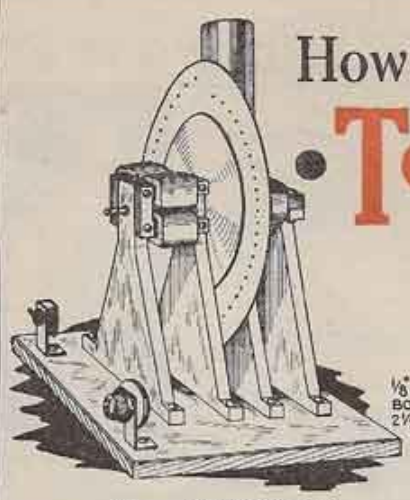
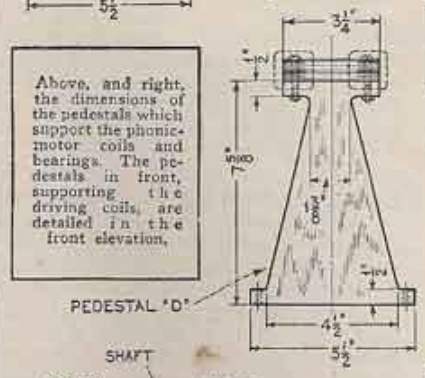
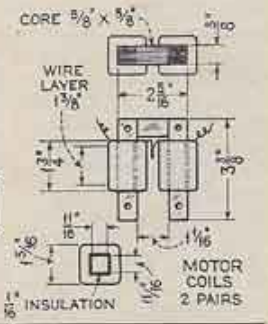
How to Make a Television Scanner Motor



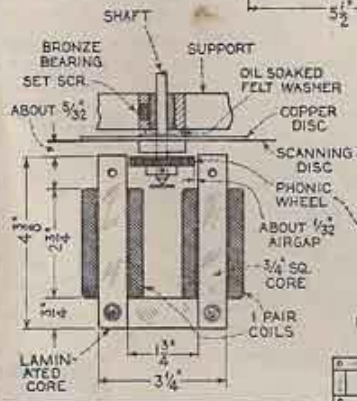
Above, side and front elevations of a standard-type television motor, pictured at the upper left; the designs contemplate the use of a 12-inch disc; the front coils drive the disc, while the rear coils synchronize its speed. The metal shield is adjustable on the rod holding the neon tube.

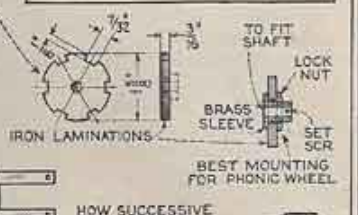


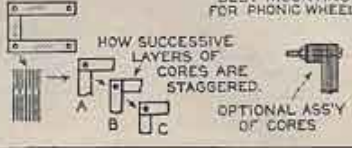
Above, and right, the dimensions of the pedestals which support the phonic-motor coils and bearings. The pedestals in front, supporting the driving coils, are detailed in the front elevation.



Dimensions of the driving (eddy-current) coils above; below, design of phonic wheel.







Above, dimensions of synchronizing coils. Right, the method of building up all coil cores.

By *JOSEPH RILEY*

THE scanning-disc motor here illustrated operates on the eddy-current principle; the magnetizing coils prescribed are for use on standard 110-volt, 60-cycle, A. C. supply. The scanning disc is rather difficult to lay out accurately, and it is undoubtedly cheaper, and more satisfactory in the end, to purchase one of these. A 60-hole disc is practically standard now, and the motor has to rotate this at 1,200 revolutions per minute, in order to receive images correctly from most television broadcast stations.

The motor herewith described has considerable power and can rotate a scanner of somewhat greater diameter than the 12-inch disc allowed for in the drawings. If you wish to adapt it to a larger disc, the four pedestals can easily be made higher.

The pedestals or supports for the magnets should preferably be cut out of ¾- or ⅞-inch thick hardwood, such as maple, oak or mahogany; ½-inch thick sheet fiber also makes a very satisfactory material for the pedestals. The shaft which carries the scanner disc and "phonic wheel" measures six inches long by ¼-inch in diameter. Two ordinary brass (or bronze) fan-motor bearings may be (and have been) used successfully for a television motor of this type; but, if you have some ball bearings available, you can use them here to good advantage. The brass or bronze spring fastened on the front of the third pedestal acts as a "thrust bearing" against the pointed end of the scanning-disc's shaft. (*Continued on pg.* 89)

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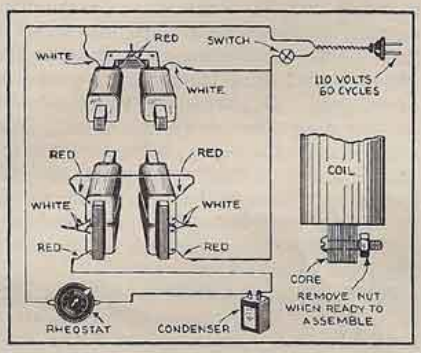
The scanning disc can be riveted or screwed to the 1/16-inch thick copper "eddy-current" disc and mounted on a suitable hub, provided with a set-screw to secure it on the shaft. The phonic wheel, made of laminated iron or transformer steel, can be pinned to the shaft, or else mounted on a brass sleeve, fitted with a set-screw, as one of the drawings shows.

The speed-regulating rheostat has a resistance of approximately 1000 ohms, and the series condenser a capacity of 1.25 microfarads.

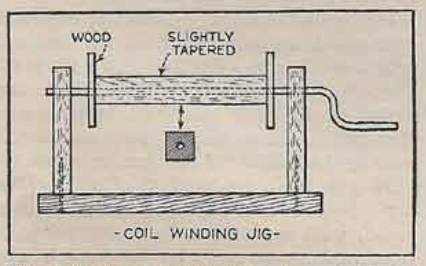
Now we come to the six coils on the motor; four of which set up eddy currents in the copper disc; the reaction between the eddy currents and the magnetic fields of the coils causing the disc to rotate.



The electrical connections of the coils used to operate the television eddy-current scanning motor.

Two of the magnetizing coils are for the phonic motor; each of these measures 2¾ inches long and is wound with eight layers of No. 22 enamelled magnet wire, the width of each layer being 2¼ inches. The laminated iron cores for the phonic motor are ¾-inch square in cross-section; the 1/16-inch (wall) fiber coil form measures ⅞-inch square inside. In winding all of the coils for this motor, a layer of thin varnished fabric or linen is wound over each layer of wire. When connecting the coils of any pair of magnets, be sure that the current flows around each coil in an opposite direction, thus producing north and south poles, respectively.

The four motor driving coils measure each 1¾ inches long, by 1 5/16 inches outside diameter. Each coil is wound on a 1/16-inch fiber sleeve, measuring 11/16-inch square inside. Eleven layers of No. 30 enamelled magnet wire each 1⅜ inches wide, are wound on each of the four



With a simple device like this, the work of winding the coils is made easier.