

RECENTLY PATENTED INVENTIONS.
Electrical Devices.

DROP-SWITCH FOR TELEPHONES.—G. L. GULLIFORD, Bloomington, Ill. In Mr. Gulliford's patent the invention has reference to telephony, and the more particular object of the improvement is the provision of a neat, efficient, and reliable form of drop-switch constituting a relaying mechanism for actuating an alarm at a distance from the telephone.

SUPPORT FOR TELEPHONE-RECEIVERS.—E. BASS, New York, N. Y. The purpose of the invention is to provide a support for telephone-receivers which will be simple, durable, efficient, and economic, independent of the telephone back and its appurtenances, and which can be quickly and conveniently applied to a wall or other support adjacent to the telephone-box without unnecessarily marring the support.

TIME-CONTROLLED ELECTRIC ALARM.—A. L. RONELL, Humboldt, Iowa. The invention in the present case relates to a time-controlled electric alarm admitting of general use and of special utility in relation to schools, railway-depots, hotels, and all other institutions in which it is desirable to sound an alarm periodically.

TELEPHONE TEST INSTRUMENT.—H. G. CHALKLEY, New York, N. Y. This improvement refers to test instruments of the kind more particularly used in detecting trouble upon telephone-wires. In operation the purpose is to provide means for dividing the current so as to enable the instrument to work with either a live wire or a dead wire. In other words, the object is to send the current through the magnet for the purpose of actuating a diaphragm and through the comminuted carbon for the purpose of enabling the voice to effect it by means of the carbon. When the instrument is used as a receiver, the magnet-coils are energized from a distance.

Engineering Improvements.

BOILER.—M. F. KENELY, Elizabeth, N. J. The aim of this invention is to provide certain new and useful improvements in boilers whereby the water is quickly heated, a rapid circulation of the water is effected, and the front of the boiler is protected against the intense heat emanating from the burning fuel in the fire-box.

DEEP-WELL PUMP.—N. A. HEYMAN, Los Angeles, Cal. In carrying out the present invention, Mr. Heyman has particularly in view the construction of an apparatus through the medium of which a steady regular flow of water from a well or mine will be maintained, such apparatus also embodying the essential and desired features of simplicity and durability. The improvement has particular relation to a pump for raising water from deep wells, mines, or the like by means of compressed air.

MANHOLE-COVER.—J. J. IRVINE, Pittsburg, Pa. In this case an object in view is the provision of means for supporting a manhead within a boiler in an open position when it is desired to clean out the interior thereof, such holding means enabling the manhead to be easily and accurately returned to its seat against the boiler in a manner to secure a tight joint between the parts and overcome any tendency to leak when the boiler is again used.

MEANS FOR FEEDING FUEL TO FURNACES.—R. W. GROVE, Lewistown, Mont. One object Mr. Grove has in view is the provision of simple and efficient means for feeding solid fuel, such as coal, into the furnace in a way to minimize manual labor and the admission of cold air to the combustion or grate chamber. A further object is to equip the fuel-feeding mechanism with means for distributing the incoming fuel over the fire-box and the bed of incandescent fuel therein, such distribution being regulated to direct the same toward one side or the other of the grate-chamber or into the middle portion thereof.

Heating and Ventilating.

GAS-HEATER.—J. R. TYSON, Reading, Pa. This invention refers to improvements in heaters of that kind which are especially designed for use on gas-fixtures to utilize the flame resulting from the combustion of gas as a means for heating and ventilating rooms or apartments. The heater is simple and compact in construction and adapted to be easily slipped into place on a common gas-jet.

HOT-AIR REGISTER.—S. TUTTLE, New York, N. Y. An object claimed by this inventor is to secure an enlarged opening from a lower room to an upper by projecting the register some distance into the room, thus allowing a portion of the floor to be cut out for a larger pipe than can be passed up through the ordinary partition. Another object is to control the air delivered by directing it wholly, partly, or not at all into either the lower or upper room.

Hardware.

SAW-SET.—P. H. L. KLETTE, Bates, Cal. The object in this case is to provide a new and improved saw-set which is simple and durable in construction, easily manipulated, positive in operation, and arranged to bring the point of the saw-tooth in contact with the plunger previous to moving the latter to set the tooth.

NUT-LOCK.—J. V. BERRY, Shamokin, Pa. In this patent the invention refers to an improvement in screws and nuts, and more particularly to the subclass known as "nut"

and "bolt" locks. The object is to furnish a ready and efficient means of securing in any desired position nuts to bolts in such a manner that the nuts may not become loosened by jarring or by any turning of the bolts or other parts to which they are attached.

Lighting and Heating.

HEATING-STOVE.—C. MATTHEWS, Columbia, Mo. Broadly stated, the invention resides in a peculiar casting involving novel details of construction whereby increased heating-surface is provided. More definitely stated, it consists in the casting formed by upper and lower members, of which the former constitutes the fire-bowl and the latter the ash-pit.

OIL-BURNER.—C. W. SIEVERT, Los Angeles, Cal. This invention relates to an oil-burner constituting to some extent an improvement over a prior patent of Mr. Sievert. The object of the present invention is to effect a more thorough and uniform vaporization and consequent combustion of the oil and also to enable the burner to be placed in any position and supplied with oil in company with a relatively thin stream of water, which effects thorough atomization of the oil and also when heated assists in transforming it into vapor.

Machines and Mechanical Devices.

AUTOMATIC DEVICE FOR OPERATING HATCH-COVERS FOR ELEVATORS.—S. E. AUSTIN, New York, N. Y. Mr. Austin's invention relates to improvements in an automatic device for operating hatch-covers for elevators of that class disclosed in a patent issued to H. Mattullah, wherein a latch-bolt is employed for sustaining a hatchway-cover, this bolt being geared to a segment on a short shaft which is equipped with a finger or cam, the latter being disposed in the path of a tappet that is movable with the platform of an elevator car or cage of a suitable type. The construction is practically noiseless in operation.

TENONING-MACHINE.—W. J. MCNAUL, Butte, Mont. The operative means provided in this invention serve to automatically load a log on a carriage embodied in the machine, to clamp the log firmly on the carriage, to preliminarily cut the log, afterward automatically reverse the carriage and the log, subject the log to the final cutting operation in a way to complete the tenons, to reverse the carriage and return the log in a completed condition to the normal position, and finally discharge the log automatically from the carriage.

DUST-COLLECTOR.—L. C. MEYEROTT, Evansville, Ill. This case refers to dust-collectors, the invention being intended as an improvement on devices of this class disclosed in a former patent to Mr. Meyerott. In the present case an object in view is the provision of means for collecting the dust that escapes on the outside of filtering-pockets when they are jarred successively, the outside dust being collected by pneumatic devices which carry the dust back again to the machine.

STOP-MOTION FOR CLOTH-TENTERING MACHINES.—J. L. DABBS, Rockhill, S. C. Much trouble and loss of time and waste of cloth is occasioned by the edges of the cloth becoming detached from the tenter-chain pins of a cloth-tentering machine, and the general object of the invention is to provide automatic means of construction adapted to stop the machine should one or both edges of the cloth become detached from the tenter-chain pins.

MACHINE FOR AERIAL NAVIGATION.—I. I. MORRIS, Mellette, S. D. The purpose of this invention is to provide an apparatus for aerial navigation which will be of simple and durable construction and effective in operation and in which a balloon-supported frame is employed provided with a motive power, including means for lifting, and means for driving, and which also carries a steering device and wheels to support the structure when on the ground.

WEIGHING-SCALE.—J. COLLINS, Sewee, Tenn. The inventor seeks to provide in this case simple and efficient means adapted for operating in a way to ascertain the relative values of commodities which differ in values—such, for example, in using the apparatus by wheat-millers to determine the quantity of flour and bran to be given in exchange for a predetermined or unknown quantity of wheat the grade of which may be up to or below a required standard.

BINDER.—E. M. ANDERSON and G. E. POST, New York, N. Y. This improvement resides particularly in the locking-mechanism. The locking device comprises the usual telescoping parts, the inner of which carries a dog which permits a free telescoping or inward movement, but impinges against the inner wall of the outer tube, so as to prevent outward movement. This dog is controlled by a cam-like member mounted to turn in the inner lock-section and when thrown to a certain position engages the dog and moves it into active position.

BORING AND TENONING MACHINE.—J. WILSON, Lathrop, Mo. The intention in this improvement is to provide a boring and tenoning machine which is simple and durable in construction, very effective in operation, easily applied or removed, and arranged to permit of quickly and accurately boring felles and other articles and forming tenons on the ends of spokes.

BALL-COCK.—A. NELSON, Quincy, Mass. This mechanism will quickly open and close

the water-supply, and by thus avoiding a slow-closing movement the inventor attains a valve which enables the tank to be quickly filled, and which avoids uncertain movements of the float which occur in many ball-cocks. A pipe and shell inclosing the same is provided, these parts being relatively movable and the water supplied to one. Means are provided for imparting the relative movement referred to, and for this relative movement to act as a guard to prevent splashing the water when discharged.

FILLING-TUBE FOR BOTTLE-FILLING MACHINES.—S. C. MILLER, Louisville, Ky. The invention relates to a class of bottle-filling machines embodying a vertically-adjustable tank from which liquid is conducted downward through self-closing tubes into a number of bottles supported below the tank to be filled therefrom. Improvements in this class of apparatus are shown in a former patent of this inventor. The object of this invention is to provide filling-tubes for the bottle-filling machine specified that in suitable number may be employed for the purpose whereby these similar members of the machine are greatly improved in operation.

ATTACHMENT FOR CAN-HEADERS.—R. D. TOWNSEND, Chicago, Ill. The object of this invention is to provide an attachment which may be placed on the machine, thus adapting it to any desired size of can without reorganizing the entire machine. This enables one machine by a very simple adjustment to be adapted to any size of can, and in small factories it will to a great extent reduce the cost of equipping, maintaining, and operating the plant. The invention is applicable, for example, to machines of that class shown in a prior patent to Wheaton, No. 477,584.

ENGRAVING-MACHINE.—I. R. BEAM, Elmira, N. Y. In the present case the invention relates to a machine for engraving from patterns; and it comprises a tracer having connection with a graver, so that by moving the tracer over a pattern or copy the graver will be made to work on the plate to reproduce the subject of the copy or pattern.

Of Interest to Farmers.

POWER DEVICE.—D. LUBIN, New York, N. Y. The present invention relates to improvements in power devices particularly adapted for drawing a cultivator or other agricultural implement through the ground to finely pulverize or break the earth around and between rows of plants or to draw such implement through unplanted ground, an object being to produce a device designed to be operated manually, and by means of which a heavy tool may be operated with but little manual exertion and digging deeply into the ground.

DUMPING AND ELEVATING APPARATUS.—P. J. MAUGER, Miner, Ill. Mr. Mauger's invention is an improvement in that class of apparatus employed for discharging or dumping grain or other commodity or material from a wagon or cart into a conveyor or chute, by which it is delivered into a permanent storage-receptacle or into a car, boat, or other medium of transportation.

DITCHING-MACHINE.—P. BERGLUND, Newman Grove, Neb. One feature of this invention is the provision for convenient vertical adjustment of the auger or borer whereby it is adapted for boring ditches of varying depths. Another important feature is the improved construction of the auger or borer itself, whereby it is adapted for both cutting and slicing the earth as the machine advances and also for throwing out the soil thereby loosened.

Pertaining to Vehicles.

TIRE.—C. MILLER, Binghamton, N. Y. The inventor claims as his object the provision of an improved form of protective non-puncturable shoe or casing for cushion and pneumatic tires, and is designed to provide for convenience in securing the opposite edges of the casing to a rim and to insure a strong connection therefor independent of the pressure of the tire proper, especially a pneumatic tire. The improvements are applicable to solid wooden felles and to metallic rims of different shapes without altering the device.

RESILIENT REST FOR VEHICLE-TOPS.—T. F. GENSMEYER, Lewistown, Minn. This invention has for its object to provide a novel, simple rest for the support of a reclining vehicle-top and which is adapted to absorb jar incidental to the sudden descent of the top when it is rocked into a reclining position to remove the top from above the seat of the vehicle.

SLEIGH.—JENNIE R. KYLE, Gex, Ky. This is an improvement in that class of sleighs which are formed of runners and hub attachments adapted for use in connection with a buggy or carriage body and its axles. Thus upon removing the wheels of a buggy or carriage from its axle-journals the latter may be inserted and secured in the hubs of the improved sleigh-runners.

Railways and Their Accessories.

INCLINED RAILWAY.—S. E. JACKMAN, Brooklyn, N. Y. The purpose of this invention is to provide an inclined railway arranged to enable persons to enjoy a continuous ride over an inclined or switchback road back to the starting-point, and to allow the proprietor to readily switch the cars in or out from the main continuous track to a siding, to completely control the vehicles during their jour-

ney, to avoid accidents, and render the travel of passengers perfectly safe.

CAR.—S. E. JACKMAN, Brooklyn, N. Y. Mr. Jackman's invention relates to amusement devices, such as inclined railways of the kind described in his patent noticed immediately above; and the object is to provide a car arranged for convenient and safe coupling to another car and having a brake mechanism under the control of the attendant to permit of checking the speed of the car on the down-slope, the car also having a circuit-closer for closing a circuit in the track to annunciate the position of the car on the track.

RAILWAY-RAIL BRACE OR TIE-BAR.—W. E. ARTHUR, Aberdeen, Md. Mr. Arthur's invention is an improvement in tie-bars or braces for railroad-tracks, by which to tie the opposite rails of the track securely together and brace one from the other. The tie-bar can be made of any desired strength and can be applied to the rails either in new work or in work already constructed and can be arranged at such intervals as may be found necessary to prevent any spreading or other lateral displacement of the rails.

TROLLEY-STAND.—J. J. BOUCHARD and W. F. ENSOR, Bradford, Pa. In the present patent, the inventors seek to produce a construction of the mechanism constituting the bearing around which the pole may swing or turn on a vertical center, the mechanism being so designed as to minimize the friction and wear on the working surfaces, to turn easily and freely without lubrication, and to exclude the entrance of dust and dirt from the working parts. They also seek to produce a construction which provides for the secure attachment of the pole to the pole-socket in a way to relieve the strain on the pole-clamp and to allow the ready interchange of different poles.

AUTOMATIC TRAIN-CONTROLLING MECHANISM.—A. E. OSBORN, New York, N. Y. The purpose of the invention in the present patent is the provision of new and improved means for automatically stopping a car or train of cars independently of the persons in charge and of the signal apparatus of the railway should such apparatus be employed.

CAR-FENDER.—J. A. WILLIAMS and L. B. BRITTON, Seattle, Wash. The improvement of these inventors relates to safety-fenders for cars and vehicles, and has for its principal object the provision of a safety-fender for cars and similar vehicles which is automatic in operation, besides being inexpensive to manufacture, as well as durable, and comprising comparatively few elements or parts which are simple in their embodiment and not liable to get out of order.

RAILWAY-SWITCH.—W. K. SMITH, Denver, Col. In this case the invention has reference to improvements in switches for street-railways, the object aimed at being to provide in connection with a switch-tongue a simple means whereby the switch may be shifted by a motor-man on a car while the car is in motion.

SWITCH-OPERATING DEVICE.—W. K. SMITH, Denver, Col. Mr. Smith's invention relates to improvements in devices for shifting switch-tongues for street-railways, the object in view being to provide a simple switching device carried by a car and so arranged that by foot-pressure the motorman may cause the shifting of a switch to either of its positions while the car is in motion.

Miscellaneous.

NON-REFILLABLE BOTTLE.—C. R. SCHUMACHER and D. SPEELMAN, Providence, R. I. In carrying out this improvement the inventors have in contemplation the provision of a bottle which shall be so constructed and arranged that the contents thereof may easily be removed, but at the same time it will be impossible to refill the same bottle again. A further object is to provide a stopper and casing for the bottle-neck which may be easily inserted therein and when in position cannot be removed therefrom without breaking the bottle.

FIREMAN'S HELMET.—C. EAGLE and F. VOGT, JR., New York, N. Y. This invention has reference to improvements in appliances to be worn by firemen in invading rooms or apartments filled with smoke; and the object that the inventors have in view is the provision of an improved helmet designed to minimize the danger of suffocation to the firemen in extinguishing a fire.

FORM OR LAST FOR BOOTS OR SHOES.—J. E. BERE, Stoughton, Mass. The principal object of the invention is to furnish a device which is simple in its embodiment and effective and reliable in use, besides possessing the capacity for long and repeated service. Another object is to provide a device of this character comprising few parts which are easily assembled together and also which is easy to handle, strong, and durable, and not liable to get out of order.

FOLDING TABLE.—W. J. NOBLE, New York, N. Y. The special object in this case is to provide a folding table, the capacity of which when extended will be relatively great, thus overcoming a previous disadvantage that in order to make the table fold compactly its extended size had to be much restricted. In attaining this end, preferably four leaves or top sections are provided. These are each furnished with a folding leg and devices for holding them in extended position. The top sections are hinged, so that when extended they

present an even table-surface, so that they may be folded flat against each other, placing the table in compact form for stowing away.

COP-TUBE.—E. H. THORNE, Fall River, Mass. The invention refers to improvements in cop-tubes of that class which are used to contain the winding of yarn in weaving machinery, although the tube may be used to advantage in holding the windings of other material. It consists of a paper cop-tube having a frictional holding-surface produced thereon by compressing the tube externally to form a series of conical portions separated by annular shoulders, against which the winding is adapted to lodge in a way to wholly overcome slipping along the tube.

BUCKET.—G. MCDLHANY, Watertown, S. D. This bucket is especially designed for use in elevating grain where it is desired to raise grain for filling bins from an upper floor. It becomes desirable in such connection to provide a bucket of large capacity which will be of sufficient strength to sustain the weight and stand hard usage and which will be provided with a dumping-door arranged to be released by a tripping-rope, so that its contents can be discharged by the operator standing at a distance.

METALLIC HORSE-COLLAR.—D. F. O'LOUGHLIN, Moorhead, Minn. In carrying out this improvement the object in view of the inventor is the provision of a horse-collar which shall be neat and durable and at the same time of such perfect fit that scalds, gall, bruises, sores, etc., on the horse's neck and shoulders are obviated.

DISTANCE OR RANGE FINDER.—E. NICHOLSON, Cleveland, Ohio. The aim of this improvement is to provide a range finder, more especially designed for use on marine vessels and the like to readily ascertain the distance the vessel is from a distant object—say a lighthouse—how far the vessel has to sail before it is abreast of the lighthouse, and the distance between the vessel and the lighthouse when abreast, all without requiring any mathematical calculations.

SHELL.—L. G. ROACH, Fredericksburg, Va. The prime feature of the invention lies in the combination of an exploding means and a centrifugally-releasable restraining device for the exploding means. This restraining device is normally active; but when the projectile begins its rotary flight the centrifugal force attending such rotation renders the restraining device inoperative, and then as the shell strikes the target the exploding device is operated by the impact of the blow.

COLLAPSIBLE CABINET OR DARK ROOM.—L. F. WILSON, Gerrardstown, W. Va. Though applicable to other purposes in the arts, Mr. Wilson's improvements are intended more especially for use as a dark room for amateur and professional photographers; and one of the principal objects is to provide a suitable structure of this kind which is collapsible into small compass, for storage or transportation, besides being light in weight and simple in construction.

HEAVY FIELD ARTILLERY.—T. D. SMYTHE, Santiago, Chile. The object in this case is to provide certain new and useful improvements in artillery whereby field-guns of great length, large caliber, and heavy weight can be readily transported from place to place and brought quickly into action with great precision and steadiness and without unduly exposing the gun and gunners to the fire of the enemy or rendering necessary a heavy shield.

NUT-LOCK.—N. D. ASDELL, Lakeview, Ore. The purpose of this invention is to provide means for securely locking a nut to a bolt at any desired point thereon. The improvement consists of novel means, employing a wedge seated in the nut and adapted for engagement with the bolt thread, a key whereby the wedge is forced into locking position, special means for securing the key, and a nut of peculiar construction.

LAMP-HANGER.—D. MCEACHERN, Rossland, Canada. This device may be readily applied over any ordinary ceiling-block by means of the bracket, the hanger-bar being secured to and depending from the bracket and supporting the toothed segment, so the latter can be rotated to bring it to any position, and a fork is so connected with the block of the toothed segment that it may be swung thereon to any adjustment and its locking-block be moved into locking engagement with the segment block and be released by drawing upon the swinging arm, so it can be adjusted to hold the lamp in any position.

HOOK AND EYE.—A. W. HERBERT and W. F. WASHBURN, New York, N. Y. In the present patent the invention relates to hooks and eyes, and the more particular object is the production of an exceedingly flat hook and eye capable of general use, affording a secure grip and admitting of a cheap and simple construction. The hooks and eyes are paired in the usual manner, and each one is made of a thin plate of metal, and preferably by stamping.

SHOE-HEEL.—G. F. FISCHER, Rochester, N. Y. The purpose of the invention is to provide a shoe-heel of the cushion type and means for attaching the heel to the insole of a shoe, and, further, to so mount the thread-section of the heel that it may be shifted to bring to the rear the forward sections, which are comparatively unworn, to take the place of the rear section of the heel, which has become unduly worn, and to vertically adjust such thread-section, so that

the latter can be worn throughout the major portion of the depth of the heel.

BOX-PLATE AND ATTACHMENT THEREFOR.—H. MCCANN, Hamilton, Canada. This invention relates to means for shaping and supporting plastic material, such as mortar of cement or hot concrete, in the erection of building or other walls from such material, and the object is to provide novel box-plates and novel means for assembling and holding such plates in box form for the reception of the plastic material and retaining it in proper shape until it becomes rigid.

TWINE-HOLDER.—C. L. PETERSON and M. O. THOMPSON, Sioux Falls, S. D. In the present patent the invention has reference to new and useful improvements in twine-holders, and the object of the inventors is the provision of a twine-holder of simple construction designed to be suspended over a counter or the like and in which the twine will not become snarled or twisted.

CANDLE-HOLDER FOR CHRISTMAS TREES.—P. RUMMELIN, Portland, Ore. In carrying out the present invention Mr. Rummelin has particularly in view the provision of a device which will combine the functions and features of a holder for sustaining the candle in a vertical position when on the tree and a receptacle for containing the grease, wax, or the like dripping from the candle.

DRAWERS.—T. F. TRIMBLE, Valatie, N. Y., and W. A. HARDER, Hudson, N. Y. The present improvement relates to drawers used more particularly as clothing for gentlemen. The garment is comfortable and to a great extent self-adjusting. The seams are so located as to have no tendency to produce chafing or to be otherwise objectionable. The inventors have produced a neat simple article of manufacture having the advantages mentioned above and capable of being cheaply made.

ICE-CREAM FREEZER.—C. E. TAYLOR, Magnolia, Ark. This invention comprises a new combination of parts of a construction capable of freezing the cream in a minimum amount of time and labor, which can be readily repaired by an ordinary tinner, and in which the parts have such correlation that they can be used for either domestic or manufacturer's uses. In addition it can be used for cooking the cream in the holder and as a milk-cooler, etc.

SUSPENSION-SEAT.—H. G. GROTE, 5-7 Doventhorsteinweg, Bremen, Germany. This invention is a suspension-seat, with or without support for the feet, for the use of passengers on the railroad or other means of transportation; for soldiers, even if transported in freight cars; for the transportation of the wounded in war, and in case of accidents or wherever it can add to the comfort of travelers. If used on shipboard, it affords a protection against seasickness.

DESIGN FOR A SMOKE-RING MAKER.—E. NAHR, New Orleans, La. The figure in this design is a full-face view of a smoke-ring maker, with the mouth in formative position for ejecting smoke-rings, the rings floating about the head, the fingers of one hand holding up a smoking cigar and the fingers of the other twisting an end of the mustache.

HARNESS-TRACE.—D. K. BELLIS, Manton, Mich. One object of this invention, which relates to improvements in harness-traces of that class which employ leather and metallic chains in their construction, is to overcome stretching of the leather by a composite trace embodying a metallic chain as an integral part thereof, the leather and the chain being so combined as to retain the desirable pliability or flexibility of the trace.

ENVELOP-SEALER.—W. MCD. HENRY, Kessley, Iowa. Mr. Henry's invention refers to improvements in sealing devices for envelopes, particularly envelopes for expressing money or other valuables, the object in view being to provide a simple device for this purpose that may be quickly sealed and the use of wax and tape or ribbon be dispensed with.

GAME APPARATUS.—D. MCRUER, Pauls Valley, Ind. Ter. Among other things this invention has for its object to provide means for automatically rotating a central object or turret, to provide an improved group of emblematical figures in the central rotary object or turret, to employ a movable or shiftable impelling device and to provide means which enable the impelling device to be advanced in case a light shot is to be discharged. The invention is an improvement on a prior patent of Mr. McRuer.

PULLEY-FASTENING.—A. W. HIGHT, Ballard, Wash. The purpose in this case is to provide means for preventing the slipping of split pulleys on their shafts. The invention is especially applicable to that class of pulleys in which the sections are held up by U-bolts or clevises passing through the pulley-sections and encircling the shaft. The invention involves certain improvements in the key for engaging the U-bolt with the shaft.

NON-REFILLABLE BOTTLE.—W. E. JOHNSON, Spokane, Wash. It is the object of this contrivance to effect an improvement in that class of non-refillable bottles which are provided with a stopper or plug having a valve adapted to open for discharge of contents of the bottle when the latter is held in the required position. The stopper with its attachments may be returned to the maker or jobber for reuse.

ADVERTISING DEVICE.—L. R. GAYNOR, Coon Rapids, Iowa. The purpose in this case is

to display an advertisement at a desired point by its flexible connection with a movable door and attract attention by joining the placard on which the advertisement is placed with a grotesque figure that will be fully exposed, along with the advertisement, when the door is moved in the act of opening it, the closing permitting a return movement of the advertisement and a merging of the grotesque figure into an unrecognizable form.

FILTER.—J. P. RUMMEL, Sioux Falls, S. D. One of the principal objects of this inventor is to provide a filter which shall separate and purify the water passing through the same of all animal matter, sediment, or the like. A further object is to construct a filter which may be easily and quickly attached to a faucet, hydrant, or spout, or the like, and which shall perform its proper function without requiring further attention.

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The celebrated "Hornaby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.
Inquiry No. 4616.—For makers of tubular smoke stacks.

Contract manufacturers of hardware specialties, machinery, stampings, dies, tools, etc. Excellent marketing connections. Edmonds-Metzel Mfg. Co., Chicago.
Inquiry No. 4617.—For makers of telephone systems.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.
Inquiry No. 4618.—For dealers in platinum wire or sparking points for gas engines.

WANTED.—New novelties that are ready for the market. Must possess merit to justify extensive advertising in this and Foreign Countries. *What have you?* Wizard Novelty Co., Inc., 1007 Filbert Street, Philadelphia.
Inquiry No. 4619.—For parties to finish and make small, light castings.

A large casualty company desires to obtain the services of three or four high-class men with good experience to inspect boilers and elevators. Please reply stating age, weight, qualifications and references. Address Inspector, Box 773, New York.
Inquiry No. 4620.—For makers of tack machines.

WANTED.—A number of good instrument and tool makers at Edison Laboratory, Orange, N. J. Wages \$3.25. Call or address Thomas A. Edison, Orange, N. J.
Inquiry No. 4621.—For makers of different novelties.

Young man studying mechanical engineering desires position with reputable house. Experience more of an object than salary. H. A. Klein, 1250 Degraw Street, Brooklyn.
Inquiry No. 4622.—For plans and specifications for a fifty-foot pleasure launch.

WANTED.—A solution to impregnate and harden articles made of paper.
Douglas Mfg. Company, Fall River, Mass.



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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(9179) E. C. H. says: We desire to install a pumping engine to raise 150,000 gallons of water in a run of 24 hours. Our boiler pressure is 110 pounds, discharge pressure 80 pounds, in case of a fire we would want to raise it to 100 pounds. Suction 15 to 20 feet. Supply of water to pump is ample. We have studied slide valves, balanced valves, semi-rotative valves, etc., and find it hard to decide which is most suitable. Will you please inform us as to the proper proportions, cylinders, stroke, etc., for a compound engine to meet our needs; also which style steam valve is the most economical? A. Without knowing all of the details of the character of the pump which you are designing, it is impossible for us to give you any information in regard to proportion of the cylinders, stroke, and valves needed for a pump to do the work which you describe. The valve which is most generally used and which gives the best satisfaction for cold water pumping, is a hard rubber disk held by means of a spiral spring on a bronze seat. Where the quantity of water to be pumped is large, a number of these valves are arranged close together. The same type of valve is usually used for the inlet as for the discharge. Much practical experience is necessary in order to build a satisfactory and efficient pump. We would advise you to write to some of the well-known pump manufacturers, and ask them if one of their regular pumps will not meet your requirements. If not, they can doubtless build you a special pump that will.

(9180) J. J. G. asks: Please answer through your paper which is the most elastic, such as glass and ivory or india rubber, and why and oblige. A. Glass, steel, and ivory are the most elastic substances known, if by "most elastic" is meant the ability to restore their form after distortion and the retaining of that power for an indefinite time. India rubber has far less elasticity of this sort. It quickly gives out and will not come completely back after distortion. India rubber has a great range of elasticity and can be bent or stretched much farther than most other substances. In range it is far more elastic than glass, steel, or ivory.

(9181) W. J. H. says: Can you tell me whether practical use is being made of gravity motors at the present time? Would it be feasible to construct a motor of this kind to generate about one-fourth of a horse power for a period of ten hours, using a steam engine or wind mill for winding the heavy weight up and then utilizing the gravity motor for power at such times when the engine or windmill was idle? What would be the best plan for the construction of such a motor? A. We know of no gravity motor on the market which would furnish a fourth of a horse power for ten hours. A clock with weights is a gravity motor, and anything which requires more power than could be run by well-constructed clock work could not be satisfactorily run in this way. A motor to furnish a fourth of a horse power for ten hours would require a weight of 33 tons lifted to a height of 150 feet, provided the efficiency of such a gravity motor were 50 per cent.

(9182) F. B. D. says: Please inform me which are the warmest, for the sides of a house, shingles or clapboards? A. If shingles are laid on building paper, or on any surface which is practically air-tight, they will probably keep a house warmer than clapboards. If, on the other hand, the shingles are laid directly on the sheathing, which usually contains a large number of cracks and openings which would admit air, the shingles will probably not keep the house so warm as the clapboards, because they will admit more air into the walls from the outside.

(9183) R. W. G. says: I am sincerely interested in knowing the shape and motions of the earth. Please answer the following questions in Notes and Queries: 1. Have any surveys ever been made to determine whether the known curvature of the earth's surface is convex or concave? A. All surveys of any extended portion of the surface of the earth demonstrate that the surface of the earth is convex. No line a mile long run for a canal in which water is to flow can be run without taking into the measurement the convexity of the earth, which is almost exactly 8 inches in one mile. For two miles it is very nearly 32