

devoted to liquid air. There seems to be no immediate prospect of this becoming a serious competitor of ice.

INDICATOR DIAGRAMS. A Treatise on the Use of the Indicator and its Application to the Steam Engine. By W. W. F. Pullen. Manchester, England: Scientific Publishing Company. 1890. Price \$2.40.

There are already a large number of books upon the indicator, but there always seems to be a genuine opportunity for a new and helpful contribution to the literature of this subject. The author gives the result of his experience and the large number of illustrations and reproductions of the diagrams will assist those who may be unfamiliar with the use of the indicator, to obtain a very competent knowledge of the subject.

KANT AND SPENCER. By Dr. Paul Carus. Chicago: Open Court Publishing Company. 1899. 16mo. Pp. 105. Price 20 cents.

Kant will ever have an important place in the history of modern philosophy, and the keynote of his success is thoroughness, holding that all philosophy must be based upon facts. Mr. Spencer on the contrary has been, according to Dr. Carus, deficient in thoroughness and earnestness.

VOLUMETRIC ANALYSIS. By John B. Coppock, T. C. S. London: Whittaker & Company. New York: The Macmillan Company. 16mo. Pp. 92. Price 50 cents.

This is specially adapted to the requirements of students entering the science and art courses in England, but the book will prove useful to American readers notwithstanding this drawback. It is one of the best and simplest treatises we have ever seen on the subject.

FERRIC AND HELIOGRAPHIC PROCESSES. A Handbook for Photographers, Draftsmen and Sun Printers. By George E. Brown, T. I. C. London: Dawborn & Ward, Limited. 1900. 16mo. Pp. 130. Price 80 cents.

This is a most valuable book in which are given examples of the work which can be turned out by various processes, including full directions for doing the same. A thoroughly practical book on this subject has been needed for some time.

GEOLOGICAL SURVEY OF CANADA. Annual Report. New Series. Vol. IX. 1897. Large 8vo. Pp. 1046, accompanied by 8 maps and 12 plates. Price 80 cents.

The portly volume before us gives an excellent idea of the work which is being done by the Geological Survey of Canada under the direction of G. M. Dawson, LL.D., F.R.S. The reports are fully illustrated and will prove of value to all who are interested in the wonderful mineral resources of Canada.

THE SOUL OF MAN. An Investigation of the Facts of Physiological and Experimental Psychology. By Dr. Paul Carus. Chicago: Open Court Publishing Company. 1900. 12mo. Pp. 482, 182 illustrations. Price 75 cents.

This is the second edition of an important book which is published in inexpensive form. The writings of Dr. Carus are well known.

THE SIXTH ANNUAL REPORT OF THE COMMISSIONER OF PUBLIC ROADS OF THE STATE OF NEW JERSEY. By Henry I. Budd, State Commissioner, Trenton, N. J. 1899. 8vo. Pp. 237.

The public roads of the State of New Jersey, together with those of Maryland, are in many ways the model roads of the United States, and the improvements which are constantly being made are most remarkable. The book is filled with valuable matter, many of the illustrations showing the roads before and after improvements were made. The figures, etc., which are given will prove of value to all those who are interested in good roads.

MAN AND THE COSMIC PRINCIPLE. By C. A. Bowsher. Champaign, Ill. 1899. 16mo. Pp. 155. Illustrated.

METEOROLOGICAL OBSERVATIONS MADE AT THE ADELAIDE OBSERVATORY AND OTHER PLACES IN SOUTH AUSTRALIA AND THE NORTHERN TERRITORY DURING THE YEAR 1896 UNDER THE DIRECTION OF CHARLES TODD. Adelaide. 1899. Quarto. Pp. 176, maps.

ELECTRIC WIRING. By Cecil P. Poole. New York: Power Publishing Company. 1900. 18mo. Pp. 101. Flexible leather. Price \$1.

This book represents an honest effort upon the part of the author to explain the computations of wiring to the uninitiated, and to present in shape for convenient reference tables and formulas for the use of engineers, including wiring tables for alternating current motors and tables showing the corrected drop in conductive circuits. The author has succeeded admirably in his efforts and the book will certainly be at the right hand of all those who have to work out the difficult problems of electrical wiring problems, which are increasing every year.

OFFICIAL PROCEEDINGS OF THE INTERNATIONAL COMMERCIAL CONGRESS. A Conference of all Nations for the Extension of Commercial Intercourse, held under the Auspices of the Philadelphia Commercial Museum in the City of Philadelphia. Philadelphia: Commercial Museum. 1899. Quarto. Pp. 442. Price \$2.

As is well known, the International Commercial Congress was held in connection with the National Export Exposition, which was held in Philadelphia from October 12 to November 1, 1899. The volume before us is prob-

ably the most valuable reference book relative to our export trade which has ever been issued, giving as it does views of a vast number of delegates from thirty-eight foreign governments.

PRACTICAL STAIRCASE JOINERY. Edited by Paul N. Hasluck. New York: Cassell & Company. 1900. 16mo. Pp. 160. 180 illustrations. Price \$1.

The editor has performed his task in a creditable manner, and it is one of the best and most easily understood books which we have seen on the subject. Stair building is not such a very intricate subject if the principles which underlie it are properly understood.

THE FILTRATION OF PUBLIC WATER SUPPLIES. By Allen Hazen. New York: John Wiley & Sons. 8vo. Pp. 321. Price \$3.

There is no subject at present confronting the water-supply engineer more important than filtration, and the author has performed a signal service for engineers in the production of so admirable a book. That it is in its third edition is a sufficient guarantee of its excellence. The subject is making such rapid strides, and there is such a widespread interest in it, that it is to be hoped that a fourth edition outlining still further progress may be called for. It is profusely illustrated.

ELECTRIC WIRING, FITTING, SWITCHES AND LAMPS. By W. Perren Maycock, M.I.E.E. London: Whittaker & Company. New York: The Macmillan Company. 1899. 16mo. Pp. 466. Price \$1.75.

This is a practical work for electric-light engineers, wiring and fitting contractors, consulting engineers, etc. It is profusely illustrated by 360 illustrations, and gives the wiring rules of the Institution of Electrical Engineers. Of course English practice is dealt with, but American engineers can gain many helpful facts from it.

AN INTRODUCTION TO THE STUDY OF CENTRAL STATION ELECTRICITY SUPPLY. By Albert Gay, M.I.E.E., and C. H. Yeaman, A.I.E.E. London: Whittaker & Company. New York: The Macmillan Company. 1899. 12mo. Pp. 467. Price \$3.

A very timely work, dealing of course with English practice, but none the less valuable on this account. It is illustrated by 200 engravings. The book is written by two very practical electrical engineers, and the result of their labors is an eminently useful book dealing with the problems which are constantly occurring in all central station work. It is a book which can be recommended.

MAN AND HIS ANCESTOR. A STUDY IN EVOLUTION. By Charles Morris. New York: The Macmillan Company. 1900. 16mo. Pp. 238. Price \$1.25.

An effort has been made in the present volume to present the subject of man's origin in a popular manner, to dwell on the various significant facts that have been discovered since Darwin's time, and to offer certain lines of evidence never before presented in this connection, and which seem to add much strength to the general argument. The subject is of widespread interest, so that the present brief and plain presentation of it will be acceptable.

THE CRIMINAL: HIS PERSONNEL AND ENVIRONMENT. A SCIENTIFIC STUDY. By August Drähms. With an introduction by Cesare Lombroso. New York: The Macmillan Company. 1900. 12mo. Pp. 402. Price \$3.

There is no more serious problem confronting society than that of the criminal, and the classic works of Lombroso have revolutionized our ideas regarding the way they should be treated. Lombroso has set his seal upon the book and this is sufficient to emphasize its importance. The author, who is resident chaplain in the San Quentin Prison, Cal., has had ample opportunity for making exhaustive studies, and he has improved his opportunities so as to gather an almost unrivaled collection of data, which he has collated and arranged in readable form. The philosophy of crime, criminal classification and categories are all admirably treated, as well as demography of crime, hypnotism, punishment, reformation and prevention.

OUTLINES OF INDUSTRIAL CHEMISTRY. A TEXT-BOOK FOR STUDENTS. By Frank Hall Thorp, Ph.D. New York: The Macmillan Company. 8vo. Pp. 541. Price \$3.50.

It was only a few months ago that we had occasion to review this admirable book, and now we have a new and revised edition. It should be at the right hand of every chemist and teacher. It contains some of the clearest expositions of intricate chemical processes we have ever seen. The good old-fashioned spelling is retained, and so furnishes a valuable example. We have nothing but praise for this book.

A MANUAL OF ZOOLOGY. By T. Jeffrey Parker, D.Sc., F.R.S., and William A. Haswell, M.A., D.Sc., F.R.S. New York: The Macmillan Company. 12mo. Pp. 563. Price \$1.60.

It is a novelty to have a scientific book by New Zealand and Australian professors, but an examination of the book reflects great credit upon the authors. It has been adapted for use in American schools and colleges. It is an excellent text book. The information is clearly and well set forth, and the illustrations admirably elucidate the text.

ON THE BUILDING AND MONUMENTAL STONES OF WISCONSIN. By Ernest Rober son Buckley, Ph.D. Wisconsin Geological and Natural History Survey. Madison, Wis. 1898. 8vo. Pp. 544.

An important report with splendidly executed plates. Although reports of this kind are of great local value, they are also of value to those who are in any way interested in petrography or in building stones, even though they may live in another section of the country.

Business and Personal.

Marine Iron Works. Chicago. Catalogue free.
For mining engines. J. S. Mundy, Newark, N. J.
"U. S." Metal Polish. Indianapolis. Samples free.
Yankee Notions. Waterbury Button Co., Waterbury, Ct.
Metal Novelties wanted. Bliss Metal Co., Prov., R. I.
Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

Write Baker Mfg. Co., Racine, Wis., about pushing any new article. Facilities excellent.

Machine Work of every description. Jobbing and repairing. The Garvin Machine Co., 141 Varick St., N. Y.

Ferracute Machine Co., Bridgeton, N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery.

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

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.

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

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters: no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated: correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(7861) A. J. L. asks (1) asks how to get rid of an annoyance on telephone line caused by induction from 500 volt generator which has line running parallel to phone line for several hundred feet. A. You can remedy your trouble with your telephone caused by the induction of the 500 volt generator by using a metallic return wire and either cross them at the poles, or if insulated twisting them together for the entire distance over which they are liable to be disturbed. See Hopkins' "Telephone Lines," price \$1.50 by mail. 2. What causes the colors blue, green, orange, etc., in coal? A. The colors in coal are explained by the diffraction and interference of light. See any larger text book of "Physics." Such as Ganot, price \$6 by mail.

(7862) T. R. asks: I want to run five fans and 26 lights, 16 candle power each, from a dynamo. What horse power engine would it require and what size dynamo? A. You will need a 5 horse power engine to do your work with ease, and a dynamo for about forty or fifty lamps. 2. What engine would be the best to use, gas or steam? A. Gas engines have in some cases been used for such small plants, by putting a heavy balance wheel upon the engine to make its motion uniform, but a good steam engine is more commonly used. The engine you name is considered a good one.

(7863) C. A. P. asks: How many feet of wire will it take to wind the armature of the alternator described in SCIENTIFIC AMERICAN, issued September 11, 1897. A. About 800 feet or two pounds.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending APRIL 10, 1900.

AND EACH BEARING THAT DATE.
[See note at end of list about copies of these patents.]

Acid and making same, diamidodiphenylamin sulfonic, F. Schmidt..... 647,237
Acid, ester of acetylpyridonecarboxylic, R. Heymann..... 647,263
Addressing machine, L. C. Crowell..... 646,956 to 646,959
Advertising clock, H. Moon..... 647,105
Air register, E. A. Tuttle..... 647,051
Alarm, See Burglar alarm
Amalgamator, Malone & Terwilliger..... 647,011
Animal trap, G. U. Hall..... 647,258
Animal trap, W. C. Hooker..... 646,989
Antijumping strap, C. S. Marshall..... 647,102
Astronomical apparatus, G. S. Gardner..... 646,976
Automatic brake, L. Rousseau..... 647,117
Automatic gate, W. A. Streitmater..... 647,205
Automobile vehicle, J. C. Anderson..... 647,244
Ax, E. Shepard..... 647,333
Backing manufacturing machine, F. C. Ward..... 647,056
Bag, See Feed bag. Hot water bag.
Bandages, forming sacks for suspensory, R. Dove..... 646,962
Bearing machine, slab, S. W. Butterfield..... 647,074
Bars, apparatus for producing tapered, J. T. Rowley..... 647,201
Bars, producing tapered, J. T. Rowley..... 647,200
Bathtub, W. H. Silver..... 647,160
Baths, special apparatus for electric, A. Maggiorani..... 647,008
Battery, See Secondary battery. Stamper battery.
Battery case for electromedical apparatus, Mahler & Dunderdale..... 647,101
Battery plate and manufacturing same, second, J. G. Salton..... 647,426
Battery tank, storage, R. N. Chamberlain..... 647,177
Bearing, ball, E. C. Meissner..... 647,012
Bearing, disk, A. C. Lindgren..... 647,270
Bearing for shafts, roller, R. E. Ball..... 647,288
Bearing for vehicle wheels, antifriction, E. Phipps..... 647,113
Bearing for wheels, antifriction, H. F. Colby..... 647,377
Bearing, roller, E. Jones..... 646,997
Bearing, vehicle axle, A. D. Bloch..... 647,385
Bed bottom brace, spring, N. Petersen..... 647,424
Bed bottom, spring, H. A. Bacon..... 647,356
Bedstead, frame, F. C. Clapp..... 647,441
Bicycle chain, J. D. Tesser..... 647,046
Bicycle lock, H. M. Winter..... 647,125
Bicycle pump, J. H. Robinson..... 647,329

Bicycle saddle, Brodie & Blake..... 647,215
Bicycles, etc., propelling mechanism for, E. F. Nordblom..... 647,196
Binder, temporary, A. J. Heinn..... 647,094
Blackboard, eraser, rapid, E. N. Black..... 647,070
Blackboard rubber, J. G. McCreedy..... 647,013
Blind slot pivot, E. Randolph..... 647,029
Block, See Surfacing block.
Blotter holder, C. S. Treadway..... 647,206
Boiler cleaner, Hudson & Allison..... 647,408
Boiler cleaning composition, steam, J. J. Hughes..... 646,950
Boiler flues, combined fire stop and scraper for, C. S. Dean..... 647,132
Boiler tube or flue cleaner or scraper, C. S. Dean..... 647,181
Bolt, See Door bolt. Sliding bolt.
Book, bill, J. W. Hellars..... 647,067
Book, check, M. P. Exhne..... 647,389
Boring implement, Maxwell & Spain..... 647,311
Bottle manufacturing machinery, R. P. Woodill..... 647,352
Bottle, non-refillable, H. Seelinger..... 647,330
Bottle stopper, L. H. Broome..... 647,240
Bottle stopper, G. A. Higbfield..... 646,988
Box, electric machine, A. Goetz..... 647,082
Box, See Mail box. Tilt box.
Box fastener, H. M. Winter..... 647,126
Box for cigarettes, etc., M. M. Marcuse..... 647,450
Brading machine, Janeway & Roebeling..... 647,410
Brake, See Automatic brake. Car brake. Bicycle brake.
Brake, J. N. & N. P. Zech (reissue)..... 11,821
Brake shoe, A. L. Streeter..... 647,045
Bridle, H. Hammer..... 646,983
Brown powder, machine for making, M. J. Fuchs..... 647,081
Broom making machine, chuck, Redgate & Gandy..... 647,115
Broom scraper, adjustable, J. Graham..... 647,225
Buggy, top, F. Calhoun..... 646,974
Bullet casting machine, J. J. Nash..... 647,319
Burglar alarm, H. C. Johnson..... 647,412
Burner, See Gas burner.
Burning garbage, etc., apparatus for, C. T. Wheeldon..... 647,432
Button, medallion, etc., E. W. Sibley..... 647,130
Cabinet, kitchen, J. Hoon..... 647,302
Cable winding safety device, F. J. Sprague..... 647,242
Cake icing or coating machine, P. D. Harton..... 647,403
Can, See Solderless can.
Car brake, equalizing, L. C. Trombley..... 647,440
Car brake mechanism, electric, U. E. Mille..... 647,142
Car coupling, C. A. Degroff..... 646,961
Car door, R. A. P. Meade..... 647,312
Car fender, J. Currie..... 647,079
Car fender, G. L. Gebrigg..... 647,083
Car fender, T. A. Remsen..... 647,030
Car, grain, W. J. Callison..... 647,440
Car lighting apparatus, automatic switch for electric, W. F. Richards..... 647,155
Car roof, double, C. H. Hutchins..... 646,992
Car side bearing, railway, J. J. Hennessey..... 646,986
Car wheel and axle, F. Myers..... 647,146
Cars, electromagnetic traction apparatus for street, G. N. Moore..... 647,454
Carpet binding, C. K. Knapp..... 647,186
Carriage, convertible baby, Stead & Heydemann..... 647,165
Carriage foot rest, S. R. Bailey..... 646,942, 646,943
Carrier, See Cash carrier.
Cartridge cap and decapper, combined, W. N. Beardsley..... 647,066
Cash carrier, C. M. Hammond..... 647,089
Cash register, M. G. Wood..... 647,211
Cattle way gate, J. M. Files..... 647,391
Chain making machine, weldless, A. G. Strathern..... 647,044
Chains, machinery for manufacturing weldless, A. G. Strathern..... 647,167
Chair, Combination chair, "Type writer's chair," Channing machine guide, T. L. Emery..... 647,133
Chart or map hanger, A. J. Marshall..... 647,143
Churn, J. & J. F. Janney..... 646,994
Churn, J. T. Morse..... 647,015
Churn dasher, J. F. Little & P. Little..... 647,391
Cigarette cutting mechanism, W. Baggeley..... 647,174
Cigarette filling machine, Andstam & Hagelberg..... 646,988
Cleaner, See Boiler cleaner.
Clock, electric, A. Lunzen..... 647,309
Clock striking mechanism, R. Turck..... 647,050
Clod crusher, H. Preston..... 647,023
Cloth shearing machines, adjusting device for, A. Brown..... 647,439
Clothes pin, spring wire, G. R. Williams..... 647,124
Clothes rack, L. Gates..... 647,239
Cock, ball, A. J. Robinson..... 647,116
Cock, safety valve, C. W. & Barbour..... 647,133
Coin controlled apparatus, C. A. Yale..... 647,383
Coke oven pusher, S. T. Wellman et al..... 647,347
Combination chair, Y. W. Rogers..... 647,156
Commutator brushes, pressure regulator for, J. O. Moisson..... 647,016
Computing and listing machine, W. P. Shattuck..... 647,238
Cooking utensil, A. W. Meyer..... 647,145
Cork and rubber for boot heels, etc., composition of, J. J. Pearson..... 647,112
Corner plaster supporting strip, J. Koch, Jr..... 647,001
Corset steel, selector, E. A. Livens..... 647,001
Cotton gin feed mechanism, roller, H. C. Champney..... 646,954
Cotton plants, machine for thinning out and cultivating, R. J. Gatling..... 646,977
Coupling, See Car coupling. Pipe coupling.
Crate, egg, B. M. Barnes..... 647,361
Crate, fish shoring, S. C. Darrow..... 647,373
Crate, folding, S. Feaster..... 647,390
Crate, folding, A. L. Ferris..... 647,134
Crusher, See Clod crusher.
Cup, See Transfer cup.
Cut off and filter, automatic cistern, A. B. B. Harris..... 647,259
Cutter, See Fine cutter. Pencil cutter.
Cutting stick, adjustable, J. M. Cohen..... 647,376
Cutting tool, H. Hill..... 647,137
Damper, J. W. Anderson..... 646,937
Decapitator, fowl, L. M. Pratt..... 647,425
Dental plugger, L. Marshall..... 647,150
Denture, artificial, A. T. Glew..... 647,400
Die adjuster or fastener, G. W. Blakeslee..... 647,367
Digger, See Potato digger.
Disinfecting device, J. B. Bengue..... 647,130
Dock, dry, F. C. Lang..... 647,269
Door belt, S. M. Model..... 647,103
Door cushion device, W. F. Davis..... 647,379
Door indicator, electric, R. H. Boardman..... 647,071
Draft equalizer, J. E. Batten..... 646,945
Draft equalizer, A. Brouk..... 646,947
Draft equalizer, C. Fern..... 646,965, 646,966
Drawing apparatus, mechanical, I. M. B. Thompson..... 647,339
Drawing instrument, N. Baashuus..... 647,064
Dresser and commode, combined, D. Hartley..... 647,446
Drill, See Pneumatic drill.
Duster, wool, F. G. Stewart..... 647,042
Dye and making same, brown, J. J. Schenkel..... 647,236
Dye, blue diphenylmethane, Hausdorfer & Reingruber..... 647,260
Dye, green, K. Bobn..... 647,370
Dyeing, F. Just..... 646,268
Eaves troughs, machine for forming beaded, J. Mat..... 647,310
Egg beater, J. C. Tutt..... 647,341
Electric circuit safety appliance, E. Thomson..... 647,168
Electric motors, automatic brake for, M. A. Beck..... 647,436
Electric switch, W. F. Jones..... 647,414
Electric switch, centrifugal, E. Cros..... 647,254
Electrical impulse transmission, R. Bell..... 647,175
Electrically driven mechanism, F. J. Sprague..... 647,240
Electrolyzing apparatus, A. J. O. Chalandre et al..... 647,217
Electromagnetic engine, P. B. Watson..... 647,210
Elevator, F. J. Sprague..... 647,239
Elevator gate, J. E. W. Fogal..... 646,968
Engine, See Electromagnetic engine. Rotary engine. Rotary steam engine. Rotary turbine engine.
Excavating and filling machine, sewer, W. Shannon..... 647,282
Extractor, See Nail extractor.
Fabric, See Knit or other fabric. Woven fabric.
Faucet, W. Geurink..... 646,979
Faucet, self measuring, E. C. Johnson..... 646,985
Feather splitting machine, J. D. Hodge..... 647,264
Feed bag, D. Hoyt..... 647,266
Feeding trough, stock, H. W. Goodwin..... 646,980
Felly brace, C. H. H. Vaughn..... 647,054
Fence machine, slab and wire, W. F. Seaman..... 647,138
Fence post, N. B. Riddle..... 647,328
Fifth wheel, W. H. Bradshaw (reissue)..... 11,820
File, Henkel & Andersen..... 647,405
Filter, A. E. Krause..... 647,089
Filter bed, Scafe & Davidson..... 647,455
Fire escape, H. J. Billmeyer..... 647,214
Fire escape, C. P. Breining..... 647,373
Fire extinguisher, A. W. Edmunds..... 647,443
Fireproof floors, process of and apparatus for constructing, P. Esch..... 646,964
Fireproofing wood, J. Schenkel..... 647,428
Fish hook, C. B. Carpenter..... 647,104
Flue cutter, W. Miller..... 647,104
Flushing device, G. M. Jenkins..... 647,411
Fringing machine, S. Kross..... 647,100
Funnel, J. B. Paradis..... 647,111
Furnace, See Smokeless furnace.
Furnace or radiator, J. W. Johnson..... 646,986
Gage, See Steam gage.
Game apparatus, H. Theobald..... 647,017
Garment supporter, G. E. Adams..... 647,212
Gas burner, H. A. Deltiers..... 647,222
Gas burner, F. C. Gilliland..... 647,183
Gas burner, J. J. Geyewetz..... 647,183
Gas generating apparatus, acetylene, E. Evans..... 647,386

(Continued on page 253.)

A Way to Change Your Work

Prepare for a better position without neglecting your present work. Our students advance in salary and position while studying. 150,000 students and graduates.

TAUGHT BY MAIL

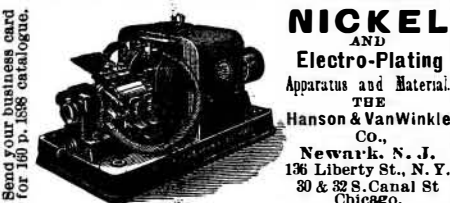
Mechanical or Architectural Drafting; Electrical, Mechanical, Steam or Civil Engineering; Architecture; Surveying; Book-keeping; Stenography, etc.
Established 1891. Capital, \$100,000. Write for circulars.
The International Correspondence Schools, Box 942 Scranton, Pa.



LAW TAUGHT BY MAIL

Professional, Elective, Commercial, Law Courses. Guarantees best instruction ever prepared. Indorsed by students and attorneys everywhere. Easy terms. Begin now.

NATIONAL CORRESPONDENCE SCHOOL OF LAW, 38 North Pa. St., Indianapolis, Ind.



NICKEL

Electro-Plating

Apparatus and Material.

Hanson & VanWinkle

Co.,

Newark, N. J.

136 Liberty St., N. Y.

30 & 32 S. Canal St. Chicago.

MAXIMUM POWER—MINIMUM COST.

If you use a pump for beer, lard, acids, starch, petroleum, brewer's mash, tanner's liquor, cottonseed oil or fluids, hot or cold, thick or thin you want to get the **TABER ROTARY PUMP** which does the most work at the least expense. Simply constructed. Can be run at any desired speed. Perfectly durable. All parts are interchangeable. Needs no skilled workman. Defects guaranteed. Catalogue free.

TABER PUMP CO., 32 Wells St., Buffalo, N.Y., U. S. A.

THE HOMEMADE WINDMILLS OF NEBRASKA.

A most valuable series of articles condensed from the Official Bulletin by Edwin Hineckley Barbour, is published in Supplements Nos. 1254, 1255 and 1256. The series is accompanied by thirty-three illustrations and gives a detailed description of a number of types of windmills which can be made by anyone who has any mechanical skill. These windmills are being made and used in large numbers in Nebraska and are giving great satisfaction. These Supplements for sale by all news-dealers, 10 cents each, or by MUNN & Co., 361 Broadway, New York City.



(Cover drawn back showing Air Sack and method of inflation)

For CAMP, YACHT, HOSPITAL and HOME.

Also AIR CUSHIONS adapted for all uses.

Send for Catalogue.

MECHANICAL FABRIC CO., Providence, R. I.

THE Batcher's A New Button

THE BEST THING YET!

Is simple and durable, and can be put on and taken off at will. Nothing like it in the world. Try a set and be convinced. If your dealer does not keep them send 25c. to us for sample doz.

THE L. & H. SUPPLY CO., 85 Commercial Avenue, Binghamton, N. Y.

ENAMEL!

High-grade Enameling done on Sheet Iron, Steel and Cast Iron.

Enamelled Signs for Advertising Purposes in All Colors. Street Names and Numbers a Specialty.

Acid-proof Enamel for Chemical and Pharmaceutical Apparatus.

Majolica Enamel for Ornamental Cast-Iron Work (New). Special Enamel for Electrical Heating Apparatus.

BALTIMORE ENAMEL CO., No. 2,

Foot Allen Street, Baltimore, Md., U. S. A.

THE Berkefeld Filter

gives a continuous flow of pure water in large or small quantities. The cylinder is made of Infusorial Earth, which retains all minute germs and impurities. The cylinder can be easily reached and cleaned as often as necessary, and taken out and boiled for sterilization purposes. Rapid filtration and the purest of water guaranteed.

BERKEFELD FILTER CO., 2 Cedar St., New York.

STANDARD STRAINER CO.,

Dripless Tea and Coffee Strainers.

37-40 MAIDEN LANE, New York.

Nickel-plated, 25 cents.

AGENTS WANTED.

ACETYLENE GAS AND CARBIDE OF

Calcium.—All about the new illuminant, its qualities, chemistry, pressure of liquefaction, its probable future, experiments performed with it. A most valuable series of articles, giving in complete form the particulars of this subject. Details of furnaces for making the carbide, gas generators, manometers, burners, etc. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 9994, 10004, 10012, 10112, 10114, 10115, 10116, 10222, 10333, 10334, 10335, 10336, 10337, 10338, 10339, 10340, 10341, 10342, 10343, 10344, 10345, 10346, 10347, 10348, 10349, 10350. Price 10 cents each, by mail, from this office, and all newsdealers.

TOLEDO COOKER CO., Box 71, Toledo, O.

The IDEAL Steam Cooker

Cooks a whole meal over one burner, on gasoline, oil, gas, or common cook stove.

Reduces Fuel Bills One-half

Makes tough meats tender.

Prevents steam and odors. Whistle blows when cooker needs more water.

Dinner Sets, Bicycles, Watches, and other valuable Premiums given with order for Cookers. Send for illustrated catalogue. We pay express. Agents Wanted.

TOLEDO COOKER CO., Box 71, Toledo, O.

Poke, animal, S. M. Reece.....	647,277
Pole changer, W. M. Chapman.....	647,291
Pole protective device, E. B. Francis.....	646,970
Post, See Fence post.....	
Potato digger, R. Rasmussen.....	647,198
Power station system, F. Sarzent.....	647,033
Precious stones, tool for holding, E. L. Anrich.....	646,939
Press, See Printing press.....	
Press, V. D. Anderson.....	647,354
Printing machine, multicolor stop cylinder, T. M. North.....	647,151
Printing press, W. K. Hodgman.....	647,406
Printing roller, E. Moreton.....	647,146
Printing surface, C. A. O. Rosell (reissue), 11,817 to 11,819.....	
Protractor, J. E. Evans.....	647,337
Pulley, See Spoke pulley.....	
Pulley expander, R. Temple.....	647,429
Pump, A. I. Sandbo.....	647,202
Pump valve, F. B. Eccleston et al.....	647,383
Pumping jack, oil well, W. W. & Q. A. Mercer.....	647,144
Race course starting device, S. Stedeker.....	647,166
Rack, See Clothes rack. Stamp rack.....	
Racking beer, R. H. Gangwisch.....	647,298
Railway, S. H. Senkins.....	647,230
Railway carriages or wagons, coupling for, R. C. J. Gauck.....	647,398
Railway crossings, automatic signal apparatus for, G. A. Vice.....	647,209
Railway ditcher, W. O'Brien.....	647,301
Railway indicator, R. H. Ford.....	647,224
Railway rail joint, J. I. Newburg.....	647,321
Railway signal, J. Jorgenson.....	647,897
Railway switch plate, F. Neilen.....	647,275
Railway tie and chair, combined, T. W. Murphy.....	647,317
Ram, hydraulic, J. M. Kline.....	647,000
Rammer, pneumatic, J. Keller.....	647,416
Reel, J. G. Bailey.....	646,941
Refrigerator overflow device, A. E. Wyatt.....	647,285
Register, See Air register. Cash register. Hot air register.....	
Regulator, See Windmill regulator.....	
Revetment, J. I. Newburg.....	647,322
Riveting machine, Carney & Gorton.....	646,952
Rocker, furniture, W. E. Kimball.....	647,231
Rod or pipe fastener, E. H. Vogel.....	647,169
Rolling mill, W. Garrett.....	647,087
Rolls, making, F. Shuman.....	647,373
Rope, cord, etc., F. E. A. Gunther.....	647,402
Rotary engine, Bell & Blake.....	647,363
Rotary steam engine, C. E. Miller.....	647,015
Rotary steam engine, E. J. Wood.....	647,172
Rotary turbine engine, J. G. Aikin.....	647,127
Safe, J. B. White.....	647,038
Scarfolding an elevator, C. F. W. Doering.....	647,321
Scale, weighing, J. B. Frem.....	647,297
Screen, Geske & Miller.....	647,399
Seal, E. Tyden.....	647,052
Sealing machine, envelop, F. B. Canode.....	647,248
Seat, See Bath seat.....	
Secondary battery, C. J. Coleman.....	647,442
Secondary battery, H. S. Gladstone.....	647,085
Seed for planting, machine for preparing, E. F. Israel.....	647,448
Self sealing jar, J. P. Lyon.....	647,233
Separator, See Grain separator.....	
Sewing machine, G. W. Baker.....	646,944
Shade adjuster, window, J. P. Bade.....	647,237
Sharpening knife, Smith & Reinhardt.....	647,040
Sharpening twist drills, machine for, M. C. Johnson.....	647,413
Shears, automatic hand over for squaring, W. B. Leeds.....	647,189
Signal, See Railway signal.....	
Skylight, J. Smith.....	647,163
Sled propeller, R. A. Kneeland.....	647,188
Sliding bolt, H. Kunz.....	647,418
Smoke consumer for locomotive or other boilers, J. A. Crawford.....	647,078
Smoke consuming apparatus, furnace, B. G. Dale & Manning.....	647,300
Smokeless furnace, E. Gessner.....	646,978
Solderless can, F. Payant.....	647,423
Spade, H. N. Hansen.....	647,081
Spader and pulverizer, combined, H. A. Bergom.....	647,069
Spike puller, N. F. Wosera.....	647,389
Spindle, See Spinning spindle.....	
Spinning, drawing, doubling, and twisting textile yarns, machine for, T. Holmes et al.....	647,138
Spinning spindle for spinning frames, ring, M. Brodeur.....	647,072
Spring, See Pumping spring.....	
Stamp rack, rubber, H. S. Folger.....	646,969
Stamper, battery, M. Weber.....	647,057
Staple setting implement, R. McKay.....	647,422
Starboring machine, W. W. Finton.....	647,444
Steam gauge, W. I. Staaf.....	647,164
Stereotyping, etc., composition for, A. Kraus.....	647,414
Stoker, automatic, R. Hutchinson.....	647,303
Stone, etc., portable tool for working, J. O'Rourke.....	647,021
Stool, camp, J. A. Wiles.....	647,171
Stopper, See Bottle stopper.....	
Stove, cooking and heating, H. D. W. Sawyer.....	647,427
Stove, hot blast, G. W. Adams.....	647,149
Stove, laundry, Blair & Broug.....	646,946
Strap, See Antijumping strap.....	
Street cleaning machine, band, R. W. Furnas.....	647,396
Street gutter cleaning machine, R. W. Furnas.....	647,395
Stronita, making, S. B. Newberry.....	647,320
Stud collar, B. & Wosera.....	647,247
Stud guard or protector, J. Cameron.....	647,176
Sugar, making, Oxnard & Baur.....	647,109
Suit hanger, C. E. Haley.....	647,227
Surfacing block and track liner, H. W. Watson.....	647,343
Switch, See Electric switch.....	
Tablet making and tracing machine, F. L. Seely.....	647,331
Tachometer, J. Aumund.....	646,940
Tank, See Battery tank. Leaching tank.....	
Tanks for water, etc., manufacture of, J. F. Crease.....	647,293
Tap, bottle, J. W. Waynick.....	647,344
Tarret trap, E. Sherman.....	647,038
Telegraphy, apparatus employed in wireless, G. Marconi.....	647,007
Telephone exchange and fire alarm system, combined, J. M. Latimer.....	647,307
Telephone signaling system, N. H. Holland.....	647,300
Telephone system, house, T. M. Dunn.....	647,253
Tellurian, J. H. Costello.....	647,252
Tellurian, T. W. Smith.....	647,204
Thill support, F. A. Crocker.....	647,253
Thill support, Curry & Davis.....	646,960
Tie, See Railway tie.....	
Tile machine, A. Weil.....	647,431
Tilting box, W. E. nondes.....	647,293
Tire, bicycle, R. Barrie.....	647,213
Tire, cellular elastic, A. Kitson.....	647,098
Tire fastener for vehicle wheels, C. Waechter, Jr.....	647,170
Tire, pneumatic, Lins & Gunther.....	647,190
Tire, pneumatic, J. J. Adair.....	646,953
Tire setting and cooling machine, J. H. Horn.....	647,407
Tire, vehicle, H. Schnepp.....	647,118
Tires, compounding fillings for rubber, T. Seebausen.....	647,119
Tobacco pipe, Voit & Messersmith.....	647,122
Tool holder, E. Perry.....	646,967
Toothpick holder, H. E. Knapp.....	647,187
Toy, C. J. Reblin.....	647,327
Traction wheel, J. C. Anderson.....	647,245
Tramway clutch, C. L. Crawford.....	647,221
Transfer cup, D. T. Berliheimer.....	647,365
Trap, See Animal trap. Target trap.....	
Trolley, J. B. Lynch et al.....	647,193
Trough, See Feeding trough.....	
Truss, J. W. Bradford.....	647,372
Tufting machine, D. E. Rowley.....	647,199
Tufting pin or button, W. P. Peng.....	647,139
Tug, tibia, G. W. F. Palmer.....	647,323
Tumbler washer, J. H. Garand.....	647,182
Type distributing apparatus, Fraser & Rose & Rose.....	646,972
Type distributing apparatus, automatic, Fraser & Rose.....	646,971
Typewriter, M. S. Carmona.....	647,275
Typewriter's chair, F. Chichester.....	647,178
Typewriting machine, F. Mayer.....	647,271
Typewriting machine, A. Schneeloch.....	647,035
Typewriting machine, C. D. Wallace.....	647,055
Undervest, J. B. Phillips.....	647,154
Valve, E. E. Frederick.....	646,973
Valve, J. C. Wood.....	647,351
Valve and valve actuating mechanism for pump, etc., G. B. Petsche.....	647,153
Valve, gas or water, A. Klawon.....	646,999
Valve gear, cut off, W. L. Russell.....	647,082
Valve gear, engine, J. H. Ansell.....	647,355
Valve, renewable seat, E. H. Lunken.....	647,192
Valve, three-way, F. W. Merritt.....	647,192
Vehicle brake block, M. Potter.....	647,114
Vehicle frame, motor, W. Hay.....	647,261
Vehicle, motor, R. Hagen.....	646,982
Vehicle, motor, F. K. Irving.....	646,983
Vehicle operating mechanism, motor, W. Hay.....	647,262
Vehicle rubber iron, E. W. Palmer.....	647,152
Vehicle seat lock, G. J. Zach.....	647,286
Vehicles, etc., driving mechanism for motor, W. Hay.....	647,404
Vehicles, storage battery suspension for motor, G. H. Condict.....	647,251
Vending apparatus, coin controlled, photograp.....	647,185
Voting machine, J. Boma.....	647,437
Wagon, dumping, S. J. Wetmore.....	647,284
Warping reel thread guide, W. H. Bartolet.....	647,065

(Continued on page 255)

A Smith Premier Typewriter

will do better work for a longer time, with less exertion, than any other writing machine. Thousands of satisfied users pronounce it....

Perfectly Simple and Simply Perfect.

Let it lighten your business burden.

ILLUSTRATED CATALOGUE FREE.

The Smith Premier is especially adapted to the "Touch System" of Typewriting.

The Smith Premier Typewriter Co. 3333 Syracuse, N. Y., U. S. A.

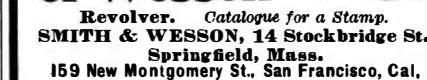


The Typewriter Exchange

1 1/2 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.
3 West Baltimore 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.

Burglar Alarm.

The BEST is a **Smith & Wesson** Revolver. Catalogue for a Stamp. SMITH & WESSON, 14 Stockbridge St. Springfield, Mass. 159 New Montgomery St., San Francisco, Cal.



Spanish Mauser Rifles & Carbines

In complete first-class serviceable order, captured in late war. 10,000 sold to us by U. S. Government, with five million ball cartridges in clips. Before exporting, we offer limited number at \$10.00 each, packed for shipment. Cartridges, \$3.00 per one hundred. F. BANNERMAN, 579 Broadway, New York, Dealer in Military Goods and War Relics.

Alois P. Swoboda

Teaches by mail, with perfect success, his original and scientific method of Physiological Exercise, without any apparatus whatever, and requiring but a few minutes' time in your own room just before retiring. By this condensed system more exercise can be obtained in ten minutes than by any other in two hours, and it is the only one which does not overtax the heart.

It is the only natural, easy and speedy method for obtaining perfect health, physical development, and elasticity of mind and body.

Perfect Health means an absolute freedom from those ailments which a well-informed mind knows are directly or indirectly due to a lack of properly arranged exercise.

Pupils are of both sexes, ranging in age from fifteen to eighty-six, and all recommend the system. Since no two people are in the same physical condition individual instructions are given in each case.

Write at once for full information and Booklet, containing indorsements from many of America's leading citizens, to

ALOIS P. SWOBODA,

34-36 Washington Street, Chicago, Ill.

"Hawkins' New 1900 Catechism" OF THE STEAM ENGINE.

PRICE, \$2.00.

Postpaid to any address. A practical book on engine running, valve setting, etc. Strictly up-to-date. Money refunded if not satisfactory.

THEO. AUDEL CO., 63 Fifth Ave., New York City.

READY SHORTLY.

AN AMERICAN BOOK ON

Horseless Vehicles, Automobiles and Motor Cycles.

OPERATED BY

Steam, Hydro-Carbon, Electric and Pneumatic Motors.

By GARDNER D. HISCOX, M. E.

Author of "Gas, Gasoline and Oil Vapor Engines," and "Mechanical Movements, Devices and Appliances."

PRICE \$3.00 POSTPAID.

This work is written on a broad basis, and comprises in its scope a full illustrated description with details of the progress and manufacturing advance of one of the most important innovations of the times, contributing to the pleasure and business convenience of mankind. The make-up and management of Automobile Vehicles of all kinds is liberally treated, and in a way that will be appreciated by those who are reaching out for a better knowledge of the new era in locomotion. The book is up to date and very fully illustrated with various types of Horseless Carriages, Automobiles and Motor Cycles, with details of the same.

Large 8 vo. About 400 pages. Very Fully Illustrated.

Send for circular of contents.

MUNN & CO., 361 Broadway, New York

Puncture Proof Folding Boat. Adopted by the U. S. War and Navy Depts. in March and Sept., 1899. Only medal awarded at World's Fair. Beautiful models, perfectly safe for family as well as sportsmen's use. Sails, center boards, rudders, King Folding Canvas Boat Co., Kalamazoo, Mich., U. S.

NEW EAST RIVER BRIDGE COMMISSION, CITY OF NEW YORK.

NOTICE TO CONTRACTORS.

For the information of intending bidders on the Approaches of the New East River Bridge in the Boroughs of Manhattan and Brooklyn, respectively, and in order that they may have ample time to prepare their estimates, notice is hereby given that the Forms of Contracts, Plans and Specifications will be ready for inspection at the Office of the Chief Engineer, 81 Broadway, Borough of Brooklyn, on and after the 23d day of April, 1900.

The time for opening the bids will be determined upon at an early date, which will be announced in a subsequent advertisement.

By order of the Commission of the New East River Bridge.

JOHN W. WEBER, Commissioner and Acting Secretary.

New York, April 5, 1900.

A NICKEL BABY FOR \$1

YOUR MONEY BACK IF YOU DON'T LIKE IT.

Founded by Mathew Carey, 1785.

HENRY CAREY BAIRD & CO.
INDUSTRIAL PUBLISHERS, BOOKSELLERS & IMPORTERS
810 Walnut St., Philadelphia, Pa., U. S. A.

Our New and Revised Catalogue of Practical and Scientific Books, 32 pages, 8vo; a catalogue of Books on Steam and the Steam Engine, Machinery, etc.; a Catalogue of Books on Sanitary Science, Gas Fitting, Plumbing, etc., and our other Catalogues and Circulars, the whole covering every branch Science applied to the Arts, sent free and free of postage to any one in any part of the world who will furnish his address.

ELECTRICAL ENGINEERING TAUGHT BY MAIL
Thousands are successful in obtaining better positions and salaries studying at home by our mail system. We teach Electrical Engineering, Mechanical Engineering, Mechanical Drawing, Electric Lighting, Short Popular Electrical Course, Elementary Mathematics, etc., by mail. Study in spare time only. Institute endorsed by Thomas A. Edison and others. Catalogue free.
ELECTRICAL ENGINEER INSTITUTE.
Dept. A, 242-242 W. 23d Street, New York.



Why Not Make Rubber Stamps?

Our "New York" Rubber Stamp Vulcanizers received the only medal awarded any Vulcanizer, World's Fair, Chicago. Simple process. Large profits. Circulars free.
Barton Mfg. Co., Dept. A, 338 B'way, New York, U. S. A.

BOYS

Does your father make you take care of his Bicycle Lamp? If so, make him get

The Majestic

for its the easiest Lamp

TO FILL—because the carbide pot is marked so the quantity of carbide is easily gauged.

TO LIGHT because the water feed is perfectly controlled by a lever.

TO CLEAN—because the reflector and its glass protector are removable by simply pressing a button.

Send for a catalogue and give it to him.

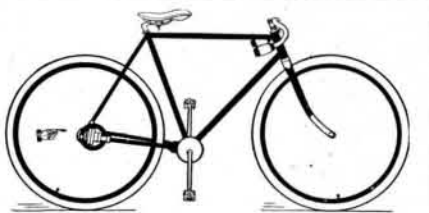
Edw. Miller & Co., Meriden, Ct.

A. W. FABER

Manufactory Established 1761.
LEAD PENCILS, COLORED PENCILS, SLATE PENCILS, WRITING SLATES, STEEL PENS, GOLD PENS, INKS, PENCIL CASES IN SILVER AND IN GOLD, STATIONERS' RUBBER GOODS, RULERS, COLORS AND ARTISTS' MATERIALS.
78 Reade Street, New York, N. Y.
Manufactory Established 1761.

The Ideal Hunting Shoe

The concentrated product of fifty years of shoemaking skill. Ten inches high, Bellows tongue, uppers gray color, soft as a glove, tough as steel, cannot be bared. The best storm-proof shoe ever placed on sale for Klondike, miners, surveyors, engineers, and any one requiring perfect foot protection. Thousands of pairs sold to satisfied patrons. *Illustr. Catalogue Free.*
M. A. SMITH & SON,
Manufacturers, 29 and 31 N. 13th St., Philadelphia, Pa.



STUDY BICYCLES

The particular feature that distinguishes the

MONARCH Bevel-Gear CHAINLESS

from other bicycles is its continuous frame connection, enclosing rear gear. A feature not found on any other wheel.

The frame is what a bicycle depends upon for strength. The Monarch frame is the strongest made. People who are riding Monarchs investigated and found "the quality" in the wheel.

Call and we will be pleased to show and explain their advantages. Write for our novel, interesting and instructive catalogue.

Monarch Bevel-Gear Chainless, \$60
Chain Models, - - - \$25 to \$40

MONARCH HEADQUARTERS,
NEW YORK, N. Y. CHICAGO, ILL.

Washing machine, J. Arnold.....	647,433
Washing machine, H. Klein.....	647,306
Water elevating and carrying apparatus, H. H. Harless.....	646,984
Water heater, R. Schumbecker.....	647,137
Waterworks system, P. J. Moran.....	647,017
Weighing and bagging machine, A. C. Bosworth.....	647,371
Weighing machine, liquid, E. Handy.....	647,040
Well drilling machine, F. K. Wiedner.....	647,343
Wheel, See-Car wheel. Fifth wheel. Grinding and polishing wheel. Traction wheel.....	
Wheel rims and means for holding covers of pneumatic tubes thereto, J. Cottrell.....	647,077
Winding machine, ball, J. K. Hammett.....	647,256
Windmill regulator, automatic, Bruis & El-dredge.....	646,950
Window guard, H. Levy.....	647,419
Wire stretcher and tightener, P. E. Gold.....	647,401
Woven fabric, W. T. Smith.....	647,335
Yoke center and pole tip, combined neck, J. G. Rieff.....	647,278

DESIGNS.

Badge, N. S. Boynton.....	32,462
Belt body, J. Livingston.....	32,521
Bolster, body, J. G. Floyd.....	32,504
Bottle, S. R. Kelly.....	32,471
Bottle, F. Schilling.....	32,470
Bracket, roller, E. F. Hartshorn.....	32,493
Brooder, C. S. Newson.....	32,508
Butter cutting machine die, M. F. Meehan.....	32,488
Button, collar, B. F. Adt.....	32,464
Clear punch, J. J. Dittgen.....	32,476
Elevator nozzle, hydraulic, G. H. Evans.....	32,459
Elevator throat, hydraulic, G. H. Evans.....	32,500
Pye, F. P. Herriek.....	32,465
Fabric, decorative, H. Giebel.....	32,522
Faucet handle, A. S. Hills.....	32,456
Faucet handle, A. J. Lyle.....	32,465
Food cutter frame or casing, J. W. Brown, Jr.....	32,487
Fruit picker, M. D. L. Hurley.....	32,489
Game board, E. F. Adams.....	32,518
Heel plate, F. A. Snell.....	32,519
Hod wood, C. T. McCurrol.....	32,491
Husking pin, R. F. Clark.....	32,483
Inhalation apparatus casing, W. C. Clark.....	32,479
Inhalation apparatus feed pipe, W. C. Clark.....	32,480
Injectors, casing for blanks for double or composite, Park & Williston.....	32,501
Injectors, casing for double or composite, Park & Williston.....	32,502
Jar or receptacle, E. K. Lemingwell.....	32,472
Lamp body, portable electric, J. S. Meade.....	32,507
Lamp, vehicle, A. H. Atwood.....	32,506
Last, shoe, F. P. Olds.....	32,520
Machine leg, A. J. Gillespie.....	32,510
Necktie fastener, F. J. Callaghan.....	32,468
Nut locking washer, J. Dickason.....	32,492
Organ case, E. Ehinger.....	32,512
Piano case, P. G. Garber.....	32,513 to 32,517
Pin, L. M. Zell.....	32,463
Pipe cleaner, F. J. Harding, Jr.....	32,482
Pitcher, H. Brun.....	32,473
Plate or similar article, C. J. Ahrenfeldt.....	32,468
Press frame, N. Du Brul.....	32,511
Rein supporter, T. W. McKelvey.....	32,494
Scale beam, W. F. Stimpson.....	32,503
Scraper, G. C. Bowles.....	32,484
Spatula, E. C. Richter.....	32,481
Spoons, forks, ladles, etc., handle for, A. F. Jackson.....	32,467
Spraying nozzle casing or cap, J. A. Watson.....	32,498
Staple extensor, M. Searls.....	32,486
Statue, F. D. Higbee.....	32,474
Table leg brace piece, J. Gillespie.....	32,475
Tooth, artificial incisor, A. T. Grew.....	32,478
Towel rack member, Reeves & Johnson.....	32,490
Truck, vehicle, L. S. Buffington.....	32,505
Twine holder, J. A. Thompson.....	32,475
Valve body, P. E. Apgar.....	32,497
Weed chain hook, C. F. Heine.....	32,485
Work bag, M. J. Elliott.....	32,477

TRADE MARKS.

Antidote for malaria, Dr. Patton Medicine Company.....	34,473
Antifat preparations, Rational Laboratory and Research Company.....	34,474
Brick, Ligonier Silica Brick Company.....	34,477
Canned corn, R. F. & G. H. Mitchell.....	34,461
Cleaning purposes, powder for, C. V. Broughton.....	34,465
Compounds for treatment of the skin and mucous membranes, T. Wolfram.....	34,468
Corsets and underwaists, ladies', Bay State Corset Company.....	34,452
Cotton goods, certain named, H. Norden.....	34,445 to 34,451
Elastic textile goods, Hub Gore Makers.....	34,454
Filler compounds or surfaces, Flood & Conklin Company.....	34,467
Flour, F. G. Stritzinger & Company.....	34,464
Foods, certain named, J. Carter & Company.....	34,463
Golf supplies and sundries, certain named, National Cement and Rubber Manufacturing Company.....	34,458
Hair curlers, J. J. Rumill.....	34,456
Horse boots, D. L. Campau.....	34,455
Lithographs, certain named real and imitation, Lithotone Colorotype Company.....	34,443
Meat extract, albumen, and preparations of all kinds, Toril Elweiss & Fleischpraeprations Company, Gesellschaft mit Beschränkter Haftung.....	34,460
Medicinal preparation for certain named diseases, R. Kovacic.....	34,471
Medicinal preparation for certain named uses, Soule Medical Company.....	34,472
Metals, antifriction, M. B. Dunbar.....	34,478
Oat food, Washburn, Crosby Company.....	34,462
Pencils, penholders, and steel pens, Lead, Eagle Pencil Company.....	34,444
Pins, hair pins, and hooks and eyes, Sterling Pin Company.....	34,457
Printing presses and certain named printers' supplies, Liberty Machine Company.....	34,475
Remedies for certain named diseases, H. P. Ramsdell.....	34,470
Remedy for certain named diseases, Koeb Lung Cure Company.....	34,469
Silver articles and tableware, sterling, W. B. Kerr & Company.....	34,442
Stoves, ranges, and furnaces, Rathbone, Sord & Company.....	34,476
Trousers, excepting rubber or waterproof trousers, men's, J. Bennett & Company.....	34,453
Whisky, Wilson Distilling Company.....	34,459

LABELS.

"C. Barthelmy's Herbal Extract," for a medicine, J. Wolf.....	7,471
"Celebrated Cascarella Stomach Bitters," for bitters, H. C. Paulson.....	7,465
"Co-do-rett," for a beverage, Simpson Spring Company.....	7,467
"Craw & Ford's Compound English Mustard," for a mustard, William H. Crawford Company.....	7,473
"Daylight Matches," for matches, Safe Harbor Match Company.....	7,464
"Duck's Back Waterproof Fiber," for wrapping paper, Mullatieu & Company.....	7,463
"Eureka Hair Restorative," for a hair restorer, B. M. Riordan.....	7,460
"Prairie Baking Powder," for baking powder, W. W. Walker.....	7,472
"Railway Ticket," for cigars, J. Simon.....	7,465
"Salt Cod Square," for codfish, J. A. Treat.....	7,474
"Solid and Reliable Footwear," for boots and shoes, Craddock-Terry Company.....	7,462
"Twilight Orange Pekoe," for tea, Bemis Brothers Bag Company.....	7,466
"Uterine," for a medicine, J. H. De Wolf.....	7,470

PRINTS.

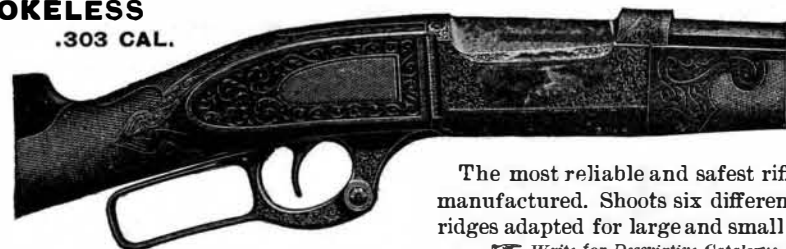
"Lynch & Company, Fish, New York," for fish, Lynch & Company.....	218
"The Parker Universal Garment Fastener," for a garment fastener, Parker Novelty Company.....	219

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1885, will be furnished from this office for 10 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York. Special rates will be given where a large number of copies are desired at one time.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are promptly applied for. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

SAVAGE Hammerless Magazine Rifle

SMOKELESS
303 CAL.



The most reliable and safest rifle ever manufactured. Shoots six different cartridges adapted for large and small game.

Write for Descriptive Catalogue A.

SAVAGE ARMS CO.

UTICA, NEW YORK, U. S. A.

Point Blank Range for Hunting.

The Only Hammerless Repeating Rifle.

Ghost of the Glacier

And Other Tales, including Making a Revolution, Susquehanna Trail, Sculpture of the Elfs, Once a Pillar of the World, Feathers of Fashion, and others. A delightful volume, beautifully illustrated. Ready for distribution about May 1. Send 10 cents to T. W. Lee, General Passenger Agent, Lackawanna Railroad, 26 Exchange Place, New York City. Edition Limited.

50 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.

CAPE NOME, CAPE YORK, ST. MICHAEL, DAWSON AND ALL POINTS ON THE YUKON RIVER DIRECT.

Operating ITS OWN Fleet of First-Class Ocean Steamships

ST. PAUL, PORTLAND, BERTHA, RAINIER, DORA and others.

Full Line of River Steamers on the Yukon.

Under contract to deliver United States Mails throughout the Territory.

First Departure, APRIL 30th, and Fortnightly thereafter.

For new Folders, Maps and further particulars as to Freight and Passage, write to

ALASKA COMMERCIAL COMPANY,

310 SANSOME STREET, SAN FRANCISCO, CAL., for all particular

FOR SALE.

The entire plant of THE UNITED STATES PIN CO., located at Seymour, Conn., on the line of N. Y., N. H. & H. R. R. (Nauvauk Division), consisting of buildings, real estate and valuable water power on Nauvauk River, including all machinery used by the above mentioned company for the manufacture of pins.

For full particulars and price address:

UNITED STATES PIN CO.,
Or, OLIN L. DIBBLE, Seymour, Conn.

WANTED.—By a large manufacturing plant in the Middle West, a pattern maker familiar with agricultural implement work. Must be a comparatively young man and thoroughly competent in all departments of his trade. Steady employment for the right man. Address, giving references and experience as well as salary expected, S. B. 68, care Scientific American, New York.

WANTED.—An extensive manufacturing establishment, located between Cleveland and Chicago, has an opening for a young and competent chemist who is thoroughly familiar with up-to-date foundry practice. Must know his business in all its details. State experience, give references, name salary expected and address O. J. 55, care Scientific American, New York.

EVOLUTION OF THE AMERICAN LOCOMOTIVE.—By Herbert T. Walker. A valuable series by a member of the National Railway Museum Committee. The locomotive from 1825 to date is described and illustrated by careful drawings, great attention being given to historical accuracy. 21 illustrations. SCIENTIFIC AMERICAN SUPPLEMENTS 1112, 1113, 1114. Price 10 cents each. For sale by Munn & Co. and all newsdealers.

500 BICYCLES \$3.10
all makes, good as new, to
NEW 1900 Models, \$11 to \$20
'98 & '99 Models, high grade, \$8 to \$13
Great factory sale, direct to rider. We ship anywhere on approval; send us an order.
EARN A BICYCLE distributing
Catalogues for us. We will give one Rider
Agent in each town. **FREE** use of sample
wheel to ride and exhibit.
WRITE AT ONCE for Bargain List and our
SPECIAL OFFER. Address Dept. 62 L.
MEAD CYCLE CO., Chicago.

CALCIUM CARBIDE EXPORT CO.,
35 NASSAU STREET, NEW YORK.
(A B C Code.) Cable Address: BRYAXE, NEW YORK.

BOYS PAPER FREE if you will send names of 12 boys friends over 12 years of age we will send you the Star for 3 months free. Greatest boys' paper published. Address with stamp, THE STAR, Dept. 84, OAK PARK, ILLS.

STANDARD CAP VALVE
for Automobiles, Carriages and Bicycle
Tires. Price, per pair, 25c. Is adapted to any
valve now in use. Has no springs, pumps freely,
and is guaranteed to be absolutely air-tight. We
manufacture all styles of air and fluid check valves.
The foreign patents are for sale.
STANDARD VALVE CO.,
186 Liberty St., New York.

YOU MAKE BIG MONEY Entertaining
CAN the Public with
Motion Pictures, the new Grapho-Amphiphone Talking
and Musical Combination and Panoramic Stereoscopic
Views \$60 to \$300 per week without previous experience.
Only a little money needed to start with, and any man
can operate our outfits successfully. Write for catalog.
Entertainment Supply Co., 56 & 58 Fifth Av., Chicago.

D. L. HOLDEN
1336 BEACH ST. PHILADELPHIA PA.
SOLE MANUFACTURER
REVEALED ICE MACHINES
SEE FIRST PAGE, SCIENTIFIC AMERICAN SEPT. 2, 1899.

PLEASE PAY EXPENSES and
per month. Steady position; self-selec-
ter; no experience needed. Send 2c for contract.
PLEASE MFG. CO., Cincinnati, O., Dept. 10.

Brass Band
Instruments, Drums, Uniforms,
& Supp. les. Write for catalog, 445
illustrations. **FREE** it gives in-
formation for musicians and new
bands. **LYON & HEALY,**
88 Adams St., CHICAGO.

Ninety per cent of the **CAPE NOME GOLD** output will be dredged out and saved by

KROGH'S CENTRIFUGAL SAND PUMPS

and Drake's Amalgamators. The only machines that have stood the most exacting tests of practical miners.

KROGH MANUFACTURING CO. 9 to 17 Stevenson St., San Francisco. Patentees and Builders.

In daily operation at the works. Builders of modern MINING, DRAINING and IRRIGATION MACHINERY of highest efficiency. Send for Descriptive Catalogue.