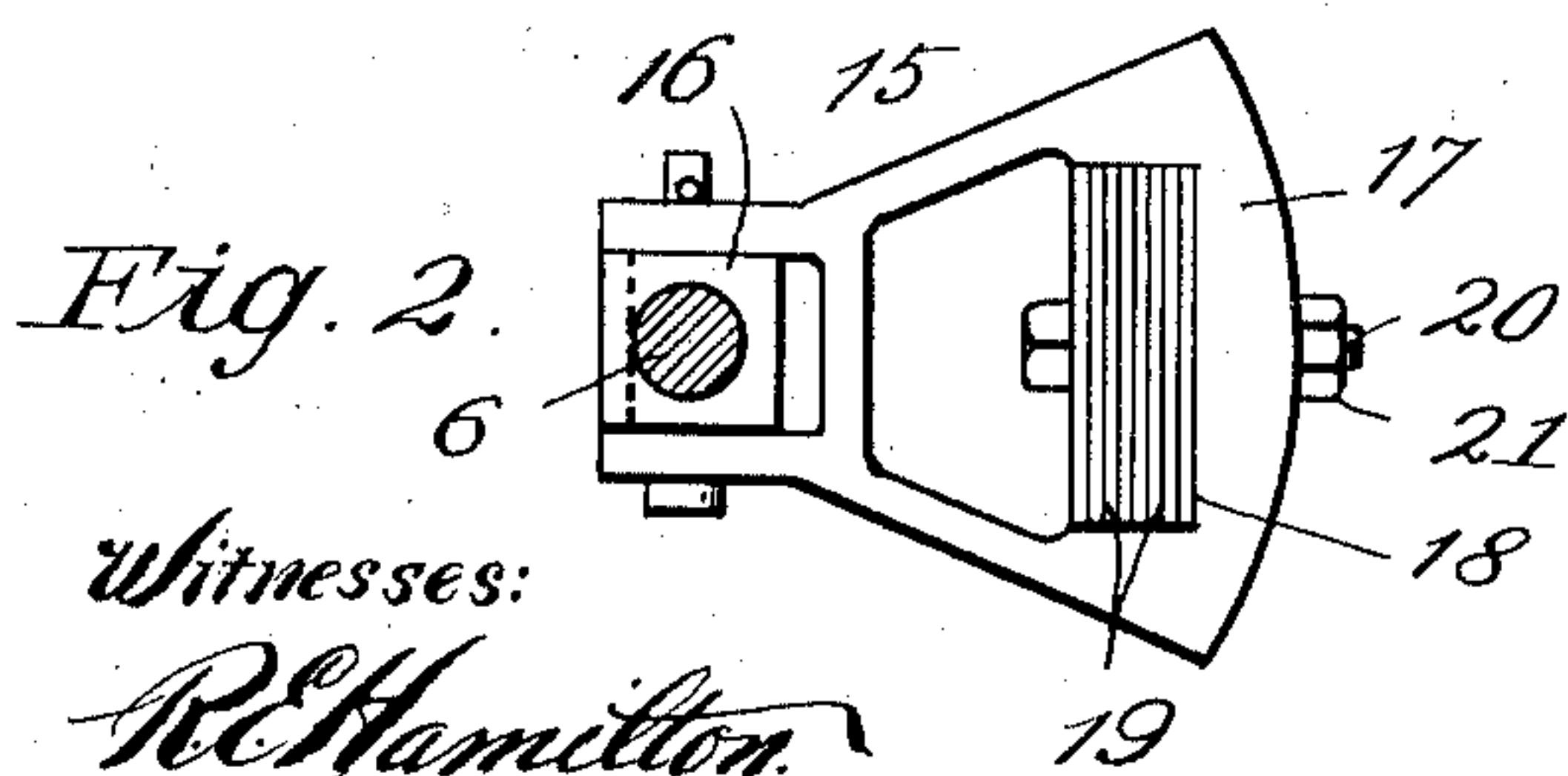
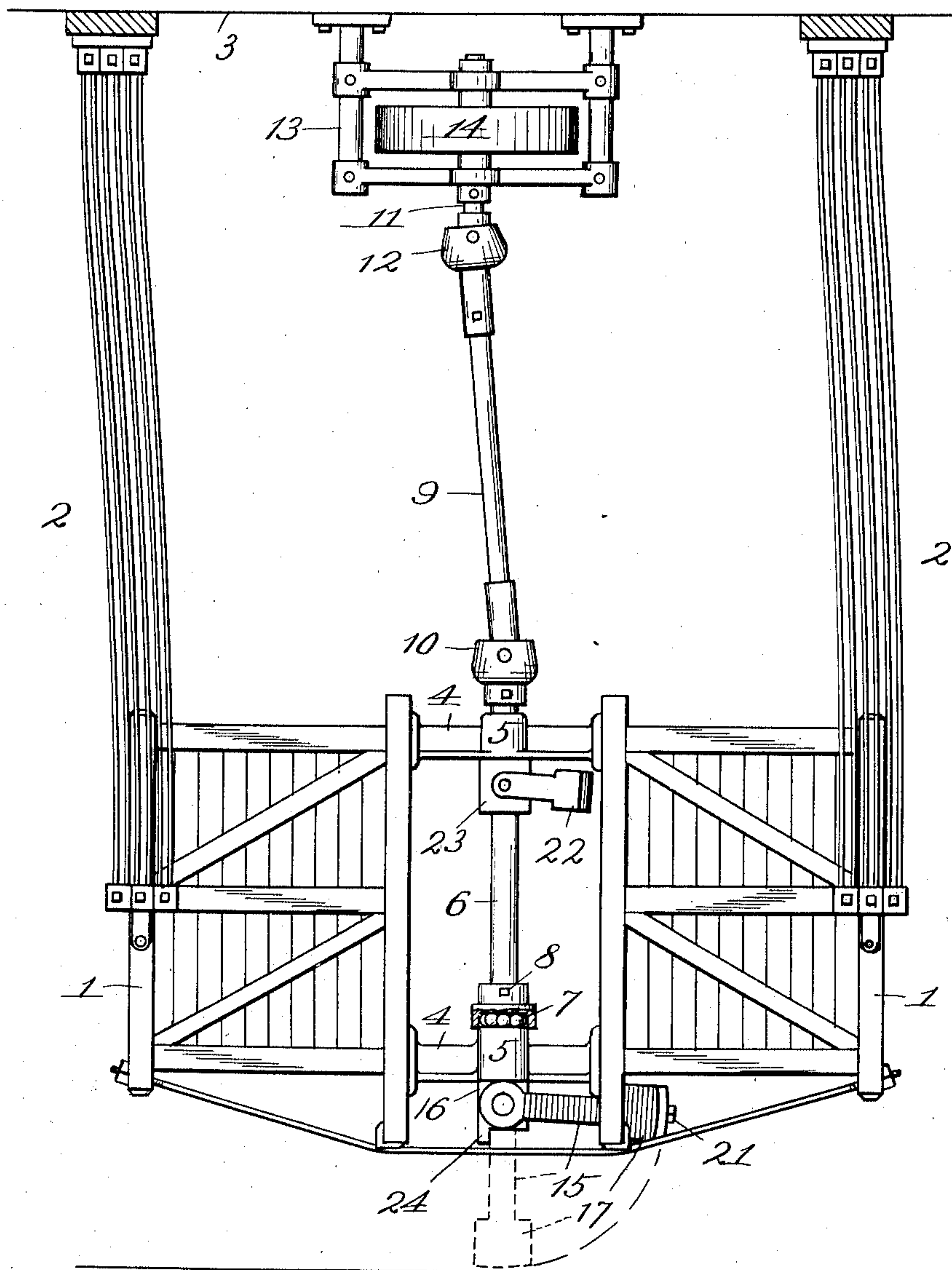


No. 883,526.

PATENTED MAR. 31, 1908.

G. W. COMBS.
GYRATORY STRUCTURE.
APPLICATION FILED MAR. 22, 1907.

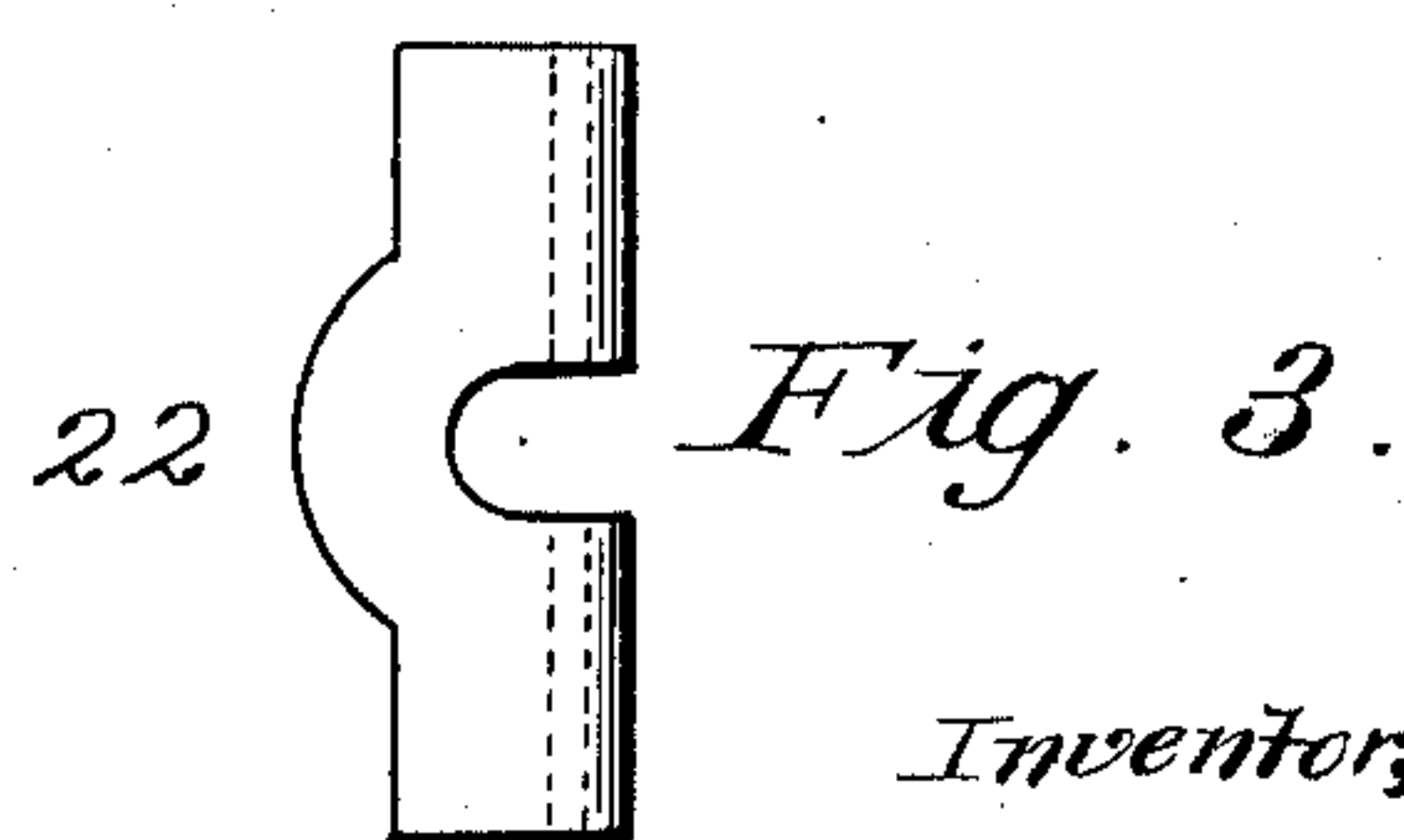
Fig. 1.



Witnesses:

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Inventor,

George W. Combs

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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM COMBS, OF LEAVENWORTH, KANSAS.

GYRATORY STRUCTURE.

No. 883,526.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed March 22, 1907. Serial No. 363,948.

To all whom it may concern:

Be it known that I, GEORGE WILLIAM COMBS, a citizen of the United States, residing at Leavenworth, in the county of Leavenworth and State of Kansas, have invented certain new and useful Improvements in Gyratory Structures, of which the following is a specification.

This invention relates to improvements in mechanical movements; and my objects are, first to provide novel means for imparting a gyratory motion to flour sifters, machines for sizing and sorting grain, ores, coal and the like; second, to dispense with the crank mechanism usually employed to produce a gyratory movement, and avoid the excessive wear and harmful vibrations experienced when using the said crank mechanism, and third, to avoid abnormal throw of the gyrating structure regardless of the speed at which it is traveling.

I attain the above objects by employing one or more self-contained members which are, preferably, controlled by the speed of the gyrating structure, and being thus controlled, are automatically adjusted to balance said structure whether the latter be starting or stopping, or rotating at constant or variable speed.

In order that the invention may be fully understood, reference will now be made to the accompanying drawing, in which:—

Figure 1 represents a gyratory structure provided with my invention. Figs. 2 and 3 are plan views of the adjustable members, forming the invention.

The device may be applied to any approved form of gyratory structure. In the drawing I have shown it applied to a bolting-machine consisting of oppositely-disposed sieve-boxes 1, freely suspended by flexible reeds or rods 2, depending from the ceiling 3 of the building containing the structure. Boxes 1 are connected at their upper and lower ends by a pair of spiders 4, having centrally-disposed bearings 5, in which a vertical shaft 6 is journaled, said shaft being supported by an antifriction roller bearing 7, secured thereto by a set-screw 8 and resting upon the lower bearing 5. Shaft 6 is driven by a yieldingly-supported shaft 9, so that it will be free to gyrate with the sieve-boxes. Shaft 9 is connected at its lower end to the upper end of shaft 6 by a universal coupling 10, and at its upper end to a drive shaft 11 by a universal coupling 12. Drive shaft 11 is

journaled in a frame 13, and driven by a fixed pulley 14.

15 designates one of my improved members which is pivotally secured to a block 16 fixed to the lower end of shaft 6, so that member 15 will be free to swing upwardly and thus impart and control the gyratory motion of the structure, or it may swing down into axial alinement with shaft 6 when at rest. This arrangement insures the sieve structure gradually moving into its gyratory motion when shaft 6 is started, without bucking and unduly straining the parts, as would be the case if member 15 were suspended at one side of the shaft, as in the latter instance the member would unbalance the sieve structure at all times except when it attained the critical speed of rotation. The sides of member 15 diverge toward its free end so that said end will be heavier than its pivoted end, and its enlarged portion 17 has a pocket 18 for the reception of one or more weights 19, secured in said pocket by a bolt 20 and a retaining-nut 21. Thus the weight of member 15 may be adjusted to impart the proper gyratory motion to the structure.

When shaft 6 is rotated the friction between it and its bearings will impart slight swaying motion to the structure and cause member 15 to swing out of line with the axis of said shaft. The centrifugal force will then swing member 15 upwardly, the rise thereof being in proportion to the rate of speed at which the structure is driven. For instance, as the speed increases centrifugal force will cause the free end of member 15 to more nearly approach a horizontal plane, and as the speed diminishes said free end will more nearly approach a perpendicular position, and thus at all times automatically prevent abnormal gyratory motion of the structure.

If member 15 were fixed at right angles to shaft 6, it would unbalance the structure to an excessive degree while gyrating, and cause it to have abnormal outward throw at all times except when said structure had attained the "critical speed of rotation," at which time the structure and the member would be in perfect balance, but the instant the speed increased or diminished the structure would again be thrown out of its normal gyratory motion.

The weight of member 15 is increased in proportion to the weight of the gyratory

structure until a certain limit is attained when I prefer to employ an additional member 22, which is pivotally secured to a block 23 fixed to the upper portion of shaft 6 to equalize the strain thereon and cause the upper end of the shaft to describe the same circle as its lower end. When said additional member is employed I provide block 16 with a depending lip 24 which prevents member 15 from swinging upwardly in an opposite direction to member 22, as it is obvious that both members must swing in the same direction to obtain the best results. When member 15 alone is employed the lip 24 may be dispensed with so that said member will be free to swing in either direction.

I do not wish it to be understood that I limit myself to the details of construction shown and described, as the invention resides broadly in one or more members for imparting and controlling the gyratory motion of a structure.

Having thus described my invention, what I claim is:—

25 1. A gyratory structure, consisting of a pair of oppositely-disposed sieve-boxes, a centrally-disposed vertical shaft connected to said boxes for gyrating the same, and a centrifugally-controlled member pivoted to the lower end of the shaft so that it may hang in axial alinement therewith when at rest.

2. A gyratory structure including a vertical shaft, in combination with a centrifu-

gally-controlled member pivoted to the lower end of said shaft so that it may hang in alinement therewith when at rest, substantially as described.

3. A gyratory structure including a vertical shaft, in combination with a centrifugally-controlled member pivoted to the upper portion of said shaft, a centrifugally-controlled member pivoted at the lower end of said shaft so that it may hang in alinement therewith when at rest, and means for preventing the lower member from swinging upwardly in a direction opposite to the upper member.

4. A gyratory structure including a suspended vertical shaft, yielding power transmission devices connected to said shaft for rotating the same, and a centrifugally-controlled member pivoted to the lower end of the shaft so that it may hang in alinement therewith when at rest.

5. A gyratory structure including a shaft, a yielding power transmission device connected to said shaft for rotating the same, a block secured to the lower end of said shaft, and a centrifugally-controlled member pivoted to said block so that it may hang in vertical alinement with the shaft.

In testimony whereof I affix my signature, in the presence of two witnesses.

GEORGE WILLIAM COMBS.

Witnesses:

G. R. COMBS,
F. D. COMBS.