

No. 858,930.

PATENTED JULY 2, 1907.

J. WARRINGTON.
GYRATORY SIFTER.

APPLICATION FILED FEB. 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

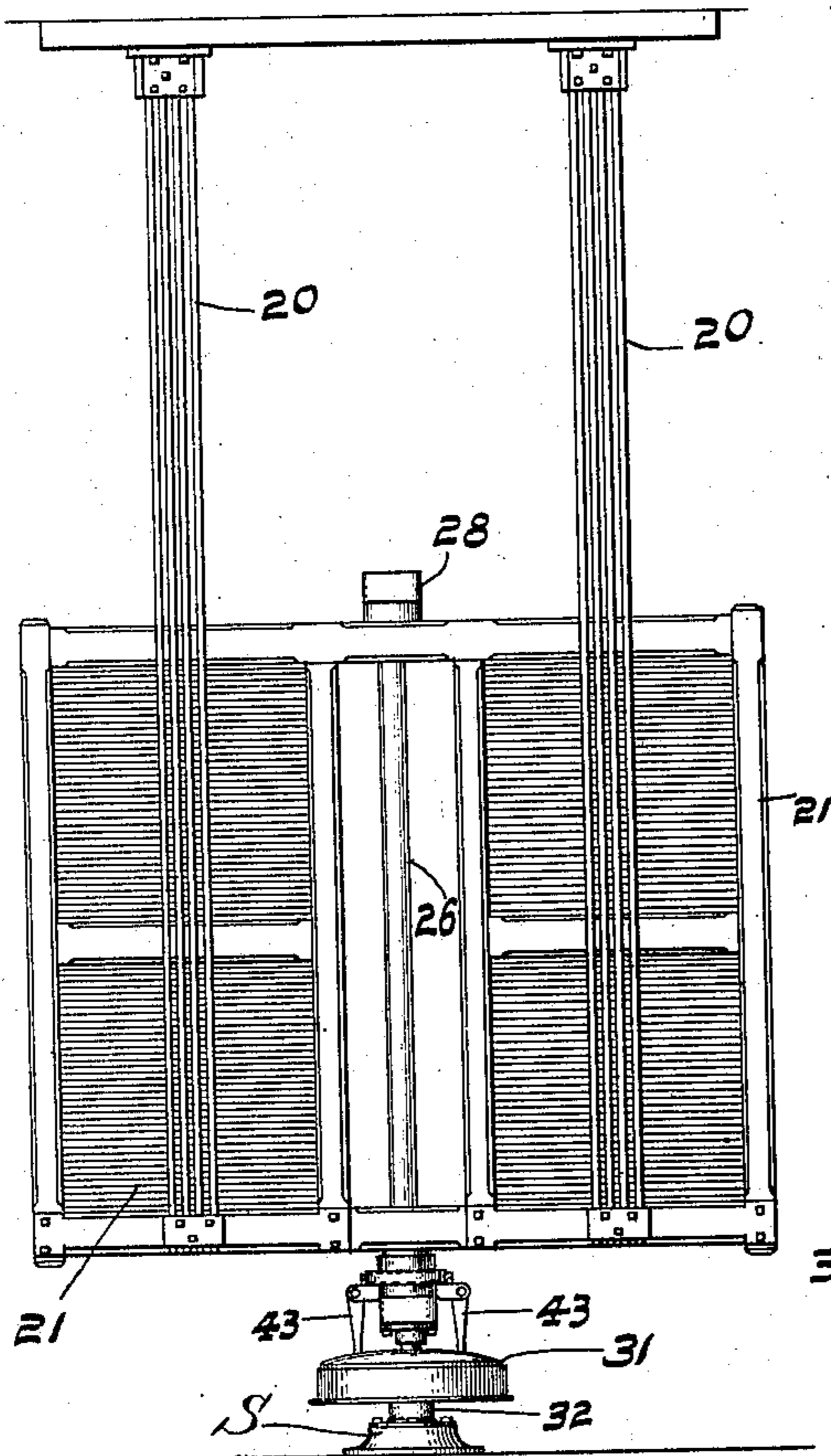
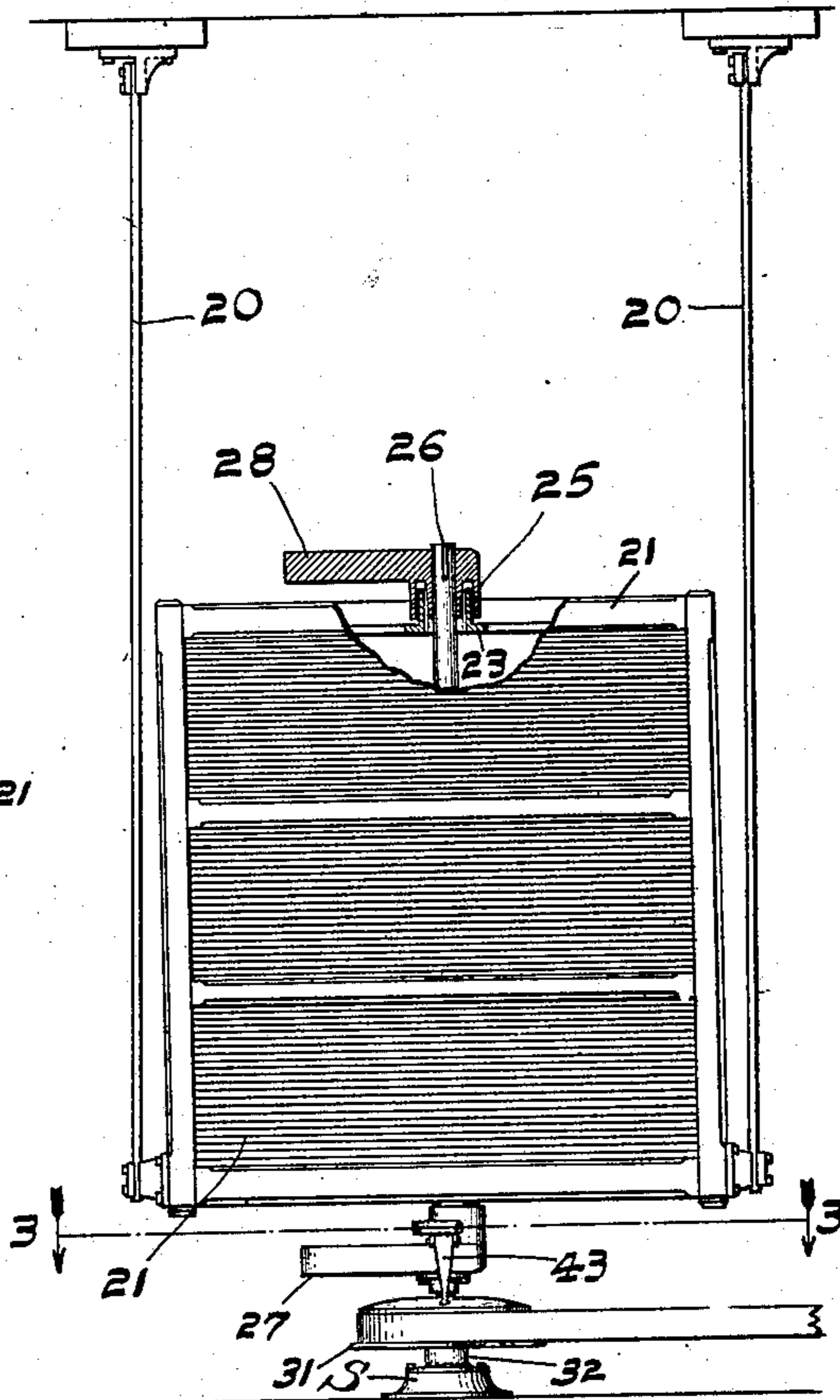


Fig. 2.



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Fig. 4.

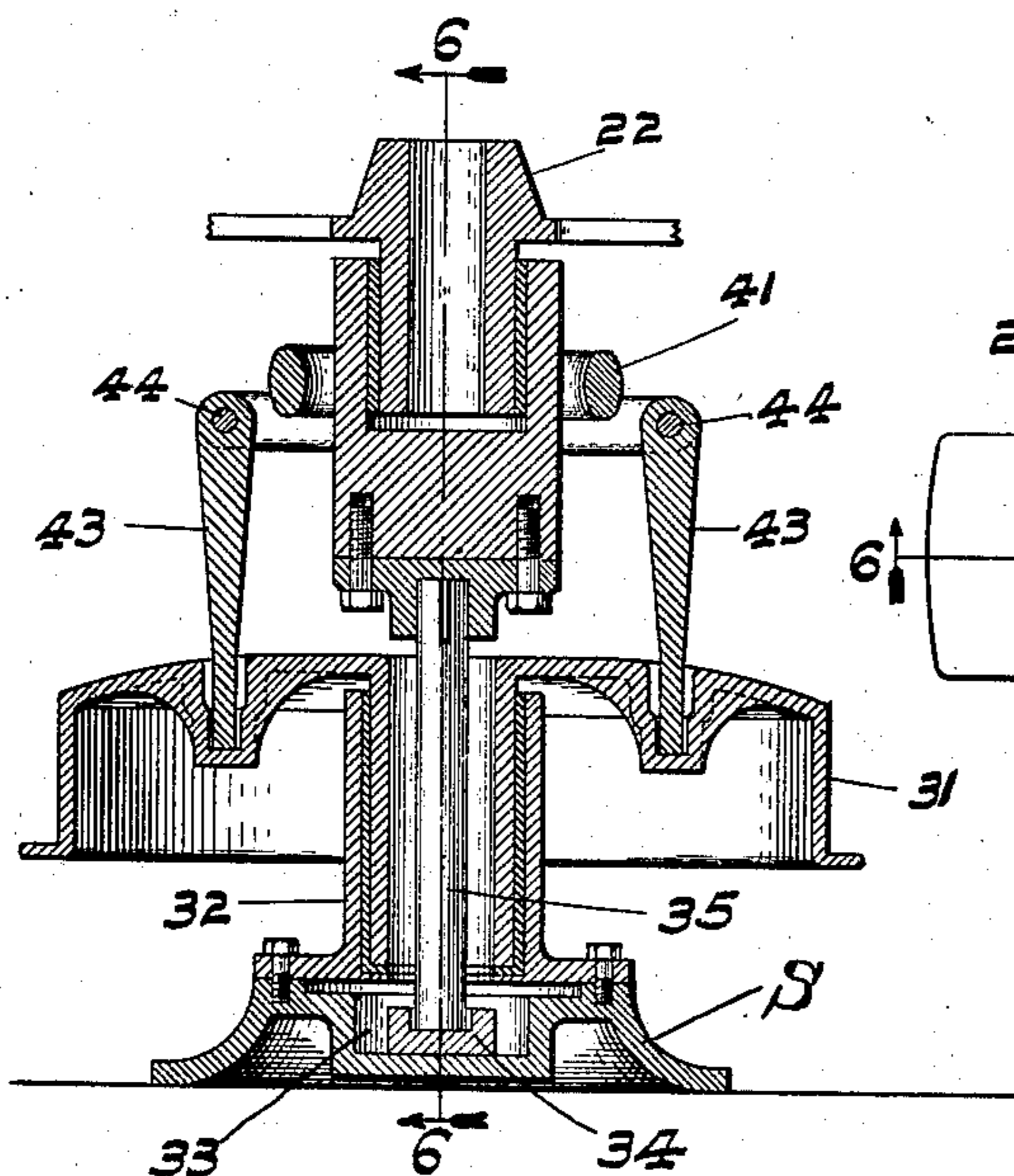


Fig. 3.

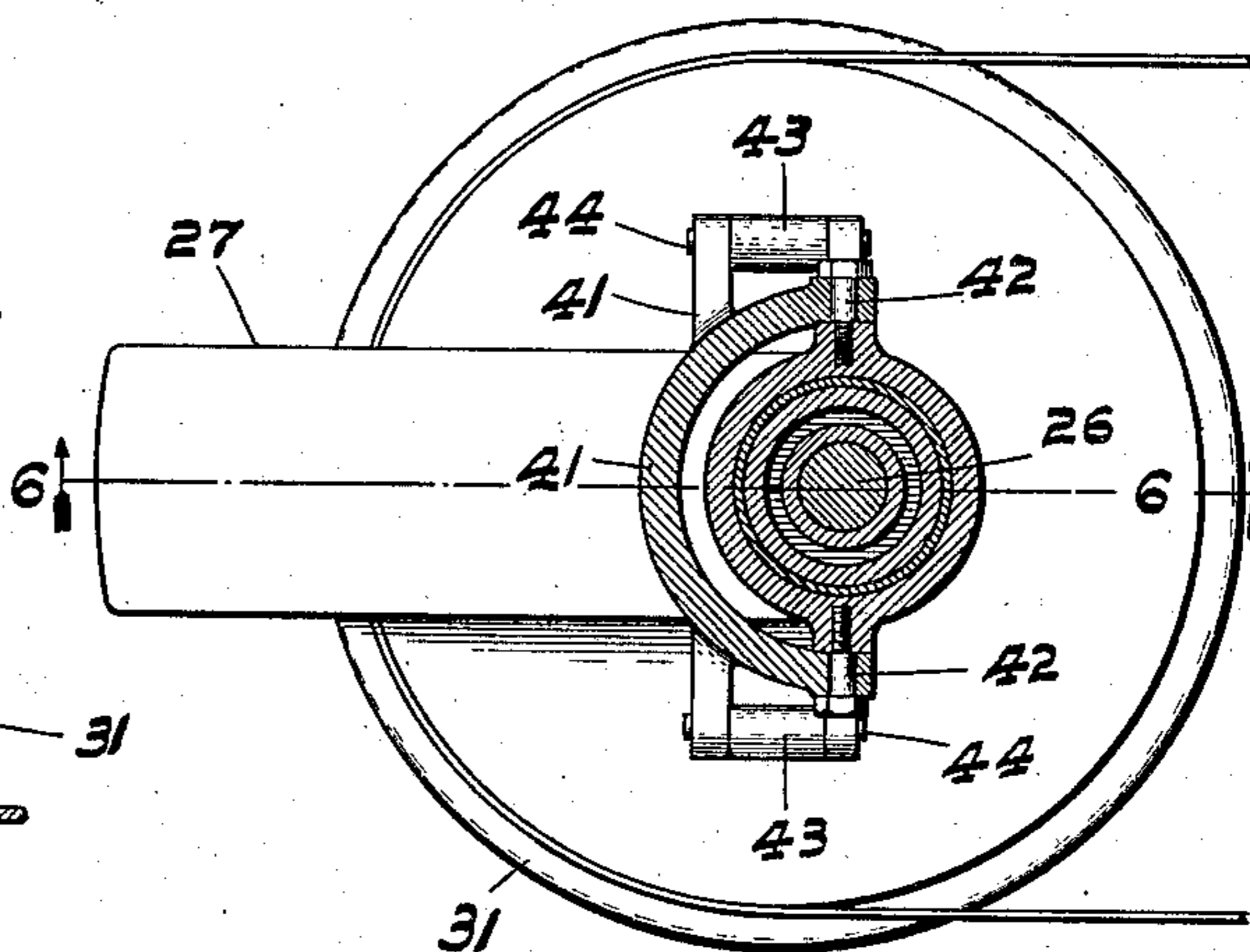


Fig. 5.

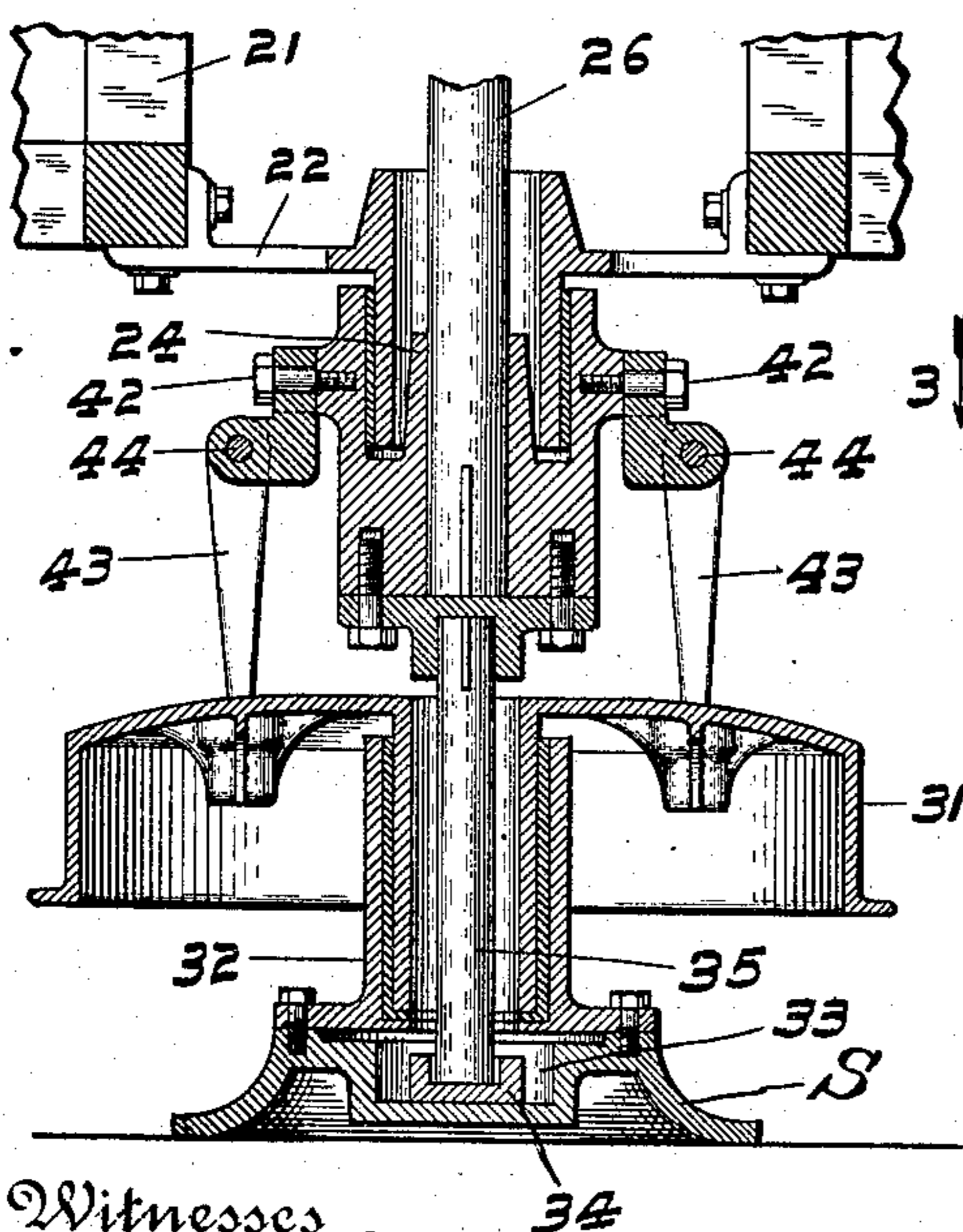
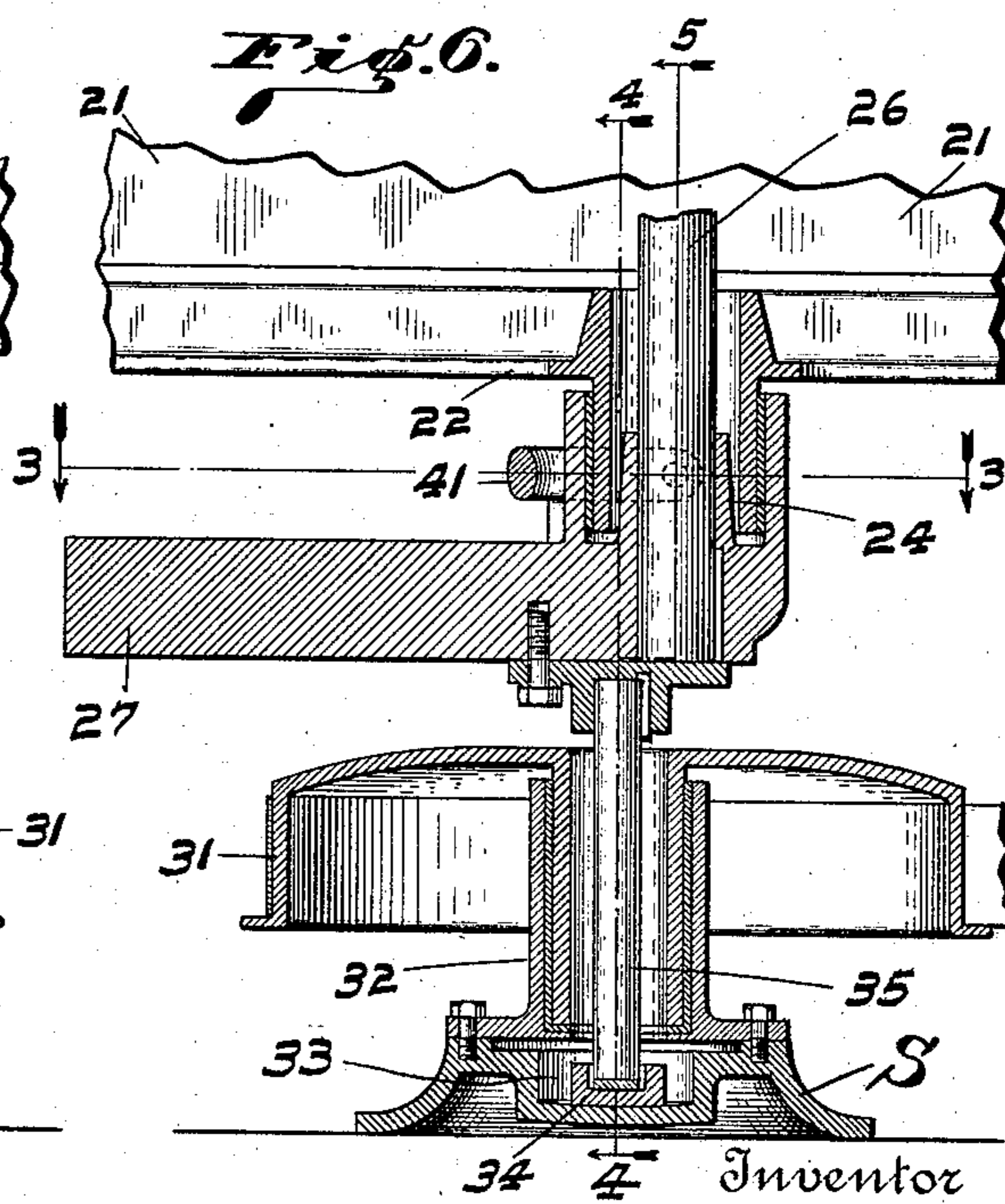


Fig. 6.



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UNITED STATES PATENT OFFICE.

JESSE WARRINGTON, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO NORDYKE & MARMON COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

GYRATORY SIFTER.

No. 858,930.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed February 11, 1907. Serial No. 356,854.

To all whom it may concern:

Be it known that I, JESSE WARRINGTON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Gyratory Sifters, of which the following is a specification.

In executing various kinds of work a gyratory movement of the operating structure is highly desirable. This is the case, for example, in that class of machinery used in flouring mills, by means of which the sieving or bolting operation is performed. In the driving of such structures it has been common either to mount the driving shaft rigidly on a floor or wall of the building, and produce the gyratory movement by means of an eccentric or crank connection between said shaft and the structure which is to be given the gyratory movement; or, to run the driving belt over a series of "idler" pulleys to a driving pulley mounted on a shaft or the like whose axis is eccentric to the axis of the shaft on which the gyratory body is mounted. In the latter case, also, the whole weight of the structure and of the driving shaft and pulleys has been carried by the suspending means.

In the machine which forms the subject-matter of my present invention, while the structure to be operated is suspended and permitted a free gyratory movement, the shaft and parts immediately attached thereto, and also the driving pulley, are supported by suitable step-bearings on an adjacent part of the building (usually the floor), so that the gyratory structure is relieved both of the weight thereof and of the pull of the belt or other driving means; and the connection between the driving pulley and the driving shaft is of such a character that while the pulley and shaft are rotatively connected they are otherwise independent.

Another feature of this invention is that the support by which the weight of the shaft and attached parts is carried, while free from the driving pulley, is arranged centrally thereof, and is capable of the slight movement necessary to relieve the building from the strain to which it would be subjected in operation, especially while starting the apparatus in motion and before the gyratory structure becomes settled to its normal movement, such as is incident to a rigid connection between the building and such gyratory structure.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a gyratory sifter equipped with a driving means embodying my present invention; Fig. 2 an end elevation thereof; Fig. 3 a plan view of the driving mechanism as seen when looking downwardly from the dotted line 3 3 in Figs. 2 and 6, and Figs. 4, 5 and 6, detail

vertical sectional views as seen when looking in the direction indicated by the arrows from the dotted lines 55 4 4 and 5 4 respectively in Fig. 6, and 6 6 in Figs. 3 and 4.

The gyratory structure 21 is shown as supported by means of flexible rods 20 from a suitable point overhead—this being a common and well known construction. Said structure may be suspended in any desired manner. Spiders 22 and 23 connected to the structure 21 contain bearings 24 and 25. In these bearings I mount a shaft 26, and the shaft carries at its ends (one or both) weights, as 27 and 28—the center of gravity being thus situated at one side of the axis of the shaft, so that when the shaft is moved the desired gyratory movement of the structure to which it is attached may be secured. These weights may be of any desired size or character. Plain solid weight-arms are shown.

The driving pulley 31 is mounted in a suitable step-bearing in the stand 32 secured to an adjacent portion of the building (as the floor) being thus free from connection with the structure which it is designed to drive except by the means which will presently be described. This pulley has a large hollow hub; and below the ledge which forms the step-bearing for said pulley-hub, is a chamber 33 (in the bottom portion S of the stand) which contains a loosely-mounted bearing block 34. Secured to the hub on the lower end of the shaft 26 (which, in the construction shown, is a part of the weight-arm 27) is a pin 35 which extends down through the central opening in the pulley 31 and rests in a suitable depression formed for the purpose in the upper side of bearing-block 34. This pin 35 is so positioned as to constitute the center of rotation when the parts are in motion and working normally. The shaft 26 revolves around this pin, the distance between the axis of the pin and the axis of the shaft being the radius of the orbit of gyration. As will be noticed, the bearing block 34 has no fixed connection with the surface on which it rests, and may therefore slide somewhat, over said surface, in case of any irregularity of movement, as when the machine is starting, and before it has attained its regular movement, being restrained only by reason of the friction between the parts. The cavity in the top of this block into which the lower end of the pin 35 enters is preferably somewhat larger than the diameter of said pin. The side walls of the chamber 33 are only for the purpose of retaining a lubricant, and are sufficiently distant from the block 34 so that the latter does not come in contact with said walls. The movement of said block is therefore not limited except by the friction between it and the adjacent surface and the nature of the apparatus. Said adjacent surface or chamber-bottom is preferably flat, as shown in Figs. 4 and 5; but it may be concave, if desired, as shown in

Fig. 6: As it is intended to keep this chamber filled with lubricant, the movement of the block 34 is of course very easy.

The yoke 41 is mounted by means of pivots 42 on the hub of the weight-arm 27, and has four ears (two pairs) extending outwardly and downwardly therefrom. Arms 43 are mounted on the pivots 44 carried by said ears, and these pivoted arms extend down into openings or cavities in the pulley 31, and, together with the yoke 41, form means of connection between said pulley and the hub on shaft 26, so that said pulley, when rotated, will impart a rotary movement to said shaft, and cause said shaft and the parts connected thereto to travel about the axis indicated by the pin 35.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In combination, a suspended structure, suspending means therefor, a shaft mounted in said structure, a fixedly mounted driver surrounding the axis of movement, a support for said shaft independent of said structure and said driver, and yielding connection independent of the suspending means between the suspended structure and the driver whereby said structure is permitted a gyratory movement in operation.

2. In combination, a suspended structure carrying a vertically-positioned shaft, weights connected with said shaft whereby it is given a tendency when in motion to travel in a gyratory path, a driver mounted in a fixed bearing adjacent to the end of said shaft and surrounding the axis of movement, a support for the shaft independent of the driver, and yielding connections independent of the suspending means between said driver and said shaft whereby the latter may be driven from the former notwithstanding the difference between the axis of rotation of the driver and the axis of gyration of the latter.

3. In combination, a suspended body, a shaft arranged centrally therein and weighted to produce a gyratory movement, a pin set eccentrically to said shaft and extending downwardly and resting in a step-bearing whereby the weight of said shaft and its weights are supported, a fixedly mounted driver surrounding the axis of rotation, and a bearing in which said driver is mounted adjacent to the step-bearing carrying the pin.

4. In combination, a suspended body, a shaft arranged centrally therein and weighted to produce a gyratory movement, a pin set eccentrically to said shaft and extending downwardly and resting in a step bearing whereby the weight of said shaft and its weights are supported, a driver having a central opening through which said pin extends but free of contact therewith, and a bearing in which said driver is mounted adjacent to the step-bearing carrying the pin.

5. In combination, a suspended structure arranged to have a gyratory movement, a driver mounted in a stationary bearing carried on an adjacent portion of the building, said driver having a central opening of considerable size, a shaft mounted in the suspended structure, and a pin set eccentric to said shaft but secured thereto and extending down through the opening in the driver, and a step-bearing for said pin.

6. In combination, a suspended structure arranged to have a gyratory movement, a driver mounted in a stationary bearing carried on an adjacent portion of the building, said driver having a central opening of considerable size, a shaft mounted in the suspended structure, and a pin set eccentric to said shaft but secured thereto and extending down through the opening in the driver, and a step-bearing for said pin consisting of a suitable block slidably mounted on a base.

7. In combination, a suspended body, suspending devices therefor, means for giving said body a gyratory movement, a stationary driver, a shaft to said suspended body, a support for said shaft independent of said driver, and a yielding connection between said driver and the shaft of said stationary body whereby they are engaged for coincident rotation but permitting a relative movement equal to the

distance between the axis of rotation and the axis of gyration.

8. In combination, a suspended body, means for giving the same a gyratory movement, a stationary driver, and a yielding means connecting the shaft of said suspended body and said driver, consisting of a yoke pivoted to a hub on said shaft and arms pivoted to said yoke and extending to and engaging with said driver.

9. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft mounted therein, a pin set eccentric to said shaft, a step-bearing for said pin carrying the weight thereof and of the shaft, said step-bearing being free to move over the surface of the support on which it rests, and said support.

10. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft mounted in bearings engaging with said suspended structure, a pin set eccentric to said shaft, and a chamber adapted to contain a lubricant and which is larger than said pin into which the lower end of said pin enters and upon the bottom of which it is supported and adapted to move.

11. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft thereto, a pin whose axial line is different from that of the shaft but operatively connected therewith, and a support upon which said pin rests having a friction surface over which said pin may move, whereby said pin and the parts carried thereby are frictionally restrained and the weight thereof supported.

12. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft thereto, a pin whose axial line is different from that of the shaft but operatively connected therewith, a support upon which said pin rests having a friction surface over which said pin may move, and a bearing-block interposed between said pin and the surface of said support.

13. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft thereto, a pin whose axial line is different from that of the shaft but operatively connected therewith, and a support upon which said pin rests having a friction surface over which said pin may move, said surface being surrounded by a wall thus forming also a lubricant chamber.

14. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft thereto, a pin set eccentric to said shaft, and frictional means co-acting with the eccentric pin for restraining abnormal throw of the suspended structure during gyration.

15. In combination, a suspended structure arranged to have a gyratory movement, a driver therefor, a shaft mounted in bearings engaging with said suspended structure, a pin whose axial line is different from that of the shaft but operatively connected therewith, and frictional means supporting the weight of the pin and parts carried thereby and co-acting with said pin for restraining abnormal throw of the structure during gyration.

16. In combination, a suspended structure, a fixedly mounted driver surrounding the axis of movement, a shaft in said structure, a pin whose axial line is different from that of the shaft but operatively connected therewith, a support upon which said pin rests, and a frictional device co-acting with said pin for restraining abnormal throw of the structure during gyration.

17. The combination, in a gyratory sifter, of a sifter body, means whereby the same is suspended, bearings arranged centrally of said body, an eccentrically-weighted shaft mounted in said bearings, an eccentric pin on said shaft, a step-bearing supporting said pin and through it said weighted shaft, a fixedly-mounted driver arranged adjacent thereto and surrounding the axis of movement, and yielding connection between said driver and said shaft.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this fifth day of February, A. D. one thousand nine hundred and seven.

JESSE WARRINGTON. [L. S.]

Witnesses:

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THOMAS W. McMEANS.