people have become rich working for us. we offer you a business which is easy to learn—one paying you large sums of money in profits. Every one who is willing to work can getrich. Men, women and even boys and girls, are making fortunes. We will start you in the business.

AGENTS WANTED to sell Lubricating and Sh. Oils. E. F. DIETERICHS, Cleveland, O.

A PATENT FOR SALE. - Address ANDERS LARSEN, Terrace, Box Elder Co., Utah.

BIG PAY to sell our Rubber Printing Stamps. Samples free. TAYLOR BROS. & CO., Cleveland, Ohio.

FOR ONE DOLLAR I will send Recipe which in the last three years has cured many severe cases of Neuralja; has never failed. Address E. HOLLIS, Box 849, Minneapolis, Minn.

\$5 to \$20 per day at home. Samples worth \$5 free. Address Stinson & Co., Portland, Me.



ELASTIC TRUSS

CURE FITS!

DEAFNESS CURED!

RAPIDLY and COMPLETELY. Hearing perfectly re-ored. New methods: RAREFACTION, ELECTRO-MEDICATION imple, Painless. Full details from Medical Director of THE AURAL CLINIC, 177 6TH AVE., NEW YORK.

CUTLER'S POCKET INHALER



Carbolate of Iodine INHALANT.

A cure for Catarrh, Bronchitis, Ashma, and all diseases of the Throat and Lungs-even Consumption—if taken in season. It will break up a Cold at Lungs-even Consumption—it is the King of Cough Medicines. A few inhalations will correct the most Offensive Breath. It may be carried as handily as a penknife, and is guaranteed to accomplish all that is claimed for it.

This Instrument, charged with the Inhalant, is a Preventice of Disease. It was first tested at Shreveport, La, during the Vellow Fever panic of 1873, and since then in various hospitals and localities infected with Malnrim, Small Pox, Diphtherin, etc., and of the great number of persons, including Physicians and Nurses, who used the Inhalate as a preventive, not one is known to have been attacked with any of the diseases to which they were exposed.

they were exposed. The diseases to which Patented through the agency of the SCIENTIFIC AMERICAN in 1473, this Inhaler has since had a larger and more extensive sale than any Medical Instrument eyer invented. It is approved by physicians of every school, and in dorsed by the leading medical journals of the world.

Over 300,000 in use.

Sold by Druggists for \$1.00. By mail. \$1.25.
W. H. SMITH & CO., PROP'S,
410 Michigan St., Buffalo, N. Y.



Brown DVKE'S BEARD ELIXIR
Forces haustrant Muntache, White Before and State of the Conference of the C

CONSUMPTION

OPIUM

Habit easily cured with CHLORIDE OF GOLD

266th Edition. Price only \$1 BY MAIL, POSTPAID.



A Great Medical Work on Manhood.

A Great Medical Work on Manhood, Exhausted Vitality, Nerous and Physical Debility, Premature Decline in man, Errors of Youth, and the untoil miseries resulting from indiscretions or excesses. A book for every man, young, middle-aged, and old. It contains 125 prescriptions for all acute and chronic diseases, each one of which is invaluable. So found by the author, whose experience for 23 years is such as probably never before fell to the lot of any physician. 300 pages, bound in beautiful French muslin, embossed covers, full gilt, guaranteed to be a finer work in every sense—mechanical, literary, and professional—than any other work sold in this country for \$2.50, or the money will be refunded in every instance. Price only \$1.00 by mail, postpaid. Illustrative sample, 6 cents. Send now. Gold medal awarded the author by the National Medical Association, to the officers of which he refers.

This book should be read by the young for instruction and by the afflicted for relief. It will benefit all.—London Lance.

There is no member of society to whom this book will not be useful, whether youth, parent, guardian, instructor, or clergyman.—Arvonau.

Address the Feabody Medical Institute, or Dr. W. H. Parker, No. 4 Buifinch Street. Boston, Mass., who may be consulted on all diseases requiring skill and experience. Chronic and obstinate diseases that HEAL have baffled the skill of all other physicians HEAL a specialty. Such treated successfully THYSELF.



HOUSES BUILT
WITH LITTLE OR NO MONEY I
650 illustrations and exhaustive text in the WITH LITTLE OR NO MONEY
650 litustrations and exhaustive text in the
greatwork "HOW TO BUILD, FURNISH
AND DECORATE," just published. Special
offer to first purchasers. "A book worth ten
times the price," "A. X. Sun. AGENTS.
Extraordinary inducements to AGENTS.
An entirely new feature: Double profits.
Large specimens and particulars free to
callers; sent by mail for 4c. In stamps.
Co-operative Building Plan Association.

24 BEEKMAN ST., NEW YORK.



CART SADDLE PADS. Outfit with full instructions how to make them for \$35. Address F. A. EVE LETH, Cynthiana, Harrison Co., Ky. Lock Box 29.

WATCHMAKERS.

Before buying, see the Whitcomb Lathe and the Webster Foot Wheel, made by the AMERICAN WATCH TOOL CO., Waltham, Mass.

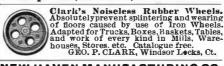


ARTISTS, Workers in India Ink, Water Colors, Pastel, Crayon, Photography; Costume, Architectural, Mechanical and Monumental Draughtsmen—all who are interested in Originating or Copying Pictures, will profit by sending for description of the AIR BRUSH, and Samples of Work, free on application.

AIR BRUSH M'FIG COMPANY, No. 67. Nassau Street, Rockford, Ills.

FRIEDR. BOECKER PHILIPPS SOHN & CO., HOHENLIMBURG, GERMANY,

Hardened Steel Strips for Corset Clasps, Hoopskirts, Feathers, and Brushes.



NEW HAVEN MANUFACTURING CO. NEW HAVEN, CONN.,
MANUFACTURERS OF IRON WORKING
MACHINE TOOLS

Lathes, Planers, Drills, Shapers, etc. ILLUSTRATED CATALOGUE ON APPLICATION.

MALLEABLE CASTINGS FROM SPECIAL THOMAS DEVLIN & CO. FINE TINNING JAPANNING AND PATTERNS LEHIGH AVE & AMERICAN ST. PHILA.

For steep or flat roofs. Applied by ordinary workment one-third the cost of tin. Circulars and samplesfree Agents Wanted. T. NEW, 32 John Street, New York



M'F'G OPTICIANS. **Exclusively Perfected** OPERA, FIELD & MARINE GLASSES,

TELESCOPES, MICROSCOPES, BAROMETERS, THERMOMETERS Magic Lanterns, "Anokato," etc.

Send at once for LIST OF USEFUL HOLIDAY



BLAKE'S CHALLENCE" ROCK BREAKER.

Patented November 18, 1879.

Patented November 18, 1879.

For Macadam Road making, Ballasting of Railroads. Crushing Ores, use of Iron Furnaces, etc. Rapidly superseding our older styles of Blake Crusher on account of its superior strength, efficiency, and simplicity. Adopted by important Railway and Mining Corporations, Cities, and Towns. First Class Medals of Superiority awarded by American Institute, 1873 and 1880.

BLAKE CRUSHER CO. Sol. 2015.

THE BALLOU M'F'G CO.,
Makers of Fine Machinery, Correct Leading Screws,
And Instruments of Precision; Astronomical Clocks,
Mathematical and Scientific Apparatus, etc.
HARTFORD, CONN.

BRICK THE AND CLAY RETORTS ALL SHAPES. BORGNER & O'BRIEN .

SPEAKING TELEPHONES

THE AMERICAN BELL TELEPHONE COMPANY, W. H. FORBES, W. R. DRIVER, THEO. N. VALL, President. Treasurer. Gen. Manager.

W.H. FORBES, W.R. DRIVER, Theo. N. VALL, President.

Alexander Graham Bell's patent of March 7, 1876, owned by this company, covers every form of apparatus including Microphones or Carbon Telephones, in which the voice of the speaker causes electric undulations corresponding to the words spoken. and which articulations produce similar articulate sounds at the receiver. The Commissioner of Patents and the U.S. Circuit Court have decided this to be the true meaning of his claim; the validity of the patent has been sustained in the Circuit on final hearing in a contested case, and many injunctions and final decrees have been obtained on them. This company also owns and controls all the other telephonic inventions of Bell, Edison, Berliner, Gray, Blake. Phelps, Watson, and others.

(Descriptive catalogues forwarded on application.) Telephones for l'rivate Line, Club, and Social systems can be procured directly or through the authorized agents of the company.

All telephones obtained except from this company, or its authorized licensees. are infringements, and the makers, sellers, and users will be proceeded against. Information furnished upon application.

MERICAN BELLI. TELEPHONE COMPANY,

AMERICAN BELL TELEPHONE COMPANY, 95 Milk Street. Boston, Mass.



NOTICE to Users of Steam Pumps.

We have received following letter in regard to one of our No. 5 "L" (\$16) Steam Jet Pumps elevating 14 inch pipe of water more than 50 feet high:

"VAN DUZEN & TIFT, Cincinnati, O.:

"Money could not buy the Jet of us unless another could be had. I would not give your No. 5"L" for a \$700 pump, equal distance to raise.

"N. A. Litchfield, Supt. Mich. Slate Co."

We make Ten Sizes of these Pumps. Prices \$7 to \$75.

Capacities 100 to 20,000 gallons per hour. State for what purpose wanted and send for Catalogue of "Pumps."

VAN DUZEN & TIFT, Cincinnati, O.



PERFECT

NEWSPAPER FILE

The Koch Patent File, for preserving newspapers, magazines, and pamphlets has been recently improved and price reduced. Subscribers to the Scientific American Supplead for the low price of \$1.50 by mail, or \$1.25 at the office of this paper. Heavy board sides; inscription "SCIENTIFIC AMERICAN," in gilt. Necessary for every one who wishes to preserve the paper.

Address

MINN & CO

MUNN & CO.,

Publishers SCIENTEIC AMERICAN



BOOKWALTER ENGINE. Compact. Substantial, Econômical, and easily managed; guaranteed to work well and give full power claimed. Engine and Boiler complete, including Governor, Pump, etc., at the low price of 3 HORSE POWER. \$240 00

#240 00

280 00

280 00

355 00

Put on ears at Springfield, O.

JAMES LEFFEL & CO.

Springfield, Ohio,

or 110 Liberty St., New York.

B. Agents Wanted. THE WILSON SEW ING MACHINE CO., Chicago or New York.



\$72 A WEEK, \$12 a day at nomeeasily made. Costly Outfit free. Address True & Co., Augusta, Me.

CASP. DIEDR. WALZHOLZ. HOHENLIMBURG, GERMANY, MANUFACTURER OF

Hardened Steel Strips for Corset Clasps, Hoopskirts, Feathers, and Brushes.



The Eclipse Engine Furnishes steam power for all Agricultural purposes, Driving Saw Muls, and for every use where a first-class and economical Engine is required. Eleven first-class premiums awarded, including Centennial, "6. Refer to No. 7. issue of "77, No. 14, issue of '78, of SCIENTIFIC AMERICAN, for Editorial illustrat'ns. FRICK & Co., Waynesboro, Franklin Co., Pa.

Telegraph and Electrical

SUPPLIES
Medical Batteries, Inventors' Models, Experimental Work, and fine brass castings. Send for catalogue C. E. JONES & BRO. Cincinnati, O. It is important to us that you mention this paper.



IRON REVOLVERS, PERFECTLY BALANCED, Has Fewer Parts than any other Blower.

P. H. & F. M. ROOTS, Manufacturers, CONNERSVILLE, IND.
S. S. TOWNSEND, Gen. Agt., 22 Cortland St., 2Dey St., COOKE & CO., Selling Agts., 22 Cortland Street, JAS. BEGGS & CO., Selling Agts. 9 Dey Street, INEW YORK.



WITHERBY, RUGG & RICHARDSON. Manufacturers of Patent Wood Working Machinery of every description. Facilities unsurpassed. Shop formerly occupied by R. Ball & Co., Worcester, Mass. Send for Catalogue.

PORTABLE FORGES—Largest manufactory in the WORLD.
EMPIRE PORTABE FORGE CO., Cohoes, N. Y.

FOR SALE. A No. 3 Reidy mangle with wringer and all fittings. Address Box 752, Newport, R. I.

FOR SALE. A Backus 36 inch water motor. Address Box 752, Newport, R. I.

STEAM FITTERS AND PLUMBERS' SUPPLIES Rue's Little Giant Injector. SCREW JACKS OF EVERY DESCRIPTION.

JOHN S. URQUHART, 46 Cortlandt St., N. Y.

WESTON DYNAMO:ELECTRIC MACHINE

The undersigned, sole agents for the above machine

ELECTROPLATING AND ELECTROTYPING,

refer to all the principal Stove Manufacturers, Nickel and Silver Platers in the country. Over 1,500 now in use. Are also manufacturers of Pure Nickel Anodes. Nickel Salts, Polishing Compositions of all kinds and every variety of supplies for Nickel, Silver, and Gold Plating; also, Bronze and Brass Solutions. Complete outfits for plating. Estimates and catalogues furnished upon application.

HANSON VANWINKLE & Co. SOLE AGENTS NEWARK, N. J.

New York Office, 92 and 94 Liberty St. 50 Large New Gold, Silver, etc., Chromo Cards, no 2 alike, name on, luc. L. Jones & Co., Nassau, N. Y.

THE BIGGEST THING OUT Sent free. E. NASON & CO., 120 Fulton St., New York.

ON THE PROPERTIES OF WATER AND Ice.—Abstract of a work by Dr. Otto Petterson, containing many new and valuable facts relative to the natural history of the waters of the globe. The waters of the Arctic Ocean and their composition. Experiments on sea water and the remarkable results obtained. The latent heat of fusion of fresh and salt ice. The chemical composition of sea water ice. Why sea water is salt. Contained in Scientific ambilican Superlement. No. 406. Price 10 cents. To be had at this office and from all newsdealers.



FOSSIL MEAL COMPOSITION,

The Leading Non-Conducting Covering

FOR BOILERS, PIPES, ETC.
With % to % inch thickness it radiates less heat than any other covering does with 2 inches.
Weighs very light, is very durable, fireproof, and is easily applied. Sold in a dry state by the pound. Fully indorsed by Professer Ordway, Massachusetts Institute of Technology, Boston.

FOSSIL MEAL CO., 48 Cedar St., New York.



MESSRS, MUNN & CO. in connection with the nuhlication of the Scientific American, continue to examine Improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had thirty-eight years' experience, and now have unequaled facilities for the preparation of Patent Drawings, Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats. Copyrights for Books. Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very reasonable terms.

A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Hints on the Sale of Pa-

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, 261 Broadway, New York.

BRANCH OFFICE .- Corner of F and 7th Streets, Washington, D. C.