## 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 mu.t be received at publication office as early as Thursday morning to appear in the following week's issue

Wanted-50 second-hand screw-cutting lathes, 8 to 12" swing, either foot or steam power. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue. Wanted manufactured or will sell oil cup, page 21& "U.S. metal polish. Indianapolis. Samples free. Presses & Dies. Ferracute Macb. Co., Bridgeton, N. J. 6 Spindle Turret Drill Presses. A.D. Quint, Hartford, Ct.

Patent Open-Side Planing and Shaping Machines. Pedrick & Ayer, Philadelphia, Pa. For first-class patterns write to Chas. Cassell, general

patternmaker, Canton, Ohio, For foundrymen's metallic pattern letters and figure

send to H. W. Knight & Son, Seneca Falls, N. Y. Steam Hammers, Improved Hydraulic Jacks, and Tube

Expanders. R. Dudgeon, 24 Columbia St., New York. Screw machines, milling machines, and drill presses The Garvin Mach. Co., Laight and Canal Sts., New York.

Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wie, Syracuse, N. Y. For Sale-Eleven hundred acres best coal land on Pacific coast. For samples, etc., address C. F. Pearson, box 148. Portland, Oregon.

For Sale-Patent No. 463,912, issued Nov. 24, 1891. Tools for miners' and blasters' use, Address R. A. McVitty, Portland, Oregon.

Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Convertible chair, cradle, and lounge. Patent for sale (No. 440,974), or wanted manufactured on royalty. Address F. A. Thomas, 149 Willoughby St., Brooklyn, N. Y. For the original Bogardus Universal Eccentric Mill. Foot and Power Presses Drills, Shears, etc., address J.S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y. Good Investment-Half interest in lamp wick raiser

for flat wicks. Price, \$500. Patented Nov. 3, 1891. Particulars for stamp. M. A. McBride, M.D., Thomaston, What do you want to buy? We will send without cost

to yen, catalogues, price lists, and information concern ing anything you wish. Paret, Willey & Co., 265 Broad Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may

apply to Munn & Co., Scientific American office, 36 Broadway, New York. A middle aged married man, a traveled salesman of

experience, now permanently located at Denver, Colo, (pop., 150,000), where he has extensive acquaintance, de sires agency of some Eastern or foreign specialty. Address Brewster & Co., Mendota Block, Denver, Colo. The Hall & Cook post hole digger (see advertisement

page 220), patented U. S. Jan. 26, 1892, has won a brilliant place among its users in Canada. Already the Canadian Pacific Railway has adopted it, and the Grand Trunk Railway took its adoption into favorable consideration just as frost set in. It is beartily indorsed by Hon. John Dryden, Minister of Agriculture for Ontario, besides a host of farmers, etc., who have thoroughly tested it. Judging from the favor it bas already received with railway, telegraph and telephone companies, farmers, well and drain diggers, etc., it will be as indispensable as the spade bas been in the past



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 dateof paper and page or number of question.

In quiries 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.

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

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

Books referred to promptly supplied on receipt of

minerals sent for examination should be distinctly

INDEX OF NOTES AND QUERIES.		No
Battery, chlorine		. 4210
Copper, to detect	<b></b>	4211
Piping for heavy pressure	<b></b>	4208
Sodium, composition of		
Steel, to anneal		4207

(4207) C. M. M. asks if there is anything that can be put in water so that by heating a piece of cast steel and plunging it into the water it will come out annealed. A. There is nothing needed in the water for "water annealing." The process is simply to heat the steel to a low red heat and allow it to cool slowly in hot ashes until it looks black or the red heat is entirely gone, then plunge in water.

(4208) H. M. B. says: Two miles from the city of Quito in Equador, and 1,600 feet above its elevation, there is a waterfull that would fill a pipe 12 inches in diameter. If that water was piped down to the city in the best iron or steel piping, what thickness of pipe would be required at the lower end to withstand the strain? A. Wrought iron pipe 12 inches is amply strong, if about 1/2 inch thick. The pressure is too great for a city water supply. Extra strong plumbing will stand a water head of 200 feet, at which height a reservoir should be placed and the water brought to it by a free run through ordinary pipe with an overflow waste. This is far better than any attempt to rnn a high pressure servi

(4209) C. H. asks: 1. Is it necessary for one desirous of learning any of the type-setting or typecasting machines to first learn the art of setting type by 

how to punctuate, capitalize, paragraph, read difficult C manuscript, etc., with the facility and correctness usually acquired by the compositor in learning to set type. 2. Where is the Rogers typograph machine manufactured? A. Cleveland, Ohio. 3. Is it probable that a machine will be invented that will print short band characters as the ordinary type are printed by these machines? A. It would be as easy to print short hand characters as Roman, but there is no call for a machine

(4210) V. D. R. writes: 1. I am a student of the high school of this place, and in one of our experiments in chemistry we were directed to take a piece of sodium and hastily plunge it under the mouth of a test tube inverted in water in a larger dish. In about nine cases out of ten an explosion takes place. Will you kindly inform me through Notes and Queries the reason of the explosion, which does not occur when potassium is substituted for the sodium. A. This is a phenomenon of the spheroidal state. The heat is at first so great as to prevent full contact of sodium and water. When the heat falls and contact occurs the sudden heating produces an explosion. Potassium acts in the same way; neither should be used unless they are held under water. Both experiments are dangerous. 2. Also please give me equation for action in Leclanche cell. A. It may be written thus: Zn+2NH4Cl=ZnCl2+ 2H+2NH<sub>3</sub>, but is undoubtedly complicated by other re actions. 3. Is it necessary to wind secondary coil of an induction coil in opposite direction to that of primary? If so, why? A. No. 4. Is there any galvanic cell which has chloride of lime in porous cup with carbon and common salt in outer cup with zinc? If so, will you please give its E. M. F. in volts? A. You are thinking of Niaudet's battery. Plate of zinc in strong solution of common salt, porous cup containing plate of carbon and packed with chloride of lime and fragments of carbon. E. M. F. 1.65 running down to 1.5 volts. Resistance high, no action on open circuit.

(4211) F. L. W. asks: Can you tell me of a test that will indicate the presence of a very small percent of dissolved copper in water? Say one-tenth of a grain or less in a gallon of water. A. Excess of ammonium hydrate produces blue coloration in solution of copper. A very slight excess is enough. Possibly in your case it would be well to evaporate the water down in a porcelain dish or other vessel to about onetenth its volume, acidify, filter and add ammonia water. Add enough to react on litmus paper or to give a perceptible odor of ammonia.

#### TO INVENTORS.

An experience of forty years, and the preparation of more than one bundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. 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. MUNN & CO., office Scientific American, 361 Broad-

## INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

March 22, 1892,

## AND EACH BEARING THAT DATE.

|See note at end of list about copies of these patents.|

(See note at end of list about copies of these par	епо.,
Air, method of and apparatus for purifying and	
regulating the temperature of, Sobotka & Kliemetschek.	471,294
Alarm. See Boller leed alarm.	
house	471,367
Annealing furnace, Winlund & Larson	471,299
Apple cutter and corer, T. Westerman	471,158
Arch, hollow cohesive, R. Guastavino, Jr	471,173
Auger, earth, N. D. Tyler	471,320
Awning, portable mine, Greenwald & Hopkins	471,217
Amalgamator for free-milling goldore, A. Woodhouse Annealing furnace, Winlund & Larson. Antiseptic sponge, artificial, A. Poehl. Apple cutter and corer, T. Westerman. Arch, hollow cohesive, R. Guastavino, Jr. Ash trap, W. H. Bell. Auger, earth, N. D. Tyler. Awning, portable mine, Greenwald & Hopkins. Axle box for street cars, N. C. Bassett. Axles, macbine for trimming the flash from, W. J. Parmelee.	411,000
Radge and bouquet holder, combined H. W.	471,136
Laun	471,181
Bag, See Mail Dag. Paper Dag.	471,433
Bag'holder, J. H. Craig	471,466
Axies, machine for trimming the hash from, W. J. Parmelee. Badge and bouquet holder, combined, H. W. Laun. Bag. See Mail bag. Paper bag. Bag fastener, R. C. Rice. Bag'holder, J. H. Craig. Bank, pocket savings, L. U. Loomis. Bar fixture, Lefebvre & Cessna. Barrow cost, E. Halford.	471,327
Barrow coat, E. Halford	471,478
Bed spring, W. L. Gillette	471,500
Belt fastener, S. Budlong	471,518
Barrow coat. E. Halford Bed, child's folding, H. Walker Bed spring, W. L. Gillette Belt fastener, S. Budlong Belt fastener, W. M. Whiting Belt fastening for driving machinery, G. Rother-	411,400
ham	471,140 471,472
Bicycle, C. R. Shorey	471,292
Bicycle, G. Zillgitt	471,249
Bil!-of-fare indicator for waiters, C. Kelley	471,124
Bird trap. L. A Fort	471,426
Belt fastening for driving machinery, G. Rotherham. Bicycle, W. A. Fleming. Bicycle, C. R. Shorery. Bicycle, G. Zillgitt. Bicycle saddle, W. I. Bunker. Bill-of-fare indicator for waiters, C. Kelley. Billiard table, Hutton & Hubert. Bird trap, L. A Fort. Bit. See Bridle bit. Saw bit. Bleaching by electrolysis, process of and appara-	
Bleaching by electrolysis, process of and apparatus for, A. E. Woolf  Block. See Pulley block.	471,454
Block. See Pulley block. Boiler. See Steam boiler.	
Doilor food clown D Vorolog	471,311
Boiler furnace, E. A. Wheeler	471,449
Boiler furnace, E. A. Wheeler.  Boilers, construction of movable fire bars of, H.  W. Shephard.	471,440
Bolt. See King bolt. Thill bolt.	471 429
Bookbinding, Allen & Weber	471,457
Book, scrap, J. Rooney	471,359
Boilers, construction of movable fire bars of, H. W. Shephard.  Bolt. See King bolt. Thill bolt. Bolt releasing device, P. Pollard. Bookbinding, Allen & Weber. Book. check or order, E. North. Book, scrap, J. Rooney. Bottle, ink. W. F. Hall. Bowling alley, H. Montgomery. Box. See Axle box. Paper box. Sand box. Brace. See Shoulder brace.	471,479
Box. See Axle box. Paper box. Sand box.	2146 <del>41</del>
Brace. See Sboulder brace. Brake. See Car brake.	
Brake apparatus, automatic vacuum, J. Gresham	471,382
Bread cutting plate, F. F. Sevey	471,198 471,493
Broiling pan, M. B. Noland	471,134
Buckle, C. C. Shelby	471,439
Buckle case, suspender, J. A. Traut	471,259
Brake See Car Drake. Brake apparatus, automatic vacuum, J. Gresham Bread cutting plate, F. F. Sevey. Bridle bit, W. Nichols. Broiling pan, M. B. Noland. Brooder, poultry, E. Barney. Buckle, C. C. Shelby. Buckle case, suspender, J. A. Traut. Bulding, borticulture, H. W. Gibbons. Burner. See Hydrocarbon vapor burner. Cable take un, W. B. Unton.	#11,000
Calendar perpetual monthly R S Howt	471,446
Cable take-up, W. B. Upton. Calendar, perpetual monthly, B. S. Hoyt. Cam cutter, French & Meyer. Camera. See Photographic camera. Can testing machine, J. B. Foote. Candles, ornamenting, T. V. Forster.	471,381
Camera. See Photographic camera.	471.352
Candles, ornamenting, T. V. Forster	471,499

Manager and the state of the state of	F-144
ar, bicycle passenger, day palace, and sleeping, E. M. Boynton	Knitting machine, circular, E. A. Hirner
ar coupling, J. H. Bolitho. 471,376 ar coupling, W. B. Bruce. 471,463	circular, J. Bradley 471,416 Knitting machine for knitting elastic fabrics, warp, J. Cooper 471,350 Knitting machine for knitting striped fabrics, circular J. Bradley 471,415
ar, bicycle passenger, day palace, and sleeping, E. M. Boynton. 471,340 ar Brack. 471,340 ar Brack. 471,475 ar coupling, J. H. Bolitho. 471,476 ar coupling, W. B. Bruce. 471,463 ar coupling, W. A. Salisbury. 471,463 ar coupling, W. A. Salisbury. 471,163 ar badding apparatus. J. F. McElroy. 471,312,471,143 ar heating apparatus. J. F. McElroy. 471,312,471,143 ar heating apparatus. J. F. McElroy. 471,312,471,143	Knitting machine for knitting striped fabrics, circular, J. Bradley 471,415
ar, band, C. Schafer.  ar heating apparatus, J. F. McElroy. 471,312, 471,313  ar heating apparatus, street, J. F. McElroy. 471,312, 471,313  ar indicatoroperating device, automatic, S. B.  471,323	circular, J. Bradley
arpet sweeper, C. Tangenberg 471.515	Lamp and shade holder, Atwood & Ashenden 471,296 Lamp carbon holder, arc, C. A. Pfluger 471,190 Lamp, central draught, H. Craighead 471,507
arriage, Wells & Morrill	Lamp, electric arc, H. Dewar. 471,507  Lamp, electric arc, H. Dewar. 471,234  Lamps, disk carbon for arc H. W. Libbert 471,534
ase. See Buckle case.	Lamp, electric arc, H. Dewar. 471,234 Lamps, disk carbon for arc, H. W. Libbey 471,526 Lasting machines, etc., stop motion for, C. Sinning. 471,495
ash and package carrier, J. Finck	Latrine and automatic masning apparatus, W.
asting grids for secondary batteries machine	Letters, device for opening, volk & Weiland
for, A. F. Madden 471,527	lock         Permutation lock.           Lock         E. T. Starr         471.344           Lock         T. Wohlmuth         471,453
hairs, fan attachment for rocking, C. Durieux 471,509 heck controlled lock, J. R. Buckingham 471,464 hock enfoty book. 47,464	Lock, T. Wohlmuth Lock for trunks, valies, boxes, etc., J. J. Sager. Locmotive, B. F. Taylor. Locomotives, smoke exhausting app ratus for, C. Anderson
attle guard, • N. Evans. hairs, fan attachment for rocking, C. Durieux 471,213 heek controlled lock, J. R. Buckingham 471,464 heek, safety bank, M. A. Drew 471,484 heek, safety bank, M. A. Drew 471,388 hurn, W. E. Depp 471,388 hurn, W. E. Depp 471,389 hurn, H. B. Eggleston 471,130 hurn, J. C. Humphreys 471,317 hurn, R. E. Miles 471,313 lamp, W. H. Robinson 471,322 leaner. See Tobacco pipe cleaner. locks. electric striking mechanism for. S. C.	Anderson G. E. Thurston 471,458 Loom shuttle guard, C. McCarty 471,209 Lubricating gland, J. N. Elliott. 471,209 Lubricator. See Windmill lubricator.
hurn, H. B. Eggleston 471,109 hurn, J. C. Humphreys 471,337	Loom shuttle guard, C. McCarty. 471,522 Lubricating gland, J. N. Elliott. 471,269
nurn, R. E. Miles	Lubricator. See Windmill lubricator.  Mail bag and lock therefor, W. F. Beasley. 471,166, 471,167  Mail bag banger, D. D. Gott
leaner. See Tobacco pipe cleaner. locks. electric striking mechanism for. S. C.	Marbleizing glass, paper, and the like, apparatus for, A. Butterfield
locks, electric striking mechanism for, S. C. Dickinson	Marker, corn. A. Ewer. 471,245
	Metal charmor ornament, L. E. A. Dumont 471,235 Metal plates with tin, apparatus for coating, Rogers & Player. 471 437
ock and valve, tapping, B. J. Bacon	ers & Player
Decentrating table J. Alves	ing, A. Steiger
opy holder, W. O. Crane	Mill. See Grinding mill. Sawmill. Mining machine, J. C. Robertson. 471,434
orn popper, D. Swanson	Mining machine, J. C. Robertson
oupling. See Car coupling. Thill coupling. rane, H. Aiken. 471,307 rane bandle, G. W. Pelton 471,332 rayon, combination, W. Q. Prewitt 471,191 ultivator, E. E. Hatfeld. 471,218 ultivator, field, G. Cordes. 471,238 urrent motor, alternating, E. Thomson. 471,255 urtain, N. J. Felix. 471,25 urtain, C. D. Vinton. 471,215 urtain, C. D. Vinton. 471,313	Mowers, grass catching attachment for lawn, A. L. Hughes
rayon, combination, W. Q. Prewitt	L. Hughes. 471,386 Musical instrument, P. Peynaud 471,276 Musical instrument, C. G. Zimmermann 471,370 Needle threader, R. Spengler. 471,150
ultivator, field, G. Cordes	Nut, lock, J. G. Netschert. 471,492 Oil reservoir, F. W. Mosby, Jr. 471,492 Ore concentrator, J. M. Thompson. 471,268 Ore conveyer and arranging ore thereon, T. A. Zilison
#174215 urtain, C. D. Vinton	Ore conveyer and arranging ore thereon, T. A. Edison. 471,268
utter. See Apple cutter. Cam cutter Fodder	Ore roasting furnace, H. F. Brown
utting and gripping tool, Timm & Johnson	L. Cudner. 471,103 Ores, concentrating, Hebron & Everson 471,174 Overshoe, L. N. Garcia 471,476 Ox shoe, W. Pearce 471,513
ecorticating machine, R. A. Baumgartner 471,372 istillation of mineral oils, apparatus for destruc-	Ox shoe, W. Pearce 471,345 Packing, metallic, Mosher & Anderson 471,185
	Pad. See Writing pad. Padlock, W. Hover 471,482
raught equalizer, P. J. Rabb. 471,396 raught equalizer, Wages & Armstrong 471,297 ramatic effects, apparatus for producing illusory, J. W. Knell (now N. Burgess) 471,126, 471,127 redge, A. K. Stone. 471,404	Pail, bucket, scuttle, etc., G. N. Inglehart 471,121 Pan. See Broiling pan. Evaporating pan. Fry-
redge, A. K. Stone	ing pan. Paper bag, compartment, W. A. Lorenz. 471,254 to 471,257 Paper hox, J. A. Scott. 471,408 Paper delivering tip, L. M. Moores 471,251 Paper holder and cutter, roll. C. K. Pickles 471,221 Paper holder and cutter, roll. C. K. Pickles 471,222 Paper weight, C. Dickenson 471,508 Pen fountain, F. S. Cooley 471,508 Pen, fountain, J. Holland 471,175 Pencil, J. Pusey 471,175 Pencil, J. Pusey 471,418
redging machine, G. Duryee	Paper holder and cutter, roll, C. K. Pickles
ggs, liquid substitute for, J. E. Furber	Pen fountain, F. S. Cooley 471,506 Pen fountain, F. S. Holland 471,175
ston	Pencil, J. Pusey       471,431         Pencil sharpener, T. Foy       471,216         Pencil sharpener, O. H. Robinson       471,435
lectric switch, A. Metzger. 471.271 lectric switch, vibrating, J. S. Gibbs. 471.237 lectrical conductors, safety device for, J. Marx. 471.302 lectrical transfer and the state of the safety of the sa	Pencies of crayons, composition of matter for, G.
lectrically-controlled elevator, A. M. Coyle 411,100	Schwarzwald
Ievator. See Electrically-controlled elevator.   471,497   1evator w. C. Baird.   471,137   1evator and dump. A. Peterson.   471,137   11,377   1	Permutation lock, E. A. Englin 471,498 Photographic album, J. R. Jones 471, 7
nd gate, W. Cooper 41.377 nd gate, M. E. Hunt 471,178 ngina See Dentel engine	Photographic films, machine for forming flexible, G. Eastman
Ring   See Bental engine	Photographic shutter, Anthony & Lewis. 471,088 Photographs, producing colored, J. W. McDonough. 471,186, 471,187 Piano, R. B. Watson 471,248
xtension table, G. O. Moland	M cDonough
xtractor, See Honey extractor. abric. See Elastic knit fabric. an, spring power, P. Schaurer. 471,196	Picture, magic, F. Tschofen
aucet, measuring, A. D. Hollis	Picture, maric, F. Tschofen. 471,305 Pigments, manufacture of, G. W. Scollay. 471,347 Pipe connection, W. Vanderman. 471,247 Pipe corrugating machine, G. C. Keene. 471,301 Pipe banger, J. Collis. 471,368
W. McCallum	Pipe banger, J. Collis. 471,348 Pipe wrench, A. L. Engelhach. 471,471 Piperazin, making, W. Majert. 471,520 Plane, carpenter's, O. Longval 471,331 Planers and shapers, to ol head for iron, F. W. & F. P. Parsons. 471,180
ermenting, C. Funk	Plane, carpenter's, O. Longval 471,391 Planers and shapers, to ol head for iron, F. W. &
ile, bill of letter, Ahrens & Gottwals	E. P. Parsons. 471,189 Plow, D. Edwards 471,411 Plow, D. J. Hill. 471,311 Plow, D. J. Hill. 471,321
11e, letter, A. Grundy 441,537 ilter, J. M. Holt 471,385 ilter, Weir & Rurness 471 496	Plow, C. C. Fleids. 471,311 Plow, D. J. Hill. 471,335
irearm, breech-loading, 3. Schmidt	Plow F. Huenerjaeger
ire escape ladder, flexible, S. L. Perry	Portfolio, C. N. Leonard
And a prince See Blastic Full Factors and a prince See Blastic Full Factors and a prince power of the prin	Pressure gauge, duplex, F. H. Haskell 471.383
Ast iron, E. Stewart	Printing press, L. W. Southgate
riction folief, G. A. Crisson	C. Crowell. 471,102 Printing press reciprocating mecbanism, W. B. Yates. 471,369
nace.	Propulsion of vessels, screw, E. J. Pahtz. 471,774 Protector, See Trunk protector. Pulley block, P. Freund. 471,519
urnaces, gas burner for, J. S. Rogers	Pulley block, P. Freund.       471,519         Pump, reciprocating, A. F. Abrahamson.       471,411         Pump, rotary, J. Menge.       471,488         Pump, rotary, B. F. Taber.       471,279, 471,280
auge, See Pressure gauge, ame counter, Frost & Bolt	Pump, rotary, B. F. Taber. 471,279, 471,230 Puttying seams, implement for, J. Hawksley. 471,125 Puzzle, W. Rose. 471,128
as heater. H. C. Earle	
ate. See End gate. ates, means for operating swinging, J. W. Rhodes. 471.193	Railway conduit, electric F.O. Biackweii 471,452 Railway head plate. J. M. Katzmaier 471,240
Rhodes	Fyroxyme variast, r. 1ate 241,325 Railway conduit, electric, F. O. Blackwell 471,375 Railway, elevated, E. D. Wilson 471,435 Railway head plate, J. M. Katzmaier 471,240 Railway signal, electric, E. T. Turney 471,250 Railway signal, electric, E. C. Wiley 471,250 Railway signal apparatus, electric, A. 1. Wilson 471,400 471,410
rapor. Hass press, J. A. Widmer	Railways, charging table for electric, E. ?. Usber 471.447
rill work, W. H. Winslow 471,161 rinding attachment, P. Forg 471,380	Rake. See Hay rake. Range attachment, J. F. Myers
rnung mill, D. C. Stover	Reducing and swaging machine, A. B. Shippee 471,148
rator.  lass press, J. A. Widmer	Register. See Cash register. Regulator. See Temperature regulator. Ther- mostatic regulator.
tame and trace connector, W. B. Nichols 471,188 andle. See Crank handle. Tool bandle.	Revolvers, barrel strap catch for, Foehl & Weeks 471,132 Rock drill maebine, W. Arnold 471,331 Rock drill tripod, A. Ball 471,332 Roller. See Friction roller. Rolling sheet metal into curved forms, machine for, W. C. Westaway 471,407 Roufing metallic, E. C. Robbins 471,338
Tobacco hanger. Trolley hanger. I type nanger.  Iarp, orchestral pedal, G. W. Elisworth	Roller. See Friction roller. Rolling sheet metal into curved forms machine
farrow, L. S. Flatau	for, W. C. Westaway. 471,407 Roofing, metallic, F. C. Robbins. 471,338
Larrow and cultivator, I. S. Flatau	Roofing, metallic, F. C. Robbins. 471,338   Ruler, V. M. Ariza. 471,458   Ruler, V. M. Ariza. 471,459   Sand box and axle collar, S. F. Welch. 471,355   Sash fastener, M. Higgins. 471,118   Sash fastener, G. B. Sloan, Jr. 471,363   Sash holder, F. Keyser. 471,241   Satchel strap, E. G. Wheeler. 471,159   Saw bit insertible M. A. Huwe. 471,250   Saw bit insertib
larvester, corn, G. W. Quinn	Sash fastener, G. B. Sloan, Jr. 471,363 Sash holder, F. Keyser 471,241
arrow, W. K. Hoagland   471,834     arrow and cultivator, L. S. Flatau   471,375     arrow and roller, combined, F. B. Harvey   471,371     arvester, corn, P. J. Garber   471,475     arvester, corn, G. W. Quinn   471,139     arvester grain butter, W. W. Barbour   471,139     arvester grain butter, W. W. Barbour   471,136     arvesters, gear shifting mechanism for convey-   ers for, G. Schubert   471,197     arvesting machine, corn, J. I. Hoke   471,197     arvesting machine, corn, J. I. Hoke   471,191     ary press, U. Gibeault   471,133     erater. See Gas beater.   471,239     erater. See Gas beater.   471,239	Satchel strap, E. G. Wheeler. 471,159 Saw bit, insertible, M. A. Howe. 471,326 Saw bolding machine 2015
Lay press, U. Gibeault	Saw bit. insertible, M. A. Howe.       471,326         Saw holding machine, S. W. Daly       471,183         Sawmill, gang, F. O. Kilgore       471,125         Saw set, J. M. Basket       471,426         Saws set, J. M. Basket       471,421
leater. See Gas beater. leating apparatus for buildings, Q. N. Evans. 471,351 ling e, door, W. P. McMasters. 471,133	Screw wood H. K. Jones 471,179
(ing e, door, W. P. McMasters	Section liner and protractor, combined, L. Miller. 471,428 Seeder, grain, S. H. Purdy
Copy holder. Hose nozzle holder. Label	Sewer trap, D. H. Donaldson
holder. Lamp and shad enolder. Lamp car- bon holder. Paper holder. Sash bolder Sew-	Birdsong 471,462
ing machine speol holder. Ing machine speol	Sewing machine spool holder, S. Whittier
Iose, F. Buscber 471,266 Iose nozzle bolder, G. W. Tinsley 471,156	Shingle edging machine, H. F. Kingsley 471,180 Shoe fastening, N. P. Sjoberg 471,304
ioney extractor, centrifugal, C. W. Metcalf. 471,487 torse restrainer, F. B. Tyler 471,201 tose, F. Buscher 471,201 tose, F. Buscher 471,201 tose, F. Buscher 471,202 tose nozzle bolder, G. W. Tinsley 471,156 tose supporter, P. F. Daniels 471,104 tot air furnace, N. A. Boynton 471,104 tot air furnace, N. A. Boynton 471,104 tot air furnace, J. Evans 471,104 tot air furnace, J. Evans 471,105 tot air furnace, N. Boynton 471,1162 tousehold utensil, J. Wood 51,1162 tousehold utensil, J. Wood 51,1162 tousehold utensil, J. Wood 51,1162 tousehold utensil, J. G. Stamp 471,1162 tousehold utensil, J. C. Copeland 471,451 tyleraulic supply system, J. G. Stamp 471,451 tyleraulic supply system, J. G. Stamp 471,451 tousehold tousehold 471,451 tousehold 471,	Shelf support, H. M. Hart. 471,481 Shingle edging machine, H. F. Kingsley 471,481 Shingle edging machine, H. F. Kingsley 471,180 Shoe fastening, N. P. Sjoberg 471,304 Shoes from squeaking preventing, J. C. Gallagher. 471,355 Shutter worker, Kraske & Naerup, Jr. 471,285 Shitter, coal, E. W. Humphreys 471,177 Signel Son Fallway stends 471,177
Tousehold utensil, J. Wood 471,189 Tousehold utensil, divided, Barry & James 471,517	Shutter worker, Kraske & Naerup, Jr. 471,128 Sifter, coal, E. W. Humphreys. 471,177
Iydraulic supply system, J. G. Stamp	Signal. See Railway signal. Signature press, C. Seybold
ndexing, R. R. Williams 471,451 ndicator. See Rill-of-fare indicator.	Small arms, firing pin lock for, J. D. Irvine. 471,164 Small arms, firing pin lock for, J. D. Irvine. 471,122 Sod slicing machine. T. Rentley. 471,921
nk well, D. Greenwood	Solde ing machine, can, W. P. Quentell. 471,360 Sole trimming machine, E. C. Moody. 471,394
OBTION	Spirometer, S. P. Lacey         471,389           Splint, P. F. Hanley         471,252           Spraying dayies W 1 Ruff         471,252
ar cover and lock therefor, fruit, J. B. Johns 471,483 ournal bearing, J. W. Terman	Sifter, coal, E. W. Humphreys.       471,177         Signal.       47,203         Signal.       47,203         Signature press, C. Seybold.       47,104         Skate sharpener, J. Young       471,104         Small arms, firing pin lock for, J. D. Irvine.       471,122         Solde slicing machine, T. Bentley.       471,230         Solde ting machine, can, W. P. Quentell.       471,300         Spirometer, S. P. Lacey.       471,300         Splint, P. F. Hanley.       471,252         Spraying device, W. J. Ruff.       471,114         Spraying device, W. J. Ruff.       471,114         Steam boiler, O. D. Orvis.       471,235         Steam generator, W. N. Barrett.       471,337         Steam trap, Renner & Hofbauer.       471,307         Steering gear for vessels, R. J. Victor.       471,307
ournal bearings, antomatic adjusting device for, G. Wilcox. 471.346	Steam generator, W. N. Barrett. 471,333 Steam trap, Renner & Hofbauer. 471,397
and some for venicles, W. H. Sheldon 471,401	Choosing Ross for Acastes IV. 9. Alctor 41/20

220		
Stooring goer stoorn I M Sandors	471,142	Ī
device for mounting and locking interchanges able, Reid. Stone chameling machine, W. H. Bryant Stool, adjustable plano, A. R. Milner. Stoye for burning hydrocarbon oil and its vapors	. 471,432 . 471,266	I
Stove for burning hydrocarbon oil and its vapors H. Ruppel.	471,399	1
H. Ruppel. Stove, gas cooking, G. A. Bischoff. Stove, vapor, C. M. Hollingsworth. Strainer for tea or coffee pots, Hays & Tefft. Strap. See Satchel strap.	. 471,208 . 471,289	at
Strap. See Satchel strap. Supporter. See Hose supporter.	. 211,110	I
Suspenders, garters, etc., clasp and hook for, P Bailly Switch Soc Flootwic switch	471,332	E
Suspenders, garters, etc., clasp and hook for, P. Bailly. Switch. See Electric switch. Syringe, vaginal, F. Reutter. Table. See Billiard table. Concentrating table. Extension table. Thrashing machine table. Target, rije. J. W. Porter.	. 471,514	
Extension table. Thrashing machine table. Target, rifle, J. W. Porter	. 471,430 471,442	
Telephone system, A. B. Ferdinand	. 471,352 . 471,310	
Table See Billiard table. Concentrating table Extension table. Thrashing machine table. Target, rifle, J. W. Porter. Teaching drawing, device for, N. O. Starks. Telephone system, A. B. Ferdinand. Telephone system, long-distance, E. Gwosdeff. Tellurian, Riter & Alford. Temperature regulator, J. F. McElroy, 471,314,471,315 Theatrical illusion apparatus, J. Arthur.	471,524	
Theatrical illusion apparatus, J. Arthur	471,371 471,130	
Thill bolt, H. V. Appley	. 471,502 . 471,199	
Thill couplings, anti-rattler for, H. V. Appley Thrashing machine table, J. B. McChesney	. 471,503 . 471,490	
Tiling, J. E. Williams Tin plates, machine for removing oil from, Wal	471,339	
Tobacco pipe cleaner F. W. Carpenter	471,284 471,474 471,504	
Toboggan slide, J. W. Grantland. Tool handle, F. A. Albert.	. 471,510 . 471,456	1
Toy, Brennan & Webber. Toy pistol, D. A. Clark.	. 471,232 . 471,098	
Trap. See Ash trap. Bird trap. Insect trap. Sewer trap. Steam trap.  Tray for writing tables at a ornamental T. R.		1
Hoy. Tripod, C. Mills.	. 471,424 . 471,392	
Trolley wire hanger, T. J. McTighe.  Trolley wire support. E. A. Sperry.	. 471,206 . 471,491 . 471,151	
Trunk protector, C. V. Thompson.  Tug, hame, D. McMillan	471,154	l
Temperature regulator, J. F. McElroy, 471,314,471,315 Theatrical illusion apparatus, J. Arthur. Thermostatic instrument, M. Martin. Thermostatic regulator, E. C. Merrill. Thill toolt, H. V. Appley. Thill coupling, D. W. Tanner. Thill couplings, anti-rattler for, H. V. Appley. Thrashing machine table, J. B. McChesney. Tile, sheet metal, J. White. Tiling, J. E. Williams. Tin plates, machine for removing oil from, Walters, and the for removing oil from, Walters, and the for removing oil from, Walters, Morris. Tobacco hanger, H. L. Freeman. Tobacco pipe cleaner, F. W. Carpenter. Toboggan slide, J. W. Grantland. Tool handle, F. A. Albert. Tower, frame, Beard & Westaway. Toy, Brennan & Webber. Toy pistol, D. A. Clark. Trap. See Ash trap. Bird trap. Insect trap. Sewer trap. Steam trap. Tray for writing tables, etc., ornamental, T. F. Hoy. Tripod, C. Mills. Trolley wire hanger, T. J. McTigho. Trolley wire hanger, T. J. McTigho. Trolley wire support, E. A. Sperry. Trunk protector, C. V. Thompson. Typewriting machine, T. Digg.ow	471,441	ı
Shortt.  Valve for controlling the inflow and discharge o hydraulic pressure, etc., Gwynne & Fowler  Valve gear, compound engine, Heintzelman	. 471,421	1
nydraulic pressure, etc., Gwynne & Fowler. Valve gear, compound engine, Heintzelman Noyes. Vaporizer, F. E. Jordan. Vaporizer, F. E. Jordan. Vaporizer, G. E. Jordan. Vegetable leaves, machine for removing th fleshy matter from, J. H. Brown. Vehicle spring, E. H. Booth. Vehicle spring, E. H. Booth. Vehicle wheel, J. Hessong. Velocipede, S. H. Kimball. Vessels, apparatus for regulating the rolling an pitching of. C. E. Emery. Veterinary surgical instrument, S. B. Dunn. Vise, J. F. Emmert. Wagon, dumping, W. H. Sheldon. Wagon top, W. Leonhardt.	. 471,253 . 471,123	1
ratus for, R. Conrader	. 471,505 e	
fleshy matter from, J. H. Brown	. 471,097 . 471,414 . 471,117	
Velocipede, S. H. Kimbail  Vessels, apparatus for regulating the rolling an	d 471,358	
Veterinary surgical instrument, S. B. Dunn Vise, J. F. Emmert.	471,107 471,169	
Wagon, dumping, W. H. Sheldon	471,402 471,484	
Vise, J. F. Emmert. Wagon, dumping, W. H. Sheldon. Wagon top, W. Leonhardt. Wall paper, method of and apparatus for making G. K. Birge. Walls, brace or ije f. r hollow, D. A. Weese. Walls, ma<-ray for the treatment of, G. I	471,287 471,204	
Walls, ma.craia for the treatment of, G. I. Wooster.  Water, apparatus for purifying, sterilizing, an filtering dri king, S. L. West.  Water distributing apparatus, A. H. Bryan. Water meter, disk, Thomson & Lambert. Welding metals, electrically, A. De Meritens. Well reamer, artesian, Swanson & Espee. Wheel. See Vehicle wheel. Whistle, steam, H. R. Frisbie. Windmill, Westaway & Beard. Windmill lubricator, B. J. Sykes. Windmill lubricator, B. J. Sykes. Windmill lubricator, W. C. Westaway. Wire clamping device, O. P. Briggs. Wire stretcher, Wallace & Parker. Wire twisting tool, A. F. Dickey. Wool clipping machine, Howard & Geddis. Wrench. See ? jpe wrench.	471,163	
Water distributing apparatus, A. H. Bryan Water meter, disk. Thomson & Lambert	471,261 471,347 471,295	
Welding metals, electrically, A. De Meritens Well reamer, artesian, Swanson & Espee Whol. So, Vobiale wheel	471,242 471,153	
Whistle, steam, H. R. Frisbie. Windmill, Westaway & Beard.	471,171 471,406	1
Windmill lubricator, B. J. Sykes. Windmill lubricator, W. C. Westaway. Wire clamping device. O. P. Briggs.	471,443 471,408 471,096	
Wire stretcher, Wallace & Parker	471,260	
Wrench. See Pipe wrench. Writing pad, I. Smigel. Yeast, process of and apparatus for manufactu ing pure, G. Guignard.	471,293	
reast, process of and apparatus for manufactu ing pure, G. Guignard	471,335	-
DESIGNS.		
Badge or medal, D. J. Cohen Bottle, J. L. Dawes Chain, watch, A. Rickert.	21,411	
Chain, watch, A. Rickert.	21,426	

Badge or medal, D. J. Cohen	21.411
Bottle, J. L. Dawes Chain. watch, A. Rickert.	21,412
Chain, watch, A. Rickert	21,426
Cream skimmer, F. K. Ward	21,418
Cutlery handle, H. P. Fairchild	21,413
Electric machine frame, A. Schmid	21,416
Game board, S. F. Redheffer	21,415
Glassware, ornamentation of, J. S. O'Connor	21,424
Lamp shade. W. S. McLewee	21.414
Lantern, F. K. Wright Milk mug, F. K. Ward	21,421
Milk mug, F. K. Ward	21,419
Needle holder, W. Schott	21,417
Souvenir medal, W. J. McKee	21,425
Spoon, E. N. Denison	21,422
Wagon body, F. K. Ward	21,420
Watch bridge, E. C. Fitch	21,423
	-

## TRADE MARKS.

Beer, John Kress Brewing Company	20,881
Beer, lager, John Kress Brewing Company	20,880
Belting, ribbon and dress, A. & S. Biumentnai	20,000
Rievelog Smith Wheel Manufacturing Co	20 803
Bicycles, D. L. Whittier 20,883	20.884
Beer, Isolin Kress Brewing Company Beet lager, John Kress Brewing Company Belting, ribbon and dress, A. & S. Blumenthal Belting, rubber, Stephen Ballard Rubber Co Bicycles, Smith Wheel Manufacturing Co Bicycles, D. L. Whittier	,
& Co Boots and shoes, Heywood Boot and Shoe Com-	20,871
Boots and shoes, Heywood Boot and Shoe Com-	20,861
pany Bread, F. Hubert	20.862
Butter, J. Newman	20,865
Butter, J. Newman. Canned tomatoes, A. A. & G. W. Charles	20,886
Champagne wines, E.P. Fagny	20,858
Cider apple grade and orange J. Manegold & Co.	20,000
Champagne wines, E.P. Fagny Chiccory, E. J. Gillies & Co. Cider, apple, grape, and orange, J. Manegold & Co. Collars and cuffs, water proof, Arlington Collarand	20,000
Cuff Company	20,869
Complexion, liquid preparation for the, Persons &	00 075
Allen English walnuts, Los Nietos and Ranchito Walnut	20,875
Growers' Association	20,895
Growers' Association Eucalyptus products, Eucalyptus Manufacturing Company. Eye lotion, Sassafras Eye Lotion Co	
Company	20,870
Hoadacha nowdors H I Parker	20,890 20,874
Insulating oil for filling the casings of electric	20,012
transformers, Thomson-Houston Electric	
Company	20,867
Headache powders, H. J. Parker. Insulating oil for filling the casings of electric transformers, Thomson-Houston Electric Company. Insulating tape for wrapping electric conductors, rubber or like, Thomson-Houston Electric Company.	
Company	20,866
Keyrings, F. J. Tahl	20,868
Lard, Rohe & Brother.	20,889
Ompany Keyrings, F. J. Tahl. Lard, Rohe & Brot her Linen fabrics, J. McCutch eon & Co. Oil, kerosene or petroleum, Tide Water Oil Com-	20,863
Dany	20,882
pany. Paint for application to metallic surfaces, Rose nz-	
weig & Bauman. Paving blocks, street, S andard Construction Co	20,876
Remedies for fevers and headaches, Sultan Drug	20,878
Company	20,879
Company	20,891
& Robbins.  Remedy for diseases of the blood, stomach, and nervous system. H. J. Meyer.  Shirts, men's, J. Kyle & Co.	20,873
nervous system. H. J. Meyer	20,872
Shirts, men's, J. Kyle & Co	20,887
Snuff, H. M. H. Bolander.	20,854
soap for cleaning and polishing metals and glass	20 857
Thread, linen, Finlayson, Bousfield & Co	20,892
Tin and terne plates, J. B. Scott & Co	20,877
Washing powder, N. K. Fairbank & Company	20,864
Soup for cleaning and polishing metals and glass and for toilet and laundry use, C. H. Dixson Thread linen, Finlayson, Bousfield & Co Tin and terne plates, J. B. Scott & Co Washing powder, N. K. Fairbank & Company Whisky, Vincent, Hathaway & Co. Wes and cordials, A. De Montebello & Co Wines and distilled linguos, snaykling and still	20,094
Delafield, McGovern & Co	20,856

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 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.

#### Movertisements.

Inside Page, each insertion - - 75 cents a line Back Page, each insertion - - - \$1.00 a line Back Page, each insertion - - - 51.00 a line
The above are charges per agate line—about eight
words per line. This notice shows the width of the line,
and is set in agate type. Engravings may head advertisements at the same rate per aga e 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.

45 sold in '88 **2,288** sold in '89 6,268 sold in '90 **20,049** sold **in** '91 A Steel Windmill and Steel
Tower every 3 minutes.
UT hese figures tell the
story of the ever-growing,
ever-going, everlasting
Steel Aermotor. Where
one goes others follow,
and we "take the country,"
Thoughold, we were unable tomake allof
the 20.094 Aermotors in "31. Orders often
waited 8 weeks to be filled, but now we have
vastly increased our plant and are prepared promptly to plant our increase in
severy habitable portion of the globe.
Are you curlous to know how the Aermotor Co, in the 4th year of its existence, came to make many times as
many windmills as all other
makers combined? How we came
to toriginate the Steel Wheel, the
Steel Fixed Tower, the Steel Titling
Tower

of list. We commenced in a field in
of which there had been no improvement for 25 years, and in which
of there seemed no taken or ambittion, 60,000 will be sold in '92 Ω Stee Stee Z Ist. We commenced in a field in which there had been no improved by the which there had been no improved by the which there seemed no talent or ambition, and no who has yet been shown except and now has yet been shown except and in feells immediation of our linearitions.

2d. Before commencing the manufacture, exhaustive scientific ments were made by a skilled mechanical engineer, in which over 5,000 dynamometric tests over 6,000 dynamometr

heavy wooden frims, obstructions before the wheel, as in a tent and the provided and the substructions from the substruction of the best to the substruction of the best wind wheels could be doubled, and the substruction of the best wind wheels could be doubled, and the substruction of the best wind wheels could be doubled, and the been done.

5. The the liberal policy of the Aermotor Co., that guarantees it is goods satisfactory or pays freight both ways, and to the theoremson output of its factory which enables it to furnish the best article at less than the poorestis sold far. For one we form the most perfect bearings over put a windmill, and have made an exhaustive re-

in a windmill, and have made an exhaustive reovision of the Aermotor and Towers.

If you want a strong, stiff, Steel Fixed Tower-or if you
want that ower you don't have toolimb (the Steel Tilting:
Tower) and the Wheel that runs when all others at and still
that costs you less than wood and lasts ten times as long
that costs you less than wood and lasts ten times as long
that costs you less than wood and lasts ten times as long
of the cost of the cost of the cost of the cost of
control, grind, out feel, pump water, turn grindstone and
saw wood, that does the work of 4 horses at the cost of
one (Sino), write for copiously illustrated printed matter,
and work, to the AER MOTOR CO, 12th and Bookwell Sts., Chicago, or 12 Main St., San Francisco.



## FRET SAW or BRACKET

WOODS

Planed Ready for Use. Books of Design.

137 Send stamp for catalogue.

CABINET WOODS AND VENEERS.

THE E. D. ALBRO CO.,

Eastern Branch, 200 Lewis St., New York, U. S. A.

H. T. Bartlett, Mg/r. F. W. Honerkamp, Ass't Mgr.

Mills Cincinnati Ohio

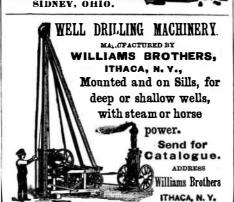
Mills, Cincinnati, Ohio.

Improved Screw Cutting 'LATHES Foot and Power.

Drill Presses, Shapers, Band, Circular, and Scroll Saws Machinists Tools and Supplies. Lathes on trial. Catalogue mailed on application. SEBASTIAN LATHE. COMPANY, 44-46 Central Ave., Cincinnati, O.







## NOW READY!

A NEW AND VALUABLE BOOK.



12,000 Receipts. 680 Pages. Price \$5.

This splendid work contains a careful compila-tion of the most useful Receipts and Replies given in the Notes and Queries of correspondents as pub-lished in the Scientific American during the past fifty years; together with many valuable and important additions.

Over Twelve 'Thousand selected receipts are here collected; nearly every branch of the use-ful arts being represented. It is by far the most comprehensive volume of the kind ever placed be-forethe public.

The work may be regarded as the product of the

forethe public.

The work may be regarded as the product of the studies and practical experience of the ablest chemists and workers in all parts of the world; the information given being of the highest value, arranged and condensed in concise form convenient.

ranged and condensed in concise form control for ready use.

Almost every inquiry that can be thought of relating to formulæ used in the various manufacturing industries, will here be found answered.

Instructions for working many different pro-

cesses in the arts are given.

It is impossible within the limits of a prospectus to give more than an outline of a few features of

to give more than an outline of a few features of so extensive a work.

Under the head of Paper we have nearly 250 receipts, embracing how to make papier maché; how to make paper water proof and fire proof; how to make paper, water proof and fire proof; how to make sandpaper, emery paper, tracing paper, transfer paper, carbon paper, parchment paper, colored papers, razor strop paper, paper for doing up cutlery, silverware; how to make luminous paper, photograph papers, etc.

Under the head of Inks we have nearly 450 receipts, including the finest and best writing inks of all colors, drawing inks, luminous inks, invisible inks, gold, silver and bronze inks, white inks; directions for removal of inks; restoration of faded inks, etc.

faded inks, etc.
Under the head of Allovs over 700 receipts are given, covering a vast amount of valuable infor-

of Cements we have some 600 receipts, which include almost every known adhesive preparation,

and the modes of use.

How to make Rubber Stamps forms the subject of a most valuable practical article, in which the complete process is described in such clear and explicit terms that any intelligent person may readily

learn the art.
For Lacquers there are 120 receipts; Electro-Metallurgy, 125 receipts; Bronzing, 127 receipts; Photography and Microscopy are represented by 60

tography and Microscopy are represented by 600 receipts.

Under the head of Etching there are 55 receipts, embracing practical directions for the production of engravings and printing plates of drawings.

Paints, Pigments and Varnishes furnish over 800 receipts, and include everything worth knowing on those subjects.

Under the head of Cleansing over 500 recipes are given, the scope being very broad, embracing the removal of spots and stains from all sorts of objects and materials, bleaching of fabrics, cleaning furniture, clothing, glass, leather, metals, and the restoration and preservation of all kinds of objects and materials.

In Cosmetics and Perfumery some 500 receipts are given.

are given.

Soaps have nearly 300 receipts.

Those who are engaged in any branch of industry probably will find in this book much that is of practical value in their respective callings.

Those who are in search of independent business or employment, relating to the home manufacture of sample articles, will find in it hundreds of most excellent suggestions.

MUNN & CO., Publishers, SCIENTIFIC AMERICAN OFFICE, 361 Broadway, New York,



MESSRS. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had forty-five years' experience, and now have unequaled facilities for the preparation of Patent Drawings, Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very reasonable terms.

A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignmenta, Rejected Cases. Hints on the sale of Patents, etc.

We also send, free of charge, a Synopsis of Foreign Patents in all the principal countries of the world.

MUNN & CO., Solicitors of Patents.

MUNN & CO., Solicitors of Patents, 361 Broadway, New York, BRANCH OFFICES.—No. 622 and 624 F Street, Pa-cific Bullding, near 7th Street, Washington, D. C.



Full Nickel-Plated, Rubber Stock, Center Fire. Entire length 8 inches. Weight 16 ounces. 32 or 88 callbre. Stock Conter Fire. Entire length 8 inches. Weight 16 ounces. 32 or 88 callbre. Stock of the S



### SPECIAL NOTICE!

entitled.

"Recent Improvements in Air Compressors,"

"Recent Improvements in Rock Drills,"
mailed free to any one who will cut out this
advertisement and mail it tous with his name
and address.

INGERSOLL-SERGEANT DRILL CO.
No. 10 Park Place, New York, U.S.A.



## ୭8୦ USE GRINDSTONES?

If so, we can supply you. All sizes mounted and unmounted, always kept in stock. Remember, we make a specialty of selecting stones for all special purposes. \*\* Ask for catalogue. The CLEVELAND STONE CO. 2d Floor, Wilshire, Cleveland, O.

# <u>Steam!</u> Steam!

Quality Higher, Price Lower.

For Strictly Cash, Complete Fixtures except Stack. 2-Horse Eureka Boiler and Engine, - \$150 4. " " " - 250 Other sizes at low prices. Before you buy get our prices.

B. W. PAYNE & SONS,

ELMIRA, N. Y. Drawer 56.

FELTON WATER WHEEL

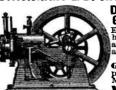
Gives the highest efficiency of any wheel in the world.

Simple and reliable, adapted to every variety of service, with heads of 20 feet and upward. Write for circulars.

The Pelton Water Wheel Co. 191a Main St., San Francisco, Cal., or 23 Sar Contral Building, Liberty and West Streets, New York.

COTTON SEED OIL AND THE PROducts of the Cotton Seed.—By D. A. Tompkins. A very exhaustive, interesting, and valuable paper, giving much practical information on cotton seed oil and its uses, and a list of the cotton seed oil mills in the South, with their capacity and capitalization. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. S30. Price 10 cents. To be had at this office and from all newsdealers.

## GAS = GASOLINE ENGINES STATIONARY and PORTABLE. All Sizes.



Dwarfs in Size, but Giants in Strength. Expense one cent an hour per horse power and requires but little attention to run them.

Every Engine Guaranteed. Full particulars free by mail Mention this paper VAN DUZEN

GAS & GASOLINE ENGINE CO. Cincinnati. O.

GEAR AND RACK CUTTING.
Frost Self-Regulating Steam Pump.
UNION MFG. CO., IT Rose Street, Battle Creek, Mich.

PLAYS Dialogues, Speakers, for School, Club and Parlor, Catalogue free, T. S. DENISON, Publisher, Chicago.

FIRM having large connections desires representation of specialties or patents in England. Write CLARKE & CO., Forest Road, Nottingham, England.

SECOND HAND FOOT POWER SCREW CUTTING
LATHE WANTED in exchange for a good second hand Safety BICYCLE,
CHANCY AVERY, Pleasant Lake, Ind.

FOR SALE. United States Right, entire or by States. The Hall & Cook Post Hole Digger, Patent 467,751. See B. and P. col., p. 219. Address, ALFRED LOVE, Aurora, Canada.

POR LEASE—THE MIDDLEBROOK GRAMTE Quarries, at Middlebrook, Mo., operated for the past 10 years by the Syenite Granite Co. of this State, will be leased for ten years from June 10th, 1892. They are the largest and finest quarries in the West. containing the well-known red granite so extensively used in many of the finest buildings, monuments, bridges, etc., in the country. Sealed proposals will be received and opened at noon. on June 1st next, for a ten year lease of the property. This Company reserves the right to reject any and all bids. You are cordially invited to inspect the property.

IRON MOUNTAIN CO., Gay Building, St. Louis, Mo.



BEATTY Pianos, \$175, Organs, \$48. Want Agents. Cat'g free. Dan'l F. Beatty. Wash'ton, N.J.

PURE CONDENSED MILK PREPARED IN THE MOHAWK VALLEY-THE FINEST GRAZING COUNTRY IN AMERICA. FROM ABSOLUTELY PURE FERSH MILK EVERY PACKAGE GUARANTEED CORRESPONDEDIA. OCIOCIFIED. MOHAWK GONDENSED MILK CO, ROCHESTER T. N.Y. U.S.