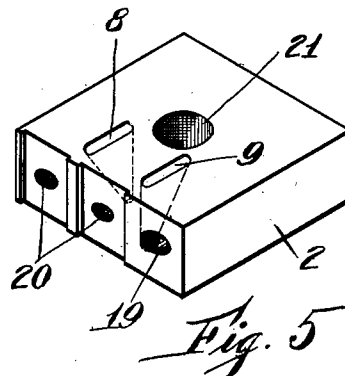
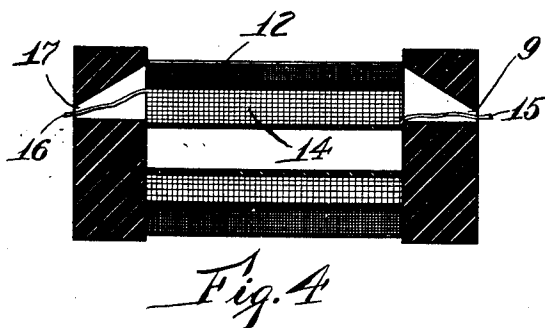
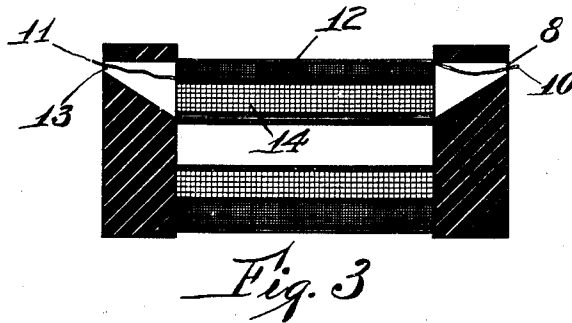
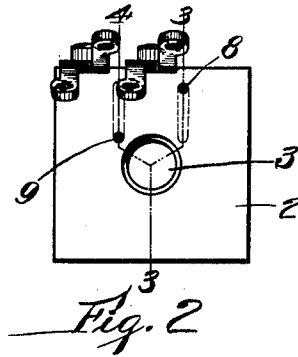
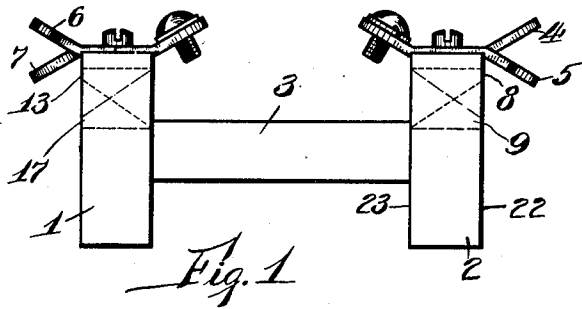


C. H. SMITH.  
SPOOL HEAD.  
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1,014,780.

Patented Jan. 16, 1912.



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# UNITED STATES PATENT OFFICE.

CHARLES H. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## SPOOL-HEAD.

1,014,780.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed March 24, 1910. Serial No. 551,322.

*To all whom it may concern:*

Be it known that I, CHARLES H. SMITH, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Spool-Heads, of which the following is a specification.

My invention relates to spool heads for electro-magnets, induction coils of all kinds, or any spool having a winding on a core with heads inclosing the ends thereof, and more particularly to that type in which the terminals or ends of the windings are brought out through the spool head.

Heretofore it has been necessary to drill holes in the spool heads for each different diameter of winding, and the object of my invention is to secure a spool head in which the terminals of any diameter of winding may be brought through without the use of a different opening or different spool head for each diameter.

In applying my invention to any spool, a single opening in the spool heads may be used to bring out the terminals of any diameter of winding.

Referring to the drawings, Figure 1 is a side elevation of a spool, showing the core and the two heads with their terminal clips, but without any winding; Fig. 2 is an end elevation of the structure shown in Fig. 1 showing the openings for the terminals of the windings; Fig. 3 is a vertical longitudinal section of Fig. 2 through the section line 3—3 showing the two spool heads, the core and two windings about the core with the terminals of the outside winding extending through the openings in the spool heads; Fig. 4 is a vertical longitudinal section of Fig. 2 along the section line 4—3 and differs from Fig. 3 in that the terminals of the inner winding are shown leading through the openings in the spool heads; Fig. 5 is a perspective view of one of the heads of the spool.

Referring to Fig. 1, 1 and 2 are the spool heads which are preferably made of fiber, although any insulating material may be used, 3 is the core, and 4 and 5 are the terminal clips which are made of brass to which the wires to be led through the openings of the spool 2 are fastened. The terminal clips 6 and 7 may answer for the same purpose for the spool head 1.

Fig. 2 shows the spool head 2 with the core 3 and the small openings 8 and 9, the upper and lower sides of which diverge from the outer surface 22 to the inner surface 23 as shown by the dotted lines of the spool head 2 in Fig. 1. The core 3 may be fastened in the head 2 in any suitable manner. It will be readily noted that the opening 9 is close to the core 3, while the opening 8 is at a greater distance from the core. My object in arranging these openings in this manner is that by their position with respect to the core, it would be readily seen to which layer of the winding the ends coming therethrough are connected. If there were but one winding on the spool the terminal or end of the layer next to the core would come through the opening 9 while the terminal from the outer layer of the winding would come through the opening 8. Where there are two windings on a spool, I would preferably arrange the terminals as shown in Figs. 3 and 4. It is obvious that the upper and lower sides of the openings 8 and 9 may be parallel, but I prefer to apply my invention as shown, although I do not wish to be limited to this exact form. By the construction shown in Fig. 2 it may be determined by an inspection of the outside of the spool where any certain terminal or end leads to, that is, whether it leads to an inner or outer layer where there is only one winding, or whether it leads to an inner or outer winding where there is more than one winding.

In Fig. 3 the terminals 10 and 11 of the outer winding 12 are shown leading through their respective openings 8 and 13 in the spool heads. While in this view I have shown the terminals of the outer winding leading through the openings, it can be readily seen that the same openings would serve the inner winding 14 if desired. From an examination of this figure it can be readily seen that the slotted openings 8 and 13 could serve as outlets for the terminals or ends of any diameter of winding which may be placed on the spool within the range of the opening. In other words, a winding of any number of layers within the range of the large end of the opening may be placed upon the spool and an end or terminal taken through the opening at a point adjacent to any layer of the winding.

In Fig. 4 I have shown the terminals 15 and 16 of the winding 14 leading out through their respective openings 9 and 17, but it can be readily seen that these openings could also serve as outlets for the terminals of the outer winding 12.

While in the Figs. 3 and 4 I have shown the slotted openings 8 and 9 with their diverging sides at different distances from the center of the head 2, they could as readily be placed at different points of the same radius of the head. Neither do I wish to be limited to the exact form of opening shown, as the main feature of my invention is to have an opening in the spool head next to the winding which is large enough to receive the terminals or ends at a point adjacent any layer of the winding of any diameter which the spool head is adapted to inclose.

Fig. 5 shows the slotted openings 8 and 9 of the spool head, the upper surface of the figure being that side which is placed next to the winding. For fastening the spool to any surface, a screw is passed through the hole 19 and into the surface to which the spool is to be fastened. Holes 20 are for inserting the screws which fasten the terminals 4 and 5 to the spool head. The hole 21 is for the insertion of the core 3. The dotted lines in this figure show the manner in which the sides of the openings 8 and 9 converge in passing through the spool head 2 from the upper to the lower side of the figure.

What I claim as new and desire to secure by Letters Patent is:

1. A spool comprising a core, a spool head secured to each end of said core, an opening passing through one of said spool heads from the inner surface to the outer surface thereof, said opening being adapted at the said inner surface to receive an end or terminal of any diameter of winding the said spool head is adapted to inclose.

2. A spool for electromagnets having a winding and a spool head inclosing the ends thereof, the said spool head having a slotted aperture adapted to receive an end of any layer of the winding.

3. A spool for electromagnets, a winding of a definite number of layers on said spool, and an aperture in a head of said spool adapted to receive an end or terminal of any

certain layer of said winding at a point adjacent to said layer.

4. A spool comprising a core, a head at each end of said core, a winding of a plurality of layers about said core and inclosed by said spool heads, an aperture extending through one of said spool heads, said aperture being adapted to receive an end of said winding at a point adjacent to any of said layers.

5. A spool for electromagnets comprising a core, a winding having a plurality of layers about said core, a spool head secured to said core having an inner and an outer surface, an opening extending through the said spool head, said opening being large at the inner surface and small at a definite point at the outer surface of said spool head, said opening at the inner surface being adapted to receive the end or terminal of any definite layer of said winding at a point adjacent to said layer, the position of the small opening designating that layer to which the end or terminal received thereby is connected to.

6. An electromagnet comprising a core, several windings each comprising a plurality of layers about said core, a spool head secured to each end of said core, and orifices extending through said spool heads, said orifices being adapted to receive an end or terminal of any layer of said windings at a point adjacent to any of said layers, the outer aperture of said orifices being so positioned as to indicate the layer to which the end or terminal received thereby is connected to.

7. A spool for electromagnets having a winding and spool heads inclosing the ends thereof, one of said spool heads having a slotted aperture adapted to receive the end or terminal of any diameter of windings, substantially within the limits of the apertured spool head.

Signed by me at Chicago, county of Cook and State of Illinois, in the presence of two witnesses.

CHARLES H. SMITH.

Witnesses:

MARJORIE E. GRIER,  
GEORGE E. MUELLER.