

No. 816,491.

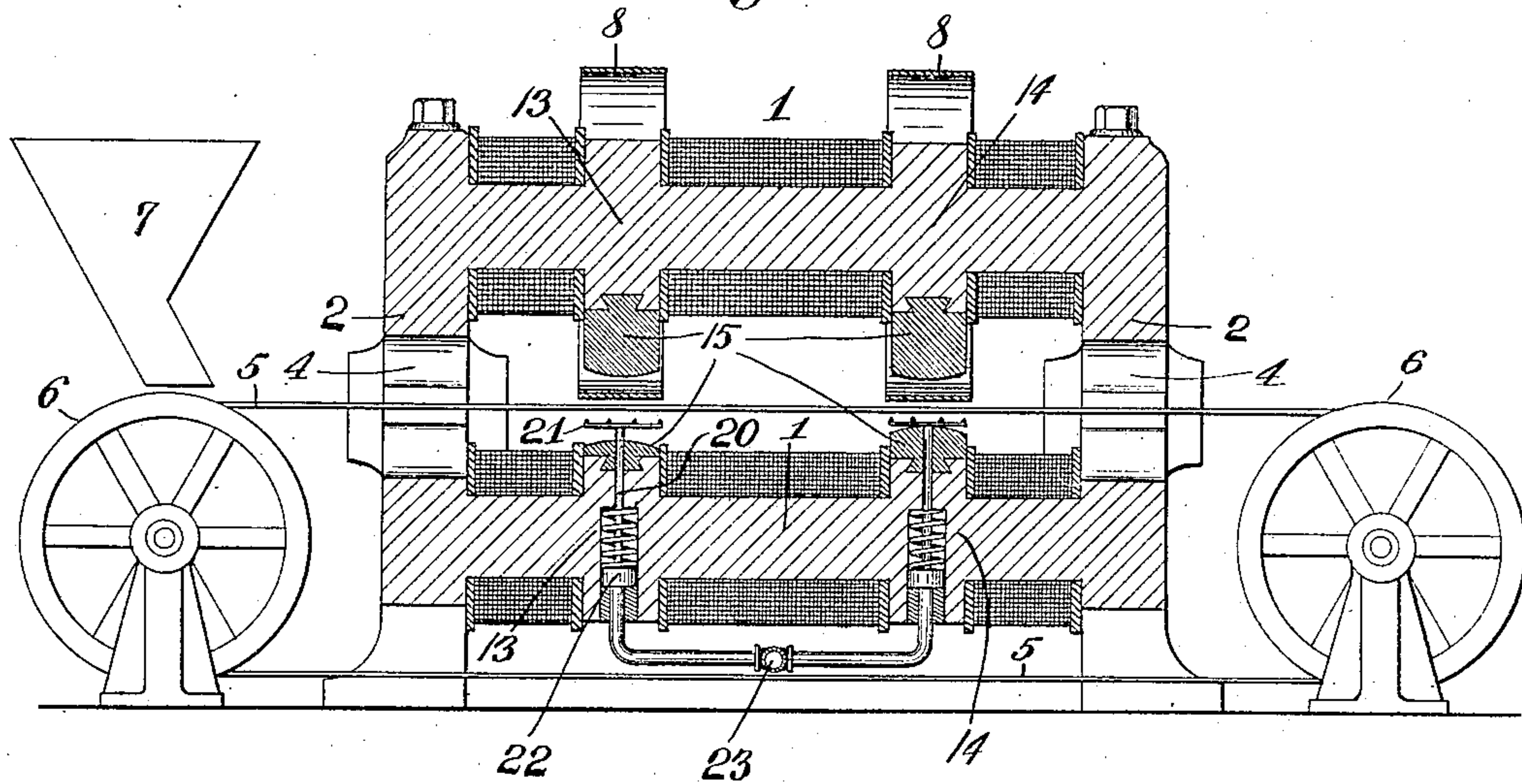
PATENTED MAR. 27, 1906.

R. R. MOFFATT.  
MAGNETIC ORE SEPARATOR.

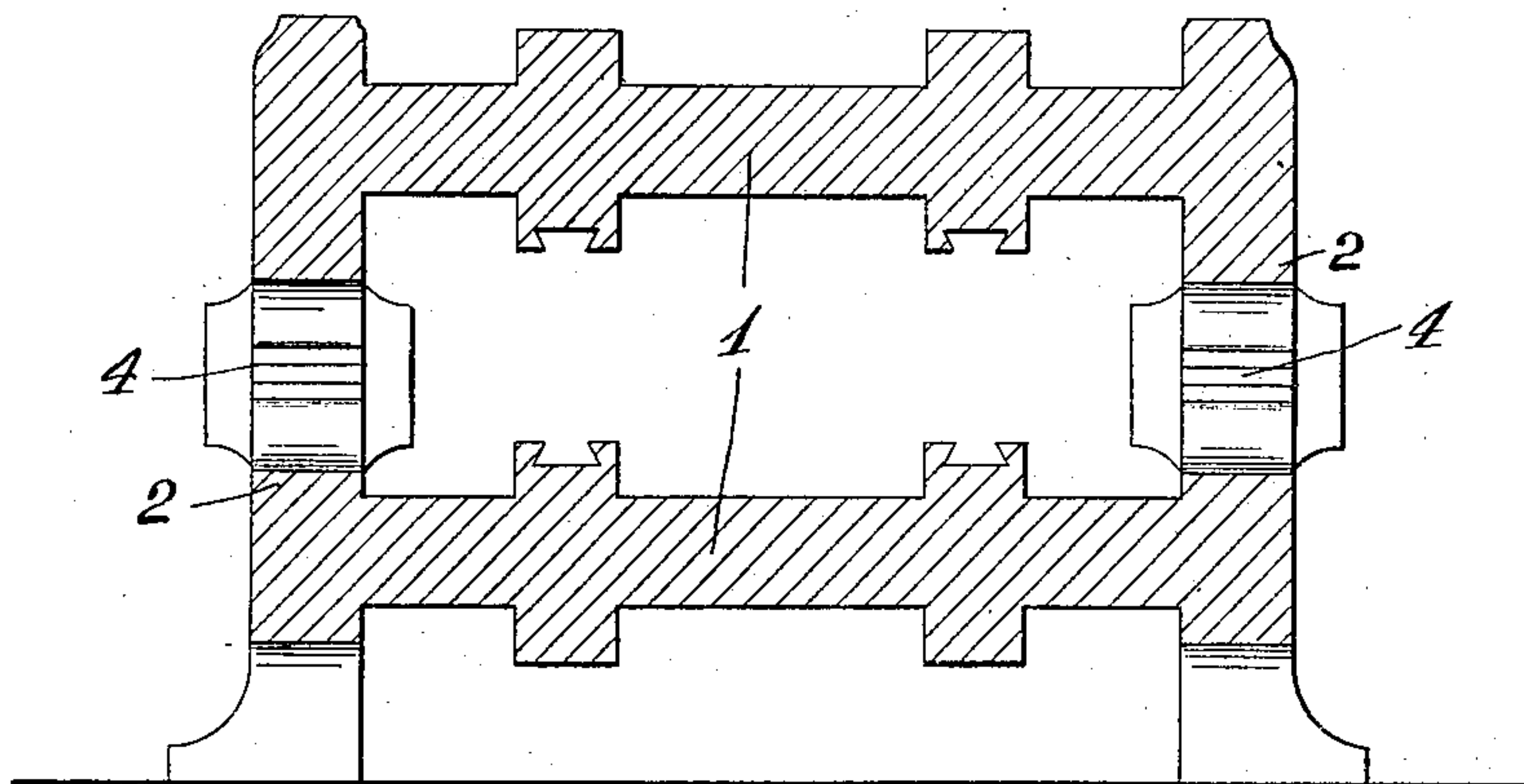
APPLICATION FILED OCT. 6, 1904.

2 SHEETS—SHEET 1.

*Fig. 1*



*Fig. 2*



Witnesses  
*Joan Kongsberg*  
*Annie Wessmann*

*Richard R. Moffatt* Inventor  
By his Attorneys  
*Becker & Spaulding*

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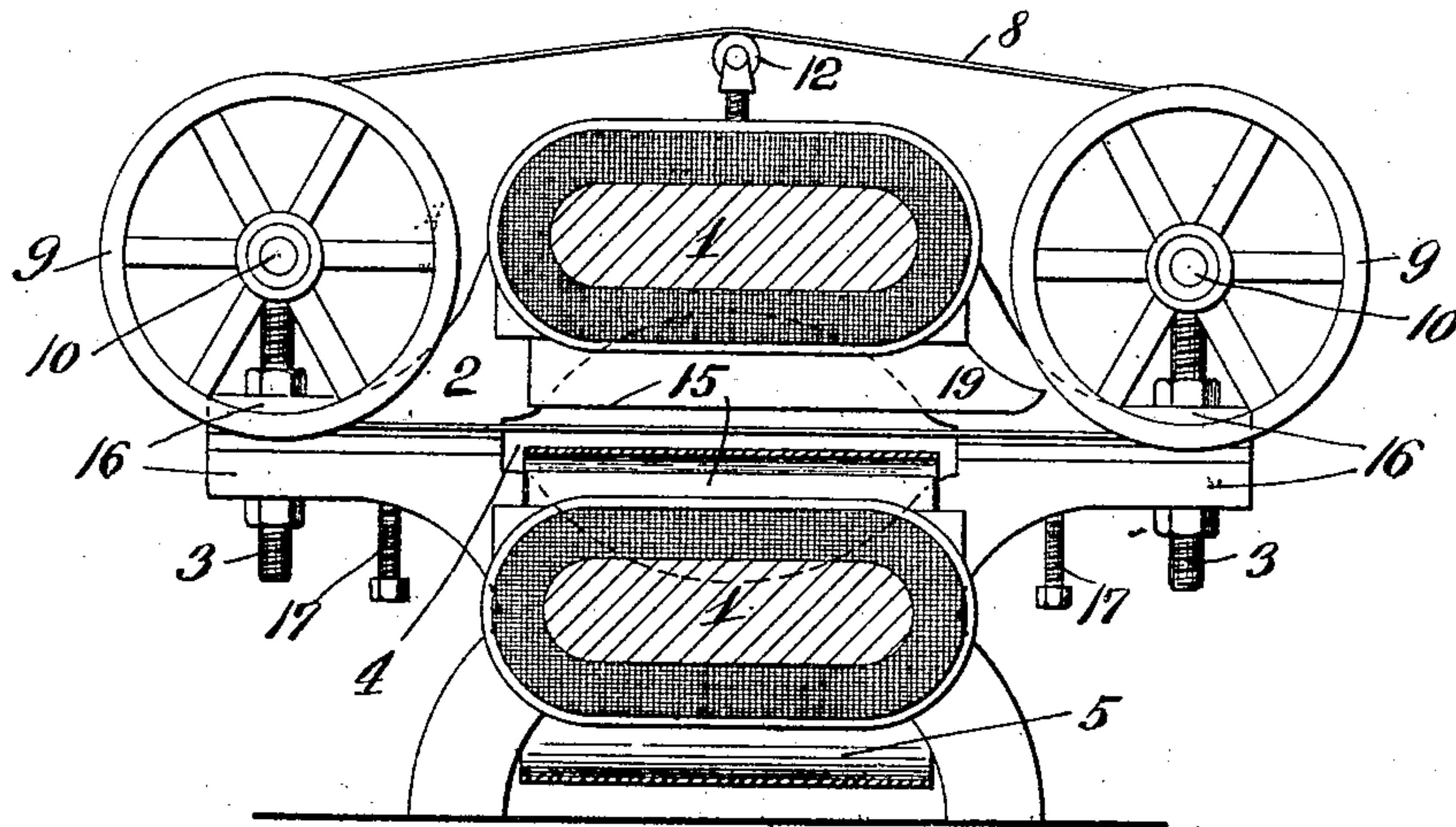
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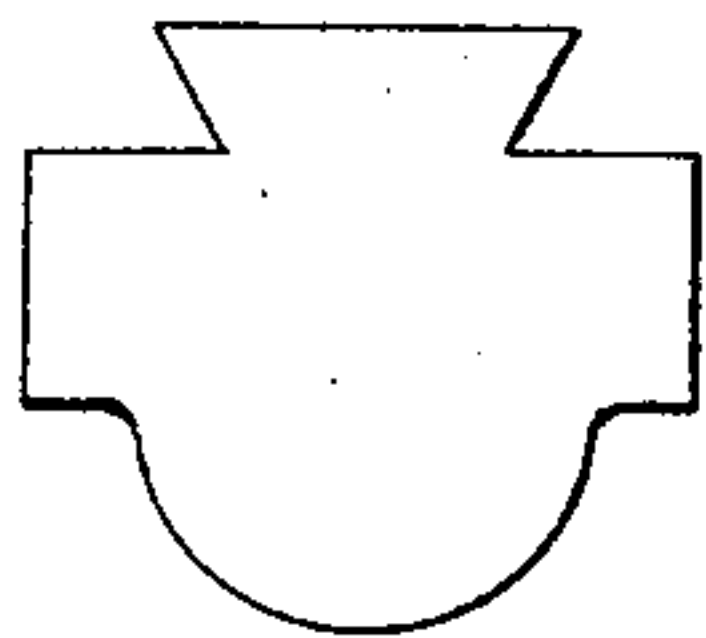
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2 SHEETS—SHEET 2.

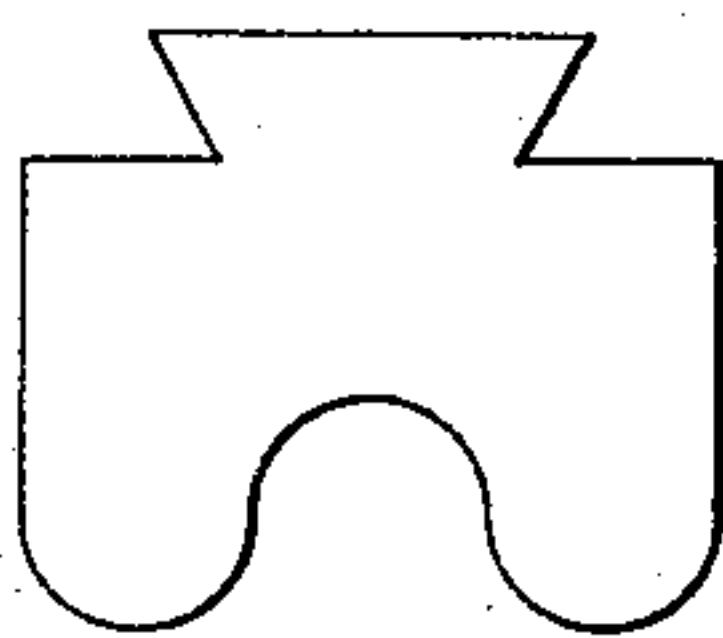
*Fig. 3*



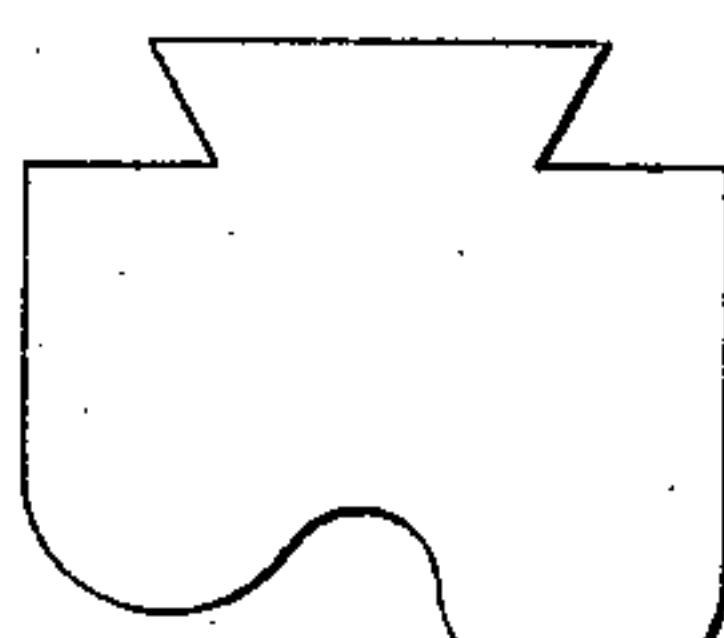
*Fig. 4*



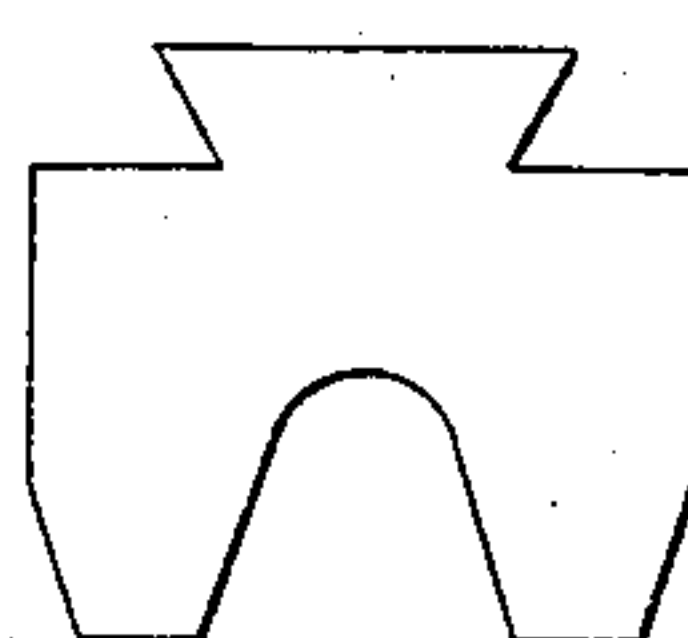
*Fig. 5*



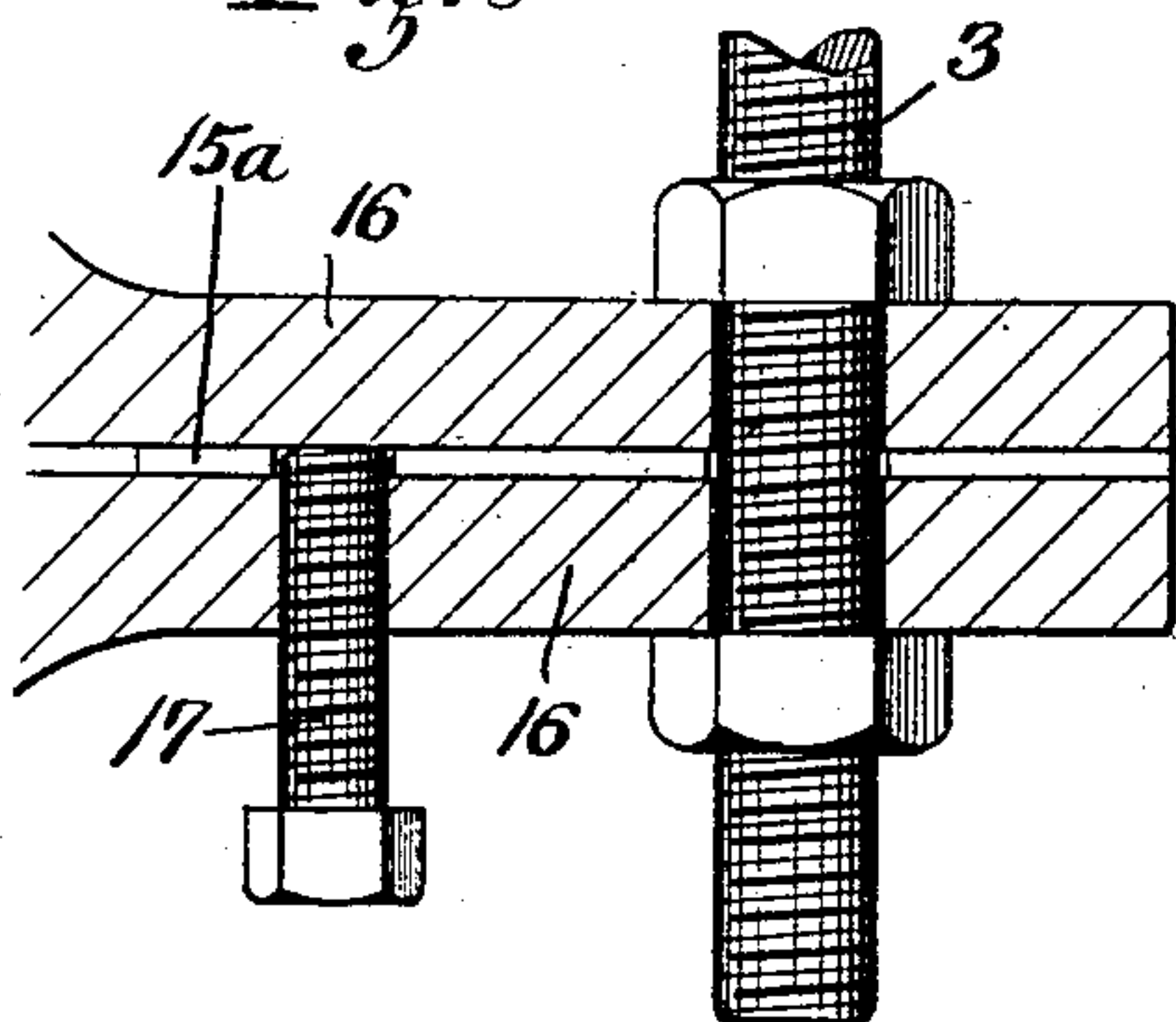
*Fig. 6*



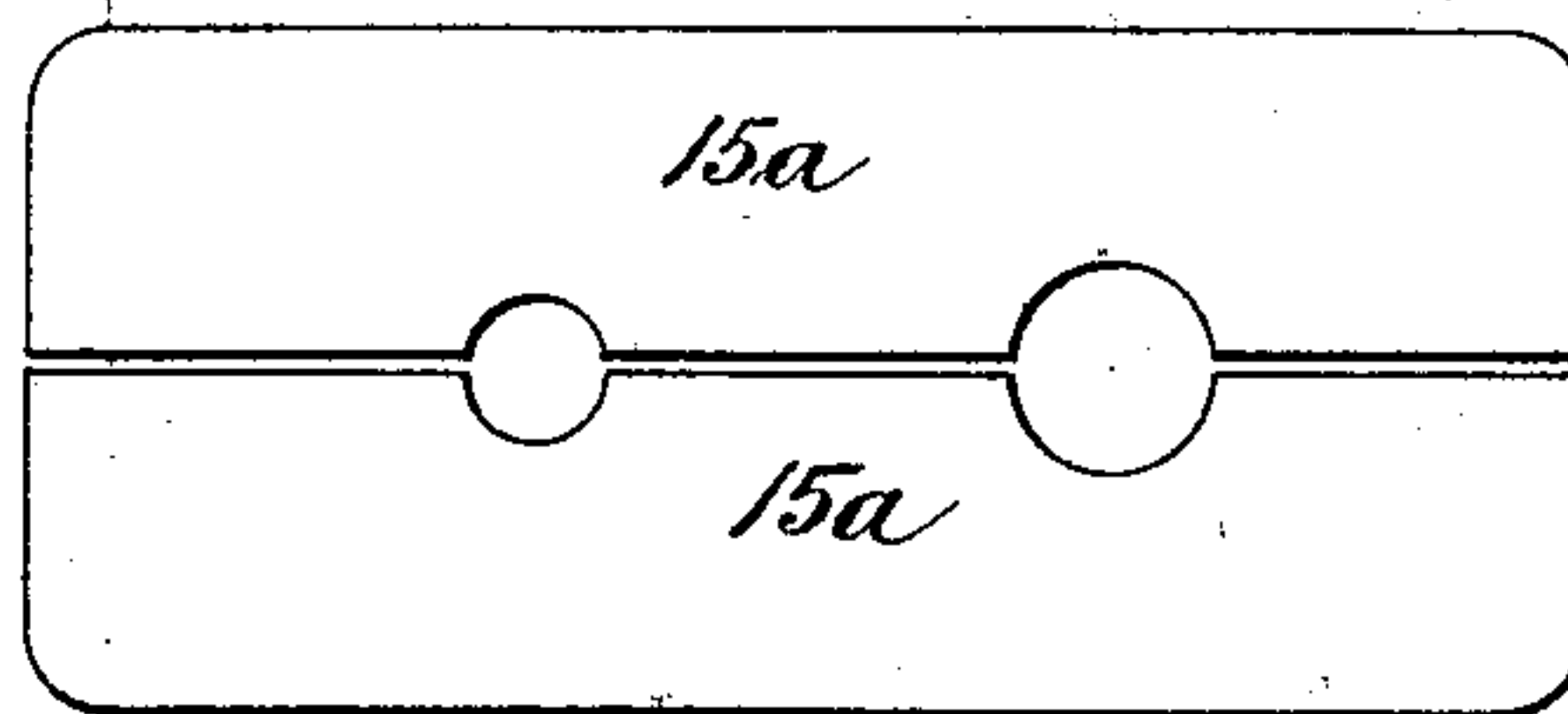
*Fig. 7*



*Fig. 8*



*Fig. 9*



Witnesses  
Joan Konigsberg  
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Richard R. Moffatt Inventor  
By his Attorneys  
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# UNITED STATES PATENT OFFICE.

RICHARD R. MOFFATT, OF BROOKLYN, NEW YORK, ASSIGNOR TO  
IMPERIAL ORE SEPARATOR COMPANY, A CORPORATION OF  
NEW YORK.

## MAGNETIC ORE-SEPARATOR.

No. 816,491.

Specification of Letters Patent.

Patented March 27, 1906.

Original application filed July 19, 1904, Serial No. 217,222. Divided and this application filed October 6, 1904. Serial No. 227,349.

*To all whom it may concern:*

Be it known that I, RICHARD R. MOFFATT, a citizen of the United States of America, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Magnetic Ore-Separators, of which the following is a specification.

My invention relates generally to magnetic ore-separators, and more especially to an apparatus for separating ore containing feebly-magnetic particles.

This application is a division of an application filed by me on July 19, 1904, Serial No. 217,222, for an improvement in magnetic ore-separators.

The object of my invention is the production of an apparatus of a very powerful nature for separating feebly-magnetic ore simple and inexpensive in its character.

The invention consists of a structure having a feed-conveyer and a plurality of separating-conveyers—in the present instance two—in combination with a magnet comprising two or more sets of opposed poles, producing two fields of different intensity, two cores, each connecting one pole of one set in circuit with one pole of the other set, and side frames connecting the poles of the same set in circuit with each other. Preferably these side frames are provided with apertures through which the feed-conveyer passes.

The invention further comprises a structure embodying two parallel cores having poles of opposite nature, side-frame extensions terminating the said cores at both ends and arranged in apposition to each other, and means for securing the said side-frame extensions together.

Other features of construction and combinations of parts will appear as the specification proceeds.

In the drawings, Figure 1 is a longitudinal sectional view of an ore-separator embodying my invention. Fig. 2 is a view similar to Fig. 1, showing only the skeleton or framework of the device. Fig. 3 is a transverse sectional view of Fig. 1. Figs. 4, 5, 6, and 7 show various forms of detachable shoes of the magnetic poles. Fig. 8 shows means for adjusting the poles with relation to each other. Fig. 9 is a plan view of part of Fig. 1.

Similar characters of reference indicate corresponding parts in the different views.

Referring to the drawings, 1 indicates two parallel cores, suitably wound, terminating at both ends in the side-frame extensions 2, arranged in apposition to each other and secured together by means of the bolts 3. The side-frame extensions are provided with apertures 4, through which the feed-conveyer 5 passes. This feed-conveyer here takes the form of an endless belt passing over the drum 6, the material being fed to the conveyer by means of the hopper 7. Extending transversely across the feed-conveyer are the separating-conveyers 8, also in the present instance in the form of endless belts and passing over the drums 9, suitably mounted on the shafts 10.

12 indicates suitable idlers over which the separating-conveyers pass. The magnet is in this instance provided with two sets of upper and lower poles 13 and 14 of opposite polarity, constituting two fields of force. It will be noticed that each core connects one pole of one set with one pole of the other set in circuit with each other and that the side-frame extensions connect the poles of the same set in circuit with each other. Means are provided whereby the field produced by one set of poles will be stronger or more intense than the field produced by the other set of poles, although both are in circuit with each other. This may be accomplished in various ways; but preferably the poles are so constructed that removable shoes, as 15, may be attached to them. It will be noticed by an inspection of Fig. 1 that the poles 13 are a greater distance apart than the poles 14, or, conversely, the poles 14 are closer together than the poles 13. Preferably the upper poles of both sets are in the same horizontal plane, while the lower pole of the second set is varied, so as to produce a greater or less distance between the two poles of the said second set. By this means the intensity of the field may be varied. The distance between the upper and lower poles may also be regulated when it is desired to vary the intensity of both fields by interposing different thicknesses of spacing-plates 15<sup>a</sup> between the contiguous flanges 16 of the side-frame extensions. A screw 17 is used to raise the side-frame extensions when it is de-



sired to insert a different thickness of spacing-plate, and the spacing-plate, as shown in Fig. 9, is in two parts with suitable cut-out portions, allowing for the passage of screws through the same. In Figs. 4, 5, 6, and 7 I show various kinds of shoes which may be attached to both pieces to conform to the nature or character of the field desired. The upper pole-pieces are preferably provided with an extension, as 19, projecting in the direction of the movement of the separating-conveyers and beyond the field of force proper, so as to facilitate the removal of the separated material out of the machine.

Under some conditions I may employ means for agitating the ore as it passes through the fields of force. For instance, as seen in Fig. 1, I provide a spring-seated plunger 20 in the lower pole-piece, having cross-pieces 21 below the feed-conveyer and having, further, a piston 22, by means of which the plunger is raised into contact with the feed-conveyer when fluid or other pressure is introduced through the pipe 23. This has the effect of jogging the feed-conveyer, thereby agitating the ore and facilitating the separation of the same.

What is claimed is—

1. In a magnetic ore-separator, the combination with a feed-conveyer and two separating-conveyers, of a magnet comprising two sets of opposed poles producing two fields of different intensity, two cores each connecting one pole of one set in magnetic circuit with one pole of the other set, and side frames connecting the poles of the same set in magnetic circuit with each other.

2. In a magnetic ore-separator, the combination with a magnet comprising two sets of opposed poles producing two fields of different intensity, two cores each connecting one pole of one set in magnetic circuit with one pole of the other set, and side frames, having apertures, connecting the poles of the same set in magnetic circuit with each other, of a feed-conveyer adapted to pass through the said apertures in the side frames, and two separating-conveyers.

3. In a magnetic ore-separator, the combi-

nation with a feed-conveyer, and two separating-conveyers, of a magnet comprising two sets of opposed poles, the poles of one set being nearer together than the poles of the other set, two cores each connecting one pole of one set in magnetic circuit with one pole of the other set, and side frames connecting the poles of the same set in magnetic circuit with each other.

4. In a magnetic ore-separator, the combination with a magnet comprising two sets of opposed poles, the poles of one set being nearer together than the poles of the other set, two cores each connecting one pole of one set in magnetic circuit with one pole of the other set, side frames, having apertures, connecting the poles of the same set in magnetic circuit with each other, of a feed-conveyer adapted to pass through the apertures of the side frames, and two separating-conveyers.

5. In a magnetic ore-separator, the combination with two parallel cores having opposed poles, side-frame extensions, having apertures, terminating the said cores at both ends and connecting the said cores in magnetic circuit, arranged in apposition to each other, and means for securing the said side-frame extensions together, of a feed-conveyer adapted to pass through the said apertures, and a separating-conveyer.

6. In a magnetic ore-separator, the combination with two parallel cores each having a plurality of poles, opposed to a like number of poles on the other core, side-frame extensions, having apertures, terminating the said cores at both ends and connecting the said cores in magnetic circuit, arranged in apposition to each other, and means for fastening the said side-frame extensions together, of a feed-conveyer adapted to pass through the apertures in the side-frame extensions, and a plurality of separating-conveyers.

Signed at New York city this 19th day of September, 1904.

RICHARD R. MOFFATT.

Witnesses:

RAYMOND C. SPAULDING,  
ANNIE WISSEMAN.