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## COLD FORGED PRODUCT.

## Fluted Tire Bolt

Patented Nov. 11, 1890; Oct. 20, 1891.



Is stiffer and stronger than a common bolt. The fluted shank prevents the bolt from turning in the rim and tire.

**COLD FORGED** { MACHINE SCREWS  
STOVE BOLTS  
LOCK CAP SCREWS  
SIDE KNOB SCREWS  
THREADED WIRES

**AMERICAN SCREW COMPANY,**  
PROVIDENCE, R. I.

**Motor of 19th Century**  
Can be used any place, to do any work, and by any one. No Boiler! No Fire! No Steam! No Ashes! No Goggles! No Engineer! A perfectly safe motor for all places and purposes. Cost of operation, about one cent an hour to each indicated horse power. For circulars, etc., address **CHARTER GAS ENGINE CO.** P. O. Box 148, Sterling, Ill.

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For rates see top of first column of this page or address **MUNN & CO., Publishers,** 361 Broadway, New York.

**SINTZ GAS ENGINE CO.**  
GRAND RAPIDS, MICH., U. S. A.  
Manufacturers of the Sintz Stationary and Marine Gas 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. Send catalogue. Mention this paper.

**ASTRONOMY**  
Poole Bros. Celestial Planisphere and Celestial Handbook just published. For descriptive circular address **POOLE BROS., CHICAGO, ILL.**

**THE MODERN MARINE BOILER.**—By A. B. Willis, U.S.N. Description of the principal features of the boilers of the United States man-of-war New York, with a plea to inventive minds for the production of a type of boiler which shall do away with the necessity of the present enormously large and heavy shells, and present a lighter substitute that will perform the duties of both envelope and heating surface conjointly. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 879, 10 cents. To be had at this office and from all newsdealers.

**The McConnell Germ Proof Filters**  
REMOVE MICROBES  
—AND—  
All Kinds of Disease Germs.  
Is a Filter and Cooler Combined.  
The ice as it melts is filtered.  
No other gravity filter does this.  
**The McConnell Filter Co.**  
POLAR ELECTRIC. BUFFALO, N. Y.

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## "THE DENSMORE"

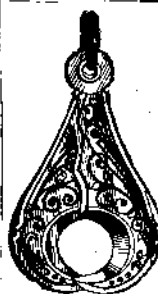
Christened by its users "The World's Greatest Typewriter." None of its operators ever go back to the use of any other. "The alignment of my machine is still perfect," is heard every day from the oldest operators of the Densmore. Many indisputable advantages and conveniences shown, and testimonials from great numbers given, in our free pamphlet. Our World's Fair Exhibit may interest you. Not competing for medals, we determined, instead, that machines from regular stock only should be shown, enabling visitors to see how they are made, and why they are made so, what they can do, and how beautifully they can do it.

**Densmore Typewriter Co., 202 Broadway, New York**

## KODAKS

\$6.00  
TO  
\$100.00

**Eastman Kodak Company,**  
Rochester, N. Y.



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STERLING SILVER.

Can be hung on watch chain. A useful present for a gentleman. Well adapted for prizes or favors at CARD PARTIES, GERMANS, etc. For sale by leading jewelers. If your jeweler has not got it and will not order it, send to us and we will fill order through some reliable dealer.

Price, \$1.50.  
**Enos Richardson & Co.**  
23 Maiden Lane, New York.

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RECENTLY PUBLISHED.

Our new catalogue containing over 100 pages, including works on more than fifty different subjects. Will be mailed free to any address on application.  
**MUNN & CO., Publishers Scientific American,**  
361 Broadway, New York.

**H.W. JOHNS' ASBESTOS STEAM PACKING**  
Boiler Coverings, Millboard, Roofing, Building Felt, Liquid Paints, Etc.  
DESCRIPTIVE PRICE LIST AND SAMPLES SENT FREE.  
**H. W. JOHNS MFG. CO., 87 Maiden Lane, N.Y.**



## The Smith Premier Typewriter

Embody the most Progressive Mechanical Principles.  
All the Essential Features Greatly Perfected.  
Perfect and Permanent Alignment.

Easiest Running, and Nearly Silent.  
All type cleaned in Ten Seconds without Soiling the Hands.

**The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A.**  
We have 20 branch offices in the principal cities throughout the United States.

**ELECTRO MOTOR. SIMPLE. HOW TO MAKE.** By G. M. Hopkins.—Description of a small electro motor devised and constructed with a view to assisting amateurs to make a motor which might be driven with advantage by a current derived from a battery, and which would have sufficient power to operate a foot lathe or any machine requiring not over one man power. With 11 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 641. Price 10 cents. To be had at this office and from all newsdealers.

**"OTTO" GAS AND GASOLINE ENGINES.**  
1/2 to 100 h.p. Can be used in cities or in country independent of gas work or gas machines.  
No Boiler, No Danger, No Engineer.  
OVER 30,000 SOLD.  
**OTTO GAS ENGINE WORKS, PHILADELPHIA.**

**IF YOU HAVE ANY SMALL ARTICLES** in Brass or Iron that you want manufactured in quantities, write to **THE JONES BROS. ELECTRIC CO., 28-30-32 West Court St., Cin'ti, O.**

**SYLPH CYCLES RUN**  
All riders say. Our spring frame with pneumatic tires saves muscle and nerve and is luxury indeed. You want the best. Investigate. We also make a 30 pound rigid frame Sylph. Cash free.  
**House-Duryea Cycle Co. Mfrs. 16 Gal. Peoria, Ill.**

**Model & Experimental Work.** Absolute Advice and Ideas not charged for. Send for particulars.  
**GARDAM & SON, 95 John Street, New York.**

**WM. GRAVER TANK WORKS, (INCORPORATED.)**  
Manufacturers of Iron and Steel  
**STORAGE TANKS.**  
OFFICE,  
3d Floor, Rookery Bldg.  
CHICAGO, ILL.

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Equitable Building, Atlanta, Ga.  
All business outside the U. S. transacted by Thomson-Houston International Electric Co. 44 Broad St. New York



**CHOLERA: EPIDEMIOLOGY OF.**—By Dr. G. Archie Stockwell. An interesting and valuable paper on the dissemination of the Asiatic Cholera, showing what does and what does not spread the disease. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 888. Price 10 cents. To be had at this office and from all newsdealers.

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**Learn the Watch Trade**  
Engraving and Jewelry Work.  
**PARSONS, IDE & CO.** Circular free.  
302 Bradley Ave., PEORIA, ILL.

**AGENTS WANTED FOR FINE TOOLS IN EVERY SHOP.**  
WRITE FOR CATALOGUE AND AGENCY.  
**C. H. BESLY & CO.**  
CHICAGO, ILL. U.S.A.

**BABCOCK & WILCOX CO. WATER TUBE**  
30 CORTLAND ST. N.Y.  
107 HOPE ST. GLASGOW, SCOTLAND  
STEAM BOILERS  
MANUFACTURED IN UNITED STATES, FRANCE, GERMANY & AUSTRIA.

**OIL WELL SUPPLY CO.**  
91 & 92 WATER STREET, PITTSBURG, PA.  
Manufacturers of everything needed for ARTESIAN WELLS  
for either Gas, Oil, Water, or Mineral Tests  
Boilers, Engines, Pipe, Cordage, Drilling Tools, etc. Illustrated catalogue, price lists, and discount sheets on request.

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combines the uses of  
1. An Air Compressor. Delivers air at 30 lbs. in a steady blast and to any extent by compounding.  
2. An Air Motor. Solid piston moving in a rotary track.  
3. Vacuum Pump. Keeping the gauge at 28 inches, a steady pull.  
4. Water Pump. Is a suction and force pump.  
5. Water Motor. Can be used simultaneously as a pump and motor.  
Small size worked by hand; larger by steam, water, air or ordinary belt power. No Valves or Springs.  
Made by Turner Machine Co., New York. Manufacturers of the Turner Patent Machine which painted the interiors of the buildings at the World's Columbian Exposition.  
Circular on application to **TURNER & CAFFIN, 1. J. 34-35 Mch'y Hall, Jackson Park, Chicago.**  
Agents Wanted for above in every State.

**Delaney's Metallic Gaskets**  
and Flanges make everlasting joints. Delaney's Expansion Packings for steam, water and ammonia are best and cheapest.  
**H. J. Delaney & Co., Third & Fowler Sts. Milwaukee, Wis.**

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**IMPROVED CHARTER GAS ENGINES**  
KIND, INEAL GAS, FALOR, ICE, GASOL, COOL, NATI, PROP, GAS, RELIABLE, SAFE, ECONOMICAL, SIMPLE, EASY TO OPERATE, PARTS, WASHINGTON & UNION STS. CHICAGO, ILL.

**ENGINES, BOILERS & MACHINE TOOLS.** Complete outfits furnished. Send for prices and full catalogue. **W. P. DAVIS, Rochester, N. Y.**

## The American Bell Telephone Company

125 MILK ST., BOSTON, MASS.

This Company owns the Letters Patent No. 186,787, granted to Alexander Graham Bell, January 30, 1877, the scope of which has been defined by the Supreme Court of the United States in the following terms:

"The patent itself is for the mechanical structure of an electric telephone to be used to produce the electrical action on which the first patent rests. The third claim is for the use in such instruments of a diaphragm, made of a plate of iron or steel, or other material capable of inductive action; the fifth, of a permanent magnet constructed as described, with a coil upon the end or ends nearest the plate; the sixth, of a sounding box as described; the seventh, of a speaking or hearing tube as described for conveying the sounds; and the eighth, of a permanent magnet and plate combined. The claim is not for these several things in and of themselves, but for an electric telephone in the construction of which these things or any of them are used."

This Company also owns Letters Patent No. 463,569, granted to Emile Berliner, November 17, 1891, for a Combined Telegraph and Telephone; and controls Letters Patent No. 474,231, granted to Thomas A. Edison, May 3, 1892, for a Speaking Telegraph, which cover fundamental inventions and embrace all forms of microphone transmitters and of carbon telephones.

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THE SCIENTIFIC AMERICAN ARCHITECTS' AND BUILDERS' EDITION is issued monthly. \$2.50 a year. Single copies, 25 cents. Thirty-two large quarto pages, forming a large and splendid Magazine of Architecture, richly adorned with elegant plates in colors, and with other fine engravings; illustrating the most interesting examples of modern architectural construction and allied subjects.

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