

No. 624,101.

Patented May 2, 1899.

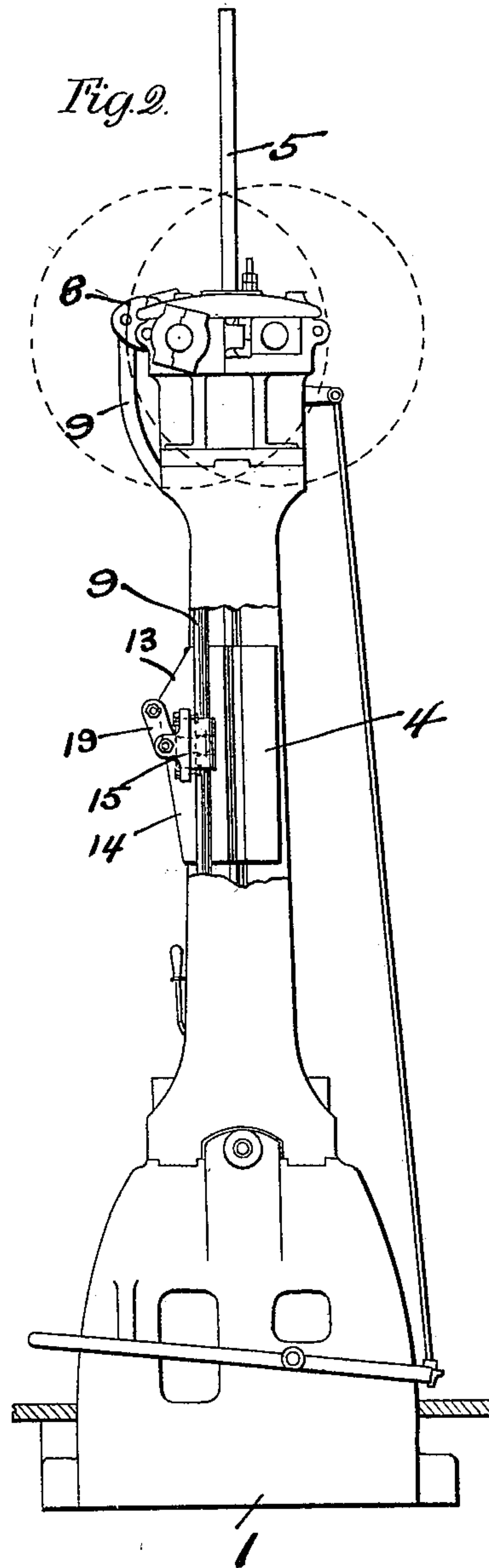
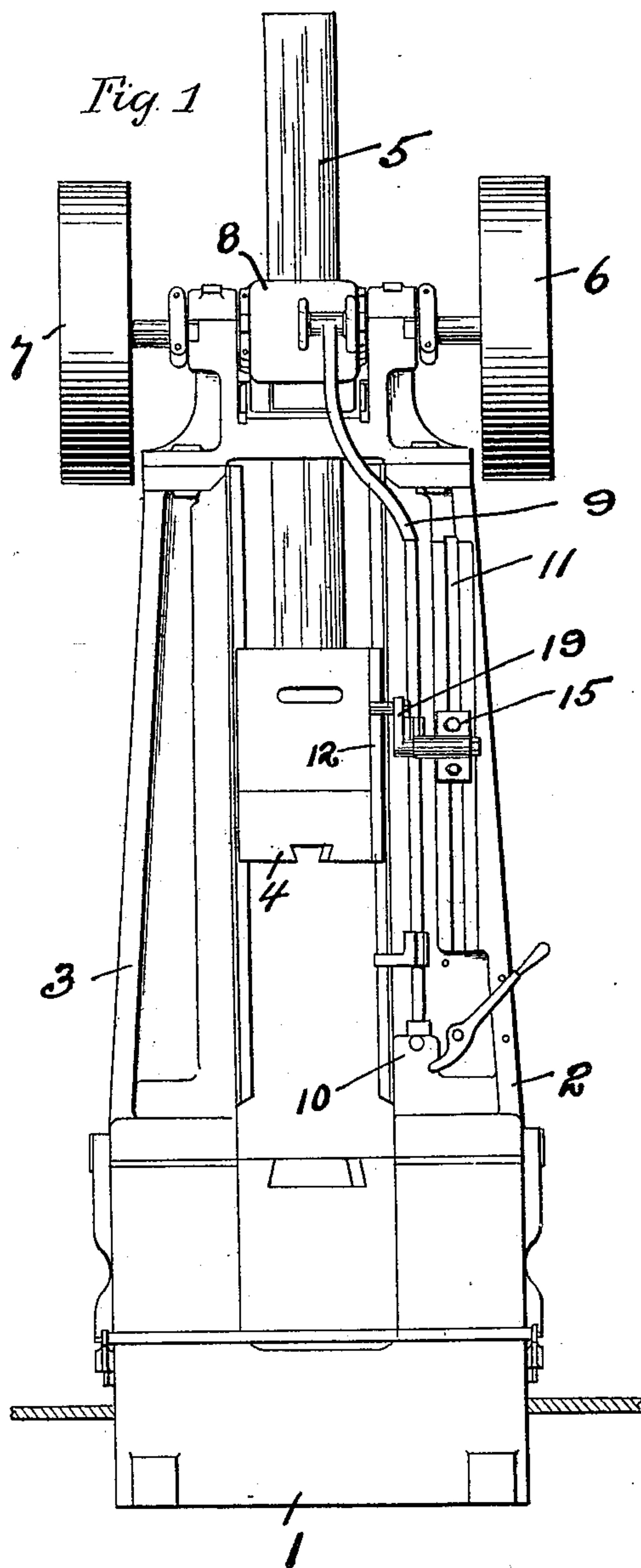
G. RUWBOTTOM & D. C. GRIGGS.

DROP HAMMER.

(Application filed Sept. 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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Fig. 3.

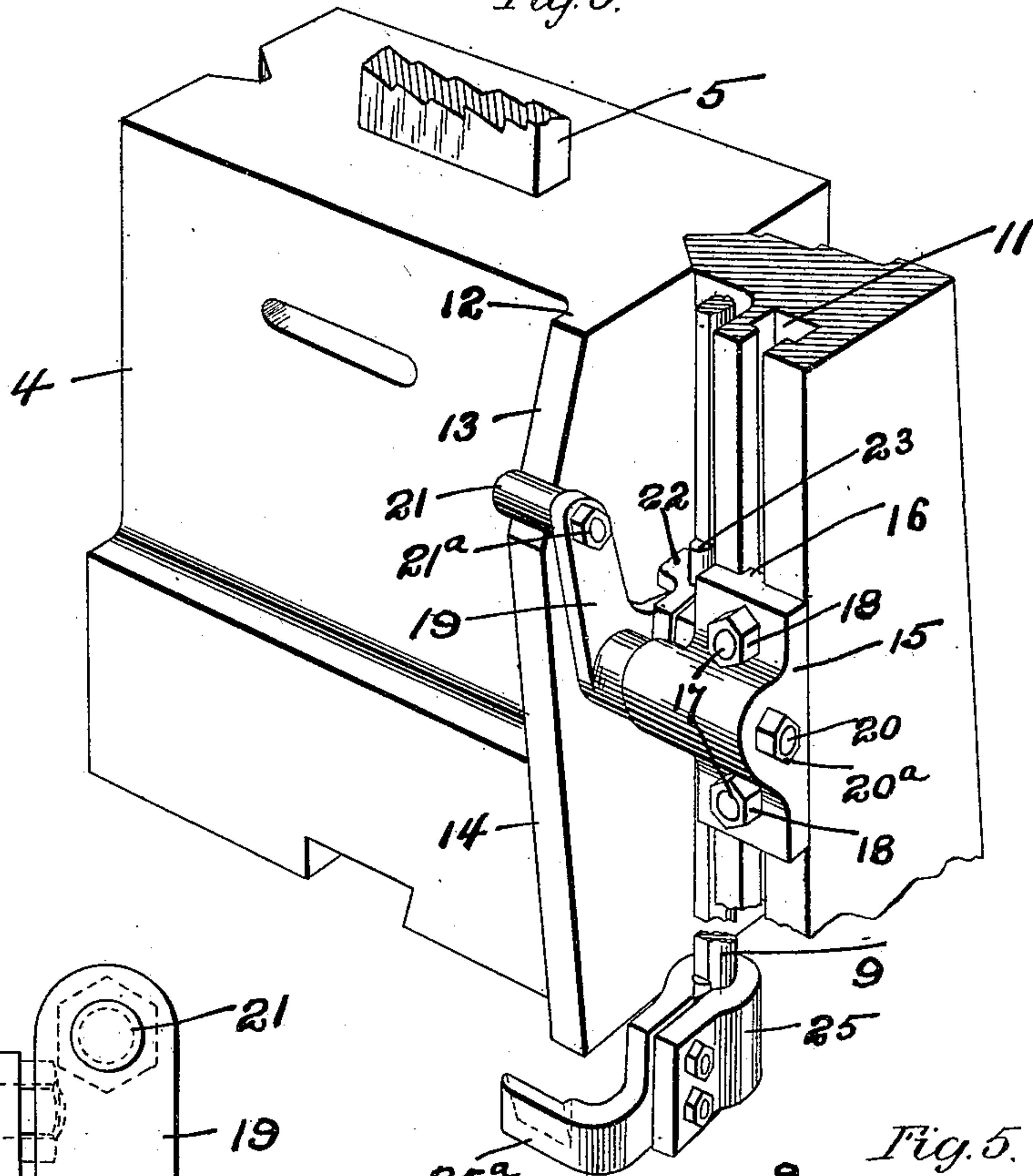


Fig. 4.

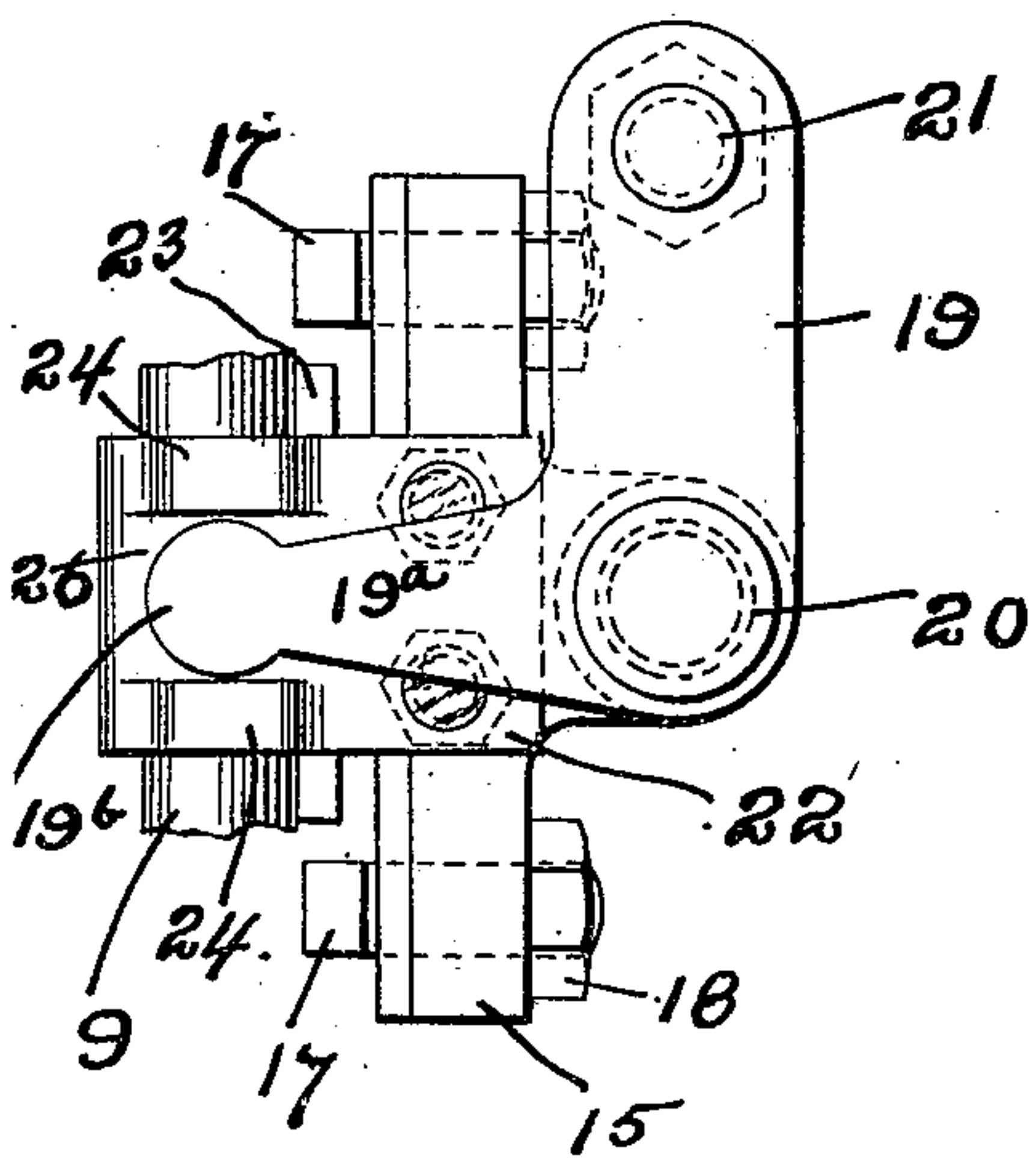
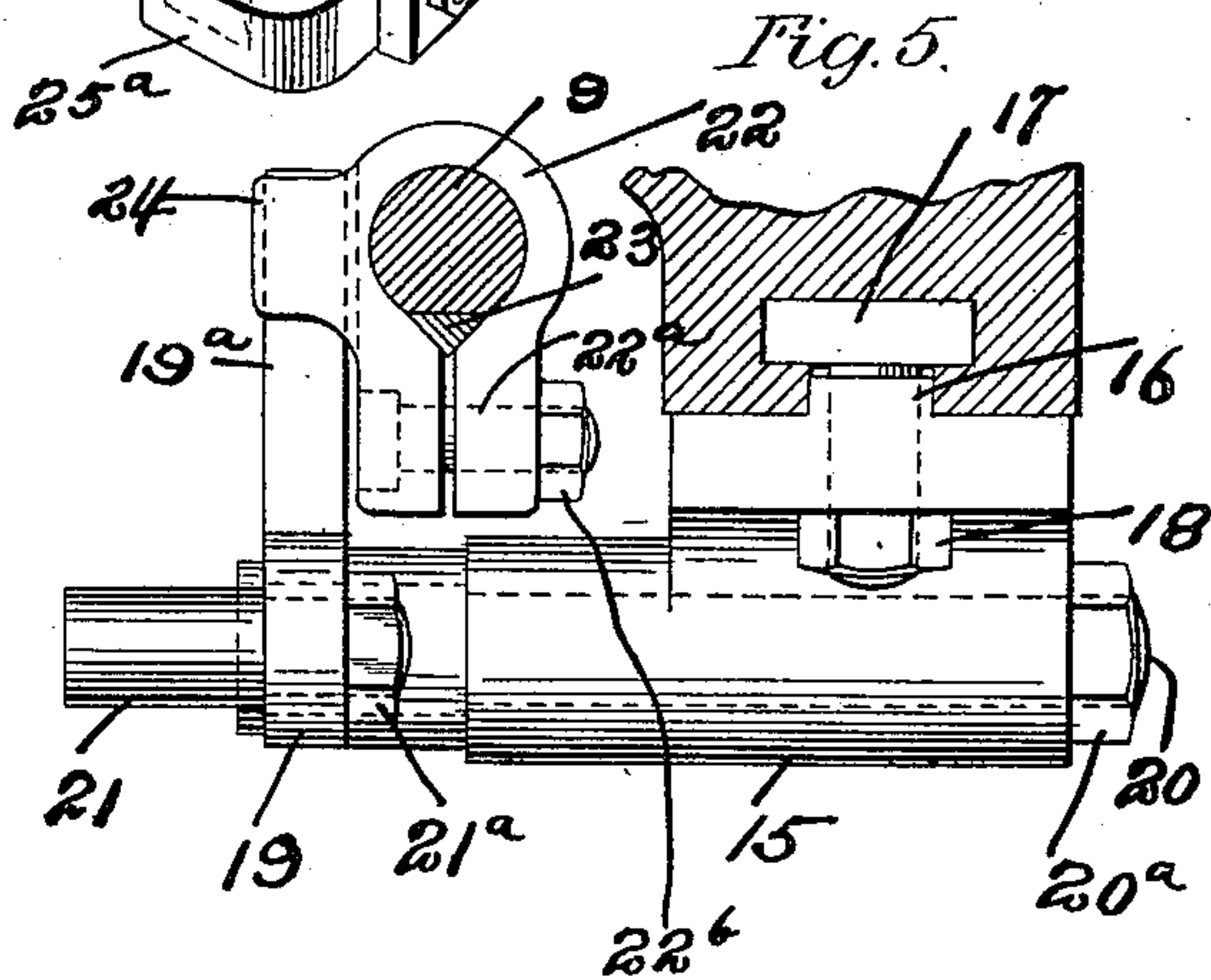


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE ROWBOTTOM AND DAVID C. GRIGGS, OF WATERBURY, CONNECTICUT, ASSIGNORS TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF SAME PLACE.

DROP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 624,101, dated May 2, 1899.

Application filed September 10, 1898. Serial No. 690,663. (No model.)

To all whom it may concern:

Be it known that we, GEORGE ROWBOTTOM and DAVID C. GRIGGS, citizens of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Drop-Hammers, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to improvements in drop-hammers, the object being to provide mechanism for automatically actuating the friction devices which lift the hammer, the construction of the mechanism being such that its operation will be positive and not dependent upon springs or readily-destructible elements, and, again, that the pounding, shock, and jar upon the parts will be reduced to a minimum.

To this end our invention consists of the drop-hammer having certain details of construction and combination of parts, as will be hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts in the several views, Figure 1 is a front elevation of the hammer complete. Fig. 2 is a side elevation thereof, a portion of the side frame being broken away. Fig. 3 is a perspective view of the hammer and lifter mechanism with a fragmentary portion of the side frame to which it is attached. Fig. 4 is a side elevation of the lifter mechanism. Fig. 5 is a plan view thereof.

With the exception of the improvements herein described the drop-hammer is of the ordinary type, there being the usual base or anvil 1, uprights or side frames 2 3, hammer or ram 4, hammer-board 5, and friction-rolls for lifting the hammer, which are rotated by pulleys 6 7, revolving in opposite directions. When the two rolls are moved toward each other, the friction upon the board raises the hammer, and when separated the hammer falls. Pivotaly secured to ears upon the case 8 of one of the rolls is the lifter-rod 9, the upward movement of which separates the rolls and the downward movement thereof closes or draws them together, the weight of

the rod being sufficient to operate the said rolls. When the hammer is descending, the end of the rod rests upon a shelf 10, integral with the upright, and when the fall is about completed the rod is knocked off the said shelf, thereby putting the entire weight of the rod upon the friction-rolls, pushing them together and lifting the hammer. To release the mechanism for the next fall, the lifter-rod must be raised until its lower end again rests upon the shelf 10. Our invention is confined primarily to the mechanism for lifting this rod, the device being designed so that the rod will be lifted at a much less speed than the hammer and operated by a gradually-inclined surface upon said hammer instead of by a pin or lug which comes into contact with the lifting-levers with a sudden blow, causing a constant clicking and pounding that is offensive for many reasons. By having the hammer travel faster than the lifter-rod in their upward movements the friction upon the board is released gradually and the shock and jar upon the mechanism caused by a quick-acting lifter-rod are avoided.

In drop-hammers heretofore made the lifting mechanism has been adjustable only to certain predetermined positions and cannot be fixed in any other intermediate position, an objection causing serious inconvenience in many classes of work. We have overcome this objection by providing the side frame 2 with a T-slot 11, which extends longitudinally the length of the upright and within which the lifting mechanism is adjustable vertically to any position within the range of adjustment, as will be later described.

The hammer or ram 4 is provided with a narrow integral projection 12, extending lengthwise of the hammer and having the two cam-faces 13 14, which unite at a point midway of the length of said projection and recede from each other, terminating at the top and bottom of said hammer. In addition to the inclined cam-faces 13 14 the lifting mechanism comprises a support 15, having a tongue 16 fitted into the T-slot 11; T-bolts 17 17, the heads of which are within the said T-slot 11 and the body portion extending through suitable bolt-holes in the support 15; 18 18, nuts

for the said T-bolts; 19, the bell-crank; 20, the bell-crank stud; 21, the cam-stud, attached rigidly to one arm of the bell-crank by the nut 21^a, and 22 the lifter-rod dog, which is
 5 adjustably clamped upon the lifter-rod 9 by the bolts 22^a, nuts 22^b, and the triangular key 23. The bell-crank 19 is loosely fulcrumed upon the stud 21, which is held rigid in the support 15 by the nut 20^a. The vertical arm
 10 19^a of the bell-crank is rounded at its outer end 19^b and operates within the slot 26, formed by the lugs 24 24, which project laterally from the dog 22.

The numeral 25 designates the knock-off dog, having the integral cam projection 25^a, and which is secured to the lower portion of the lifter-rod in the same manner as the lifter-rod dog.

The operation of the device is as follows:
 20 As the hammer ascends the cam-stud 21, which lies in the path of the cam-face 13, is brought into contact therewith, and the inclination of the said cam-face causes the bell-crank 19 to rock upon the stud 20, raising the
 25 outer end 19^a of the crank-arm 19, which lifts the lifter-dog 22 and with it the lifter-rod 9, thus releasing the friction mechanism and through it the hammer or ram. After the hammer is released it descends by gravity,
 30 and when its fall is about completed the cam-face 14 is brought into contact with the cam projection 25^a of the knock-off dog 25, and the dog is forced outward, carrying with it the lifter-rod, which drops off the shelf 10,
 35 causing the hammer to ascend, as before described. The downward movement of the lifter-rod 9 rocks the bell-crank 19, bringing it back to its original position and again presenting the cam-stud 21 over the
 40 cam-face 13, ready to be acted upon by the ascending hammer. It is clear that by the construction of the side frame 2, lifter-dog 22, and support 15 the device can be adjusted to any position with great exactness.
 45 By providing the lifter-dog 22 with the lugs 24 24 and inserting between them the end of one of the arms of the bell-crank any movement of the lifter-rod is imparted to the bell-crank, or vice versa, and we are thus enabled to obtain
 50 a positive movement and avoid the use of springs or like mechanical elements. The pitch of the cam-face 13 determines the ratio of speed between the lifter-rod and the hammer, and by varying the pitch the lifter-rod
 55 can be actuated at any desired speed.

It is apparent that there are minor changes that can be made within our invention, and we would therefore have it understood that we do not limit ourselves to the exact con-

struction herein shown and described, but 60 claim all that falls fairly within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In lifter mechanism for a drop-hammer, the combination of an adjustable support, a crank-stud within said support, the axis of which is parallel with the base of said support, a lifter-dog adjustably secured to the
 70 lifter-rod, a bell-crank pivotally fulcrumed in the center thereof upon one end of the said crank-stud and operating in a path parallel to the side of said hammer one arm of said crank having a positive connection with said
 75 lifter-dog, and a cam-stud projecting laterally from the other arm of the said bell-crank, substantially as set forth.

2. In a drop-hammer having a hammer provided with an inclined cam-surface, and side 80 frames, in one of which is a vertical T-slot; the combination therewith of a lifter mechanism composed of a support adjustable on said T-slotted frame and provided with means whereby the same may be rigidly secured in
 85 any vertical position thereon, a lifter-dog adjustably secured to the lifter-rod and having an open slot in one side thereof, a bell-crank pivotally fulcrumed to said support one arm of which is operative within the open slot in
 90 said lifter-dog and a laterally-projecting stud secured to the other arm and lying normally in the path of the said inclined cam-surface, substantially as set forth.

3. In a drop-hammer, the combination of the 95 hammer provided with an inclined cam-surface, side frames, in one of which is a vertical T-slot, a support adjustably secured to said T-slotted frame, a crank-stud within said support, the axis of which is parallel to the
 100 front of said frame, a lifter-dog adjustably attached to the lifter-rod and a bell-crank rotatably mounted upon the said crank-stud and operating in a plane at a right angle thereto, substantially as set forth.

4. In lifter mechanism for a drop-hammer, the combination of the support 15, T-bolts 17, 17, lifter-dog 22, bell-crank 19, cam-stud 21, and crank-stud 20, all constructed and operating substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE ROWBOTTOM.
 DAVID C. GRIGGS.

Witnesses:

NELLYE DONAHUE,
 J. M. GALLOND.