

1000 Miles On One Charge BEST for LEAST MONEY Guaranteed for One Year

BELL PUMPS Will Save Your Tire

Franco: American Auto & Supply Co. Sole Agents
1404-1406 MICHIGAN AVENUE CHICAGO, ILL.
WRITE FOR DETAILED DESCRIPTION

LET US BE YOUR FACTORY
WRITE FOR ESTIMATE ON ANY ARTICLE
YOU WANT MANUFACTURED
STAMPINGS, MODELS, EXPER. WORK
WRITE FOR FREE BOOKLET
THE CLOBE MACHINE & STAMPING CO.
970 Hamilton St., Cleveland, O.

and Bottlers' Machinery. THE VILTUER MFG. Co. 899 Clinton St., Milwaukee, Wis.

MODELS & EXPERIMENTAL WORK, Inventions developed. Special Machinery E. V. BAILLARD. 24 Frankfort Street. New York.

RUBBER Expert Manufacturers Fine Jobbing Work PARKER, STEARNS & CO., 228-229 South Street, New York



Hollow Concrete Building Blocks Best. Fastest. Simplest, Cheapest Machine. Fully guaranteed. A MONEY MAKER THE PETTYJOHN CO. 615 N. 6th Street, Terre Haute, In

WANTED.—Electrical Draftsmen, \$3.04 to \$4.48 per diem. Subinspectors (electrical), \$3.04 to \$3.52 per diem. A competitive examination will be held for the above positions April 3.197. For further information address "Commandant, Navy Yard, Brooklyn. N. Y."

ENGINE MANUFACTURER WANTED of great merit—patented. For further information address L. L. BLAKE, 521 East 43d St., Chicago.

# MODELS O INVENTIONS PERFECTED UNION MODEL WORKS OF UNION MODEL WORKS OF UNION OF CHARGE OF CHICAGO.

MODELS & EXPERIMENTAL MACHINERY. Gears. Dies. Tools. Novelties manufactured. Fine, Accurate work a Specialty. M. P. Schell, 1759 Union Street, San Francisco.

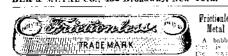
EMENT BOOKS. How to Use Portland Coment Sidewalk Construction, 50c.; Reinforced Concrete Construction, \$92.50; 100. EMENT AND ENGINEERING NEWS, Chicago, III.



STUDENTS' and Draftsmen's Library Club. Wm. T. Comstock, 23 Warren St., New York



SELL YOUR OLD RUBBERS & METALS
FOR THE HIGHEST PRICES.
We buy sld rubber, scrap metal, capper, brass, lead, etc., in 50 lb. lets
for over, see just 16t festor. Write for price list. UNITED RUBBER & METAL CO., 482 Broadway, New York.



implies. Satisfied customers are the best unia with. You can reduce a penses in the plant by reducing long expenses and a and trading stower of machinery to babbit it, by the use of Panton less.

Frictionless Metal Co., Chestnut St., Chattanooga, Tenn.

### TEXAS LANDS

that will produce crops valued at \$200 to \$300 per acre are now selling at \$25 to \$30 per acre. Southern latitude makes it possible to ship the tender, highpriced vegetables long before northern gardens have sprouted. Finest all-the-year-'round climate in America. Excursions from Chicago each first and third Tuesday monthly. Only \$25 for the round trip-30-day return limit. Write to-day for my illustrated book about lands in the GULF COAST COUNTRY of Texas and full particulars. JOHN SEBASTIAN, Dept. G. C., La Salle Station, C



Anyone sending a sketch and description cay delily ascertain our opinion free whether an vention is probably patentable. Communications strictly confidential. HANDEBOK on Patents nt free. Oldest agency for securing patents. Patents taken through Munn & Co. receive scial notice, without charge, in the

# Scientific American.

A handsomely illustrated weekly.

Culation of any scientific fournal, year; four months \$1. Sold by all newsdealers.

MUNN & CO 361 Broadway, New York

Branch Office. 625 F St., Washington, D. C.

Metal manufactures, certain, Eberhard Manufacturing Co..... therefor, automatic, Wilcox & White Co.

Oil and animal fat mixture, vegetable, Southern Gotten Oil Co.

Oil, cotton seed, American Cotton Oil Co.

Oil, cutting, Clarkson & Ford Co.

Oil, cutting, Clarkson & Ford Co.

Oil, lubricating, Clarkson & Ford Co.

Oil, lubricating, National Refining Co.

Oil, summer white cotton seed, American Cotton Oil Co.

Oil, summer white cotton seed, American Cotton Oil Co.

Ointment, carbolic, Van Vleet-Mansfield Drug

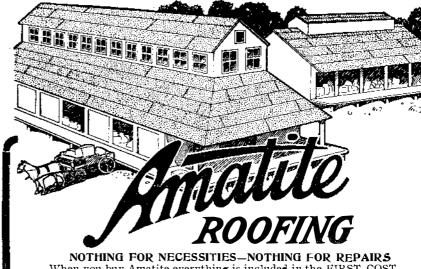
Ointment, itch. Van Vleet-Mansfield Drug Levi Shees and slippers, ladies' and misses' leath-Ce. C1,125
Slate, reefing, Banger Reefing Slate Manufacturing Association. C1,040
Saap. Pampeiam Mfg. Co. C1,081
Soup preparations, certain named, Fabrik ven Maggis Nahrungsmitteln. C1,042, 61,043
Steve gaselene. National Refining Ce. C1,055
Stove polish, W. Wierhake. C1,088
Tea, Chase & Sauboru. gages, etc. Hehmann & Maurer Mfg. Co. C1,159
Thermemeters, baremeters, mercury gages, etc. Hehmann & Maurer Mfg. Co. C1,159
Thread and yarns, Chicago Thread Mfg. Co. 61,108
Teilet preparations, certain named, Pempeian Mfg. Ce. C1,159
Teilet preparations, certain named, Pempeian Mfg. Ce. C1,159
Tenics, nerve, Peal Medicine Ce. C1,198
Traps, animal, Oneida Community. C1,173
Treusers, Petsdam Clething Manufacturing Ce. C1,082 Ce. \$1,082
Vermifuge, candy, Van Vleet-Mansfield Drug
Ce. ... \$1,212
Waists, shirts, and suits, ladies' and misses',
A. Cehen \$1,212
Watches, watch cases and watch mevements,
Langenderf Watch Ce.,
61,129 te 61,133, 61,166, 61,167
Water, mineral, Hinckley & Schmitt. 61,127
Water, mineral, Virginia Etna Lithia Springs
Ce. \$1,142
Wax, Bucilage and paste, sealing, Thaddeus
Davids Ce. \$1,087
Whisky, L. W. Walker. 61,085
Whisky, J. Walsh & Ce. 61,087
Whisky, J. Walsh & Ce. 61,097
Whisky, H. F. Corbin & Co. 61,091
Whisky, H. Depnauer. 61,095
Whisky, Sielemann Distilling Ce. 61,090
Whisky, Bdw. B. Bruce Co. 61,122, 61,123
Whisky, H. Resenbeim & Sen. 61,149
Whisky, H. Resenbeim & Sen. 61,149 Vermifuge, candy, Van Vleet-Mansfield Drug

### LABELS.

"Buster Brewn Bread," for bread, W. E. 

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, provided the name and number of the patent desired and the date begiven. Address Munn & Co., 361 Broadway, New York.

Care Address mun a comparison of the formular patents may new be obtained by the inventers for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.



When you buy Amatite everything is included in the FIRST COST. There is no cost for EXTRAS, because we furnish nails and cement for

There is no MAINTENANCE cost, because its mineral surface makes painting and coating absolutely unnecessary.

There is no REPAIR COST, because Amatite is so constructed that it needs no attention after it is once laid on the roof.

There is no LABOR cost, because Amatite is so easy to lay that you can do the work yourself.

The first cost is the only cost—THE FINAL COST. Amatite is the only Ready Roofing embodying every good point that a roof should possess

Heat and cold, rain and snow, acids and chemicals do not affect it, and in addition to this its mineral surface makes it one of the best fire-retardents known. It is roofing at its best.

Free Sample A Booklet telling more about it and a Free Sample will be sent upon request. Send at once and see for yourself how much better Amatite is then the "paint me every two years or leak" roofings.

### Barrett Manufacturing Co.

Chicago Cleveland Allegheny Kansas City ouis Boston Minneapolis Philadelphia New Orleans Cincinnati London, Eng. St. Louis



Automatic Adding Machine Co., 340 Broadway, N. Y. City

GEM" Adding Machine

Free 10-Day Trial. We Pay Exthat clears the dials to zero instantly. A High-Grade Mechanical Production. Does the work of high-priced machines. Handlest thing an engineer can own. Great for outdoor work. Carried in your pocket. Guaranteed for two years. Catalog Free.



## Cyclopedia of Applied Electricity

5 Large Vols., 2,500 Pages

ORDER NOW-SAVE ONE-THIRD

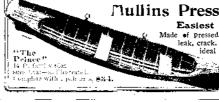
Regular Price, \$30.00. Special 30-Day Price, \$19.80

Sent, express prepaid, for five days' FREE examination if you mention SCIENTIFIC AMERICAN. Pay \$2.00 down and \$2.00 a month thereafter until you have paid \$19.80, if you keep the books. We send for them, at our expense, if they do not meet your needs.

The only reason this set of books is offered at such a low price is to acquaint the public with the superior instruction of the American School of Correspondence—these books being partly compiled from the instruction papers. A 200-page handbook sent free on request.

Partial List of Contents.—Magnetism, Measurements, Wiring. Telegraphy. Direct Current Dynamos and Motors, Electrical Construction, Management of Dynamos and Motors, Power Transmission, Telephone, including Common Battery System, Automatic Telephone and Wireless Telegraphy.

AMERICAN SCHOOL OF CORRESPONDENCE



Mullins Pressed Steel Boats Can't Sink Easiest to Row-Absolutely Safe Made of pressed steel, with air chambers in each end like a life beat. Can't leak, crack, lry out or sink—last a lifetime. Every beat guaranteed. The ideal beat for families—summer reserts—parks—beat liveries, Strong, safe, speedy. Write for our Catalogue of Row Boats, Motor Boats, Hunting and Fishing Beats.

The W. H. Mullins Co., 118 Franklin St., Salem. O.

# how to Make a 100-mile Wireless Celegraph Outfit

In the following Scientific American Supplements, the well-known wireless telegraph expert, Mr. A. Frederick Collins, describes clearly and simply, without the aid of mathematics, the construction of a 100-mile wireless telegraph outfit. Complete drawings accompany his

The design and construction of a 100-mile

The design and construction of a 100-mile wireless telegraph set is described in SCIENTIFIC AMERICAN SUPPLEMENT 1605.

The location and erection of a 100-mile wireless telegraph station is described in SCIENTIFIC AMERICAN SUPPLEMENT 1622.

In SCIENTIFIC AMERICAN SUPPLEMENT 1623, the installation and adjustment of a 100-mile wireless telegraph station is fully explained.

The adjustment and tuning of a 100-mile wireless telegraph outfit is discussed in Scientific American Supplement 1624.
The theory and action of a 100-mile wireless telegraph outfit is explained in Scientific American Supplement 1625.
The management and operation of ship and shorestations is clearly set forth in Scientific

AMERICAN SUPPLEMENT 1628, These  $\sin$  articles constitute a splendid treatise on the construction, operation and theory of wireless telegraph instruments. The complete set will be mailed to any address for 60 cents.

Single numbers will be mailed for 10 cents Order from your newsdealer, or from

MUNN @ CO., 361 Broadway, New York, N. Y.

DON'T BUY GASOLINE-ENGINES "THE MASTER WORKMAN," a two-cylinder engine; revolutionizing power. Its weight and bulk are half that of single cylinder engines, with greater durability. Costs Less to Buy-Less to Run. Quickly, ensity started. Vibration practically overcome. Cheaply mounted on any waron. Its a combination portable, stationary or traction engine. SEAD FOR CATALOGUE. THE TEMPLE PUMP CO., Mfrs. Meagher and 16th Sts., Chicago. THIS IS OUR FIFTY-THIRD YEAR.