

(No Model.)

G. S. FINNEY.
MAGNETIC ORE SEPARATOR.

No. 443,042.

Patented Dec. 16, 1890.

Fig. 1.

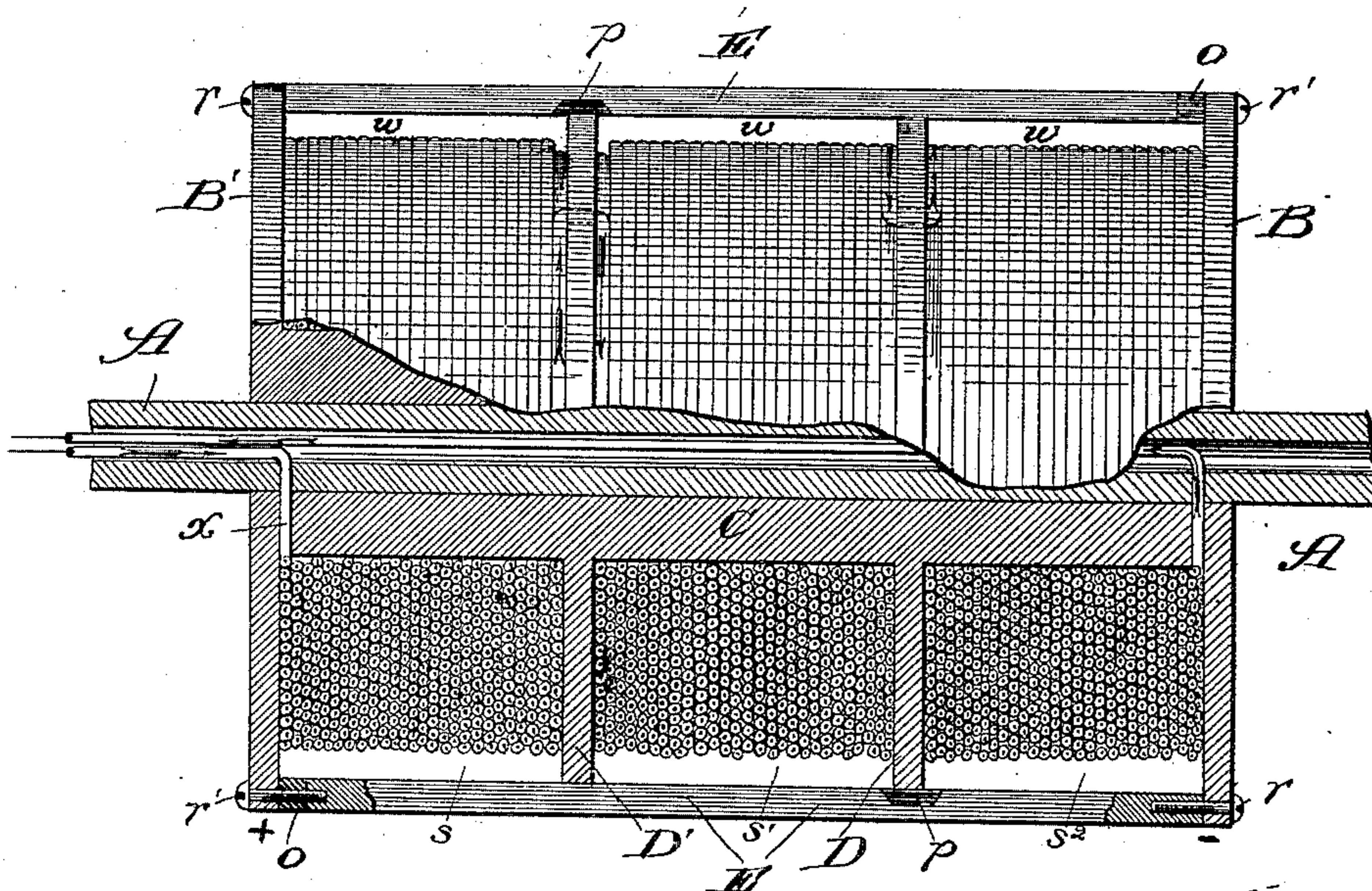
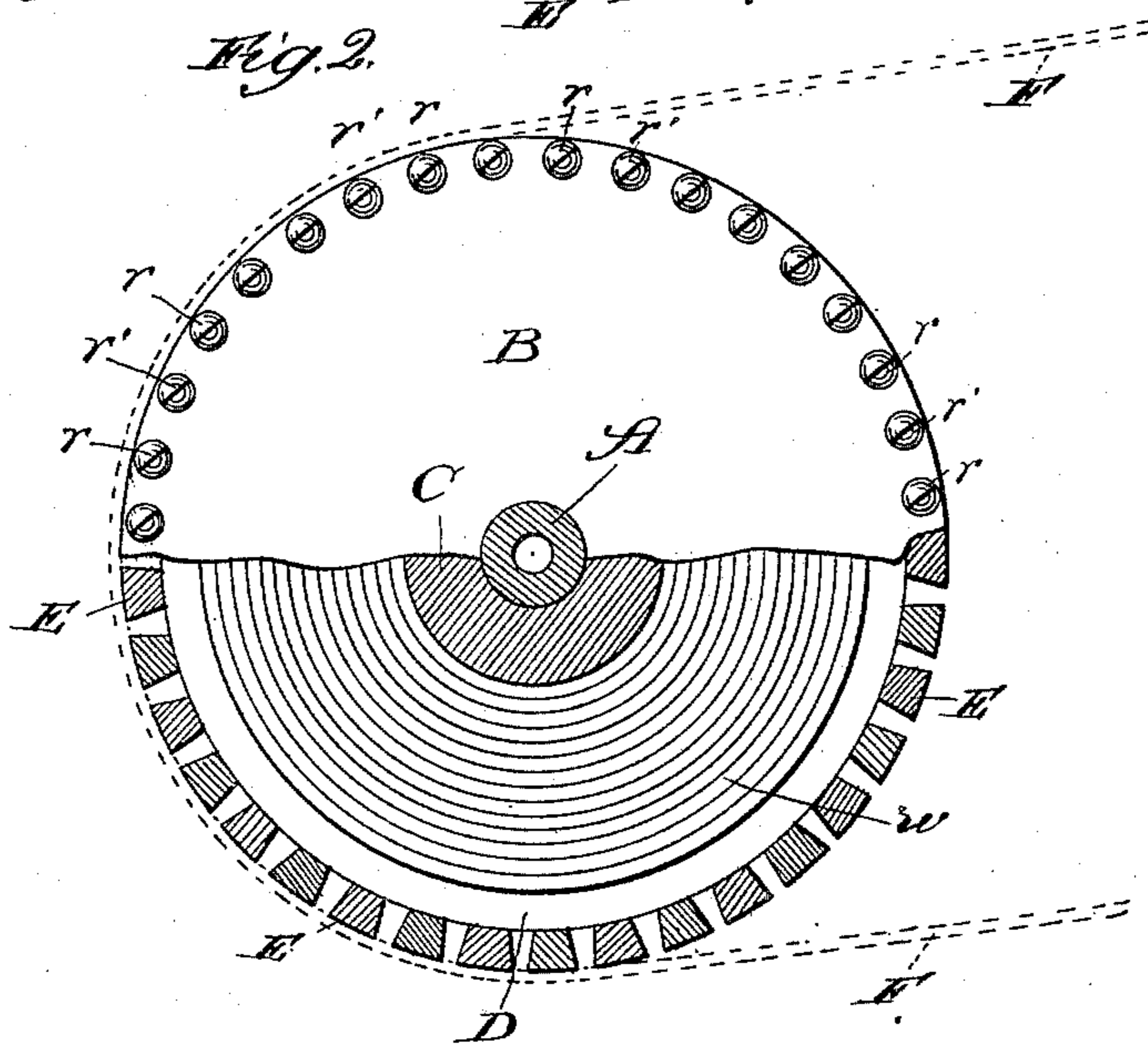


Fig. 2.



witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE S. FINNEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ROTARY
MAGNETIC ORE SEPARATOR COMPANY, OF SAME PLACE.

MAGNETIC ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 443,042, dated December 16, 1890.

Application filed March 25, 1890. Serial No. 345,246. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. FINNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Magnetic Separators, of which the following is a specification.

My invention relates to an improvement in the class of magnetic separators for separating metal to save it from other material or materials with which it is mixed, as from ore or iron ores, or metallic minerals from their gangue, or to clean the material to be saved of metal refuse contained in it, and in which are employed a magnetic wheel and an endless belt of non-magnetic material surrounding the wheel and serving to support the material while being treated and convey the refuse and the matter to be saved after the separation away to different points of deposit.

More particularly stated, my present invention is designed as an improvement upon the magnetic separator for which an application for Letters Patent of the United States, Serial No. 329,884, was allowed me on the 25th day of January, 1890, the object of my improvement being to multiply the parts of my said other construction, thereby the better to distribute the energy, and thus increase the capacity and efficiency of the machine.

My invention consists in the general as well as in the specific construction, whereby I am enabled to provide a magnetic separator which shall fulfill the object stated.

In the accompanying drawings, Figure 1 is a view in broken longitudinal sectional elevation of my improved magnetic wheel, and Fig. 2 a view of the same in broken end elevation and having the non-magnetic endless belt indicated by dotted lines.

A is the rotary shaft, which, particularly for the sake of convenience in winding the insulated wire *w* of the structure, as hereinafter described, should be hollow, as shown. At desired distances apart, according to the length of the wheel, upon the shaft A and revoluble with the latter are the metal (preferably soft iron) heads B and B', which should be of disk shape.

C is a metallic sleeve surrounding the shaft

A to rotate with it, and provided at intervals with plates or disks D and D' (the number of which may be increased as desired) like the heads B and B' and revoluble with the shaft.

E E are metal bars, (soft iron,) preferably of the V shape in cross-section illustrated in Fig. 2, and let, as shown, into the peripheries of the heads at the opposite ends of the bars, the latter being alternately secured in place by screws or the like of differing insulating qualities, as by screws *r* and *r'*, respectively, of brass and iron, alternating with each other around each head B and B', from which the adjacent ends of the bars are alternately insulated, as by means of the brass pieces O. Where the bars E cross the peripheries of the intermediate disks D and D' they are insulated from the latter alternately at the points of contact by a suitable medium, as brass mountings *p* let or dovetailed into the narrower inner sides of the bars.

The sleeve C is wound with the insulated wire *w* in opposite directions around the core afforded by the sleeve on its supporting-shaft between the adjacent pairs of disks B' D', D' D, and D B, as indicated. Thus the winding may begin with the wire at *x*, (passed through the hollow shaft to that point,) filling the space *s* therewith, pass thence into the adjacent space *s'*, (as through the disk D',) in which it is wound in the opposite direction around the core afforded by the sleeve C, pass thence into the adjacent space *s''*, wherein it is wound, as in the space *s*, and from the space *s''* be extended through the hollow shaft, with the opposite end of the wire, or that nearest the initial winding, to the source of electrical excitement, as a dynamo-electric machine, (not shown, unless the magnetism of the wheel be permanent, as it may be.) Thus, as will be seen, the wheel formed in the manner described and with which I use the non-magnetic endless belt F comprises a series of electro-magnets alternating in polarity on a common core and having the poles extended by the bars E from opposite ends of the series crosswise of the plane of the circumference of the wheel and forming elements of its cylindrical surface, thus broadly constituting my improvement for affording its stated relative advan-

tages of increased distribution of energy, capacity, and efficiency.

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

5 1. A magnetic wheel for a separator, comprising a series of electro-magnets having a common core and having the poles extended from opposite ends of the series crosswise of the plane of the wheel's circumference and
10 forming elements of its cylindrical surface, substantially as described.

2. A magnetic wheel for a separator, comprising a core having heads B and B', intervening plates D D', affording intervening
15 spaces s s' s^2 , wound alternately in opposite directions with wire w , and bars E, extending between the heads across the said intervening plates and alternately insulated at opposite ends from the said heads around the latter

and from the intervening plates lengthwise 20 of the bars, substantially as described.

3. A magnetic wheel for a separator, comprising a hollow shaft A, having heads B and B', intervening plates D D' on a sleeve C on the shaft and affording intervening spaces s 25 s' s^2 , wound alternately in opposite directions with wire w , extending at opposite ends of the coils through the hollow shafts, and bars E, extending between the heads across the said plates and alternately insulated at oppo- 30 site ends from the said heads around the latter and from the intervening plates lengthwise of the bars, substantially as described.

GEORGE S. FINNEY.

In presence of—

J. W. DYRENFORTH,

M. J. FROST.