

for use again in this manner, but the elastic properties of tubing can not well be restored.

(10503) C. N. asks how to bottle horseradish. A six tablespoonfuls scraped or grated horseradish, 1 tablespoonful white sugar, 1 quart vinegar. Seal the vinegar; pour boiling hot over the horseradish. Steep a week, strain, and bottle. Exposure to the air will discolor.

NEW BOOKS, ETC.

POCKETBOOK OF AERONAUTICS. By Major Hermann W. L. Moedebeck, in collaboration with O. Chanute and others. Translated by W. Mansergh Varley, B.A., D.Sc., Ph.D. London: Whittaker & Co., 1907. 14mo.; pp. 426; 140 diagrams and illustrations. Price, \$3.25.

This book is a comprehensive resumé of the entire subject of aeronautics. It is written by a well-known German authority, and has been brought up to date by the various collaborators. The book contains sixteen chapters dealing with such subjects as physics of the atmosphere; meteorological observations in balloon ascents and the computation of results; the technology of gases; the theory, practice, and technique of ballooning, and ballooning from a military standpoint; kites and parachutes; animal flight; artificial flight; airships; flying machines; motors and air screws. All of these subjects are treated in detail. The section of the book dealing with balloons and ballooning is very complete, and includes a brief history of military ballooning in all the different countries. The question of firing projectiles at and from balloons and airships is also discussed, and there is an interesting chapter on balloon photography.

The section on artificial flight is divided into three parts. The first of these is historical, and the other two, by Otto Lilienthal and Octave Chanute, respectively, treat of this subject from a practical standpoint, and describe the various machines of different inventors with which experiments have been made, besides giving the theories of the action of the air upon plane and curved surfaces. The book contains reproductions of a number of excellent photographs of Lilienthal and the Wright brothers in gliding flight. A letter of the Wright brothers, written November 17, 1905, in which they detail their final successful flights with a motor-driven aeroplane, is reproduced. Chapters XIII and XIV, on flying machines and on motors (by Major Hermann Hoernes) treat very elaborately of the laws of air resistance found by various experimenters, the fundamental laws of aerodynamics, aerodynamical calculations, etc.; and of all kinds of motors such as electric, steam, and gasoline, that come useful to the aeronaut. The Major also has a chapter on air screws, which will be found valuable. The book also contains a list of the different international aeronautical societies, of which there are over a score throughout the world. An Appendix gives many valuable tables and formulae.

TUNNEL SHIELDS AND THE USE OF COMPRESSED AIR IN SUBAQUEOUS WORKS. By William Charles Copperthwaite, M.Inst. C.E. New York: D. Van Nostrand Company, 1906. 4to.; pp. 390; 260 illustrations and diagrams. Price, \$9.

This is an elaborate treatise on the tunneling shield and its use in subaqueous work. The book has been compiled from papers printed in the Proceedings of the Institution of Civil Engineers, and from descriptions of tunneling work that have appeared in technical journals. The author is a man of considerable experience in this line of work. He discusses the shield from the date of its invention in 1815 up to the present time, and illustrates all of the various types that have been designed and put in operation. The book contains a chapter on the use of compressed air in engineering work, with some notes on caisson disease. Another chapter discusses the use of cast-iron lining in tunnels. The shield which was the invention of Mr. Alfred E. Beach, one of the original editors and proprietors of this journal, and with which he constructed a tunnel beneath Broadway in 1869 is illustrated and described. The Great-head shield, which was invented and used about the same time in England, is also discussed in Chapter IV. Other chapters are devoted to the use of the shield in water-bearing strata and the use of the shield in masonry tunnels. Chapter X describes the recent tunneling work carried out in England and in France by means of a shield, or with compressed air. The final chapter of the book is a practical one on the cost of construction and operating a shield. The book is completed by two Appendices giving a chronological list of events connected with tunneling by means of a shield or compressed air, and also giving English patents relating to this manner of tunneling from 1818 to 1904 inclusive. This book is especially recommended to engineers or others wishing to become familiar with this fascinating subject.

INDEX OF INVENTIONS

For which Letters Patent of the

United States were Issued

for the Week Ending

April 2, 1907.

AND EACH BEARING THAT DATE

(See note at end of list about copies of these patents.)

Table listing inventions with patent numbers and dates. Includes items like 'Acid plants, tower for sulphuric, R. Cellar', 'Adhesive compound, M. R. Isaacs', 'Advertising machine, E. W. Brown', etc.

Wood-working Machinery

For ripping, cross-cutting, mitering, grooving, boring, scroll-sawing, edge moulding, mortising; for working wood in any manner. Send for catalogue.

Engine and Foot Lathes

MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. BEST MATERIALS. BEST WORKMANSHIP. CATALOGUE FREE. SEBASTIAN LATHE CO., 120 Culvert St., Cincinnati, O.

Little Giant GASOLINE MOTORS. Reliable, Reversible, Two Cycle. Two and Three Port. Guaranteed for one year. Simple and easy to operate. Our Free Catalog A3 is worth your having.

ORIGINAL BARNES Upright Drills. Positive Feed. 10 to 50-inch Swing. Send for Drill Catalogue. W. F. & JNO. BARNES CO. (Established 1872). 1999 Ruby St., Rockford, Ill.

A GOOD INVESTMENT. For \$1.75 we will send by express, post prepaid, complete N. D. outfit with full instructions for learning TELEGRAPH OPERATING.

PATENTS. Our Hand Book on Patents, Trade-Marks, etc., sent free. Patents procured through Munn & Co. receive free notice in the SCIENTIFIC AMERICAN. MUNN & CO., 361 Broadway, N. Y. BRANCH OFFICE: 625 F St., Washington, D.C.

Neustadt Automobile and Supply Co. ST. LOUIS, MO. Makers of BODIES, WHEELS and COMPLETE OUTFITS. 1907 Catalogue Write For It.

"Success" Automobile, \$250. Practical, durable, economical and absolutely safe. A light, strong, steered Auto-buggy. Suitable for city or country use. Speed from 4 to 20 miles an hour.

Wizard Repeating LIQUID PISTOL. Will stop the most vicious dog (or man) without permanent injury. Perfectly safe to carry without danger of leakage. Fires and recharges by pulling the trigger. Loads from any hand. No cartridges required. Over 60 shots in one loading. All dealers, or by mail, 50c. Rubber-covered holster, 50c. extra.

METAL POLISHES.—FORMULAS FOR Putz Pomades, Pastes, Liquides, Powders and Soaps for polishing metals, are contained in SCIENTIFIC AMERICAN SUPPLEMENT Nos. 1284, 1285 and 1289. Price 10 cents each from this office and all newsdealers.

GOES LIKE SIXTY SELLS LIKE SIXTY. \$60. GILSON ENGINE. For Pumping, Cream Separators, Churns, Wash Machines, etc. ASK FOR TRIAL. GILSON MFG. CO., 160 Park St., East Washington, Wis.

WELL DRILLING Machines. Over 70 sizes and styles, for drilling either deep or shallow wells in any kind of soil or rock. Mounted on wheels or on sills. With engines or horse powers. Strong, simple and durable. Any mechanic can operate them easily. Send for catalog. WILLIAMS BROS., Ithaca, N. Y.

To Book Buyers. We have just issued a new 112-page catalogue of recently published Scientific and Mechanical Books, which we will mail free to any address on application. MUNN & COMPANY Publishers of SCIENTIFIC AMERICAN 361 Broadway, New York

Table listing various patents and inventions with numbers and names. Includes items like 'Clothes line poles, device for holding, Coventry & Archer', 'Clutch coupling for shafts, automatic, J. F. Thomas', 'Clutch mechanism, M. I. Rosenthal', etc.





**GENTLEMEN**  
WHO DRESS FOR STYLE  
NEATNESS, AND COMFORT  
WEAR THE IMPROVED

# BOSTON GARTER

THE RECOGNIZED STANDARD  
The Name is stamped on every loop—

The *Velvet Grip* CUSHION BUTTON CLASP

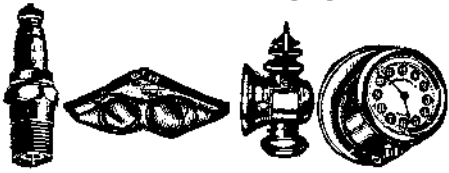
LIES FLAT TO THE LEG—NEVER SLIPS, FEARS NOR UNFASTENS

Sample pair, Silk 50c., Cotton 25c. Made on receipt of price.

GEO. FROST CO., Makers  
Boston, Mass., U. S. A.

**ALWAYS EASY**

## Motor Supplies



Order your Automobile and Motor Boat Supplies by mail.

We make a specialty of mail orders and are fully qualified to give you better attention and advice than anyone else in the business.

We carry in stock practically everything pertaining to the motor car and motor boat at lowest prices consistent with quality and good service.

P. M. S. 6-inch Dashboard Searchlight for small cars and boats, with French mirror, copper front and back and swivel, \$10. Complete, with basket generator and tubing, \$18. Larger sizes in proportion.

P. M. S. Generator will run two big headlights, \$10; high grade.

French Siren Horn, loudest made, \$30.

Puritan Gas Tanks, \$30. More gas for less money.

Sole agents for Universal Auto and Marine Carburetors.

We ship to any part of the world.

Complete catalogue to interested parties.

Dealers. As we are manufacturers' agents it will pay you to get in touch with us.

**PIERSON MOTOR SUPPLY CO.**  
1175 Bedford Ave., Brooklyn, N. Y.



**THE INTERNAL WORK OF THE WIND.** By S. P. LANGLEY. A painstaking discussion by the leading authority on Aerodynamics, of a subject of value to all interested in airships. SCIENTIFIC AMERICAN SUPPLEMENTS 946 and 947. Price 10 cents each, by mail. Munn & Company, 361 Broadway, New York City, and all newsdealers.

**Merkel Motor Cycle**

1907 Model

The only comfortable, non-injurious motor cycle on the market, built on the latest model, including the famous "Merkel" motor, Grip control, and Spring Frame and Fork, absolutely the safest and speediest roadster or racer yet made.

Write for Catalogue and Prices  
**MERKEL MOTOR CO.**  
1052, 26th Avenue, Milwaukee, Wis.

Send for **FERRO CATALOG**

that explains fully the unique construction of the

**Ferro Auto-Marine Engines** and tells just why they have created such widespread interest this year.

Or send 10 cents for our complete Treatise on Marine Engines. Write us to-day.

**THE FERRO MACHINE & FOUNDRY CO.**  
75 Wade Building, Cleveland, O.  
Large Stock at 75 Cortlandt Street, New York, N. Y.

Perforated strips or sheets, apparatus for forming, D. A. Ritchie.....	849,267
Perforator, H. Upton.....	848,809
Phonograph, C. Richterhof.....	848,687
Phonograph, W. Rosenfeld.....	849,086
Photograph plate, F. W. Walsh.....	849,034
Photographic film cartridges, spool for, F. J. Mathen.....	849,076
Photographic print testing device, F. Sohon.....	849,277
Photographic printing apparatus, F. H. Auld.....	849,184
Photometer, integrating, C. P. Steinmetz.....	849,027
Piano action, L. N. Soper.....	849,278
Pianoforte, G. Bless.....	848,957
Picking block, M. J. Murray.....	849,011
Pipe bracket, H. Wyler.....	848,950
Pipe coupling, W. Bartholomew.....	848,873
Pipe hanger, adjustable, C. H. Hook.....	849,132
Pipe testing machine, J. P. Mern.....	848,759
Pliers, punch, and similar tool, W. A. Bernad.....	848,877
Plow, W. P. Hendon.....	848,825
Plow attachment, C. A. Phillips.....	848,848
Plow blade, cultivating, A. R. Sullivan.....	848,779
Plow, disk, C. C. Leuty.....	848,912
Plow stock, A. R. Mallory.....	848,913
Plug and wall receptacle, attaching, Hartley & De Reamer.....	848,902
Plug, electrical connecting, Vogel & White.....	848,941
Pocket, safety watch, G. W. Robertson.....	848,924
Policeman's club, Diehl & Eickhoff.....	849,216
Post card frame or mount, E. E. Fairchild.....	849,111
Power transmission device, C. A. Taylor.....	848,703
Power transmission device, A. Churchward.....	849,051
Printers' galleys, galley lock for, H. L. Azzit.....	848,717
Printing and embossing apparatus, E. E. Angell.....	849,038
Printing plates, preparing half-tone, L. Kern.....	848,833
Projectile, E. Ohl.....	849,015
Projectile, anchor, E. S. Clough.....	849,205
Propeller, J. A. Wade.....	848,942
Propeller, A. Hector.....	849,238
Propelling and floating device for boats and the like, H. Mikorey.....	849,006
Propelling mechanism, boat, H. Thormeyer.....	849,176
Pulley casing, R. H. Bowen.....	848,802
Pulley frame, L. Zamboni.....	849,308
Pump, J. H. Burkholder.....	848,629
Pump, C. Valliquette.....	849,030
Pump, lift, F. A. Rdhl.....	848,857
Pump, multiple, J. F. Liebenritt.....	848,836
Pumping jack, E. Shavan.....	849,236
Puzzle, C. C. Hayhurst.....	848,793
Pyramid, derivative, Weber.....	848,793
Rail bond, W. A. Foster.....	848,983
Rail joint, W. A. Hanvey.....	848,901
Railway alarm, C. J. Courtright.....	849,107
Railway crossing signal, D. J. Brush.....	849,046
Railway gate, G. E. Murray.....	848,677
Railway signaling system, electric, J. B. Struble.....	849,173
Railway switch, E. F. Greene.....	848,986
Railway switch, overhead, E. C. Newton.....	848,681
Railway tie, F. Bryer.....	848,806
Railway tie, composite, L. H. Wolf.....	849,093
Rake, U. S. Jessop.....	849,244
Rake, R. H. Whittier.....	849,304
Recorder, D. Patterson.....	848,846
Reel carrier, J. J. Tellington.....	848,932
Reel seat, F. C. Gorham.....	849,231
Regulator, See Feed water regulator.	
Relay structure, H. G. Webster.....	848,793
Resistance devices, making, L. E. Barringer.....	848,954
Rings, etc., faring machine for metal, G. H. White.....	848,948
Rock and ore crusher, G. H. Thurston.....	848,782
Rock drill, F. E. Glaze.....	849,229
Roll catch, M. Kopp.....	848,911
Roll forming machine, Nungesser & Harmon.....	848,919
Rolling machine, hoe, F. W. Cameron.....	848,630
Rope clamp, C. W. Guftzeit.....	849,065
Rotary drier, H. Brinker.....	849,044
Rotary engine, D. F. Smith.....	848,860
Rotary engine, J. Burn.....	849,326
Rotary explosion engine, L. W. Lombard.....	848,666
Rotary motor, C. S. Batdorf.....	849,099
Rubber footwear, making, M. C. Clark.....	848,807
Rugs, carpets, etc., material for, F. Bartelt.....	849,186
Saw iron, P. A. Hoya.....	849,331
Safe round door, M. Mesler.....	848,674
Safety elevator, Bennett & Binder.....	849,188
Safety pin, R. Douglas.....	849,217
Sash adjuster, J. W. Paterson.....	849,016
Sash lock and support, D. E. Barnes.....	848,953
Sash lock, ventilating window, F. E. Jeffers.....	849,072
Saw tooth, L. G. McKam.....	848,842
Scale, spring, M. H. Hansen.....	848,740
Scenery, theatrical, E. S. Cameron.....	848,880
Scraper, wheeled, J. S. Norris.....	849,013
Screen, F. Miksell, Jr.....	849,244
Screw, R. S. Matheson.....	848,914
Seal, L. A. Brown.....	848,879
Sealing apparatus, package, J. H. Tuttle.....	848,706
Sealing apparatus, package, C. B. Frost.....	848,735
Sealing device, package, C. B. Frost.....	848,734
Seeding machine, L. E. Waterman.....	848,790
Self locking block and pulley, G. M. Jensen.....	848,905
Sewing machine seam trimmer and edge binner, W. R. Abercrombie.....	849,347
Sewing machine thread controlling and unwinding device, J. H. La Bate.....	849,140
Sewing machine, iron wagons, device for fastening, F. M. Sargent.....	849,023
Shade and curtain pole holder, window, J. H. Green.....	848,987
Shade, double-acting window, M. Ecker.....	849,219
Shade fixture, window, S. R. Skov.....	849,167
Shade holding device, C. L. Hopkins.....	849,133
Shade roller, A. L. Sutton.....	849,284
Shaft reversing device, Sundberg & Ericsson.....	848,931
Shampoo registering device, H. C. Kelley.....	848,960
Sharpener, shears, W. G. Wilson.....	849,180
Sheep shears, M. A. Lipscomb.....	849,252
Shipping case, N. J. Busby.....	849,352
Shirt waist, M. Frerksen.....	849,117
Shock absorber, W. Mazzocco.....	849,150
Shuttle spindle, W. Koehler.....	849,073
Sidewalk light, E. A. Reich.....	849,020
Sight, C. & M. A. S. White.....	848,947
Sign, electric, W. B. Garrett.....	849,226
Sign exhibitor, automatic, F. A. Johnson et al.....	848,657
Signal system, electric, W. M. Thomas.....	849,287
Signal system, electric, E. Bliss.....	849,287
Signaling, electric, J. B. Struble.....	849,172
Signaling instruments, casing for electric, E. W. Vogel.....	849,343
Signaling system, fire and police, W. Condon.....	848,636
Sink bath, and wash tub, combined, W. J. Minns.....	849,254
Siphon, W. S. Shields.....	848,696
Skirt marker, W. H. Simmons.....	849,341
Sled, G. Koch.....	848,910
Sled runner, F. Bryer.....	848,805
Soldering sheet metal plates, J. Donoghue.....	848,978
Sole, cushion, H. A. Roberts.....	848,779
Sole leveling machine, E. E. Winkley.....	848,713
Speculum, illuminable, R. H. Wampler.....	849,344
Speed mechanism, variable, A. W. Puker.....	848,768
Speed mechanism, variable, F. A. Weller.....	848,870
Spring wheel, J. Fliegel.....	849,223
Stacker, hay, A. F. Kearns.....	848,832
Stamp, automatic identification, J. T. Earle.....	848,887
Stanchion, F. S. Overacker.....	849,264
Steam boiler, E. A. Voight.....	848,786
Steamer, domestic, S. M. Johns.....	848,906
Stenciling machine, S. T. Smith, Jr.....	848,777
Stoking supporting means, G. F. Mansfield.....	849,253
Stoker, mechanical, F. J. Crollus.....	848,728
Stokers, coal magazine for automatic, L. D. Smith.....	848,861
Stone polishing wheel, S. H. Mills.....	848,760
Stove attachment, gas heating, V. W. Blanchard.....	849,320
Stove, gas burning, V. W. Blanchard.....	849,323
Stove, gas cooking, V. W. Blanchard.....	849,315
Stove guard, gas heating, V. W. Blanchard.....	849,319
Stove lining clamp and support, S. Weinberg.....	848,794
Stove or range, gas cooking, V. W. Blanchard.....	849,316
Stovepipe drum, J. J. Roberts.....	848,689
Strap, See Breast strap.	
Street indicator for electric railways, automatic, E. M. Smith et al.....	849,276
Striker plate, J. H. Shaw.....	848,859

## Constructive Watch Adjustment

When you buy an ordinary watch you actually purchase movement and case *separately*, the movement having been placed in a case not made for it and adjusted by means of the hairspring regulator. This is merely *regulative* adjustment and can not be compared in efficiency with the *constructive* adjustment of the

# HOWARD WATCH

which is *completed* by the makers. After the movement is assembled it is tested and adjusted until absolutely accurate. Then it is placed in its own case and tested and timed for weeks. The slightest variation caused by casing is corrected by a complete readjustment.

To further protect it, every HOWARD Watch is enclosed in a velvet-lined mahogany cabinet, accompanied by Certificates of Guarantee giving the movement and case numbers, and the fixed price at which the watch is sold everywhere.

Howard Watches are made in men's sizes *only*. Prices range from \$35 to \$150, according to quality of case, number of jewels, and adjustments.

"Watch Wisdom" FREE

We want you to have a free copy of "Watch Wisdom," a mighty interesting book which tells more about time than you ever knew before. It's written by Elbert Hubbard. Write to-day.

**E. HOWARD WATCH COMPANY**  
South St., Waltham, Mass., U. S. A.

**16 ft. Steel Launch with 2HP Engine**

18-21-25 foot launches at proportionate prices. All launches fitted with two cycle reversing engines with speed controlling lever; simple engine made; starts without cranking, has only 3 moving parts. Steel rowboats, \$20.00. All boats fitted with water-tight compartments; cannot sink, need no boat house. We are the largest manufacturers of pleasure boats in the world. Orders filled day they are received. We sell direct to user, cutting out all middlemen's profits. Free catalog.

**MICHIGAN STEEL BOAT CO.**  
1332 Jefferson Ave.  
Detroit, Michigan

**KREMENTZ COLLAR BUTTON**

ONE PIECE QUALITY STAMPED ON BACK

**KREMENTZ**

On the Back of the Button Insures Permanent Satisfaction. It cannot break from service. The shape of the head makes it

1. Easy to button.
2. When buttoned it stays buttoned.
3. Easy to unbutton.

Sold by Jewelers and Haberdashers. Write for booklet: The Story of a Collar Button.

**KREMENTZ & CO., 77 Chestnut St., Newark, N. J.**

**NOW READY**

# Industrial Alcohol

Its Manufacture and Uses

## A PRACTICAL TREATISE

BASED ON

DR. MAX MAERCKER'S "INTRODUCTION TO DISTILLATION" AS REVISED BY DR. DELBRÜCK AND LANGE

COMPRISING

Raw Materials, Maltng, Mashing and Yeast Preparation, Fermentation, Distillation, Rectification and Purification of Alcohol, Alcoholometry, The Value and Significance of a Tax-Free Alcohol, Methods of Denaturing, Its Utilization for Light, Heat and Power Production, A Statistical Review, and The United States Law

By **JOHN K. BRACHVOGEL, M. E.**

528 Pages      105 Engravings      Price, \$4.00

THE value and significance of a tax-free alcohol have been so widely discussed in the press and periodical literature of the entire country, that it is unnecessary to emphasize the great importance of the subject, especially to our agricultural and industrial interests. For years we have been far behind the nations of Europe in this regard, and in consequence our literature has been sadly lacking in authoritative works covering this phase of industrial activity. This book was designed with the especial purpose of filling this want, and it is the latest and most comprehensive work of its kind which has been published in this country.

It is based upon the researches and writings of the most eminent of Germany's specialists in the sciences of fermentation and distillation. It covers the manufacture of alcohol from the raw materials to the final rectified and purified product. An introductory section deals with the importance of the new law and what it means to the farmer and the manufacturer. Additional sections cover the methods of denaturing, domestic utilization of alcohol for heating and lighting purposes, alcohol as a fuel for power production, and a statistical review. The full United States law is given in an Appendix.

The 105 illustrations are of especial value and excellently supplement the text.

Few in number are those to whom this book would not prove of interest and value. The farmer, the manufacturer, the power-producer, the householder, will all find that denatured alcohol is of such importance to them, that its use and introduction will effect savings and economies which were hitherto impossible of accomplishment.

Send for Descriptive Circular.

**MUNN & COMPANY, Publishers, 361 Broadway, New York**





**LOFTIS SYSTEM Diamonds ON CREDIT**  
 You Can Easily Own a Diamond or Watch. Pay 15¢ on delivery, balance 8 monthly payments. Descriptive catalog free. Write today. Old Reliable, Original Diamond and Watch Credit House and Watch Credit House  
 Loftis Bros. & Co. Dept. Dist., 92 State St., Chicago, Ill.

**Build It Yourself**  
 See First and Pay Afterwards  
 ON THE EASY PAYMENT PLAN



Get Pioneer Perfect Frames now—finish your boat in season and pay as you build.  
 That's the fair way—the square way—the Pioneer way.  
 You know that Pioneer Perfect Frames are honestly made, that they supply the hard part—finished completely and on your mind that they save you two-thirds the boatbuilders' prices and nine-tenths of freight charges—but you don't know it—although you are entitled to—so we meet you more than half way—we ask you to pay only part down—that is your guarantee that Pioneer Perfect Frames are all we claim and that you will be successful with them.

**PIONEER PERFECT FRAMES**  
 include perfect parts, fitted, tested, set up complete by our boatbuilders, then knocked down for shipment—you have merely to reassemble them—only common tools needed. Patterns and instructions for finishing already laid with frames. Or, if you want to build your boat complete, get a set of Pioneer Guaranteed Patterns—Try Them 20 Days.  
 If they are not all we claim, simple, easy to follow and thoroughly practical, just return them and get your money back without question. Start now—build your boat in your spare hours before spring.  
 Write to-day for free booklet, or send 25¢ for big 100 page 9x12 book on boatbuilding. Prices, descriptions and 300 illustrations of 40 styles of boats you can build, engines, fittings, etc., and other practical information. Your-quarter back if you're not more than satisfied.  
 Pioneer Boat & Pattern Co., Wharf 85, Bay City, Mich.

**A MONEY MAKER**  
 Hollow Concrete Building Blocks  
 Best, Fastest, Simplest, Cheapest  
 Machine. Fully guaranteed.  
**THE PETTY-JOHN CO.**  
 415 N. 6th Street, Terre Haute, Ind.

**VALUABLE PATENT FOR SALE**  
**IMPROVED RATCHET BIT BRACE**  
 (See Scientific American, March 30, 1907, for full description.)  
 A Money Maker, but we have other interests demanding all our time. Would consider proposition to manufacture on royalty.  
**KARLSON & GRAN**  
 134 Oak Street Chicago

**CONCRETE BUILDING BLOCK MANUFACTURERS**  
 Reduce cost by my process, which allows you to cast "slippy wet" blocks on dry process machines and remove at once. Double moulds waste the inner mould after each block is made. For full information, address  
**S. W. HENDRICKSON, Patentee, White Plains, N. Y.**

**AMERICA'S MOST POPULAR RAILWAY**  
**CHICAGO AND ALTON**  
 PERFECT PASSENGER SERVICE

BETWEEN  
**CHICAGO AND KANSAS CITY,**  
**CHICAGO AND ST. LOUIS,**  
**CHICAGO AND PEORIA,**  
**ST. LOUIS AND KANSAS CITY.**

THROUGH PULLMAN SERVICE  
 BETWEEN CHICAGO AND  
**HOT SPRINGS, Ark., DENVER, Colo.,**  
**TEXAS, FLORIDA, UTAH,**  
**CALIFORNIA AND OREGON.**

IF YOU ARE CONTEMPLATING A TRIP, ANY PORTION OF WHICH CAN BE MADE OVER THE CHICAGO & ALTON, IT WILL PAY YOU TO WRITE TO THE UNDERSIGNED FOR RATES, MAPS, TIME-TABLES, ETC.  
**GEO. J. CHARLTON,**  
 GENERAL PASSENGER AGENT,  
 CHICAGO, ILL.

**60 YEARS' EXPERIENCE**  
**PATENTS**  
 TRADE MARKS  
 DESIGNS  
 COPYRIGHTS &c.  
 Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents. Patents taken through Munn & Co. receive special notice, without charge, in the  
**Scientific American.**  
 A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months, \$1. Sold by all newsdealers.  
**MUNN & Co., 361 Broadway, New York**  
 Branch Office, 625 F St., Washington, D. C.

- Ointment for piles, cuts, burns, etc., James W. Foster Co. 61,666
- Ointments, Pitman-Myers Co. 61,758
- Organs, pipe, L. D. Morris 61,711
- Paint, mixed, and enamels, Helzapfel's Compositions Co. 61,631
- Paper and typewriter ribbons, carbon, Corona Supply Co. 61,727
- Paper, blue-print, Technical Supply Co. 61,675
- Pills, Railway & Co. 61,759
- Plasters, corn and bunion, Bauer & Black 61,694
- Printing plates, apparatus for making stereotype, Campbell Printing Press & Manufacturing Co. 61,726
- Rat and roach exterminator, Stearns Electric Paste Co. 61,655
- Rat, vermin, and insect destroyer or exterminator, H. C. Spetzler 61,742
- Remedies for certain diseases, American Druggists Syndicate 61,722
- Remedies for certain diseases, Dr. Miles Medical Co. 61,728
- Remedies for certain diseases, Goodness Bros. 61,732
- Remedies for the cure of blood, liver, and kidney diseases, G. H. Lawson 61,708
- Remedy for certain diseases, Railway & Co. 61,739
- Remedy for colds and throat and lung troubles, E. Heffernan 61,773
- Remedy for diseases of the stomach and bowels, Pepsin Syrup Co. 61,688
- Remedy for liver complaints, Dr. D. Jayne & Son 61,681
- Remedy for purifying the blood and preventing cholera, H. Vincent 61,690
- Remedy for whooping cough, Spino Co. 61,760
- Rheumatism, pleurisy, etc., cure, Mist Rheumatic Co. 61,784
- Salve for the cure of eczema, etc., E. Lawson 61,668
- Salve, eye, E. Kahakka 61,706
- Seeds, grass, grain, timothy, and clover, Albert Dickinson Co. 61,692
- Sewing machines, sewing machine attachments, covers, tables, and stands, White Sewing Machine Co. 61,720
- Shirts, men's cotton and woolen, Elmira Shirt Manufacturing Co. 61,769
- Silk fabrics, Lanza Silk Co. 61,779
- Silk ribbons, piece goods, and linings, S. C. Guyre 61,754
- Soap, Lever Brothers Co. 61,633
- Soap, Mexican Amole Soap Co. 61,635
- Soap, E. D. Ward 61,637
- Soap, R. M. Hollingshead 61,774
- Soap, antiseptic toilet, Hall & Ruckel 61,630
- Soldering and cleansing metals, solution for, Brumer Bros. 61,641
- Soldering flux, M. W. Dunton & Co. 61,781
- Spices, Black Hawk Coffee & Spice Co. 61,637
- Sweaters, cardigan jackets, knitted bathing suits, and stockings, Platt & Clark Co. 61,714
- Taffy or taffee, M. Hyman Confectionery & Catering Co. 61,780
- Thinners or solvents, Lilly Varnish Co. 61,634
- Tires, solution for repairing, J. E. Sans 61,654
- Tonic, Rheinstrom, Bettman, Johnson & Co. 61,780
- Tonic, restorative and nutritive, J. M. Liebermann 61,735
- Tooth paste and powder, P. Biersdorf & Co. 61,678
- Toy figures, C. Sackman 61,716
- Toy holding belts, hoops, or girdles, M. D. Coates, 24 61,746
- Typewriting machines, Royal Typewriter Co. 61,674
- Varnishes and stains, X-Ray Varnish Co. 61,638
- Velveteens, N. Erlanger, Blumgart & Co. 61,786
- Violin, mandolin, guitar, and banjo strings, Buegeleisen & Jacobson 61,679
- Washing machines, Richmond Cedar Works 61,740
- Washing machines, W. J. Zull 61,797
- Water, javelle, A. Castaing 61,680
- Water purifying and softening preparation, Porcela Co. 61,672
- Water purifying apparatus, Pittsburg Filter Mfg. Co. 61,737
- Whisky, F. C. Ronziehaugen 61,688
- Whisky, Casey Brothers 61,699
- Whisky, A. Lipman 61,709
- Whisky, Sunset Distilling Co. 61,719
- Whisky, P. Freiler 61,731
- Whisky, Jaeger Bros. Co. 61,733
- Whisky, Geo. Benz & Sons 61,752
- Whisky, Kohn Distilling Co. 61,778
- Whisky, I. Menheimer 61,785
- Whisky, William H. Lee & Co. 61,794
- Whisky, eye, Theo. Moore Distilling Co. 61,761
- Wood and furniture polishes, Citizens Wholesale Supply Co. 61,629
- Wool, fine and cross-bred grades of, D. S. Pratt 61,673

**LABELS.**

- "Arbor Series Heliotrope," for soap, Armour & Co. 13,438
- "Arbor Series Lilac," for soap, Armour & Co. 13,451
- "Arbor Series Rose," for soap, Armour & Co. 13,444
- "Arbor Series Violet," for soap, Armour & Co. 13,449
- "Arcadia Heliotrope," for soap, Armour & Co. 13,445
- "Arcadia Lilac," for soap, Armour & Co. 13,442
- "Arcadia Violet," for soap, Armour & Co. 13,447
- "Asparagus Smyrna Fig Coffee," for coffee, A. E. Cracker, Jersey Distilling Co. 13,428
- "Butterik," for trousers, L. G. Titus 13,453
- "Extypoo," for a depilatory, E. Smith 13,431
- "Frickel Nocksem-All," for cleansing compound, H. Frickel 13,435
- "Lydia E. Pinkham's Vegetable Compound," for medicine, Lydia E. Pinkham Medicine Co. 13,433
- "Night Gowns, S. J. U. Co.," for night gowns, South Jersey Underwear Co. 13,452
- "Plymouth Rock Coffee Jelly Compound," for coffee jelly compounds, Plymouth Rock Gelatine Co. 13,429
- "Rosilite," for cleaning compound, M. J. Roberts 13,434
- "Saven Mucha Heliotrope," for soap, Armour & Co. 13,450
- "Saven Mucha Lilac," for soap, Armour & Co. 13,437
- "Saven Mucha Sandalwood," for soap, Armour & Co. 13,439
- "Saven Mucha Violet," for soap, Armour & Co. 13,446
- "Si Perkins," for cigars, Koello-Mueller Label Co. 13,427
- "Sylvan Carnation," for soap, Armour & Co. 13,443
- "Sylvan Lilac," for soap, Armour & Co. 13,441
- "Sylvan Rose," for soap, Armour & Co. 13,440
- "Sylvan Sandalwood," for soap, Armour & Co. 13,448
- "Transpareza Complexion Glycerine Soap," for soap, Armour & Co. 13,436
- "Union Maid," for flour, Patten Milling Co. 13,430

**PRINTS.**

- "Handling the Flour Question—Right," for flour, Washburn Crosby Co. 1,947
- "Hello! Hello!" for flour, Washburn Crosby Co. 1,944
- "If You Were a Miller," for flour, Washburn Crosby Co. 1,946
- "Lilies of the Valley and Sundown Backs, Congress Playing Cards," for playing cards, United States Playing Card Co. 1,949
- "Some People Fuss and Fume and Pret Over Bread Making," for flour, Washburn Crosby Co. 1,945
- "The Alarm Clock," for a cereal breakfast food, Cream of Wheat Co. 1,943
- "The Household Surgeon," for antiseptic healing oil, Paris Medicine Co. 1,948

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 be given. Address Munn & Co., 361 Broadway, New York.  
 Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.

**A WATCH FOR THE LABORATORY**  
 OR FOR ANY OTHER PURPOSE WHERE AN ACCURATE MOVEMENT COMBINED WITH A 1-5 SECOND RECORDER IS ESSENTIAL.

THIS New York Standard Chronograph  
 IS THE ONLY ONE MADE IN AMERICA  
 AND THE ONLY ONE FULLY GUARANTEED. FOR SALE BY ALL JEWELERS.

New York Standard Watch Co., 401 Communipaw Ave., Jersey City

**The Varnish that lasts longest**  
 Made by Murphy Varnish Company.

**\$15 "GEM" Adding Machine**  
 Free 10-Day Trial. We Pay Expressage. Has a Resetting Device that clears the dials to zero instantly. A High-Grade Mechanical Production. Does the work of high-priced machines. Handiest thing an engineer can own. Great for outdoor work. Carried in your pocket. Guaranteed for two years. Catalog Free.  
**Automatic Adding Machine Co., 340 Broadway, N. Y. City**

**Mullins Steel Pleasure Boats Can't Sink**  
 Easiest to Row—Absolutely Safe  
 Made of steel, with air chambers in each end like a lifeboat. Can't leak, crack, dry out or sink, last a lifetime. Every boat guaranteed. Ideal boat for families, summer resorts, parks, boat livery, strong, safe, speedy. Write for our catalogue of Row Boats, Motor Boats, Hunting and Fishing Boats.  
**The W. H. Mullins Co., 118 Franklin St., Salem, O.**

**SEALED PROPOSALS.**  
 PROPOSALS FOR CONSTRUCTION, ETC. Office of the Constructing Quartermaster, Fort Bliss, Texas, March 8th, 1907. Sealed proposals, in duplicate, for the sinking of a twelve-inch tubular Deep Well, installing a Deep Well Pump over same; For constructing a Deep Well Pump Shelter and Trestle, an 150,000 gal on Steel Tank on a 70 foot Trestle, and furnishing and installing two 40 H. P. Boilers, at this post, will be received here until 12 M. June 3rd, 1907, and then opened. Applicants for plans and specifications must enclose a signed receipt to insure the safe return of the same. Envelopes containing proposals should be endorsed "Proposals for Construction to be opened June 3rd, 1907," and addressed to the Constructing Quartermaster.

**INVENTORS. P. Bellows**  
 259 Broadway, New York, can make the working drawings of your inventions.

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

**ICE MACHINES** Corliss Engines, Brewers and Bottlers' Machinery. THE FILTER MFG. CO., 890 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**

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

**MODELS & INVENTIONS PERFECTED**  
**& GEARS** UNION MODEL WORKS  
 193 So. CLARK ST. CHICAGO

Wanted.—Machines or specialties to manufacture by well equipped machine shop. Write us what you have. **Kieder Machine Co., Franklin, N. H.**

**CEMENT BOOKS.** How to Use Portland Cement 50c; Cement Siewalk Construction, 50c; Reinforced Concrete Construction, \$2.50; Hollow Concrete Block Building Construction, 50c; Portland Cement and Engineering News, Chicago, Ill.

**VENTRILOQUISM**  
 Learned by any Man or Boy at home. Small cost. Send to-day 2-cent stamp for particulars and proof.  
**O. A. Smith, Room 318, 2040 Knoxville Ave., Peoria, Ill.**

**Wanted PROPOSITIONS**  
 from SCIENTIFIC MEN ENGINEERS & PLUMBERS  
 A joint committee of the Automobile Trade Association and the Automobile Club of America, appointed at the suggestion of the Fire Department and the Bureau of Combustibles of the City of New York, to investigate the leakage of waste gasoline and oils from automobile garages into the City sewers and to provide ways and means for preventing same, is desirous of securing any propositions which would effectually prevent any possibility of such occurrence, and enable the garages to comply with the ordinances of the City of New York applicable to garages.  
 Communications should be addressed to the Chairman of the Joint Committee, C. R. MABLEY, 1765 Broadway, New York.

**College Men Wanted**  
 Profitable Summer Work. Permanent Employment If You Want It  
 We want an energetic man or woman in every county to handle an extraordinary new book proposition. Nothing like it for big sales and big commissions. Write at once to  
**THE REVIEW OF REVIEWS COMPANY**  
 13 Astor Place, Room 414, New York

**GAS ENGINE DETAILS.—A VALUABLE** and fully illustrated article on this subject is contained in SUPPLEMENT No. 1292. Price 10 cents. For sale by Munn & Co. and all newsdealers.  
**MANUFACTURERS**  
 I want to buy that part of your product that you cannot sell to the regular trade, but would be good enough to sell at some price; Name defects and sacrifice price **F. O. B. Address G. F. H., 1804 Grand Avenue, Kansas City, Mo.**