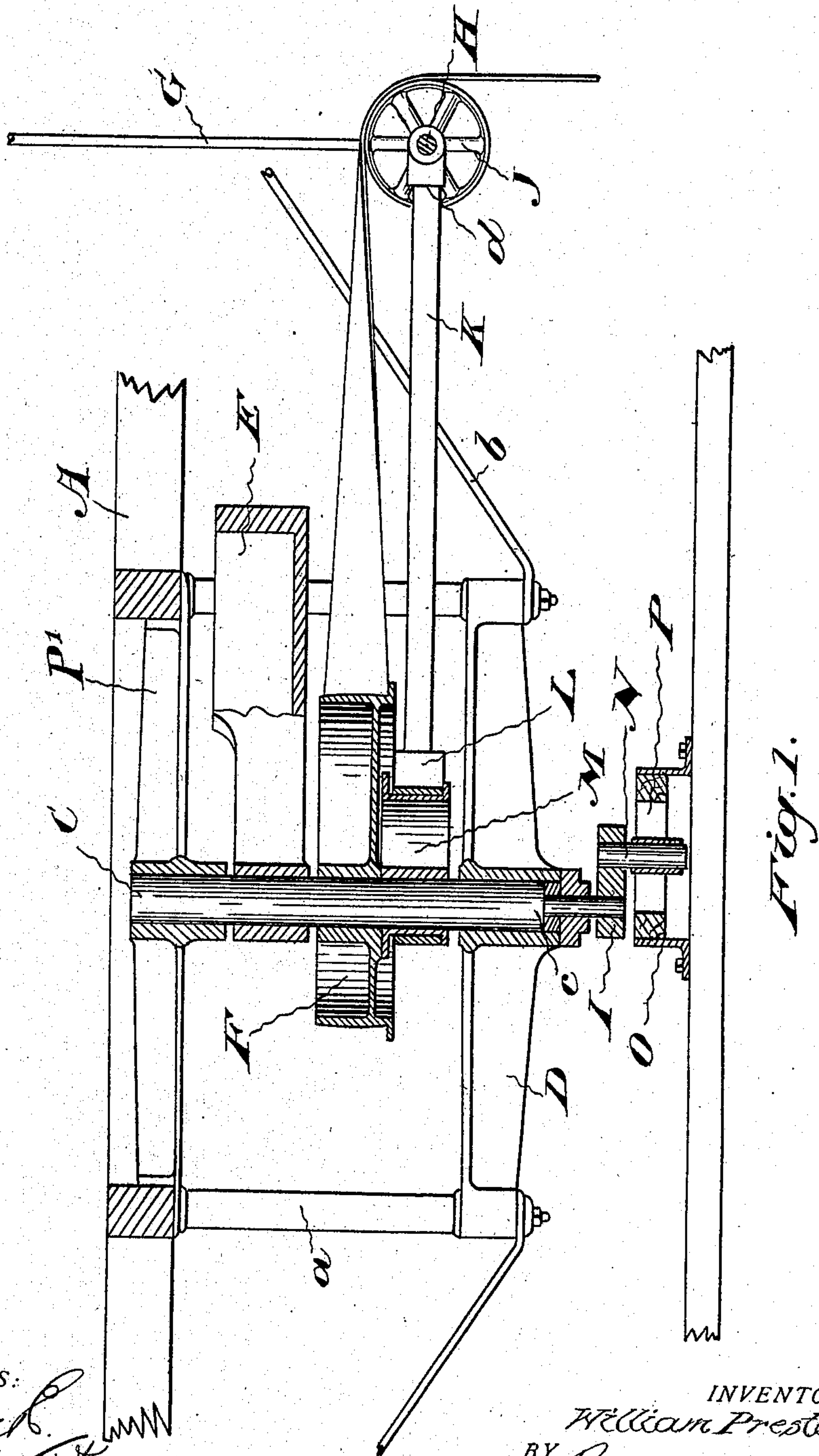


No. 885,082.

PATENTED APR. 21, 1908.

W. PRESTON.
GYRATORY SIFTER.
APPLICATION FILED SEPT. 17, 1906.

4 SHEETS—SHEET 1.



WITNESSES:

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4 SHEETS—SHEET 2.

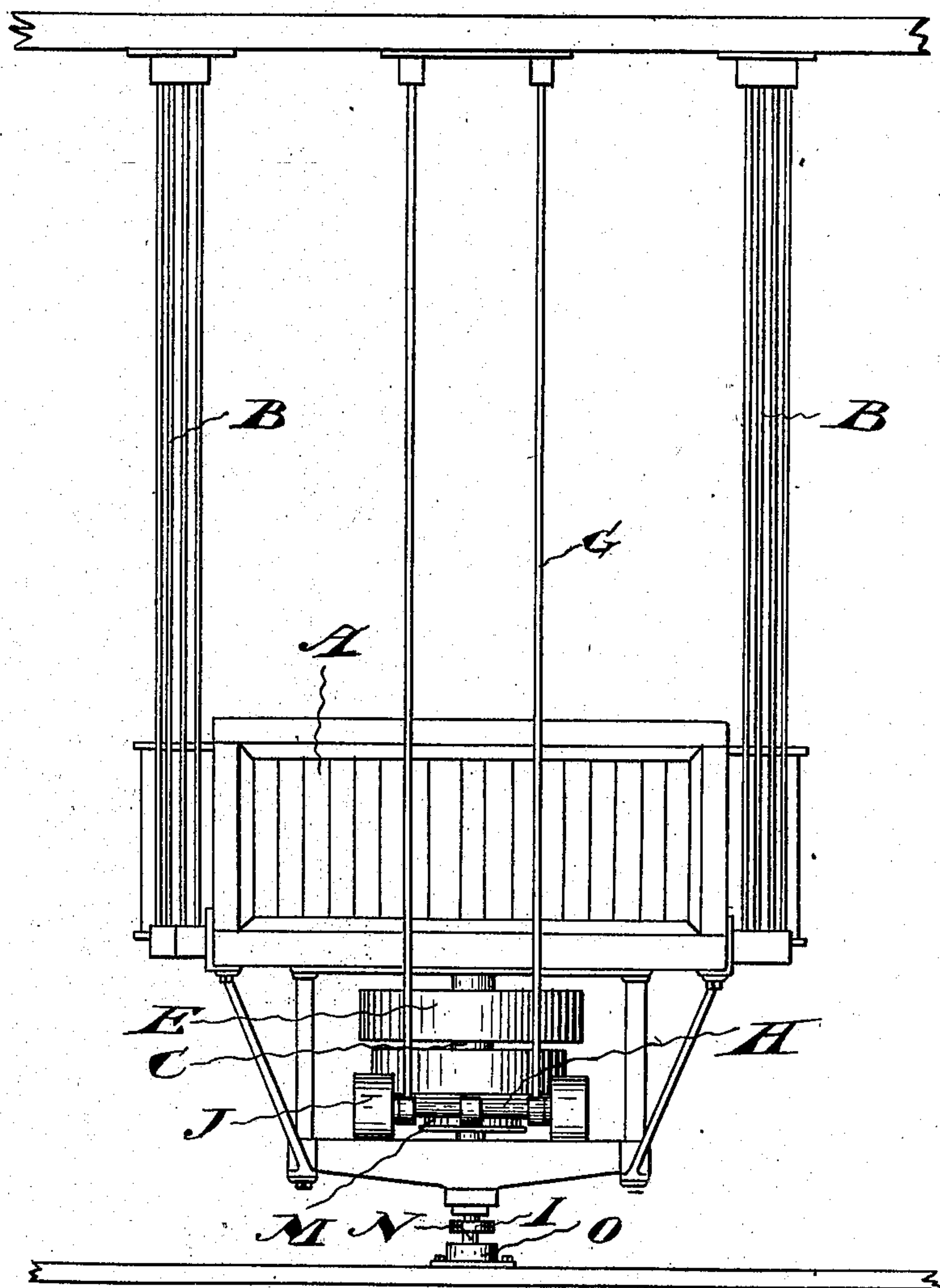


Fig. 2.

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4 SHEETS—SHEET 3.

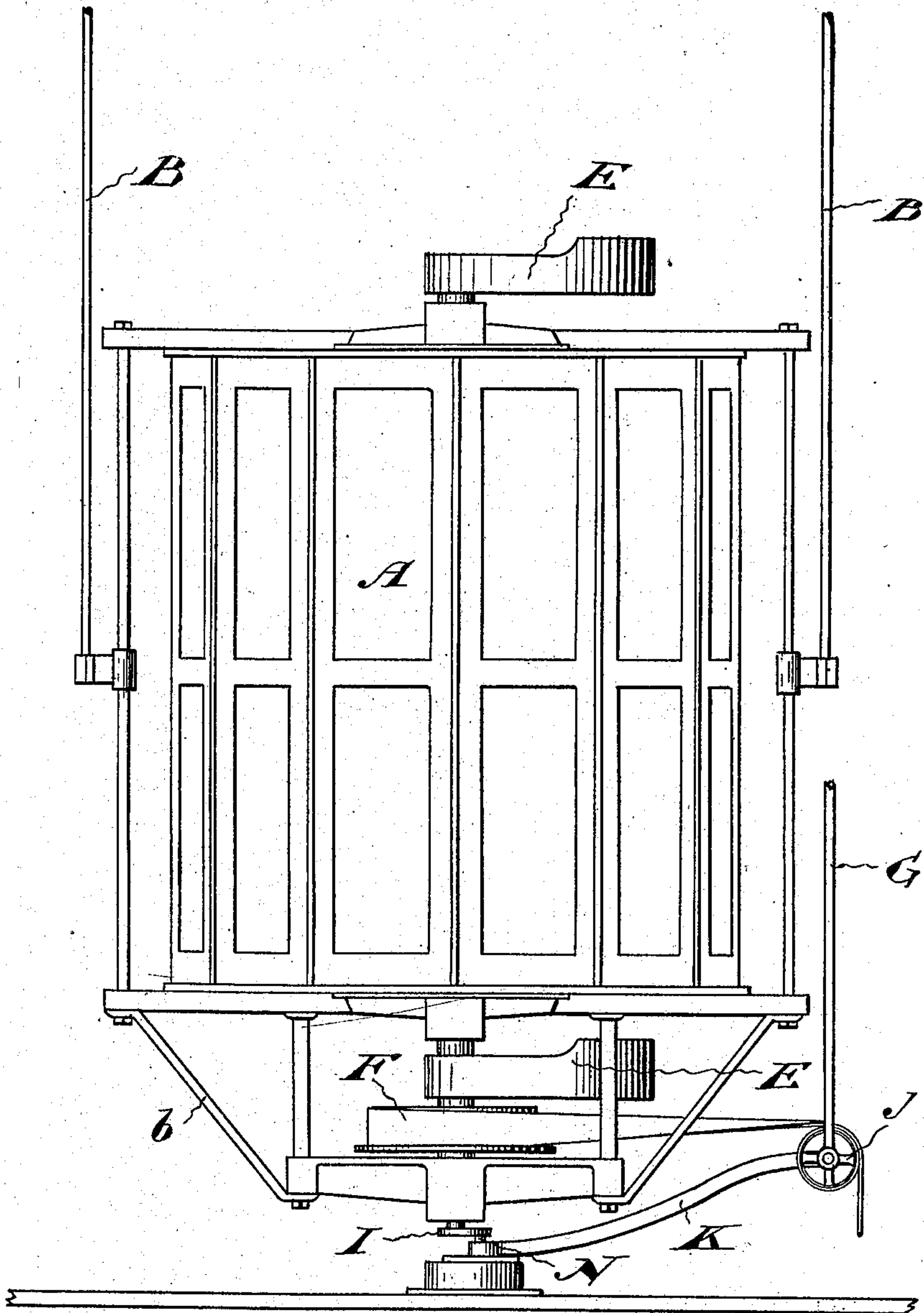


Fig. 3.

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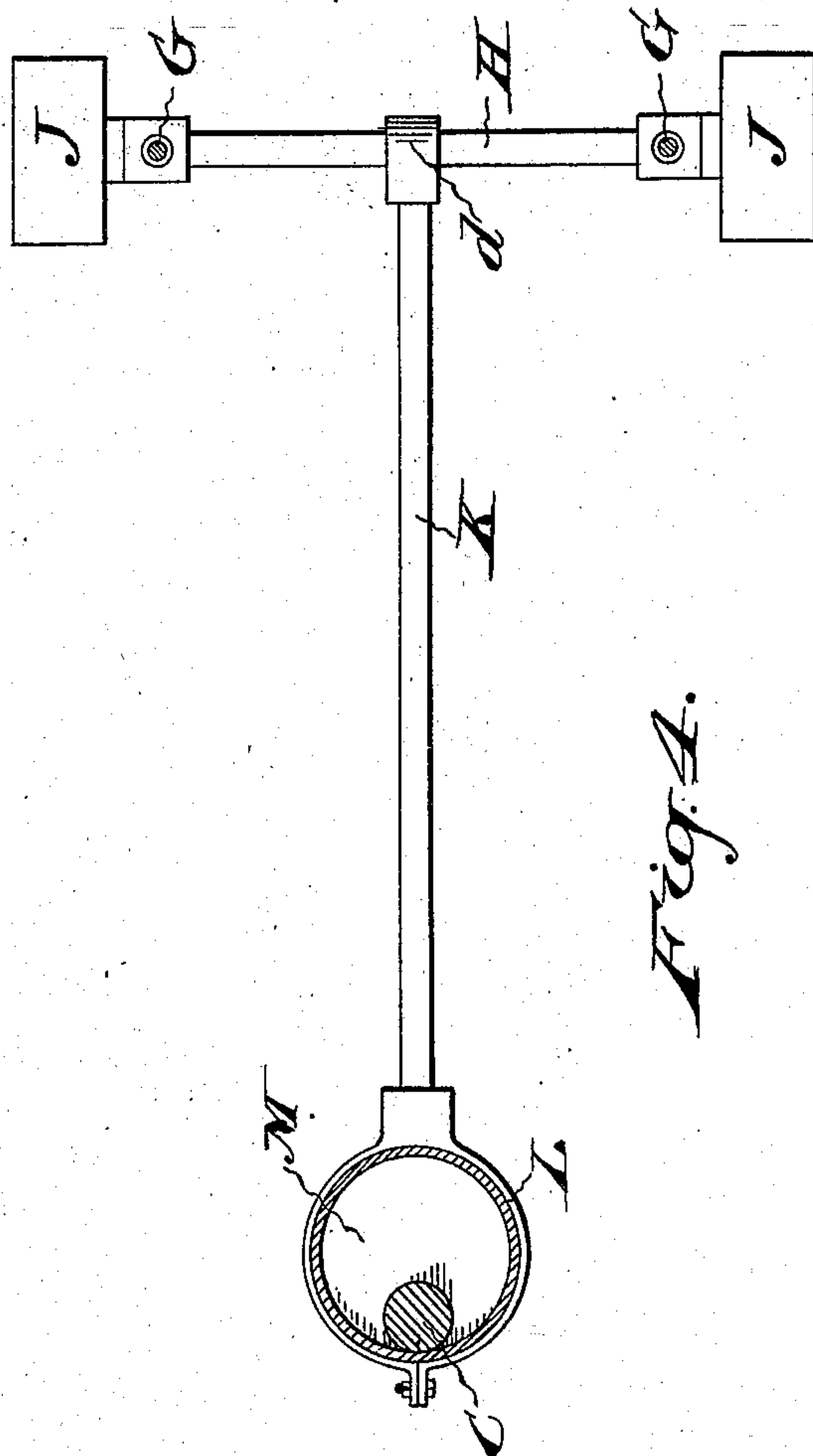
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UNITED STATES PATENT OFFICE.

WILLIAM PRESTON, OF STRATFORD, ONTARIO, CANADA.

GYRATORY SIFTER.

No. 885,082.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed September 17, 1906. Serial No. 334,878.

To all whom it may concern:

Be it known that I, WILLIAM PRESTON, of the city of Stratford, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Gyratory Sifters, of which the following is a specification.

This invention relates to sifters in which the sifter box is flexibly suspended and is gyrated by the rotation of a vertical shaft, and my object is to devise a sifter of this type in which the shaft is supported solely on the sifter, or parts connected therewith, and in which the sieve box is gyrated in any suitable manner from the shaft.

A further object is to devise means for gyrating the box.

With these objects in view my invention consists essentially in supporting the vertical shaft on the sifter box and on a bridge tree rigidly secured to and below the sifter box; in journaling the shaft in the sieve box and bridge tree and providing it with a weight to one side of the shaft and with an eccentric pulley driven by a shaft passing round suitable idlers, and in journaling the idlers on a frame yieldingly connected to a stationary part, the said frame being connected with the vertical shaft in such a manner that the idlers are held in a constant position relative to the center of gyration, all substantially as hereinafter more specifically described, and then definitely claimed.

Figure 1 is an end elevation showing a sifter constructed in accordance with my improvements. Fig. 2 is a side elevation, partly in section, of the driving mechanism of the same. Fig. 3 is a front elevation showing my invention applied to a high sifter box. Fig. 4 is a plan showing the eccentric and related parts.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the sifter box, of any suitable construction. This box is supported from a point overhead by rods B, possessing sufficient flexibility to permit of a gyratory movement of the sifter box.

C is a vertical sifter shaft having its upper end journaled in the spider P' secured to the under side of the sifter box. Its lower end has a suitable step-bearing in the bridge tree D, which is rigidly connected with the sifter box by means of the struts a and braces b. The shaft C to permit of the desired gyratory motion is provided with the weight E ex-

tending out to one side thereof. To the shaft C is secured an eccentric pulley F, the greatest throw of which is in the same direction as the weight E, i. e., on the same side of the shaft as the center of gravity of the weight.

The shaft C is in line with the vertical axis of the sifter box, and the weight and eccentric are so proportioned that when the apparatus is in use and the eccentric pulley F driven the sifter box, shaft and bridge tree gyrate about the actual center from which the circumference of the pulley is struck. As the sifter box and shaft gyrate together while the circumference of the pulley F does not gyrate but is substantially stationary relative to extraneous stationary parts it is evident that idler pulleys to lead the driving belt to the pulley F cannot be connected with the sifter box but must be connected to a relatively stationary part. At the same time the idler pulleys must follow the "lunging" which tends to occur when the sifter is first put in motion. I therefore provide a frame for the idler pulleys which is yieldingly connected with the ceiling, or other relatively stationary extraneous part, and connect this frame with the vertical shaft in such a manner that the idlers are held in a constant position relative to the center of gyration.

On reference particularly to Fig. 1 it will be seen that on flexible rods G secured to the ceiling I secure a shaft H. On this shaft H I journal the idler pulleys J. A brace K is hinged on this shaft H at d. This brace has formed therein a strap L, in which runs the eccentric M secured to the shaft C, and similar to, though preferably of smaller size than, the eccentric pulley F. Thus when lunging of the sifter occurs the shaft H swings correspondingly on the rods G.

In order to restrain the lunging when starting the machine I connect a vertical pin N with the crank I which is secured to the toe c of the shaft. This pin is substantially in the axis of gyration and extends down into a casting or frame O secured to the floor, or other extraneous stationary part. The upper part of this casting is provided with a buffer P preferably of wood, in which is formed a hole somewhat larger than the pin so that though a small amount of lunging is permitted to allow for any variations and inequalities in the running of the machine, yet any excess is promptly restrained.

The parts of my invention to which I wish to draw special attention are, first, the bridge tree, rigidly secured to and below the sifter box, as this forms a very satisfactory, strong and durable method of carrying the driving shaft; second, the driving of the vertical shaft by an eccentric pulley, which, when the apparatus is in use, rotates on the center of gyration; third, the use of the yieldingly supported idler pulleys which are held at a constant distance from the center of gyration, and fourth, the restraining of the lunging by limiting the horizontal movements of the frame and the idler pulleys, or the parts by which they are held in their relatively constant positions.

In Fig. 3 I illustrate my invention as applied to a sifter box of the ordinary high type. The only differences of any improvement which will be noted are that a weight E is provided for the vertical shaft both above and below the sifter box, and that the brace K instead of being connected with the eccentric M is connected with the pin N on the crank I, but it is evident that the crank in this case forms an exact equivalent for the eccentric shown in Figs. 1 and 2.

I find that by the use of the bridge tree rigidly secured to and below the sifter box I am enabled to support the driving shaft entirely on the sifter structure, which has not heretofore been possible with low sifter boxes, in which, owing to their internal construction, it is impossible to have a shaft passing up to the top of the box, as in the high box type. By so connecting the shaft, and by using therewith my eccentric pulley drive I entirely avoid the disagreeable shaking of the building which is always indispensable with the older forms of drive for low or plan-sifter boxes. I find too that my eccentric pulley drive gyrates the machine with the greatest possible steadiness, the curve of gyration being substantially a true circle. In older types of boxes this approximated an ellipse or conjoined elliptical loops, while it was exceedingly difficult to secure a sufficient radius of gyration. With my present drive any desired radius of gyration can be secured, depending on the eccentricity of the pulley, but it will be found that the balancing weight must be adjusted to suit any particular throw of the eccentric pulley, either by increasing the weight or extending it out to a greater distance from the shaft.

It will be noted that relative to any stationary point, while the shaft gyrates, the pulley merely rotates and is therefore non-gyrating. This is due to the fact that the center of gyration of the system is substantially the geometrical center of the eccentric pulley.

I am ware that eccentric pulleys have been employed heretofore in gyratory sifters but as far as I know they have been gyratory and

used with non-gyrating shafts thus requiring the idler pulleys for the driving belt to be connected to the sifter itself, whereas in my machine I am able to carry my idlers on an extraneous support.

What I claim as my invention is:—

1. The combination of a sifter structure; means for yieldingly suspending the same; a shaft vertically journaled on said structure; a weight secured to the shaft to one side of the same; an eccentric pulley secured to the shaft; a frame yieldingly connected to a stationary extraneous part; idlers journaled thereon; a brace yieldingly connected to said frame; an eccentric on the shaft similar to the eccentric pulley; and an eccentric strap on the brace engaging the said eccentric, substantially as described.

2. The combination of a sifter structure; means for yieldingly suspending the same; a shaft vertically journaled on said structure; a weight secured to the shaft to one side of the same; an eccentric pulley secured to the shaft; a frame yieldingly connected to a stationary extraneous part; idlers journaled thereon; a brace yieldingly connected to said frame; an eccentric on the shaft similar to the eccentric pulley; a strap on the brace engaging the said eccentric; a crank secured to the lower end of the shaft; a vertical pin secured to the crank; and means carried by an extraneous stationary part limiting the horizontal movements of the pin, substantially as described.

3. The combination of a sifter structure; means for yieldingly suspending the same; a bridge tree rigidly secured to and below said structure; a vertical shaft journaled at its lower end in the bridge tree, and at its upper end on the under side of the structure whereby the shaft is firmly carried at each end entirely below the sifter structure; and means whereby the said shaft may be caused to gyrate the said sifter structure, substantially as described.

4. The combination of a sifter structure; means for yieldingly suspending the same; a spider secured to the under side of the sifter structure; a shaft vertically journaled at its upper end in said spider; a bridge tree rigidly secured to and below the said spider, and provided with a step bearing for the shaft whereby the shaft is firmly carried at each end entirely below the sifter structure; and means whereby the said shaft may be caused to gyrate the said sifter structure, substantially as described.

5. The combination of a sifter structure; means for yieldingly suspending the same; a shaft vertically journaled at its upper end in said structure; a bridge tree rigidly secured to and below the said structure, and provided with a step bearing for the shaft; a weight secured to the shaft to one side of the same; an eccentric pulley secured to the

shaft; a shaft yieldingly connected to a stationary extraneous part; idlers journaled thereon; a brace yieldingly connected to said idler shaft; an eccentric on the vertical shaft similar to the eccentric pulley; and a strap on the brace engaging the said eccentric, substantially as described.

6. The combination of a sifter structure; means for yieldingly suspending the same; a bridge tree rigidly secured to and below the said structure; a vertical shaft revolubly carried by said structure and bridge tree, means whereby the revolution of the shaft will gyrate said structure; a pulley on said shaft; a shaft yieldingly connected to a stationary part; idlers journaled thereon; and connections between the idler shaft and the vertical shaft whereby the idlers may be held in a constant position relative to the center of gyration, substantially as described.

7. The combination of a sifter structure; means for yieldingly suspending the same; a shaft vertically journaled on said structure in fixed relation thereto and gyrating therewith; a weight secured to the shaft to one side of the same; and a non-gyrating eccentric pulley secured to the shaft, and having its greatest radius on the same side of the

shaft as the center of gravity of the weight, substantially as described.

8. The combination of a sifter structure; means for yieldingly suspending the same; a shaft vertically journaled centrally on said structure in fixed relation thereto and gyrating therewith; a weight secured to the shaft to one side of the same; and a non-gyrating eccentric pulley secured to the shaft, and having its greatest radius on the same side of the shaft as the center of gravity of the weight, substantially as described.

9. The combination of a sifter structure; means yieldingly suspending the same; a shaft vertically journaled on said structure and gyrating therewith; a weight secured to the shaft to one side of the same; an eccentric pulley secured to the shaft; idlers supported independent of the sifter structure; and means for maintaining the idlers at a constant distance from the rim of the eccentric pulley, substantially as described.

Stratford, Ont., 10th September, 1906.

WILLIAM PRESTON.

Signed in the presence of—

J. C. MAKINS,

E. M. BARLOW.