WATER TROUGH FOR STOCK.—James F. Elliott, Manson, Iowa. An improved self-regulating trough for watering hogs and other stock is provided by this invention, the trough being adapted to supply a number of distantly located drinking cups. A tank is connected with a water supply by a pipe having a self-regulating valve, and one or more pipes lead from the tank, each of the latter pipes being connected with a post on which one or more drinking cups are held, the tank thus supplying the several drinking cups constantly with water. The water removed by the stock is instantly supplied again from the tank, and the latter is kept replenished by the action of the self-regulating valve in the primary supply pipe.

Miscellaneous.

SPROCKET WHEEL AND CHAIN.—John C. Cottie, New York City, and Charles J. Marks, Brooklyn, N. Y. An improvement especially adapted for bicycle use has been devised by these inventors, the wheel having rolling surfaces, or ball bearings, for engagement with the chain, the balls being held in cleats on the periphery of the wheel, and forming substitutes for the usual teeth of a sprocket wheel. The roller surfaces are between web flanges, making the wheel self-cleaning and the chain not liable to catch in a garment. In the chain each alternate link is double, the connecting link being single, and the teeth are placed at one side of the transverse center of the links, forming segmental pockets of different sizes, giving a maximum clearance without detracting from the pulling or pushing power of the chain.

PNEUMATIC TIRE.—William L. Stewart, Wilmerding, Pa. According to this improvement the outer tube or cover of the tire is made of a flat band of rubber coated fabric in whose opposite edges are eyes or hollow beads through which extend wires connected by hook latches when the cover is placed in position, an overlapping flap then covering the inner surface of the joint, and its outer edges lying in a groove in the rim. There are turnbuckles at each side of the valve tube by which looseness in the binding wire may be taken up while the tire is deflated. A tire of this construction may be easily removed from or placed in position on a wheel, as it does not depend upon the compressibility of the rubber of the outer tube or cover to hold the tire in place. The wire and fastener may be used with any form of hose pipe or double tubed tires, doing away with the use of cement and strengthening the wheel rim.

BOTTLE AND STOPPER.—Wilbur F. Hyer, Meridian, Miss. A bottle which cannot be a second time presented as an original package has been devised by this inventor. Its neck has an exteriorly threaded collar, below which is a flange, and the corked bottle is covered by a thimble which has at its lower edge a flange resting on the collar. A nut screwing on the collar engages the flange of the thimble, and is held in such position by a locking pin which cannot be readily removed without breaking some of the parts.

CEMENT MATERIAL FROM BLAST FURNACE SLAG.—Alexander D. Elbers, Hoboken, N. J. To adapt slag for use with hydraulic cement as an ingredient for mortar, this inventor has devised a process for treating the ground slag with a weak solution of nitric acid, thus superficially desulphurizing it and impregnating it with nitrosyl. It is supposed that the still sulphurous interior of the slag particles will not be affected by the chemical reactions likely to take place in applied cement, either submerged or exposed to the air, while the absorption of nitrosyl prevents the ferruginous slag from changing superficially to ferric hydrate.

NAIL OR TACK DRIVER.—Thomas J. Langston, Johnston, S. C. This is an implement readily carried in the hand, in which nails or tacks may be put and automatically arranged and fed to the driving mechanism, one at a time. A plunger is arranged in a hollow handle having an exterior chute or slideway for the nails or tacks, there being on the handle a driving head having guide wings forming a slideway and continuation of the chute, while a pivoted, spring-pressed and grooved tongue is arranged parallel to and forms part of the nail pathway. The driving end is held lowest in filling the implement with nails or tacks, which are sprinkled into the hopper.

PUMP.—James P. Wintz, Sour Lake, Texas. To readily pump oil or quicksand from wells, the suction pipe which extends into the well casing, according to this invention, is provided at its lower end with a funnel, the base of which engages the wall of the casing to divide its upper from its lower end. A valve forms a flexible connection between the base of the funnel and the inner surface of the casing, for the upper compartment of which there is a water supply pipe and an indicator marking the height of water in the compartment, and the flexible connection permits a downflow of water to cause the oil to rise to the lifting range of the upper plunger.

FIFTH WHEEL.—William H. Bradshaw, Orange, N. J. This device consists of a circular track at each edge of which is a recess to receive the vertical members of an inverted U shaped cover, between which and the track is held a series of rollers extending entirely around the track, the spindles of the rollers being journaled in a band on each side forming side sections, permitting the rollers to revolve freely at spaced distances apart, no matter what weight may be brought on the upper or cover member.

MANIFOLDING ATTACHMENT FOR BOOKS, PADS, ETC.—Edward D. McKenna, Brooklyn, N. Y. Two patents have been granted this inventor, one of which is more especially for an attachment for books used by salesmen and others, to give a bill and retain a duplicate, the attachment being simple and compact, and providing for the moving of the copy sheet to receive a new entry at each time that the book is opened. According to the other invention the carbon paper may be attached to a removable cover or to a roll, and the roll and a support therefor detachably attached to the book in which manifold copies are to be made, any desired length of carbon or transfer paper being drawn from the roll and carried between leaves. The roller may be plain or spring-controlled, and the carbon paper after use may be returned to the roll and be entirely out of the way, thus obviating the inconvenience of a loose sheet, liable to frequent displacement.

SKATE ATTACHMENT.—Luke W. Kenney, New York City. To facilitate the attachment of an ankle support at the heel portion of a skate, this inventor has devised for the support an attaching plate which may be applied to a club skate without interfering with the action of any of its parts, the invention also constituting an improvement upon heel plate attachments forming the subject of two other patents previously issued to the same inventor. The ankle support comprises a yoke to the upper portion of which are pivoted bowed arms from which straps extend around the leg above the ankle, and the attachment may be made to roller skates as well as to ice skates.

SAFETY BELT.—Ella I. Cooley, Coldwater, Mich. To secure a child in a high chair or in a carriage, according to this invention, a waist belt around the child is connected to a retaining strap around the back of the chair, or other fastening, by an elastic loop band, and, to restrict the movement of the elastic band, a second strap, with buckle, is also used to connect the retaining strap with the waist belt.

BOSOM PAD.—Dora Harrison, Lansing, Mich. To fill the breast pockets in corsets and other garments, and insure a proper fitting of the dress, an inflatable pad, according to this invention, is inserted in a cylindrical shell made of silk or similar fabric, with draw strings at its ends. The inflatable pad is made of very thin rubber, rendered non-odorous by special treatment, and the two breast shaped compartments are connected by a contracted tubular part from which extends a small filling tube, by which the wearer may inflate the compartments as desired.

DRESS SHIELD.—This is a further invention of the same inventor, according to which the shield is composed of an inflatable central or saddle portion and inflatable side portions arranged side by side, the portions communicating with each other and there being means for attaching the shield to a garment. The compartments are inflated by a filling tube, and the shield yields readily in every direction, affording perfect freedom to the arms without danger of binding.

FOLDING BED.—Oscar D. Reichard, Philadelphia, Pa. A bed for use as a crib, or in connection with a couch, is provided by this invention, one folding up conveniently to be stored under an ordinary bedstead. The invention consists principally of a holder or platform adapted to receive the mattress and bedclothes, the holder being hung at its ends on links connected with hinged parts of the head and foot boards of the frame. The bedding is held horizontally whether raised or lowered, there being no springs or weights required, and the bed not being liable to get out of order or fold or close up.

IRONING TABLE.—Howard Rupert, Philadelphia, Pa. The ironing board of this table has a tapering end resting on a trestle, the other end resting on a hinged leg, whose inclination may be varied to raise or lower the board. A wire frame, covered by canvas, is removably held inside the table legs to form a clothes support, and on the top of the ironing board is held a curved sleeve board, which may be reversed to bring either edge on top to facilitate the proper ironing of sleeves or other garments. The table may be conveniently folded for storage in small space.

HYDRAULIC AIR COMPRESSOR.—Frederick A. Erbe, North Beach, N. Y. To compress air to force beer to faucets, as a substitute for the ordinary beer pump, and for other purposes, this inventor has devised a hydraulic compressor comprising a peculiar combination of floats and weights within a tank with which water connection has been made. The floats and weights automatically open and close the water inlet and exit valves and the air inlet valve, so that the tank is alternately filled and emptied of water and air, the air being compressed in the tank before it is discharged.

EXTRACTING LOOP SEALS FROM BOTTLES.—Charles F. Schield, Cambridge, Ohio. The extractor for seals and stoppers which forms the subject of this patent has a cam mounted on a spindle, a lever fulcrumed on and having an offset for engagement with the cam, while a foot at the opposite end engages the seal or stopper. A tension device connected with the offset end of the lever acts to normally hold its foot out of position for engaging the stopper. The device facilitates the quick removal of seals, no matter how tightly they may be seated in the necks of the bottles.

HERNIAL TRUSS.—William B. Starbuck, Nantucket, Mass. This truss has a pear shaped pad cased in leather, there being a staple in the back of the casing with which the body belt is connected, while the leg strap is secured to the small end of the pad and adapted to buckle onto the body strap.

STOVE POLISH.—Edwin G. Rust, Primghar, Iowa. A brilliant black polish, according to this invention, is made of ivory black, black lead, quince seed mucilage, gelatin, alcohol and water, combined as described in specified proportions. The polishing liquid quickly dries when spread on the metal surface, and the surface may then be polished with but little labor by a dry brush or a soft cloth.

Designs.

DISH DRAINER.—William O. Campbell, New York City. This is a convenient receptacle in which to place dishes after washing and to facilitate rinsing them. It has a body tapering inward toward the bottom and a tapering spout, in front of which is a rod resting in sockets in the sides of the body.

INCANDESCENT LAMP BULB.—Lawrence H. Dolan, Alexandria, Ind. This bulb has an annular hood whose top surface tapers outward from the shank, and below the hood it has something of a cup formation, ornamented by intersecting lines forming facets, the central bottom part of the cup portion terminating in a point.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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(7149) B. & M. write: We have a bicycle gear to 70; 20 tooth front sprocket and 8 rear. If we change the sprockets to 40 and 16 respectively, we still keep the same gear 70. Have we reduced the breaking strain on the chain? If so, about how much? A. You have reduced the strain to one-half.

(7150) C. W. K. says: Can you put me in the way of obtaining a transparent waterproof cement that will unite two flat surfaces of mica? A. A colorless cement for joining sheets of mica is prepared as follows: Clear gelatine is softened by soaking it in a little cold water, and the excess of water is pressed out by gently squeezing it in a cloth. It is then heated over a water bath until it begins to melt, and just enough hot proof spirit (not in excess) stirred in to make it fluid. To each pint of this solution is gradually added, while stirring, ¼ ounce of gum ammoniac and 1½ ounce of gum mastic previously dissolved in 4 ounces of rectified spirit. It must be warmed to liquefy it for use and kept in stoppered bottles when not required. This cement, when properly prepared, resists cold water.

(7151) C. E. B. asks: 1. What is the buoyancy of a vacuum per cubic foot? A. About 537 grains per cubic foot. It varies with the temperature and barometric pressure. 2. Is it possible to remove tattoos? A. Our SUPPLEMENT, Nos. 695 and 1078, has articles on this subject.

(7152) E. S. B. asks: How many cubic inches of water can be changed into its two gases by a dynamo run by a two hundred horse power engine per second? A. A fair allowance for voltage required to decompose water is 2 volts. This provides an ample excess. The engine may be taken as developing by the dynamo 100,000 to 130,000 watts at 2 volts, or 50,000 to 65,000 amperes. This would give from 0·28 to 0·36 cubic inch of water per second. Of course the current could be greatly reduced by passing it through successive decomposition vessels in series, and using a higher voltage, but this would be at the expense of a great deal of energy.

(7153) L. A. McK. asks: In simple electric motor described by George M. Hopkins in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 641, should the Russia iron strips in the field magnet be cut lengthwise with the sheet, that is, with the grain, and would it decrease the motor's efficiency any to cut them crosswise with the grain? A. It is quite immaterial how the sheets are cut.

(7154) I. E. P. asks: Is the specific gravity of an object altered when enveloped in compressed air. If so, to what extent? A. As the specific gravity of bodies is measured under atmospheric pressure, any increase of density in the air will slightly decrease the specific gravity. As air at mean temperature is nearly 800 times lighter than water, at 15 pounds excess of air pressure its density would be doubled, and a body should have less specific gravity by $\frac{1}{15}$ of its value in the compressed air.

(7155) H. J. asks: 1. What is the resistance of a standard 16 candle power 110 volt lamp? A. 244 ohms. 2. Of a 16 candle power 52 volt lamp? A. 37 ohms by the Edison rating. 3. Is the resistance the same when cold as when burning? A. No; the above are hot resistances; the resistances cold are less.