

**ELGIN WATCHES**

**Time's Pulse**

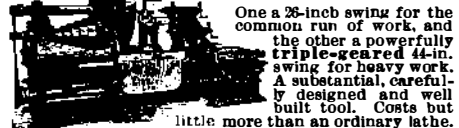
is recorded truthfully and minutely by that marvel of mechanical skill—an

**Elgin Ruby Jeweled Watch.**

Since Elgin began to be a third of a hundred years ago—nearly eight million of these complete, truthful time tellers have done faithful duty, more than any other factory has produced in the same period. **The World's Standard.**

Sold by Jewelers Everywhere.

## McGabe's Pat. Double Spindle Lathe



**TWO LATHES IN ONE.**

One a 26-inch swing for the common run of work, and the other a powerfully triple-gear 44-in. swing for heavy work. A substantial, carefully designed and well built tool. Costs but little more than an ordinary lathe.

**J. J. McCABE, 14 DEY STREET, NEW YORK.**

## Buy Telephones

THAT ARE GOOD—NOT "CHEAP THINGS." The difference in cost is little. We guarantee our apparatus and guarantee our customers against loss by patent suits. Our guarantee and instruments are both good. **WESTERN TELEPHONE CONSTRUCTION CO.** 250-254 South Clinton St., Chicago.

Largest Manufacturers of Telephones exclusively in the United States.

## "American-Hunnings" TELEPHONES.

Transmitters, Magneto Bells and Telephone Switchboards. Over 200,000 of our telephones in successful operation. Used by War and Navy Departments. In ordering state length of line, whether single line or metallic circuit and number of telephones to be used on one line. Send for catalogue "S. A." **AMERICAN ELECTRIC TELEPHONE CO.,** 173 South Canal St., Chicago, Ill.

## GREAT OPPORTUNITY

**MORFET ROLLING MILL PLANT FOR SALE.**—Owing to the death of James Morfett, his Rolling Mill Plant will be sold by order of the Essex County Orphan's Court at public auction on Tuesday, May 9, 1899, at 2 o'clock P. M., on the premises at Glen Ridge, N. J. Steam and water power. All equipment for casting and rolling brass, copper, gold, silver, etc. Good condition, ready to start. On D. L. & W. R. R., one-half hour from New York; switch to mill. Must be sold. Will go very cheap. Easy terms. Chance of a life time. Apply to **J. A. HERCHER, Attorney of Executor, Prudential Building, Newark, New Jersey.**

**MAGAZINE PLATE HOLDERS**

CAN BE FITTED TO ANY CAMERA. PATENTED. 20 STYLES OF "GRAPHIC" CAMERAS. 4x5 1/2 10" 5x7 12" SPECIAL CAMERAS MADE TO ORDER. **THE FOLMER & SCHWING MFG CO.** 271 CANAL ST. NEW YORK.

**NOW READY.**

## LIQUID AIR

AND  
**The Liquefaction of Gases.**

By Prof. T. O'CONOR SLOANE.

365 pages. 8vo. Containing many illustrations, with portraits of Faraday, Pictet, Cailletet, Dewar and Tripler. Bound in Buckram.

**PRICE \$2.50.**

IN offering this book to the public, the publishers feel that, as it is the only work on the subject, they are helping in forwarding the higher scientific education of the people. The world at large is now interested in natural science, and since its earliest developments nothing, with the possible exception of Electricity, has excited such widespread attention as Liquid Air.

This book contains the full theory of the subject. It gives the entire history of the liquefaction of gases, from the earliest times to the present, and also contains a description of all the experiments that have excited the wonder of audiences all over the country. It shows how liquid air, like water, is carried hundreds of miles and is handled in open buckets; also the formation of frost on bulbs—Filtering liquid air—Dewar's bulbs—Liquid air in water—Tin made brittle as glass—India rubber made brittle—Descending cloud of vapor—A tumbler made of frozen whisky—Alcohol solidified—Mercury frozen—Frozen mercury hammer—Liquid air as ammunition—Liquid air as basis of an explosive—Burning electric light carbon in liquid air—Burning steel pen in liquid air—Carbon dioxide solidified—Atmospheric air liquefied—Magnetism of oxygen.

It tells what may be expected from liquid air in the near future. It gives the history and biography of the subject from earliest times.

This is not only a work of scientific interest and authority, but is intended for the general reader, being written in a popular style, and will be easily understood by everyone. Send for full Table of Contents.

**MUNN & CO., PUBLISHERS,** 361 BROADWAY, NEW YORK.

Jar closure or sealing device, W. P. Martin.....	623,326
Joint. See Frame joint.	
Journal box, axle, M. L. Conway.....	623,501
Junction box, Murphy & Neilson.....	623,172
Label affixer, G. McCadden.....	623,530
Label making machine, W. Holmes et al.....	623,213
Ladder, extension, J. R. Jones.....	623,476
Lamp, acetylene gas, H. Millward.....	623,412
Lamp, arc, T. E. Drohan.....	623,279
Lamp burner, oil, C. Throckmorton.....	623,443
Lamp, electric arc, A. Mouglin.....	623,329
Lamp, miner's, P. Hommel.....	623,370
Lantern, folding, J. W. Smith.....	623,436
Lantern holder, T. C. Puckett.....	623,370
Lap board, R. J. Doty.....	623,143
Lathe, turret, J. P. Lavigne.....	623,322
Ledger, transfer, J. Barker.....	623,549
Letter for signs, electric, C. A. Chase.....	623,275
Liquids, pneumatic apparatus for raising, W. Evans.....	623,357
Lock. See Cycle lock. Cylinder lock. Window lock.	
Lock, W. E. Sparks.....	623,264
Lock, or latch, H. G. Voigt.....	623,196
Loom reed, B. Wood.....	623,196
Loom stopping mechanism, J. H. Northrop.....	623,174
Lubricator. See Vessel lubricator.	
Match, H. I. Buxton.....	623,233
Match machine, W. L. Nye.....	623,217
Match safe and cigar cutter, G. H. Earnest.....	623,206
Measuring can, G. W. Chandler.....	623,499
Measuring machine, liquid, Cherry & Brainard.....	623,500
Mechanical movement, G. K. Cheney.....	623,133
Medicine dose indicator, J. B. Mowry.....	623,171
Metal parts, composition for and method of heating, R. Delescler.....	623,239
Mineral water head, J. Ormerod.....	623,218
Mineral wool, manufacturing, A. D. Elbers.....	623,308
Motor, R. Creuzbaur.....	623,137
Necktie, W. E. McKee.....	623,378
Nut, adjustable axle, S. R. Bailey.....	623,124
Oil cake trimming machine, A. W. French.....	623,241
Oil can, C. L. Waggoner.....	623,345
Oils or fats, refining, J. N. Harris.....	623,368
Optical dynamometer, C. H. Brown.....	623,131
Ore cooler, multitubular, P. Argall.....	623,231
Ore cooler, rotary, P. Argall.....	623,230
Oven, etc., baker's, M. Sjöholm.....	623,222
Packing, holding device, A. Ball.....	623,127
Packing, piston rod, G. H. Lewis.....	623,482
Paddle wheel, P. Pieri.....	623,424
Painting apparatus, J. H. Davis.....	623,307
Paper pile joggling mechanism, W. C. Hopkins.....	623,371
Pen, fountain, Bryant & Townsend.....	623,461
Pen, fountain, J. H. Zeigler.....	623,391
Photographic printing process, D. C. S. Schultz-Hencke.....	623,491
Photographic projecting machine, Miller & Rice.....	623,410
Picture exhibitor and table, combined, J. Lamme.....	623,164
Picture frame, E. McDonald.....	623,253
Pin. See Clothes pin.	
Pipe threading and cutting machine, F. E. Wells.....	623,450
Planter, corn, I. Brechner.....	623,343
Pocket edge protector, A. B. Bishop.....	623,400
Post. See Fence post.	
Press. See Cider press. Hay press.	
Printing machine, electrically connected, Shea & O'Lair.....	623,293
Pulley, expandable, R. Heinle.....	623,246
Rack. See Bicycle rack. Display rack.	
Railway, King & Babendrieler.....	623,249
Railway signaling device, electric, D. Valentine.....	623,444
Railway system, electric, W. Stein.....	623,223
Railway ties, etc., device for use in extracting, A. Zetter.....	623,300
Railway wear plate, duplex, C. D. Paxson.....	623,420
Railways, safety cable system for electric, H. B. Cox.....	623,136
Rake. See Hay rake.	
Refrigerating machine, L. Block.....	623,270
Register. See Register at right.	
Reversible seat, D. E. Hipwell.....	623,310
Reversing mechanism, E. E. Norton.....	623,381
Rolling unsymmetrical flanged sections, J. Kennedy.....	623,479
Rolls, apparatus for heating, J. James.....	623,512
Roll, clamp, W. H. Borer.....	623,138
Rotary drier, Whiting & Berquist.....	623,338
Rotary engine, J. Baird.....	623,457
Sack, bag, etc., A. M. Bates.....	623,199
Saddle pommel, detachable, P. W. Peters.....	623,178
Safe or vault, C. Eyster.....	623,145
Satchel, H. Schöbel.....	623,446
Saw guide, band, H. Vedder.....	623,446
Saw machine table guide, F. A. Humphrey.....	623,156
Seafold, L. M. Wilber.....	623,269
Screen. See Fly screen.	
Sealing machine, bottle, A. A. Carper.....	623,274
Sealable seat.	
Sewing machine, Bouton & Varnum.....	623,351
Sewing machine, W. P. Gammons, Jr.....	623,147
Sewing machine feeding mechanism, E. B. Allen.....	623,271
Sewing machine ruffler, M. Hemleb.....	623,309
Shaft for two-wheeled vehicles, C. F. Carlson.....	623,462
Shoddy making machine, R. S. Marks.....	623,176
Shoe bottom burning iron, H. F. Rooney.....	623,350
Shoe tongue, B. L. Blanc.....	623,350
Show fixture, E. Leger.....	623,377
Shutter or door fastener, H. T. Moody.....	623,286
Skate wheel, roller, O. W. Everett.....	623,358
Skirt supporter, A. Bernstein.....	623,453
Skirt supporter, J. De la Motte.....	623,453
Sleigh, B. S. Hall.....	623,244
Smoke consumer, F. S. Church.....	623,353
Smoke consumer, W. Redpath.....	623,426
Smokestack and spark arrester, Clay & Ree es.....	623,134
Spark iron, R. W. Volkmann.....	623,183
Spark arrester, Rufus & Krichbaum.....	623,183
Speed changer, H. H. Cummings.....	623,139
Staking machine, Pierce & Poinsett.....	623,423
Station indicator, F. H. Cheyne.....	623,202
Station indicator for railway cars, automatic.	
Steam boiler, L. O. Morgan.....	623,215
Steering gear, regulating valve for, J. D. Williams, Jr.....	623,170
Stone cutter's maul, J. A. Tulloch.....	623,454
Stopper. See Bottle stopper.	
Street cleaner, G. M. Ward.....	623,496
Studding or support for partition wall, T. C. ran.....	623,354
Suspensory, P. M. Kennedy.....	623,315
Switch, E. D. McGlamery.....	623,254
Switch. See Elevator switch. Telephone duplex switch.	
Switch, A. Kunz.....	623,320
Tanning, G. W. Houston.....	623,403
Tap wrench, A. J. Smart.....	623,435
Telephone duplex switch, G. C. Buell.....	623,352
Telephone switchboard circuit, E. H. Smythe.....	623,437
Tenoning machine relishing attachment, V. C. Luppert.....	623,485
Terne plates, rolls for making, T. Williams.....	623,389
Testing device, R. H. Pinkham.....	623,335
Thill coupling, W. D. & H. W. Hopkins.....	623,214
Thill coupling, Richards & Snyder.....	623,427
Thread cutter, J. J. Sullivan.....	623,294
Tiles, machine for manufacturing building, J. B. Seaser.....	623,261
Tin plate cleaning machine, H. F. Akin.....	623,347
Tire, pneumatic, G. H. Clark.....	623,278
Tire pneumatic wheel, G. H. Clark.....	623,276
Tool blanks, making, E. Rogers.....	623,384
Tool handle fastening, W. L. Marble.....	623,194
Toy, E. Gier.....	623,210
Toy battleship, A. G. Jacobs.....	623,160
Toy cannon, A. G. Jacobs.....	623,159
Train dispatcher's indicator, R. F. Adams.....	623,392
Trestle attachment, G. E. Palmer.....	623,175
Trough. See Water trough.	
Trousers hook and bar, A. J. Shipley.....	623,484
Truck, A. L. Church.....	623,163
Truck bed or body, E. F. C. Danzer.....	623,356
Truck, car, J. Taylor.....	623,440
Truss, S. C. Fancher.....	623,207
Truss pad frame, J. R. Knapp.....	623,337
Twine fastener, F. M. Lee.....	623,166
Twine holder, Tivy & Hill.....	623,493
Twine holder takeup device, Tivy & Hill.....	623,494
Twyer for smiths' hearths or forges, W. Linde-mann.....	623,493
Typewriter, J. De la Mar.....	623,502
Typewriter, W. Sears.....	623,262
Typewriter attachment, J. T. Simms.....	623,221
Typewriting machine, W. J. Barron.....	623,1232
Typewriting machine, C. N. Westwood.....	623,451
Valve, J. O'Meara.....	623,418
Valve, G. W. Vollmann.....	623,184
Valve, air check, G. E. Cordeau.....	623,185
Valve, rate, E. L. Upson.....	623,265
Valve mechanism, engine, J. T. Lindstrom.....	623,251
Valve, sewer air inlet, F. C. Keene.....	623,478
Vehicle, motor, F. A. Pocock.....	623,133
Vehicle, motor road, H. C. Hart.....	623,142
Vehicle top, D. Shivel.....	623,186
Vehicle wheel, A. E. Elliott.....	623,240
Vehicle wheel, C. A. Hussey.....	623,372
Vehicle wheel, W. W. Kitchen.....	623,405
Velocipede pedal, E. Germaine.....	623,339
Vessel, sailing, J. R. Walsh.....	623,282
Vessel, freight delivery, J. E. Walsh.....	623,297

(Continued on page 273)

**YOU CAN'T LOSE**

AN EDUCATION. MANY PEOPLE HAVE QUALIFIED THEMSELVES for Better Positions and Higher Pay by devoting some of their spare time to study at home. Tuition fees low. Payable in cash or installments. Thorough courses by mail in Electrical, Mechanical, Civil, Mining, Steam and Sanitary Engineering, Architecture, Mechanical Drawing, Machine Design, etc. Best Test Book. Seven years' experience in teaching by correspondence. Write for free illustrated 100-page S. A. circular, sample pages of text books, drawing plate, and booklet of letters from students all over the world.

**The United Correspondence Schools, 156 Fifth Ave., New York**

**THE ONLY CAMERA FOR ALL PURPOSES**

**PREMO CAMERA**

**ROCHESTER OPTICAL CO.**

30 SOUTH ST. ROCHESTER, N.Y.

**BICYCLE TIRE REPAIRING.—THE**

Mending of Single Tube Tires.—A practical article illustrating the method of inserting patches and plugs with pliers and pluggers, together with rubber band plugging and the use of puncture bands. 9 illustrations. Contained in SUPPLEMENT 1102. Price 10 cents. For sale by Munn & Co. and all newsdealers.

**TOLIDOL**

**TRY TOLIDOL**

For Dry Plates and Bromide Papers. Acts rapidly, is stainless and can be used repeatedly. Tubes for amateurs ready for immediate use, 25c. Pure Tolidol for professionals, 60c. ounce. Recommended by plate manufacturers. Dealers sell it. Haller-Kemper Co., Atlas Block, Chicago

**A \$5 Printing Press**

will print your cards, labels, etc. Saves you money. Large circular press \$18.00 Full printed instructions for use.

**KELSEY & CO., Mfrs., MERIDEN, CONN.**

**Hammer Dry Plates.**

Absolutely Uniform and Clean. For the Hand Camera and Professional.

**NO FRILLING IN HOT WEATHER.**

Sold by all dealers. Send for Hammer's Little Book.

**HAMMER DRY PLATE CO., ST. LOUIS, MO.**

**Ralston Still.**

A delight to every woman's heart. Supplies the table with an abundance of Sparkling, Pure Water, sterilized and aerated by a new process, and absolutely free from all germs of disease, poisonous gases and old acid matter. Purifies the most infected water without trouble or expense by utilizing the waste heat of the kitchen range. No larger than a tea-kettle, and as easily cleaned. New 1890 Model with all latest improvements, plated finish, etc., only \$10.00. Guaranteed the best in the world—best in workmanship and construction, easiest to operate, and with the largest capacity per hour. If found otherwise, may be returned at our expense.

Officially Adopted by the Ralston Health Club. Highest Award and Gold Medal at Omaha Exposition. Extensively Used by the U. S. Government. Over 1,000 Testimonials from Satisfied Purchasers.

Send for Booklet "B," list of dealers and other interesting printed matter. Manufactured only by

**THE A. R. BAILEY MFG. CO., 54 MAIDEN LANE, NEW YORK.**

**The Telephone Magazine**

CHICAGO.—Only paper published on Telephone Exchanges and Apparatus, Line Construction, Interior Wiring, Signaling Devices, Telephone Troubles and How to And them and many other instructive features. Handsomely illustrated. \$1.00, sample 10c. Wanted: Bright, pushing agents. Write for terms and territory.

**Marquette Building, CHICAGO, U. S. A.**

**TURBINES**

Send for Circular "M."

**JAS. LEFFEL & CO.,** Springfield, Ohio, U. S. A.

**PATENTS**

50 YEARS' EXPERIENCE

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

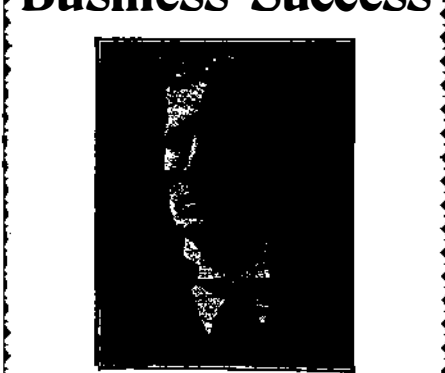
**Scientific American.**

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.

## 15 Cents may open the door to Business Success



Send 15 1-cent stamps for three months' trial subscription to

**"THE BOOK-KEEPER"**

A handsome 200-page Magazine for Book-keepers, Cashiers and Business Men. It teaches book-keeping, shorthand, penmanship, law, short cuts, corporation accounting, banking, business pointers, amusing arithmetic, lightning calculations, etc.

**\$1.00** Employers Need It to simplify expenses. **A YEAR.** Employees Need It to increase salary.

**THE BOOK-KEEPER CO., Ltd., Publishers,** DEPT. 20, DETROIT, MICH.

**WE WANT YOU** to send us your name and address of your neighbor's name and address as we would like to send **EVERY GOOD FARMER** a **FREE SAMPLE COPY OF THE Agricultural Epitomist**

For the busy, practical working farmers of America. It is their paper and claims their support. Don't fail to write us at Once Giving Address: Postal W 1111, AGRICULTURAL EPITOMIST, Indianapolis.

**KNOWLEDGE THAT PAYS**

HEALTH, STRENGTH, BEAUTY AND WEALTH.

Every portion of the body enlarged and strengthened. Will Power and Personal Magnetism developed. Simple, scientific methods. Philosophy of success as demonstrated daily. Interesting reading free.

**Prof. L. H. Anderson, S. A. 49, Masonic Temple, Chicago.**

**THE INGERSOLL DOLLAR WATCH**

Now household words. 2,000,000 Sold in 2 years under an ABSOLUTE GUARANTEE printed below has made them so. We have demonstrated that a \$1.00 Watch for a Dollar is possible. The sales are now over 3,000 per day. You want one—either for yourself, your boy, or your "Bike." As good as any Watch made for ordinary every-day use.

**Keeps Accurate Time.** (Guaranteed as below.) Has lever escapement, quick train; second hand; good nickel case; Keyless Wind and Set; 15 size. Buy this Watch to use and a

**\$1.00 EACH**

**\$50.00 one for SHOW.** Sent postpaid for ONE DOLLAR. Attachments for Bicycle 25c. extra. **ROBT. H. INGERSOLL & CO., 45 Cortlandt St. Dept. No. 147, N. Y.**

**PROFIT FOR MAKER ONLY.**

We manufacture 170 styles of vehicles and 60 styles of harness and sell them to you direct from our factory at wholesale prices. In fact, we are the largest manufacturers of vehicles and harness in the world selling to the consumer exclusively. When you buy on this plan you pay only the profit of the manufacturer. No traveling expenses, no losses, no agent's commission and no dealer's profits.

**We Have No Agents,** preferring to deal with you direct. No matter where you live, we can reach you and save you money. We ship our vehicles and harness anywhere for examination and guarantee safe arrival.

**We Manufacture Everything** see well, and we can assure you of good quality from beginning to end: good wood work, good finish, good trimmings, fine style good iron and steel, good paint and varnish, and the largest selection in the land. Large Illustrated Catalogue FREE.

**Elkhart Carriage & Harness Manfg. Co. Elkhart, Indiana.**