

Advertisements.

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(About eight words to a line.)

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COLUMBIA BICYCLES. THE POPE MFG. CO. & TRICYCLES. BOSTON, MASS.

Branch Houses: 12 Warren Street, New York. 115 Wabash Avenue, Chicago, Ill.

THE INFINITELY SMALL.—AN interesting paper by the Rev. W. H. Dallinger, LL.D., on the origin and life histories of some of the least and lowest living things.

RADIATORS FOR STEAM OR HOT WATER HEATING. SEND FOR DESCRIPTIVE CATALOGUE OF THE BUNDY MANUFACTURED BY A. A. GRIFFING IRON CO. 650 COMMUNIPAW AV. JERSEY CITY, N. J.

SOUND SIGNALS.—BY A. B. JOHNSON. Descriptions of some of the most approved inventions for signaling by sound.

H. W. JOHNS' ASBESTOS Roofing, Building Felt, Steam Packings, Boiler Coverings, Fire Proof Paints, Cements, Etc.

Syracuse Malleable Iron Works

BLOWPIPE-FLAME FURNACE.—A paper by A. C. Tappert, describing a new boiler furnace, in the designing of which the chief objects have been economy in fuel and preservation of the boiler.

WM. A. HARRIS, Providence, R. I. (Park St.), Six minutes' walk West from station. Original and Only Builder of the HARRIS-CORLISS ENGINE.

THE ANTHRACITE COAL FIELDS of Pennsylvania.—By Chas. A. Ashburner. History, Topography, Structural Geology, Stratigraphical Geology, Composition and Origin of Pennsylvania Anthracite.

WITHERY, RUGG & RICHARDSON. Manufacturers of Patent Wood Working Machinery of every description.

STEAM CATAMARAN MAY BARRETT.—Plans and specifications of the catamaran May Barrett, a family cruising boat built for use on rivers and lake.

AUSTRALIA. American Manufacturers wishing to be represented in these colonies please communicate with Messrs. Inray & Co., Australian Agents.

PATENTS.

MESSRS. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine inventions, and to act as Solicitors of Patents for Inventors.

MUNN & CO., Solicitors of Patents, 361 Broadway, New York. BRANCH OFFICE.—Corner of F and 7th Streets, Washington, D. C.

JENKINS BROS.' VALVES. Gate, Globe, Angle, Check, and Safety. MANUFACTURED OF BEST STEAM METAL.

SAWS Wanted 5000 Sawyers and SAWERS full address for a copy of Emerson's Book of SAWS. We are first to introduce NARCISAL GAS for heating and tempering SAWS with wonderful effect upon improving their quality and toughness.

CUTTING UP BEEF.—DIAGRAM showing how a side of beef is cut in the three principal cities, New York, Chicago and Philadelphia.

WIRE ROPE Address JOHN A. ROEBLING'S SONS, Manufacturers, Trenton, N. J., or 17 Liberty Street, New York.

HIGH EXPLOSIVES FOR WAR PURPOSES.—A paper by Prof. C. E. Munroe, U.S.N.A., discussing some recent experiments on the use of high explosives for war purposes.

NOTICE to Users of Steam Pumps. We have received following letter in regard to one of our No. 5 "L" (\$16) Steam Jet Pumps.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN.

MODERN BRONZE ALLOYS.—A Paper by P. F. Nury, C.E., presenting some valuable data concerning such bronzes as are being usefully employed for engineering purposes.

"VULCAN" Cushioned Hammer. Steel Helve, Rubber Cushions, TRUESQUARE, ELASTIC BLOW Full Line of Sizes.

REPAIR OF BOILER TUBES.—BY N. W. Elsholz. A very valuable paper. How to repair leaky tubes. How to remove worn out tubes.

1852. 1885. The Latest Improvement IN TRACTION ENGINES

The only Engines where the power is practically and successfully applied to the four truck wheels. Exceeds all other Traction Engines in pulling and steering through mud holes, sand, or any soft or uneven ground.

WESTON DYNAMO-ELECTRIC MACHINE The undersigned, sole agents for the above machine for ELECTROPLATING AND ELECTROTYPING.

HANSON VAN WINKLE & Co. SOLE AGENTS NEWARK, N. J. New York Office, 92 and 94 Liberty St.

PERFUMES.—A PAPER BY JACOB JESSON, describing various articles used in perfumery, and the mode of preparing essences therefrom.

STEAM ENGINES. Horizontal and Vertical. Dredging Machinery, Flour, Powder, Slate and Flint Mill Machinery, Turbine Water Wheels.

FIRE BRICK FILE AND CLAY RETORTS ALL SHAPES. 23 1/2 ST. ABOVE RACE, PHILADELPHIA. BARREL, KEG, Hogshead, AND STAVE MACHINERY.

ROOT'S NEW IRON BLOWER. POSITIVE BLAST. IRON REVOLVERS, PERFECTLY BALANCED, Has Fewer Parts than any other Blower.

THE WALL.—A LECTURE BY PROF. T. R. SMITH, F.R.I.B.A. Physical Qualities and Mode of Constructing Walls of the Middle Ages.

MALLEABLE AND FINE GRAY IRON ALSO STEEL CASTINGS FROM SPECIAL THOMAS DEVLIN & CO.

A New Drill Chuck. THE HARTFORD. No. 1 holds 0 to 1/2 in. Price, \$7.00. No. 2 holds 0 to 3/4 in. Price, \$8.00.

The Cheapest and Best Lubricator. The feed is very plain and positive. It has less parts than any other yet produced.

SILVERING GLASS.—A PAPER BY F. L. JAMES, Ph.D., describing the various methods of depositing silver upon glass, etc.

PIPE COVERING. FIBROUS ASBESTOS REMOVABLE COVERINGS. Fireproof Non-conducting Coverings for Steam Pipes, Boilers, and all hot surfaces.

PROSPECTING MINERAL LANDS A SPECIALTY. ARTESIAN WELLS BORED ROUND AND STRAIGHT ADMITTING A LARGER PUMP & CEMENT PROPORTION TO SIZE OF HOLE THAN BY ANY OTHER PROCESS.

COPPER WIRE; HOW DRAWN.—AN interesting description of the process of drawing copper wire as practiced at the celebrated works of Mouchel, at Aube, Bolshoret, and Tillyeres, France.

THE AMERICAN BELL TELEPHONE CO. 95 MILK ST., BOSTON, MASS.

This Company owns the Letters Patent granted to Alexander Graham Bell, March 7th, 1876, No. 174,465, and January 30th, 1877, No. 186,787.

The transmission of Speech by all known forms of Electric Speaking Telephones infringes the right secured to this Company by the above patents.

Inventors.—The undersigned will exhibit Patented Articles and Models at the Exposition to be held in New Orleans, on very moderate terms.

The Scientific American. THE MOST POPULAR SCIENTIFIC PAPER IN THE WORLD.

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MUNN & CO., Publishers, 361 Broadway, New York.

THE Scientific American Supplement.

THE SCIENTIFIC AMERICAN SUPPLEMENT is a separate and distinct publication from THE SCIENTIFIC AMERICAN, but is uniform therewith in size, every number containing sixteen large pages.

To Foreign Subscribers.—Under the facilities of the Postal Union, the SCIENTIFIC AMERICAN is now sent by post direct from New York, with regularity.

PRINTING INKS. THE Scientific American is printed with CHAS. T. BENTON JOHNSON & CO.'S INK.