

(2) M. H. S. asks for a novelty for his show window. A. Arrange a light tin velvet-covered coffin so as to be held in mid-air by a magnet and held down by two fine silk threads. Use a black background, and the threads will be unseen, and you will have a representation of "Mahomet's coffin."

(3) Millwright writes: Please explain whether there is or is not a place in the center of a revolving shaft which does not turn? A. All places and particles in a revolving shaft turn with it. There is no place that does not turn.

(4) J. J. S. writes: 1. I have completed a handsome design of the simple electric motor as described March 17, SCIENTIFIC AMERICAN. Have followed directions very carefully and minutely, also watched and benefited by the correspondence on same in your columns. Made my field magnet of solid wrought iron 1/2 inch thick, 2 1/2 inches wide, with 1 1/2 inch square, iron clamped and bolted between the ends, and all connecting surfaces filed true. Armature ring core is No. 18 soft iron made as described, and I got on 11 coils of 8 convolutions, each 4 layers deep, and could only get 7 convolutions in the 12th coil. The contact of each coil with the brass commutator screw is perfect. I commenced to wind field magnet coils at inside end each coil, and connected as per corrected description in SCIENTIFIC AMERICAN. My armature runs true without any vibration at all, and brushes of copper on hard rubber disk are all connected up as described. The coils on armature are encircled by two bands each consisting of five strands silver-plated steel wire No. 28. I run the motor 2,500 revolutions per minute by attaching it to our mill, and it did not generate any electric current. I attached two wires from a two-jar Diamond carbon battery to its binding posts, and it would not turn the motor, but when I revolved the armature myself I could see brilliant electric sparks flowing between the copper brushes and the brass screw heads. Each jar contained 7 carbon rods 1/2 x 7 inches and 1 zinc rod. Can you tell me where to remedy the defect, if any, in my motor? Will not 4 jars Diamond carbon battery run one sewing machine by the motor? A. By making your armature coils of unequal size you have introduced one element of weakness. The coils should be all of the same size. With due care 12 coils of full size can be wound on the armature core. You should replace your steel binding wire with hard drawn brass. One binding at the center is sufficient. Two cells of Diamond carbon battery are insufficient to move the motor. It requires 6 or 8 large cells of plunging bichromate battery. 2. Will I be infringing on any one if I should construct the 8 light dynamo for my own use? A. We believe there is nothing in the dynamo that is covered by existing patents.

(5) D. M. B.—Almost any transmitter and receiver when carefully adjusted and used on a clear, well insulated line, with the maximum of battery, and with a resonator attached to the receiver, may be heard over a distance of 25 or 30 feet in a very quiet place. Edison's loud-speaking telephone may be heard farther than that. Probably the reason why loud-speaking telephones are not more largely in use is that they require more care and attention than the ordinary ones.

(6) H. M. asks: 1. How must I change the simple electric motor to receive twice the power? A. Make it one-half larger in all of its dimensions, linear. 2. How many watts are equal to one man's power? A. 1/2 horse power is generally allowed for a man power, equal to 93 1/2 watts. 3. What battery will last longest, and which will give most power—Bunsen, Smee, or Grenet, all being of same size? A. Of the three named, the Bunsen will give the most power for the longest time on the average. At first the Grenet or Smee will give more current, but it will soon run down. 4. How large a spark can I obtain from an induction coil which is 7 inches long, being wound with 2 layers of No. 16 cotton covered wire and about 6 ounces of No. 38 silk covered wire, the core being made of No. 18 iron wire 1 inch in diameter, using 4 cells of half gallon Smee batteries? A. Probably not more than 1/4 inch. To get the best effect from your coil you should use at least twice as much fine wire. 5. How can I make an electric cartridge of small size, which can be set off with an induction coil? A. In a wooden or paper cartridge shell insert two wires from opposite sides to within one sixteenth inch of each other, then fill in with powder. Connect the wires with the terminals of your induction coil. 6. How can I make a good resistance box, such as used to govern electric currents? A. Make it of coils of insulated German silver wire of different sizes and lengths.

(7) K. B. asks: 1. Could a secondary battery charged by four gravity cells be adapted to the simple electric motor? A. It is possible, but not practicable. It would require a long time to charge the requisite number of secondary cells. 2. If so, could I make one like Gaston Plante's, using the alloy which comes with tea instead of the lead most used? A. The lead is too thin. It would last only a very short time. 3. Could you turn the motor into a dynamo, giving the same current that would be required to run the motor? A. When run as a dynamo, it would not produce the current required to run it as a motor. 4. Could you use No. 12 or 14 iron wire for the armature ring? A. Yes.

(8) F. A. W. H. writes: In talking about hydraulic presses, I said that in launching the Great Eastern the weight was so tremendous, the vessel being sent off sideways, and the ground sinking, that the water used in the presses was driven through six inches of iron, not pouring through, but standing out in beads. My listener refused to believe such a thing possible—that water could be driven through iron; and so we agreed to refer it to you. A. Driving water through iron in this way is not an unusual phenomenon with hydraulic cylinders. They will leak ammonia when they will not show water.

(9) W. H. R.—The walls of ice houses should be started from the bottom with hay packing at least 6 inches thick, with tight board lining inside and double row of hay packing above ground. Pack the ice with 6 inches of hay next to the walls all around. Hay is better than straw to confine the air in the pack-

ing. Place 2 to 3 feet of hay on top of the ice. Take out the ice from the top, always covering as soon as possible.

(10) A. P. S. asks for some paste or grease that can be applied to advantage to gun barrels used in sea ducking to prevent rust. When the sea is rough, water often comes over the side of the boat and drenches the gun. Oils and vaseline are not effective, being washed off by the first few waves. A. Try melted paraffine or beeswax. Warm the gun and smear a thin coat of wax on the metallic parts of the gun with a rag. Or clean the gun free from grease, and varnish with shellac or spar varnish. Clean when required with alcohol or turpentine.

(11) F. W. S. asks (1) a receipt for making a black that will stand, on the stack and smoke arch of a locomotive. A. Paint the stack with thin coal tar mixed with finely ground plumbago. Make of the consistency of ordinary paint. 2. A receipt for polishing brass. A. Tripoli and engine oil on a cloth is all that is necessary for polishing the brass work of a locomotive; wipe often with an oily cloth. Too much polishing wears off corners and edges, and soon makes the brass work look old from wear.

(12) R. A. W. asks (1) if there is any cement or glue that will fasten rubber to iron. A. Pitch and gutta percha equal parts melted together will cement rubber to iron. 2. What quick process is there to grind small white brook pebbles down to any shape? A. Use corundum wheels, such as are used by dentists for grinding porcelain teeth. They must be used wet.

(13) C. V. asks: 1. How many 2 quart Bunsen batteries does it take to operate a 2 candle lamp? A. It depends upon the resistance of the lamp. Probably two cells would answer. 2. Will such a lamp give as much power of light as a common Christmas tree candle? A. Yes. 3. Also how many batteries 2 quart Bunsen does it take to light a six candle lamp? A. Four.

(14) H. P. M. asks: 1. How near could the poles of a circular magnet be, and still give the full force of the magnetism? A. It depends upon the size of the magnet. Probably the most favorable distance can be determined only by experiment. 2. What kind of steel is best for a permanent magnet of true circular form? A. Chrome steel. 3. Would there be any attraction at any other part of the circle besides at the poles? If so, would it be the same at all points around the circle? A. It would diminish to zero gradually as the distance from the poles increased. 3. Where could I get a magnet of this kind made and charged? A. By any of the manufacturers of electrical instruments. See our advertising columns.

(15) F. W. G.—The size and insulation of wire for dynamos and motors depend entirely on the kind of motor or dynamo and the kind of current passing through its conductors. A high tension current requires better insulation than a low tension current. Nothing poorer than the best double covered wire should be used.

(16) C. V. A.—The dynamo described in SUPPLEMENT, No. 161, will run three 5 candle power Edison lamps. It is not an easy matter to make a good storage battery; you can however make an experimental one by roughening lead plates, coating them with a paint made of red lead and dilute sulphuric acid—water 10 parts, acid 1 part—separating the plates by rubber bands arranged vertically, and connecting alternate plates with one pole of the dynamo and intermediate plates with the other pole.

(17) R. B. H.—1. Cast iron will not answer well for the core of the armature ring of the simple electric motor, as it is not readily magnetized and demagnetized. 2. The wire sent is No. 20; it is too small for the armature winding.

TO INVENTORS.

An experience of forty 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 on 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 August 28, 1888, AND EACH BEARING THAT DATE.

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

Table listing inventions such as Acid distributor, Sulphuric, S. Frazier, Anatomical apparatus, E. Smith, Badge holder, G. B. Franks, Bag, See Paper bag, Baling press, C. Peterson, Banjo, J. F. Luscomb, Bar, See Finger bar, Grate bar, Pinch bar, Truck bar, Barrow, W. M. Potts, Basket, E. N. Little, Batteries, electrode for secondary, S. L. Tripp, Batteries, electrode for storage, J. T. Van Gestel, Battery, See Galvanic battery, Battery zincs, making, Carr & Borden, Beehive, T. M. Cobb, Beer cooling device, J. F. Theurer, Bell ringer, steam, G. B. Snow, Belt, electric, H. P. Pratt, Belt shifter and tightener, S. Shive, Belts, apparatus for stretching, M. Gandy, Binder, temporary, W. D. Ready, Blind finishing machine, L. Rivers, Blower, folding fire, J. M. McMeen, Blower, rotary pressure, G. Crowell, Boat, H. E. McGuire, Boot, lumberman's, J. H. Stickney, Boot or shoe nailing machine, J. E. Cutlan, Boots or shoes, attaching heels and top lifts to, C. W. Glidden, Bottle stopper, W. A. Bond, Box, See Fire alarm signal box, Bracket, See Window shade bracket, Brake, See Car brake, Bucket, well, J. L. Van Hook, Bullet, F. P. Langitt, Burglar alarms, circuit changing device for, F. H. Nutter, Burner, See Liquid fuel burner, Hydrocarbon burner, Button, E. S. Dodge, Button fastener, C. M. Platt, Calendar or memorandum roll, H. S. Hack, Calipers, micrometer, E. J. Hadley, Can, See Creaming can, Cannon, making, J. P. Lavigne, Car brake, J. W. Sims, Car coupling, H. H. Burden, Car coupling, A. W. Burnham, Car coupling, G. W. Cisco, Car coupling, H. B. Johnson, Car coupling, L. Showalter, Car, dumping, J. W. Nesmith, Car, electric tram, J. T. Van Gestel, Car heaters and car lamps, safety attachment for, G. F. Seaver, Car loader, W. H. Jennings, Car, railway, C. M. Smith, Car seat, H. S. Hale, Car signal, railway, Larned & Sill, Car, stock, C. Hager, Cars, coupling device for street, F. A. Pierce, Cars, propelling and heating street, W. E. Prall, Cars, ventilating, H. Penoyer, Carding engine, J. M. Hetherington, Cards, ornamenting, C. Schwartz, Carpet fabric, J. Humphries, Carpet sweeper, W. J. Drew, Carriage top, S. E. Kierolf, Cart, road, L. Miller, Case, See Cigarette case, Filing case, Caster, C. Stengel, Centrifugal force, apparatus to illustrate, J. Coffin, Chain wrench, J. Maguette, Chamois holder, A. T. Veeder, Chuck, jeweler's lathe, H. N. Moseley, Churn, W. H. Curtice, Churn, R. & T. Stockdale, Chute, coal, J. H. Du Bois, Cigar bunching machine, M. A. Winget, Cigarette case, J. Berthel, Cleaner, See Railway track cleaner, Stove pipe or flue cleaner, Clocks, electric motor for self-winding, F. W. Brainerd, Clothes drier, G. Conover, Clothes drier, G. Cox, Clutch, friction, S. H. Pitkin, Coffin fastener, M. Bremer, Commode, earth closet, or similar appliance, C. L. Doll, Condiments and the like, pot for, R. H. Finlay, Conduit, fluid, S. L. Bailey, Cooking vessel, C. J. Parker, Cooling rooms, etc., ammonia system for, J. Ring, Corset, M. P. Bray, Cotton scraper and sweep, W. R. Craig, Coupling, See Car coupling, Thill coupling, Crank pins, device for turning, T. Urquhart, Creaming can, C. W. Parks, Creosote, etc., obtaining, F. S. Clark, Cuckoo, G. R. Olney, Cup, See Oil cup, Cutter, See Paper cutter, Rotary cutter, Cutter heads, tread guard for, J. L. Packard, Damper regulator, F. Leclere, Dental electric apparatus, C. A. Eisenhart, Dental matrix, H. P. Booth, Desk, school, M. W. Kidder, Ditching machine, I. N. Knight, Door check, B. F. Bougahn, Door plate and letter box door, combined, R. Stafsvick, Dovetailing machine, N. S. Clement, Drier, See Clothes drier, Drill grinding attachment, twist, F. Mossberg, Drilling device, A. K. Cross, Drilling device, P. M. Sharples, Drum, E. Zoeller, Drum, military, B. Fleck, Drums, snare tightener for, J. H. Buckbee, Jr., Eaves gutter hanger, M. Koch, Eccentric tread, A. J. Tyler, Educational apparatus, I. F. Hall, Electric arc light support, Schardt & Jones, Electric conduit, underground, E. H. Phipps, Electric light carbons, furnace for baking, J. Burns, Electric machines, commutator for dynamo, J. T. Van Gestel, Electric meter, H. G. Morris, Electric meter, K. Raab, Electric motor, J. Batley, Electric motor, J. T. Van Gestel, Electric wires, suspending overhead, A. E. Harris, Electrical conductor, W. A. Conner, Electrotyping dies, making, J. W. Tufts, Elevator, See Hydraulic elevator, Elevator, Bullock & Hanson, Elevator, G. A. Weld, Elevator gate, automatic, A. Miller, Engine, See Carding engine, Rotary engine, Steam engine, Traction engine, Engine shafts directly to the driven machines, device for gearing, E. H. Hewins, Engines, variable expansive and reversing motion for oscillating cylinder, J. W. Hartley, Eraser, blackboard, H. C. Goodrich, Eyeglasses, nose guard for, G. H. Emerson, Fabric, See Carpet fabric, Fabric turfing implement, D. Lewis, Fan or brush, by, H. Rembert, Faucet, right and left hand stop and waste, W. Briggs, Feathers, machine for reducing, C. Wolff, Feed trough, W. Andrus, Feed trough, Hughes & Wade, Fence, N. Shaftsmail, Fence machine, W. Peepser, Fence making machine, L. T. Curtis,

Table listing inventions such as Fence making machine, A. K. Degood, Fence making machine, J. Zeigel, Fence, picket and barbed, J. Locher, Fence, portable, E. Demuth, Fence, wire, B. Scaries, Fertilizer distributor, W. W. Turnipseed, File and binder, letter, B. Lawrence, Filing case, B. H. Morgan, Filter, oil, G. W. Gallaway, Finger bar, L. D. Minnick, Finger shield, A. Ahlquist, Fire alarm signal box, electric, S. A. Chase, Fire alarms, thermal circuit closer for, Petit & Bresson, Fire arms, rust preventer for, C. I. Wooster, Fire escape, L. Hill, Fire extinguisher, I. N. Goodnight, Fire extinguisher for railway cars, F. E. Squire, Fishing rod holder, A. F. & W. Meisselbach, Forming tool, W. W. Emerson, Frame, See Tobacco frame, Frog or car replacer, portable, W. O. Cooke, Fruit jar, G. H. Harvey, Furnace fuel feeder, A. Warne, Fuse lighter, W. H. Randall, Galvanic battery, A. V. Meserole, Gas condenser and tar separator, F. Bredel, Gaseous fuel, apparatus for the manufacture of, A. Thompson, Gate, See Elevator gate, Water gate, Gate, D. England, Gate, J. W. Paulen, Gate, J. B. Rowe, Gill boxes, etc., device for lowering the fallers in, J. Stake, Glass mould, W. Haley, Grain binders, bundle carrier for, H. J. Case, Grain binders, packing mechanism for, J. S. Davis, Grain hoppers, means for operating the slides of, J. Dable, Grate, F. S. Bissell, Grate bar, Kitson & Reagan, Grate bar, J. Mahony, Grate for furnaces, stoves, etc., fire, G. C. Dunklee, Grinding machine, F. C. Hall, Grinding mill, roller, W. D. Gray, Grooving machines, cutter head for, J. T. Gzybowski, Guns, breech mechanism for, T. Nordenfelt, Hair crimper, N. Allen, Handle, See Trunk handle, Hanger, See Eaves gutter hanger, Vehicle spring hanger, Hardening and tempering by electricity, apparatus for, P. Diehl, Harness, M. M. Hitt, Harness hooks, wear plate for, W. B. Hayden, Harrow, C. La Dow, Harrow disks, machine for grinding, E. A. Sloat, Harrow tooth, cultivating, C. C. Crumb, Harrows, machine for making disks for, W. J. Hogan, Harvester, J. S. Davis, Harvester, corn, P. R. Hunt, Harvester, grain binding, A. O. Slentz, Harvester guard renovator, G. W. East, Hasp lock, L. A. Brown, Hat brims, machine for shaping, L. H. Hoyt, Hats, adjustable block for stretching, J. E. McLoughlin, Hay or grain cock weather shield, J. A. & L. R. Symmes, Hay press, W. A. Laidlaw, Hay rake, horse, B. Desautels, Heater, See Open front heater, Water heater, Heating apparatus, E. E. Gold, Heating, cooking, and vaporizing apparatus, portable combination gas, H. P. Miller, Heel beading machine, J. H. Ryder, Heeling machine, A. E. Ellis, Heeling machines, manufacture of nail dies for, E. Merritt, Hemp, jute, ramie, etc., machine for disintegrating, J. J. Green, Hemp, ramie, etc., machine for disintegrating, J. J. Green, Hemp, ramie, etc., machine for treating, J. J. Green, Hinge, J. M. Grau, Holdback, vehicle, J. P. Van Dusen, Holder, See Badge holder, Chamois holder, Fishing rod holder, Hoof parer, H. F. Riblett, Hopple, B. Spieth, Horse power, A. Sampson, Horseshoeing rack, S. M. Martin, Horse tail tie, C. D. Haldeman, Hose connection, M. W. Webb, Hose nozzle supporter, O. P. Prescott, House, portable, A. Lindblad, Hydrant, A. J. Tyler, Hydraulic elevator, E. Hunt, Hydrocarbon burner, J. Reid, Ice or refrigerating machine, J. E. Siebel, Incrustation preventive, D. H. Cameron, Indicating and calculating machine, P. Yoe, Indicator, See Railway station indicator, Speed indicator, Street or station indicator, Ingot manipulator, O. P. Mason, Inkstand, S. B. Jerome, Insect powder blower, E. W. Mersereau, Ironing machine, G. J. Fritz, Jar, See Fruit jar, Key, See Loop key, Knitting machine, N. W. Pierce, Knitting machine, circular, H. C. Rightmire, Knitting machines, stop motion for, R. B. Goodyear, Knitting stockings, S. Henshall, Ladder, extension fire, T. W. Russell, Ladder, step, O. M. Sweet, Lamp, arc, J. Lea, Lampblack, apparatus for the manufacture of, S. Cabot, Jr., Lamp, central draught, F. Rhind, Lamp, electric arc, Spencer & Jaquith, Lamp, incandescent gas, H. Shaw, Lantern, tubular, W. C. Whitney, Last, Bickford & Stetson, Last, H. M. Goodhue, Lasts, avril heel shoudering machine in the manufacture of, W. Thompson, Lasting machine, T. O'Boiger, Lathing, metallic, B. Scaries, Leather splitting machine, D. Knox, Leather stretching machine, W. E. Adams, Life preserver or buoy, F. Gregson, Liquid fuel burner, C. J. Edmonds, Lock, See Hasp lock, Nut lock, Loom, H. Talks, Loom shuttle, self-threading, J. B. Daudelin, Loom take-up mechanism, F. A. Arbenz,