C. E. F. AHLM.

MAGNET SHIELD.

APPLICATION FILED JAN. 13, 1908.

906,599. Patented Dec. 15, 1908.

FIG. 1.

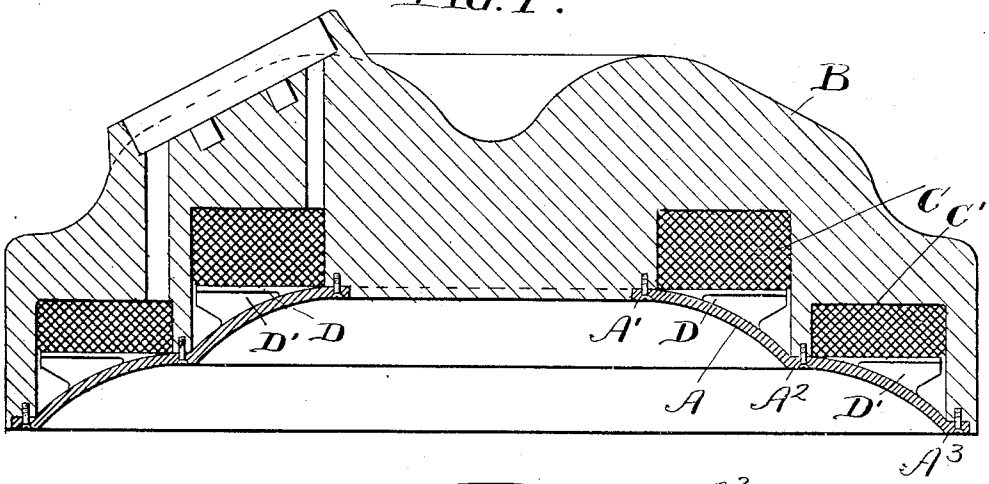
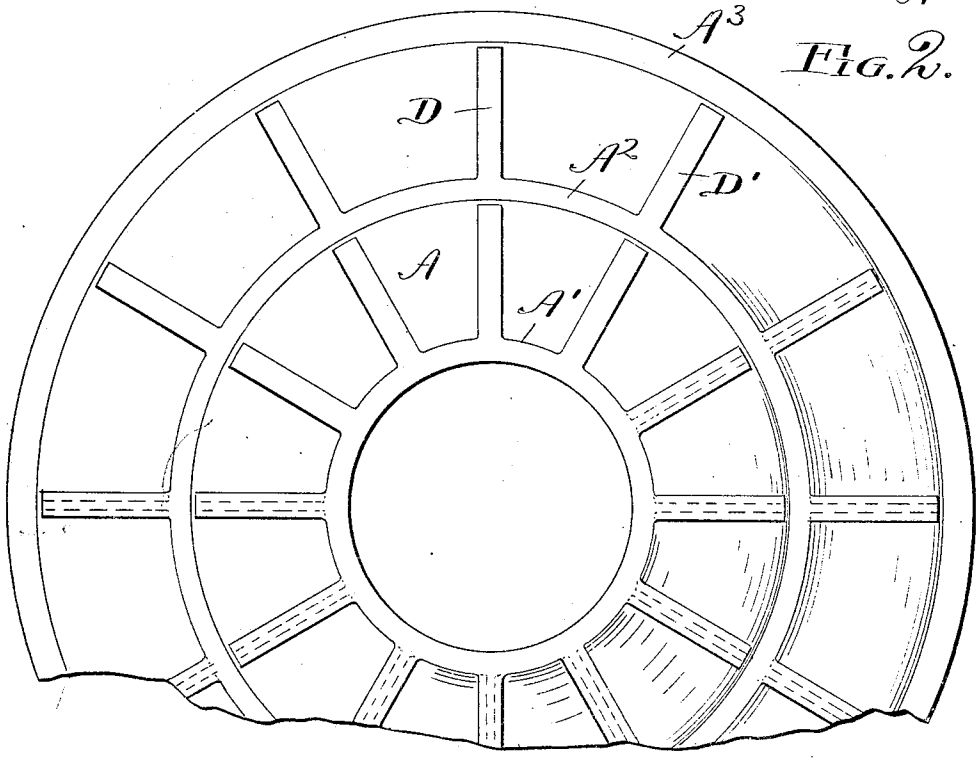


FIG. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

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MAGNET-SHIELD.

No. 906,599. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed January 13, 1908. Serial No. 410,518.

To all whom it may concern:

Be it known that I, CHARLES E. F. AHLM, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Magnet-Shields, of which the following is a full, clear, and exact description.

The object of the present invention is to provide a shield for lifting-magnets, such as are used for lifting and conveying loads of small articles, like scrap, pig iron, nuts and bolts, by merely lowering the magnet onto the pile of material and energizing the former. Such a magnet, for example, is shown in my prior patent No. 837,174 of November 27, 1906.

My purpose is, particularly, to provide a shield capable of being attached to and extending between the poles of the lifting magnet, in such manner as to hold the material to be lifted away from the magnet coils, at a distance greater than the mere thickness of the metal of the shield, and thus cause the magnetic flux to enter more deeply into the pile. In addition to the above stated function, the shields are adapted to protect the coils and support them in their proper position. These, and other advantages, will appear from the specification below, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical cross section of a form of shield constructed according to the principles of my invention, and shown as attached to a bell magnet having three poles and two coils. Fig. 2 is a plan view of the shield, a portion of it being broken away.

In the form shown in Fig. 1, the shield A is constructed to be attached to a tri-pole magnet B having two coils C, C′ properly interposed between its poles,—the outer poles of the magnet being lower than the inner or central pole. The shield has a central opening and three parallel horizontal zones A', A^2, A^3, one at the outer edge and one at the inner edge and one around the opening in the center, all adapted to fit seats on the lower faces of the pole pieces, whereby attachment to the magnet is readily made,—screws being used for this purpose. On the upper side of the shield I provide at suitable spaced intervals supporting ribs D adapted to receive the load of the coils interposed between the adjacent pole pieces. These ribs are preferably broadened at the top to afford a proper bearing surface, while its central web D′ is somewhat reduced to eliminate as much metal as possible. The said ring A with its triangular shaped radial ribs D may be regarded as a ring with its outer periphery deeper, or thicker, than its inner periphery. The said ribs are shown deeper toward or near their outer ends. By reason of the shield being shaped in this manner and provided with the supporting ribs adapted to sustain the coils, it will be seen that it possesses the functions outlined in my statement of invention and produces the results sought in the simplest and least expensive manner. According to this construction, not only will this single element serve as a support for the coils, but, by reason of its shape and construction, it will hold the material which is being lifted by the magnet at a substantial distance from the coil, which distance may be increased to any extent short of that which would cause the reluctance along the path through the material to become so great as to result in an undue amount of leakage across the space between the face of the shield and the coil above.

These shields are, obviously, especially adapted to lifting magnets where an outer pole hangs below the inner pole, and in which the coil, at its outer circumference, is at an appreciable distance above the outer pole face. Were a mere flat plate, without means such as would insure the proper spacing of the lifted material away from the coils, used beneath the coils in the magnets shown, not only would there be a certain awkwardness in attaching the same, but the material lying against the flat plate would afford a short path for the magnetic flux, through which it would pass, skimming the surface of the pile without being forced to enter very deeply into it. Practically, none of the magnetic lines would pass off the lower end of the outer pole, since they would find a shorter path of less reluctance immediately beneath the coil. It will, therefore, be seen that the shield particularly increases the effectiveness of bell magnets, as above stated.

Having thus described my invention, I claim:

1. In a lifting magnet, an inner pole and an outer pole, the active face of the outer

pole being lower than the active face of the inner pole, a magnetizing winding between the said poles, and an annular shield for retaining the said winding, the said shield being thicker near its outer edge than at its inner edge.

2. In a lifting magnet, an inner pole and an outer pole, the active face of the outer pole being lower than the active face of the inner pole, a magnetizing winding between the said poles, and an annular shield for retaining the said winding, the said shield having ribs with a greater depth near the outer periphery of said shield than at the inner periphery thereof.

3. In a lifting magnet, an inner pole and an outer pole, the active face of the outer pole being lower than the active face of the inner pole, a magnetizing winding between the said poles, an annular shield for retaining the said winding, there being an annular space, wider at its outer edge than at its inner edge, between the said winding and the said retaining shield, and means on the retaining shield for supporting the said winding.

4. In a lifting magnet, an inner pole and an outer pole, the active face of the outer pole being lower than the active face of the inner pole, a magnetizing winding between the said poles, an annular shield for retaining the said winding, there being an annular space, wider at its outer edge than at its inner edge, between the said winding and the said retaining shield, and ribs on the retaining shield for supporting the said winding.

5. In a lifting magnet, an inner pole and an outer pole, the active face of the outer pole being lower than the active face of the inner pole, a magnetizing winding between the said poles, and an annular shield for retaining the said winding, there being an annular space, wider at its outer edge than at the inner edge, between the said winding and the said retaining shield.

6. In a lifting magnet, an inner pole, an outer pole, the active face of the latter being lower than the active face of the inner pole, a magnetizing winding between the said poles, and means covering the said winding and spacing the material attracted by the magnet further below the outer edge of the winding than below the inner edge thereof.

7. In a lifting magnet, an inner pole, an outer pole, the active face of the latter being lower than the active face of the inner pole, a magnetizing winding between the said poles, and means including a non-magnetic plate and ribs supported thereby for covering the said winding and spacing the material attracted by the magnet further below the outer edge of the winding than below the inner edge thereof.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

CHARLES E. F. AHLM.

Witnesses:
J. M. WOODWARD,
H. R. SULLIVAN.