

RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

ELECTRIC COUPLING.—T. C. JAMES, Manistee, Mich. The electric coupling is designed particularly for connecting signal wires between the cars of a railway train. It provides a joint of simple construction so arranged that should the sections be separated, either intentionally or through accident, the circuit will be completed in each section, and will therefore not interfere with the signaling system.

Machines and Mechanical Devices.

WEIGHING-MACHINE.—C. B. COMEGYS, Ashgrove, Mo. The machine is designed to weigh out merchandise by its value—that is to say, when properly set, to weigh out the worth in merchandise of a certain sum of money and to automatically cut off the merchandise when the proper amount has been delivered.

UNIVERSAL PRINTING-MACHINE.—C. L. DAWSON, Jacksonville, Ill. This machine will quickly and cheaply print announcements in letters of large size, and is particularly adapted for use of stores, real estate agents and others. The apparatus comprehends a universal letter type which is constructed in separate sections, so as to be capable of printing any letter or numeral by a selective action which brings into printing position such of the sections as are required for any particular letter.

CLUTCH.—E. DYSTERUD, Monterey, Mexico. The clutch is designed especially for use in connection with alternating-current electric motors. It comprises a clutch member carried by a rotary part of the motor and controlled by centrifugal force, this clutch member working with the second member fast on the shaft which is to be driven. When the motor is revolving at low speed the shaft is not driven therefrom; the centrifugal force, however, attending a revolution at high speed causes the clutch members to be engaged and the shaft is driven.

EMBOSSING-MACHINE.—I. CLAPPER, Osna-burg, Ohio. The machine affords improvements in embossing or printing ornamental designs on hollow building blocks or tiles during the process of forming the same, and is so constructed as to permit ready adjustment of the embossing cylinder for any desired depth of impression.

CARDING-MACHINE ATTACHMENT.—C. D. INGRAHAM, Penacook, N. H. Mr. Ingraham provides a new and improved carding machine attachment for preventing any of the stock from passing over the ends of the cylinder and going to waste and causing all the stock in the lap to pass to the doffer to insure formation of a lap of uniform thickness throughout its width.

MACHINE FOR MAKING BASKET-COV-ERS.—C. ENGBERG, St. Joseph, Mich. This invention, relating to machines for making covers for baskets and other receptacles, involves certain novel mechanism concerning the holder for the work and the means for rotating or otherwise actuating the holder as it co-acts with the stapling or nailing device.

MACHINE FOR POLISHING RINGS.—G. H. GASKINS, Portsmouth, Va. Mr. Gaskins provides a ring-carrier for the rings to be polished, a polishing strap to operate between its ends on the ring, and a carrier for this strap which is capable of reciprocation. The inventor informs us that the machine has been built and is now running successfully and giving satisfaction in the United States Navy Yard at Norfolk, Va.

Medical Apparatus.

APPLICATOR.—G. J. VAN SCHOTT, Passaic, N. J. The invention provides a new and improved applicator more especially designed to enable the patient, unaided by a physician, to apply medications to the cervix uteri or to the cervical canal without danger of injuring any of the interior parts of the vagina and womb.

BURNER AND INHALER.—W. R. WARNER, Vergennes, Vt. The burner and inhaler is arranged to permit the user to burn suitable herbs or drugs in a very convenient manner and to bring the fumes arising from the burning process directly to the mouth or nostrils of a patient to insure proper application of the fumes without waste of the herbs or drugs.

Miscellaneous Inventions.

PIPE AND FLUE CLEANER.—C. F. CRAD-ICK and G. W. FARLIN, Jr., Butte, Mont. This simple and practical device affords effective means for the loosening and removal of soot accumulation from the interior of a stove-pipe and also from the ordinary chimney flue in a dwelling. It further affords an efficient implement for removing an obstruction from a sewer pipe or the like.

HEEL FOR BOOTS OR SHOES.—J. G. REA, Paterson, N. J. The heel can be readily secured in position and the worn-out sections removed and interchanged or replaced by new ones. It comprises a plurality of rubber blocks clustered together and secured by a circum-scribing endless metallic band.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

THE NATION'S BASKETS.

The Mergenthaler-Horton Basket Machine Company is making great preparations for handling the big basket crops which are offered to it. An order has just been given out for the manufacture of 100 new machines for making 8-pound grape baskets. These 100 machines combined will have a capacity of 400,000 8-pound baskets per day. Some idea of the immensity of the demand for this size of baskets may be gathered from the fact that the contracts which are now offered to the Company for baskets of this size alone will require the running of these 100 machines 10 hours a day 300 days in the year.

Four hundred thousand baskets per day for 300 days is 120 million baskets. If anyone were to see one or two millions of baskets piled up together, he would imagine that there were enough baskets in the pile to pack the grapes of the universe. Yet the State of New York alone demands at least one-half of the 120 million of 8-pound grape baskets, which these machines of the Basket Company will make each year.

There is a net profit to the Basket Company of not less than \$6.00 per thousand on all baskets of this size. And this profit of \$6.00 remains after reducing the selling price of baskets \$2.00 per thousand below any wholesale price ever made. It can therefore be easily seen that the product of these machines alone will earn a net profit to the Company of \$720,000 per year, or over 7 per cent on the entire capital stock.

THE 5-POUND GRAPE BASKET.

The demand for 5-pound grape baskets is fully as great as for 8-pound grape baskets. The Company has already been compelled, for lack of machines, to refuse an order for 45 million 5-pound grape baskets for this year's crop. It now has machines to the number of 26 in operation making 5-pound grape baskets, and will place an order for 75 more of these machines just as soon as it can be done without retarding the work of the 100 machines already referred to as being made to make 8-pound baskets.

PROFIT ON GRAPE BASKETS.

Before this time next year these 200 machines will be working steadily, turning out baskets for next year's crop. The profit on 5-pound grape baskets, as handled by this Company, amounts to a little over \$5.00 per thousand net. The number of baskets which these 5-pound machines will make each year is fully as great as the number which the 8-pound machines will make. Figuring it as 120 million of 5-pound baskets at a profit of \$5.00 per thousand, and it is easy to see that this item will add \$600,000 a year to the Company's profit, or a total for grape baskets alone of \$1,300,000, which is over 13 per cent on the entire capital of the Company, earned by the business in grape baskets which the Company's automatic machines absolutely control.

QUART BERRY BASKETS.

The volume of business in quart berry baskets amounts in dollars and cents to fully as much as the volume of business in grape baskets, and this Company's equipment for making the quart berry basket is being rapidly extended. At the present time there are already 8 berry basket machines in operation. These machines have a capacity of 12,000 berry baskets per day each, or a total of 96,000 berry baskets per day. Negotiations looking toward the completion of a contract for the manufacture of 50 more of these berry basket machines are going forward as rapidly as possible. When these machines are completed, which will be within a few months, the Company's capacity for making berry baskets will be about one and one-half billions per year.

The selling price of berry baskets at the lowest rate known anywhere is \$2.25 per thousand; this Company is prepared to sell these berry baskets at \$1.60 per thousand and make a net profit of \$1.00 per thousand out of this for every thousand baskets made. More than one-half of the entire berry basket business is already offered to this Company, and it is merely a question of the completion of the negotiations when the entire demand for berry baskets will be turned over to this Company to supply. It is absolutely certain that the whole berry basket business will be contracted to this Company before its machines can possibly be completed to turn out the work. A very simple calculation on the volume of berry basket business, as stated above, sold at the unheard-of low price of \$1.60 per thousand, out of which the Company makes a clean \$1.00, will add one and one-half millions more to the yearly profit of the Company. This will make a total of profit earned on grape baskets and berry baskets of \$2,800,000 per year, or 28 per cent on the entire capital of the Company.

THE TILL BASKET.

Next in order of calculation is the basket known as the Till Basket. This basket is used for the shipment of peaches from Georgia and the Southern States; for the shipment of plums and for the shipment of tomatoes from all the Southern points to the Northern markets.

The Mergenthaler-Horton Basket Machine Company has just perfected a machine for the manufacture of these "till baskets." This machine works on the same principle as the machine for making quart berry baskets, and will turn out these "till peach baskets" at the same speed that the berry basket machine turns out berry baskets, which is 12,000 per day.

35 PER CENT TO 40 PER CENT ON ENTIRE CAPITAL.

From the fragmentary statistics which it has been possible to secure, and the offers that have been made to the Company of orders for this class of baskets, it is entirely reasonable to believe that the Company's profit on this class of baskets alone will amount to over \$1,000,000 per year. Adding this profit to the figures already demonstrated in the foregoing, and it becomes an immediate commercial certainty that the Mergenthaler-Horton Basket Machine Company will earn a profit for its shareholders amounting to between 35 and 40 per cent on the entire capital of the Company, without taking into account at all the tremendous volume of business which it is making preparation to handle on the Pacific coast. This volume of business from California, Washington and Oregon is very large. Last year the shipments of fruit east from California amounted to over 200 carloads per week for eight months in the year. The baskets for the handling of this great California and Pacific coast demand will add very largely to the Company's profits. No figures could now be made on this field of operations which would have a sufficiently authentic basis to warrant the effort in setting them forth, but everyone who gives the matter an instant's thought can see that the expectation to handle the entire basket trade of the Pacific coast is an entirely justifiable one, and indeed overtures of business from the fruit people controlling the California trade, are already in progress.

An illustration of the superiority of the automatic machine labor over hand labor in the matter of speed and excellence is given at the exhibitions this Company is carrying on in New York, Chicago, Boston and Philadelphia, and will shortly be opened in St. Louis, Buffalo and Pittsburgh.

Shares of the Mergenthaler-Horton Basket Machine Company's stock are now being sold at 75 cents a share (par value \$1.00 full paid and non-assessable). It will be seen from the resume of the basket situation as herein set forth, that no more attractive opportunity for the investment of small or large sums can possibly be found, than in the shares of this Company.

Checks for subscriptions should be drawn to the order of Charles R. Barlow, Treasurer. The Directors reserve the right to reject any subscription. No subscription accepted for less than 50 shares. The price of shares in this Company will be advanced almost immediately, and may be advanced without further notice. The executive offices of the Company are at 287 Broadway, New York.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring them. In every case it is necessary to give the number of the inquiry. MUNN & CO.

Marine Iron Works. Chicag. Catalogue free.

Inquiry No. 2626.—For a machine for putting cylinder heads in piling after being driven.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 2627.—For manufacturers of adding machines.

WATER WHEELS. Alcott & Co., Mt. Holy, N. J.

Inquiry No. 2628.—For engine lathes and machines for making stoves with electric motors attached.

For mining engines. J. S. Mundy, Newark, N. J.

Inquiry No. 2629.—For machines for making white bone substitutes.

Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

Inquiry No. 2630.—For makers of broom machinery.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 2631.—For makers of marine engine castings.

We design and build special and automatic machinery for all purposes. The Amstutz-Osborn Company, Cleveland, Ohio.

Inquiry No. 2632.—For ball-bearing casters for use in rolling mills in handling shears, being a ball which will revolve in any direction set on ball-bearings.

Automobiles built to drawings and special work done promptly. The Garvin Machine Co., 149 Varick, cor. Spring Streets, New York.

Inquiry No. 2633.—For makers of turning lathes.

Manufacturers of patent articles, dies, stamping tools, light machinery. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 2634.—For makers of fountain pen stocks.

Clippings of everything printed on any subject in the American and foreign press. United States Press Clipping Bureau 153 LaSalle Street, Chicago, Ill.

Inquiry No. 2635.—For makers of porcelain for spark plugs of gasoline motors.

Designers and builders of automatic and special machines of all kinds. Inventions perfected. The W. A. Wilson Machine Company, Rochester, N. Y.

Inquiry No. 2636.—For parties to make engines out of aluminum.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

Inquiry No. 2637.—For a kerosene oil burner to generate 400 deg. of heat within four hours from the time of lighting.

IDEAS DEVELOPED.—Designing, draughting machine work for inventors and others. Charles E. Hadley, 584 Hudson Street, New York.

Inquiry No. 2638.—For a machine for covering wire with silk.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Inquiry No. 2639.—For a machine for forming grass into twine by winding it with thread.

INVENTORS, ATTENTION!—Highest prices paid for novelties in card or paper. Established 30 years. Address The Tablet and Ticket Co., No. 87 Franklin Street, Chicago, Ill.

Inquiry No. 2640.—For makers of double-action suction pumps.

THE MODERN CORPORATION.—Information about incorporation, advantages, expenses, etc., new book, 90 pages, vellum, 56 cents, postpaid. Send stamp for sample pages. The Ronald Press, 170 Broadway.

Inquiry No. 2641.—For the manufacturers of the Acme oil and gas engine.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Inquiry No. 2642.—For dealers in counting machines to be attached to typewriters or cash registers.

Inquiry No. 2643.—For dealers in well-drilling machinery.

Inquiry No. 2644.—For dealers in aluminum or "flowered" tin picture frames.

Inquiry No. 2645.—For makers of small gasoline engines of 2 h. p. or less.

Inquiry No. 2646.—For a foot or electric power machine for cutting cloth in ovals or scallops.

Inquiry No. 2647.—For makers of car-building machinery.

Inquiry No. 2648.—For a stationary gasoline engine for running a small plant for cutting stones.

Inquiry No. 2649.—For a power pipe-threading and cutting machine for cutting pipes 2 to 6 inches.

Inquiry No. 2650.—For makers of sewage disposal plants.

Inquiry No. 2651.—For makers of electric mining drills and general mining machinery.

Inquiry No. 2652.—For ax handle and spoke machinery.

Inquiry No. 2653.—For manufacturers of celluloid or hard rubber goods.

Inquiry No. 2654.—For makers of coal briquettes.

Inquiry No. 2655.—For manufacturers of lithographic stones.

Inquiry No. 2656.—For the manufacturer of the Grabber check protector.

Inquiry No. 2657.—For dealers in useful industrial toys.

Inquiry No. 2658.—For dealers in oil drills and machinery for operating the same.

Inquiry No. 2659.—For makers of netting machines, especially for hammocks.

Inquiry No. 2660.—For manufacturers of nut crackers.

Inquiry No. 2661.—For dealers in hat creasers.

Inquiry No. 2662.—For dealers of aluminum in sheets.

Inquiry No. 2663.—For parties to engage in the construction of airships and light engines per horse power.

Inquiry No. 2664.—For parties to make, in large quantities, a small iron casting similar to a toy.

Inquiry No. 2665.—For parties to manufacture rubber rings.

Inquiry No. 2666.—For manufacturers of spring motors.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

May 20, 1902,

AND EACH BEARING THAT DATE.

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

Table listing various inventions and their patent numbers, including items like 'Accounts, system of device for keeping hotel', 'Acid and sulfur amhydrid, making sulfuric', 'Acid, apparatus for making sulfuric', etc.

(Continued on page 387)

Pick a Perfect Pencil

One with a "dependable" point, a uniform grade—one that draws a clear, sharp, well-defined line, and to do this you will have to choose

DIXON'S AMERICAN GRAPHITE PENCILS

the best made lead pencil in any country. Hard, soft or medium. Suitable for all purposes. Architects, draftsmen, clerks, reporters, etc., find them a boon.

Send 10 cents for samples. Worth double the money.

JOSEPH DIXON CRUCIBLE CO.
Jersey City, N. J.

ARTESIAN

Wells, Oil and Gas Wells drilled by contract to any depth from 50 to 500 feet. We also manufacture and furnish everything required to drill and complete same. Portable Horse Power and Mounted Steam Drilling Machines for 100 to 1200 feet. Write us stating exactly what is required and send for illustrated catalogue. Address

PIERCE WELL ENGINEERING AND SUPPLY CO.
136 LIBERTY STREET, NEW YORK, U. S. A.

RESTFUL SLEEP
In Camp, on the Yacht and at Home.

"Perfection" Air Mattresses,
CUSHIONS and PILLOWS.



Style 6. Camp Mattress with Pillow attached. Also showing Mattress deflated.

Clean and Odorless, will not absorb moisture. Can be packed in small space when not in use.

Send for Illustrated Catalogue.

MECHANICAL FABRIC CO., PROVIDENCE, R. I.

The Typewriter Exchange

146 Barclay St., NEW YORK
124 La Salle St., CHICAGO
38 Bromfield St., BOSTON
817 Wyandotte St., KANSAS CITY, MO.
209 North 9th St., ST. LOUIS, MO.
432 Diamond St., PITTSBURGH, PA.
5 North Calvert St., BALTIMORE, MD.
536 California St., SAN FRANCISCO, CAL.

We will save you from 10 to 50% on Typewriters of all makes. Send for Catalogue.

To Owners of Gasoline Engines, Automobiles, Launches, Etc.

The Auto-Sparker

does away entirely with all starting and running batteries, their annoyance and expense. No belt and switch and batteries. Can be attached to any engine now using batteries. Fully guaranteed; write for descriptive catalogue.

Motsinger Device Mfg. Co.,
14 Main St., Pendleton, Ind.

PALMER

MARINE and STATIONARY MOTORS

2 and 4 CYCLE

are no experiment, as they are in successful operation in all parts of the world. Launches in stock. Send for Catalogue.

PALMER BROS.,
Cos Cob, Conn.

D. L. HOLDEN
REAL ESTATE TRUST BLDG PHILA., PA.
SOLE MANUFACTURER
REGALED ICE MACHINES
SEE FIRST PAGE, SCIENTIFIC AMERICAN SEPT. 2, 1899.

JUST PUBLISHED

Practical Pointers For Patentees

Containing Valuable Information and Advice on

THE SALE OF PATENTS.

An Elucidation of the Best Methods Employed by the Most Successful Inventors in Handling Their Inventions. By F. A. CRESEE, M. E.

152 Pages. Cloth. Price, \$1.00.

THIS is the most practical up-to-date book published in the interest of Patentees, setting forth the best methods employed by the most successful inventors in handling their patents. It is written expressly for Patentees by a practical inventor, and is based upon the experience of some of the most successful inventors of the day. It gives exactly that information and advice about handling patents that should be possessed by every inventor who would achieve success by his ingenuity, and will save the cost of many expensive experiments as well as much valuable time in realizing from your inventions. It contains no advertisements of any description and is published in the interests of the Patentee alone, and its only object is to give him such practical information and advice as will enable him to intelligently handle his patent successfully, economically and profitably. It gives a vast amount of valuable information along this line that can only be acquired by long, expensive experience in realizing from the monopoly afforded by a patent.

Send for Descriptive Circular.

MUNN & CO.,
Publishers, 361 Broadway, New York.

Bed bottoms and bedsteads, certain named, National Spring Bed Company.....	38,315
Boots and shoes, Marks, Rothberg & Co.....	38,294
Boots and shoes, Walker & Whitman.....	38,295
Bullet shells, fitted, Elberg & Company.....	38,319
China and earthenware, A. O. Meyer.....	38,312
Corn oil and corn oil cake, National Storage Company.....	38,307
Cutlery, certain named, B. Peres.....	38,314
Dry goods, certain named, Laurel Cotton Mills.....	38,288
Dry goods, certain named, A. O. Meyer.....	38,289, 38,290, 38,292
Enamelled ware, A. Geisel Manufacturing Company.....	38,313
Fabrics, cotton, Ward, Hamberg & Co.....	38,293
Fabrics, except silk velvets, and cotton, wool, and silk threads and yarns; wool, cotton, half-wool, silk, and half-silk, A. O. Meyer.....	38,291
Flour, wheat, F. G. Atkinson.....	38,311
Foods, crackers, and biscuits, breakfast, Grocers' Specialty Mfg. Co.....	38,302
Furns, bust, Henderson & Henderson.....	38,286
Fur goods, certain named, Gordon & Ferguson.....	38,287
Gelatin and preparations of gelatin, Milligan & Higgins Glue Co.....	38,309
Harmoniums, Strauss Bros. & Co.....	38,311
Horse boots, Gillham Mfg. Co.....	38,316
Medicated tablets for the cure of certain named diseases, J. D. Glass.....	38,297
Mineral waters, Winona Mineral Water Co.....	38,301
Mowing machines, Hopkins Patent Company.....	38,318
Oils, petroleum illuminating and lubricating, Great Western Oil Company.....	38,308
Paper, transparent wrapping, H. Lindenmeyr & Sons.....	38,285
Remedy for the cure of piles, Biquit, C. A. Perlin.....	38,296
Soap, laundry, Michigan Soap Works.....	38,306
Starch, New Orleans Coffee Co.....	38,304
Steel, Gysinge Aktiebolag.....	38,320
Thermometers, surgical glassware and instruments, Beeton, Dickinson & Co.....	38,310
Tires, vehicle, New York Belting & Packing Company.....	38,317
Toilet creams, ointments, and soaps, I. R. McEwen & Co.....	38,298
Varnishes, certain named, Chase, Roberts & Co.....	38,309

LABELS

"Ballou's Rosegay Cigars," for cigars, C. E. Ballou.....	9,148
"Blue Label Pure Rye Whiskey," for whiskey, C. F. Sullivan & Co.....	9,145
"Calden's Saponaceous Dentine," for dentifrice, A. L. Caldin.....	9,157
"Coca-Cola," for medicinal preparation, A. J. & G. E. Coleman.....	9,155
"Dr. Danforth's Veterinary Carbo-Negus," for a disinfectant, Dr. A. C. Daniels, Inc.....	9,159
"Eucalene," for medicine, I. M. Adams.....	9,151
"Floto's Breakfast Drink," for coffee substitute, T. D. Floto.....	9,144
"Hydrastoids," for medicine, Dinot & Delfosse.....	9,153
"King Seal," for cigarettes, A. Costakis.....	9,149
"Malt Wheat Biscuit," for a food product, Leibold Good Food Company.....	9,143
"O. L. Taylor Pure Rye Whiskey," for whiskey, C. F. Sullivan & Co.....	9,146
"Salalgin," for medicine, Dinot & Delfosse.....	9,152
"Special Reserve," for whiskey, Clott, Vincent & Co.....	9,147
"Speedy Cure," for medicine, Speedy Cure Remedy Company.....	9,154
"Tenderfoot," for foot powder, New England Chemical Company.....	9,158
"Terra Glycoline," for poultices, F. Dolmen Company.....	9,156
"Tonard's Canadian Root Grease," for boot grease, D. T. Abercrombie.....	9,150

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.

NEW BOOKS, ETC.

METALLURGY OF CAST IRON. By Thomas D. West. Third Edition. Cleveland, Ohio: The Cleveland Printing and Publishing Company. 1900. 8vo. Pp. i-xvi, 627.

The author, who has had a wide experience as a molder and founder in loam, dry and green sand work, in the specialties of founding, has prepared this book with the object of making it valuable not only to the founder, the molder, the blast furnaceman, the chemist, the draftsman, the pattern-maker, and the college specialist, but to all who may in any way be desirous of obtaining a working knowledge of cast iron in its application to founding or allied interests. The book, which is in its third edition, has been thoroughly revised, much material having been added on the making, mixing, melting and testing of cast iron, part of which constitutes twenty new chapters, including researches, experiments and discoveries. This work, which has had a notable effect upon foundry practice, advocates methods much in advance of the old-school practice.

PLANE SURVEYING. By Paul C. Nugent. A.M., C.E. New York: John Wiley & Sons, London: Chapman & Hall, Ltd. 1902. 8vo. Pp. xvi-577.

It has been the author's purpose to present the principles of his subject by the deductive method, and to direct attention to special cases and to questions likely to arise in the mind of the student. In arrangement and in treatment the book departs from the accepted works on surveying. Among the most valuable chapters in the book may be mentioned those on the planimeter and mine surveying.

THE COPPER HANDBOOK. 1902 Edition. Compiled and published by Horace J. Stevens. Houghton, Mich. Pp. 416. Octavo.

This is the only work published that is devoted exclusively to copper, and the only work in any language covering the technology and statistics of the copper industry. Some 700 mines of copper, including all mines of importance in the world, are listed and described, the length of the descriptions varying from a few lines in the case of properties of little importance to a dozen pages in case of the largest mines.

When the Public has faith in a name it is a faith that must be backed up by good works.

Elgin Watches

Every genuine Elgin has the word "Elgin" engraved on the works.

have the name and works; and the faith of nearly 10,000,000 users as the world's standard timekeeper.

Sold by every jeweler in the land. Guaranteed by the world's greatest watch works. Illustrated booklet mailed free.

ELGIN NATIONAL WATCH COMPANY, Elgin, Ill.

The Deadly Faucet!

From it comes the germ-laden water of carrying with it all the elements of disease, but if you use

The Berkefeld Filter

the water will be thoroughly purified in passing through the cylinders of Infusoria Earth which retains every atom of solid matter. Easy to clean. Yields a gallon of pure water in 4 minutes.

BERKEFELD FILTER CO., 4 Cedar St., New York.

ROTARY PUMPS AND ENGINES. Their Origin and Development.—An important series of papers giving a historical resume of the rotary pump and engine from 1688 and illustrated with clear drawings showing the construction of various forms of pumps and engines. 38 illustrations. Contained in SUPPLEMENTS 1109, 1110, 1111. Price 10 cents each. For sale by Munn & Co. and all newsdealers.

THE MIETZ & WEISS KEROSENE and GAS ENGINE

has KEROSENE cheaper and safer than gasoline. Automatic, simple, reliable. No electric battery or flame used. Perfect regulation. Belied or directly coupled to dynamo for electric lighting, charging storage batteries, pumping and all power purposes.

A. MIETZ, 129-135 4th St., New York.

ADOPTED BY U. S. GOVERNMENT. Highest Award for direct coupled Generator Set, Paris Exposition, 1900. Gold Medal, Pan-American Exposition, Buffalo, 1901.

Van Norman Universal Bench Lathes

with fine of attachments for screw cutting, milling, grinding, etc., are splendidly adapted for line experimental work, etc.

Send for catalogue.

Waltham Watch Tool Co.,
Springfield, Mass.

THE Khotal

Kerosene Stove

is a gas range for city or country homes, small, compact and powerful; burns without smoke, soot, or smell; generates its own gas from kerosene; economical in first cost and maintenance. Prices from \$3.75, upwards. Send for catalogue.

THE HYDROCARBON BURNER COMPANY,
192 Fulton Street, New York City.

A NEW RESULT from the EDISON PHONOGRAPH

Accomplished.

MR. EDISON'S LATEST INVENTIONS—THE Moulded Record & the New Reproducer

duplicate the human voice in volume and clearness. Absolutely free from scratching, perfectly smooth and uniform. The Moulded Records are "high speed," made of hard wax, freely and safely handled. New Reproducers on all Phonographs. Ask your dealer for exchange proposition "Gen" excepted. Phonographs in Nine Styles, \$10.00 to \$100.00. Records, 50c; \$5 per dozen.

NATIONAL PHONOGRAPH COMPANY, Orange, N. J.,
New York, 833 Chambers St., Chicago, 144 Wabash Ave.

"Sure Signal" AIR PUMP WHISTLE

An independent, ever-ready Whistle for boats and launches operated by other than steam power. No air tank, no fuss or bother; simply pull the handle and produce a clear musical tone reaching a half mile. Not a toy, but a practical, powerful, perfectly made China White Brass or nickel, 30 in. high. An ornament to any boat. Not expensive. Send for Price List.

ROWEN MFG. CO., South Street, Auburn, N. Y.

IS YOUR BACK WORTH \$1.50?

Our Trimmer cuts along walks and curbing and around flower-beds and shrubs, where the lawn-mower won't cut. Will you do it in the old back-breaking way with sheepshears and scissors? Not use the

"Canton" Lawn Trimmer

it cuts quickly and easily, and if your time is worth anything you can't afford to do without it.

Only Costs \$1.50
It's the best yet; push it along, work the lever, and watch the grass fly.

Send to any address upon receipt of price.

THE CANTON CO.,
1220 E. Fourth St., CANTON, OHIO.

GERE GASOLINE ENGINES

SIMPLEST BOAT ENGINES MADE
CABIN AND OPEN BOATS
ENGINE CASTINGS, BOAT FRAMES
GEOM. GERE YACHT LAUNCHING
GRAND RAPIDS, MICHIGAN.

NEW CAT FOR 4 STAMPS

Howard Two and Four Cycle MARINE AND AUTO MOBILE MOTORS

Write for Cat. Grant Ferris Co. Troy, N. Y.

ELECTRIC SEWING MACHINE MOTOR. The instructions and numerous illustrations of details contained in this article will enable any mechanic of average ability to build an efficient motor that will operate a sewing machine. The cost of materials for this machine should not exceed five dollars. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 1210. Price 10 cents by mail from this office and from all new dealers.

A TRUSGOTT BOAT

Simple, Safe, Reliable, Speedy.

Built either cabined or open in sizes from 16 to 100 feet in length. For catalogue giving full information write

Truscott Boat Mfg. Co.,
ST. JOSEPH, MICH.

Truscott Boat Mfg. Co., ST. JOSEPH, MICH.

Scientific American SUPPLEMENT CATALOGUE

1876-1902

15,000 Valuable Papers
JUST PUBLISHED.

A LARGE edition of this new catalogue now ready for distribution. Thousands of new papers are listed in it, bringing it up to date. Sixty three-column pages. Copies will be mailed free to any address in the world on receipt of request. All Supplements listed in catalogue can be supplied for ten cents each.

MUNN & CO.,
Publishers, 361 Broadway, New York.