

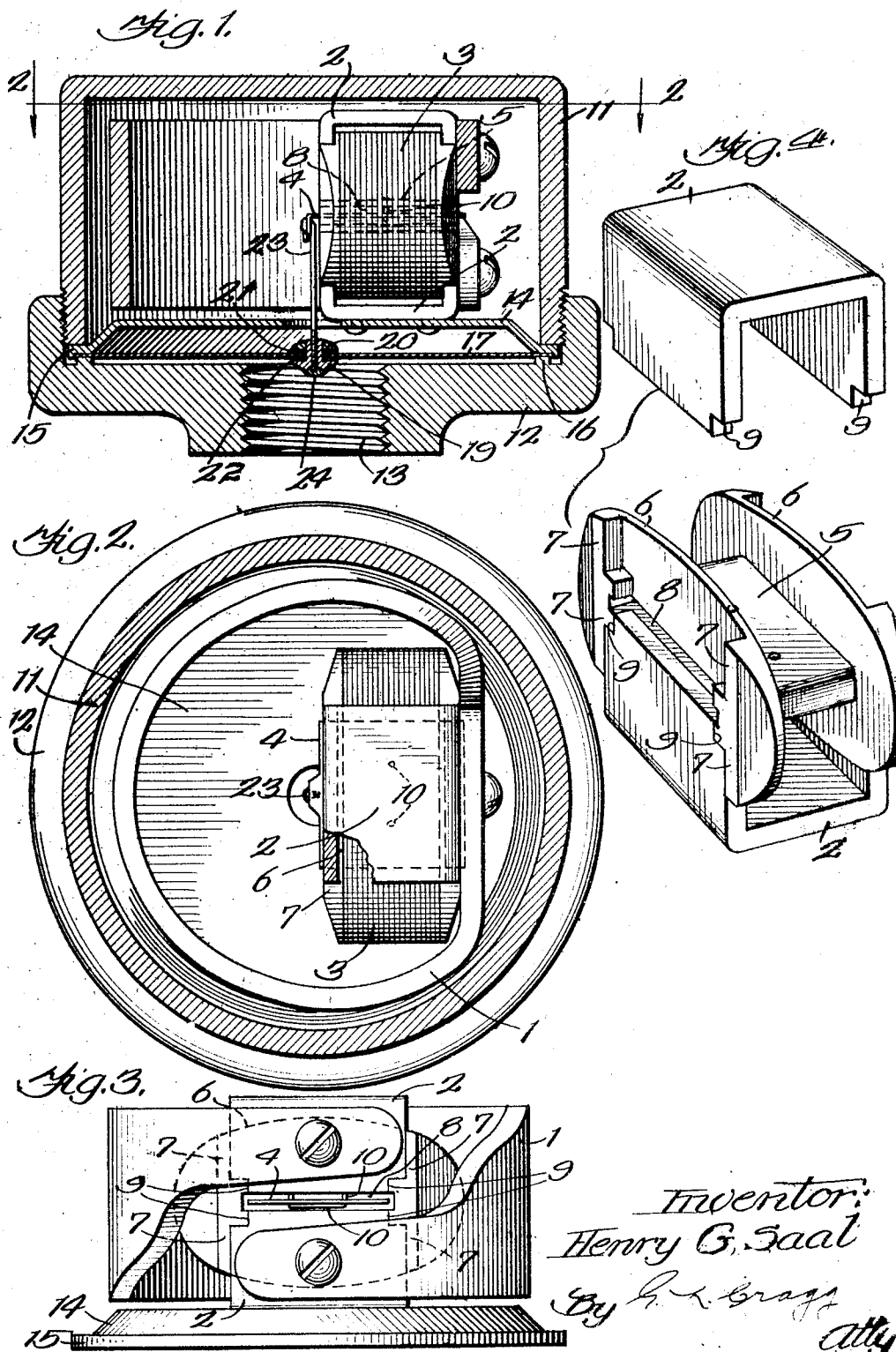
Feb. 16, 1926.

1,573,094

H. G. SAAL

POLARIZED ELECTROMAGNET

Filed March 20, 1925



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Patented Feb. 16, 1926.

1,573,094

UNITED STATES PATENT OFFICE.

HENRY G. SAAL, OF CHICAGO, ILLINOIS.

POLARIZED ELECTROMAGNET.

Application filed March 20, 1925. Serial No. 17,082.

To all whom it may concern:

Be it known that I, HENRY G. SAAL, a citizen of the United States, residing at Chicago, in the county of Cook and the State of Illinois, have invented a certain new and useful Improvement in Polarized Electromagnets, of which the following is a full, clear, concise, and exact description.

My invention relates to polarized electromagnets and has for its object the provision of an improved construction and assembly of some of the component parts thereof.

The permanent magnet is provided with two polar extensions, each end of the magnet having such an extension. These polar extensions are of U-form symmetrically arranged to define a quadrilateral winding space in which the winding and its spool are disposed. The spool for the winding is preferably molded in one piece from bakelite or other suitable molding material. The spool preferably comprises a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool. The shoulders of each pair are symmetrically related and inwardly facing to define spaces in which said polar extensions are received.

The invention will be more fully explained in connection with the accompanying drawing in which Fig. 1 is an axial sectional view of a telephone receiver containing the preferred form of polarized magnet of my invention; Fig. 2 is a sectional view on line 2-2 of Fig. 1; Fig. 3 is a view in side elevation of the structure illustrated in Figs. 1, 2 and 3 but with the receiver casing removed; and Fig. 4 is a perspective view illustrating the spool and one polar extension in assembly and the other polar extension separated.

Like parts are indicated by similar characters of reference throughout the different figures.

The permanent magnet 1 is preferably ring like in form. Its polar extensions 2 are of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the magnet winding 3 and the armature 4 of the magnet. The

winding spool comprises a body portion 5 and two flanges 6, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders 7 on opposite sides of the spool. The shoulders of each pair are symmetrically related and inwardly facing to define spaces in which said polar extensions are received. The spool is formed with an opening 8 extending therethrough and between the L shaped shoulders of each pair, the polar extensions are formed with angular recesses 9 at each of its corners in which adjacent sides of the shoulders are received. The coil 3 is wound upon said spool between its flanges. The armature 4 is mounted upon a stirrup 10 and is placed within the spool opening and between said polar extensions. The spool, which, with its flanges is preferably made of molded bakelite, is thus firmly assembled with and supported by the polar extensions without the aid of additional means.

The body portion 11 of the receiver casing is exteriorly threaded at its rim to receive the casing cap 12 that is screwed thereon and has a central sound conveying passage 13 here shown as being interiorly threaded for connection with a sound amplifying horn. A rigid cup 14 has its circular out-setting rim 15 clamped between the threaded end of the casing body and an annular ridge 16 formed upon the interior of the cap 12. The telephone receiver diaphragm 17 composed of mica, bakelite, or other suitable resilient sheet material, is interposed and clamped between the ridge and the annular rim of the cup, this rim constituting a seat for the diaphragm. As is set forth in a copending application, the diaphragm is tensioned to resist deflection from its normal plane in either direction. A rivet passes through a central portion of the diaphragm and has flanges 19 and 20, one upon each side of the diaphragm. The flange 19 is integrally formed with the body of the rivet and the flange 20 is secured in plane by staking. Cushion washers 21 and 22 are employed, one being clamped between each rivet flange and the adjacent face of the diaphragm. A link 23 is screwed, at one end, into said rivet and is further secured thereto by a drop of solder 24 upon the outer ends of the link and rivet. This link is connected at its other end to one end of the armature

4. The assembly of the diaphragm and armature described form the subject matter of my copending application Serial No. 27,299 filed May 1, 1925.

5. It is obvious that changes may be made without departing from the spirit of my invention.

Having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough and between the L shaped shoulders of each pair, the polar extensions being formed with angular recesses at each of their corners in which adjacent sides of the shoulders are received; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

2. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough, the polar extensions being formed with angular recesses at each of their corners in which adjacent sides of the shoulders are received; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

3. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with

one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool made of molded material comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough and between the L shaped shoulders of each pair, the polar extensions being formed with angular recesses at each of their corners in which adjacent sides of the shoulders are received, a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

4. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool made of molded material comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough, the polar extensions being formed with angular recesses at each of their corners in which adjacent sides of the shoulders are received; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

5. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool be-

ing formed with an opening extending therethrough and between the L shaped shoulders of each pair; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

6. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool comprising a body portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

7. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool made of molded material comprising a body

portion and two flanges, one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough and between the L shaped shoulders of each pair; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

8. In a polarized electromagnet, the combination with a permanent magnet; of two polar extensions of U form, each end of the permanent magnet being provided with one of these extensions which are symmetrically arranged with the ends of each facing and spaced apart from the ends of the other to define a space for the winding and armature of the magnet; a winding spool made of molded material comprising a body portion and two flanges; one at each end of the body portion, said flanges having, each, two symmetrically related pairs of L shaped shoulders on opposite sides of the spool, the shoulders of each pair being symmetrically related and inwardly facing to define spaces in which said polar extensions are received, the spool being formed with an opening extending therethrough; a winding upon said spool and between its flanges; and an armature within the spool opening and between said polar extensions.

In witness whereof, I hereunto subscribe my name.

HENRY G. SAAL.