



Portrait Copyrighted by Rockwood, 1897.

THE GREAT WARNER LIBRARY COMPLETED.

The Special Introductory Club Price To Be Advanced.

THE completion of the remarkable Library of the World's Best Literature is accomplished. It is indeed the literary event of the present generation. All that remains now, in order that complete sets may be delivered to the thousands of people who have taken advantage of the introductory price as offered by Harper's Weekly Club, is the printing of the last volume.

When this volume comes from the press, as it undoubtedly will some time during the present month, the special price and easy payments, that are just now offered by Harper's Weekly Club, will be withdrawn, and the regular subscription canvas at full prices will be inaugurated.

We have no hesitation in advising our readers to take advantage of the present opportunity, as we believe the Warner Library is a work of such extraordinary character that sooner or later it

will find its way into every home of culture and refinement.

That such a marvelous survey of the literature of the world, with exposition and criticism of the foremost living men of letters, can be had for a sum less than the cost of the simplest collection of single volumes, makes this a Library which, from the standpoint of economy alone, no lover of books can afford to be without.

A postal card sent to Harper's Weekly Club, or Fifth Ave., New York, will secure full particulars regarding the favorable terms upon which it is being offered (during publication) to Club members, and which will positively be withdrawn as soon as the last volume comes from the press.

In calling the attention of our readers to this passing opportunity, we believe we are doing them a special favor.

PHYSICAL AND SCHOOL APPARATUS



TOEPLER HOLTZ SELF CHARGING MACHINE
For School, College or X Ray work.
Circular free.
E. S. RITCHIE & SONS, Brookline, Mass.

The Edison Lalande Battery.

The Ideal Battery for Gas Engines. Absolutely Constant. Durable. Simple. No loss of energy while cell is idle. Very low internal resistance. Large ampere. No attention required until all energy of elements is exhausted. Will not freeze. Seven different types, each designed for special work. Used by the largest gas engine manufacturers in the world.
Send for Catalogue and Price List.
THE EDISON MFG. CO.
Thos. A. Edison, Proprietor,
112 EAST 23D ST. NEW YORK

ROCK DRILLS AIR COMPRESSORS

SIMPLEST, MOST EFFICIENT and DURABLE.

RAND DRILL CO.

Send for Catalogue. 100 Broadway, New York.

WOODEN TANKS.

For Railroads, Mills and Manufactories. Builders of Steel Towers and Tanks. La. Red Cypress Wood Tanks a specialty.
W. E. CALDWELL CO.,
217 E. Main Street, Louisville, Ky.

WORKS LIKE A CHARM.

Perfect satisfaction is experienced using our No. 5, 6 or 9 Hand Pipe Threading and Cutting Machines. Crank or ratchet power. Gears housed from dust. Chasers set by graduation to any size, can be released from threading while in motion, opened to permit pipe being cut, and instantly closed.
Send for Free Catalogue to
The Merrell Manufacturing Co., 501 Curtiss Street, Toledo, Ohio.

SCREW PITCH GAUGE.

Has 20 pitches—9 to 40. Can be used inside a small nut. Five other styles, Whitworth and V thread.
Send for Free Catalogue to
The S. S. STALLITT CO., Box 13, Athol, Mass., U. S. A.

THE BICYCLE: ITS INFLUENCE IN Health and Disease.—By G. M. Hammond, M.D. A valuable and interesting paper in which the subject is exhaustively treated from the following standpoints: 1. The use of the cycle by persons in health. 2. The use of the cycle by persons diseased. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

A TIGHT GRIP.

The SKINNER PATENT DRILL CHUCK is simple, strong, and accurate. The jaws are of hardened tool steel. Stands severest tests. Is self-centering, self-tightening, most durable. Holds straight or taper shank drills.
Send for catalogue.
SKINNER CHUCK CO., Church St., New Britain, Conn.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

MARCH 22, 1898,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Abrasive appliance, O. F. Felix.....	601,133
Acid, extracting tannic, H. M. Rau.....	601,170
Adjustable chair, J. M. Bulkley.....	601,085
Aerial navigation, T. Leibrand.....	600,878
Air compressor, hot air, Anderson & Erickson.....	601,061
Alarm. See Burglar alarm. Burglar and fire alarm.....	
Alarm gage, electrical, J. Hackney.....	600,866
Auger, earth, A. F. Bauer.....	601,116
Auger, earth, J. G. Jordan.....	600,875
Automatic switch, F. Boch.....	601,049
Automatic switch, F. S. Rogers.....	601,045
Awl, N. D. Chase.....	601,123
Bag. See Hand bag.....	
Balance, C. H. Mattice.....	600,979
Banjo attachment, W. Kumpf.....	600,918
Barrel hoop, W. D. Marshall.....	601,079
Battery, W. Morison.....	601,042
Battery or turret for coast defense, A. Schausten.....	600,891
Bed pan, M. A. Slatter.....	601,084
Bed roller guide or track, G. Kern.....	600,915
Bedstead, invalid, G. E. Homan.....	601,001
Bed clamping device, J. Hankin.....	600,869
Benjamin orange, C. H. H. S.....	601,063
Berth, ship's, W. P. Hoskins.....	601,143
Bicycle, D. W. Caswell.....	601,122
Bicycle, J. G. Mooney.....	601,025
Bicycle air pump, G. W. Cook.....	601,126
Bicycle brake, R. Hoffman.....	601,197
Bicycle brake and support, L. Tuchscherer.....	601,185
Bicycle lock, E. Franke.....	600,962
Bicycle lock, W. Slingerland.....	601,047
Bicycle support, J. J. Whittle.....	601,109
Blank for negotiable instruments, J. J. Kulage.....	600,917
Block. See Thrust block.....	
Blower, rotary, T. W. Green.....	601,136
Blowpipe, H. King.....	601,208
Bluing device, clothes, Rabbi & Lett.....	600,953
Board. See Clip board. Wagon shoveling board.....	
Boiler. See Steam boiler.....	
Boiler flues, device for removing scale from, H. Lauer.....	601,151
Boilerstand, F. V. Winters.....	600,903
Bolster, C. E. Bauer.....	601,032
Books, boxes, etc., method of and apparatus for veneering with celluloid covers and corners of, A. C. Hafely et al.....	601,214
Book or shoe tongue, G. T. Woodside.....	601,102
Bottle, O. G. Oden.....	601,102
Bottle, A. T. Plummer.....	601,166
Bottle, non-refillable, D. M. Beal.....	601,117
Bottle stopper, A. Voelker.....	600,901
Bottle stopper dust guard, G. Knielmen.....	601,183
Box. See Car spit box. Electric contact box.....	601,037
Boxes, etc., machine for securing in position bottoms of pasteboard, M. Heinemann.....	600,871
Brace. See Metal brace.....	
Bracket. See Staging bracket.....	
Brake. See Bicycle brake. Car brake. Vehicle brake. Wagon brake.....	
Bread making machine, P. F. & A. F. Bryce.....	601,221
Broom clamp, reversible, W. Stutler.....	600,956
Brush, J. F. Herbert.....	601,056
Buffing or sandpapering machine, J. H. Ryder.....	600,933
Burglar alarm, J. M. Kramer.....	601,157
Burial case, D. H. Harrison.....	601,181
Burial casket, T. S. Garrison.....	601,153
Burner. See Gas generating burner. Hydrocarbon burner.....	
Button, cuff, A. V. Groupe.....	601,137
Cab, hansom, Faradis & Desrosiers.....	601,202
Cab, hansom, Faradis & Desrosiers.....	601,202
C. Seguy, L. Roentgen ray photography, portable.....	601,172
Can opener, I. Hamel.....	601,139
Can opener, S. D. Talbert.....	601,182
Cane header, sugar, C. W. MacWilliams.....	601,153
Cane on cane carriers, apparatus for storing and feeding sugar, J. P. Kemper.....	601,149
Cant hook, J. M. Ellis.....	601,033
Capsule machine, D. Genese.....	600,863
Car brake, electric motor, Hayes & Carbine.....	601,206
Car coupling, J. D. Bryan.....	601,119
Car coupling, Kitter & Moyers.....	600,983
Car coupling, W. T. Wilson.....	600,995
Car couplings, uncoupling lever and lever lock for, W. Kelso.....	601,020
Car fender, J. F. Eisenhower.....	601,131
Car fender, S. F. Moore.....	601,155
Car fender, street, A. W. Routh.....	601,046
Car or other ventilator, railway, W. E. Andrew.....	601,203
Car, ore, G. E. Trux.....	600,881
Car roofs, means for draining, C. A. Mann.....	600,923
Car spit box, E. Margolies.....	601,000
Car, street railway, Garey & Landon.....	601,054
Car ventilator and dust excluder, railway passenger, B. W. Garrett.....	600,896
Cars, pneumatic controlling system for electric, S. H. Short.....	600,896
Carbide, preserving, I. L. Roberts.....	601,064
Carbureting apparatus, air, S. A. Miles.....	601,061
Carding engine, G. Martin.....	600,882
Cars, or other vehicles, apparatus for washing, H. Nicholasburg.....	601,003
Carrier. See Hay carrier.....	
Cartridge loading machine, H. P. Hall.....	601,138
Case. See Folding case. Gear case.....	
Cash register, W. P. Parsons.....	601,164
Casks, device for sulphuring, P. J. Nicolini.....	600,926
Caster, L. B. Denton.....	601,178
Casting apparatus, J. A. Potter.....	601,083
Cattle guard, M. Buchanan.....	601,120
Chair. See Adjustable chair.....	
Chair, H. W. Bolens.....	600,854
Chair locking device, convertible, T. W. Wash.....	600,992
Chocolate coating machine, P. J. Vanderlinde.....	601,217
Churn, J. A. Hawk.....	600,978
Clamp. See Broom clamp. Scaffold clamp.....	
Clasp or fastening device, A. R. Pettit.....	600,887
Clip board and bookbinder, combined, E. A. Russell.....	601,027
Cloth napping mechanism, C. M. Musgrove.....	600,885
Clothes drainer, M. Tyner.....	601,066
Clutch and power station system, magnetic, B. J. Arnold.....	600,941
Coats, hats, etc., locked holder for, W. R. Fowler.....	601,053
Cock, steam boiler gage, E. M. Hewson.....	601,142
Combination lock, W. H. Taylor.....	600,800
Conduit, L. Skaffe.....	600,935
Connection, W. H. Burnett.....	600,961
Copy holder, J. M. Lloyd.....	600,922
Cotton distributor and feeder, seed, C. M. Simington.....	601,174
Coupling. See Car coupling. T-hill coupling.....	
Coupling, E. Hayes.....	600,988
Cross tie, O. Olsson.....	601,101
Current motor, alternating, W. Langdon-Davies.....	601,023
Curtain operator, J. Acker et al.....	600,940
Curtain pole holder, M. H. Marcus.....	601,024
Cuspidor tongs, G. Prouty.....	600,930
Damper governor, Kummer & Bertrand.....	600,966
Decanting or drawing off wines or other liquids, apparatus for, G. Gray.....	601,075
Dental engine, L. T. E. Methot.....	600,924
Dental machine, retainer, J. M. Strout.....	601,007
Ditching machine, W. H. Scott.....	601,106
Door saddle, R. Wilson.....	600,984
Drier. See Rotary drier.....	
Drill. See Rock drill.....	
Dye, blue-black mixed trisazo, M. Bonizer.....	601,033
Electric circuit closing device, G. Newman.....	600,909
Electric contact box, J. N. Thomas.....	600,937
End gate, wagon, W. L. Smith.....	600,898
Engine. See Carding engine. Dental engine. Gas engine. Internal combustion or detonating engine. Rotary engine. Rotary steam engine.....	
Engine, G. E. Whitney.....	601,218
Enginetender, traction, Ferguson & Holmen.....	601,225
Extractor. See Stump extractor.....	
Feeding grain to horses, device for, Morgan & Rose.....	600,980
Fence making device, M. Mogenson.....	601,041
Fence weaving machine, wire, M. L. Poulter.....	601,167
Fences, end post for line wire, O. Harley.....	600,964
Fender. See Car fender.....	
Filter, E. A. Wilder.....	600,939
Firearm, magazine, J. Harle.....	601,097
Fire escape apparatus, W. F. Weber.....	601,029
Fireproof floor and ceiling, T. B. Camp.....	601,036
Flour maturer and dough raiser, D. G. & H. A. Reitz.....	601,171

(Continued on page 221)



Star Lathes
Foot power
Screw...
...cutting
Automatic
Cross feed
9 and 11-inch Swing.
New and Original Features
Send for Catalogue B.
Seneca Falls Mfg. Company,
695 Water St., Seneca Falls, N. Y.

POWER & FOOT LATHES
SHAPERS, PLANERS, DRILLS
MACHINE & SHOP OUTFITS, TOOLS
AND SUPPLIES. CATALOGUE FREE
SEBASTIAN LATHES CO. 120 CULBERT ST. CINCINNATI, O.

A College Education for 7 Cents a Day

Improve your condition. Thorough courses, by mail, in Mechanical, Steam, Electrical, Civil, and Sanitary Engineering. Mechanical Drawing and Machine Design easily learned by our methods. Small tuition fees—cash or monthly installments to suit your convenience. Courses in the Home Schools of Art, Architecture and Trades. Write for free S. A. Circular, containing sample instruction and question pages, list and prices of courses, sample of mechanical drawing plate, etc. State subjects interested in. Special inducements to those enrolling now.

THE UNITED CORRESPONDENCE SCHOOLS,
F. W. EWALD, Gen. Mgr. 154, 156, 158 5th Ave., New York

Walworth's Solid Die Plate
The Standard
Price List on application to
WALWORTH MFG. CO., 20 Oliver St., BOSTON, MASS.

BARNES' New Friction Disk Drill.

FOR LIGHT WORK.
Has these Great Advantages:
The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drill within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue.
W. F. & JNO. BARNES CO.,
1999 Ruby St., - Rockford, Ill.

Pipe Threading Machines

of Highest Merit.
COMBINATION BENCH and PIPE VISES.
Catalogue containing interesting information free.

Signal & Keeler Mfg. Co.,
Box S., Edwardsville, Ill.

A TELEGRAPH OPERATOR'S WORK IS PLEASANT

pays good wages, and leads to the highest positions. We teach it quickly and start our graduates in telegraph service. Expenses low. Established 26 years. Write for Catalogue.
VALENTINES' SCHOOL OF TELEGRAPHY,
No. 6 Mill St., Danversville, Wis.

WOODWORKING MACHINERY.

For Planing Mills, Carpenters, Builders, Furniture, Chair, Vehicle, Wheel and Spoke Makers, etc.
Correspondence Solicited.
Illustrated 312-page Catalogue free to manufacturers and foremen.

THE ECAN CO.
327 to 347 West Front Street,
CINCINNATI, OHIO.

THE COBURN PATENT TROLLEY TRACK

HOUSE DOOR HANGERS
The first made with adjustable track.
The track can be put up in 30 minutes.
Send for Book.

The Coburn Trolley Track Mfg. Co., Holyoke, Mass.

The Forbes Patent Die Stocks for Hand Power

Ten inch pipe cut off and threaded by one man with ease.
Send for Catalogue.

CURTIS & CURTIS,
6 Garden St., Bridgeport, Conn. No. 56 Hand Machine
Range 2 1/2 to 6 inch

VANDERGRIFT APOLLO IRON & STEEL COMPANY
BEST BLOOM
TRADE MARK
PITTSBURGH

APOLLO BEST BLOOM GALVANIZED IRON

differs from other makes in being of uniform softness and workable.

Takes less time to do a job.

Return to your jobber at his expense any sheet, or part of a sheet, that develops in working any defect whatever.

Apollo Iron and Steel Company,
Pittsburgh, Pa.

ESTABLISHED 1850. THE DEFIANCE MACHINE WORKS

MANUFACTURERS OF SPECIAL WOOD WORKING MACHINERY FOR HUB SPOKE, WHEEL BENDING, WAGON, CARRIAGE, SHAF, POLE, NECK, YOKE, SINGLETREE, HANDLE & BARREL-HOOP FACTORIES.
LARGEST LINE IN THE WORLD
SATISFACTION GUARANTEED.

To Inventors!

THE AMERICAN ORDNANCE COMPANY offers special facilities to Inventors desiring the development of their patented or unpatented inventions. A department has been organized especially for the development of inventions in SPECIAL or AUTOMATIC MACHINES, MILITARY or SPORTING WEAPONS or AMMUNITION. Address inquiries to

Factories { 319 Crescent Ave., Bridgeport, Conn.
44 Federal St., Lynn, Mass.
New York Office { Room 914, 253 Broadway.
W. B. Froeligh, Manager.