(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 ½ inch thick, 2½ inches wide, with 1¼ 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 ⅛×7 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. ⅛ horse power is generally allowed for a man power, equal to 93¼ 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 ¼ 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 packing. 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.

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Shafts, anti-friction step for, P. M. Sharples 388,457
Sheet metal beading machine, W. J. Bayrer 388,471
Sheet metal puncturing machine, Waelde & Cery 388,604
Shells, multiple primer for, N. W. Pratt 388,787
Shelves, book support for, M. W. Harrington 388,674
Shoe rest, Huntington & Tracy 388,685
Sifter, L. M. Nixdorff 388,575
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Skate, J. A. La Chaine 388,693
Sled roads, device for making, H. B. Frey 388,407
Sleigh, J. W. & H. Cox 388,531
Sole edge burnisher, C. Amazeen 388,751
Sower, broadcast seed, T. Grubb 388,485
Speed indicator, H. Conant 388,532
Spinning machines, device for pasting cop bottoms on, Cooper & Cordingley 388,636
Spinning spindles, step for, J. Booth 388,392
Spoke socket, M. L. Smith 388,735
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Springs, machine for making wire, O. S. Foster 388,658
Square and protractor, combined, J. D. Smith 388,734
Stamp, hand, H. H. Norrington 388,437
Stamping press, F. M. Leavitt 388,698
Stanchion, H. C. Miner 388,572
Steam engine, J. Bonicard 388,755
Stone composition, artificial, C. A. Shank 388,726
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Storage battery plate, C. D. P. Gibson 388,668
Store service apparatus, H. Hebert 388,559
Stove, charcoal burning cooking, C. Morse 388,435
Stove pipe or flue cleaner, R. G. Smith 388,794
Straightening machine, W. A. McCool 388,701
Street or station indicator, C. F. Niklaus 388,709
Sugar evaporator, E. B. Everingham 388,546
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Switch for tracks for carrying iron, E. A. Kern 388,688
Syringe, vaginal, D. J. Terrell 388,510
Tea and coffee pot, portable, E. E. C. Thompson 388,600
Telegraphy, P. B. Delany 388,481
Telegraphy, railway, G. T. Woods 388,803
Telephone exchanges, switch board for, C. E. Scribner 388,791
Thill coupling, O. P. Barker 388,521
Thrashers, grain separator for, J. T. Fenton 388,483
Thrashing machines, band cutter and feeder for, J. H. Spurgin 388,595
Tie. See Horse tail tie.
Tire bolter and cutter, W. A. Johnson 388,778
Tobacco frame, J. F. Drury 388,646
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Trunk handle, G. Crouch 388,638
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Twisting frames, etc., stop motion for, Smith, Jr., & Ambler 388,509
Type, printer's, J. G. Pavyer 388,713
Valve, A. D'Lanoy 383,766
Valve controller, thermotic, G. W. Blake 388,754
Valve for incubators, thermostatic, M. S. Greenleaf 388,666
Valve, steam engine, J. Heath 388,414
Valve, steam exhaust pipe, J. Erwood 388,654
Vehicle, M. F. Goodrich 388,408
Vehicle, road, M. M. Conger 388,763
Vehicle running gear, A. Bock 388,524
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Vessel for transporting breakable goods, L. Sloan 388,733
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Wagon body, F. Burgess 388,528
Wagon body, R. G. Hart 388,675
Wagon, coal, J. R. Wilson 388,801
Wagon curtain, J. H. Hucke 388,563
Wall paper, F. Beck 388,472
Washing machine, W. F. Moore 388,706
Washing machine, J. Shepherd 388,728
Washing machine, J. R. Welpton 388,606
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Watches, cannon pinion for, L. C. Briggs 388,625
Watches, setting mechanism for, A. Fischer 388,404
Water gate, C. J. Cheney 388,632
Water heater sectional, W. Kirkwood 388,418
Water motor, J. Wilhelm 388,750
Water wheel, current, L. Colt 388,531
Wheel. See Metal wheel. Traction wheel. Water wheel.
Wick, lamp, A. S. Yanez 388,609
Window dresser, G. F. Hall 388,776
Window shade bracket, T. Gorsuch 388,775
Wire rope or cable, H. W. Farley 388,656
Wire tightener, D. T. Brown 388,626
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Yarn for filling, etc., preparing, R. C. Newell 388,436
Yoke ring, neck, R. K. Burt 388,758

DESIGNS.

Basket, W. Haley 18,566
Biscuit or cracker, D. H. Stauffer 18,580
Bottle, A. Kohn 18,572
Button, campaign, J. M. Jones 18,571
Button, campaign, R. Liebmann 18,574
Carpet, M. F. Beale 18,559
Carpet, E. Fisher ..... 18,563 to 18,565
Carpet, H. Horan ..... 18,567 to 18,569
Carpet, W. L. Jacobs 18,570
Carpet, E. Poole ..... 18,575 to 18,578
Checkrein hook, G. S. Cascaden 18,561
Corset, J. Koon 18,573
Fan, handkerchief, etc., D. Rhodes 18,579
Handkerchief, H. G. Worthington 18,582
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Type, font of, H. Brehmer 18,560
Walls, surface ornamentation of, L. Clemencet 18,562

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