No. 862,129. PATENTED AUG. 6, 1907.

D. A. & C. W. BLAKE.

JACK.

APPLICATION FILED SEPT. 26, 1906.

2 SHEETS—SHEET 1.

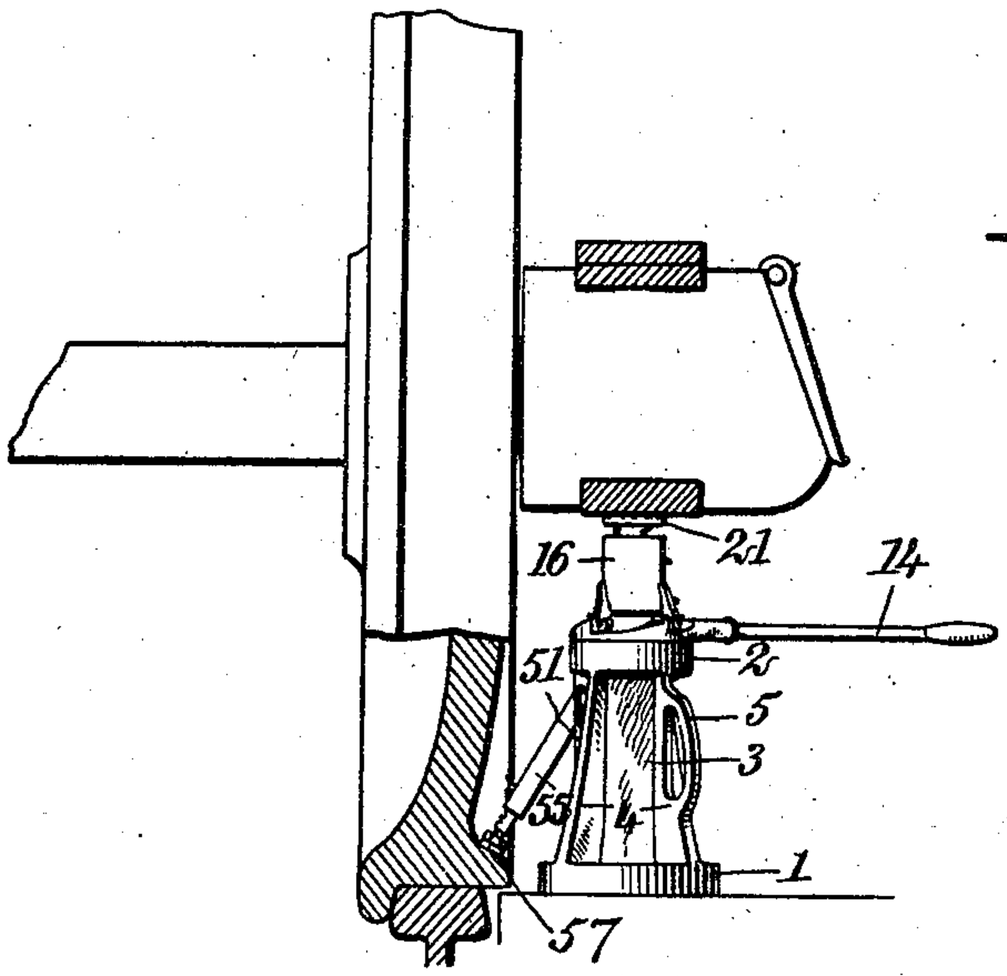
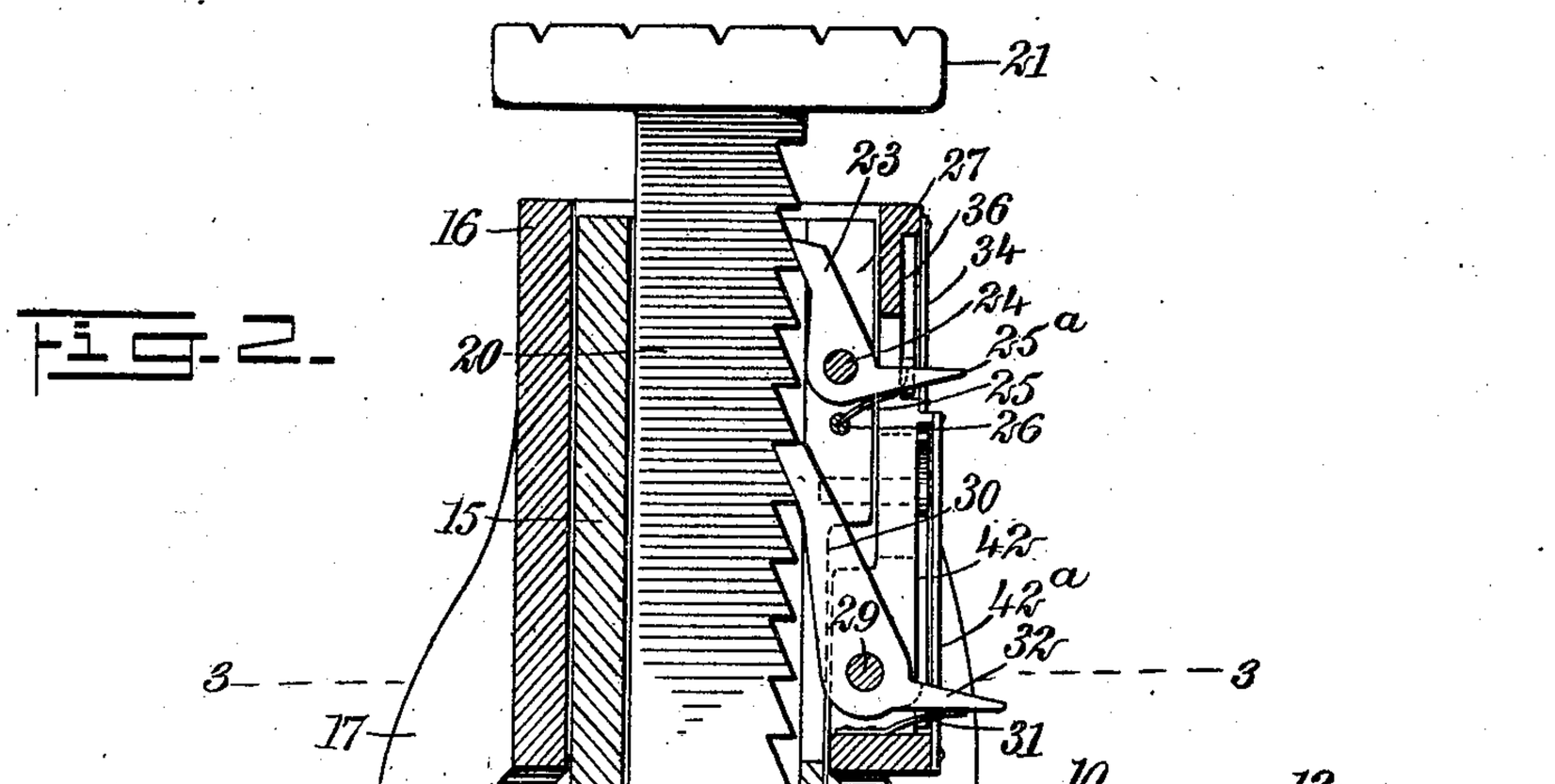


Fig. 1.

Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

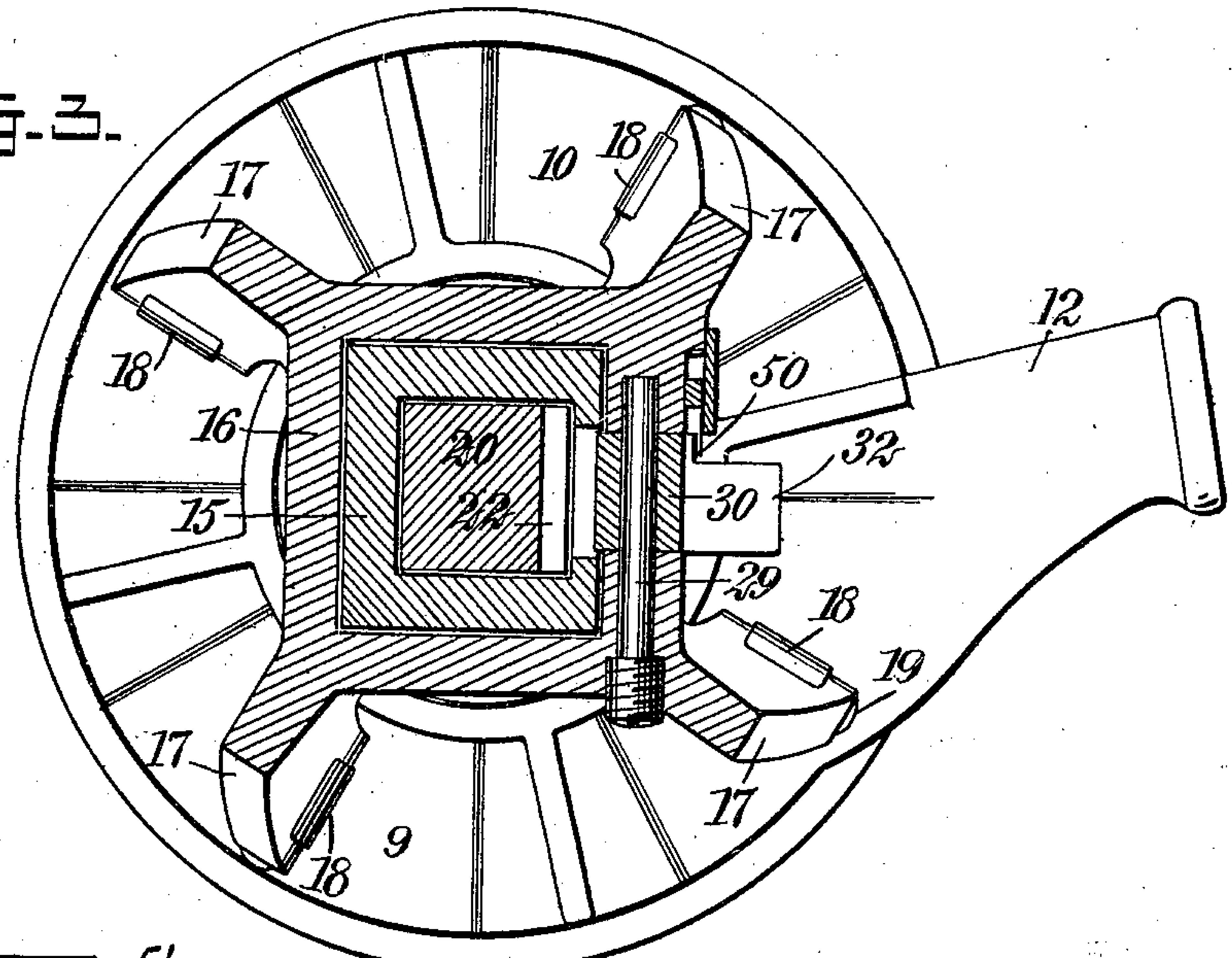


Fig. 5.

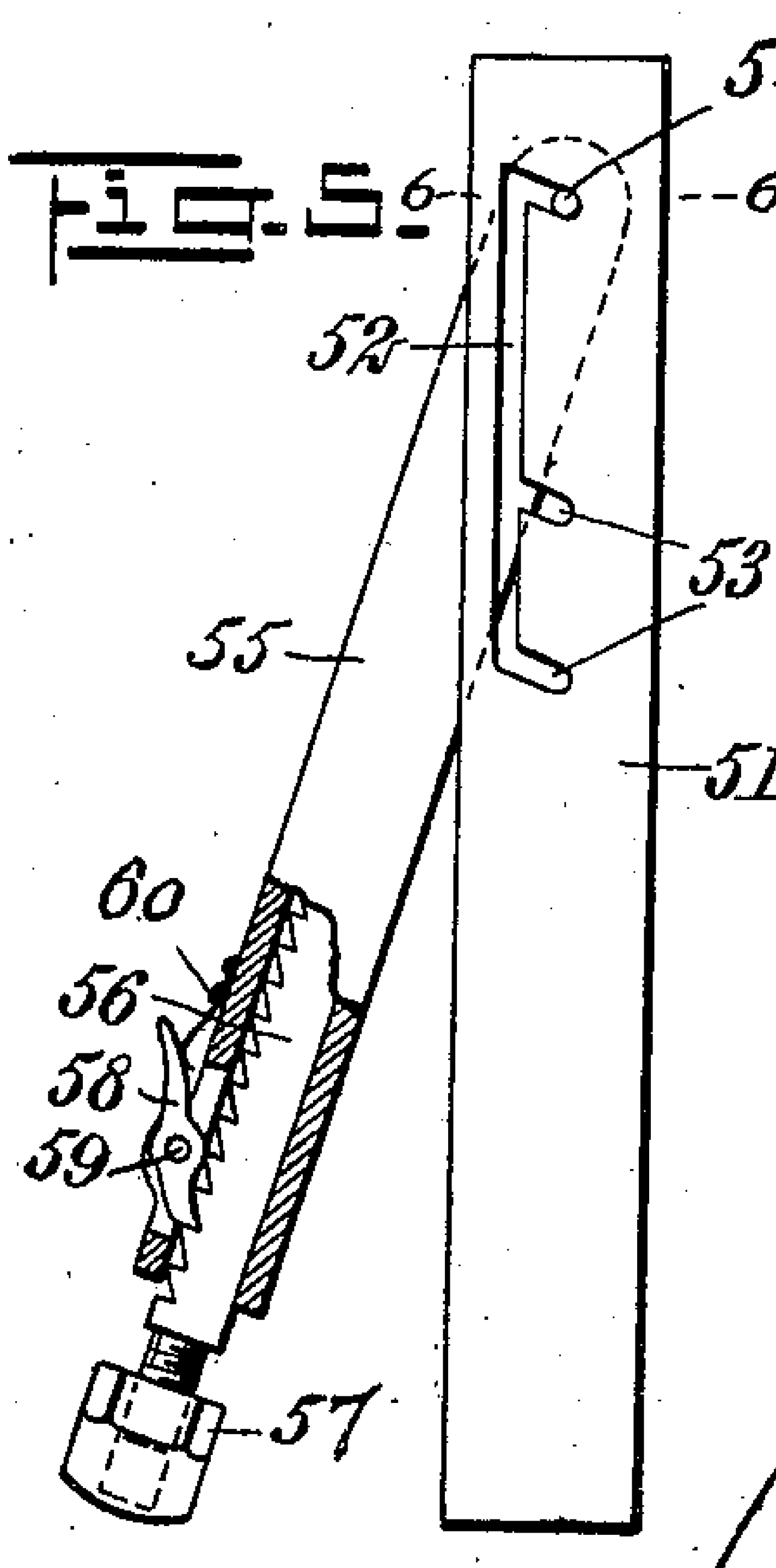


Fig. 4.

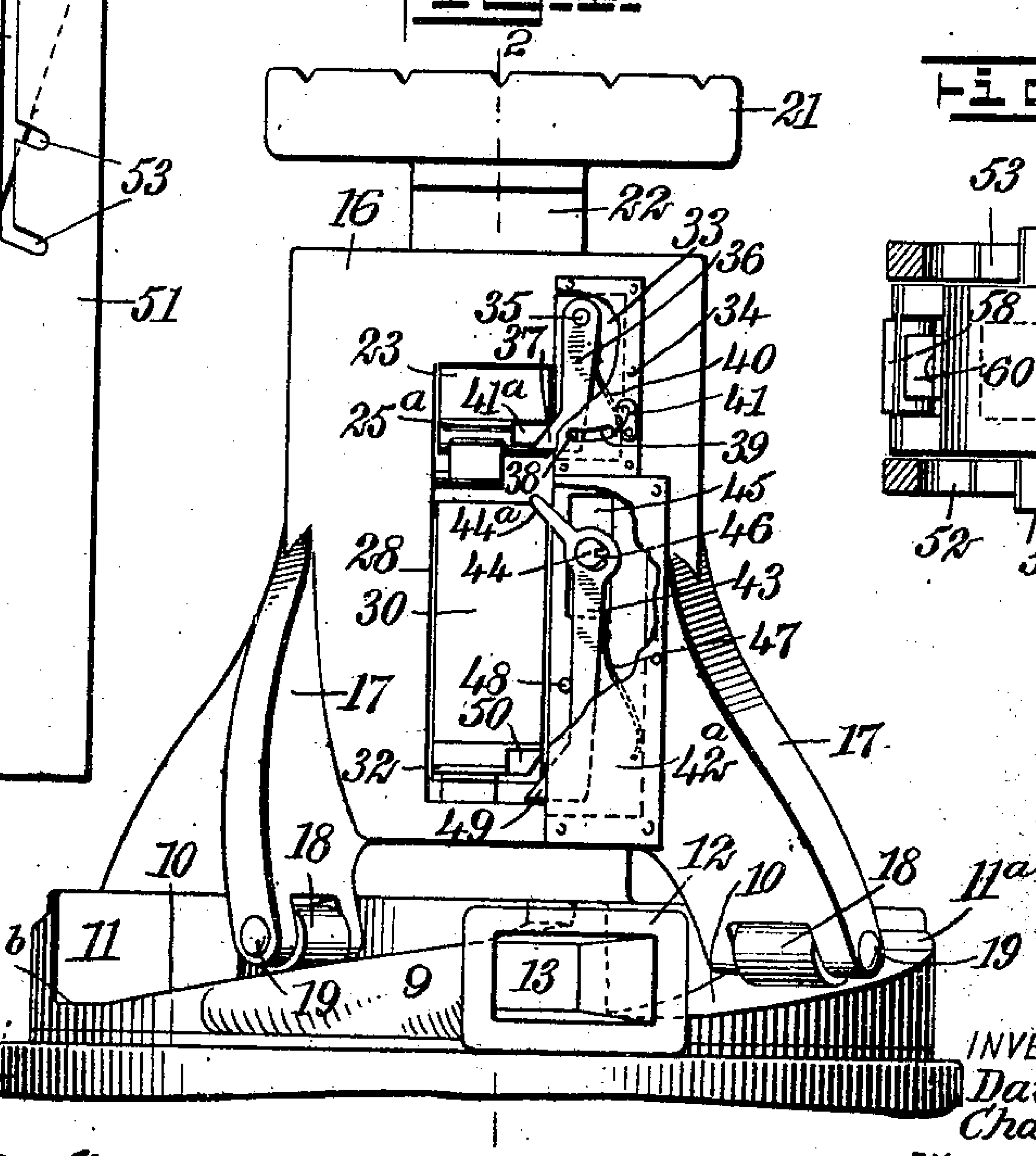
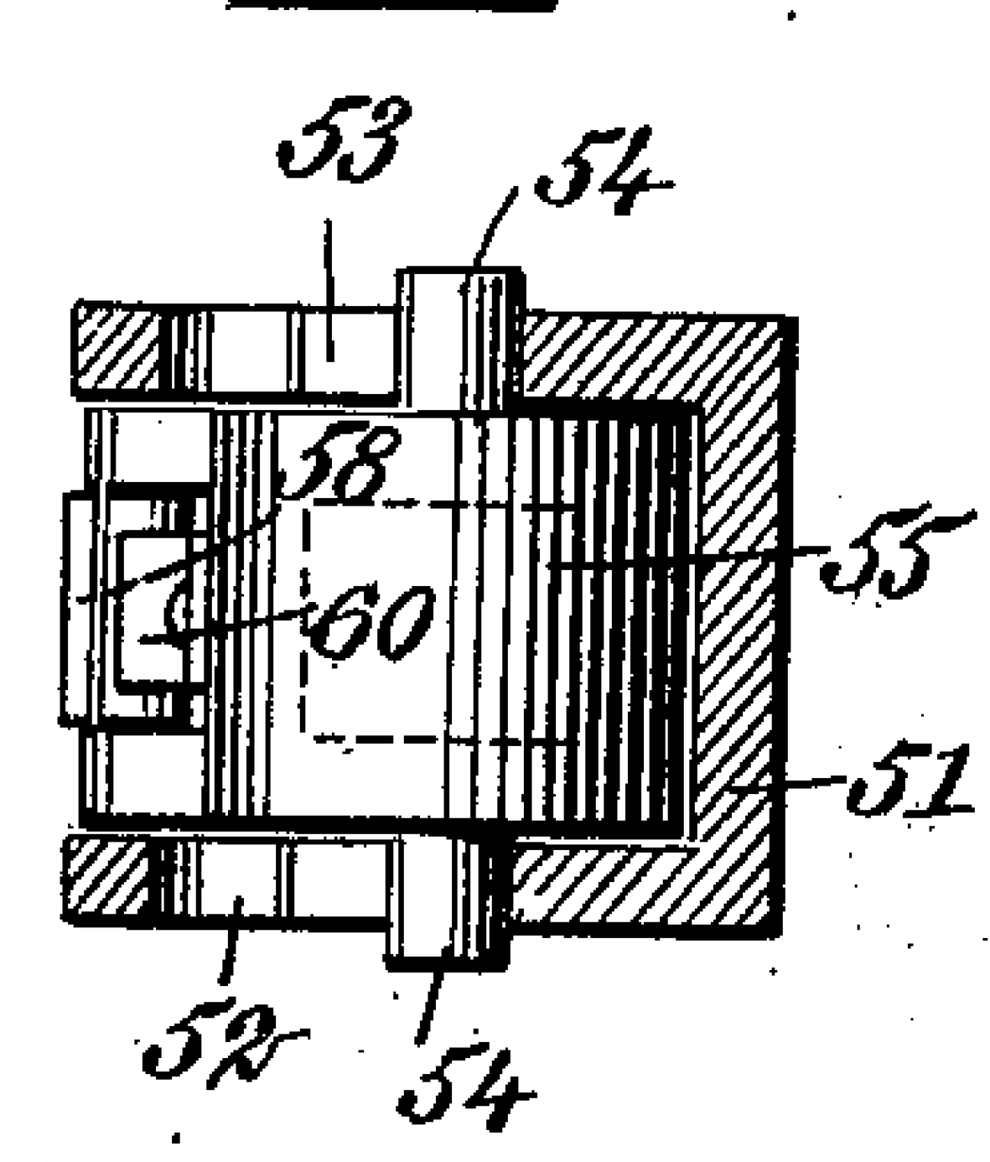


Fig. 6.



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UNITED STATES PATENT OFFICE.

DAVID ALEXANDER BLAKE, OF SAN ANGELO, TEXAS, AND CHARLES WILLIAM BLAKE, OF LAKE GEORGE, NEW YORK, ASSIGNORS OF THREE-FOURTHS TO SAID DAVID A. BLAKE AND ONE-FOURTH TO SAID CHARLES W. BLAKE.

JACK.

No. 862,129. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed September 26, 1906. Serial No. 336,260.

To all whom it may concern:

Be it known that we, DAVID ALEXANDER BLAKE, a resident of San Angelo, in the county of Tom Green and State of Texas, and CHARLES WILLIAM BLAKE, a resident of Lake George, in the county of Warren and State of New York, both citizens of the United States, have invented a new and Improved Jack, of which the following is a full, clear, and exact description.

This invention is an improvement in jacks, more especially designed as a lifting means for railway use where heavy loads are to be raised. It is, however, not limited to this use as it will be found to be of advantage in other relations.

Among the objects of the invention is to provide in a device of this character a safe, simple and effective structure which will elevate the load with a minimum power, in that the weight thereof is thrown on a frictionless bearing while being raised or lowered, also to make provision for the automatic uniform lowering of the load without altering or changing the mode of operation of the jack, but continuing said operation in like manner.

The invention further contemplates the addition of an improved, adjustable attachment acting to hold a car wheel or the like in fixed relation to the rail while the truck is being jacked up.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the jack showing it in the act of raising a car truck, and holding the wheel thereof from movement on the rail; Fig. 2 is a central, vertical, sectional view through the upper portion of the jack, said section being taken substantially on the line 2—2 of Fig. 4; Fig. 3 is a transverse, sectional view on the line 3—3 of Fig. 2; Fig. 4 is a front side elevation of the upper portion of the jack, looking in a direction at right angles to Fig. 2 and showing the cam ring at an intermediate point of the extreme positions of its movement; Fig. 5 is a detail view of the attachment for holding a car wheel or the like from movement on the rail while the jack is in operation, and Fig. 6 is a transverse, sectional view of the same on the line 6—6 of Fig. 5.

Referring more especially to Fig. 1, the numeral 1 indicates a base, preferably circular in shape, joined to a smaller circular top 2 by means of a square stem 3 formed as an integral part thereof. This part of the jack is reinforced at the corners of the stem by tapered flanges 4 joining the base and top, one of said flanges being fashioned into a handle 5 to be used in carrying the jack from place to place. The top 2 of the jack is provided with an annular groove in its top face, in which is mounted a frictionless ball or roller bearing, that shown comprising balls 6 freely movable in annular grooves in rings 7. The rings 7 surround a cylindrical hub 8 which is extended slightly beyond them, on which a cam ring 9 is journaled resting on the top ring 7. This cam ring, as best shown in Fig. 4, is made up of a series of inclined planes or cams 10 equally spaced about the top face of the ring and joined together by abrupt shoulders 11, said shoulders being extended slightly above the highest portion of each cam face, forming stops for a lifting block hereinafter described.

Extending from the cam ring 9 at some suitable portion of its periphery is an arm 12 provided with a socket 13 at its outer end, preferably formed tapered, in which a lever 14 is designed to be inserted for oscillating the ring 9. Beyond the hub 8 the body of the jack is further extended, providing a reduced portion 15 preferably formed square in cross section. Over the extension 15 is slidably mounted a lifting block 16, also square in cross section and having at the lower end of each of its corners legs 17, inclined at such an angle as to be perpendicular to the cam faces 10 of the ring 9 when the lifting block is in operative position. The lower ends of the legs 17 are bifurcated for receiving balls or rollers 18 journaled on pins 19 passing transversely through the legs. These rollers rest on the cam faces 10 and reduce the friction when the cam ring is oscillated, to give the lifting block a reciprocatory motion.

Passing entirely through the center of the jack is a square opening in which a ratchet bar 20 is slidably contained, said bar having an enlarged head 21 which sustains the load, and downwardly inclined ratchet teeth 22 on its front face.

The extension 15 is provided on its front face adjacent to the ratchet teeth 22, with a slot extending almost its entire length. Pivotally mounted on a pin 24 in this slot is a pawl 23, adapted to engage with the teeth 22 and normally forced inwardly against the same by a spring 25, fixed in the kerf of a pin 26, and pressing upwardly on an outwardly extending arm 25^a projecting from the pawl 23. It should be noted that the metal forming the extension 15 about the pin 24 is thickened at 27, to insure sufficient strength of this portion of the jack for sustaining heavy loads. A slot 28 is cut from the front face of the lifting block 16 and is in register with the slot in the extension 15 when the parts are assembled.

Pivotally mounted on a pin 29, in the slot 28 of the lifting block is a pawl 30, also designed to engage with the ratchet teeth 22 of the ratchet bar, and being normally forced in contact therewith by a spring 31, pressing upwardly on an outwardly extending arm 32,

formed as an integral part of the pawl. At one side of the slot 28 the lifting block 16 is formed with a depression 33, covered by a plate 34, between which is pivotally suspended on a pin 35 a trigger 36, which has at its lower end a projecting toe 37, and carries adjacent thereto an extending pin 38 passing through an arc-shaped slot 39 in the plate 34. This slot and pin limit the trigger in its pivotal movement, which is normally forced forward by a spring 40 secured to it and pressing against the back wall of the depression 33. A hook 41 pivoted to the outside of the plate 34, acts to engage that portoin of the pin 38 extending beyond said plate and hold the trigger at the limit of its outward movement and out of action. The extending toe 37 of the trigger 36 is wedge-shape, providing it with an inclined edge and coöperates with a cut-out portion 41^a and one side of the arm 25^a of the pawl 23 to lower the load in a manner hereinafter made apparent.

Just below the depression 33 is a second and somewhat more extended depression 42 covered by a plate 42^a, formed in the lifting block 16, in which is pivotally suspended a trigger 43 from a pin 44 fixed in the extension 15 and passing through a slot 45 in the lifting block. The pin 44 has a key-way cut in it at one side, designed to engage with a tooth 46 when the trigger 43 is moved away from the pawl 30 by an extending arm 44^a. A spring 47 fixed to the back portion of the trigger 43 and pressing on the back wall of the depression 42, normally forces the trigger to a forward position, which is limited by a pin 48 projecting from the lifting block 16. The trigger 43 is fashioned at its lower end in substantially the same way as the trigger 36, providing a forwardly extending toe 49 designed to coöperate with a cut-out portion 50 in the arm 32 of the pawl 30.

The operation of this part of the jack is as follows: When the cam ring 9 is turned to the left as the reader faces the drawing, the rollers 18 ride on the inclined or cam faces 10, carrying the lifting block 16 to an elevated position; and since the pawl 30 is fixed to said block and in engagement with the teeth 22 of the ratchet bar 20, this bar is likewise forced upwardly. Just before the rollers 18 strike the shoulders 11, they ride upon a somewhat steeper incline 11^a, which admits of the pawl 23 freely passing under one of the teeth of the ratchet bar. The cam ring is then revolved in the reverse direction, thereby allowing the lifting block to descend by its own weight until the rollers 18 contact with the opposite faces of the shoulders 11. The load is then sustained on the pawl 23, transmitting the weight thereof to the extension 15 through the pin 24. When the rollers 18 are at the rearward limit of their movement they register with depressions 11^b at the lower end of the inclined faces 10, allowing the pawl 30 to freely pass under a tooth of the ratchet bar. By repeating the oscillation of the cam ring, it is evident that the ratchet bar and the load resting upon it continually move up, the pawls alternately engaging the said bar as outlined. On now moving the cam ring from its extreme right hand position to the left, the bottom edge of the toe 49, which is at this time just above the arm 32 adjacent to its cut-out portion 50, contacts near the edge thereof and turns the pawl on its pivot as the lifting block ascends, withholding said pawl from engagement with the teeth of the ratchet-bar. A point will, however, be reached on the upward movement of this block when the toe 49 will ride over the edge of the cut-out portion 50, acting to release the pawl which will, under the influence of its spring, reëngages the teeth of the ratchet-bar. This release of the pawl 30 occurs just before the cam ring reaches the limit of its left-hand movement whereupon the slight further movement of the cam ring to the left, will, through the action of this pawl, push the ratchet-bar up slightly in order that the weight which during this time has been transmitted to the pawl 23, will be removed, admitting of the easy disengagement of the pawl 23 from its engaged tooth of the ratchet-bar. In the travel of the lifting-block upwardly, the inclined edge of the toe 37 contacted with the edge of the cut-out portion 41^a of the upper pawl and forced the trigger 36 outward against the tension of its spring until the toe cleared the arm 25^a, when it was forced back in position over it by said spring just as the movement of the cam ring to the left was completed. On moving the cam ring in the reverse direction, the lifting block and load, which is at this time supported on the pawl 30 through the ratchet-bar, all descend and the toe 37 contacts with the arm 25^a over the edge of its cut-out portion 41^a and turns the pawl 36 on its pivot away from the teeth of the ratchet-bar until the movement of the cam to the right is almost completed, when the toe 37 rides over the edge of the cut-out portion 41^a, acting to release the pawl 36, which is forced by its spring into reëngagement with the teeth of the ratchet-bar. As the slight further movement of the cam ring to the right is finished, the pawl 23 checks the descent of the ratchet-bar and the load thereon, removing it from the pawl 30 and adapting the latter to be easily withdrawn from its engaged tooth. During the descent of the lifting block the inclined edge of the toe 49 contacted with the edge of the cut-out portion 50 of the arm 32, which forced the trigger 43 against the tension of its spring until the toe had cleared said arm when it was under the influence of its spring again forced over it. This last movement of the toe occurred just as the cam ring had reached the limit of its right hand movement and brought the parts back to initial position. It is thus seen that a repetition of the oscillations of the cam ring when the trigger mechanism is in operation will lower the load step by step in the same manner as did the oscillations of the cam elevate the load when the trigger mechanism was held in inoperative position.

In connection with the jack is provided an attachment (Fig. 5) comprising a trough-like container 51, secured in an upright position between two of the flanges 4 of the jack body. This container is formed with a slot 52 running longitudinally at its upper end and passing through both walls thereof, said slot at each side being formed with downwardly inclined portions 53 arranged at any convenient point of its length. Trunnions 54 extending from each side of a casing 55 at its upper end, engage with the slots 52 and sustain the casing in adjusted position by passing the trunnions into any part of the downwardly inclined portions 53. The casing 55 is preferably square in cross section and has a corresponding bore running its entire length, in which is slidably contained a ratchet bar 56, the latter being reduced in diameter at its lower end, on which a nut 57 is threaded. A pawl 58, pivotally mounted in a slot in the lower end of the casing on a pin 59, is nor-

mally pressed by a spring 60 secured to the casing, to engage with the teeth of the ratchet bar 56, said teeth being so formed that the bar may be pulled outwardly from the casing but will be prevented from moving therein by reason of the pawl engaged therewith. This attachment will be used for holding the wheel of the car from movement on the rail while the truck is being jacked up.

Should the jack be in such a position that the end of the ratchet bar cannot reach the wheel, the trunnions 54 are moved in the slots 52 to engage in the inclined portions 53 in a lower position. The ratchet bar is then pulled from its casing to press on the wheel at the desired point, after which the nut 57, by means of a wrench or other convenient device, is unscrewed to tightly clamp said wheel. The load can now be raised without fear of the wheel moving.

The precise embodiment of the invention is not material provided its essential characteristics are employed as pointed out in the annexed claims.

Having thus described our invention we claim as new and desire to secure by Letters Patent:

1. In a jack, a stem, a frictionless bearing seated in the upper end thereof, a cam ring journaled on the stem, a ratchet bar slidably contained in the stem, a lifting block slidable on an extension of the stem and resting on the cam ring, a pawl pivotally mounted in said extension, and a second pawl pivotally mounted in the lifting block, acting to alternately engage and disengage with the ratchet bar as the cam ring is oscillated.

2. In a jack, a body portion, a cam ring journaled thereon, a lifting block resting on the cam ring, a bar slidably contained in the body portion, means for elevating the bar as the cam ring is oscillated, and means adapted to engage said raising means to lower the bar when the ring is oscillated.

3. In a jack, a body, a bar slidably contained therein, a lifting block slidably mounted over the bar, a cam ring on which the lifting block is seated, and a frictionless bearing sustaining the cam ring.

4. In a jack, a body, a bar slidably contained therein, lifting means slidably mounted over the bar, and a ring on which the lifting means is seated, having a cam face operable to reciprocate the lifting means and raise the bar.

5. In a jack, a support, a frictionless bearing mounted in the upper end thereof, a ring seated on the bearing, having a series of cam faces, a bar slidably contained in the support, a lifting block slidably mounted over the bar, legs secured to the corners of the block, and rollers journaled in the legs and resting on the cam faces of the ring, as described.

6. In a jack, a support, an extension carried by said support, a ratchet bar slidably contained in the extension, a lifting block slidably mounted on the extension, pawls pivoted to the extension and to the lifting block, means for reciprocating the lifting block to alternately engage and disengage said pawls, whereby the bar is elevated, and means adapted to engage said pawls to lower said ratchet bar when the lifting block is reciprocated.

7. In a jack, a support, a ratchet bar slidably contained therein, a lifting block slidably mounted on the support, a pawl pivoted to the support and a second pawl pivoted to the lifting block to alternately engage the teeth of the ratchet bar when the lifting block is reciprocated to elevate the bar, and a trigger mechanism adapted to be thrown into engagement with said pawls, whereby as said block is reciprocated the bar is depressed.

8. In a jack, a support, a frictionless bearing seated in the upper end thereof, a cam ring journaled on the support and resting on the bearing, a ratchet bar slidably contained in the support, a lifting block slidable over the ratchet bar and resting on the cam ring, a pawl pivoted to the support in engagement with the ratchet bar, a second pawl pivoted to the lifting block in engagement with the ratchet bar, and means projecting from the cam ring adapted to oscillate it, whereby the pawls are alternately engaged with the ratchet bar to elevate it.

9. In a jack, a support, a ratchet bar slidably contained therein, a lifting block slidable over the ratchet bar, a pawl pivoted to the support, a pawl pivoted to the lifting block in engagement with the ratchet bar, means for reciprocating the lifting block to alternately engage said pawls to raise the bar, and a trigger designed to engage with each pawl, whereby as the lifting block is reciprocated the bar will be lowered.

10. In a jack, means for holding a wheel or the like from movement while the jack is in operation, comprising a casing adjustably mounted at the side of the jack, a bar slidable in the casing, means for holding the bar in adjusted relation, and means adjustable on the end of the bar, for the purpose described.

11. In a jack, means for holding a wheel or the like from movement while the jack is in operation, comprising a container fixed to the side of the jack, slots having inclined portions in the container, a casing having trunnions adjustable in said slots and adapted to be fixed in said inclined portions, a ratchet bar slidable in the casing, means for securing the ratchet bar in adjusted position, and a nut threaded on the outer end of the ratchet bar, for the purpose described.

12. In a jack, a support, a ratchet bar slidably contained therein, a lifting block slidably mounted over the ratchet bar, a pawl pivoted to the support and to the lifting block, adapted to engage the ratchet bar, whereby as the lifting block is reciprocated the pawls are alternately engaged to lift the bar, a trigger adapted to engage each pawl, whereby as the lifting block is reciprocated the bar is lowered, and means for holding the triggers in inoperative position.

13. In a jack, a support, a ratchet bar slidably contained therein, a lifting block slidably mounted over the ratchet bar, a cam ring for reciprocating the lifting block, a pawl pivoted to the lifting block and to the support, whereby as the cam ring is oscillated to reciprocate the block, the pawls are alternately engaged to raise the bar, a trigger mechanism for engaging the pawls, whereby as the lifting block is reciprocated the ratchet bar is lowered, and means for holding the trigger mechanism in operative and inoperative relation.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

DAVID ALEXANDER BLAKE.
CHARLES WILLIAM BLAKE.

Witnesses to the signature of David A. Blake:
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R. W. HILLIS.
Witnesses to the signature of Charles W. Blake:
WILLIS S. WORDEN,
JAMES A. BARKLEY.