

I. C. RUST.
WINDMILL MECHANISM.
APPLICATION FILED APR. 24, 1909.

936,568.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

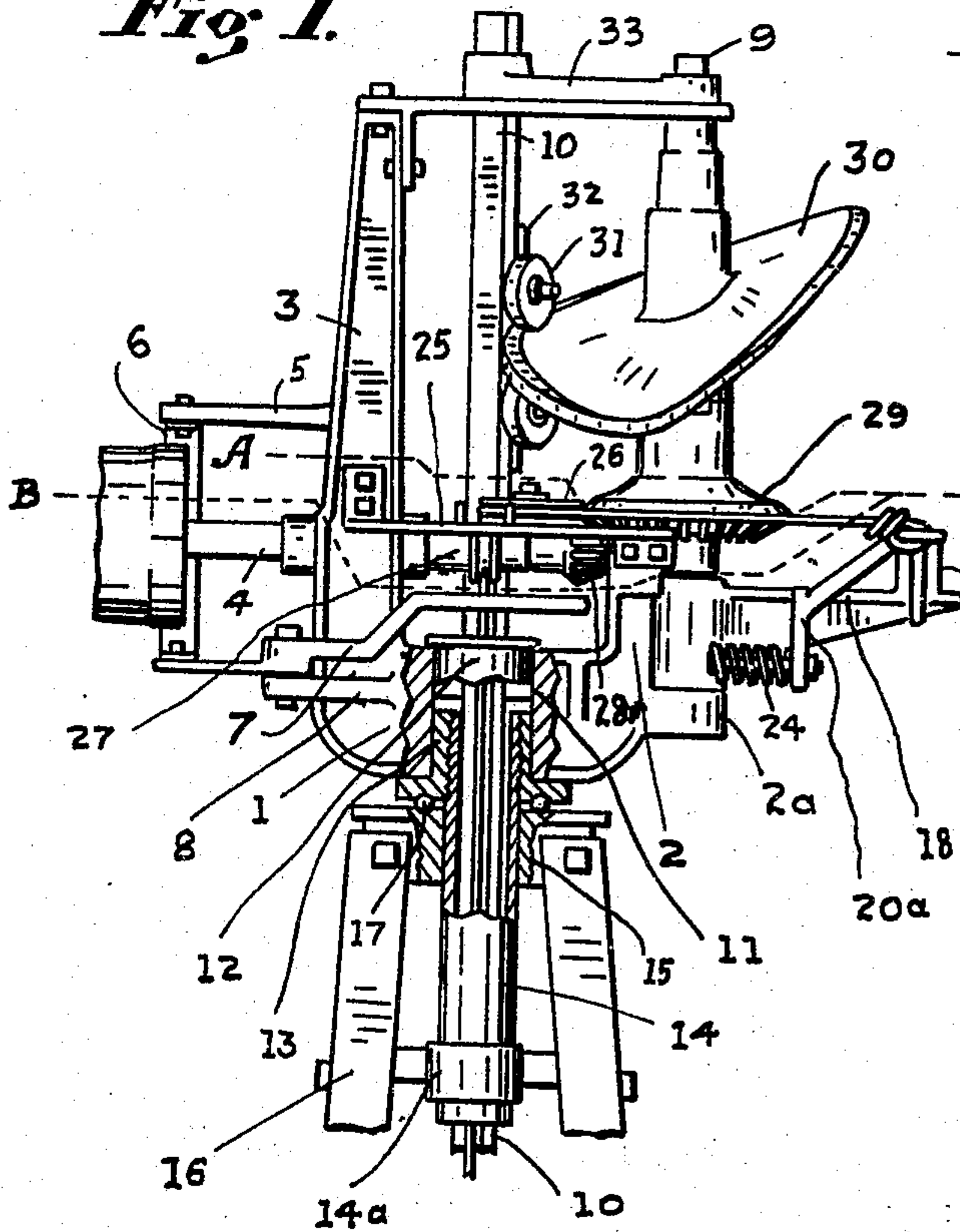


Fig. 2.

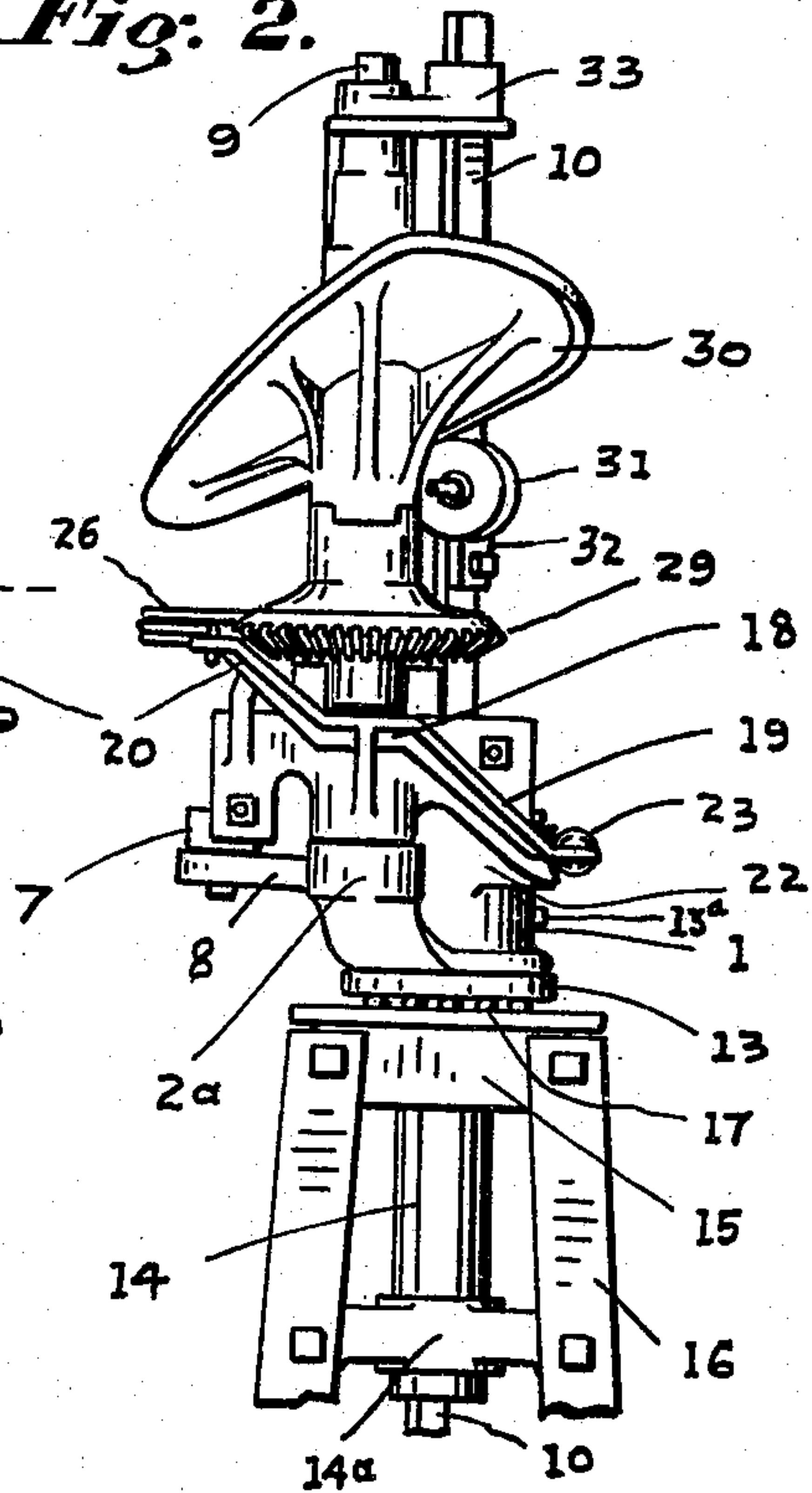
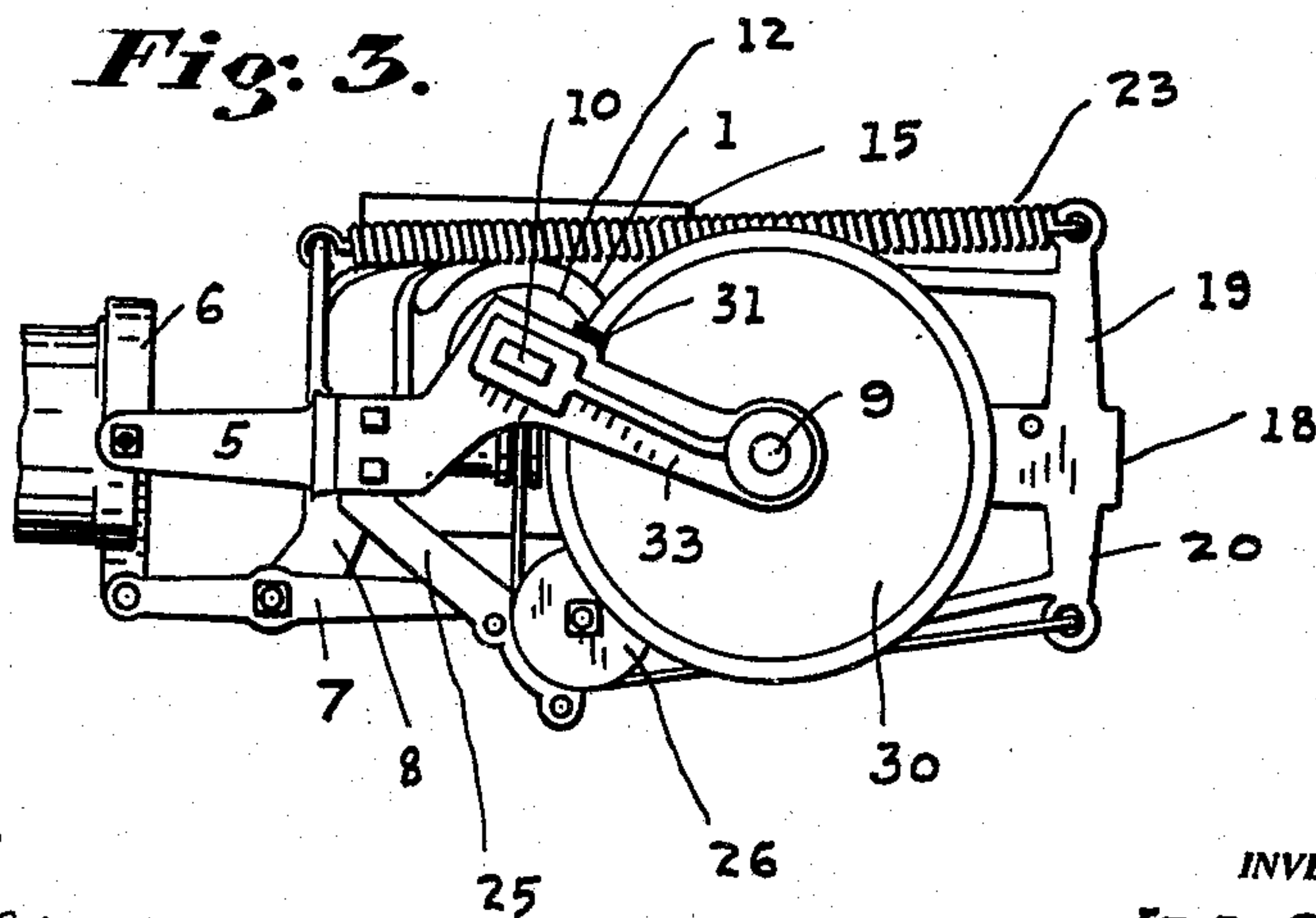


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

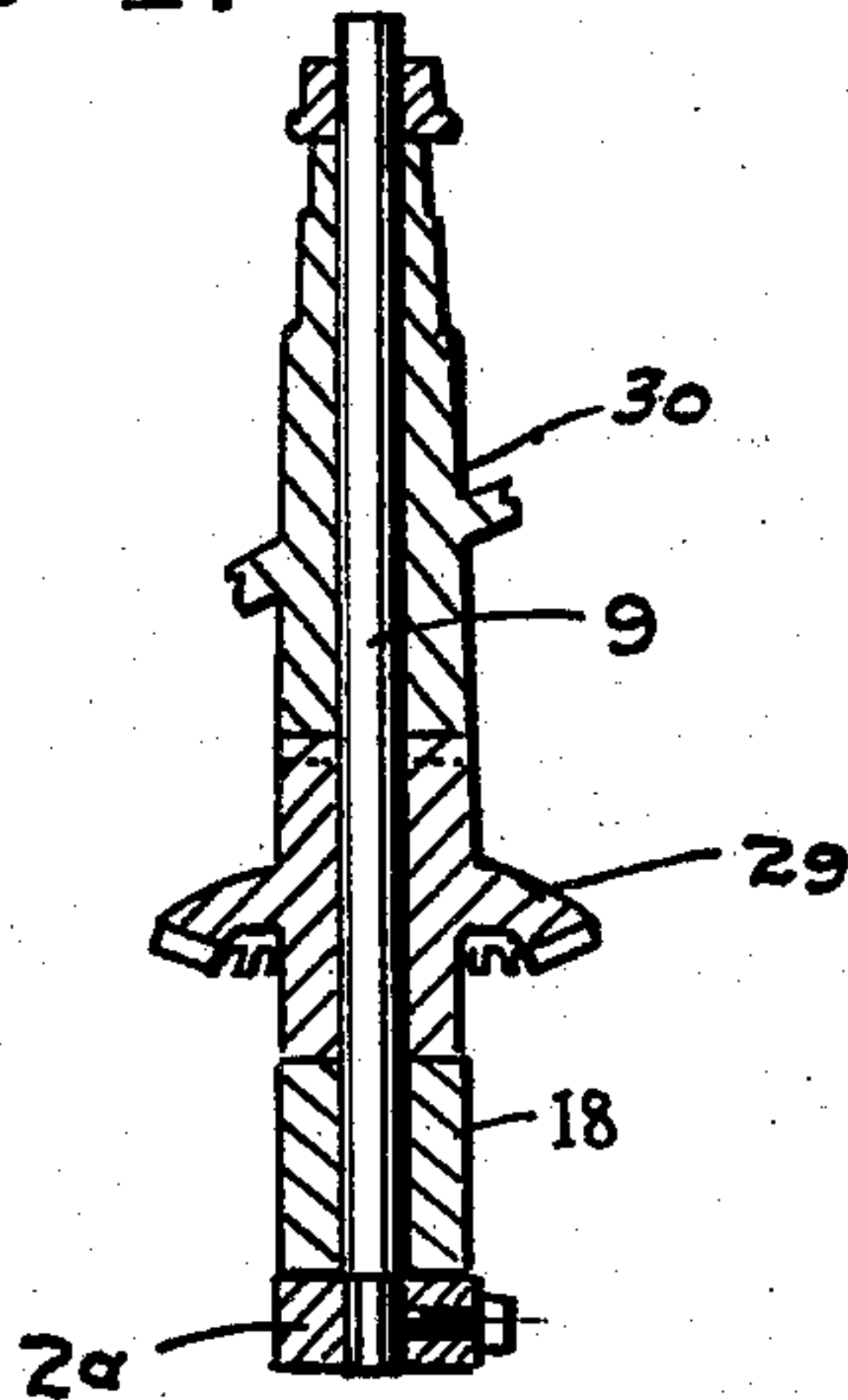


Fig. 6.

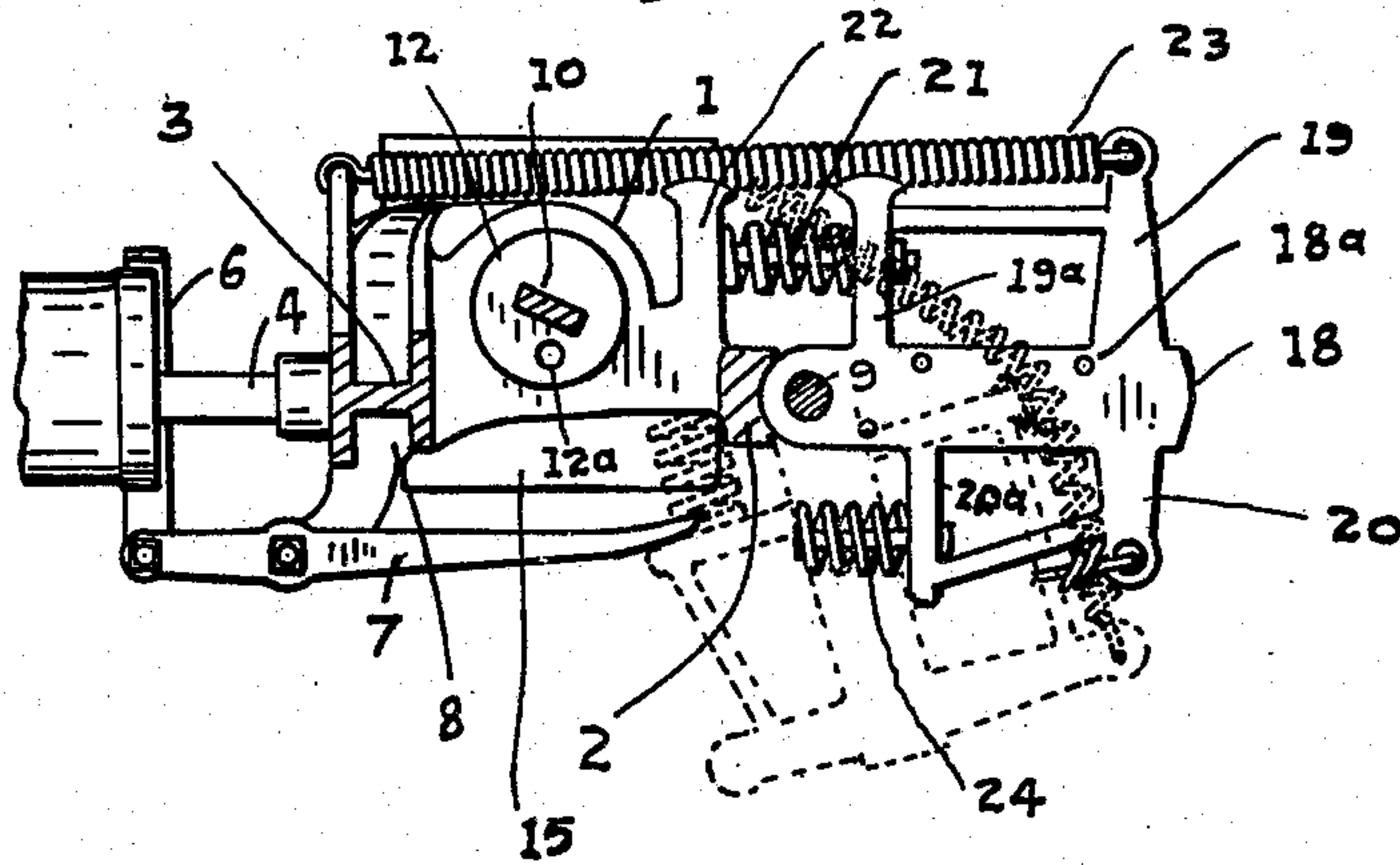
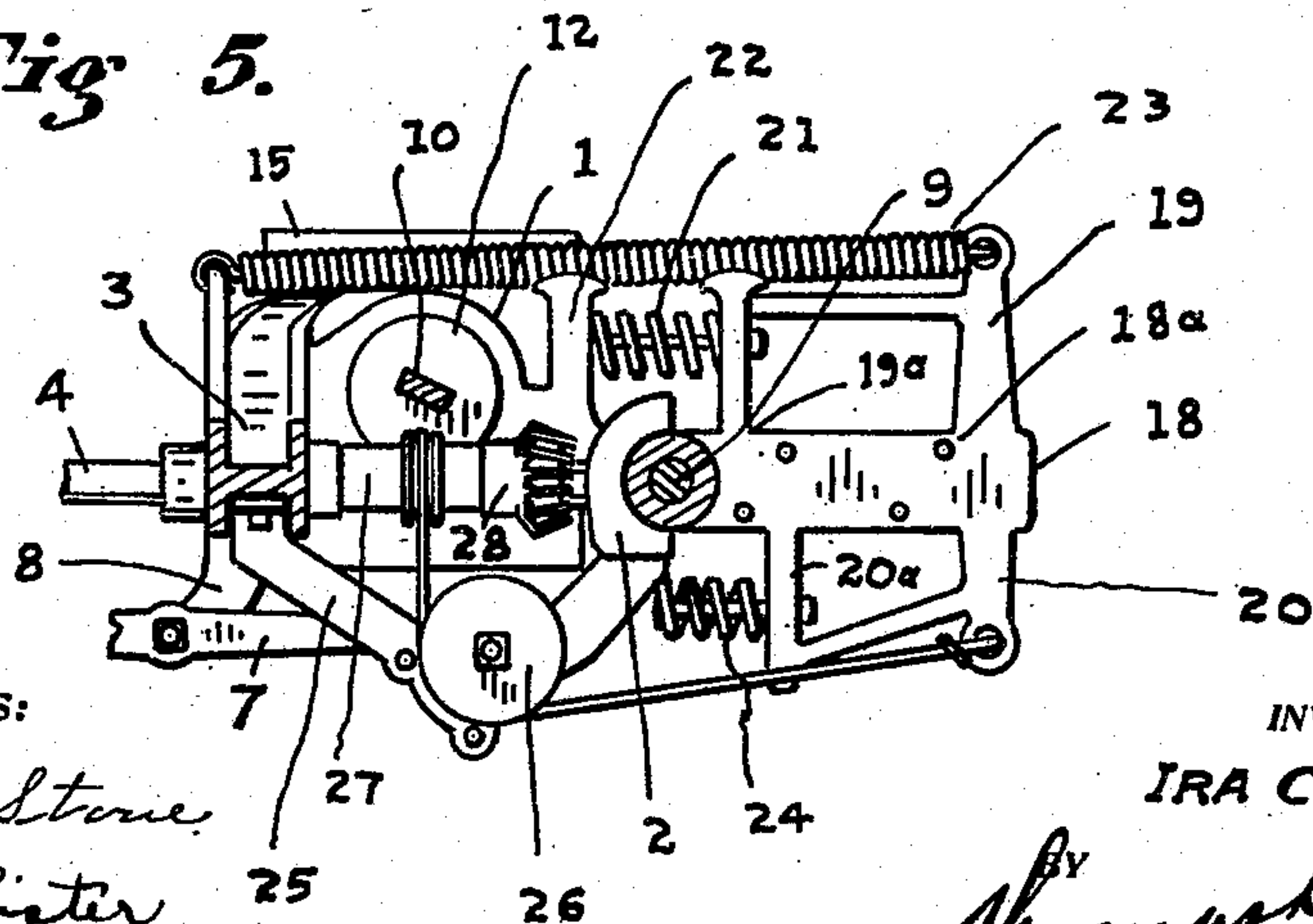


Fig. 5.



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UNITED STATES PATENT OFFICE.

IRA C. RUST, OF FARMLAND, INDIANA, ASSIGNOR OF ONE-FOURTH TO CHARLES A. MENDENHALL AND ONE-FOURTH TO EDWARD J. MENDENHALL, OF FARMLAND, INDIANA.

WINDMILL MECHANISM.

936,568.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed April 24, 1909. Serial No. 491,903.

To all whom it may concern:

Be it known that I, IRA C. RUST, a citizen of the United States, and residing at Farmland, in the county of Randolph, State of Indiana, have invented new and useful Improvements in Windmill Mechanisms, of which invention the following is a specification.

This invention pertains to improvements in power transmitting means wherein rotary movement is converted into reciprocatory motion, and it has more especial reference to mechanisms of wind mills. In this class of mills it is very desirable that the motion furnished by the rapidly rotating wind wheel, shall be so converted and transmitted that the member or rod which operates the pump or other machinery, will have imparted to it a positive regular and steady movement.

To accomplish the aforesaid desirable results, are the objects, broadly stated, of my invention.

Further objects of my present invention are to provide a power and motion transmitting means which may be easily rendered inoperative and the wind wheel may be held against rotary movement.

Other and more specific objects are to provide a device of the kind described which will be substantial and strong, not liable to get out of order or repair, and which will be economical of construction and easy of installation.

The aforementioned objects of my invention are accomplished by and my invention is embodied in the new construction, combination and arrangement of parts described in this specification, defined in the appended claims, and illustrated in the accompanying drawings.

Similar characters of reference refer to corresponding parts throughout the several views in the drawings, in which—

Figure 1 is a side view, Fig. 2 is an end view, and Fig. 3 is a plan view of my invention complete, the central portion in the first named view being shown in section. Fig. 4 is a detached transverse sectional view of the cam member and upright shaft removed. Fig. 5 is a horizontal plan view taken on the line A Fig. 1. Fig. 6 is a horizontal plan view taken on the line B Fig. 1.

From the base 1 of the frame of my improved mechanism rise the upwardly dis-

posed arms 2 and 3. Journaled in suitable bearings carried by the said arms is the shaft 4 upon the outward portion of which is secured the hub of the wind wheel and which hub may be of any acceptable style or structure. Projecting from the arm 3 is a lug 5 upon the end of which is fastened the fixed end of the brake band 6. This flexible brake band is of proper form to engage the peripheral face of the said hub, and its lower end is fastened to the short arm of the lever 7 which is pivotally supported on the lug 8. This lever is so formed that the free end thereof will occupy the position relative to the frame, as plainly shown in the drawings. The bottom portion 2^a of the arm 2 has a vertical bore in which the upright shaft 9 is journaled. The upper portion of the arm 2 has a horizontal bore or recess in which the inner end of the shaft 4 is journaled. The center point of the base portion 1 is to one side of the center line of the shaft so that there will be ample clearance between the said shaft, and the vertical reciprocatory bar 10. As a means to sustain the reciprocatory bar 10 in correct central position in the bore 11 of said base portion, there is provided the guide block or bushing 12 suitably secured in position and having an aperture in which the bar 10 is free to move slidingly. The shoe 13 has its upper portion of proper diameter to fit within said central bore, where it is held by set screws 13^a. Screwed tightly into the shoe is the hollow upright member 14 which extends downwardly through the platform of the tower upon which the mill is carried. The lower end of this upright is free to move rotatively but is held against transverse movement by the spider 14^a which is secured to the tower structure. The platform 15 which is suitably supported in fixed position by the tower structure 16, has a central opening through which the aforesaid upright 14 is easily passed. Complementary annular races in the facing surfaces of the shoe and the platform form runways between which are disposed the balls 17. By this construction and arrangement of the several parts the frame has the usual free pivotal movement, and will be sustained in correct vertical position.

It will be understood that a swivel connection (not shown) at a proper location in the rod 10 is provided, so that the rod will

be operative at all times regardless of the relative position of the mill frame on its platform.

Loosely supported on the upright shaft 9 is the vane beam 18 that has the holes 18^a in its upper side to receive bolts for fastening the vane (not shown) rigidly in position thereon. This vane beam has the arms 19—19^a and 20—20^a joined together respectively by suitable stiffening webs. Carried by the arm 19^a is the strong buffer spring 21 the free end of which spring will bear against the lug 22 carried by the frame. The normal position of the vane beam with reference to the frame, when the mill is operating, is that shown in Fig. 5, the vane beam is held in the position shown, by the coil spring 23 which has its one end fastened to the arm 19 and the other to the frame proper. The outer ends of the arm 19^a and the lug 22 are suitably widened and recessed so as to let the coil spring 23 rest and move therein. Carried by the arm 20^a is the buffer spring 24 the function of which will presently be referred to.

On a bracket 25 carried by the frame, is the grooved pulley 26. A cable or rope that is fastened to the arm 20 is passed over this pulley thence over a grooved pulley 27 that is carried loosely on the shaft 4, thence downwardly through the perforation 12^a in the guide block 12. This cable is sufficient in length so that a person standing on the ground at the base of the tower may manipulate same. When the cable is pulled downwardly the vane beam will be moved around into the dotted line position shown in Fig. 6. As this position of the vane beam is reached the wind wheel will no longer stay in the wind and by the pressure of the arm 20^a against the brake lever 7, the brake band is quickly tightened against the hub of the wind wheel and the latter will be held against rotation. The attendant may then secure the cable so that the vane beam may be kept in the inoperative position. To prevent undue jar of the frame and to prevent too sudden actuation of the brake lever, when the operation of throwing around the brake beam is performed, as just described, is the function of the buffer spring 24. With the pulling down of the cable and the moving of the vane beam, as the latter reaches the dotted line position, the buffer spring strikes the base portion of the frame in advance of the engagement by the arm 20^a of the lever 7. On the inner end of the shaft 4 is secured a bevel gear wheel 28 which meshes with the gear wheel 29. This gear wheel 29 is loosely disposed on the upright shaft 9, and the upper face of its hub is toothed, as shown in Fig. 1, and Fig. 2 to receive the complementally toothed hub of the cam wheel 30. The structure and position of this cam wheel is plainly shown in Figs. 1, 2 and 3, the

peripheral face of its web will operate between a pair of antifriction rollers 31—31 which are journaled on the pillow block 32 that is fastened to the bar 10.

The general feature of a cam of the character herein shown rigged to be actuated by gearing from a shaft adapted to be operated by a wind wheel, said cam to actuate a reciprocatory member, is shown in Patent No. 913,918, granted to me March 2, 1909. Since the construction of the device shown in said patent, my present invention has been developed and perfected.

In the present invention the conformation of the web of the cam wheel is such that as the cam wheel is rotated, the movement of the reciprocatory bar 10 is decidedly more rapid in its downward stroke than upon its upward stroke, the desirability of which is obvious. The time necessary for the reciprocation of the bar 10 is so conserved that, (in the proportionate ratio as shown) the "lift" movement is given two thirds, and the downward stroke one third of the time necessary for the rotation of the cam wheel.

By the new combination, construction and arrangement of the several parts my invention is rendered of practicable utility for any desired stroke of the pump piston. Cam wheels having different forms of webs to accommodate pumps of greater or less stroke, or for pumping material of varied specific gravity, may be supplied. The upper portion of the hub of the cam wheel is of such length that when the top member 33 which forms the upper boxing for the upright shaft 9, and the guide head for the reciprocatory bar 10, is bolted into position on the upper end of the arm 3, the parts will all be retained in the correct position as shown, and the frame will be complete.

It will be understood that minor changes may be made in the conformation and detail construction and arrangement of the several parts, within the scope of my invention as the same is defined by the appended claims without departing from the nature or spirit of my invention, and without sacrificing any of its advantages.

What I claim as my invention and desire to secure by Letters Patent of the United States, is—

1. A device of the kind described comprising a frame having oppositely disposed and upwardly extended, a main arm and a short arm the said arms being at one side of the base portion of said frame, the said base portion being provided with a vertical aperture in which is retained a guide head, a reciprocatory bar guided in said guide head and having a pair of anti-friction rollers carried thereon, an upright shaft supported by said short arm, a cam wheel mounted loosely on the said upright shaft the web of which cam wheel will engage the said anti-

friction rollers, a bevel gear wheel upon which the said cam wheel is removably carried, a driving shaft journaled in the arms of the frame and having a pinion thereon to mesh with the said bevel gear wheel, a frame member in which the reciprocatory bar is guided and in which the upper end of the upright shaft has a bearing and which frame member is removably secured to the main arm.

2. A device of the kind described comprising a frame having oppositely disposed and upwardly extended, a main arm and a short arm, the said arms being at one side of the base portion of said frame, the said base portion being provided with a vertical aperture in which is retained a guide head, a reciprocatory bar guided in said guide head and having a pair of anti-friction rollers carried thereon, an upright shaft supported by said short arm, a cam wheel mounted loosely on the said upright shaft the web of which cam wheel will engage the said anti-friction rollers, a bevel gear wheel upon which the said cam wheel is removably carried, a driving shaft journaled in the arms of the frame and having a pinion thereon to mesh with the said bevel gear wheel, a frame member in which the reciprocatory bar is guided and in which the upper end of the upright shaft has a bearing and which frame member is removably secured to the main arm, a vane beam supported by the frame, yieldable means to sustain the vane beam normally in alinement with the driving shaft, means to move the vane beam out of said alinement.

3. A device of the kind described comprising a frame having oppositely disposed and upwardly extended, a main arm and a short arm, the said arms being at one side of the base portion of said frame, the said base portion being provided with a vertical aperture in which is retained a guide head, a reciprocatory bar guided in said guide head and having a pair of anti-friction rollers carried thereon, an upright shaft supported by said short arm, a cam wheel mounted loosely on the said upright shaft the web of which cam wheel will engage the said anti-friction rollers, a bevel gear wheel upon which the said cam wheel is removably carried, a driving shaft journaled in the arms of the frame and having a pinion thereon to mesh with the said bevel gear wheel, a frame member in which the reciprocatory bar is guided and in which the upper end of the upright shaft has a bearing and which frame member is removably secured to the main arm, a vane beam having its end carried loosely on the upright shaft, and having arms extended on either side and at substantially right angles thereto, a buffer spring carried by each of said arms, a holding spring having its one end connected to one

of said arms and its other end connected to the frame, there being a lug on the frame to be engaged by the buffer spring that is adjacent the holding spring so that by the tension of the holding spring the position of the vane beam so sustained will be in alinement with the driving shaft, and means to move the vane beam out of said alinement.

4. A device of the kind described comprising a frame having oppositely disposed and upwardly extended, a main arm and a short arm, the said arms being at one side of the base portion of said frame, the said base portion being provided with a vertical aperture in which is retained a guide head, a reciprocatory bar guided in said guide head and having a pair of anti-friction rollers carried thereon, an upright shaft supported by said short arm, a cam wheel mounted loosely on the said upright shaft the web of which cam wheel will engage the said anti-friction rollers, a bevel gear wheel upon which the said cam wheel is removably carried, a driving shaft journaled in the arms of the frame and having a pinion thereon to mesh with the said bevel gear wheel, a frame member in which the reciprocatory bar is guided and in which the upper end of the upright shaft has a bearing and which frame member is removably secured to the main arm, a vane beam having its end carried loosely on the upright shaft, and having arms extended on either side and at substantially right angles thereto, a buffer spring carried by each of said arms, a holding spring having its one end connected to one of said arms and its other end connected to the frame, there being a lug on the frame to be engaged by the buffer spring that is adjacent the holding spring so that by the tension of the holding spring the position of the vane beam so sustained will be in alinement with the driving shaft, means to move the vane out of said alinement embodying a bracket carried by the frame upon which is mounted a pulley, a cable having its end fastened to the arm of the vane beam that is opposite the holding spring the free end of which cable is passed over the said pulley and over the driving shaft, and down through the guide head substantially as described.

5. In a wind mill mechanism the combination of a frame, a driving shaft journaled thereon above and aside from the center of the base portion of said frame, a reciprocatory bar having anti-friction rollers thereon, a guide head in said base portion of the frame and through which is guided the said reciprocatory bar, a bevel gear wheel journaled on said frame, a cam wheel carried by the bevel gear wheel, having its web engaging the said anti-friction rollers, a wind wheel, a flexible brake band adapted to engage the hub of the wind wheel, a lug provided on the frame and to which lug the brake band has its end

fastened, a brake lever fulcrumed on the
frame and that has connection with the brake
band, the arm of said lever being of such
form as to be engaged by the arm of the
5 vane beam when the latter is moved out of
alinement, a vane beam provided with ex-
tended arms on either side thereof, and that
has its inner end connected loosely to the
frame, a holding spring having connection
10 with the frame and with one of the said
extended arms, to hold the vane beam in
alinement with the driving shaft, a pulley
supported by the frame, a pulley carried by
the horizontal shaft, a cable having its end

secured to the arm on the vane beam that is 15
opposite the holding spring, said cable being
passed over the said pulley supported by
the frame and the said pulley carried by the
horizontal shaft and hence down through
the guide head carried by the base portion of 20
the frame, substantially as described.

In testimony whereof I have hereunto
signed my name to this specification in the
presence of two subscribing witnesses.

IRA C. RUST.

Witnesses:

ETHEL L. LISTER,
JOHN W. RYAN.