

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.

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

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READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**
MUNN & CO.

Marine Iron Works, Chicago. Catalogue free.
Inquiry No. 4603.—For machinery for making knitted goods.

Autos.—Duryea Power Co., Reading, Pa.
Inquiry No. 4604.—For a machine for sharpening toilet clipper blades.

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Handle & Spoke Mchy, Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.
Inquiry No. 4606.—For a machine for perforating hard-drawn copper 3/16" B.V. with round holes. Also for dealers in such copper.

Mechanics' Tools and materials. Netprice catalogue. Geo. S. Comstock, Mechanicsburg, Pa.
Inquiry No. 4607.—For makers of pianos, furniture and carriages, having export trade.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.
Inquiry No. 4608.—For machines for shrinking and measuring cloth.

Metal Stamping Co., Niagara Falls, N. Y., cuts and forms sheet, bar, rod, or wire any shape.
Inquiry No. 4609.—For a quick-speed tool steel alloy containing tungsten, molybdenum and chromium.

Novelty makers should write sending lists to Howie & Co., general importers, Auckland, New Zealand.
Inquiry No. 4610. For a pencil-making machine worked by a 1/2 or 2 H. P. engine.

Let me sell your patent. I have buyers waiting. Charles A. Scott, Granite Building, Rochester, N. Y.
Inquiry No. 4611.—Wanted, an oil burner suitable for use under a small, horizontal boiler for steam-heating purposes.

Gear Cutting of every description accurately done. The Garvin Machine Co., 149 Varick, cor. Spring Sts., N. Y.
Inquiry No. 4612.—For the present address of the Massey Harris Co., Ltd., of Canada.

Party desires to purchase either entire or half interest in small manufacturing plant. Must be desirable. Geo. F. Russel, 2944 Vernon Ave., Chicago, Ill.
Inquiry No. 4613.—For makers of electric automatic registers to register the number of times the circuit of an electric battery is closed.

We manufacture anything in metal. Patented articles, metal stamping, dies, screw mach. work, etc. Metal Novelty Works, 43 Canal Street, Chicago.
Inquiry No. 4614.—For a shooting gallery outfit.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and hand organs. For prices and terms write to C. W. Parker, Abilene, Kan.
Inquiry No. 4615.—For machines for spinning piano bass strings, also moulding machines for piano frames and general small work.

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