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PATENTED JULY 23, 1907.

O. S. BEYER.
DROP HAMMER.

APPLICATION FILED AUG. 27, 1904.

4 SHEETS—SHEET 1.

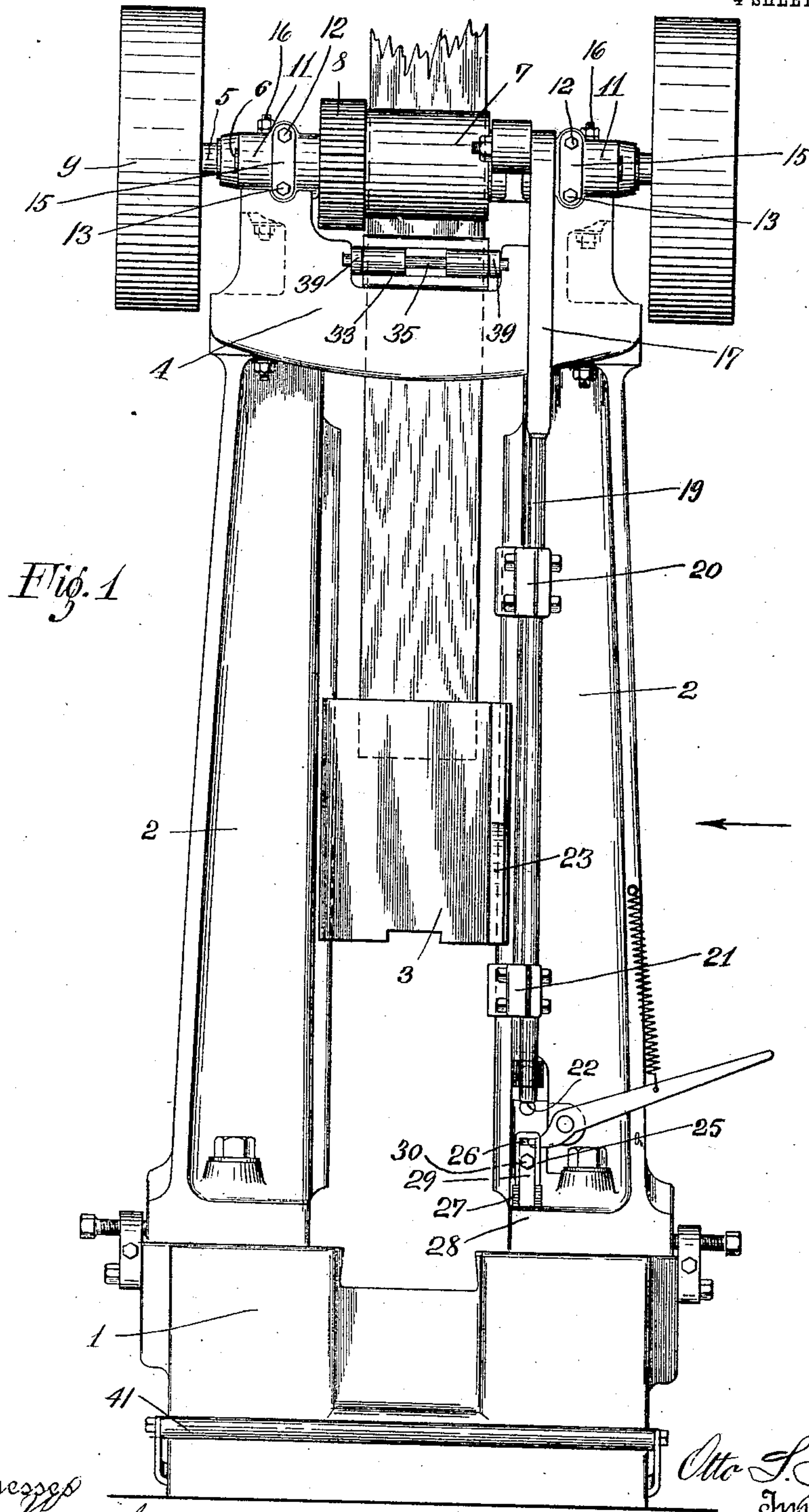


Fig. 1

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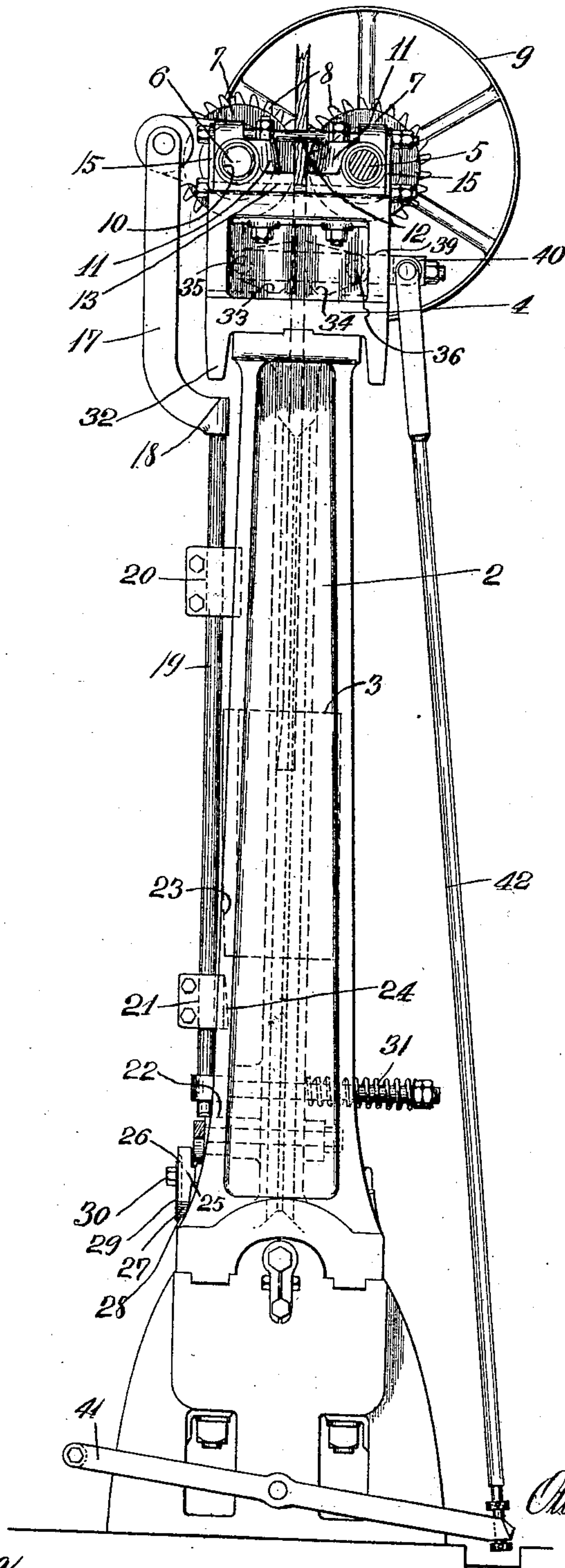
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Fig. 2



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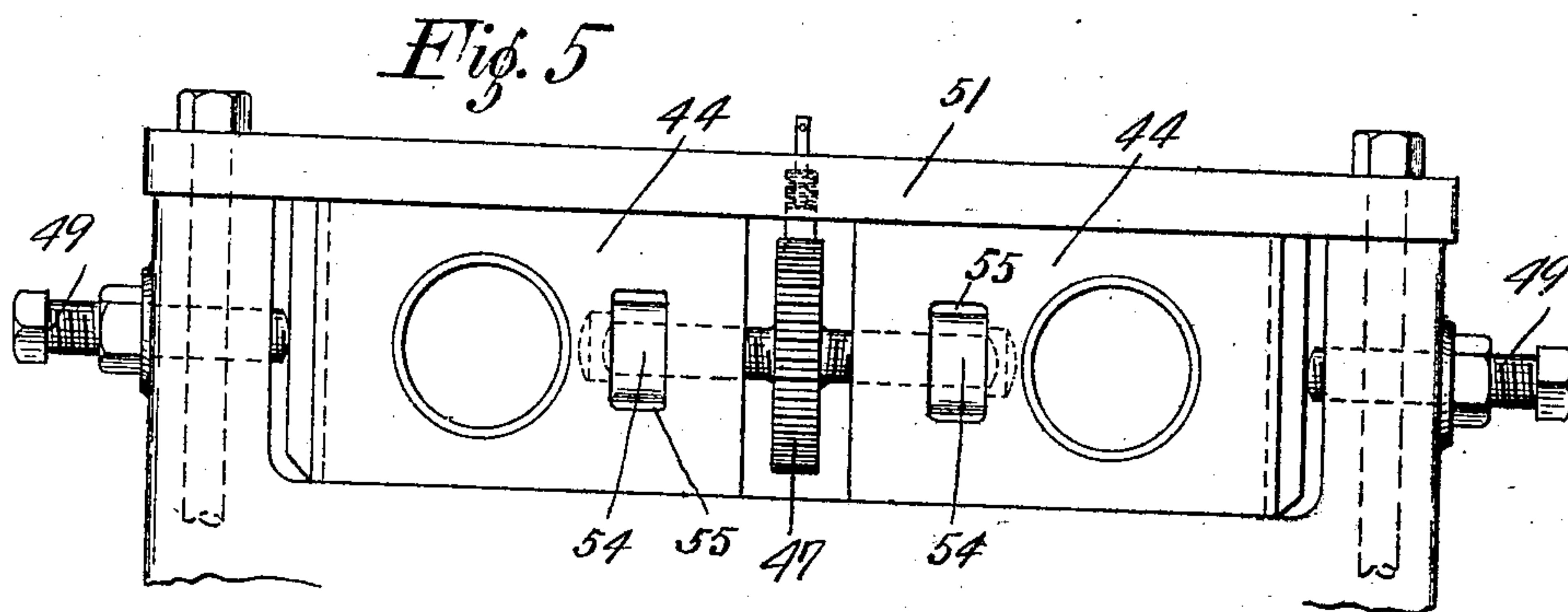
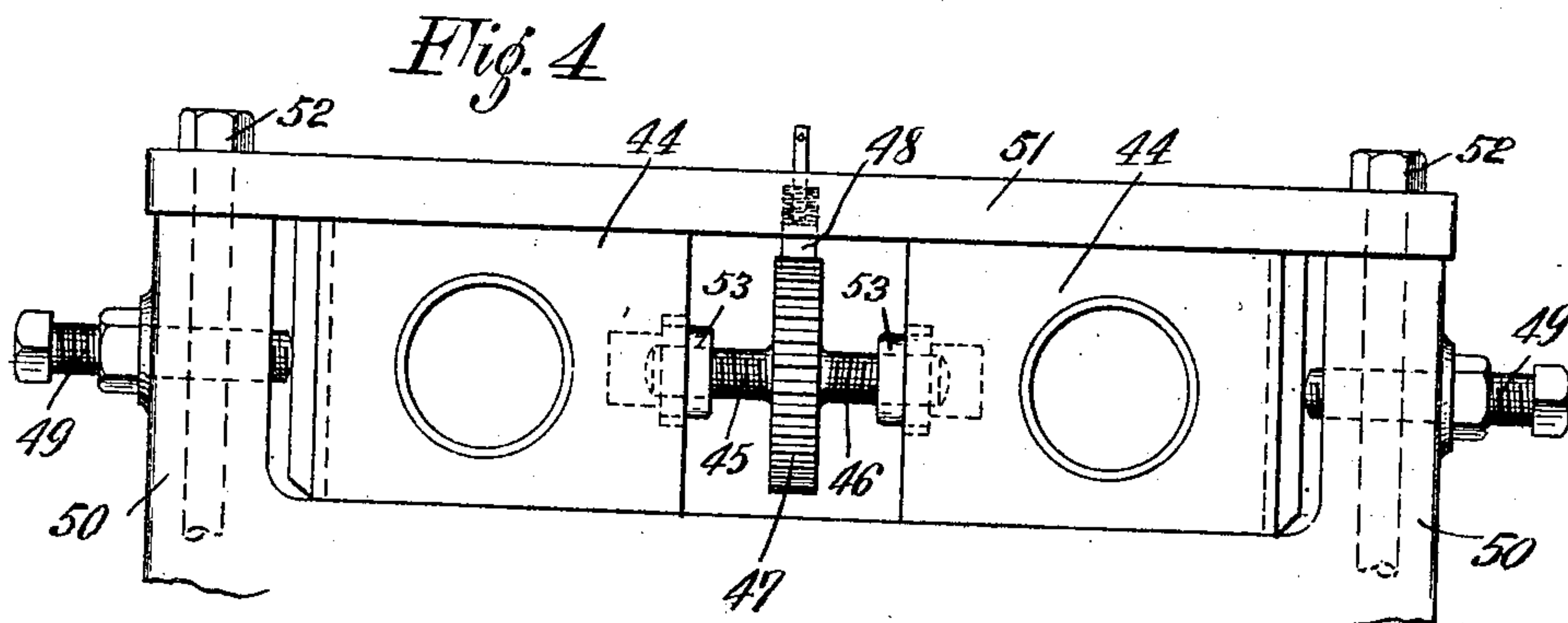
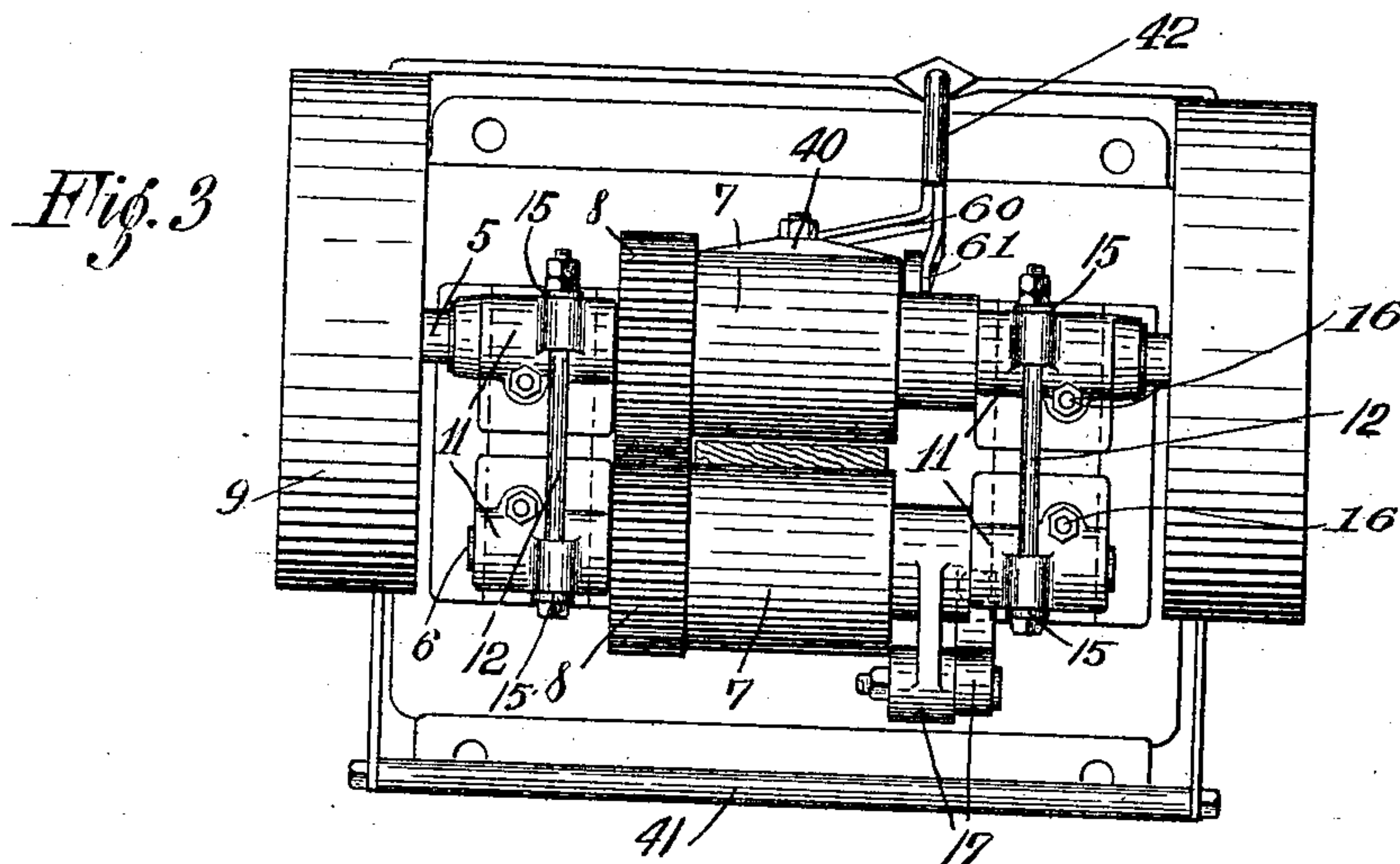
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4 SHEETS—SHEET 3.



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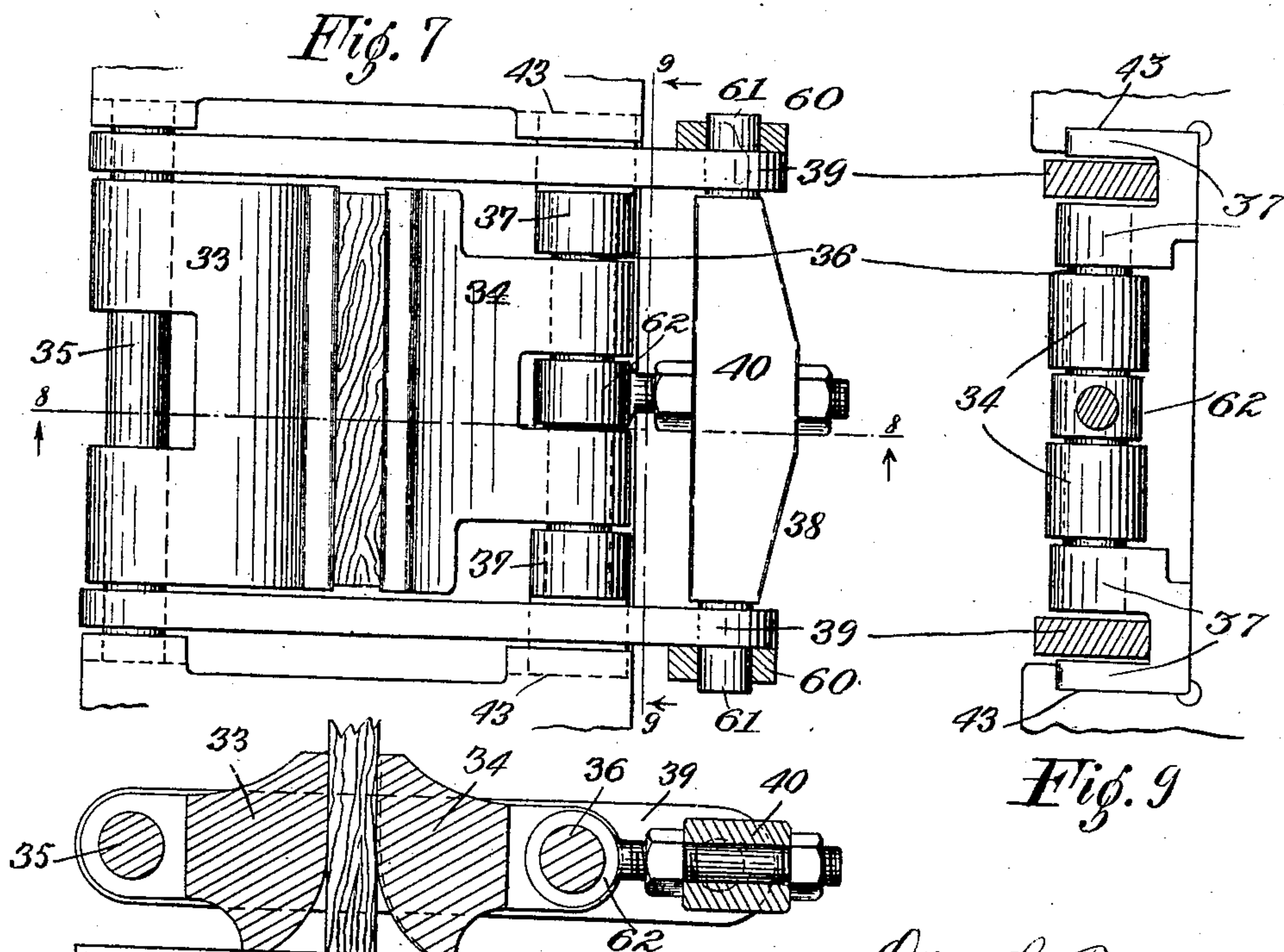
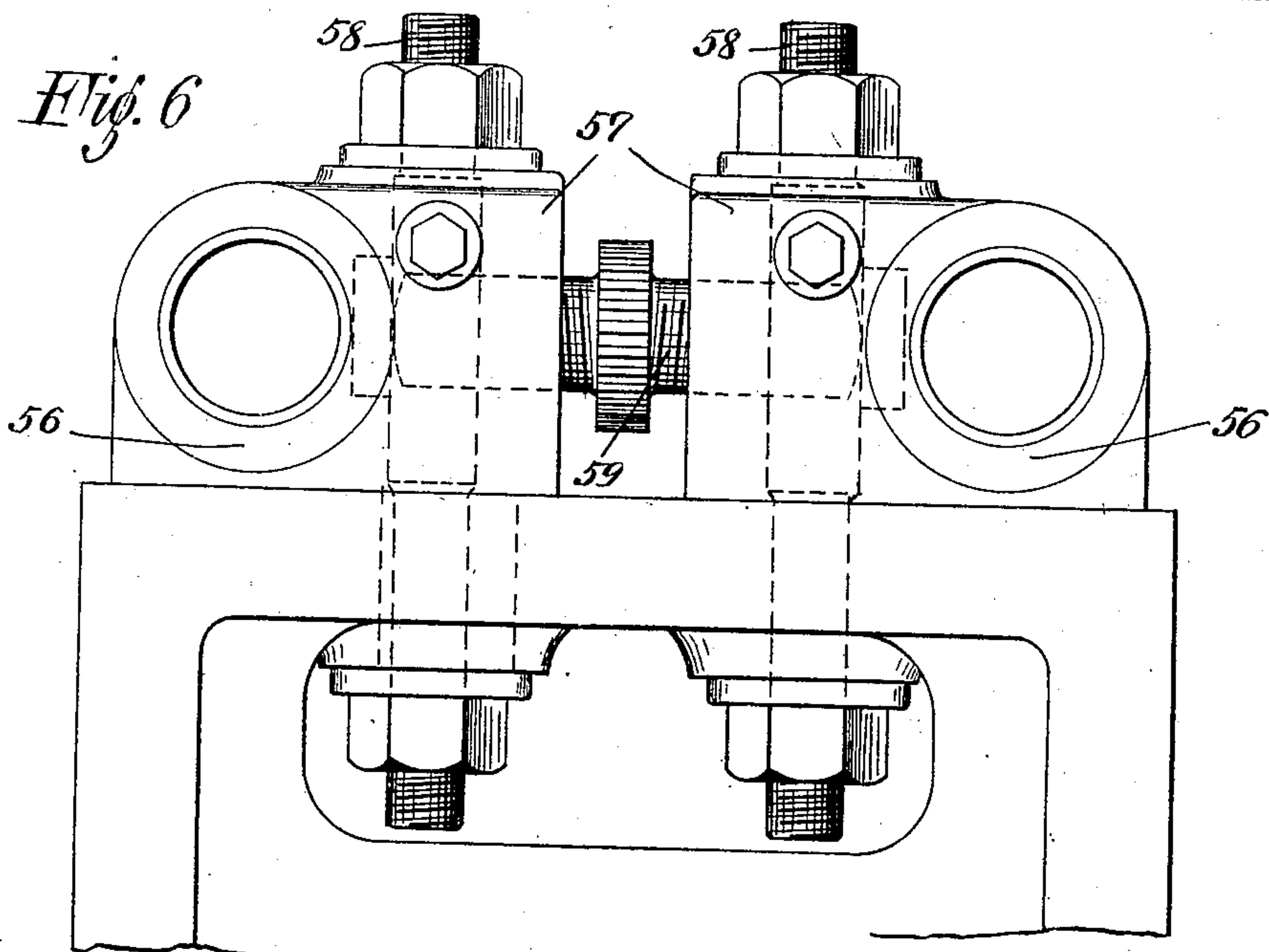
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

OTTO S. BEYER, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO E. W. BLISS COMPANY,
A CORPORATION OF WEST VIRGINIA.

DROP-HAMMER.

No. 860,784.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed August 27, 1904. Serial No. 222,397.

To all whom it may concern:

Be it known that I, OTTO S. BEYER, a citizen of the United States of America, and a resident of East Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Drop-Hammers, of which the following is a specification.

My invention relates generally to drop hammers, and has more especially reference to an improved construction in which increased strength is combined with simplicity of structure and ease of adjustment.

In the prior art, it has been customary to form the bearings of one of the lifting roll shafts integral with the cast iron frame, the bearing of the other lifting roll shaft being adjustable by means of a set screw passing through the framework and bearing against a box forming the bushing for the said shaft. In order to lift the hammer head, the tension between the two lifting rolls is very considerable. But with the structure just described, the strain would fall entirely upon the cast iron construction of the framework, thereby frequently causing a break in the parts, oftentimes resulting in injury to the attendant of the machine.

My invention contemplates the elimination of this obnoxious feature, and to this end I preferably employ sliding boxes for both shafts of the lifting rolls, or bushings, for these shafts, that are independent of the framework. I further interpose between these two boxes an adjustable connection which takes up the strain, that in the old construction fell entirely on the framework.

Another disadvantage attendant upon the present construction of drop hammers resides in the clamping jaws as used at the present time. These clamping jaws are designed to hold the hammer head suspended by clamping the board and have usually been in the form of two pivoted members moving in an arc of a circle and one of which is eccentrically disposed so as to enable the board to be clamped in the proper manner. The effect of this construction is that these clamping jaws come in contact with the board at one point only with the result that a deep incision or recess is gradually worn in the board. This disadvantage I purpose to obviate by causing one of the said clamping jaws to move in a straight direction into and out of contact with the board. By this means a much larger surface is acted upon by these jaws, thereby greatly increasing the effectiveness of the structure, and also permitting the strain to be transferred to parts that are better able to stand the tension.

Minor improvements and additional novel features of construction and combinations of parts will appear as the specification proceeds.

In the accompanying drawings: Figure 1 is a front elevation of a drop hammer embodying my invention.

Fig. 2 is a side elevation of Fig. 1 looking in the direction of the arrow. Fig. 3 is a plan view of Fig. 1 showing the preferred construction of boxes for the lifting rolls. Figs. 4, 5 and 6 show modifications of this construction. Fig. 7 is a plan view of the improved structure of clamping jaws. Fig. 8 is a sectional view on the line 8—8 of Fig. 7. Fig. 9 is a sectional view on the line 9—9 of Fig. 7.

Similar characters of reference indicate corresponding parts in the different views.

The machine shown in the present instance is of a conventional type of drop hammers, and is provided with a bed plate 1 from which extends two uprights 2 forming a guide-way for the hammer head 3, and, in general, forming a framework, in conjunction with the cross piece 4 which connects the two uprights at the top, for supporting the various parts of the machine.

5 and 6 indicate the two lifting roll shafts supporting the lifting rolls 7 and provided with gears 8 for imparting the motion of the pulley 9 in the usual way to both of the lifting rolls. The shaft 6 is eccentric as indicated at 10 so that when the said shaft is turned a distance, the lifting rolls will grip the board of the hammer head and lift the same. Each of the said lifting roll shafts is mounted in the boxes 11 detachable from the framework and provided with an adjustable connection between each pair of opposed boxes for adjusting the distance between the lifting rolls and for taking up the strain. In Figs. 1, 2 and 3, I show what I consider the preferred form of this construction. In this instance, the boxes are made adjustable on the framework, and each opposed pair of boxes is connected together by means of the upper and lower rods 12 and 13, adjustably secured to the said boxes by means of the nuts 14. Connecting the upper and lower rods on each box is an outside washer 15. From this construction it will be observed that the said upper and lower rods and the washer 15 form an independent framework for taking up the strain and relieving it from the cast iron frame of the machine, and adapted further to hold the boxes in the proper position should the strain be severe enough to cause a breakage in the said boxes at any point. The said boxes are suitably fastened to the framework of the machine by means of the vertical bolts 16. A shaft 6 is turned a distance at the proper intervals by any well known means such as, for instance, through the instrumentality of the bell crank 17 having the contacting portion 18 and carrying the lifting roll operating rod 19. This rod is provided with the upper and lower dogs 20 and 21 in the usual manner, and rests with its free lower end upon the ledge 22 of the framework. Upon the descent of the hammer head the inclined surface 23 of the same will engage with the inclined surface 24 of the dog 21 and cause the lifting roll operating rod to be thrown out of engagement with the ledge 22 and

down upon the support 25. This support is in the form of a member having a recess 26 and resting upon the leather washers 27 in turn supported upon the ledge 28 of the framework. The plate 29 is inserted in the said recess and extends down to the ledge 28 and has a bolt 30 passing through it and the said support 25, securing the parts to the framework. This construction is of considerable value in taking up the force of the blow caused by the dropping of the lifting roll operating rod on the support 25. Upon the upward movement of the hammer head, the lower end of the lifting roll operating rod is moved back on the ledge 22 by reason of the hammer head coming in contact with the dog 20 and spring 31 tending to draw it back to its original position. In order to relieve the strain from the lifting rolls upon the upward movement of the hammer head, I provide the stop 32 on the framework against which the contacting portion 18 of the bell crank strikes as it ascends.

33 and 34 indicate two clamping jaws for clamping the board so as to hold the hammer head suspended when not in use. The clamping jaw 33 is mounted loosely on the pivot 35 while the clamping jaw 34 is mounted on a horizontally moving carriage so that it will move in a straight direction toward and away from the board as indicated in Fig. 8, thereby preventing the board from being worn. In the more particular construction followed I prefer to mount the clamping jaw 34 loosely on the pivot 36 carried by the horizontally movable carriage 37, and to provide a pivoted framework 38 loosely connected to the pivot on the horizontally movable carriage for imparting motion to the same so as to cause it to travel in a straight direction. In the present instance, this pivoted frame is mounted on the pivot 35 and is composed of two links 39 preferably of wrought iron extending beyond the pivot on the horizontally movable carriage and connected together by means of the cross piece 40, and loosely attached to the pivot 36 at its free end by means of the adjustable connection 62. Any suitable means may be utilized for imparting motion to the horizontally movable carriage, such as, for instance, the treadle 41 connected to the cross piece 40 by means of the rod 42 the upper end of which terminates in the forked connection 60, pivoted loosely on the ends 61 of the said cross piece 40.

The action of the clamping jaws will be readily understood, and is as follows: Upon depressing the treadle 41, the framework 38 will move upward, swinging around its pivot 35, thereby causing a motion in a straight direction of the horizontally movable carriage 37 and clamp 34, by reason of the loose connection 62 between the carriage and framework, thus releasing the board. When the treadle is released, the horizontally movable carriage will travel toward the board and cause the clamping jaws 34 to clamp the said board over a considerable surface as indicated in Fig. 8. The carriage is guided in its travel by means of the ways 43.

As the clamps are pivoted loosely on their respective pivots, they will, by reason of their weight, remain in the horizontal position shown in Fig. 8 during the motion above described, and also at any time permit of the elevation of the board independent of the action of the treadle. During the elevation of the board, the clamps will naturally swing slightly up-

ward, but their weight will always keep them in position to clamp the board when the upward motion of the same ceases. If this construction is used, the wearing away of the board referred to above will be prevented, and the entire strain of the parts will fall on the two wrought iron links 39 which are sufficiently strong to take it up in the proper manner.

In Figs. 4, 5, and 6, I have shown three modifications of my improved lifting roll box construction. In Fig. 4, I have denoted the two opposed boxes by the numeral 44. Interposed between these two boxes there is a right and left screw 45 and 46 having a gear 47 by means of which the parts can be adjusted when released from the spring seated stop 48. In addition to this I provide set screws 49 at the outer ends of the boxes, passing through the uprights 50, which latter are used as supports for a top plate 51 holding the box in position, and secured to the uprights 50 by means of the bolts 52. The screws 45 and 46 engage in the bushings 53 so that when it is desired to move the boxes closer to each other a pulling action takes place. In Fig. 5, I locate the bushings here denominated as 54, in suitable slots or cut outs 55 in the boxes so that the action, when adjustment takes place, is both a pulling and a pushing action. Under some circumstances this is preferable to the construction shown in Fig. 4. In Fig. 6, the boxes 56 are provided with bosses 57 through which the bolts 58 pass, securing the said boxes to the framework, thus dispensing with the top plate 51 used in the constructions shown in Figs. 4 and 5. In this instance, also, I use a right and left screw 59 for adjusting the boxes with relation to each other.

The operation of the drop hammer as a whole is similar to that of other machines of the same nature, and it is not considered necessary, therefore, to explain the same in detail here, the operation of the novel features having already been noted hereinbefore.

What I claim is:

1. In a drop hammer, the combination with two clamping jaws, of a pivot supporting one of said clamping jaws, a horizontally movable carriage, a pivot on the said carriage for supporting the other of the said clamping jaws, a pivoted framework loosely connected to the pivot on the horizontally movable carriage, and means connected to the said pivoted framework for actuating the same so as to cause the horizontally movable carriage to move in a straight direction.

2. In a drop hammer, the combination with two clamping jaws, a pivot for supporting one of the said clamping jaws, a horizontally movable carriage, a pivot on the said carriage loosely supporting the other of said clamping jaws, a framework pivoted on the pivot of the first mentioned clamping jaw, and loosely connected at its free end to the pivot on the movable carriage, and means connected to the said pivoted framework for actuating the same so as to cause the carriage to travel in a straight direction.

3. In a drop hammer, the combination with two clamping jaws, of a pivot loosely supporting one of the said clamping jaws, a horizontally movable carriage, a pivot on the said carriage loosely mounting the other of the said clamping jaws, two links pivoted on the pivot of the first mentioned clamping jaw, and extending beyond the pivot on the moving carriage, a cross piece loosely connecting the said links to the pivot on the horizontally movable carriage, and means connected to the said cross piece whereby the cross piece may be raised for causing the carriage to travel in a straight direction.

4. In a drop hammer, the combination with two lifting rolls, of opposed fixed but adjustable boxes supporting the same, means for causing one roll to move within its box toward the other roll, upper and lower rods connecting the

said opposed boxes and adjustably secured to the same, and means for securing the said boxes to the framework of the machine.

5 In a drop hammer, the combination with two lifting
rolls, of opposed fixed but adjustable boxes supporting the
same, means for causing one roll to move within its box
toward the other roll, an adjustable framework connecting
the said opposed boxes comprising upper and lower rods
adjustably secured to the said opposed boxes, nuts and
10 washers connecting the upper and lower rods in each box,
and means for securing the said boxes to the framework
of the machine.

6. In a drop hammer, the combination with two clamp-
ing jaws, a pivot for supporting one of the said jaws, a
15 carriage, a pivot on said carriage loosely supporting the
other of the said jaws, a framework pivoted on the pivot

of the first mentioned jaw, and loosely connected at its
free end to the pivot of the said carriage, and means for
elevating the free end of the said framework.

7. In a drop hammer, the combination with a lifting roll 20
operating rod, of a bell crank connected to the same for
moving one of the rolls toward and away from the other,
a contacting portion at the point where the bell crank and
lifting roll operating rod are joined, and a stop located in
the path of the said contacting portion on its upward 25
stroke.

Signed at Brooklyn, N. Y. this 19th day of August 1904.

OTTO S. BEYER.

Witnesses:

H. KLOETHE,

FRED. H. MCGAHIE.