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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.



Mistakes in Addition, Office Headache, and mistakes in carrying forward don't occur when the Comptometer is used. It saves half the time in doing the work and all time looking for errors. Solves with rapidity and absolute accuracy all arithmetical problems. Why don't you get one? Write for Pamphlet.

FELT & TARRANT MFG. CO.
62-65 ILLINOIS ST., CHICAGO

Visitors to the WORLD'S FAIR should inspect the handsome Registers, Sunshine Recorders, Anemometers, and other Meteorological apparatus on exhibit in Weather Bureau Building, from Julien P. Fritz, 107 E. Ger. St., Baltimore, Md., U. S. A., who also manufactures Heliographs for U. S. Army and State Militias. Write for Catalogue.

WM. GRAVER TANK WORKS,

(INCORPORATED.)



Manufacturers of Iron and Steel
STORAGE TANKS.
OFFICE,
3d Floor, Rookery Bldg.
CHICAGO, ILL.

SAWS Wanted 50,000 Sawyers and Lumbermen to send us their full address for a copy of Emerson's Book of SAWS, new 1893 edition. We are first to introduce NATURAL GAS for heating and tempering Saws with wonderful effect upon improving their quality and toughness, enabling us to reduce prices. Address **EMERSON, SMITH & CO. (Limited),** Beaver Falls, Pa.

THE CHASE WOOD RIM PULLEY
ALL IRON EXCEPT THE RIM
BORED TO SHAFT SIZE KEYS AND SET SCREWS SAME AS AN ALL IRON PULLEY. LARGE PULLEYS FOR ANY AMOUNT OF HORSE POWER. A SPECIALTY. SEND FOR DESCRIPTIVE CIRCULAR TO F. A. CHASE & CO. MFRS. 7 EDDY ST. PROVIDENCE R. I.

IT

Looks and Acts

Like an Expensive Watch.

Appearance, time and durability are all there, yet it costs only \$4 to \$15 in many styles;

The

Quick-winding

Waterbury.

Your jeweler sells it.

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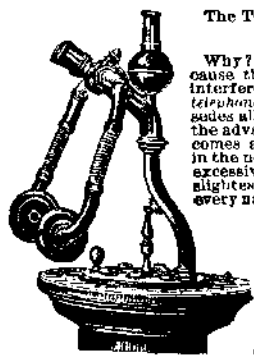
PATENTS!

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

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We also send, free of charge, a Synopsis of Foreign Patent Laws, showing the cost and method of securing Patents in all the principal countries of the world.
MUNN & CO., Solicitors of Patents.
361 Broadway, New York.
BRANCH OFFICES:—Nos. 62 and 64 F Street, Patent Building, near 7th Street, Washington, D. C.



The Telephone entirely superseded for indoor purposes by the

HOMACOUSSTIC.

Why? Because the Homacoustic requires no batteries, therefore no maintenance, because the Homacoustic intensifies the vocal sounds, secures absolute privacy, is not interfered with by atmospheric disturbances, and because it is much less costly than the telephone, and further because its first cost is its last cost. The Homacoustic also supercedes all existing means of inter-communication; the principal in pneumatic; it has all the advantages of the telephone, with none of its disadvantages. The Homacoustic overcomes all external sounds. The Admiralty of the British Navy installed the Homacoustic in the newest ship in the British Navy with pronounced success, and notwithstanding the excessive vibration of the iron bulkheads and the tremendous noise of the engine, the slightest word of command was distinctly audible. The Homacoustic will be installed in every navy in the world.

PEARSON'S WEEKLY, THE SEARCH LIGHT—SOCIETY NEWS, OFFICES, HENRIETTA ST., LONDON, W. C., JUNE 27TH, 1893.

THE HOMACOUSSTIC SPEAKING TUBE COMPANY. GENTLEMEN:—I am very well satisfied indeed with the speaking-tube system which you have installed in my premises. The installation is quite complicated, almost every room in this large building being in more or less direct communication with the other. I find the switch in my room which places me in direct communication with 15 separate portions of the building, works perfectly easily and without the slightest trouble. Your system is an indefinitely better one than any telephone system that I have seen, indeed I think it would be very hard to beat the Homacoustic for purposes of internal communication.

Yours faithfully, C. ARTHUR PEARSON.

The Homacoustic Company has for disposal the valuable fundamental patents fully granted in America, Canada, Germany, France, Austria, India, etc. Applications to the Homacoustic Company's head office, 22 Queen Street, London, England, or to H. C. Byrbe, 475 British Section, Electricity Building, World's Fair, Chicago, where the Homacoustic may be seen in full operation.

SEND FOR OUR CIRCULAR

IN ONE MINUTE

IT WILL CONVINCE YOU OF OUR ABILITY TO SUPPLY
TOILET PAPER FOR LESS MONEY THAN IT CAN BE OBTAINED ELSEWHERE. **A. P. W. PAPER CO. ALBANY, N. Y.**

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Take one with You
to the World's Fair.

They're the only practical camera for the purpose. No bulky glass plates—no troublesome holders—no need of hunting up a dark room. With our special Columbian spoils of film, containing 200 exposures you can have your Kodak loaded before leaving home and can then "press the button" as often as you like, while at the Fair without the necessity of reloading.

Eastman Kodak Co.,

Send for Catalogue. Rochester, N. Y.

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

**The Smith Premier Typewriter**

Embodies 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.

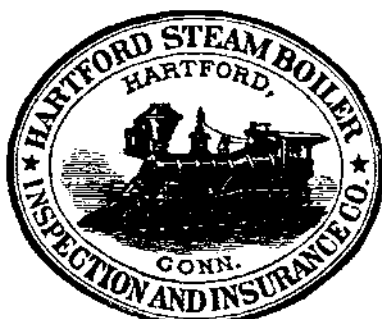
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OF
Engravings
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New York.

H. W. JOHNS' ASBESTOS STEAM PACKING

Boiler Coverings, Millboard, Roofing, Building Felt, Liquid Paints, Etc.
DESCRIPTIVE PRICE LIST AND SAMPLES SENT FREE.
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All riders say they cannot see how we can do it for the money: \$20 buys an elegant Oxford safety bicycle, built and fitted, plated, rubber-tired, guaranteed to be first class, simple in construction, strong, durable and accurately fitted, which makes it superior to Wheel a pleasure. Instead of hard work, make use of the highest grade, each wheel guaranteed. Write today for our illustrated FREE catalogue.
DEPT. E.—OXFORD MFG. CO. 338 WABASH AVE. CHICAGO.



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 new dealers.

ELECTRICAL * MINING * MACHINERY

Electric Mine Locomotives, Electric Drills, Electric Coal Cutters, Electric Pumps, Electric Hoists.

WE ARE THE ONLY HOUSE IN THIS COUNTRY FURNISHING ELECTRICAL MINING MACHINERY
GENERAL ELECTRIC COMPANY,

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Boylston Building, Atlanta, Ga.
15 First Street, San Francisco, Cal.
All business outside the U. S. transacted by Thomson-Louston International Electric Co. 44 Broad St. New York
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401-407 Sibley Street, St. Paul, Minn.
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Masonic Temple, Denver, Colo.

CASH PAID for all kinds of good Second-hand Iron and Wood-Working Machinery. Address **W. F. DAVIS, ROCKESDALE, N. Y.**

"The ease of cycling is in the tire."
Columbia Bicycles are fitted with the
COLUMBIA PNEUMATIC TIRE
The Columbia catalogue is the most readable book of its class—beautifully illustrated—free at Columbia agencies—by mail for two 2-cent stamps.
Guaranteed against puncture. Fastest and most resilient. Built to last.
POPE MFG. CO.,
Boston, New York, Chicago, Hartford.

LIFE SAVING DEVICES.—A collection of suggestions of devices for communication between the shore and stranded vessels, offered to the London Daily Graphic by various correspondents. With 100 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT Nos. 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674 and 675. Price 10 cents each, or \$1.50 for the series. To be had at this office and from all new dealers.

P. PRYBIL
519-531 W. 41st ST.
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MANUFACTURER OF
Metal, Horn, and Ivory Working
MACHINERY.
Especially Lathes of the Most Improved Styles and Latest Patterns.
Extension Spline Lathes. Improved Lathe of the Most Improved Styles and Latest Patterns.
22" swing or 44" extended. Weight 1,400 lbs.
24" " " " " 3,000 lbs.
26" " " " " 3,000 lbs.
Agents Wanted.

THE ARMSTRONG MACHINES,
For Cutting Off and Threading Pipe.
For Hand or Power.
No. 1 cuts off and threads 1 to 3 inch.
No. 2 cuts off and threads 1 to 4 inch.
No. 3 cuts off and threads 1 to 6 inch.
Our aim is to make these machines as good as our Stocks and Dies, which are universally acknowledged to be THE BEST. Send for catalogue.
THE ARMSTRONG MFG. CO., Bridgeport, Ct.

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.

IMPROVED CHARTER GAS ENGINES.
USING GASOLINE OR NATURAL GAS.
RELIABLE, SAFE, DELICATE, ECONOMICAL, SIMPLE PARTS.
H. W. CALDWELL & SON,
SOLE MFRS.
WASHINGTON & UNION STS., CHICAGO, ILL.

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