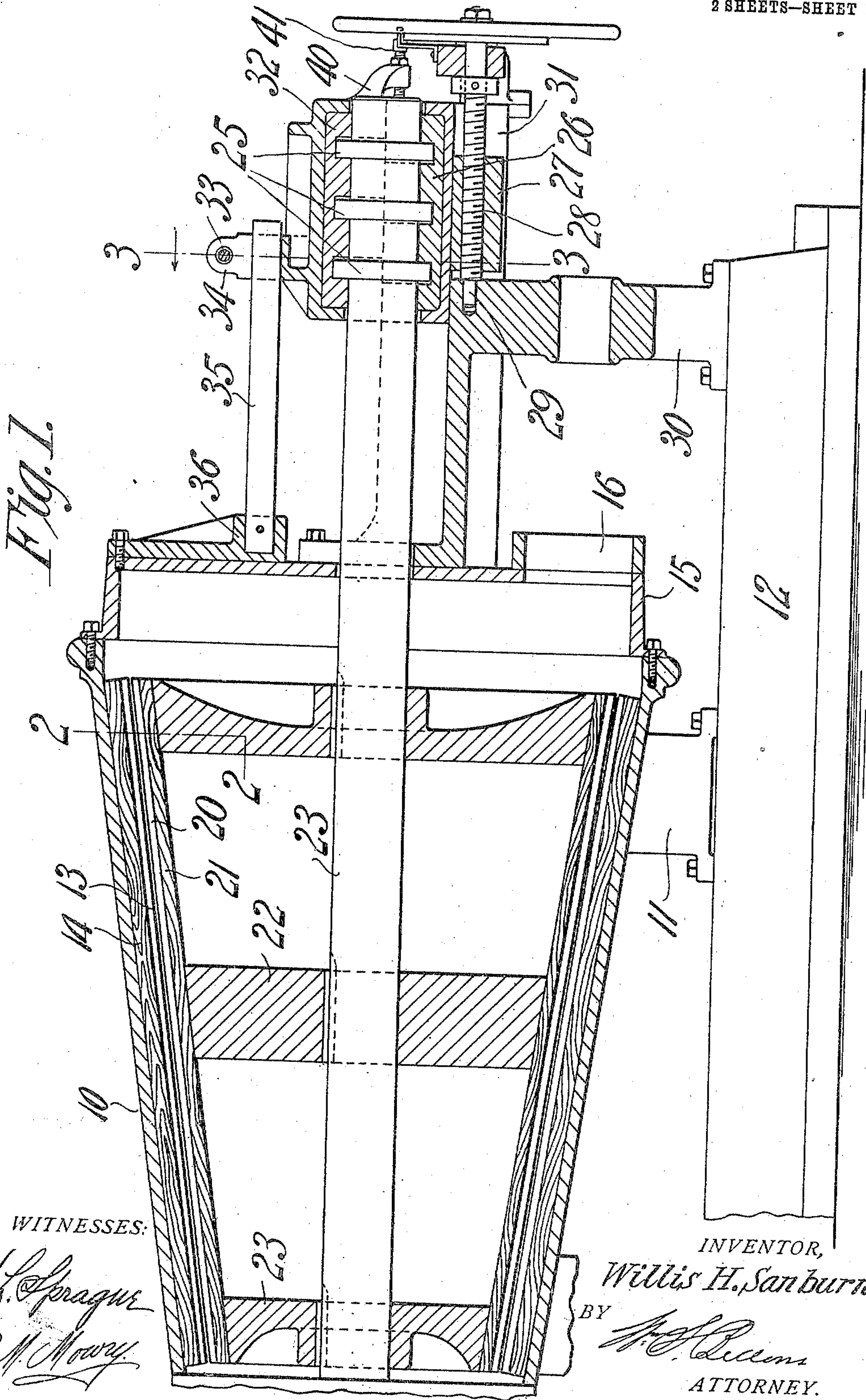


W. H. SANBURN.
 PAPER PULP REFINING ENGINE.
 APPLICATION FILED JAN. 27, 1909.

950,868.

Patented Mar. 1, 1910.
 2 SHEETS—SHEET 1.



WITNESSES:

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R. M. Lowry

INVENTOR,

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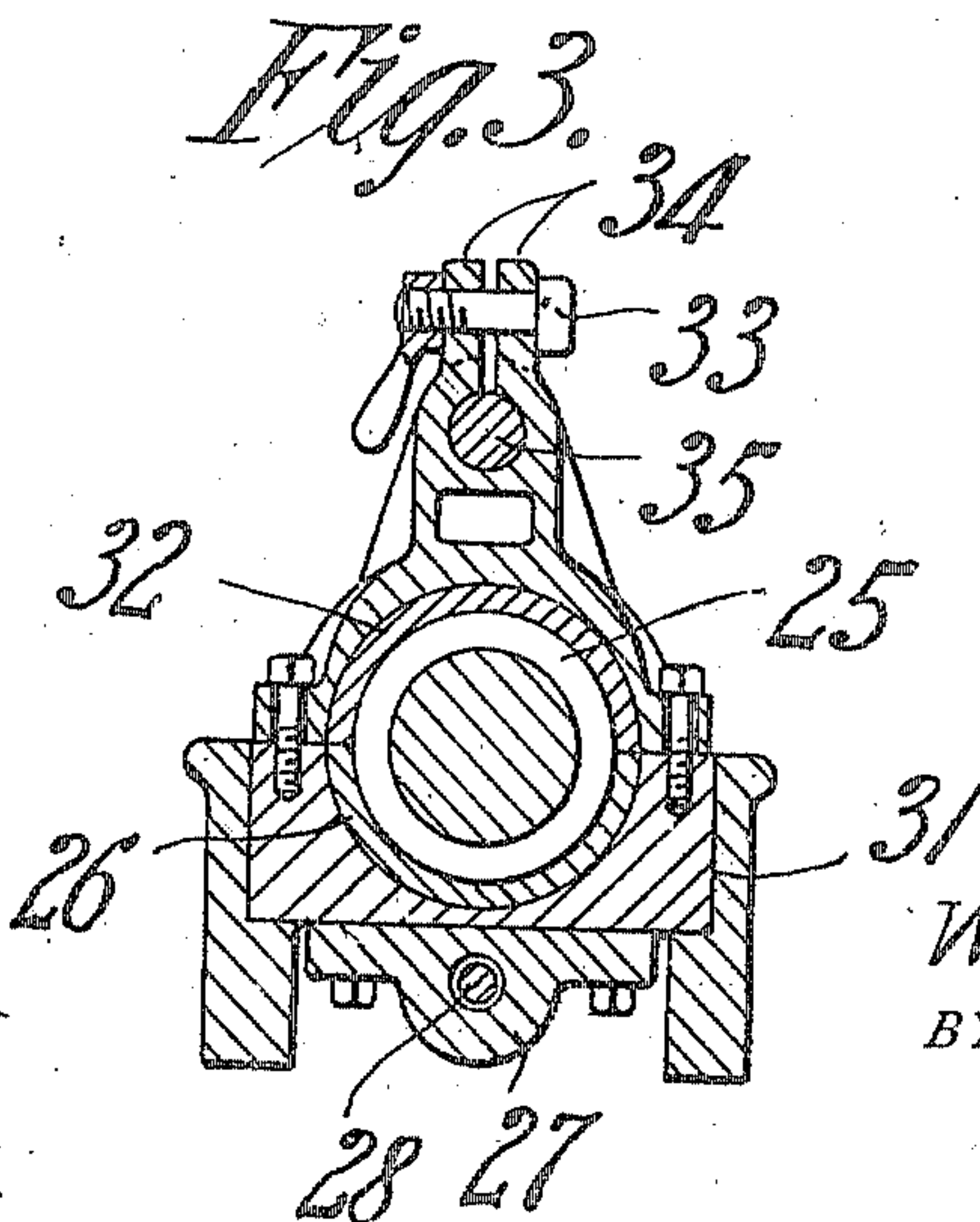
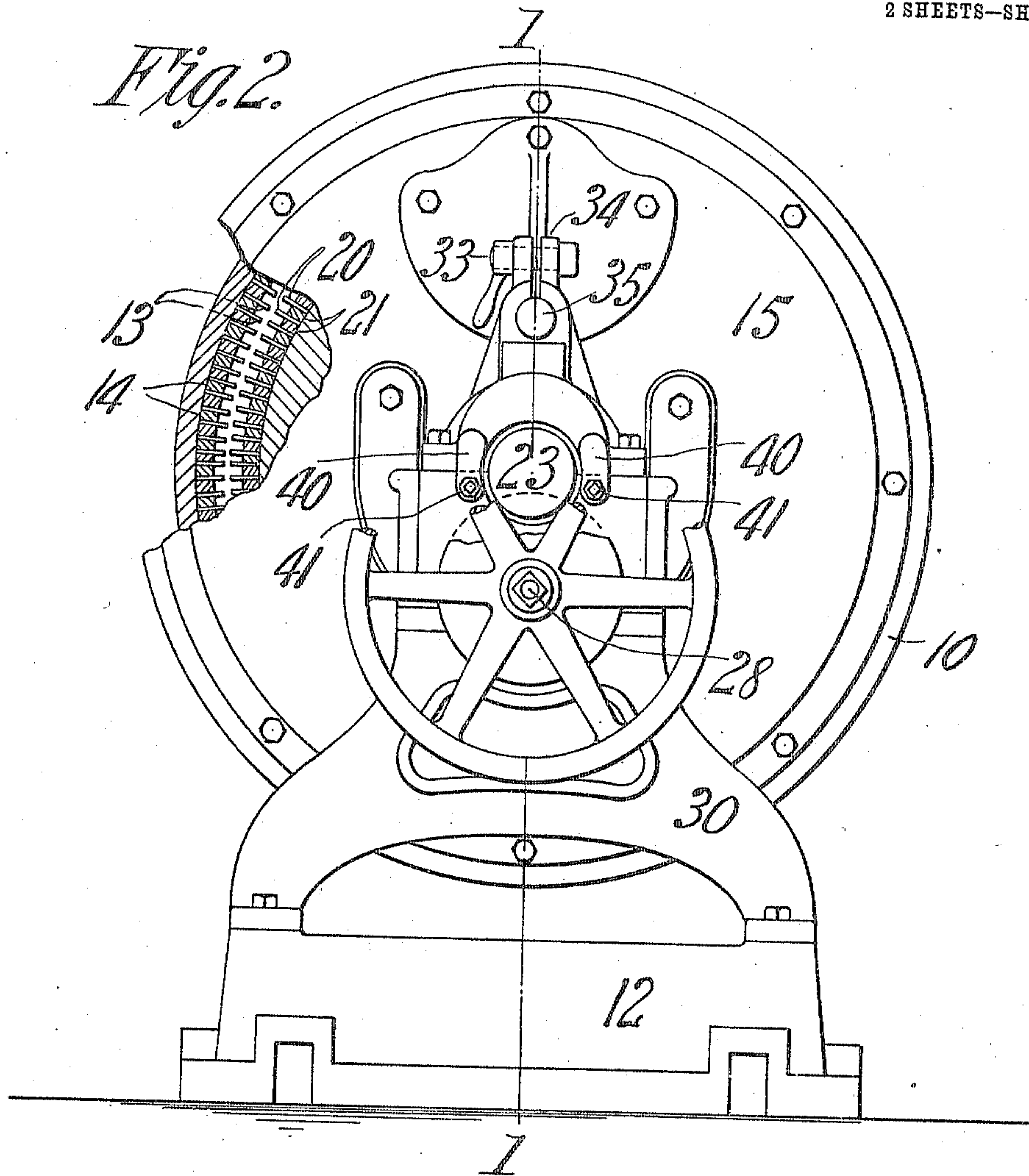
ATTORNEY.

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WILLIS H. SANBURN, OF WEST SPRINGFIELD, MASSACHUSETTS.

PAPER-PULP-REFINING ENGINE.

950,868.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed January 27, 1909. Serial No. 474,609.

To all whom it may concern:

Be it known that I, WILLIS H. SANBURN, a citizen of the United States of America, and resident of West Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Paper-Pulp-Refining Engines, of which the following is a full, clear, and exact description.

This invention relates to pulp-refining engines such as are generally used in paper manufacturing, and it has for its object the provision of a device of this nature in which the movable beater-blades may be closely adjusted relatively to the stationary blades and so as to do away with all back-lash or longitudinal movement of the beater-shaft which would result in varying the distance between the blades.

The refining engine which constitutes the subject matter of the present application is designed to operate upon the pulp in such a manner as to drag the fibers and to lay them smooth without in any way cutting or destroying them, and in order to accomplish this result in the most satisfactory manner it becomes necessary to regulate the distance between the movable blades and stationary blades of the device so that only a certain thickness of pulp can enter between them. It therefore is one of the essential features of the present device that, inasmuch as the blades are longitudinally inclined relatively to the axis of the beater-shaft, all longitudinal movement of the beater-shaft shall be avoided so as to maintain the distance between the blades uniform at all times, it being understood, however, that for different grades of paper to be made, the distance between the blades may be increased or decreased so as to leave a thicker or thinner layer of pulp to be operated upon.

The invention has been clearly illustrated in the accompanying drawings in which—

Figure 1 is a central longitudinal section of a pulp-refining engine embodying my invention. Fig. 2 is an end view thereof partly broken away on line 2 of Fig. 1, and Fig. 3 is a vertical section on line 3, 3 of Fig. 1.

In the drawings, in which similar characters denote similar parts, the numeral 10 denotes a casing which is preferably stationary and supported on standards 11 secured upon a base 12. Disposed on the inner surface of the casing 10, are a series of blades 13 pro-

jecting radially inward therefrom and separated from each other by spacing-strips 14 as usual. Secured to the right hand open end of the casing is a receiver 15 consisting substantially of a cylindrical chamber having at its bottom an outlet 16 from which the refined pulp may be withdrawn. The pulp enters the casing 10 at the smaller and left hand end and is carried along on the blades 13 into contact with a series of beater-blades 20 separated from each other by spacers 21 and secured upon the outer periphery of disks 22 which are mounted for rotation upon and with a shaft 23 to which power may be applied near the left hand end of the device, as shown in Fig. 1, from any convenient source.

The adjacent edges of the blades 13 and 21 are disposed substantially in parallelism so that the thickness of fiber pulp between the blades will be substantially uniform throughout the entire length of the blades and the fibers will, therefore, be acted upon in a uniform manner. Hence it will be understood that, inasmuch as these blades are inclined relatively to the axis of the shaft 23, any longitudinal movement of this shaft would result in changing the distance between the blades and consequently establish a change in the thickness of the pulp, a feature which it is the special aim of the present invention to overcome. The right hand end of the shaft 23 is provided with a series of thrust-collars 25, adapted to enter corresponding grooves in the lower half 26 of a two part bearing which is provided with a lug 27 formed on or secured thereto in the manner shown in Fig. 3, and in screw threaded engagement with an adjusting-screw 28 having a step bearing 29 in a frame 30 which supports the casing at that end and which also has guide-ways 31 so that said box 26 may slide longitudinally thereon. Inasmuch as it is essential to guard against any movement of the shaft 23 in the bearing, the upper half 32 of the bearing is made shiftable relatively to the lower half 26 thereof, so that the left faces or walls of the grooves in the upper half 32 of the bearing will engage the left faces of the collars 25; while the right hand walls of the grooves in the lower part 26 of said bearing will engage the right hand faces of said collars. Consequently, it will be seen that the upper part 32 of the bearing may be shifted to the right and relatively to the lower bearing part 26

until every particle of looseness or back-lash between the collars 25 and bearing parts 26, 32 respectively will be taken up.

The particular means for adjusting the shaft with its beater-blades longitudinally relatively to the stationary blades consists particularly of the screw 28, above referred to, which serves to pull the two part box 26, 32, bodily endwise toward the right, in order to vary the clearance distance between the blades and thus increase or decrease, as the case may be, the thickness of the pulp operated upon by these blades. When properly adjusted the entire device may be firmly secured in place, as for instance by a clamp-screw 33 which passes through a split hub 34 on an ear projecting from the upper bearing half 32, this hub being adapted to grip a rod 35 which is held on a bracket 36 attached to the casing 15 so that a rigid structure throughout will be obtained.

In recapitulation attention is called to the fact that the present device comprises two distinct adjusting features, viz., the removal or avoidance of all back-lash between the shaft-collars 25 and the bearing, which is accomplished by shifting the upper half 32 of the bearing relatively to the lower half 26 thereof, and secondly, the movement, bodily, of the bearing with the shaft 23 and the beater-blades carried thereby to effect a change in the thickness of the pulp to be operated upon.

The particular means for accomplishing

the shifting movement of the bearing half 32 to the lower half 26 may be of many different constructions, and I have shown in the drawings a pair of ears 40 formed on the upper bearing half 32 and carrying adjusting screws 41 butting against the body portion of the lower bearing half 26.

It is to be distinctly understood that I do not confine myself to the particular construction of the several elements above described and shown in the drawings, as many changes may be made therein without departing from the spirit or gist of the invention.

I claim:

The combination, with a casing having a bearing and a series of longitudinally inclined blades, and a beater-device comprising a series of inclined blades coöperative therewith, of a shaft supporting said beater-device and journaled in said casing, means for preventing longitudinal movement of said shaft in said bearing, a screw in engagement with said casing and for shifting said bearing in one direction, a rod on said casing, and a clamp-device carried by one of the bearing parts and in engagement with said rod to hold said bearing in shifted position.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

WILLIS H. SANBURN.

Witnesses:

G. R. DRISCOLL,
WM. S. BELLOWS.