

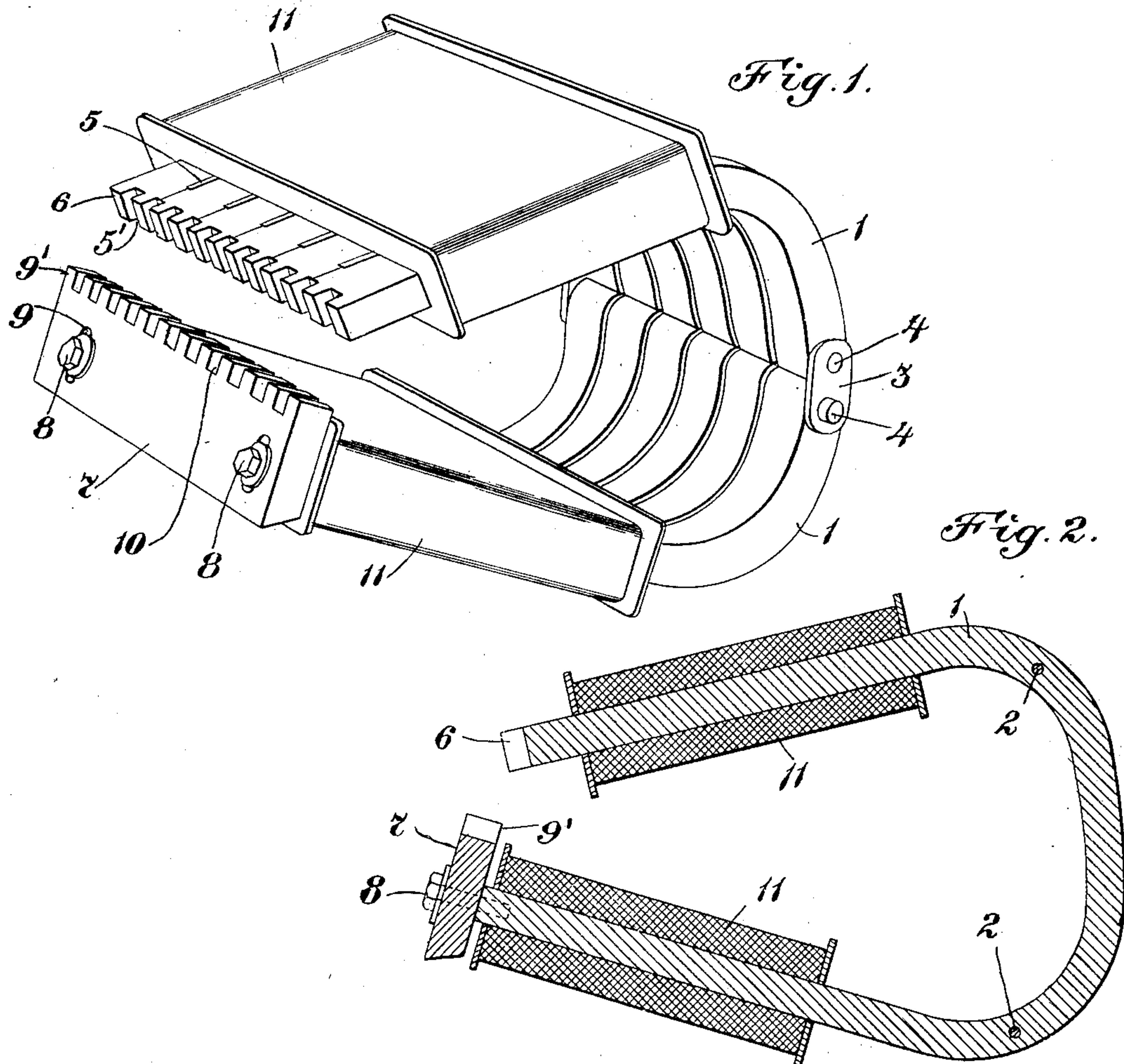
No. 750,594.

PATENTED JAN. 26, 1904.

H. F. CAMPBELL.
MAGNET.

APPLICATION FILED MAY 16, 1901.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY F. CAMPBELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO NATIONAL MAGNETIC MINERAL SEPARATING COMPANY, A CORPORATION OF MAINE.

MAGNET.

SPECIFICATION forming part of Letters Patent No. 750,594, dated January 26, 1904.

Application filed May 16, 1901. Serial No. 60,432. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. CAMPBELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Magnets, of which the following is a specification.

This invention relates to a new and improved magnet; and it consists in the novel features of construction and relative arrangement of parts hereinafter fully described in the specification, clearly illustrated in the drawings, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this application, wherein like characters are used to indicate like parts wherever they occur.

Figure 1 is a perspective view of a magnet constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of a modified form.

Referring to Figs. 1 and 2, 1 represents a series of curved bars of magnetic material, each having the general shape of one-half of a horseshoe. A series of these bars, here shown as six, although the number may be varied, are fastened together by pins 2 in order to secure said bars in proper relation to each other and to maintain them in position. The said series of bars are pivoted at their curved ends by means of a pintle-plate 3 and pins 4, projecting from the ends of the bars 1 into the plate, as shown. Any other form of construction may be employed, if desired, the purpose being to hinge the horseshoe-magnet at its rear part in order to permit the adjustment of its poles, hereinafter described, to and from each other. The hinge connection may be of such a character that the poles will remain in any position of hinged adjustment by reason of the construction of the hinge, or the adjusted position may be maintained by any desired mechanism. The bars 1 are separated from one another except for a short distance at the ends, forming insulating cooling air-spaces 5. The ends of the bars 1 forming the upper arm of the magnet are serrated to form projecting notches 6 and intervening recesses or spaces 5'. To the ends of the bars

1 of the lower half of the magnet is secured a pole-piece 7 by means of bolts 8 passing through slots 9 in the pole-piece into the ends of the bars 1. By this construction the pole-piece 7 may be adjusted. The upper edge of the pole-piece 7 is serrated to form projections 9' and intervening spaces 10. A spool 11 is arranged upon each arm of the magnet in order to vitalize the magnet in the usual way.

A magnet of the kind described is capable of exerting a magnetic pull of great force with particular reference to the form shown in Figs. 1 and 2. Such magnets are easy of construction and inexpensive. By reason of the gashed or staggered surface of the poles in the form shown in Figs. 1 and 2 zones of varying intensity are produced, the power and relative potentiality of which may be varied as desired by varying the strength of the current passing through the spools and by varying the size of the bars, their relative distance from one another, or the size and shape of the notches and projections at the end of the pole-pieces. By the hinge construction shown in Fig. 1 the pole-pieces of the magnet, as stated, may be adjusted toward and from each other and toward and from any material or object placed between the poles. When adjusted, the two parts of the magnet may be held in their adjusted position by any suitable clamping or adjusting device or apparatus.

The form of magnet shown in Figs. 1 and 2 for some classes of work I prefer to construct in hinged form, as shown in Fig. 1, while for other classes of work the laminæ will not be divided, but will be continuous from pole to pole, as in Fig. 2.

The particular form of magnet herein described and claimed is designed for use in connection with that type of magnetic ore-separator in which the ore or the material is subjected to the action of a magnet while supported on a belt or its equivalent moving past the pole or poles of the magnet. As hereinbefore stated, the gashed or staggered surface of the poles (shown in Figs. 1 and 2) results in the production of zones of varying intensity.

These zones therefore cause the ore or other material passing the magnet to be agitated violently to aid in the separation of the particles from each other, as will be readily understood. The horseshoe form of magnet (shown in Figs. 1 and 2) provides a space between the opposite poles of the magnet, which is open to permit the material under treatment to be passed between said poles and to be therefore subjected to a stronger field of force than when subjected solely to the fields of force at the end of a simple bar or series of bar-magnets.

As hereinbefore stated, the pole-piece 7 is adjustable by means of the screw 8 and slots 9. This enables the intensity of the magnetic field to be modified without changing the position of the bars of the magnet.

I do not wish to be understood as limiting myself to the precise form of the projections 6 and the spaces 5, since other forms of projections and intervening spaces might be employed, the purpose being to interrupt the surface of the pole, so as to provide or form a plurality of zones of varying intensity.

Instead of separating the laminæ or otherwise insulating the laminæ from one another I prefer in cases where great potentiality is desired to have said laminæ in contact and not insulated from one another.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

1. A magnet comprising parallel horseshoe-shaped bars arranged to have an air-space between them, means for magnetizing said bars, and a pole-piece adjustably mounted upon the lower ends of the said bars.

2. A magnet comprising parallel horseshoe-shaped bars each of which is provided with a cut-out portion whereby air-spaces are formed between the bars, means for magnetizing the bars, and an adjustable pole-piece mounted upon the ends of the lower portion of said bars.

3. A magnet comprising parallel horseshoe-shaped bars having a portion of their contacting faces cut away to form an air-space, the upper ends of said bars being serrated, means for magnetizing the bars, and a pole-piece adjustably mounted upon the lower ends of the said bars, the portion of said pole-piece adjacent to the upper ends of the bars being serrated.

4. A horseshoe-shaped magnet having means whereby the distance between its ends or poles may be varied, and having one of its ends or poles gashed or formed with a staggered or interrupted surface to produce magnetic zones of varying predetermined arrangement and potentiality, all of the projecting portions of each pole having the same polarity.

In testimony whereof I have affixed my signature in presence of two witnesses.

HENRY F. CAMPBELL.

Witnesses:

C. F. BROWN,

E. BATCHELDER.