

A NEW ELECTRIC HOIST

for rapid handling of loads under 5 tons. This hoist is designed for use in shipyards, docks, machine shops, etc., and is light, compact, weather-proof and practically indestructible.

SPRAGUE ELECTRIC CO., 527 West 34th St., New York.

RECENTLY PATENTED INVENTIONS. Agricultural Implements.

HARROW.—H. H. LARSEN, Crookston, Minn. Mr. Larsen's present invention is an improvement upon a construction previously patented by himself.

Dental Improvements.

DENTAL FORCEPS.—W. T. MARTIN, Yazoo City, Miss. The beaks of these forceps are thin and sharp and yet strong, and are adapted to be forced into the tooth sockets around tooth roots.

DENTISTRY.—G. G. MARTIN, Pecos City, Texas. Dr. Martin's invention is an improvement in dentistry which has for a primary object to provide means whereby the natural teeth which have become loosened from any cause, such for instance as pyorrhea and Riggs disease, may be tightened and held in place in the jaw.

Engineering Improvements.

ROTARY ENGINE.—F. C. JEWELL, Seattle, Wash. Mr. Jewell is the inventor of an improved rotary engine, the distinguishing feature of which consists in providing two intermeshing pistons operated in a double cylinder and actuated in connection with certain peculiar devices for controlling and supplying the admission of steam.

ROTARY ENGINE.—M. D. KALBACH, Lebanon, Pa. Mr. Kalbach's invention provides an engine whose direction is readily controlled and in which devices are employed for so controlling the cut-off valve as to secure advantage of the direct action and expansion of the steam in a simple and effective manner.

ROTARY ENGINE.—G. M. WALKER, Lincoln, Neb. The objects attained by this invention are the provision of means for utilizing the steam expansively in a rotary friction engine; to automatically adjust the abutments of the rotary piston for operation according to the direction in which the engine is desired to be driven.

ROTARY ENGINE.—J. M. WILLIAMS, Krebs, Ind. Ty. This invention is an improvement in that class of rotary engines in which a piston is eccentrically mounted on a shaft adapted to be rotated within a circular drum and to co-operate with a swinging or otherwise movable abutment located in a chamber forming a circumferential enlargement of the steam chamber of this drum.

TRACTION-ENGINE COUPLING.—J. W. BULLER, Jansen, Neb. Mr. Buller's invention relates to means for detachably connecting a traction engine to the tender, and likewise for connecting the fuel and water supplying tender with a portable threshing machine or other wagon for its progressive movement.

Mechanical Devices.

BREAD-CUTTING MACHINE.—C. J. VANN, Brooklyn, N. Y. The object of this invention is to provide an improved device of simple construction which is more especially designed for use in hotels, restaurants, boarding-houses and the like.

CASH-REGISTER.—H. POTTIN and LUCIE MOUSSIER, 100 Rue St. Lazare, Paris, France. The improvements which are provided in this invention consist in so arranging a cash register as to automatically prevent the key levers indicating the number to be added to those already registered.

(Continued on page 428.)

Absolute Protection Against Fire



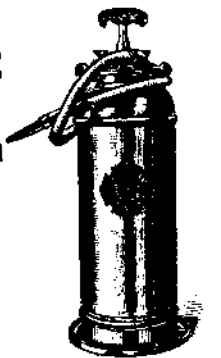
NO ACIDS NON-EXPLOSIVE NON-FREEZING

All our extinguishers filled with the marvelous "Little Giant" solution and operated on the pump principle

References: All Fire Insurance Companies and Fire Departments in the United States.

The Little Giant Fire Extinguisher Company

19 Liberty Street, New York



Three Gal. Size \$25.00

DON'T

think because our Preston Model is offered to you at such an extremely low price that it is lacking in quality. It embodies all the good points necessary to make it capable of any work up to its capacity and good looking for.

ELECTRIC LAUNCH MOTOR.—THE design in this paper is for a motor of unusual simplicity of construction, which can easily be built by an amateur at small cost.



WIRELESS TELEGRAPHY.—SCIENTIFIC AMERICAN SUPPLEMENT Nos. 1211, 1327, 1328 and 1329, contain illustrated articles on this subject by G. Marconi.

AUTOMOBILES

A valuable and fully illustrated article with complete scale drawings showing construction of steam automobile that can be built for less than \$500.

The Galvanized Spring Steel Frame of a King boat keeps it always in perfect form. We are now making 18 ft. Tenders for Torpedo Boats 8 and 9 U. S. NAVY.

This is the time to write us. KING FOLDING CANVAS BOAT CO., 673 North Street, Kalamazoo, Mich., U. S. A.

American Steel & Wire Co.

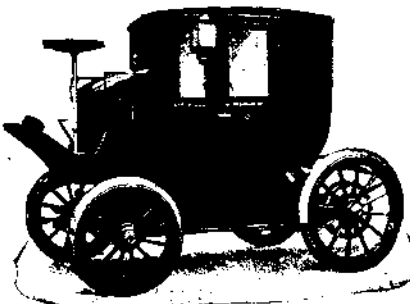
Chicago New York Worcester Denver San Francisco

WIRE ROPE ELECTRICAL WIRES WIRE OF ALL KINDS

Columbia AUTOMOBILES

(ELECTRIC AND GASOLENE)

For all requirements of Pleasure General Use or Business



Columbia Extension-Front Brougham

- RUNABOUTS VICTORIAS SURREYS TONNEAUS CABRIOLETS TOURING CARS BROUGHAMS BUSES TRUCKS DELIVERY WAGONS PATROL WAGONS AMBULANCES

Catalogue on application; also separate pamphlets for each vehicle, containing complete detailed information.

Electric Vehicle Co.

HARTFORD, CONN.

NEW YORK: 100 Broadway BOSTON: 43 Columbus Ave. CHICAGO: 1421 Michigan Ave.

HEROES OF HISTORY

FROM 360 A. D. DOWN TO OUR OWN TIMES Sent FREE For Your Approval

"History," as Lowell says, "is mainly the biography of a few imperial men," the men whom the ages have honored and who have lived more interesting than a romance, for what they have done and what they have done is FACT, not FICTION.

New Library of Biography

These biographies afford the easiest, most pleasant and most fascinating way to become acquainted with the world's history for the past 2300 years.

The One Superb Christmas Gift

25 Handsome Volumes

We send them all to you at once for your approval, and pay TRANSPORTATION CHARGES. We do this because we want you to examine the entire work at your leisure.

Why You Need This Work

First of all because it is the best because it is the only biographical library which adequately covers the field; the only library written by really distinguished authors, historians and critics.

Just Now Less Than Half Price

We shall distribute over as wide an area as possible a portion of the first edition at a fraction—less than half—of the regular subscription price.


A few sets have been bound to special order in Genuine Half Morocco (4 1/2 lbs. tops, which we will supply for \$1 on examination and \$3 monthly for 16 months.

The PERKINS BOOK CO. 296 Broadway, New York

FREE INSPECTION COUPON. Please send me for my free inspection, all transportation charges prepaid, one complete set of "Heroes of History"—25 volumes, in Cloth or Half Morocco binding, to be returned within ten days at your expense if not satisfactory.

Name: Address: (Sci. Am. Dec.) In ordering Cloth, fill in 9 mos.; if Half Morocco 16 mos.

**WOOD or METAL Workers**



Without Steam Power should use our Foot and Hand Power Machinery. Send for Catalogues.

A—Wood-working Machinery, B—Lathes, etc.

SENECA FALLS MFG. CO.  
69<sup>th</sup> Water St., Seneca Falls, N. Y.


**ENGINE & FOOT LATHES** MACHINE SHOP OUTFITS TOOLS AND SUPPLIES

SEBASTIAN LATHE CO. CINCINNATI, O.

**WORKS LIKE A CHARM.**

Perfect satisfaction is experienced using our No. 5, 6 or 8 Hand Pipe Threading and Cutting Machines. Crank or ratchet power. Gears housed from dust. Chasers set by graduation to any size, can be released from threading while in motion, opened to permit pipe being cut, and instantly closed.

Send for Free Catalogue to The Merrell Manufacturing Co., 501 Curtiss Street, Toledo, Ohio.



**THE OBER LATHES**

For Turning Axe, Adze, Pick, Sledge, Hatchet, Hammer, Auger, File, Knife and Chisel Handles, Whiffletrees, Yokes, Spokes, Porch Spindles, Stair Balusters Table and Chair Legs and other irregular work.

Send for Circular A.

The Ober Mfg. Co., 10 Bell St., Chagrin Falls, O., U.S.A.

**MORAN FLEXIBLE JOINT** for Steam, Air or Liquids.

Made in all sizes to stand any desired pressure.

Moran Flexible Steam Joint Co., Inc'd, 149 3d East St., LOUISVILLE, KY.



**NEW BINOCULAR.** (The Triöder.)

Small as an opera glass. More powerful than the largest field glass. Send for Circulars.

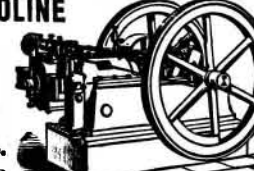
QUEEN & CO. Optical and Scientific Instrument Works, 1010 Chestnut Street, NEW YORK: 50 Fifth Ave. PHILADELPHIA, PA.



**GAS and GASOLINE ENGINES.**

Using Natural Gas, Coal Gas, Producer Gas, and Gasoline direct from the tank. 1 to 40 H. P. actual.

The Springfield Gas Engine Co., 21 W. Washington St., Springfield, O.



To Owners of Gasoline Engines, Automobiles, Launches, Etc.

**The Auto-Sparker**

does away entirely with all starting and running batteries, their annoyance and expense. No belt—no switch—no batteries. Can be attached to any engine now using batteries. Fully guaranteed; write for descriptive catalog.

Motsinger Device Mfg. Co., 14 Main St., Pendleton, Ind.



**Automobile Engine** for Business

After careful testing we offer to the public, with confidence, the H. & M. Compound Engine. Dimensions of Cylinder are 2 3/4 and 5 in. x 4 in. stroke. Height of Engine 21 in. Base 8x12 in. Weight, Engine, 36 lbs. 3 crank shaft bearings. All working bearings of bronze. Piston rods of machinery steel. Air and boiler pumps connected from cross head. Plain side valves. We also build running gears and make parts.

SHAFFER, RUNCE & CO., Lockport, N. Y. Successors to SHAFFER, RUNCE & MARVIN.



**YAN NORMAN Universal Bench Lathes**

have a full line of the most improved attachments for Screw Cutting, Milling, Grinding, Etc.

Send for Catalogue.

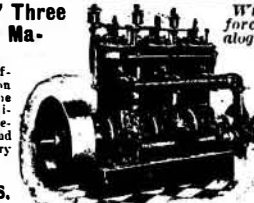
WALHAM TOOL COMPANY, Springfield, Mass.



**The "Wolverine" Three Cylinder Gasoline Marine Engine.**

The only reversing and self-starting gasoline engine on the market. Lightest engine for the power built. Practically no vibration. Absolutely safe. Single, double and triple marine and stationary motors from 3 to 30 H. P.

WOLVERINE MOTOR WORKS, Grand Rapids, Mich.



**Squabs Pay Boat Hens**

Easier, need attention only part of time, bring big prices. Raised in one month. Attractive for poultrymen, farmers, women. Send for FREE BOOKLET and learn this immensely rich home industry.

Plymouth Rock Squab Co., 14 Friend St., Boston, Mass.




**Our Pen-Carbon Letter Book** Copies Letters While You Write

Use your own paper. Any pen, any ink, no press

Government Officials, Colonists, Farmers, will find it invaluable.

Every man who writes letters should write for price: if his sponsor does not help it. We manufacture Ditmars' Typewriter Ribbons and Carbon Paper.

PEN-CARBON MANIFOLD CO., Dept. 1, 145-79 Centre St., New York, U.S.A.



**SALTING-MACHINE.**—J. W. GHEEN, Astoria, Ore. Mr. Gheen's invention relates to machines for supplying salt to cans used for canning meats, fish, and other foods. The object of the invention is to provide a machine of simple construction by means of which measured quantities of salt may be rapidly fed into the cans.

**STAMP-AFFIXING MACHINE.**—C. J. FANCHER, Granby, Conn. The machine comprises a mechanism for moistening the corners of the envelopes, for feeding the stamps to a point adjacent to the moistened corners, for detaching the stamps from each other, and for pressing the stamps upon the moistened corners of the envelopes by a peculiar rolling motion.

**TUMBLING-MACHINE.**—H. E. BARRON, Attleboro, Mass. This machine is designed more especially for treating jewelry such as chains, parts thereof and the like, to clean and polish the same in a very inexpensive and thorough manner. Mr. Barton's invention provides a very simple and durable construction for effectively performing this operation.

**MOTION-TRANSMITTING DEVICE.**—G. G. BERTZEL, Copenhagen, Denmark. In sewing machines with rotating shuttles, it is very advantageous to impart to the shuttle shaft a variable rotating motion in order that the upper thread may have sufficient time to be drawn away from the catcher before the new stitch is made. This may be effected by means of specially shaped cog-wheels: but by such an arrangement the parts are subjected to considerable wear, and therefore in this invention the cog-wheels are replaced by a peculiar form of angle lever capable of turning around two axes at right angles to each other, the one arm of the lever being connected with the driving-shaft, while the other arm is connected with the catcher.

**Railway Improvements.**

**CAR-BRAKE.**—J. RUNNOR, Crested Butte, Colo. An improvement in car brakes is provided by this invention, which relates particularly to slack-adjusters for such brakes. The slack-adjuster is so constructed that it may be quickly set to take up the required slack. This operation may be performed by operating the take-up block by means of the foot of the operator, thus leaving his hands free.

**Miscellaneous.**

**DRAFTING INSTRUMENT.**—C. H. QUIMBY, Jr., Confluence, Pa. Mr. Quimby's improved drafting instrument is more especially designed for the use of railroad engineers in the work of railroad location. The instrument provides a railroad-curve projector, a curved scale being arranged to permit the user to readily select such curve or combination of curves as will best suit the conditions shown on the plan or contour map and to obtain the length of the curve without further calculation.

**CHANGEABLE-ADDRESS HOLDER.**—D. E. WERTS, Grants Pass, Ore. Mr. Werts is the inventor of a changeable address holder which will be found useful for trunks, valises and other kinds of baggage. The holder comprises a clamping-plate, which is adapted to clamp the address label in place. The clamping-plate is held in a frame-plate by an eccentric disc which may be rotated out of engagement with frame-plate when it is desired to remove or change the address label.

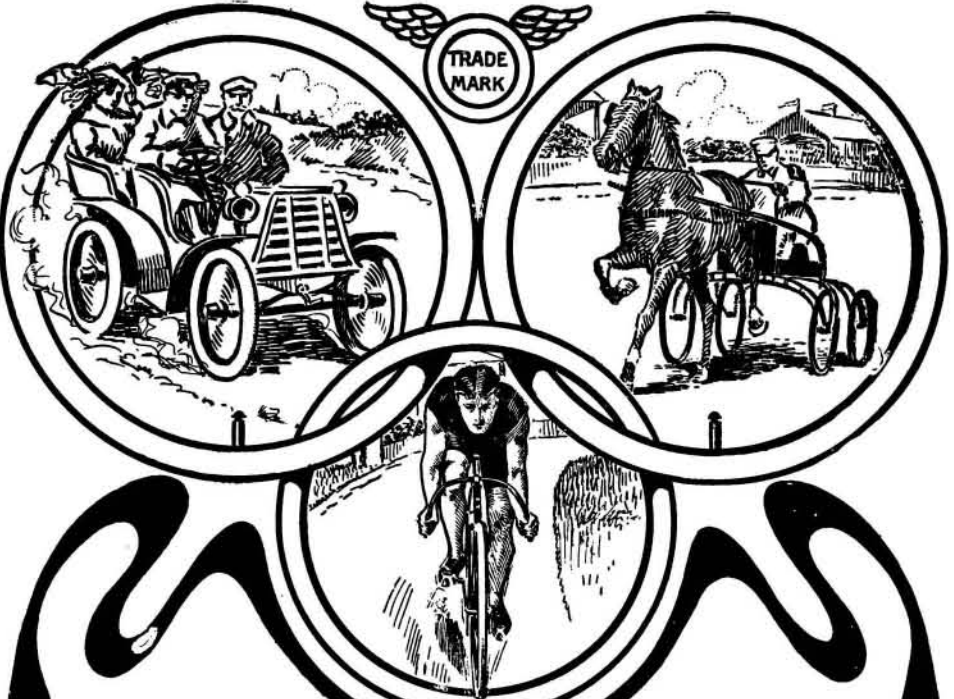
**DOG ATTACHMENT FOR LOGGING-CARS, ETC.**—G. T. HUGHES, New Waverly, Tex. Mr. Hughes provides by this invention, an improvement in dog attachments for logging cars, sleds, wagons, etc., and the invention has for its object to provide a device which will securely retain logs on a car, sled or wagon, and also readily release the same for unloading when required.

**BOOK-HOLDER.**—B. A. JONES, Indianola, Neb. By this invention books are held on the shelves of bookcases in an upright position and are prevented from leaning or falling over when the shelves are only partly full or when one or more books are removed from a full shelf. This is accomplished by long and narrow bars placed horizontally and attached to the inside of the back part of the bookcase between the shelves and by projections which are attached to these bars and project between the books to hold them in place.

**STOCKING.**—M. LAMOND, Oakland, Cal. Mr. Lamond's invention seeks to overcome the objections and difficulties incident to the use of ordinary stockings and stocking-supporters, such, for instance, as the insecure connection of the supporters with the stockings, the inconvenience of application and adjustment, the tendency of the top of the stocking to swerve one side or the other, and the sagging of the stocking between the points of suspension.

**GAME APPARATUS.**—H. J. FRYSENGER, Baltimore, Md. The invention is an improvement in game apparatus, being especially in the nature of an apparatus for playing what the inventor terms "royal pin ball." In playing the game a ball which swings on a cord must be so struck as to clear certain fixed posts and knock down the pins beyond.

**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.



**Double Tube Single Tube**

**Dunlop and Hartford**

**Pneumatic Tires**


For Automobiles, Bicycles and Other Vehicles.

We have in stock, and will supply, the proper size and weight tires for any kind of wheels. Let us advise you regarding the tires best adapted to your requirements, and send you some signed statements received by us from some of the best auto makers and dealers in this country, endorsing our product.

**They are Standard Tires of their Respective Types.**

Manufactured by THE HARTFORD RUBBER WORKS CO., Hartford, Conn.


BRANCH HOUSES LOCATED IN ALL PRINCIPAL CITIES.



**Splitdorf Coils**

THE RECOGNIZED STANDARD AUTOMOBILE SPARKERS.


**C. F. SPLITDORF,**  
17-27 Vandewater St., N. Y.



**The Americans Lead The World**

We are doing our part by producing the best jump spark apparatus for the ignition of gasoline engines. Our coils give a hot, rich spark. Our double insulated, mica-cored spark plugs are guaranteed against breaking down of insulation. Our Little Giant Distributor can be operated on either touch or jump spark. And our dry batteries have the longest life. These are essential points of good ignition. If you have trouble, don't forget that our outfit will dispel them. Send for catalogue. Mention this paper.

AMERICAN COIL CO., West Somerville, Mass.



**THE COLUMBIA LOCK NUT**

meets a long felt want in the mechanical world. It is praised and recommended by all who are acquainted with its merits. No railroad, automobile or other manufacturing concern, where there is jar and vibration, and where a positive and secure fastening is required, can afford to be without it.

Write for prices and catalogue. Sample free.

**The Columbia Lock Nut Co. (Incorporated)**  
BRIDGEPORT, CONN.



**LAUNCHES**

Steam and Sall Yachts, Row Boats, Canoes. Our catalog gives the truth in detail about the best boats built. Write for it to-day. Address

**RACINE BOAT MANUFACTURING CO.**  
Box 35, Racine, Wis.

