No. 743,763. PATENTED NOV. 10, 1903

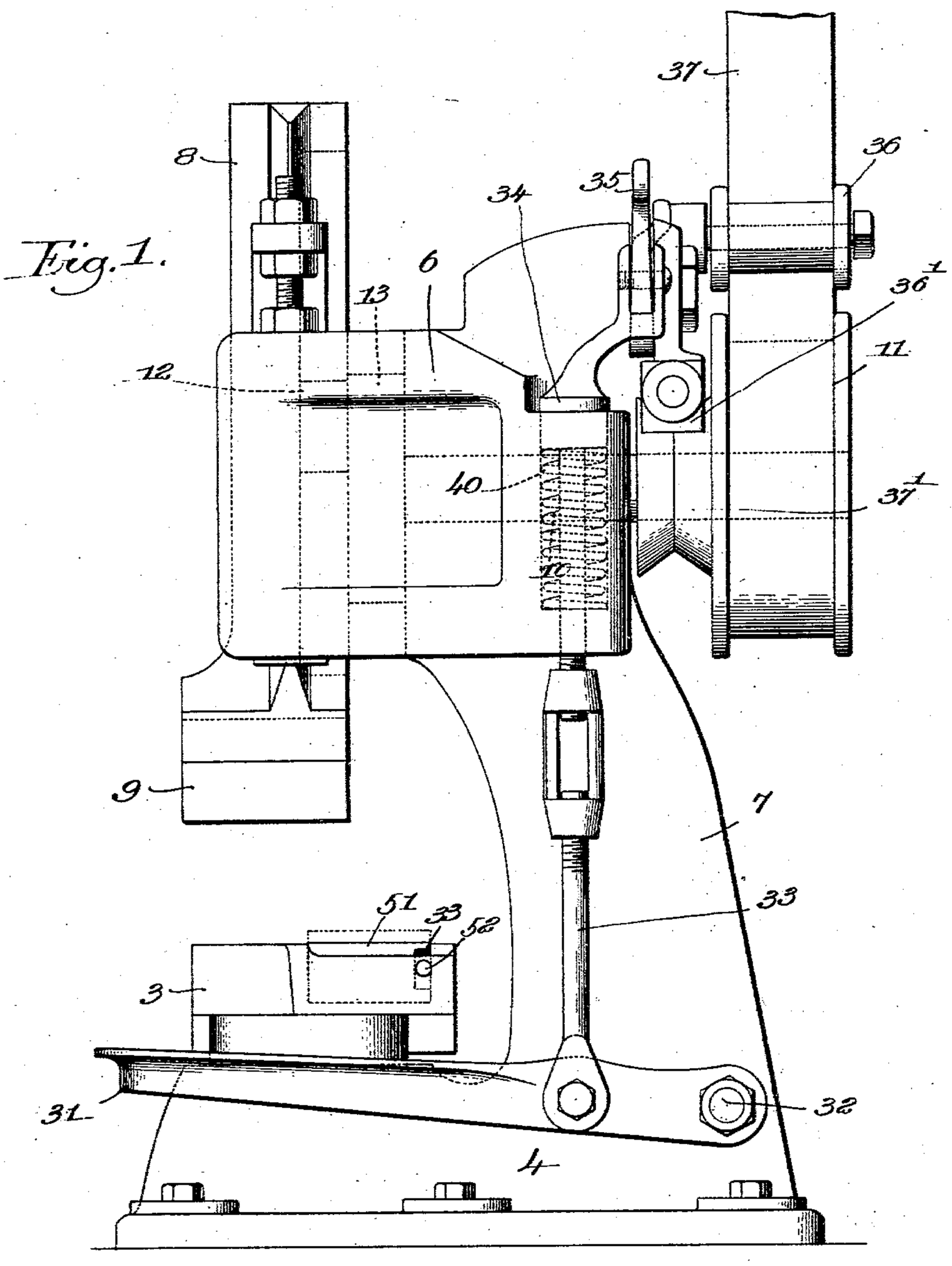
W. E. SHEEHY.

POWER HAMMER.

APPLICATION FILED OCT. 24, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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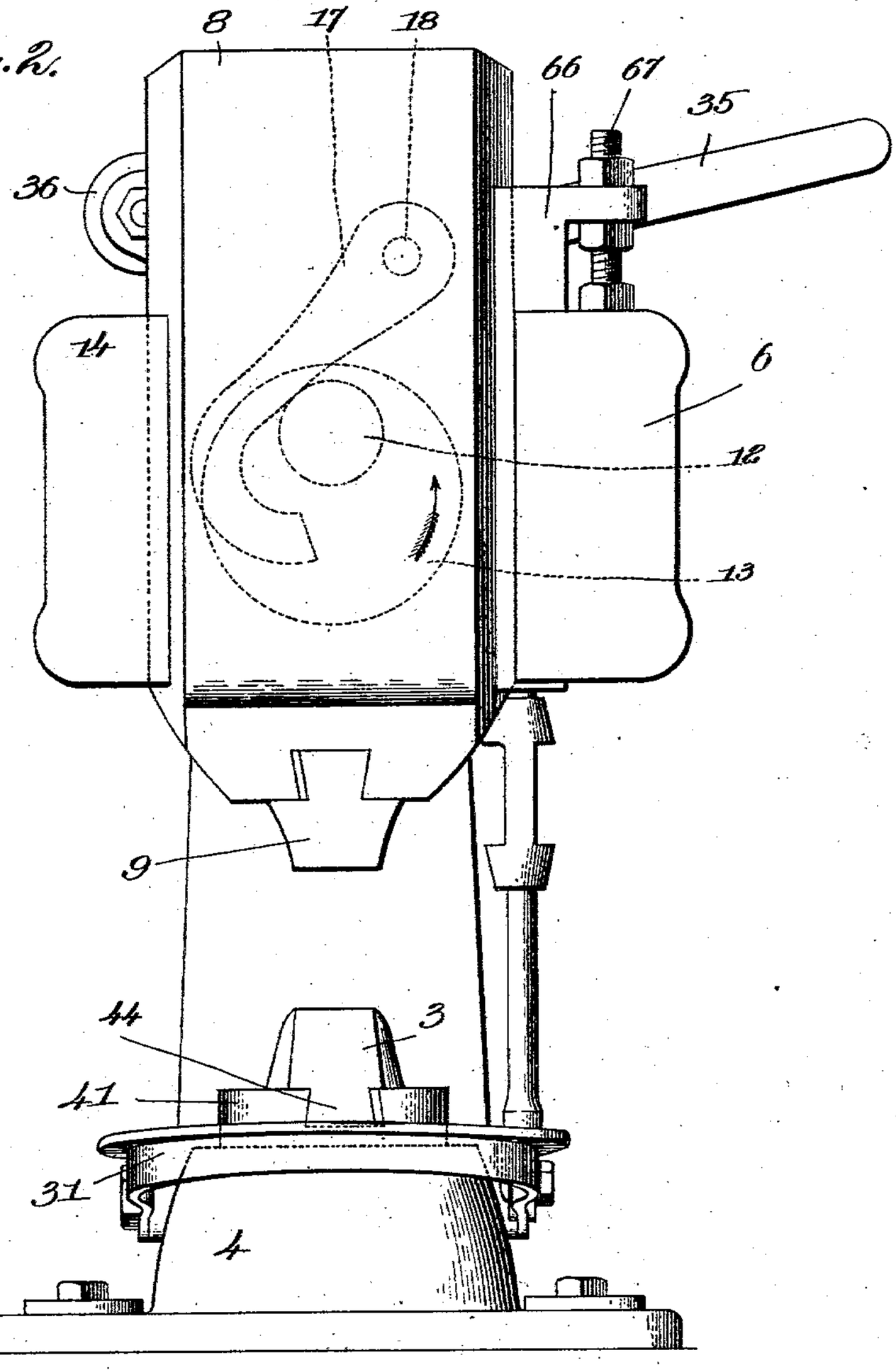
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.

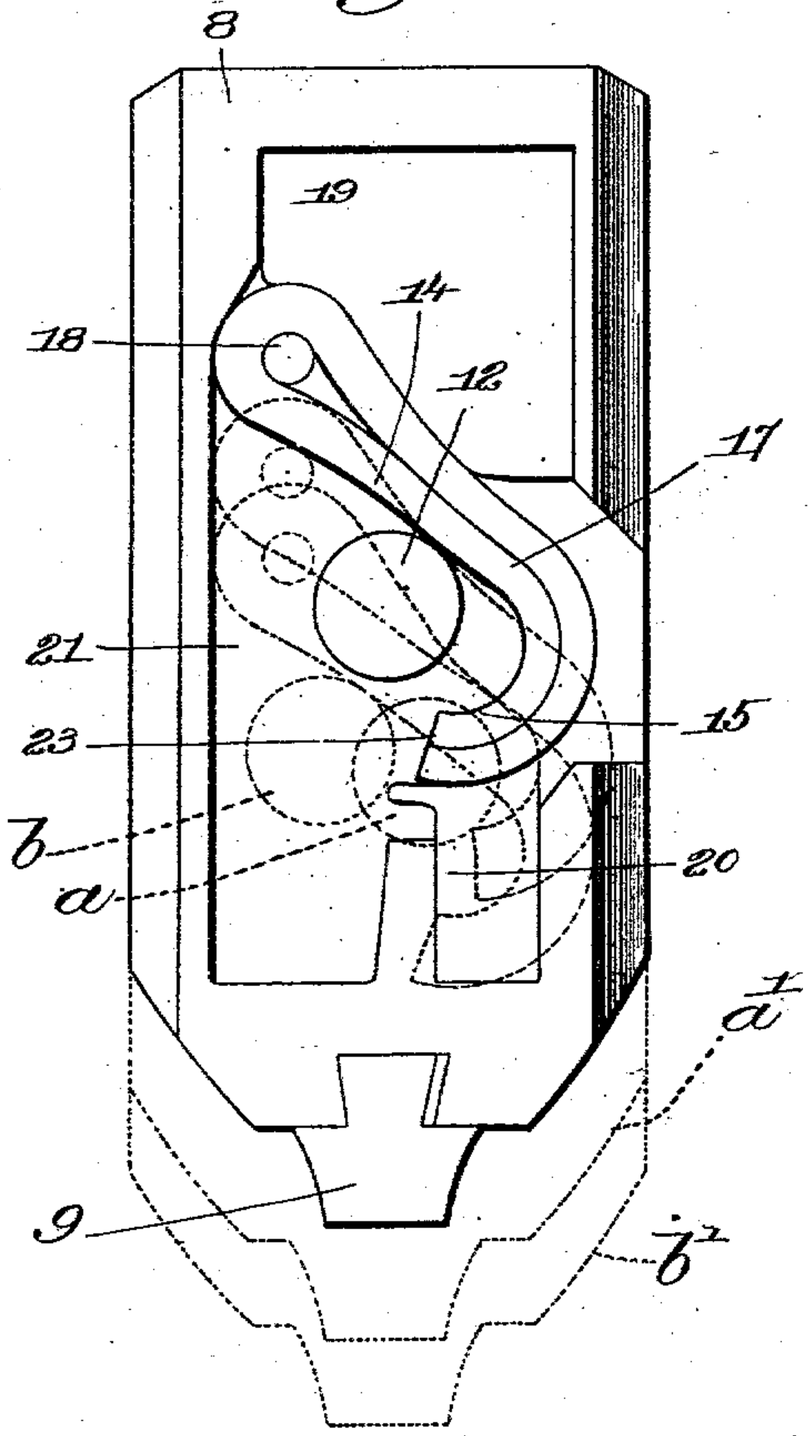


Fig. 5.

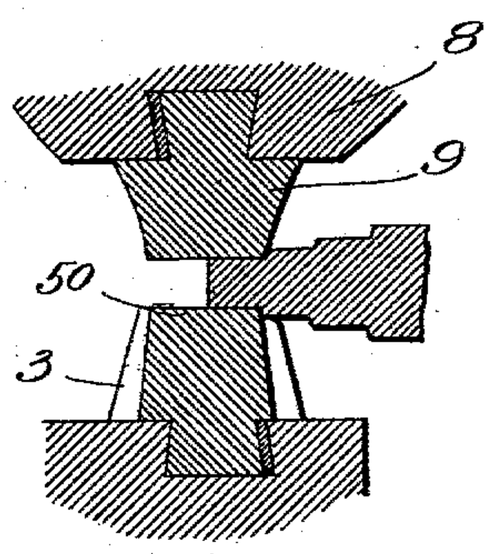


Fig. 6.

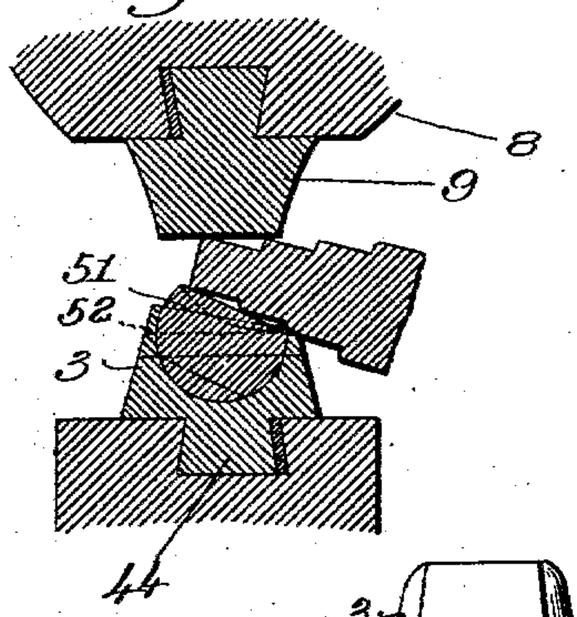


Fig. 7.

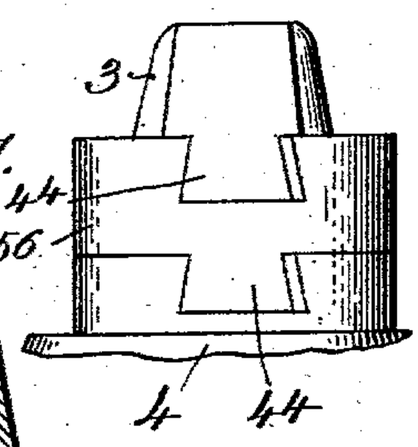
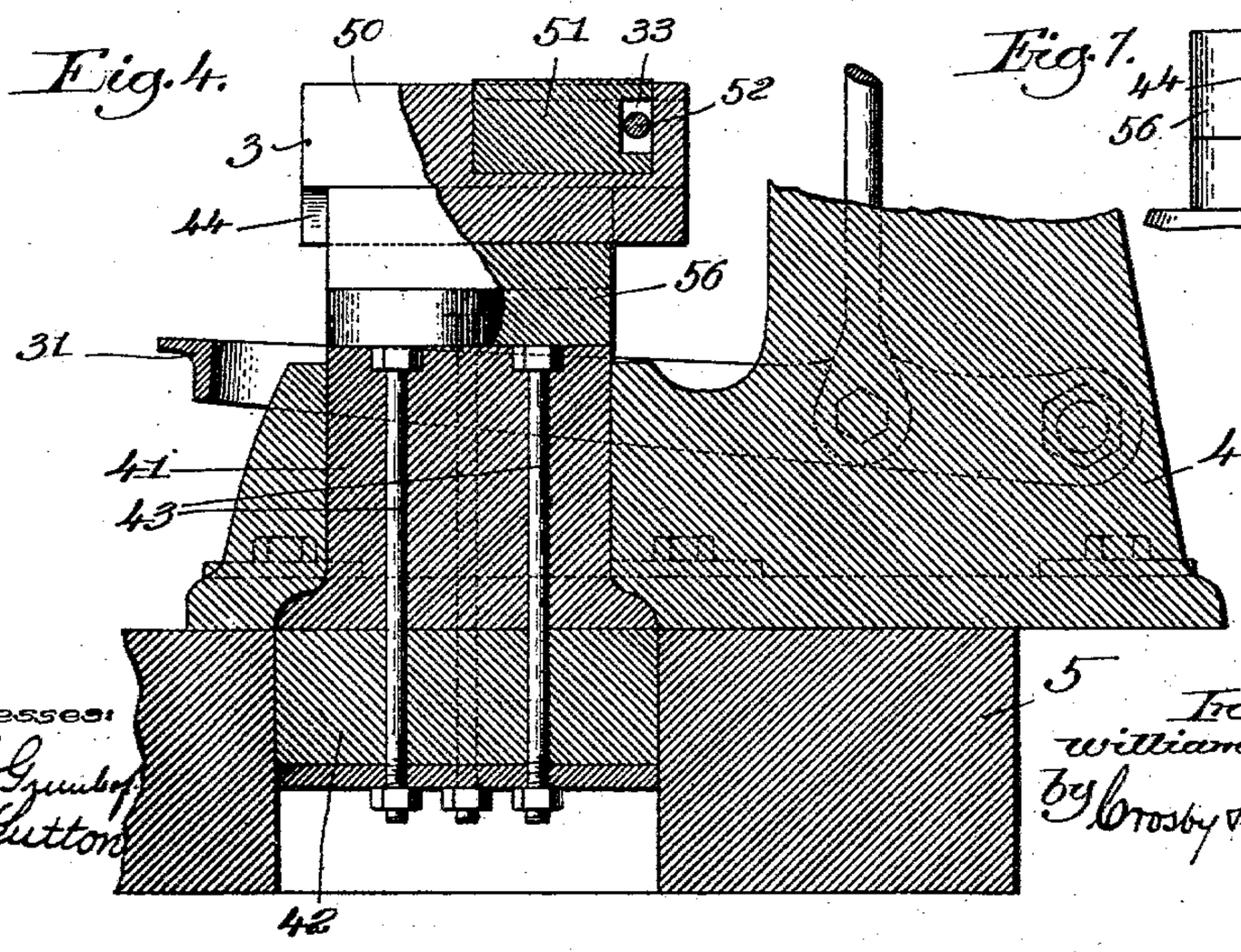


Fig. 4.



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No. 743,763. Patented November 10, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM E. SHEEHY, OF BOSTON, MASSACHUSETTS.

POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 743,763, dated November 10, 1903.

Application filed October 24, 1902. Serial No. 128,523. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SHEEHY, a citizen of the United States, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Power-Hammers, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to power-hammers; and its object is to provide a novel means for giving the hammer its reciprocations.

The improved hammer-actuating mechanism comprises a rotary actuating-pin, which operates in a recess in the hammer-block. The recess is constructed to have a lifting-wall and a depressing-wall, against which said crank-pin alternately engages thereby to raise and lower said block. The depressing-wall is so situated and of such shape with relation to the path of movement of the actuating-pin that the latter passes off from said wall during the downward movement of the hammer, whereby the actuating-pin gives the hammer-block its initial movement toward the anvil, but becomes disengaged from said block during the movement of the latter, so that the final movement of the hammer is effected by the action of gravity and the momentum given to the hammer during its initial movement.

Referring to the drawings, Figure 1 is a side elevation of my improved hammer. Fig. 2 is a front view. Fig. 3 is a view of the back side of the hammer-block, showing different positions of the actuator and corresponding positions of the hammer-block. Fig. 4 is a section through the anvil and lower part of the frame. Figs. 5 and 6 show the operation of the special type of anvil herein illustrated, and Fig. 7 shows a slightly-different way of mounting the anvil.

The frame supporting the operative parts may be constructed in any suitable way, and I have herein shown it as comprising the base 4, which is supported upon suitable foundations 5, and the head 6, supported by the stand or arm 7. The head has suitable ways therein, in which reciprocates the hammer-block 8, to which is secured in any approved way the hammer 9.

The actuating mechanism herein shown comprises a shaft 10, supported in the head 6 and carrying an actuating stud or pin 12, which is mounted eccentrically and which therefore has a revolving movement similar to that of a crank-pin. One convenient way of supporting this pin is by mounting the same in a disk 13, fast on the end of the shaft.

The hammer-block has at its rear side a recess in which said pin 12 operates. Said recess has the lifting-wall 14 and the depressing-wall 15, against which the pin 12 alternately impinges, the engagement of the pin with the lifting wall or shoulder 14 operating to lift the hammer-block and the engagement of said pin with the depressing wall or shoulder 15 operating to give the hammer-block its initial downward movement.

The shoulder or wall 15 is so constructed that the actuator passes out of engagement therewith before it has reached its lowest point and during the downward movement of the hammer-block. The result of this construction is that the actuator operates to give the hammer-block its initial movement only in a downward direction, the remainder of the movement being effected by the momentum acquired by the block during its initial movement and also by gravity. These walls or shoulders are preferably formed of some yielding material—such, for instance, as rawhide, leather, or similar material. In the preferred form of my invention the wall 14 is inclined, as shown in Fig. 3, and the two walls 14 and 15 together have an approximately hook shape. This particular arrangement of walls, however, is not essential, as they might have other contours than that shown and come within my invention, provided the wall 15 is so situated and of such shape that the pin passes off from it during the downward movement of the hammer. As herein illustrated, the walls 14 and 15 are formed by a piece 17 of yielding material, such as rawhide or leather, which is doubled or folded over the pin 18 and which is received in a suitable recess in the inner face of the hammer-block. 19 and 20 designate suitable backing-blocks against which the member 17 rests and which hold it in shape. These backing-blocks are preferably of some suitable elastic material, such as rubber, for a purpose hereinafter described.

The operation of the actuator upon the hammer-block will be apparent from an inspection of Fig. 3, in which three different positions of the parts are shown in full and dotted lines, respectively. The full-line position represents the actuator at the upper limit of its stroke and the hammer-block 8 in the same relative position. With the shaft rotating in the direction of the arrow, Fig. 2, the first quarter-revolution thereof will carry the actuator down the inclined wall or shoulder 14 until it is finally seated in the neck or curved portion of the member 17. At this point the actuator comes into engagement with the lower wall or shoulder 15, and further rotation of the shaft impinges said actuator against said wall or shoulder and causes a downward movement of the hammer-block. During such downward movement the actuator by its engagement with the wall or shoulder 15 operates to give the block 8 a positive movement toward the anvil, and consequently I refer to said wall as a "depressing-wall."

When the actuator is in the dotted-line position *a* and the block is in the dotted-line position *a'*, it will be observed that the said actuator is about to pass out of engagement with the depressing wall or shoulder 15, and during the movement of said actuator from dotted-line position *a* to dotted-line position *b* the hammer-block continues its downward movement by virtue of the momentum acquired during its initial movement and also by the action of gravity. When the hammer-block reaches its lowest position or dotted-line position *b'*, the actuator has reached the dotted-line position *b* and again comes in engagement with the lifting wall or shoulder 14. Continued movement of the actuator by its impingement against the said lifting-shoulder 14 operates to raise the hammer-block into the full-line position, when the operation, as above described, may be repeated. It will thus be seen that I have provided a device which operates to give the hammer-block a positive initial movement, but which becomes released from the said block during its movement, whereby the movement of the hammer-block during the latter part of the stroke is entirely independent from the movement of the actuator and is effected solely by the momentum of the said block, assisted by the action of gravity.

By employing a yielding material, such as leather or rawhide, for the member 17 and backing the latter with elastic backing-blocks the impingement of the actuator against the walls or shoulders 14 and 15 is cushioned, and the shoulders will yield somewhat to conform to the rotary movement of the actuator. In addition such particular construction of the shoulder 15 permits the actuator to give the said block a quicker impulse, and also permits the point or end of the wall or shoulder to yield slightly to allow the actuator to snap out of engagement therewith.

I consider the method by which the motion is given to the hammer-block as very important, since at the time that the hammer strikes the work it is entirely free from any of the actuating mechanism.

I have herein illustrated any suitable or usual mechanism for starting and stopping the rotation of the driving-shaft 10 at the appropriate times, the said mechanism consisting of a foot treadle or bail 31, pivoted to the frame, as at 32, and having connected at one side thereof a rod 33, which in turn is connected to a spring-actuated plunger 34, operating in a suitable socket in the head 6. The plunger is connected to a lever 35, pivoted to said head and carrying at one end a roll 36, adapted to engage the driving-belt 37 when the treadle 31 is depressed. A brake 36' is also connected to said lever in such a way that when the treadle is depressed the brake is raised from the brake-surface 37'; but when the treadle is in raised position the brake is applied. With this construction to start the machine the treadle is depressed and the roll 37 brought into engagement with the belt, thereby to tighten the belt sufficiently to set the shaft 6 in rotation.

Obviously the speed of rotation of the shaft, and consequently the force given to the initial movement of the hammer-block, depends upon the degree to which the belt is tightened, a matter under the entire control of the operator.

As soon as the treadle 21 is released the spring 40 of the plunger operates to apply the brake and also allows the belt to slacken, whereby the machine will be stopped.

The anvil 3 is supported upon a stand or support 41, which is independent from the base of the stand for the hammer, and is supported upon foundations 42, independent from the foundations 5 for the base 4. As herein shown, the base 4 is provided with an opening or socket in which the stand 41 is received, and said stand is bolted to the foundation 42 by means of bolts 43. The upper end of the stand is provided with a dovetailed groove to receive a correspondingly-shaped rib 44 on the anvil 3.

The anvil herein illustrated is similar in many respects to that illustrated and claimed in my copending application, Serial No. 166,943, filed July 25, 1903, and is not, therefore, specifically claimed herein. It comprises a fixed portion 50, having a fixed work-receiving face and a freely-rocking member 51, which also has a work-receiving face. The freely-rocking member 51 sets in a recess in the anvil-die and is held in place in any suitable way, as by a pin 52, extending into a slot 53 in the end of said rocking member. The anvil is so positioned that the hammer is situated partially over the face of the fixed portion 50 and partially over the face of the rocking member 51. This construction of anvil is especially useful in forging tapered work, and in accomplishing this result the work is first positioned on the fixed face of

the anvil, as shown in Fig. 5, and roughed out. Thereafter it is placed upon the rocking member 51 and finished, said rocking member permitting the work to be given such a position that the hammer and anvil coöperate to smooth and completely finish it. The operation of this form of anvil is more fully set forth in my above-mentioned application, to which reference may be had.

In case it is desired to elevate the face of the anvil to operate on thinner work, I may interpose a block 56 between the anvil and its foundation or support 41. In this case the block 56 has a dovetailed groove in which the dovetailed rib 44 of the anvil is received, and said block is in turn provided with a dovetailed rib which is received by the groove in the stand 41.

In order to enable the hammer-block to be readily removed, I form one of the ways in which said block slides in a removable gib 66, which is received in a groove in the head of the frame and which is adjustably held in place by the screw 67.

While in order to properly describe my invention it has been necessary to illustrate and describe in detail one embodiment thereof, I do not wish to be limited to the exact construction above set forth, as my invention is capable of embodiment in other constructions not herein illustrated.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a power-hammer, a reciprocating hammer-block having a recess provided with a lifting-wall and a depressing-wall, a rotary actuator having a crank-pin operating in said recess and adapted to engage said walls alternately thereby to raise and lower the block, the depressing-wall being so situated with relation to the path of movement of the crank-pin that the latter passes off from the end of said wall during the downward movement of the block.

2. In a power-hammer, an anvil, a reciprocating hammer-block provided with a recess in one side having a hook-shaped wall, a rotary actuator having a crank-pin to engage said wall and thereby raise and lower the hammer-block, the said wall being so situated with relation to the path of movement of the crank-pin that said pin passes off from the point of the hook during the downward movement of the block.

3. In a power-hammer, an anvil, a reciprocating hammer-block provided with a recess having a downwardly and outwardly inclined wall which merges into a substantially horizontally and inwardly extending wall, and a rotary actuator having a crank-pin to engage said walls, the horizontally and inwardly extending wall having such relation to the path of movement of the crank-pin that the latter will pass off from said wall during the downward movement of the block.

4. In a power-hammer, an anvil, a reciprocating hammer-block provided with a recess in one side, having a hook-shaped resilient wall, and a rotary actuator having a crank-pin to engage said wall and thereby raise and lower the hammer-block, said resilient wall having such relation to the path of movement of the crank-pin that the latter passes off from the end of the wall during the downward movement of the block.

5. In a power-hammer, a reciprocating hammer-block having a crank-pin-receiving recess and a rotary actuator having a crank-pin operating in said recess, said pin by its engagement with one wall operating to raise the hammer-block, and by its engagement with the other wall operating to depress said block, the latter wall being of such a length and so situated with relation to the path of movement of the crank-pin that the latter passes off from the end of said wall during the downward movement of the block.

6. In a power-hammer, an anvil, a reciprocating hammer-block having a crank-pin-receiving recess provided with resilient walls, and an actuator having a crank-pin operating in said recess, said pin by its engagement with one wall operating to raise the hammer-block, and by its engagement with the other wall operating to depress said block, the latter wall being of such a length and so situated with relation to the path of movement of the crank-pin that the latter passes off from the end of said wall during the downward movement of the block.

7. In a power-hammer, an anvil, a reciprocating hammer-block having a substantially hook-shaped member of yieldable material secured to one side thereof, a backing for said member, and an actuator having a crank-pin to engage said hook-shaped member and give to the hammer-block its reciprocating movement.

8. In a power-hammer, an anvil, a reciprocating hammer-block having a substantially hook-shaped member of yieldable material secured to one side thereof, a resilient backing for the shank and point of said hook-shaped member, and an actuator having a crank-pin to engage said member.

9. In a power-hammer, an anvil, a reciprocating hammer-block having a substantially hook-shaped member of yieldable material secured to one side thereof, a backing for said member, and an actuator having a crank-pin to engage said hook-shaped member and give to the hammer-block its reciprocating movement, the point of said hook-shaped member being so situated that the crank-pin will pass off from the same during the downward movement of the block.

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

WILLIAM E. SHEEHY.

Witnesses:
WILLIAM J. FOLEY,
WALLACE N. GREENWOOD.