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The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Stow flexible shaft. Invented and manufactured by Stow Mfg. Co., Binghamton, N. Y. See adv., page 254.

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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 This is for our information and not for publication.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.

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.

(4569) Mechanic asks: What is the most approved motor or engine that is run by compressed air? A. Any motor or engine that is suitable for steam is equally good for compressed air. The economy of expansion applies to both air and steam.

(4570) L. J. W. asks how to construct a simple metal thermostat or regulator for a home-made incubator. A. It is not a simple matter to make a thermostat. However, you can make a thermostatic bar that might answer your purpose by pressing or riveting together steel and brass strips, each about 1-16 inch thick, ¾ inch wide and 15 inches long. For other forms of thermostat consult "Experimental Science" and SUPPLEMENT, Nos. 420, 848.

(4571) A. B. asks: What is the proper place for a blower—under the grates of boiler or in the smoke stack? A. When the smoke stack has ample capacity but is weak in draught from low height, a blower connected under the grate is the most economical and satisfactory. A steam jet in the stack is much used, but is wasteful of steam for the work it does, as applied in the ordinary way with an open jet. The Korting multiple nozzle jet blower is a most economical and efficient device in either place, as most convenient.

(4572) J. P. G. asks what size wire to use in winding the fields and armature of the dynamo described in SUPPLEMENT No. 161, and with what size wire would you make the connections? A. For the leads on your dynamo use No. 16 wire. The proper sizes of wire for the winding are given in the article referred to. They are respectively No. 16 and No. 18, Am. W. G.

(4573) A. B. C. asks: 1. Has the strength of a flash of lightning (in volts) ever been calculated? If so, what is it? A. The E. M. F. of a bolt of lightning has been estimated to be 3,500,000 volts and the current to be about 14,000,000 amperes. 2. How can I color glass for a ruby light for photographic purposes? A. Coat your glass with red lacquer. It would be well to put red lacquer upon one side and orange lacquer on the opposite side. 3. In making a dynamo should the wire of the armature be insulated from the core? A. Yes. 4. Would the field magnet be better if made of cast iron or steel? A. The core of a field magnet should be made of the softest wrought iron. 5. How can I find the resistance of an incandescent lamp? A. By any of the methods of measuring resistances. You can use a rheostat, battery and galvanometer and measure it by means of the methods of substitution, or you can measure it by using a Wheatstone bridge. 6. How is the loop of bamboo in incandescent lamp carbonized? A. By inclosing it in a form buried in powdered carbon and subjected to a red heat for an hour or so. 7. Is there any good way to renew the carbon in incandescent lamps? If so, how? A. We know of no simple way to accomplish this. The following is extracted from "L'Année Electrique:" *To mend a ruptured filament.* Open the bulb at the top, break off the pieces of the old filament, put in some liquid hydrocarbon (naphtha), insert new filament, start voltaic arc between one of its ends and one of the terminals. This solders it with a deposit of carbon. Repeat for other end and terminal. Empty out hydrocarbon, exhaust, and seal lamp.

(4574) E. P. asks how the paste of litharge and red lead are mixed for a storage battery. A. The litharge and red lead are mixed with dilute sulphuric acid; acid 1 part, water 9 parts.

(4575) B. W. S. says: Is it not true that an air fan or blower will handle more air if the blades of the fans are thin than if they are thick, and if so, why? A. It makes little or no difference with thick or thin blades when the blower is working against pressure, as with forge fires, but makes considerable difference when used for ventilations only with no pressure. In this case there should be as little obstruction as possible in the air way. Such a fan should have the greatest area possible with the least air friction surface for economy or efficiency.

(4576) C. F. W. asks how to make "serpent's eggs." A. The black liquor which results as a useless product when coal oil is purified with sulphuric acid is to be treated with fuming nitric acid. The dark colored resinous matter which swims on the surface is then collected, washed and dried, when it forms a yellowish brown mass having about the consistency of sulphur which has been melted and poured into water. When this mass is ignited it undergoes such a wonderful increase in bulk that a cylinder 1 inch long will give a snake about 4 feet in length.

(4577) Admirer says: We are contemplating putting in water works for our city. We wish to know if we put a reservoir at the source of our water supply, which is 12 miles from the town and 1,500 feet fall, will the pressure be too great and will the resistance of common cast pipe sufficient to hold the water without bursting, and what size pipe would be necessary for a town of 2,000 people? A. The questions you ask are too important to be answered in a casual way. Your need the advice of a competent engineer, with a knowledge of the grades, to properly lay out the work. The pressure will be too great for cast iron pipe and for the plumbing. Wrought iron pipe is strong enough with a differential pressure valve, but a reservoir at a proper height near the town is preferable, with a free flow from the source. You will probably need an 8 inch pipe for the upper section and 6 inch wrought iron pipe the balance of the distance.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

October 11, 1892,

AND EACH BEARING THAT DATE.

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

Advertising board, P. E. Green 484,194
Advertising device, P. Herrmann 484,314
Air brake coupling, J. E. Marble 484,034
Alarm. See Burglar alarm. Burglar and fire alarm. Fire alarm.
Alloy, anti-friction, T. D. Bottome 484,084
Auger handle, G. E. Rogers 484,050
Automatic sprinkler, J. Kane 484,321
Axle box, car, E. L. Sharpneck 484,054
Axle lubricator, H. V. Conway 484,088
Axle lubricator, C. C. Pierce 484,234
Bag holder, A. Young 484,079
Banana case, J. T. Cornforth 484,355
Banjo, D. T. Moore 484,222
Bank, E. M. Goldsmith 484,310
Barrel heater, Weigel and Waechtler 484,073
Basic lined furnace, J. H. Darby 484,181
Battery. See Galvanic battery. Storage battery.
Battery compound, W. Wright 484,385
Bean picker, H. A. Bacon 483,986
Bee smoker, G. W. Brodbeck 484,172
Beer apparatus, J. H. Kersenbrock 484,025
Beer bottling apparatus, J. H. Kersenbrock 484,024
Bench. See Wash bench.
Beverages, charging portable fountains with carbonated, J. F. Wittemann 484,078
Binder for leaves, G. H. Winslow 484,275
Binding device for periodicals, newspapers, etc., O. F. Westrup 484,268
Bit. See Bridle bit.
Blacking machine, coin-operated boot or shoe, N. B. Knight 484,324
Blast furnace, M. W. Iles 484,020
Block. See Chain block.
Board. See Advertising board. Game board.
Boiler, J. H. Waterman 484,350
Boiler furnace, steam, M. E. Herbert 484,153
Bookbinding, D. Waide 484,349
Book or music leaf holder, A. O. Brown 484,292
Bottle stopper, protective, J. Lihrowicz 484,330
Box. See Stamp and match box.
Box fastener, C. C. Martin 484,373
Box machine, Murry & Stutsman 484,041
Brace. See Ratchet drill brace.
Brake. See Wagon brake.
Brick in kilns, setting, F. Alsip 484,170
Brick machine, G. Isaacs 484,319
Bridge gate, C. Stocker, Jr 484,122
Bridge, portable, J. T. Cassidy 484,086
Bridle bit, A. F. Ruhlow 484,342
Brush, E. I. Miller 484,107
Buckle, G. E. Adams 484,279
Buckle, suspender, R. M. Wilson 484,274
Buggy spring equalizer, C. Glattly 484,309
Buildings, construction of, B. Russell 484,244
Burglar alarm, portable, D. D. Nolley 484,232
Burglar and fire alarm, combined electric, D. D. Nolley 484,233
Burner. See Vapor burner.
Butter cutter, J. A. Kaiser 484,023
Button, cuff, L. F. Brooks 484,291
Buttons, attaching, J. Mathison 484,105
Cabinet, J. Stein 484,121
Cabinet for displaying sample goods, A. T. Selden 484,166
Cable crossings, automatic release for, F. W. Smith 484,346
Cable splice, electric, F. A. C. Perrine 484,045
Cameras, finder attachment for, W. B. Cogswell 484,179
Cane and stool, combined, R. T. More 484,334
Cannon, telescopic sight for, V. Berberich 484,285
Car coupling, C. A. Tower 484,125
Car, dumping, M. W. Iles 484,019
Car, railway, C. J. Seymour 484,119
Car seat, C. H. Matthiessen 484,215
Cars, apparatus for indicating the positions of railway, Hunter & Lucock 484,205
Cars or similar vehicles, system of and apparatus for heating railway, J. A. Shinn 484,343
Carbon filaments, manufacture of, T. A. Edison, 484,184, 484,185
Carving machine, Layer & Taylor 484,102
Case. See Banana case. Packing case.
Cash carrier apparatus, J. Schiemer 484,248
Cash register, E. F. Roberts 484,376
Cash register and indicator, T. Carney 484,296
Cash register, indicator, and recorder, T. Carney 484,297
Caster wheel, A. B. Diss 484,305
Casting metal around internal cores, mould for, F. G. Stone 484,124
Chain block, J. R. Morgan 484,038
Chair. See Folding chair. Pneumatic chair.
Channeling machine, H. H. Arnold 484,130
Channeling machine, J. B. Hadaway 484,368
Chart and blackboard, combined, J. B. & M. C. Powell 484,338
Christmas tree light, H. W. Diek 484,304
Chuck, drill, H. C. Sergeant 484,118
Cigar bunch machine, F. C. Miller 484,219
Cinder conductor, H. C. Sargent 484,164
Clamp. See Joiner's clamp.
Cleaner. See Well or cistern cleaner.
Clip. See Hame clip.
Clock, alarm, W. E. Porter 484,236
Closet. See Dry closet.
Clothes drainer, A. H. Ristedt 484,340
Clothes line prop and clothes hanger, combined, C. A. Potts 484,162
Clutch, J. Fitzgerald 484,308
Clutch, W. H. McConnell 484,224
Cock, gauge, J. F. Holdam 484,316
Collar, cuff, and garment rack, H. Caspar 484,085
Colter plow, G. C. Westervelt 484,127
Column, architectural, J. M. Larimer 484,026
Converters, lining for Bessemer, C. W. Bildt 484,286
Cork, treating, J. T. Smith 484,345
Corn husker, M. Wilson 484,076
Corners, covers, and like parts for books, boxes, etc., of celluloid or kindred material, making, A. C. Hafely 484,006
Cotton chopper and planter, combined, F. H. Parker 484,337
Coupling. See Air brake coupling. Car coupling. Steam coupling. Thill coupling.
Crate, F. B. Sites 484,059
Cuff holder, L. S. Sampson 484,246
Cultivator and pulverizer, C. C. Reynolds 484,239
Curtain rods, combined socket and bracket for, C. W. Lawrence 484,028
Cutter. See Butter cutter.
Cutter head, rosette turning, R. B. Moore 484,221
Cycle saddle, J. B. Brooks 484,289, 484,290
Decorticating grain, J. Sloan 484,258
Dental instrument, J. C. Blair 484,287
Desk, sectional, W. A. Eaton 484,357
Door closer, H. Bunker 483,989
Door hanger, C. D. Lawrence 484,157
Draught equalizer, T. Keller 484,371
Dress, M. K. Staab 484,257
Drilling machine, H. H. Wilderman 484,270
Drinking trough, G. S. Singer 484,057
Dry closet, W. D. Dickson 483,997
Dumbbell, C. W. Ayton 484,352
Dust collector, J. J. Gerard 484,090
Dyeing, E. Zillessen 484,080
Eaves trough hanger, W. E. Tuller 484,347
Electric switch, M. R. Utley 484,380
Electrical depositing meter, T. A. Edison 484,183
Electrical distribution, system of, H. W. Leonard 484,208
Engine. See Gas engine. Steam engine.
Envelope, J. W. Kohn 484,372
Elevator safety device, Mundt & Hoops 484,109
Elevators, means for transmitting power to grain, D. A. Robinson 484,048
Feed bag holder, J. H. E. Zeip 484,278
Feed box regulator, A. A. Morris 484,039
Feed regulator, M. A. Swing 484,064
Feed trough and rack, combined, J. W. Moore 484,037
Feeding mechanism, L. C. Crowell 484,141
Fence, J. T. Lucas 484,158
Fence, L. S. Safford 484,245
Fifth wheel, S. H. Sexton 484,378
File, letter, H. L. Sawyer 484,247
File, paper, O. F. Westrup 484,267
Fire alarm, electric, H. Cortland 484,140
Fire dog and grate, combined, G. T. Glascock 484,091
Fire escape, A. V. Goltermann 484,093
Fire escape, Murphy & Rankin 484,042
Fire escape, P. B. Sullivan 484,260
Fly paper, sticky, O. & W. Thum (r) 11,276
Folding chair, H. A. J. Rieckert 484,240
Folding chair, D. A. Sinsabaugh 484,058
Folding mechanism, L. C. Crowell 484,142
Frame. See Leather frame.
Fruit pitter, G. C. Howell 484,154
Fume arrester, Iles & Sheedy 484,016
Fumes from metallurgical furnaces, device for catching and saving, M. W. Iles 484,017
Furnace. See Basic lined furnace. Blast furnace. Boiler furnace.
Furnace for metallurgical operations, J. N. Lauth 484,329
Furnace for metallurgical purposes, J. N. Lauth 484,328
Furnace top, blast, M. W. Iles 484,018
Gauge. See Sugar alarm gauge.
Galvanic battery, J. W. Hoffman 484,096
Game apparatus, H. J. Saxton 484,115
Game board, parlor bowling, P. H. Colell 484,087
Garment fastener, F. E. Bennett 483,988
Garment, suspensory, C. C. Taylor 484,065
Gas engine, J. Wehrschmidt 484,168
Gate. See Bridge gate.
Gate, W. T. Harris 484,198
Glassware, device for manufacturing hollow, T. B. Atterbury 484,131
Glue applying apparatus, J., Sr., & L. Luger 484,031
Glue heater, J. Luger, Sr 484,032
Gun, multicharge, J. R. Haskell 484,007, 484,010, 484,011
Gun, multicharge or accelerating, J. R. Haskell 484,009
Guns, apparatus for working disappearing, Noble & Murray 484,374
Hame clip, J. Scott 484,053
Hame fastener, E. Beaubien 484,283
Hame fastener, R. Lambert 484,327
Hanger. See Door hanger. Eaves trough hanger.
Handle. See Auger handle.
Harrow, V. E. Randall 484,047
Heater. See Barrel heater. Glue heater.
Heating and ventilating apparatus, A. Willgeroth 484,272
Heating boiler, steam or hot water, G. C. Blackmore 484,033
Hem folder and presser, F. Henry 484,366
Hides or skins, machine for treating, W. Evans, 484,146, 484,147
Hinge, blind, A. J. Avery 484,351
Hinge, lock, C. E. Gillespie 484,361
Hinge, spring, Held & Pattesson 484,200
Hoisting device and support, H. Sellheim 484,252
Hoisting machine, O. Flohr 484,358
Holder. See Bag holder. Cuff holder. Lead or crayon holder. Spoon holder. Watch holder.
Hoop pointing and lapping machine, A. F. Ward 484,126
Horse shield, C. H. Baldwin 484,282
Horse taming apparatus, R. Mazza 484,216
Horseshoe nail blanks, die for swaging, W. W. Miner 484,220
Hose band, G. Ferguson 484,190
Hose clamps, device for applying, Z. L. Chadbourne *et al.* 484,298
Hydrant, J. A. Gregg 484,197
Incubator, L. Kuhner 484,325
Index, M. S. Ford 484,151
Injector, automatic restarting, W. Penberthy 484,044
Injector, steam, J. N. Derby 484,302, 484,303
Inkstand, fountain, E. C. Mayloy 484,105
Insulator, F. M. Locke 484,209
Insulator, trolley wire, A. Anderson 484,280
Jar covers, tool for turning fruit, J. Van Altena 484,070
Jeweler's turk's head roll, F. Mossberg 484,108
Joiner's clamp, F. Martin 484,104
Joint. See Rail joint.
Joist lifter, W. Heister 484,365
Journal bearing, W. Curran 484,143
Kettle, confectioner's, W. Brierley 484,134
Kiln, continuous, W. Radford 484,237
Lamp, J. Kirby, Jr 484,323
Lamp, central draught, N. Roitman 484,242
Lamp, electric arc, J. A. Hayes 484,199
Lamp extinguisher, M. Goetze 484,362
Lamp socket, incandescent electric, C. J. Klein 484,207
Lamps, manufacturing central draught, Young & Neville 484,277
Lathe tool holder, W. C. Homan 484,317
Lawn sprinkler, G. Carlson 484,294
Lawn sprinkler, D. C. Wilgus 484,074
Lead or crayon holder, C. W. Boman 484,133
Leather dressing or finishing machine, L. E. Learoyd 484,029
Leather frame, L. F. Caulfield 484,137
Lifter. See Joist lifter.
Lighting device, hydrocarbon, Cody & Lawton 484,354
Lights, apparatus for regulating the intensity of incandescent, J. F. McElroy 484,110
Log loader and turner, W. E. Hill 484,013
Loom let-off mechanism, I. Fontaine 484,002
Loom shedding mechanism, F. Lacey 484,326
Loom temple, C. J. Hateh 484,364
Lubricator. See Axle lubricator.
Lubricator, J. Greer 484,195, 484,196
Machine motor, E. S. Reed 484,238
Match igniter, automatic, R. Senner 484,253
Match lighter, G. Gregson 484,311
Metal plates, bars, etc., means for shaping, N. B. Trist 484,264
Metal shears, E. T. Horner 484,203, 484,370
Metals from copper alloys, recovering, M. W. Iles 484,021
Melting pot, R. S. Pease 484,161
Mortising machine attachment, J. B. Nichols 484,225
Motor. See Machine motor. Water motor.
Music, apparatus for writing, A. Tessaro 484,262
Nickel from ores, extracting, T. Macfarlane 484,033
Nut cracker, O. H. Robertson 484,049
Nut lock, Huber & Ervin 484,204
Optometer, focal center, J. S. Sherman 484,005
Ordnance, J. R. Haskell 484,012
Ores, reduction of complex, W. C. Wetherill 484,269
Packing case, J. Chase 483,991
Packing, piston, F. N. Burridge 484,188
Paper bag machine, F. L. Baker 484,281
Paper folding machine, J. Carnes 484,295
Paper slitting and winding machine, A. P. Brown 484,173
Paper stock grinding machine, M. H. Simonet 484,056
Pattern for draughting garments, J. H. Choquette 484,138
Pearl, etc., implement for cutting, F. Wilkie 484,075
Pencil sharpener, F. J. Walker 484,071
Photographer's background holder, W. I. Scandlin 484,165
Photographic printing frame, F. O. Bynoe 484,175
Pick, Mitchell & Birkinshaw 484,333
Picker. See Bean picker.
Plants and press adapted therefor, pressing and drying, R. H. Day 484,301
Plow, U. A. Cleveland 484,178
Plow, W. W. Davis 483,994
Plow, G. C. Westervelt 484,129
Plow, combined riding and walking gang, A. M. Fitch 484,000
Plow, hillside, C. P. McWane 484,043
Plow, side hill, G. C. Westervelt 484,128
Pneumatic chair, A. P. Watson 484,072
Pocketbooks, etc., frame for, E. Oldenbusch 484,111
Pole, tubular metallic, D. Dorward 484,144
Pot. See Melting pot.
Power transmitter, A. S. Tragethon 484,066
Privy, P. Mueller 484,040
Projectile, J. R. Haskell 484,008
Propeller, screw, C. B. Wattles 484,382
Pulley, wood split, D. A. Sprinkle 484,167
Pump, A. D. Cook 484,139
Pump, E. H. Weatherhead 484,383
Pump and water elevator, force, M. L. G. Wheeler 484,169
Pump, steam, G. J. Roberts 484,241
Punching and shearing machine, combined metal, E. T. Horner 484,369
Purse, S. C. Langfeld 484,101
Quarry frame bar, H. C. Sergeant 484,117
Rack. See Collar, cuff, and garment rack.
Rail joint, W. Curtis 483,993
Rail joint, M. C. Niles ..... 484,226 to 484,229
Rail joint, J. H. Rouse 484,341
Rail, track, Hill & Meiring 484,315
Railway, W. Latimer 484,027
Railway crossing, M. G. Knight 484,100
Railway gate, C. A. Snider 484,256
Railway signal, E. Urbain 484,068
Railway switch, electrically-operated, Stone & Webster 484,123
Railway tie and fastening, Moore & Hodgson 484,036
Railways, automatic block signal for, S. J. Stuckey 484,062
Rake and broom, combined, J. W. Koonce 484,156
Ram, hydraulic, L. T. Webster 484,266
Range and position finder, B. A. Fiske 483,999
Ratchet drill brace, W. P. Nolan 484,231
Razor, safety, E. L. Schmitz 484,116
Recorder. See Speed recorder.
Refrigeration, electrical, M. W. Dewey 484,182
Register. See Cash register.
Regulator. See Feed regulator. Feed box regulator. Watch regulator.
Rolling machine, metal, E. T. Horner 484,368
Roof valley, F. C. Tinnemeyer 484,263
Roofing joint, W. H. Jellison 484,320
Rosette, C. Wirt 484,077
Rubber dam, C. P. Pitman 484,046
Sash fastener, C. S. Fay 484,149
Sash fastener, J. C. Plunkett 484,235
Sawmill dog, Martin & Hanna 484,332
Sawmill set works, H. Gawley 484,360
Saw tooth swage, W. W. Ryder 484,163
Sawing machine, automatic cut-off, E. Fischer 483,998
Scalper, purifier, and grader, combined, N. W. Holt 484,202
Scraper, agricultural, R. E. Wilson 484,273
Screw and clamp, box, Miller & Farrow 484,159
Screwdriver, Gay & Parsons 484,004
Seat, T. H. Hicks 484,367
Secondary battery, W. D. Silvey 484,120
Separator. See Steam separator.
Shafting support, J. A. Evans 484,148
Sharpening matcher heads, machine for, W. E. Hazard 484,094
Shears. See Metal shears. Sheep shears.
Sheep shears, J. D. Todd 484,379
Sheet delivery mechanism, W. Scott 484,251
Sheet metal cans, machine for making, G. B. Hopper 484,014
Sheet metal pipes, machine for making, H. D. Rice 484,112
Shingle, metallic, D. D. Lupton 484,211
Ship's ventilator, T. Utley 484,348
Shirt bosom, A. Rothe 484,243
Shoe fastener, Hamill & Johnson 484,313
Shoe fastening, G. W. Watson 484,381
Shutter opener, A. H. Hull 484,098
Sifting and sorting flour or meal, machine for, Faist & Fux 484,306
Sign, A. L. Brumfield 484,174
Sign, street, M. Hofheimer 484,097
Signal. See Railway signal.
Signal boxes, device for preventing accidental closing of electric circuits in, W. H. James 484,206
Sinker, D. W. Settle 484,254
Skate sharpener, C. Holland 484,201
Slicer, fruit or vegetable, S. M. Jones 484,155
Speed recorder and odometer, O. J. Fuchs 481,152
Spindle support, W. F. Draper 484,356
Spoon holder, G. W. Babcock 484,061
Spring hook, J. C. Newey 484,336
Sprinkler. See Lawn sprinkler.
Sprocket wheel, variable pitch, F. Gleason 484,005
Square folding, J. C. Sweet 484,261
Stamp and match box, A. Goertz 483,092
Steam coupling and automatic parting and cut off device, F. Balbian 483,987
Steam engine, M. Ulrich 484,069
Steam generator, W. J. Ranton 484,339
Steam separator, D. Cochrane 483,992
Steaming apparatus, grain, H. S. Jeweli 484,099
Stereotype plate and holder, M. Bennitt 484,082
Stove, O. Nilson 484,230
Stove, Ruehle & Schmidt 484,113
Stove, oil, R. Z. Liddle 484,030
Strainer for mixed drinks, W. Wright 484,276
Street cleaning machine, R. W. Furnas 484,191, 484,192
Sugar gauge for vacuum pans, E. H. Duhme 484,145
Suspenders, H. A. Hempel 484,095
Suspension hook, G. A. Moss 484,335
Switch. See Electric switch. Electrically operated switch.
Switch operating device, G. Schumacher 484,250
Table attachment for bedsteads, C. C. Elston 484,187
Taper for night lights, E. Ludde 484,210
Telegraph, railway train, M. S. Relley 484,375
Telephone, magnetic, C. S. Forbes 484,150
Tether, animal, R. E. Robison 484,377
Thill coupling, W. M. Sayre 484,052