

RECENTLY PATENTED INVENTIONS.

Mechanical.

CONSTRUCTION OF DRY DOCKS.—Edward S. Walsh, New York City. The invention relates to an improvement in the construction of dry docks and like structures, and the object of the invention is to provide a means whereby the excavating machinery or apparatus may be much more expeditiously and conveniently handled during the progress of the work than heretofore, and consequently lessening the expense and labor in creating such structures. This invention consists in a method of constructing dry docks and similar excavations by the employment of machines necessary for the work and capable of floating, so that the work shall consist, first, in dry excavation, next supplying water to the excavation for the purpose of floating the said machinery, and, finally, erecting a partition at one end of the excavation when completed.

DUMPING WAGON.—Thomas Hill, Jersey City, N. J. The invention relates to dumping wagons and carts, having longitudinally moving or rolling bodies upon the truck portions of the frame. The device is simple and durable in construction and cheap to manufacture. The invention consists principally of a wagon body provided at its under side with eyes forming the fulcrum for the body to tilt the latter on the lower end of the rail or running surface of the side bars of the frame.

WHEEL.—Samuel Carnes, Vienna, Ga. This invention consists of the combination with the hub having annular flanges provided with peripheral spoke sockets, and the tire and felly of the clips having pins entering recesses in the felly and having pins and concentric recesses on their opposite sides, and the spokes entering the hub recesses and there provided with nuts for adjusting them outwardly into engagement with the clip pins and recesses.

ICE VELOCIPED.—James Edward Leahan, Boston, Mass. This invention relates to certain improvements in that class of devices commonly termed "ice velocipedes," constructed on the principle of a bicycle and adapted to be propelled over ice or snow, and the object of this improvement is to provide a device of this character of a simple and inexpensive construction which shall be light and strong and provided with means whereby, when the device is used for coasting, the least possible resistance will be offered to its passage over the ice. The invention consists in an ice velocipede having a frame provided with skates or runners, and also provided with a driving wheel adapted to be operated by the feet of the rider, one of the skates or runners being vertically movable, so as to be adapted to be raised or lowered to take the weight of the machine and rider off the driving wheel or to raise said wheel entirely out of operative position.

WINDMILL.—Olef E. Peterson and George L. Curtis, Logan, Utah. This invention is an improvement in the class of windmills having a variable crank, that is to say, a crank which is slidable longitudinally, such movement or adjustment being regulated by the force of the wind on the wheel, so that the work done is automatically graduated to correspond with the power applied. In brief, the invention consists in a windmill of the class specified and in the combination with the casing or rotatable support of the slidable journal box, the wind wheel and its shaft, which is rotatable in and movable longitudinally with said journal box, a crank keyed on the inner end of said shaft, and the pump rod lever which is slidable in its fulcrum and has a universal joint connection with said crank, and means for holding the wheel against the pressure of the wind.

DUMPING WAGON.—Charles E. Plummer, Winchendon, Mass. The invention relates to dumping wagons, and the object of the invention is to so construct a dumping wagon that while the body of the wagon is fulcrumed over the rear axle, a portion of the load will be carried by the forward axle in a four-wheeled vehicle. Another object of the invention is to so hang and mount the body of the vehicle on the running gear thereof that, no matter how heavy the load may be in the body, the body may be carried from carrying to dumping position by the action of the team, thereby dispensing with the services of an attendant or attendants in the dumping operation. Another object of the invention is to so mount the body of the wagon on the running gear that, when the body is dumped, the entire vehicle may be drawn forward and the body carried away from the load. In brief, the improvement consists of the combination with an axle, a reach attached to the axle, and a body mounted to slide over the said axle, of a push bar provided with portions for engaging the body and having sliding and guided movement in the reach, and locking devices adapted to secure the body to the push bar and reach.

AXLE BOX.—William Walker, Mayfield, Pa. The object of the invention is to so construct the box as to prevent water and dirt from gaining access to the oil holder, thereby preventing a waste of oil, since in many mines, where coal is loaded out of water, the water and dirt run into the boxes usually employed and force the oil out from the holder. Another object of the invention is to construct the axle box in such manner that no packing will be required, and so that it will not be necessary to remove any bolts or nuts when changing a bent axle or a broken or worn out wheel, since the box is made in slidably connected sections. In brief, the invention consists of a body section, provided with an axle seat, an oil holder partially embracing the axle and having slidable connection with the said body, lugs projecting from the slide of the oil holder, and stops carried by the body and adapted to be engaged by the said lugs and limit the movement of the oil holder in one direction, whereby the said oil holder will not be separated from the body, and yet may be filled or cleaned.

Electrical.

MAGNETIC MEDICAL APPARATUS.—Augustus B. Slater and Nils A. Renstrom, Omaha, Neb. The invention relates to improvements in magnetic medical apparatus, and the object of the invention is to produce an apparatus which may be made in the form of a couch, sofa, chair, or other article on which a person may sit or

lie, and which has a series of electro-magnets arranged in such a manner as to create a magnetic field in which a patient may lie and thus receive the benefit of the electromagnetism without danger of objectionable shock, even though the patient have very delicate sensibilities. A further object of the invention is to produce an apparatus of this kind which is constructed in such a way that the lines of force may be varied at will, so that the electromagnetism may be made to exert itself on any part of the patient's body, causing the currents to travel in different directions when desired. It consists of a support for a body and electro-magnets distributed beneath the surface of the support, so as to create a magnetic field.

Agricultural.

BAND CUTTER AND FEEDER.—William McCaleb, Bluff, Ills. This invention is an improvement in that class of band cutters and feeders in which the portion of the apparatus constituting the sheaf or bundle carrier is adapted to be turned up or detached, so that it may be supported on the body or main portion of the frame while the machine is stored or being transported. The feature of novelty is the construction and combination of parts whereby the bundle carrier is adapted to be detached and swung over and held in place on the main portion of the frame.

LAWN MOWER.—Alexander J. Blunt, Olivia, Minn. The invention relates to an improvement in lawn mowers, and the object of it is to so construct a lawn mower that a reciprocating knife forming a portion of the cutting mechanism may be operated by the manipulation of the handles of the machine, and furthermore, to provide a balance wheel rotated by a reciprocating movement of the handles, the momentum of which balance wheel will be utilized to make uniform and regular the propelling power for the aforesaid knife. In brief, the invention consists in a lawn mower of the combination with a frame, of a fixed and a reciprocating knife, handles pivoted to the said frame, and capable of movement to and from each other, a crank shaft the crank arms of which are connected to the handles, a balance wheel driven by the crank shaft, gearing driven from the crank shaft, and a connection between the said gearing and the reciprocating knife.

CORN HUSKING ATTACHMENT FOR FEED CUTTERS.—George Arthur Stevens, Ringwood, Ill. The object of the invention is to provide a machine in which the cornstalks may be cut into suitable lengths for feed simultaneously with the effecting of the husking of the ears of corn, and to so construct the husking mechanism that but few of the kernels of corn will be separated from the cob, and whereby, further, should any of the kernels of corn become detached during the process of husking, said kernels will be caught and carried to a conveyor together with the husks of corn, thus preventing the loose or shelled corn from being fed to the stock together with the cut feed, since it is more desirable to feed the kernels of corn in a pulverized condition. In brief, the invention consists in a husking machine, of the combination with a substantially smooth roller and of an adjacent roller having flattened peripheral surfaces, and blades longitudinally located upon the said flattened surfaces, the cutting edges of the blades in the revolution of the rollers being made to face the substantially smooth roller.

Miscellaneous.

FOLDING STAND.—William E. Baxter, of Frankfort, Ky. The invention is an improvement in folding stands, and especially in stands for use in and forming parts of camping kits, which may be employed efficiently for supporting a coffee pot, boiler, or cooking utensils on a fire when in use, and when not in use can be folded compactly for a storage. In brief, the invention consists of a folding stand comprising the open frame top, the legs pivoted near their upper ends to said top and foldable into the plane of said top or down to form legs and stopped in both adjustments by abutment with the top frame.

COOKING APPARATUS.—William E. Baxter, Frankfort, Ky. The invention is in the nature of a cooking apparatus for campers, for house use, and for wood, charcoal, gas, oil, etc., wherein are provided an oven and a stove, the stove being formed in detachable sections, and such sections being adapted when separated to be stored within the oven, the oven being also adapted to contain pans, dishes, etc., sufficient to constitute a limited camp kit, the whole being adapted for compact storage, adapting the improvement for pleasure or army camp purposes. In brief, the invention consists of the combination with the oven having an outer casing provided at its open end with inwardly projecting lugs, and the inner casing or shell fitted removably in the outer casing and having at its free end a flange overlapping the open end of the outer casing and having notches or openings for the lugs of the outer shell, the door hinged to the inner shell and the bolt pivoted to said door and turning into engagement with the lugs whereby to hold the door closed, and the inner shell within the outer one.

CLOTHES PIN.—Irvin Y. Baringer, Perkaskie, Pa. The invention relates to that class of clothes pins which are adapted to remain permanently on the clothes line; and it has for its object to construct a pin of the character indicated, so that its members will exert a uniform pressure throughout their length. A further object of the invention is to provide such a pin with means for facilitating putting it on the line and removing it therefrom. A still further object of the invention is to provide the pin with an additional means for clamping the clothes pin. The invention consists of a clothes pin, comprising a twin shank, the members of which are a less distance apart than the diameter of the clothes line, and an open or split loop at one end of the shank, one member of the loop being bent over the end of the other member and then down approximately parallel therewith, forming overlapping members between which a line can be passed into the loop.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion: about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

Marine Iron Works. Chicago. Catalogue free.

"U. S." metal polish. Indianapolis. Samples free.

Mariner & Hoskins. Assayers, 81 Clark St., Chicago.

W. Hoskins & Co., Assay Furnaces, 81 Clark St., Chicago.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Handle & Spoke Mch. Co., Oberlin, Ohio, Chagrin Falls, O.

Screw machines, milling machines, and drill presses.

The Garvin Mach. Co., Light and Canal Sts., New York.

The celebrated "Hornshy-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.

Stay with your job, and with your wages pay installments for a profitable olive orchard. Booklet free. Whiting's Olive Colony, Byrne Building, Los Angeles, Cal.

More profitable than your business. Investigate Ransome's Concrete Construction. Easily learned. Liberal terms for exclusive rights. Ransome & Smith Co., 758 Monadnock Block, Chicago.

For Sale.—Two valuable patents Nos. 559,718 and 559,717 on sailing and marine vessels. See illustrated article in SCIENTIFIC AMERICAN of May 30, 1896, page 341. For terms and further particulars address W. J. Martinez, 115 Magazine Street, New Orleans, La.

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 or 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.

(6882) L. S. writes: 1. I wish to make an induction coil capable of throwing a ten inch spark. Please give length and diameter of secondary coil; size of wire for primary and number of layers; size of wire for secondary and number of pounds. What kind of current passes through condenser—static or otherwise? Explain how condenser increases length of secondary spark. Why is primary generally made considerably longer than secondary? A. Our SUPPLEMENT, No. 160, describes a coil capable of giving a 1½ inch spark. A coil of double the linear dimensions of this one, if properly constructed, should give a ten inch spark. Such coils are hard to make and should not be attempted by the amateur. Wind the secondary in six or more sections. There is no such thing as a static current; the condenser becomes charged ("statically" may be applied, but adds nothing to the meaning), and at once discharges, overcoming the prolongation of action due to the extra current, demagnetizing coil and causing more of the energy to go into the spark discharge. The primary is much shorter, as regards feet of wire in it, than is the secondary. If the number of turns in the secondary is divided by the number in the primary and the voltage of the primary circuit is multiplied by the quotient, the result gives the approximate voltage of the secondary circuit. The approximation is apt to be far from close, however.

(6883) W. J. S. writes: Will you kindly tell me how I can make the cells of battery to use to light a one or two candle power electric lamp for a bicycle headlight? A. A small bicarbonate plunger battery is probably as good for your purposes as any. Use very perfectly amalgamated zincs and have it so that they can be withdrawn from the solution when not in use. The carbons you may have very thin to save room. You will need three couples for one candle power.

(6884) F. M. asks where to procure a description of all the different automatic circuit breakers that are now on the market. Also, please tell me what is the best practical insulator, that is, will stand the greatest amount of heat. A. You will have to apply to the different dealers in electrical supplies for such information. Porcelain represents about the best insulator under the limitations of your query.

(6885) E. J. M. asks: 1. What is meant by saying that galvanic batteries are connected in series and in parallel, and what are these different modes of connection used for? A. The SCIENTIFIC AMERICAN, vol. 61, No. 15, and our SUPPLEMENT, No. 792, describe different ways of connecting battery cells. 2. What is an earth battery? A. Our SUPPLEMENT, No. 157, among other batteries, describes this. It is of little value. 3. In the SCIENTIFIC AMERICAN of August 9, 1879, page 91, communication (10) H. W. F., describes a cheap battery. Does this battery soon polarize? What is it used for? A. The battery is for closed circuit work. It will polarize rather early, owing to small quantity of solution. 4. Have you a number of the SCIENTIFIC AMERICAN SUPPLEMENT describing the making of the different kinds of galvanic batteries? If so, will you please send it to me? A. We refer you to our SUPPLEMENT, Nos. 157, 158, 159, and 792, for illustrations and descriptions of numerous forms of batteries.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice in both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., Office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

June 16, 1896,

AND EACH BEARING THAT DATE.

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

Air compressing apparatus, hydraulic, G. E. Warren, Jr.	562,052
Anti-train robbery apparatus, Matthews & Sherburne	562,008
Asphalt, A. Fischer	562,176
Axle, vehicle, F. G. Davis	562,357
Bale band fastener, P. K. Dederick	562,122
Bale tie making machine, wire, P. K. Dederick	562,123
Beam, structural, J. H. Edwards	562,175
Bearing, roller, P. Danseur	561,971
Bed, folding, J. Auerbach	562,269
Belt, electro-magnetic, A. Dow	561,975
Belt fastener, C. E. Nellis	562,149
Bicycle canopy, G. C. Ormerod	562,091
Bicycle crown forging, L. B. Gaylor	561,987
Bicycle saddle post, H. Serrell	562,203
Bicycle support, S. A. Brown	562,273
Bicycle trainer, H. S. Robinson	562,287
Binder or file, temporary, A. Weller	562,254
Blind roller support, Venetian, C. L. Miller	562,233
Block system, automatic, J. Shoecraft	562,253
Boiler, L. Saunders	562,199
Boiler furnace steam, J. S. D. Shanks	562,252
Boiler safety check, F. Albin	562,287
Boiler stay, Preston & Holden	562,225
Bolt cutter, C. Hagelstein	562,181
Book cover, C. L'Enfant	562,228
Bootjack, L. H. Uffers	562,450
Bottle cap stopper, M. Riley	562,243
Bottle carrier, R. A. Wittmann	562,058
Bottle moulding machine, A. S. Reeves	562,154
Bottle, mullage, C. R. Hamer	562,134
Bottle stopper, C. Hutter	562,225
Bottle stopper, J. C. Weitzel	562,327
Bottles, stopper, W. Brooks	562,065
Box fastener, T. H. Macdonald	562,183
Bracket, E. Lenney	562,229
Brake shoe, W. S. Dehart	561,972
Brake shoe, W. W. Whitcomb	562,246
Bridge, H. F. Mitchell	562,191
Brush, floor polishing, W. C. & J. J. Koetner	562,362
Brush, tooth, L. W. Jones	562,287
Bumping post, M. Haley	562,297
Burglar alarm, G. H. Reichold	562,197
Burglar alarm, electric, H. Rohrdant	562,325
Button, collar, cuff and stud, O. W. Young	562,060
Camera, photographic, J. Cole	561,966
Car, combined sleeping and parlor, Reese & Willis Adams	562,241
Car controller, electric, E. A. Sperry	562,100
Car coupling, Poteet & Fitzgerald	562,024
Car coupling, L. E. Redden	562,028
Car fender, R. F. Freusner	562,320
Car fender and brake, E. F. Dietrichs	562,184
Car fender, automatic, Cogniasse & Shultz	562,171
Car, railway, F. W. Duntun	562,218
Car, railway, M. B. Schaffer	562,237
Car, railway, H. H. Sessions	562,343
Car windows, portable dust deflector for, C. H. Adams	562,111
Cars, ticket holder for railway, H. Cushman	562,120
Card shooter, C. H. Judson	562,121
Carding machines, silver dividing device for, A. Boris	562,070
Carpenter's case, E. E. Culbertson	562,000
Carpenter's stretcher, W. T. Reaser	562,027
Carriage, J. N. Leitch	562,136
Cart, combination, H. H. Sieb	562,043
Cart, draught frame for two wheeled, Clapp & Bailey	562,255
Checkrow line distributor, C. B. White	562,166
Christmas tree candle holder, C. Reinhardt	562,155
Churn, W. L. Haley	562,296
Churn, H. L. Holt	562,186
Cigarette cutting machine, D. J. Campbell	561,964
Cigarette making machine, A. Brandt	562,323
Cithern, keyboard, K. Oatman	562,187
Clothes drier, Bisel & Hancock	562,261
Clutch, friction, G. A. Armstrong	562,165
Coin controlled machine, J. B. Carr	562,280
Coloring fabrics, composition of matter for, M. A. Stevens	562,045
Compound pipe, G. W. Harrington	562,359
Compound pipe, E. C. Storow	562,205
Condenser and lint cotton conveyer, storage, W. A. Patterson	562,338
Conveying apparatus, J. G. Delaney	561,973
Corn shock loader, apparatus, G. B. Foster	562,173
Corn shock press, portable, G. D. Foster	562,177
Cotton gin, saw, J. W. Cooper	562,263
Cotton press, T. J. Griffin	562,180
Counting or adding machine, J. J. McGinty	562,143
Crate, folding poultry, D. E. Rosenberger	562,031
Crib, portable suspended, W. D. Ranney	562,134
Crutch, F. A. Lund	562,333
Curtain or shade fixture, O. H. P. Spencer	562,257
Curtain hanger, adjustable, J. M. Murdock	562,017
Cutting bellically coiled shavings or strips, machine for, C. W. Roman	562,273
Display rack, J. L. Martin	562,265
Display rack, C. L. Willis	562,276
Display stand, F. L. Carr, Jr.	562,215
Distilling apparatus, water, M. L. Sargent	562,326
Door, sliding, J. F. McElroy	562,141
Drawing press, F. H. Holmgren	562,310
Dredging apparatus, G. D. Miller	562,332
Drier. See Clothes drier.	
Drill. See Traveling swing drill.	
Drink mixer, J. L. Nelson	562,018
Drying furnace, W. P. Taggart	562,345
Ductile articles, mechanism for ornamenting, S. H. L. Leavens	562,300
Dye, dark green, Schmid & Jedicke	562,138
Easel, W. E. & J. Marboff	562,118
Electric brake, emergency, B. F. Card	562,138
Electric conductors, testing joint for, B. L. Toquet	562,261
Electric distributing system, R. B. Brown	562,309
Electric machine and motor, dynamo, Germain & Downing	562,179
Electric motor controller, E. A. Bryant	562,116
Electric switch, J. F. McElroy	562,142
Electric switch, automatic, Barstow & Lindsay	561,998
Electrical energy indicator, T. Duran	562,054
Electrolytic diaphragm, M. Kiliani et al.	562,304
Elevators, automatic power controller for, J. H. Laing	562,381
Engine, F. C. Rinsche	562,029
Engine. See Gas engine. Rotary engine.	
Engine clutching mechanism, rotary, W. E. Prall, Jr.	562,153
Engine controlling mechanism, W. H. Knight	562,306
Envelopes or wrappers for newspapers, etc., opener for, F. E. Munn	562,336
Ether, obtaining, Otto & Verley	562,193
Fabric for tubular articles, J. Lyall	562,312
Faucet, Fowler & Pettie	562,297
Feeder regulator, Bramwell, Feather & Clark	562,220
Fence, metallic, Wolcott & Beaman	562,328
Fence, portable sectional, T. Stillaway	562,046
Fence post, C. H. Van Wagener	562,207
Fence support, wire, M. Neil	562,088
Fence, wire, C. Lane	562,308
Fence, wire, W. P. Randall	562,222
Fence wiring tool, J. B. Cleaveland	562,170
Fence, machine for weaving cross wires in wire, H. Carter	561,985
Fencing, loom for weaving wire, W. N. Parrish	562,154
Fiber, composition for treating, C. Eiros	562,121
File case or cabinet, W. J. Boniface	562,352
File wrapper for holding bills, papers, etc., J. S. Dearborn	562,234
Filter, water, J. H. Pierce	562,151
Fire alarm, pneumatic, A. Goldstein	562,130
Fire alarm signal box, J. J. Ruddle	562,054
Firearm, breechloading, M. V. Deno	562,286
Fire extinguisher nozzle, J. G. Hagmann	562,295
Fireproof floor, H. W. Geraerds	562,221
Fishing rod holder, automatically actuated, O. Plath	562,195
Fodder bundle, J. O. Johnson	561,994
Frame. See Separable frame.	
Furnace. See Boiler furnace. Drying furnace. Roasting furnace.	

Pills, powders and ointments, Morison & Company. 28,390
Powders, headache, L. J. Yaess. 28,389
Remedies, certain named, C. J. Ulrici. 28,387
Remedies for gonorrhea and diseases of the urinary organs, Hartmann & Ranck. 28,386
Remedy, catarrh, E. J. Thell. 28,388
Salmon and canned fruits and vegetables, packed, J. G. Meisler. 28,400
Shirts, pants and overalls, J. A. Lamy Manufacturing Company. 28,377
Thermometers, R. Hoehn Company. 28,401
Trunks, wall, S. Jackson. 28,403
Underwear, including knitting waists, children's, Kinderhook Knitting Company. 28,376
Washing, bleaching and cleaning fluid, Clarus Company. 28,376

PRINTS.

"Keep Your Mouth Shut," New York Consolidated Card Company. 18
"The Ace," New York Consolidated Card Company. 17

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1833, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$40 each. 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.

Advertisements.

ORDINARY RATES.

Inside Page, each insertion - - 75 cents a line
Back Page, each insertion - - - \$1.00 a line

For some classes of Advertisements, Special and Higher rates are required.

The above are charges per agate line—about eight words per agate. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.

Star **Lathes**

Foot Power
Screw cutting
Automatic
Cross Feed
9 and 12 inch Swing.

New Designs. Novel Features.
Send for Catalogue B.

SENECA FALLS MFG. COMPANY,
685 Water St., Seneca Falls, N. Y.

AMERICAN PATENTS.—AN INTERESTING and valuable table showing the number of patents granted for the various subjects upon which petitions have been filed from the beginning down to December 31, 1894. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1,002. Price 10 cents. To be had at this office and from all newsmen.

POWER & FOOT LATHES.

SEBASTIAN LATHE CO. 120 CULVERT ST. CINCINNATI, O.

SHAPERS, PLANERS, DRILLS, MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. CATALOGUE FREE.

HANDY ABOUT THE HOUSE.

POCKET COMPANION
 TOOL
 FOLDED

Three tools you are always needing about gas fixtures, curtains, doors, windows—wherever there is "tinkering" to be done. Screw-driver, Brad-awl, Wrench—all in one compact combination, suitable for the pocket. Finely finished, nickelled. Weighs only 2 oz. If your hardware dealer hasn't it, we will send it on receipt of 45 cents. Stamps taken.

THE L. S. STARRETT CO., Box 34, Athol, Mass.

ENDLESS CHAIN
RIVER FERRY BOATS.

Parties prepared to design or build a ferry operated on the endless chain or similar plan by hand or horse power may hear of a probable customer by addressing Thomas Shipley, United Bank Building, Cincinnati, O.

**The Curtis Steam
 Pressure Regulator**

A steam saving appliance of established value. May be used wherever necessary to control or reduce steam pressure. Its employment means a great saving in operating expenses.

Send for circular S. A.

D'ESTE & SEELEY CO.,
 29-33 Haverhill St., Boston.

BARNES' UPRIGHT DRILLS

Complete line, ranging from Light Friction Disk Drill to 42" Back Geared Self-Feed. Send for New Catalogue.

W. F. & JOHN BARNES CO.
 1999 Ruby Street, ROCKFORD, ILL.

118 Educational Institutions are using

LATHES

MADE BY
F. E. REED CO.
 P. O. Box 817,
 Worcester, Mass., U. S. A.

Engine, Hand and Foot Lathes.

MICROMETER RULINGS

in English and Metric Scales.

Special Rulings for Colleges and all Microscopical Work.

J. ZENTMAYER,
 Microscope Manufacturer,
 207 S. 11th Street, PHILADELPHIA, PA.

PERFORATED METAL
 OF EVERY DESCRIPTION
THE HARRINGTON & KING PERFORATING CO.
 CHICAGO, ILL. U. S. A. AND 284 PEARL ST. NEW YORK
 AND FOR ALL USES *****

EDGE TOOLS
are often nearly ruined by using a grindstone not adapted to the work. Our quarries produce a large variety of grits suitable for grinding any tool.

 *May we send you our Catalogue, which will give you some information?*

GRAFTON STONE COMPANY.
No. 80 River Street. **GRAFTON, OHIO.**

INDEX.

ILLUSTRATIONS.

A

Acetylene apparatus..... 8
Acetylene lamp..... 137
Adjustable saw guide..... 488
Air, liquefying..... 228
Alarm and speed measure..... 196
Amalgamator, Dunn's..... 180
Ang-Kor Wat, ruins..... 376
Antelope Konzi..... 107
Avenue in Havana..... 232
Axle box, car, Noyes'..... 69

B

Bag tie, Scofield's..... 245
Baku, oil wells of..... 121
Barometer, column of..... 123
Bars, metallic production..... 389
Battery, dry, new..... 81
Bath, shower..... 70
Battleship Iowa..... 9, 253
Battleship Massachusetts..... 256
Beach, Alfred Ely..... 18
Beach, A. E., inventions..... 40
Bearings, ball, antifriction..... 361
Bed and sofa, combined..... 390
Bell, bicycle..... 11
Bell, bicycle, new..... 277
Bell, great, of Moscow..... 353
Bell shifter, Pratt's..... 153
Berlin Industrial Exp..... 258
Bicycle bell, new..... 11, 277
Bicycle, Eagle..... 17, 20
Bicycle frame, improved..... 6
Bicycle lamp bracket..... 85
Bicycle lamp, electric..... 72
Bicycle, motor, new..... 223
Bicycle path, spiral..... 104
Bicycle, Punnett..... 11
Bicycle rims, press for..... 216
Bicycle riveter..... 39
Bicycles, army, new..... 91
Bicycle skirt screen..... 261
Bicycle tire..... 261
Bicycle transportation..... 283
Bicycle, Tribune..... 4
Bicycle, twenty-five cent..... 229
Biltmore..... 75
Bit, improved..... 102
Blowpipe, new..... 100
Boa constrictor..... 139
Boat propelling mechanism..... 149
Boiler explosion, Piqua..... 379
Boiler fire box..... 36
Boiler furnace..... 374
Boiler tube cutter..... 292
Boiler, tubular, Heron's..... 53
Boiler, Yarrow..... 369
Bottle stopper, Wyckoff's..... 212
Brake, car, new..... 212
Brake, Fricklander's..... 244
Brick, interlocking..... 197
Bridge, new, over Hudson..... 273
Bridge, railroad, novel..... 357
Budapest Exposition..... 314
Buoy, electric light..... 169
Burner, oxyhydrogen..... 165
Burner, stereopticon..... 187

C

Cake baked in a hat..... 234
Camera, hand, novel..... 182
Cabaret du Neant..... 132
Camera, pocket, novel..... 331
Camera stand..... 573
Candlestick, miner's..... 153
Car axle box, Noyes'..... 69
Car brake, new..... 212
Car coupler, Gallien's..... 356
Car coupling, Smith's..... 149
Car fender, new..... 137
Car, postal, street..... 137
Carriage, baby..... 180
Carriage, gun, disappearing..... 161
Carriage, horseless, race of..... 377
Carriages, motor..... 107
Carriage, horseless, race of..... 377
Cars, gas motor, Dessau R.R..... 73
Cart, snow and dirt..... 100
Chain, cycle, adjustable..... 260
Chalk holder, Stocker's..... 52
Channels of N. Y. bay..... 170
Check row device..... 164
Chimney cowl..... 180
Chimney, efficient..... 36
Chimney, straightening a..... 251
Clamp, rim, for wheels..... 341
Clutch, speed power, variable..... 21
Clock pendulum, new..... 104
Clocks, Japanese..... 101
Coal crusher, new..... 508
Coal dock, a great..... 200
Construction, tubular, Pease's..... 52
Coppersmithing..... 373
Corn and feed mill..... 250
Corn, pod..... 250
Coupling, car, Smith's..... 149
Coupling, hose, automatic..... 245
Coupling, hose, Colwell's..... 292
Coupling, thill, Price's..... 164
Crib attachment, bed..... 362
Crookes, William..... 107
Cruiser Olympia..... 177
Cuba, island of..... 223
Curious locomotive explosion..... 404
Current, electric, measurement..... 250
Curtain fixture, Bassett..... 280
Cycle chain, adjustable..... 68
Cyclometer, Ingersoll's..... 120
Cyclotron, electric..... 120
Cyclist, policeman..... 26
Czar, coronation of..... 385

D

Dance, skirt, the..... 392
Derrick, great, Dock Dept..... 380

Destroying vacuum, a..... 408
Disinfecting plant..... 148
Dog bicyclist..... 229
Dog power in cycling..... 312
Dock, dry, U. S. Navy Yard..... 300
Docks, Hudson River, alteration..... 358
Drawbridge gates, mechanical..... 5
Drawbridge, Harlem River..... 81, 88
Dumbwaiter, improved..... 213
Dynamograph, a..... 213

E

Earth, permeability of..... 363
Elephant, white..... 10
Engine, fire, quadr cycle..... 264
Engine, gas and pump..... 144
Engine, gas and gasoline..... 164
Engine, gas, Parker's..... 373
England and Soudan..... 283
Eolipyle chimney..... 53
Expedition, Polar, Nansen's..... 163
Exposition, Berlin..... 258
Exposition, Buapest..... 328
Exposition, electrical, N. Y..... 308

F

Falls, Niagara, gorge road..... 193
Filter and intake..... 101
Fire box, boiler..... 36
Fire escape, novel..... 353
Flight, human..... 153
Flood, after the..... 203
Florida tree palm..... 410
Frying and tube cutter..... 356
Flying machine, Lilienthal's..... 153
Furnace, boiler..... 374
Furnace, calcining, Wethey..... 341
Furnace, Thorne's..... 22

G

Galveston, jetties at..... 321
Games, board, novel..... 197
Games, Olympic..... 313
Garden, a tropical..... 43
Gas, acetylene..... 8
Gas burner, Welsbach..... 165
Gas engine and pump..... 244
Gas engine, boiler, for..... 25
Gas engines, Parker's..... 373
Gas generator and burner..... 52
Gas machine, new..... 248
Gas motor cars, Dessau R.R..... 73
Gasoline motor cycle..... 229
Gate, bridge, new..... 26
Gate, wagon, fastener..... 197
Gloves, kid, manufacture..... 405
Grain shovel for unloading cars..... 405
Gramophone..... 385
Gunboats, composite..... 33
Gun, 16 inch, coast..... 346

H

Hailstones, large..... 347
Hanger, electric lamp..... 363
Harp, 3000, to make..... 252
Hat, safety, for miners..... 276
Hippopotamus, the..... 201
Holder for tool sharpening..... 323
Hoof spreader..... 244
Horse detach and brake..... 244
Horse, detaching device..... 167
Hose coupling, automatic..... 245
Hose coupling, Colwell's..... 292
Hunting trap, Delavergne..... 312
Huts, Cuban..... 225

I

Ice shaver and milk shaker..... 308
Igniters, electric..... 25, 90
Illusion, Vanity Fair..... 297
Illusion, X ray..... 152
Insect destroyer..... 374
Insulator, Biegar's..... 101
Intake and filter..... 101
Iowa, battleship..... 9
Iowa, ship, launch of..... 273
Isfjord, Iceland..... 237

J

Jack, logging, new..... 228
Jacket, orange tree..... 376
Jenner, Edward, M.D..... 344
Jetties, Galveston..... 321

K

Kites, scientific..... 171

L

Lamp, acetylene..... 137
Lamp, arc, Manhattan..... 139
Lamp, bicycle, electric..... 72
Lamp, electric, hanger..... 382
Lamp, floor, electric..... 107
Lamp, gas, for lanterns..... 165
Lanterns, projection..... 165
Lath and motor..... 104
Lath, copying..... 372
Lath, gun, 16 inch..... 337
Lath, Rivett..... 196
Launch, Priscilla..... 57
Lausanne, tramways of..... 24
Lawn sprinkler..... 212
Leather riveting machine..... 53
Letter canceling machine..... 241
Letter fling cabinet..... 383
Lifeboat, Taylor's..... 121
Light, electric, Edison..... 378
Lights, maritime..... 169

Lizard, frilled..... 217
Locomotive, mine..... 356
Logging jack, new..... 228

M

Magnetographs..... 249
Mars, the planet..... 133
Massachusetts, battleship..... 296
Medal, Jenner..... 344
Milk shaker and ice shaver..... 308
Mill, corn and feed..... 213
Miners, tool for..... 153
Monument of Nicholas I..... 383
More Castle..... 225
Mortise, blind..... 267
Moscow, holy gate of..... 385
Motorcycles, testing..... 345
Motor, Dickson's..... 240
Motor, water gas..... 24
Mouse trap, natural..... 326
Music leaf turner..... 151

N

New double-deck-turret battle-ship Kearsarge..... 401
Niagara Falls gorge road..... 193
Niagara power plant..... 49, 209
Nose bag, Burbank's..... 278

O

Observatory, Royal, Greenwich..... 281
Oil wells of Baku..... 121
Olympia, cruiser..... 177
Orange tree jacket..... 376
Oxygen, liquefying..... 229
Oyster and mice..... 536

P

Packing, rod, Walker's..... 228
Pavement, cushion..... 373
Pendulum, clock, new..... 22
Photographs, X ray..... 155, 184
Platform, a serviceable..... 246
Plover attachment..... 331
Plover, steam..... 292
Pocket dental..... 293
Pocket companion, Bache's..... 196
Policeman, cyclist..... 26
Postal delivery box..... 41
Potato growing, remarkable..... 53
Potato sorting machine..... 229
Power plant, Niagara..... 216
Press for bicycle rims..... 216
Princess Topaze..... 27
Priscilla, launch..... 57
Projectiles of Dudley gun..... 266
Projectiles, speed of..... 266
Pump, centrifugal..... 244
Puzzle, thief and detective..... 342

Q

Quadricycle fire engine..... 284
Quint's turret drill..... 405

R

Rabbit drives, California..... 299
Railroad bridge, novel..... 357
Railroad scheme, elevated..... 24
Railroad wreck, curious..... 168
Railway, pneumatic, Beach..... 41
Railway, trolley, underground..... 113
Ray, X, experiments of Edison..... 219
Ray, X, focus tube..... 218
Ray, X, Tribolet..... 45
Rice culture, Louisiana..... 280
Riveter, bicycle..... 36
Riveting machine, leather..... 53
Road packing, Walker's..... 228
Roentgen, Prof..... 115

S

Saw mill, English's..... 388
Scars, prints of..... 169
Screen, skirt, bicycle..... 361
Screw, Archimedean..... 376
Scythe, adjustable..... 116
Seal for vessels containing liquids..... 405
Seat, spring, Davy's..... 308
Separator, Gilmore's..... 132
Sewer inlet, improved..... 232
Shade supporter..... 132
Shadowpicture, first..... 235
Shield, the Beach..... 56
Ship of war, Iowa..... 9
Skates, sailing on..... 187
Skating rink, a great..... 181
Skirts, preparation of..... 185
Skirt dance, the..... 392
Sofa and bed combined..... 390
Sorting machine..... 276
Spark arrester..... 100
Speed controller..... 132
Speed measure and alarm..... 193
Sphinx, diadem of..... 235
Sprinkler, lawn..... 212
Stable cleaning apparatus..... 234
Stadium, Olympic..... 21
Stadium, scene in..... 313
Steam and solar heat..... 53
Steamship St. Paul..... 84
Stereoscope, inverting..... 305
Still for tar..... 57
Stone dresser, new..... 37
St. Paul, steamship..... 84
Straw stacker, pneumatic..... 181
Street in Havana..... 282
Sugar plant on, Cuban..... 225
Sun spots of May 31..... 379

Swaging machine..... 17
Switch, electric..... 148

T

Tacks, manufacture of..... 116
Talking machine, new..... 305
Tapping machine..... 212
Tar, still for..... 57
Telephone cabinet ventilators..... 89
Telephony, train..... 216
Thermometer, recording..... 149
Thermophone, the..... 217
Thill coupling, Price's..... 164
Thrasher, rice, cyclone..... 289
Tilbury, Dutch..... 340
Time recorder, watchman's..... 212
Tire, bicycle..... 261
Tool holder attachment..... 323
Topaze, Princess..... 27
Tops, curious..... 87
Torpedo boat, high speed..... 33
Torpedo boat, Holland..... 267
Train telephony..... 216
Tramways of Lausanne..... 24
Trapeze, Leamy..... 59
Trap, mouse, natural..... 326
Tree, great, California..... 89
Tribune bicycle..... 41
Tricycle, dog power for..... 812
Trolley hanger and cut out..... 72
Trophies, Olympian..... 340
Truck bearing..... 404
T-square, improved..... 280
Turbine wheel, Hager's..... 323
Tube, Crookes..... 108
Tube, focus, X ray..... 218
Tubes, Crookes, improved..... 342
Tubular construction, Pease's..... 52
Turbine, Niagara..... 215
Turbine, Hager's..... 323
Typewriter and adder..... 145
Typewriter, Hammond..... 145
Typewriter, the Beach..... 40

V

Vacuum pans, copper..... 373
Vacuum tubelighting..... 129
Valve, hose coupling..... 292
Vanderbilt, estate of..... 75
Vapour, fair, illusion..... 297
Vehicle, electric device..... 323
Ventilator machine, automatic..... 133
Ventilator, hydraulic..... 393
Ventilators, telephone cabinet..... 89
Vessel, sailing, improved..... 341
Vessel, regl..... 216
Viviscope, the..... 385

W

Walls, defective, rebuilding..... 126
Warp sizing, improvement..... 241
Warriors, Soudanese..... 283
Water wheel, turbine, Haag's..... 298
Welding machine, electric..... 69
West Street, widening of..... 353
Wheels, rim clamp for..... 341
Winch, improved..... 276
Windmill, Rowan's..... 276
Women of Khartoum..... 283

MISCELLANY.

Figures preceded by a star (*) refer to illustrated articles.

A

Academy of Sciences, National..... 291
Academy of Sciences, New York..... 291
Acetylene apparatus..... 8
Acetylene apparatus, Fuller..... 180
Acetylene explosion..... 73
Acetylene explosive mixture..... 390
Acetylene and fire insurance..... 264
Acetylene gas in Italy..... 323
Acetylene gas, uses of..... 234
Acetylene, ignition temp..... 218
Acetylene lamp..... 137
Acetylene for photometry..... 235
Acetylene on tramways..... 389
Acetylene, poisonous action..... 90
Acetylene for steam engines..... 376
Air, formic, action on seeds..... 358
Adams, W. L., death of..... 70
Adjustable saw guide..... 408
Advertising, novelty in..... 231
Aerial irrigation..... 408
Aerodrome, Langley's..... 323
Aerolite, explosion of..... 116
Aeronautical Society, Boston..... 264
Africa, our trade with..... 391
Aged, care of the..... 147
Aged, the, of Old World..... 375
Air, foul, indication of..... 343
Air, liquefying..... 228
Air, seashore, salt in..... 182
Air, solid..... 394
Alcohol, d hydrating..... 11
Alkaloids, variable..... 99
Alps of Japan..... 104
Aluminum wheel..... 21
Aluminum coffins..... 6
Aluminum cooking utensils..... 147
Aluminum, corrosion..... 170
Aluminum, electric conduct..... 261
Aluminum in Norway..... 147
Aluminum in surgery..... 168
Amalgamator, Dunn's..... 180
American Institute fair..... 155
Americans win Olympian games..... 242
Angkor Wat, ruins..... 376
Anhalonine..... 310
Animals, change of color in..... 22
Animals, farm, value of..... 227
Animals, left or right handed..... 54
Animals, longevity of..... 343

Annealing, molecular..... 338
Antelope, Konzi..... 107
Anthon..... 39
Antonine..... 39
Antiseptic, new..... 36
Ants, language of..... 138
Apprenticeship system..... 322
Arctic regions, life in..... 70
Argon in air..... 248
Argon and helium..... 328
Ark, Noah's..... 283
Armor and shot, contest..... 227
Arms, improved..... 35
Art league, public..... 98
Art, new, Herkomer's..... 122
Asepsis, Edson's..... 198
Astronomical note..... 186
Astrop, Edwin..... 89
Athens, excavations in..... 299
Atlanta Exposition..... 41
Atoms, color of..... 70
Auditoriums, keynote of..... 42
Auk, egg of..... 342
Austral heat in..... 170
Avalanche, Swiss, study..... 375
Axle box, car, Noyes'..... 69

B

Babcock, Lieut. W. C..... 179
Bacteria in flax treatment..... 263
Bacteria in milk..... 282
Bacteria of soil..... 298
Bag tie, Scofield's..... 245
Baku, oil wells of..... 121
Balloon, Andre's..... 278
Ballons scientific observation..... 408
Banana, the..... 186
"Barisal guns" and "mist pouff-ers"..... 403
Barometer, collapse of..... 172
Barometer, homemade..... 170
Barth, shower..... 137
Bars, metallic, production..... 389
Battery, boron..... 164
Battery, dry, new..... 81
Battleship Iowa..... 9, 253
Battleship Massachusetts..... 256
Battleship Texas..... 42
Battleship turret, test of..... 331
Battleships, two new..... 35
Bay, Hudson's, rise of land..... 340
Beach, Alfred Ely..... 18
Beetles, elm, to kill..... 118
Beils, shower..... 171
Bearings, ball, antifriction..... 361
Bed and sofa, combined..... 390
Bees, memory of..... 214
Bees, work of..... 215
Belts, glue joints in..... 340
Beginning of a new volume..... 403
Bell, bicycle, new..... 11, 277
Bell shifter, Pratt's..... 153
Bel strainer..... 138
Belting, cement for..... 76
Belts, glue joints in..... 199
Berlin Industrial Exposition..... 253
Berlin's sewage problem solved..... 403
Bessemer process, invention of..... 268, 338
Bicycle bell, new..... 11, 277
Bicycle craze, ravages..... 281
Bicycle, Eagle..... 17
Bicycle exhibition, N. Y..... 66
Bicycle frame improvements..... 6
Bicycle frames, welding..... 69
Bicycle lamp bracket..... 85
Bicycle lamp, electric..... 72
Bicycle, the modern..... 2
Bicycle, motor, new..... 223
Bicycle path, spiral..... 104
Bicycle, Punnett..... 11
Bicycles, army, new..... 91
Bicycles, number in use..... 291
Bicycle notes..... 3, 58, 246, 291, 308
Bicyclist, dow..... 223
Bicycle, twenty-five cent..... 229
Bicycles, new..... 291
Bicycles, number in use..... 291
Cocaine on race track..... 9
Coffee as a disinfectant..... 405
Coffee, influ. on digestion..... 462
Coffee, aluminum..... 373
Colds, how taken..... 267
Colds, novel cure for..... 214
Collar, explosion of..... 166
Colors, according to latitude..... 74
Columbia University..... 307
Combustion, spontaneous..... 275
Commerce, Behring Strait..... 184
Commerce with Great Britain..... 188
Construction, tubular, Pease's..... 52
Consumptives, cold air for..... 139
Continent, antarctic..... 58
Copper, action, on animals..... 374
Coppersmithing..... 373
Copyright bill, new..... 179
Corks, old, uses for..... 26
Corona, solar, photographed..... 200
Corona, solar, photographing..... 357
Corn and feed mill..... 250
Corn, pod..... 250
Coronation of the Czar..... 385
Corporation, greatest..... 122
Cotton, Egyptian..... 238
Cotton, Japanese demand..... 25
Cotton mills of Japan..... 263
Coupler, car, Gallien's..... 356
Coupling, car, Smith's..... 149
Coupling devices, introduction of..... 359
Coupling, hose, automatic..... 245
Coupling, hose, Colwell's..... 292
Coupling, thill, Price's..... 164
Crabapple culture..... 301
Cremation, progress..... 186
Crib attachment, bed..... 362
Critics, liability of..... 198
Crookes, William..... 107
Cruiser Buenos Aires..... 5
Cruiser Olympia..... 177
Cryostat..... 234
Crystals, large, prep..... 155
Cuba, island of..... 223
Curious locomotive explosion..... 404

© 1896 SCIENTIFIC AMERICAN, INC.