

No. 855,343.

PATENTED MAY 28, 1907.

A. J. ROBINSON.
QUICK RELEASE FOR GRINDING MILLS.

APPLICATION FILED MAR. 10, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

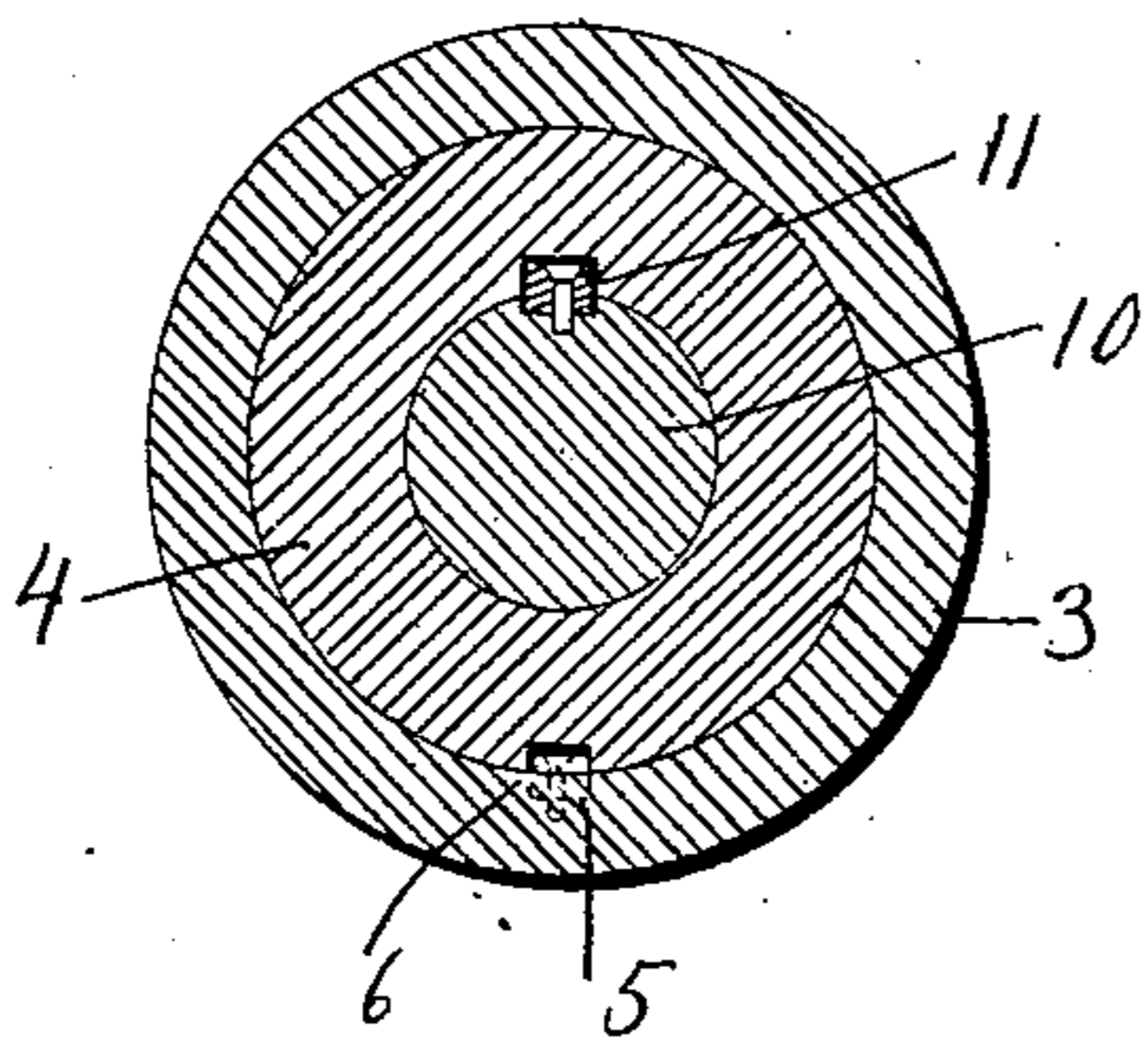
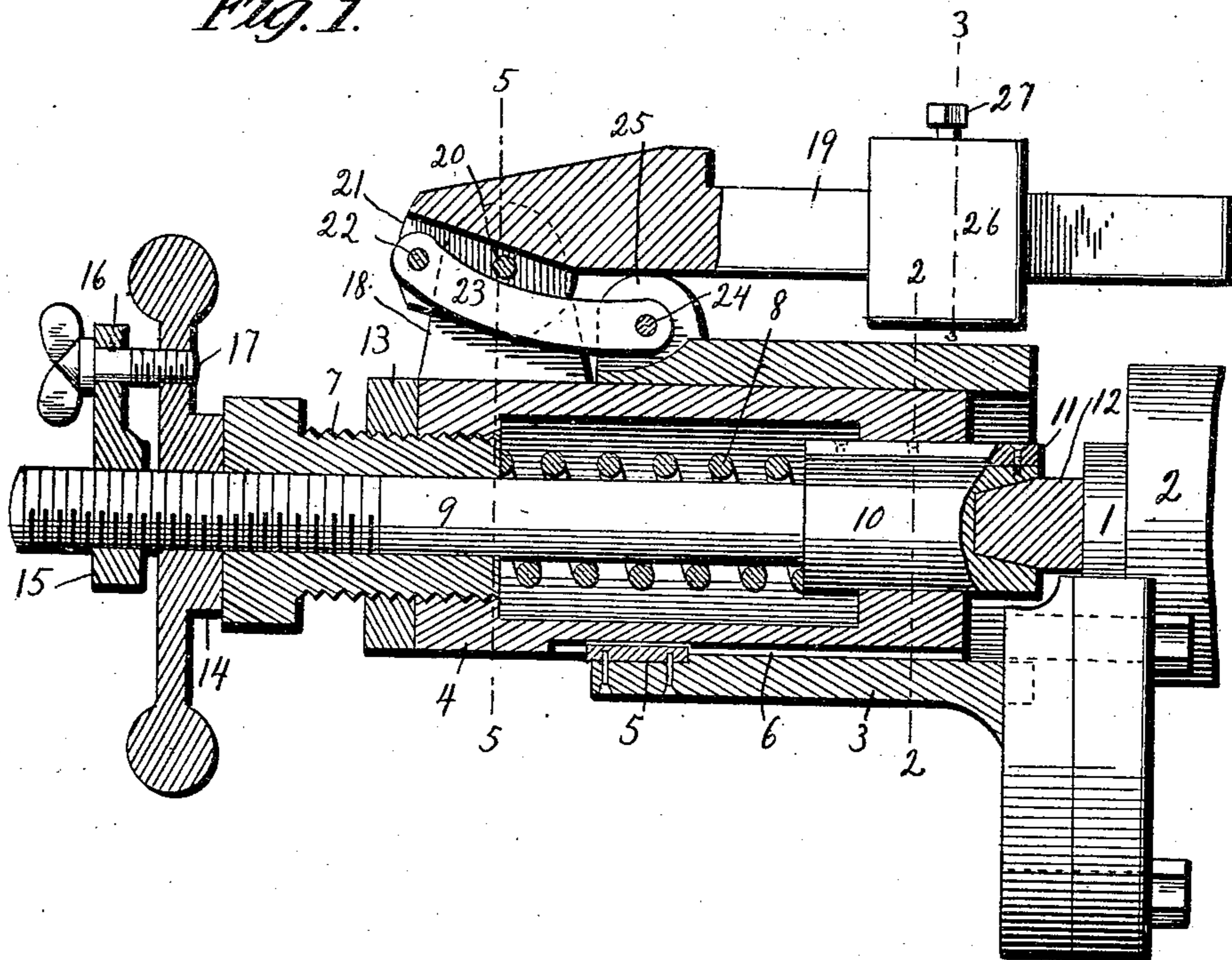


Fig. 2.

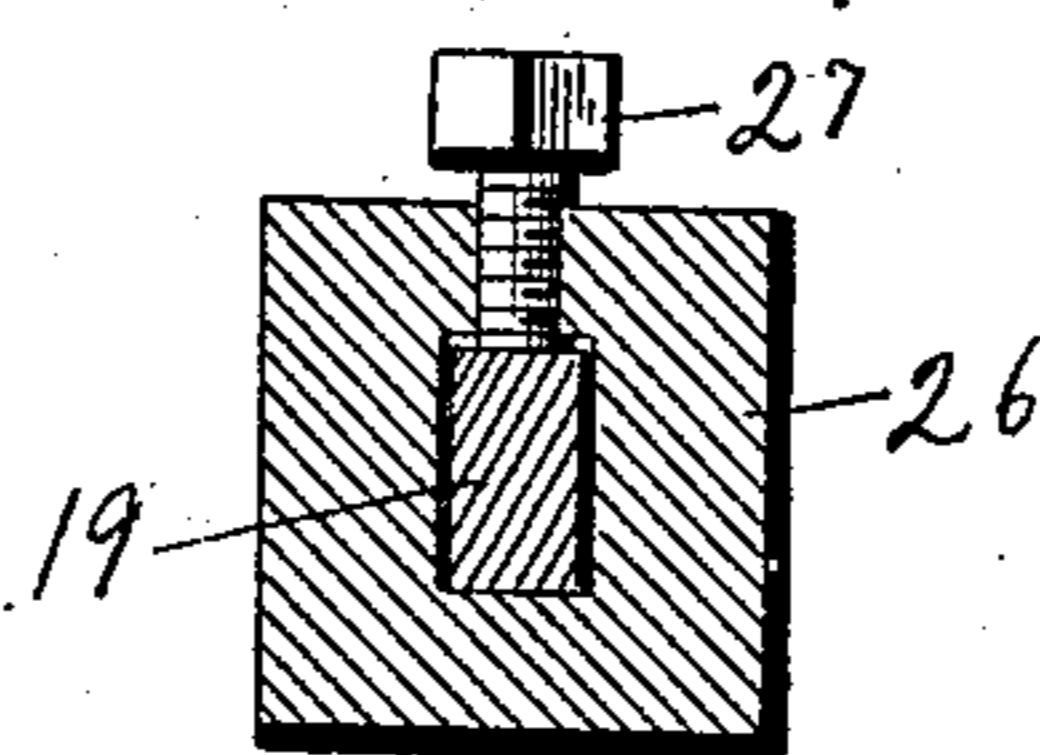


Fig. 3.

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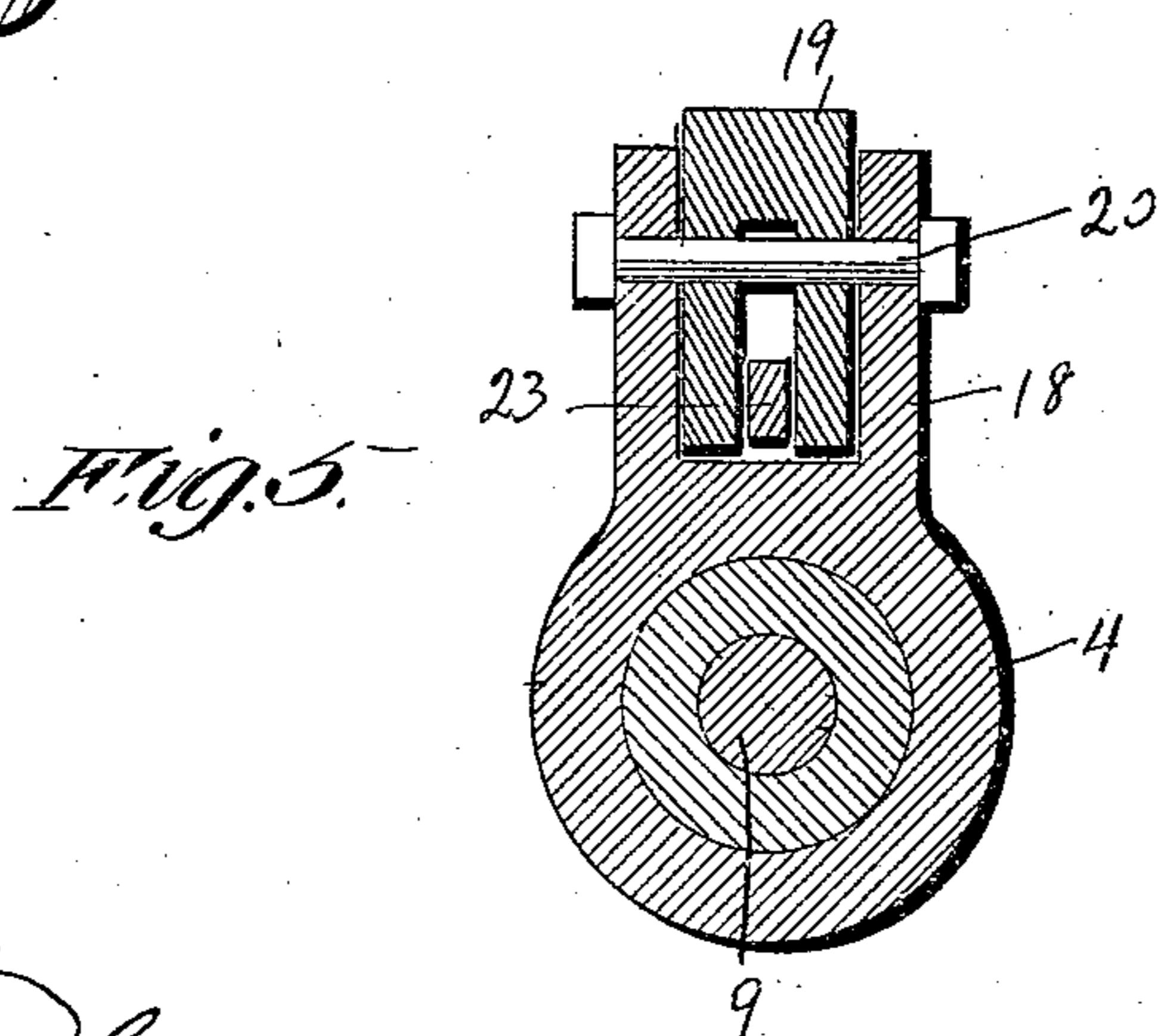
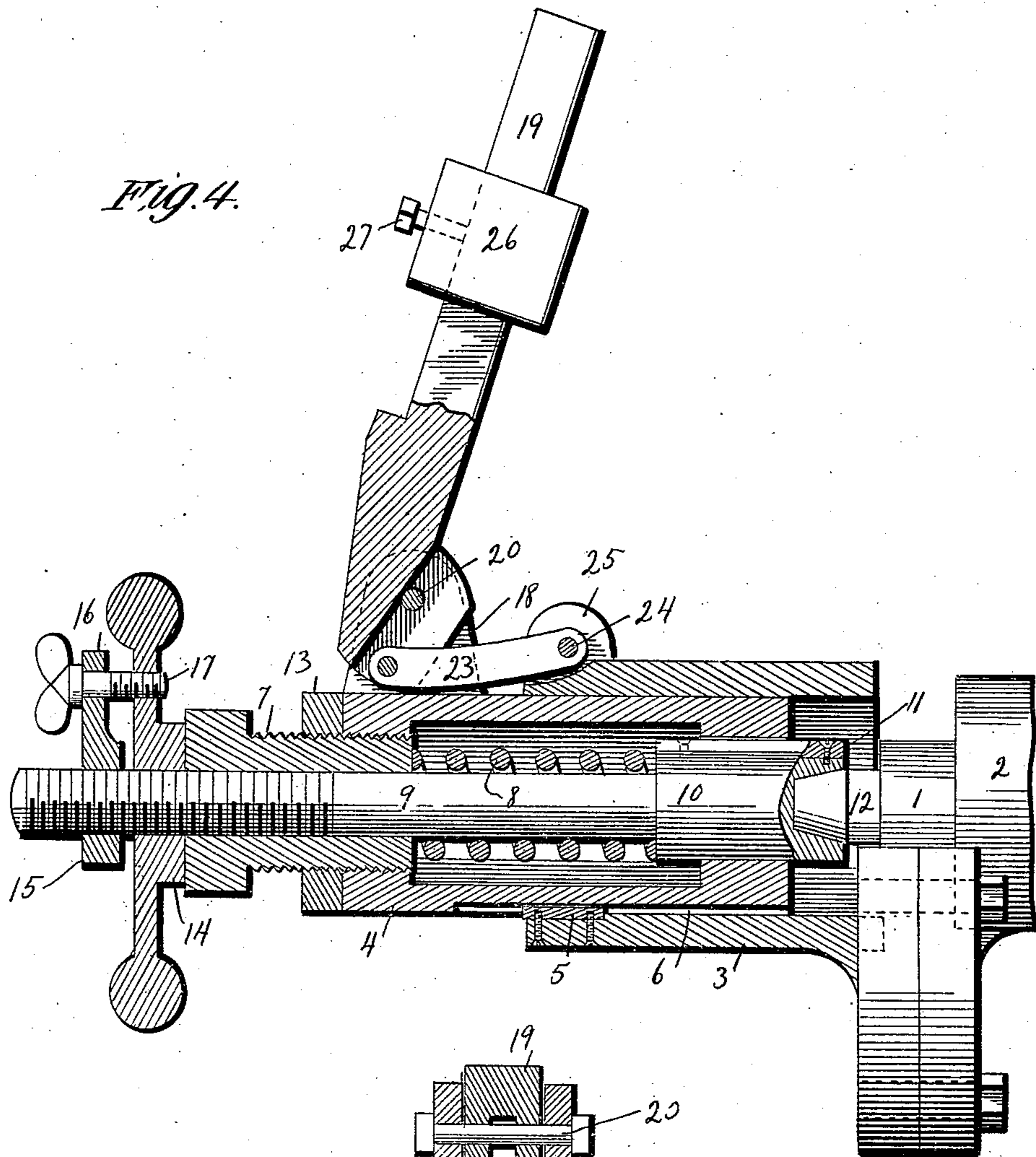
Rexford M. Smith, Attorney

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3 SHEETS—SHEET 3.

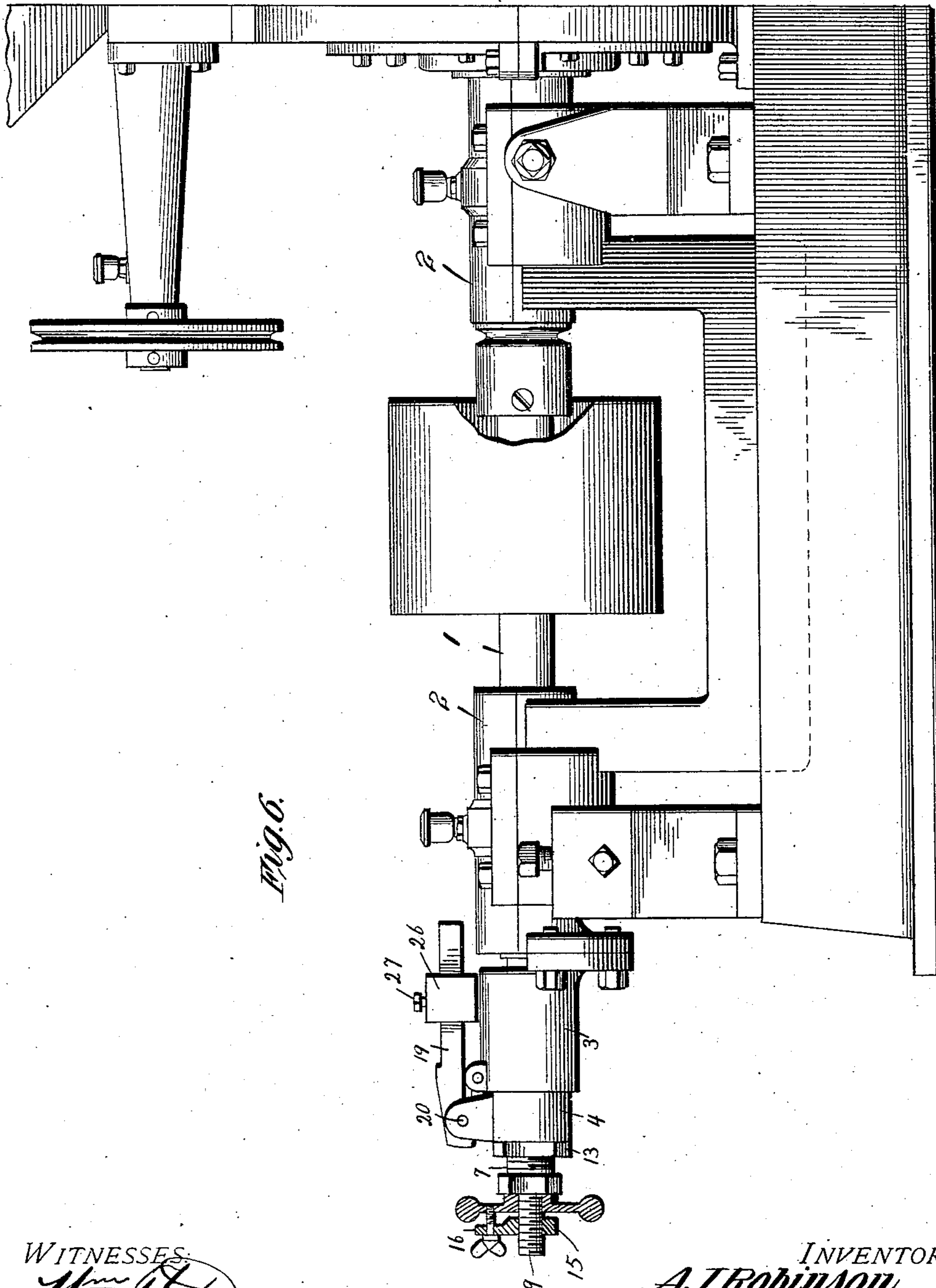


Fig. 6.

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UNITED STATES PATENT OFFICE.

AARON J. ROBINSON, OF FREMONT, NEW HAMPSHIRE.

QUICK RELEASE FOR GRINDING-MILLS.

No. 855,343.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed March 10, 1905. Serial No. 249,419.

To all whom it may concern:

Be it known that I, AARON J. ROBINSON, a citizen of the United States, residing at Fremont, in the county of Rockingham and State of New Hampshire, have invented a certain new and useful Quick Release for Grinding-Mills, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to grinding mills of the type in which a divided horizontal shaft is provided with opposing grinding disks mounted on the inner adjacent ends of the shaft sections, and in which one of the shafts together with its disk is movable in the direction of the axis of the shaft for the purpose of allowing for separation between the grinding disks to permit hard substances and foreign matter to escape without injury to the disks and other parts of the mill.

The present invention has special reference to the means for holding the movable section of the shaft and the disk thereon up to their work, the object of the invention being to provide means for automatically relieving the pressure on the outer end of the movable shaft section, the mechanism contemplated in this invention being so constructed and arranged that the buffer which holds the shaft to its work will be relieved with progressively diminishing force as excessive pressure is applied to the movable disk in a lateral direction, the degree of resistance to the movement of the buffer decreasing progressively as the degree of separation between the grinding disks increases.

A further object of the invention is to provide in connection with said automatic relief mechanism, means for regulating the degree of resistance applied to the movable disk in its outward movement to relieve excessive pressure, and also to effect the return of the buffer to its normal operative position.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement of parts herein fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a vertical longitudinal section through the buffer casing, showing also the buffer step or slide and its operative connections partly in section and partly in elevation. Fig. 2 is a cross section taken on the line 2—2 of Fig. 1. Fig. 3 is a cross-section taken on the line 3—3 of Fig. 1. Fig. 4 is a section

similar to Fig. 1, showing the buffer slid outward and the weighted controlling lever swung upward. Fig. 5 is a cross-section taken on the line 5—5 of Fig. 1. Fig. 6 is a view in elevation of one half of a grinding mill, showing the invention applied thereto.

Like reference numerals designate corresponding parts in all figures of the drawings.

In the accompanying drawings 1 designates the endwise movable section of the divided shaft of the ordinary horizontal grinding mill, said shaft being mounted in the usual journal boxes, one of which is shown at 2.

Connected with the machine frame and projecting outwardly therefrom is a fixed buffer casing 3 which is preferably cylindrical in shape and adapted to receive a correspondingly shaped buffer step or slide 4, the latter being prevented from turning by means of a key 5 which is connected with the casing 3 and works in a spline 6 in the step or slide 4. The step or slide is hollow and the outer end thereof is bored and threaded to receive a tension screw 7 against the inner end of which is seated one end of a buffer spring 8, which encircles a buffer stem 9 provided at its inner end with a buffer head 10, against which the opposite end of the spring 8 bears. The head 10 is preferably cylindrical in shape and is prevented from turning by means of a key 11 which is carried by the head 10 and works in a spline in the inner end of the step or slide 4. The inner end of the head 10 is countersunk, as shown, to receive a contact point or plug 12 of suitable material to withstand the wear caused by contact with the contiguous end of the rotary shaft section 1.

The tension of the spring 8 is regulated by means of the tension screw 7, the latter being held to its adjustment by means of a jam nut 13 bearing against the outer end of the step or slide 4. The buffer head is set at the proper point to afford the proper resistance between the grinding disks by means of a disk setting device in the form of a nut 14 threaded upon the stem 9 and held locked by means of a jam nut 15, also threaded upon the stem 9 outside of the nut 14, the nut 15 being provided with an extension 16 through which is inserted a thumb-screw 17, serving to cant the nut 15 causing the latter to bind on the threaded stem 9 and thereby lock the nut 14 against turning.

Pivotaly connected to a bracket 18 ex-

tending upward from the buffer slide or step 4, is a relief lever 19, said lever being fulcrumed at 20. The lever 19 is provided with a short elbow or extension 21 to which is pivotally connected at 22 a link 23, the opposite end of which is pivotally connected at 24 to a lug or ear 25 on the fixed buffer casing 3. 26 designates a weight adjustable lengthwise of the lever 19 and adapted to be held fixed at any point thereon by means of a set-screw 27.

The buffer spring 8 ordinarily holds the movable disk up to its work and acts with increasing resistance to permit the movable disk to recede from the immovable disk of the mill in a manner well understood by those familiar with the art to which this invention appertains. When the disks are subjected to excessive pressure, as when a large hard object enters between the disks and forces the movable disk laterally a considerable distance, the step or slide 4 begins to move outward, the lever 19 swinging upward and lifting the weight 26. The farther the lever 19 swings upward, the less resistance it affords to the outward movement of the step or slide 4 by reason of the disposition of the weight and the location of the pivot points of the lever and the extremities of the link 23. Correspondingly, the farther the movable disk recedes from the stationary disk, the less becomes the resistance to such movement, for the same reason. In this way a large hard object is permitted to pass through the mill and between the grinding disks thereof without injury to the grinding disks and other parts of the mill. By adjusting the weight 26 inward and outward on the lever 19, more or less resistance may be imparted to the movement of the buffer step or slide.

The quick release mechanism hereinabove described is applicable to grinding mills of

either single or double runners, or any mill employing a laterally movable grinding disk.

Having described the invention, I claim as new:—

1. The combination of a grinding disk, a shaft therefor movable endwise away from working position, means including a spring holding said disk yieldingly to its work, and means brought into action by the yielding movement adapted to progressively lessen the resistance to said movement.

2. The combination of a grinding disk, a shaft therefor movable endwise away from working position, means including a spring holding said disk yieldingly to its work, and means brought into action by the yielding movement adapted to progressively lessen the resistance to said movement and also to return the disk to its working position.

3. The combination of a grinding disk, a shaft therefor movable endwise away from working position, means including a spring holding said disk yieldingly to its work, and a link-connected lever brought into action by the yielding movement adapted to progressively lessen the resistance to said movement.

4. The combination of a grinding disk, a shaft therefor movable endwise away from working position, means including a spring holding said disk yieldingly to its work, a link-connected lever brought into action by the yielding movement adapted to progressively lessen the resistance to said movement, and a weight adjustable on said lever to vary the degree of resistance of said lever.

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

AARON J. ROBINSON.

Witnesses:

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REXFORD M. SMITH.