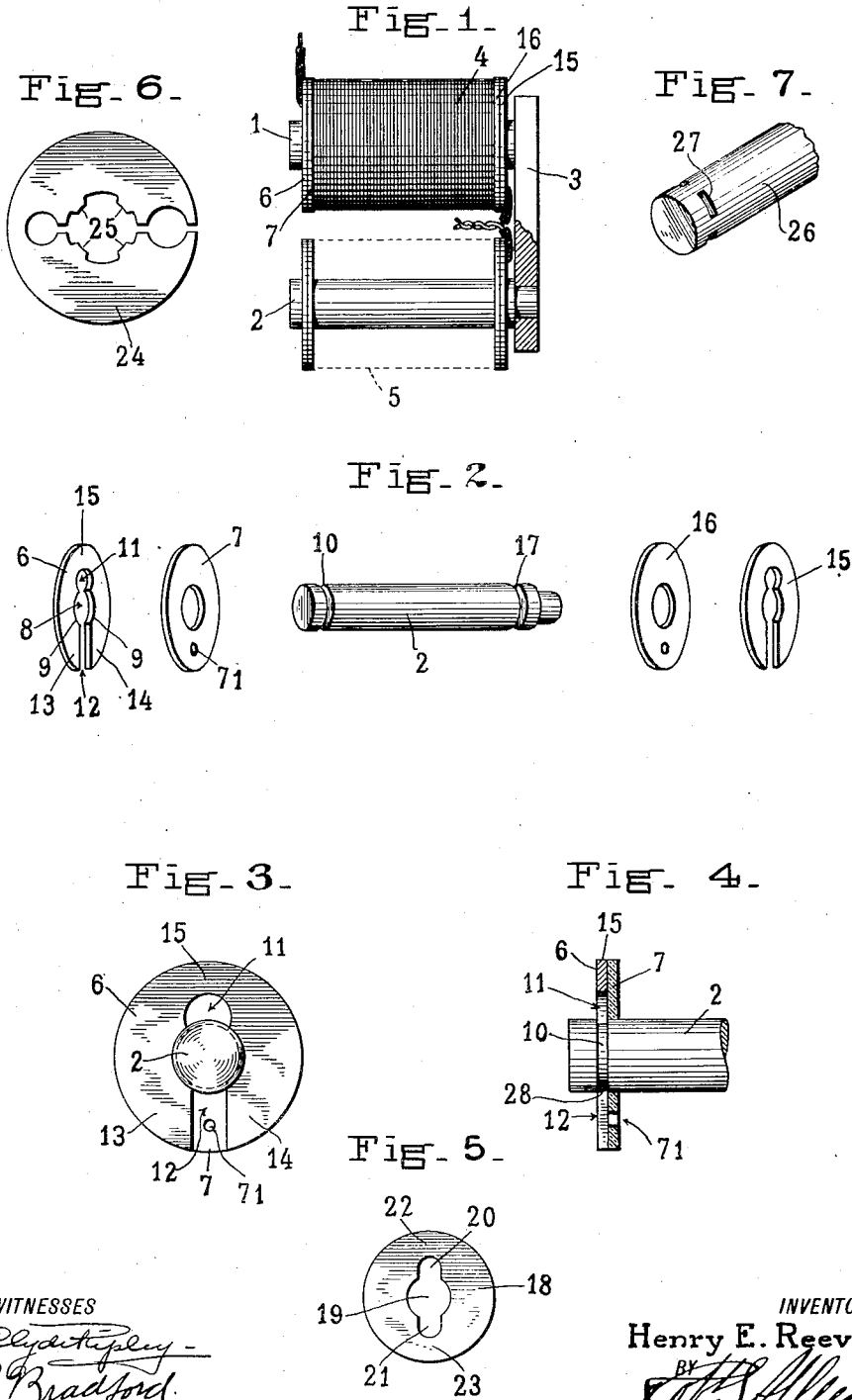


H. E. REEVE.
ELECTROMAGNET CONSTRUCTION.
APPLICATION FILED APR. 8, 1911.

1,236,357.

Patented Aug. 7, 1917.



WITNESSES
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ELECTROMAGNET CONSTRUCTION.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY E. REEVE, a citizen of the United States, and resident of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electromagnet Construction, of which the following is a specification.

It has been customary to form the heads of electromagnets of fiber or hard rubber. Fiber is absorbent and therefore objectionable. Hard rubber is very fragile and is injured by heat. Difficulty has been encountered in such constructions, particularly when the coil is immersed in a heated liquid for the purpose of applying a protective coating. The heat if excessive is likely to soften and warp the rubber heads and loosen them from the magnet cores. Similarly the heads are injured if the magnets are subjected to heat when in use. The principal object of my invention is to form an electromagnet with heads which can be readily put on the core but which will be compact and inexpensive and not injured by heat and which will be durable and permanent and unaffected by moisture and not liable to chemical injury.

The invention contemplates forming each head of the magnet of a washer or disk of suitable metal preferably such as brass and having a central opening to receive the core. Parts of the metallic disk are cut away so as to make the head somewhat flexible for the purpose of assembling. The method of securing the head on a grooved core is also an important part of my invention. A layer of mica or other suitable insulating material is preferably interposed at the inner surface of the metallic head.

Figure 1, shows an electromagnet of horse-shoe type, the coil windings being omitted from one of the cores.

Fig. 2, is a perspective view of the parts of a magnet embodying the improvements of my invention.

Fig. 3, is an end view of a single coil magnet.

Fig. 4, is a detail side view showing one end of the magnet and the head in section.

Fig. 5, is an end view of the head of a modified construction.

Fig. 6, is another modified form of head disk.

Fig. 7, is an end view of a core for the disk of Fig. 6.

In Fig. 1 the two cores 1 and 2 are connected by the bar 3. Core 1 has a winding 4. The outline of a winding for core 2 is indicated by the dotted line 5.

The left hand head of the core 2 consists of the metallic disk 6 and the insulating disk 7. The disk 6 has a central opening 8 the edges of which 9, 9 are designed to fit snugly in the groove 10 in the end of the core 2. The diameter of the core at the bottom of the groove 10 is preferably very slightly larger than the original diameter of the opening 8 in the disk 6 and the width of the groove 10 is substantially the thickness of the disk 6 so that the disk elastically engages the core preferably both at the sides and bottom of the groove.

On opposite sides of the opening 8 the disk 6 is slotted as at 11 and 12 so that the disk is in fact made up of the two halves 13 and 14 connected together at 15 so that the disk can be slightly sprung for the purpose of assembling it on the end of the core 2. The two halves 13 and 14 are sprung apart slightly so as to increase the diameter of the opening 8 sufficiently to allow the disk to slip over the end of the core until the edges 9, 9 fit into the groove 10. When the halves 13 and 14 are released the elastic quality of the metal causes the disk to grip the core in the groove 10 and hold the disk securely in place. The side walls of the groove 10 serve as shoulders to prevent the disk 6 from displacement.

The insulating disk 7 fits on the core 2 just inside of the disk 6 and forms an insulating medium between the metallic disk 6 of the magnet and the windings. The insulating disks may be cemented to the metallic disks and a suitable number of holes as 71 pierced near the center line of the slots 12 in the metal disk 6 for the winding terminals. The disk 7 not only insulates the coil from the metallic disk 6 but closes the openings 11 and 12.

The right hand head of the magnet is similarly made up of the metallic disk 15 and the insulating disk 16, the disk 15 fitting on to the right hand end of the core 2 in the groove 17.

In Fig. 5 I have shown a modification of the metal head. The disk 18 has a central

opening 19 and slots 20 and 21 at opposite sides thereof so as to divide the disk into two parts connected at 22 and 23. This construction is stiffer but not quite so easy to assemble on the core as the disk 6.

The disk 6 of Figs. 2 to 4 and disk 24 of Fig. 6 also avoid induced currents as there is no metallic circuit in them around the core.

- 10 In Fig. 6 the disk 24 has interiorly directed prongs or tongues 25. In Fig. 7 the core 26 has recesses 27 for receiving the tongues 25 and providing in effect shoulders for positioning the disk 24 longitudinally and circumferentially.

When constructed as preferred the disk 6 even when the opening 8 is round grips the core snugly in the groove 10 and is not easily turned. A part of the core 2 may be indented however or drawn over into the groove 10 between the parts 13 and 14 as at 28, Fig. 4 to afford additional means for preventing the disk 9 from turning on the core.

- 25 The slots 11 and 12 afford convenient ingress and egress for the coil terminals.

The advantages of the invention are the cheap cost of construction, its durable character and freedom from liability to injury when subjected to heat or shock and its economy of space and material.

This application is a divisional application from #595,042 filed by me December 1st, 1910.

- 35 What I claim is:—

1. In an electromagnet, a core for a magnet winding having a peripheral groove therein and a coil-supporting head disk rigidly applied to the said core comprising a plate of sheet metal of substantially the same thickness as the width of the grooveway in the core, provided with a central opening of substantially the size of the grooved portion of the core whereby to grip the core when applied thereto and with a slot extending inwardly from the edge portion of the plate into the said central core opening to thereby render said plate sufficiently elastic to be forced over the core into engagement in the grooveway therein, said slot being of less width than the diameter of the

core opening in the disk to prevent the disk working off the core.

2. In an electromagnet construction, a core rod of magnetic material, a relatively thin nonmagnetic sheet metal disk permanently and rigidly gripped on one end of said core rod and forming a head for retaining the coils in place on the core rod, said core rod having a shoulder to prevent endwise movement of said disk, and said head disk being slotted to enable it to be forced on to the end of said rod, magnet coils wound on the core rod and supported in coil form by the metallic head disk and insulating material between the coils and the head disk.

3. In an electromagnet, a spool construction, comprising a core rod of magnetic material having a peripheral groove therein near the end thereof a thin sheet metal end disk having a central opening and rigidly secured in the groove at the end of the core rod, said sheet metal disk having a slot cut therein from the edge to the central opening to adapt the end disk to being sprung into place to assemble it on the core rod and to avoid an electric circuit around said disk, a thin insulating disk on the core rod covering the inside face of the end disk and a wire coil wound on the core against the insulating disk supported by the metallic end disk.

4. An electromagnet comprising a core rod of magnetic material, relatively thin non-magnetic metal head disks applied to the opposite end portions of the core rod, means rigidly securing said metal non-magnetic head disks on the core rod and holding the same thereon against endwise displacement, relatively thin disks of insulating material surrounding the core rod and engaging the inside faces of the metallic non-magnetic head disks, and a magnet coil wound on the core rod between the insulating disks, supported in coil form by the metal head disks and insulated from said metal supporting disks by the insulating disks at the inside faces of said supporting disks.

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Witnesses:

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