Advertisements.

ORDINARY RATES.

Inside Page, each insertion - - 75 cents a line Buck Page, each insertion - - - \$1.00 a line

The some classes of Advertisements, Special and Higher rates are required.

The above are cnarrees per agaze line—about eight words per line. This notice shows the width of the nne, and is set in agaze type. Engravines may bead advertisements at the same rate per agaze line, by measurement, as the letter press. Advertisements must be received at Publication office as early as Thursday norning to appear in the rollowing week's issue.



AMERICAN PATENTS. - AN INTER-AMERICAN PATENTS.—AN INTER-esting and valuable table showing the number of patents granted for the various subjects upon which petitions have been flied from the beginning down to December 31. 1894. Contained in SCIENTIFIC AMERICAN SUP-PLEMENT, NO. 1002. Price 10 cents. To be had at this office and from all newsdealers

POWER & FOOT | SHAPERS, PLANERS, DRILLS, LATHE S. | MACRINE SHOP OUTFITS TOOLS AND SUPPLIES. CAYALOGUE FREE SEBASTIAN LATHE CO. 170 CULVERT ST. CINCINNATI. D.

mart

Were not always so to study and read had to get all the from other people engineers, mechan to-day read Lord Machinery M an educator. It the most valuable facts every month cents. You oug \$1 a year. Sen sample to :: :: 618 Atlantic Av Were not always smart. They had to study and read and learn. They had to get all the ideas they could from other people. The smartest engineers, mechanics and machinists to-day read Lord's Power and Machinery Magazine. It is an educator. It gives its readers the most valuable information and facts every month for less than 10 cents. You ought to subscribe. \$1 a year. Send 10 cents for a

GUILD & LORD 618 Atlantic Ave., BOSTON, Mass. Suppright 1995,-Bates-Whitman Company, N. Y. ON ONE



THE CURTIS Water Pressure Regulator

For Hotels and Public Buildings, Water Motors, Hydraulic Elevators, etc. Will maintain the pressure desired, with perfect uniformity, regardless of any and all fluctuations in the outside pressure.

Send for Circular S. F.
D'ESTE & SEELEY CO. 29-33 Haverhill St., Boston.

WORK SHOPS

of Wood and Metal Workers, with-out steam power, equipped with BARNES' FOOT POWER MACHINERY
allow lower bids on jobs, and give
greater profit on the work. Machines
sent on trial if desired. Catalog Free.

W. F. & JOHN BARNES CO.
1999 RUBY ST., ROCKFORD, ILL.



Rivet Machinery RAPID ACTION

MODERN DESIGN HIGH-GRADE WORK

BUILT BY P.O. Box 54, WATERBURY, CONN

WIRE STRAIGHTENER

This straightener is of an improved pattern, and will straighten wire from No. 3 to No. 20.

Price\$12.00

13 Send stamp for catalogue of machinists' tools.



CHANDLER & FARQUHAR, 38 FEDERAL STREET,

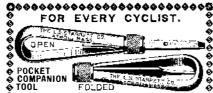
Repair Bicycles for a Living.—Your boy's hobby may be mechanics; if so, get him the proper tools.

Here is a bicycle repair outfit complete. Illus. catalogu of tools for stamp. Fred. Frasse Co., 21 Warren St., N. Y



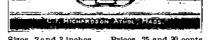
With the new attachment, the Rivett Automatic Chuck Closer, from 100% to 300% more work can be done. NEW TOOLS . . . NEW CATALOGUE, 1896





Three tools you are always needing: Screw-driver, Awl, Wrench. All in one light, compact combination, finely finished, nickeled. Weighs only 2 oz. Length closed 3 in. If your bardware dealer hasn't it we will send it on receipt of 45 cents. Stamps taken. THE L. S. STARRETT CO., Box33, Athol, Mass.

TRANSITS AND LEVELING INSTRUMENTS. NICKEL ELECTRIC LEVELS



Sizes, 2 and 3 inches. For Book on C. F. RICHARDSUN & Son, the Level. P. O. Box 977, Athol, Mass., U. S. A

Queen" Builder's Transit \$100 IMPROVED TRANSITS AND LEVELS

Graduated entirely on our large dividing engines. Special award at World's Fair. All kinds of Engineering, Surveying and Drafting Instruments and Materials. 220 p. Illustrated Catalogue mailed free only if this ad is mentioned QUEEN & CO., Inc., 1011 Chestnut St., Philadelphia

BILLINGS' IMPROVED KEY RING Patent applied for.

Spinning and Twister Ring Blanks

The Billings & Spencer Co., Drawer 3, Hartford, Conn.

WESTERN ELECTRICIAN PARE

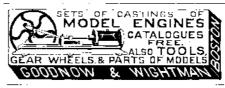
SCIENTIFIC AMERICAN SUPPLE-MENT. Any desired back number of the SCIENTIFIC AMERICAN SUPPLEMENT can be bad at this office for 16 cents. Also to be had of newsdealers in all parts of



'My Well and what came out of it." A story by the novelist Frank R. Stockton "Your Well and what will come out of it."

By Pohlé Air Lift Pump

Bulletins to tell you will be sent on application The Ingersoll-Sergeant Drill Co. Havemeyer Building, 26 Cortlandt Street, New York.



ACETYLENE GAS AND CARBIDE OF ACE I YILLAY GAS AND CARDIDE OF Calcium.—All about the new illuminant, its qualities, chemistry, pressure of liquefaction, its probable future, experiments performed with it. A most valuable series of articles, giving m complete form the particulars of this subject. Apparatus for making the gas. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 998. 1004, 1007, 1012, 1014, 1015, 1016, 1022, 1035 and 1038. The most recent apparatus of simple and more elaborate type described and illustrated in special acetylene Supplement No. 1057. Price 10 cents each. To be had at this office and from all newsdealers.

Electricity (1) Mechanics; Mechanical and Architectural Drawing; Plumbing; Architecture; Mining; Civil Engineering in all Branches; Steam Engineering (Stat'y., Loco. and Marine).

Muchicists, Miners,
Plumbers, Givi Enginers, Ilraugktkmen,
Curpentors, Scaum Firtura,
References, Free Appuratite, Send for Oircolors, Stating Subject
you trisk to Study,
B 942, Kennten

The International Correspondence Schools OLDS SAFETY VAPOR ENGINES FREE from cams, gears, rockarms and complications. Greatest simplici-

Greatest simplicity, efficiency, and durability. Get catalogue by sending 2 2-cent stamps.

P. F. OLDS & SON,
The Gasoline Engine Builders, Box 418, LANSING, MICH.

"WOLVERINE" GAS AND GASOLINE ENGINES, STATIONARY

The "Wolverine" is the only reversible Marine Gas Engine on the market. It is the lightest engine for its power. Requires no liconsed engineer. Absolutely safe, Mannfact'd by WOLVERINE MOTOR WORKS, 12 Huran Street, CRAND RAPIDS, MICH.

GAS and GASOLINE ENGINES.

Using Natural Gas, Coal Gas, Producer Gas, and Gasoline di-rect from the tank. 1 to 40 H. P., actual. The Springfield Gas Engine Co 21 W. Washington St. Springfield, O.

SINTZ GAS ENGINE CO. GRAND RAPIDS, MICH., U. S. A.

Manufacturers of the Sintz Stationary and Marine Cas and Gasoline Engines. Especially adapted for Boats and Electric Lighting. Runs with manufactured or natural gas—Boats and launches. Prices within the reach of all. Estation this paper.

This beats Wind, Steam, or Horse Power. We offer the WEBSTER 2½ actual horse power

GAS ÉNGINE for \$150, less 10% discount for cash. Built on interchangeable plan. Built of best material. Made in lots of 100, therefore we can make the price. Boxed for shipment, weight 800 pounds. Made for Gas or Gasoline.

By Write for Special Catalogue.

WEBTER MFG. CO.

1074 West 15th Street, CHICAGO



Lidgerwood Hoisting Engines.

300 STYLES AND SIZES. OVER 12,000 IN USE. Send for Catalogue

LIDGERWOOD MFG. CO. 96 Liberty Street, New York.

PREISTMAN SAFETY OIL ENGINE

"A thoroughly successful commercial Engine using a Safe Oil."—Frankin Institute No Extra Insurance, No Steam, No Gas, No Gasoline. Reliable, Safe, Economical. and Convenient. Chosen by Nine Governments. Used for nearly every purpose.

PREISTMAN & CO., Incorp'd, Comment of the Control o VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Glogs nor
freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 sach. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, 0.

Experimental & Model Work E. V. BAILLARD, 106 Liberty Street, N. Y.





The WINSHIP Platform Sprinkling



Wagon.
The most complete Sprinkling
Wagon ever built.
The Accommodation
Gear Street Sprinkler,
to fit any lumber wagon, is sold with lone
or upright tank, and
with or without wagon. The Winskip
Mig. Co., Racme, Wis





ATENTS!

MESSES, MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine improvements, and to act as Solicitors of Patents

Elbridge Electrical Mfg. Co. ELBRIDGE, N.Y.



Our 8 Light Dynamo.

MANUFACTURERS OF

Dynamos

for Light and Power.

Measuring Tapes.

Lufkin's, Eddy's, Roe's, etc., and supplies of all kinds for Architects, Engineers and Draughts-

Frost & Adams Co. Established in 1848.
39 Cornhill, ROSTON

LITTLE GIANT SCREW PLATES



Wire sizes for Jewelers, Dentists, Tool Macres, and Amateurs se. Machinists sets nus, and Amateurs
use, Machinists' sets
with Taper, Plug,
and Hottoming Laps
for pipe and bicycle
work. Also blacksuiths and carriage
Send for fully illustrated catalogue.
OS. & CO., P.O. Box B, Greenfield WELLS BROS. & CO., P.O. Box B, Greenfield, Mass.

ORNAMENTAL IRON INDUStry.—Description of the method of manufacturing wrought iron into ornamental and artistic forms, With 9 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT. No. 1020. Price 10 cents. To be had at this office and from all newsdealers.



Trucks of Every Description. The HandyTruck

Price F. O. B. \$2.00 Self-Lubricating \$2.25

A Book on Trucks Free Boston & Lockport Block Co. 143 Commercial St., Boston, Mass.

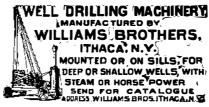
DORMAN'S VULGANIZERS are used all over the world.

are used all over the world.

Exclusive Manufacturers of Steam Machines for Rubber Stamps. We also make Dry Heat Vulcanizers. Complete outfits from \$10 to \$1,000. All Stamp and Stencil Tools and Supplies. Brass and Steel Dies for all purposes. Seals, Engraving and Die Sinking of all kinds. Established 1890.

THE J. F. W. DORMAN CO.

121 E. Fayette St., Baltimore, Md., U. S. A



AUTOMATIC-OPENING

SCREW CUTTING CHUCK The only chuck made that works automatically without outside contractions.

In use by the most rominent manufacturers in the U.S. and other countries.

Pat. Dec. 1889. KARL MISCHKE, 162 W. 27th Street, New York, Manuf'er of hardware specialties and tools of all kinds.

TURBINE WATER WHEELS.
SEND FOR PAMPHLET.
JAMES LEFFEL & CO.,
Springfield, Ohio, U. S. A. Combination Bench and

"PEERLESS" DUPLEX PIPE THREADING MACHINES

> Pipe Vises. ontinuous Feed Ratchet Drill

© 1896 SCIENTIFIC AMERICAN, INC