

No. 609,807.

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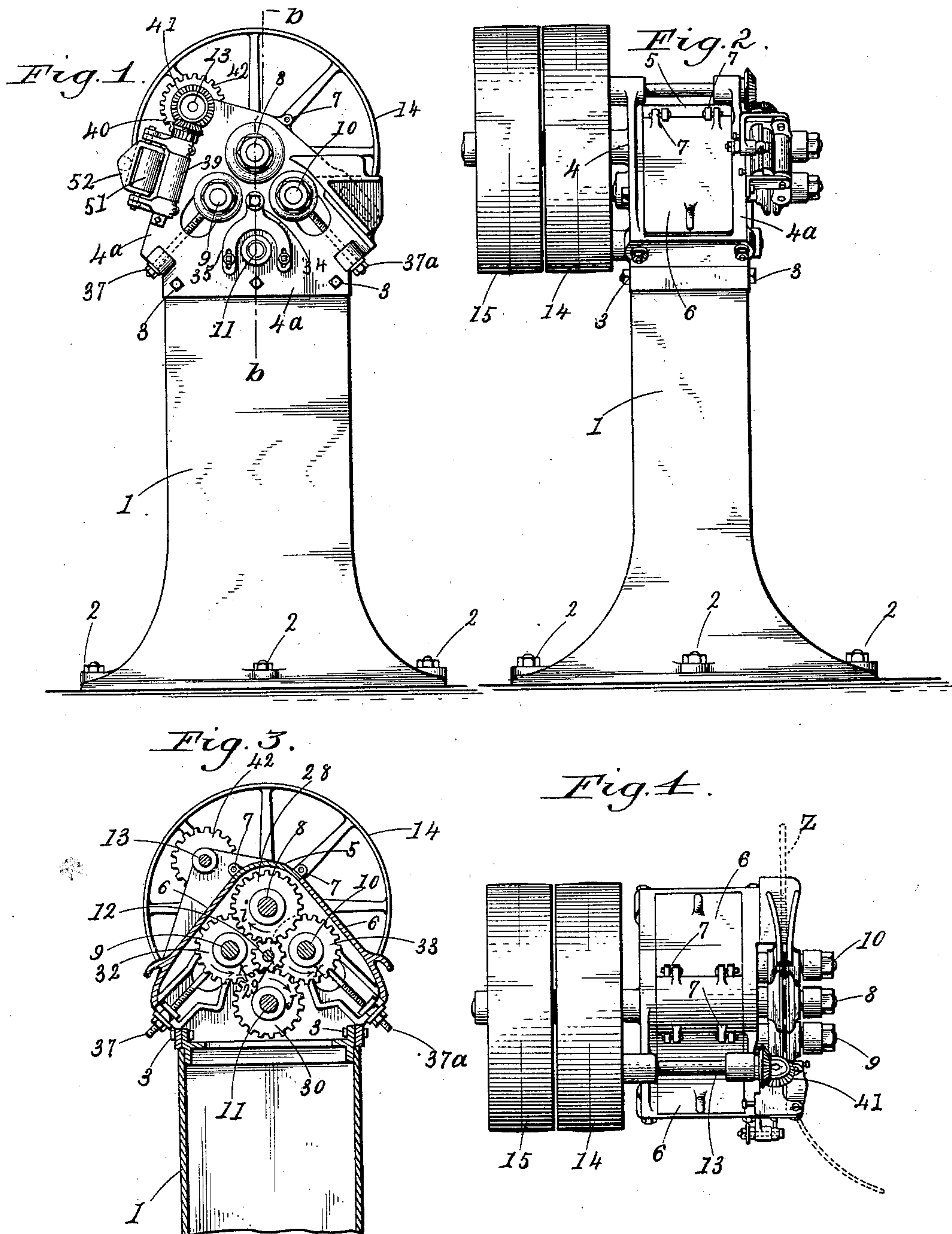
E. & B. HOLMES.

MACHINE FOR FLARING AND BENDING METAL HOOPS.

(Application filed Sept. 29, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,

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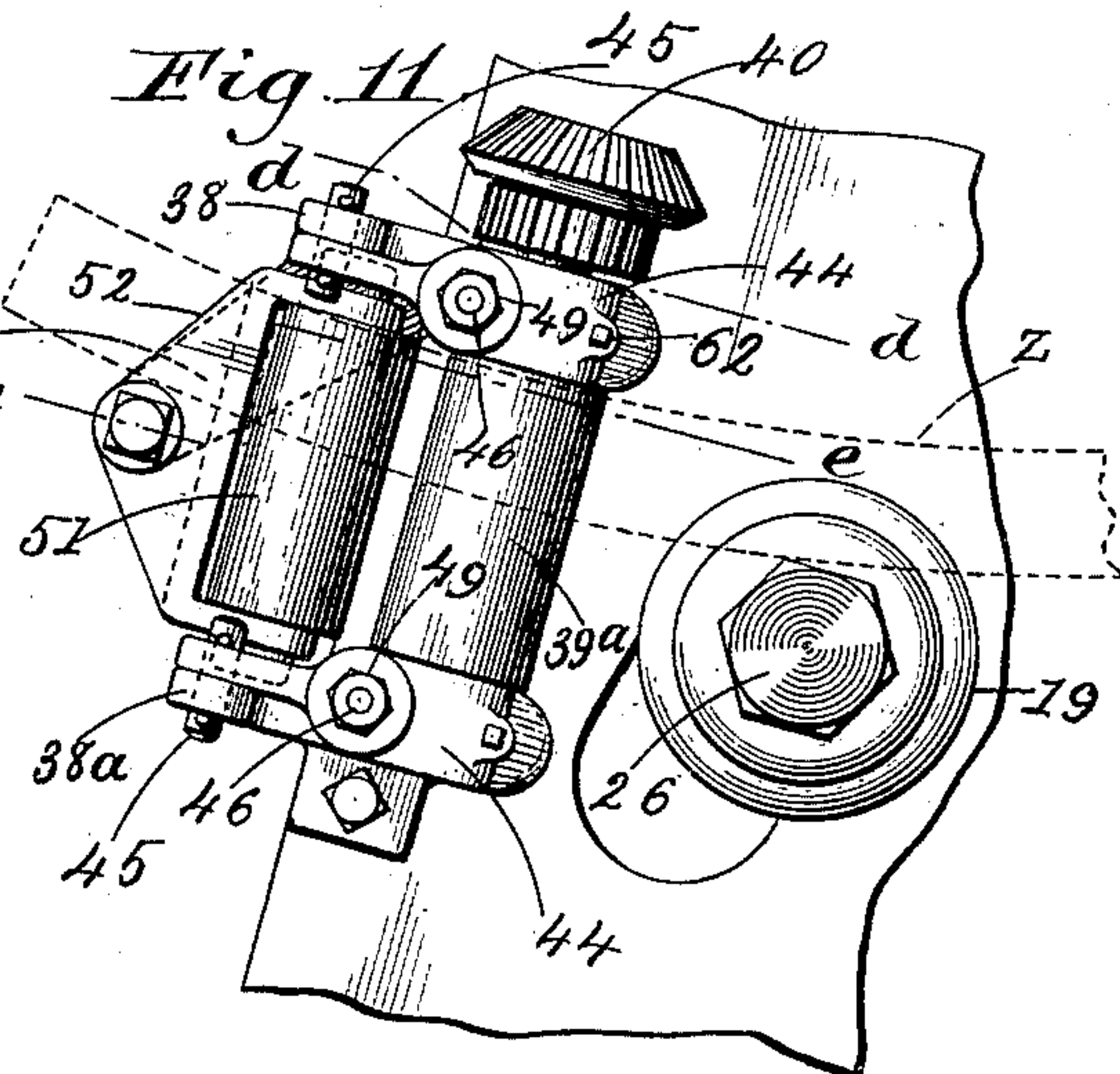
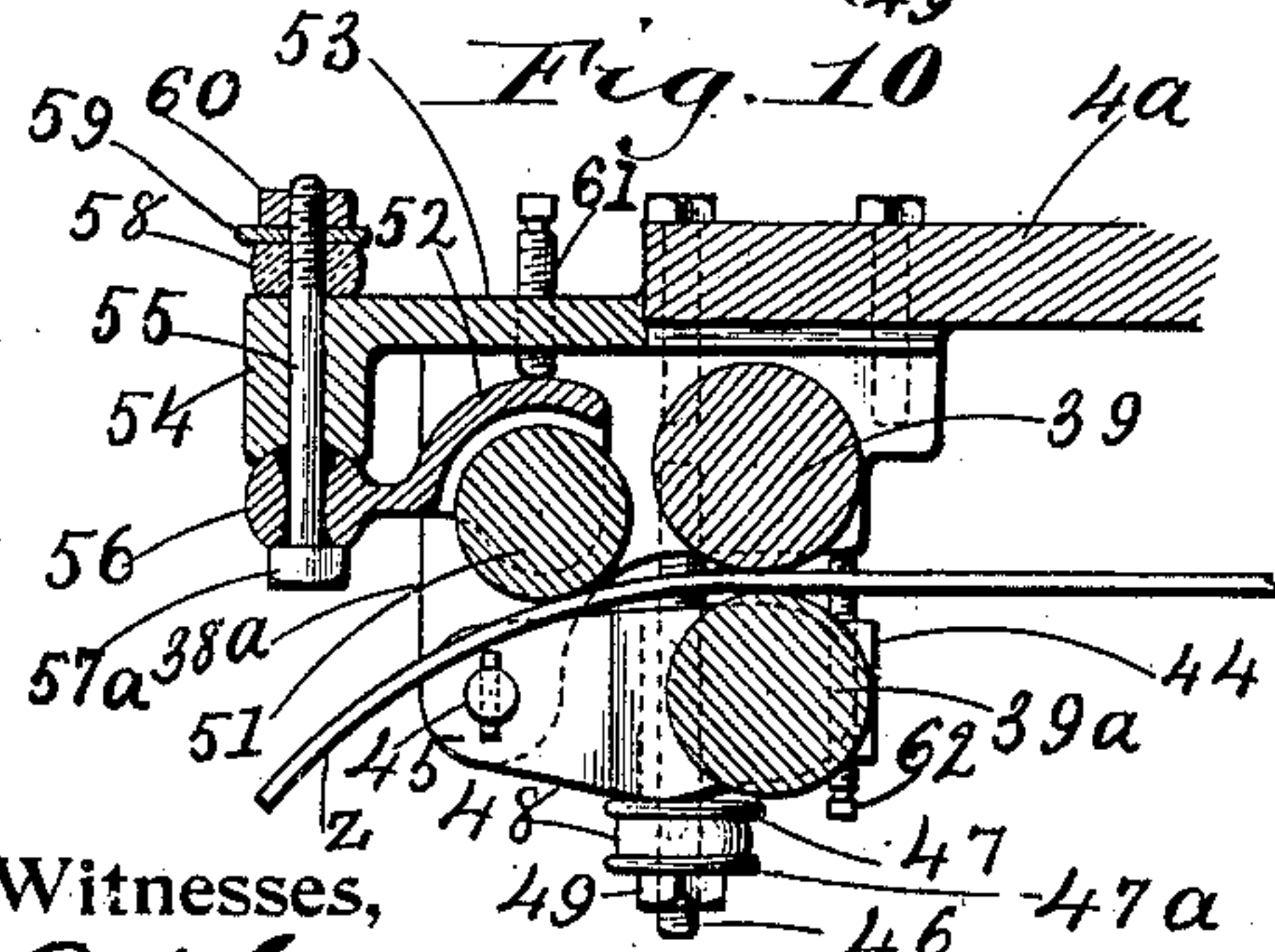
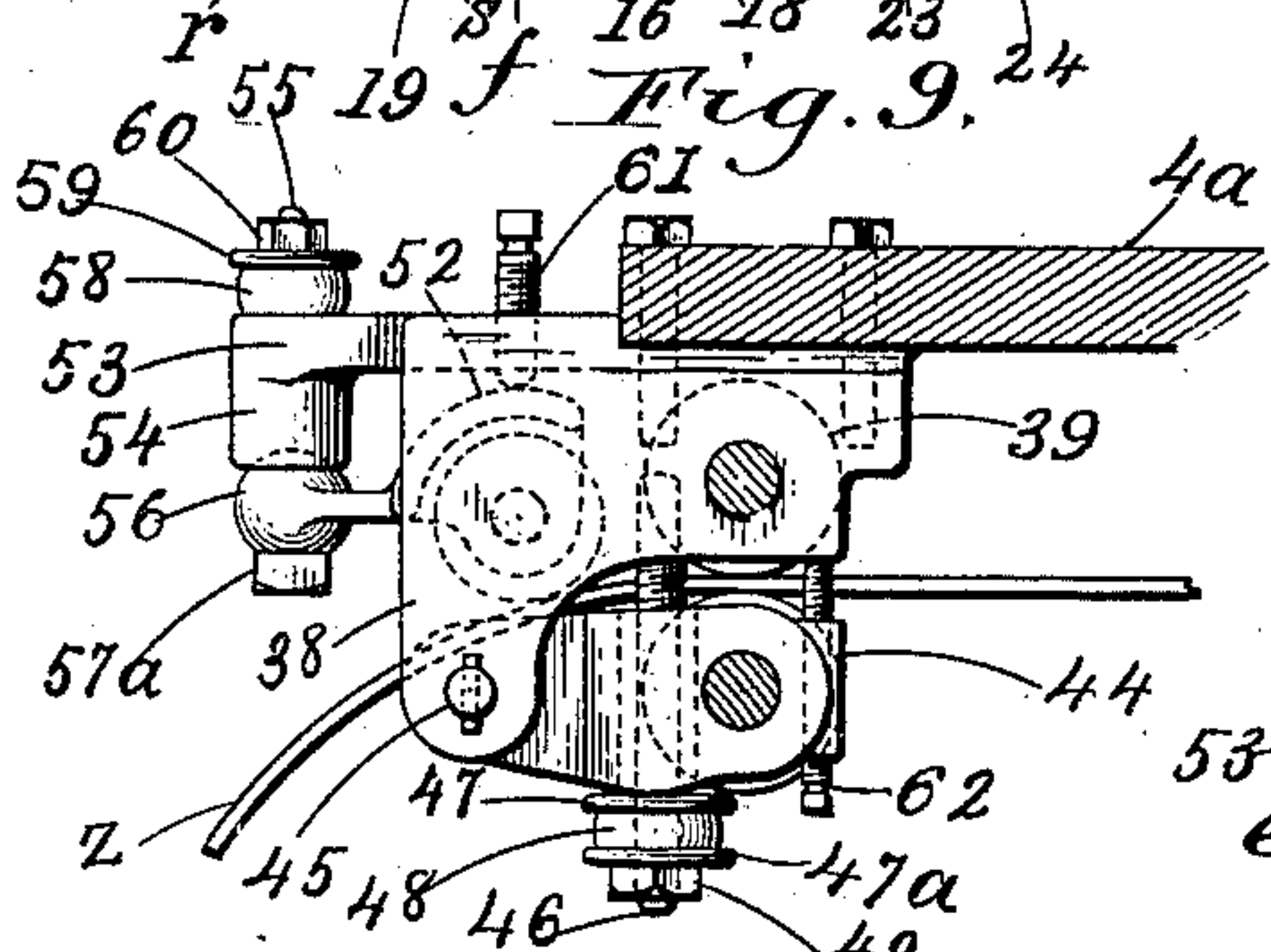
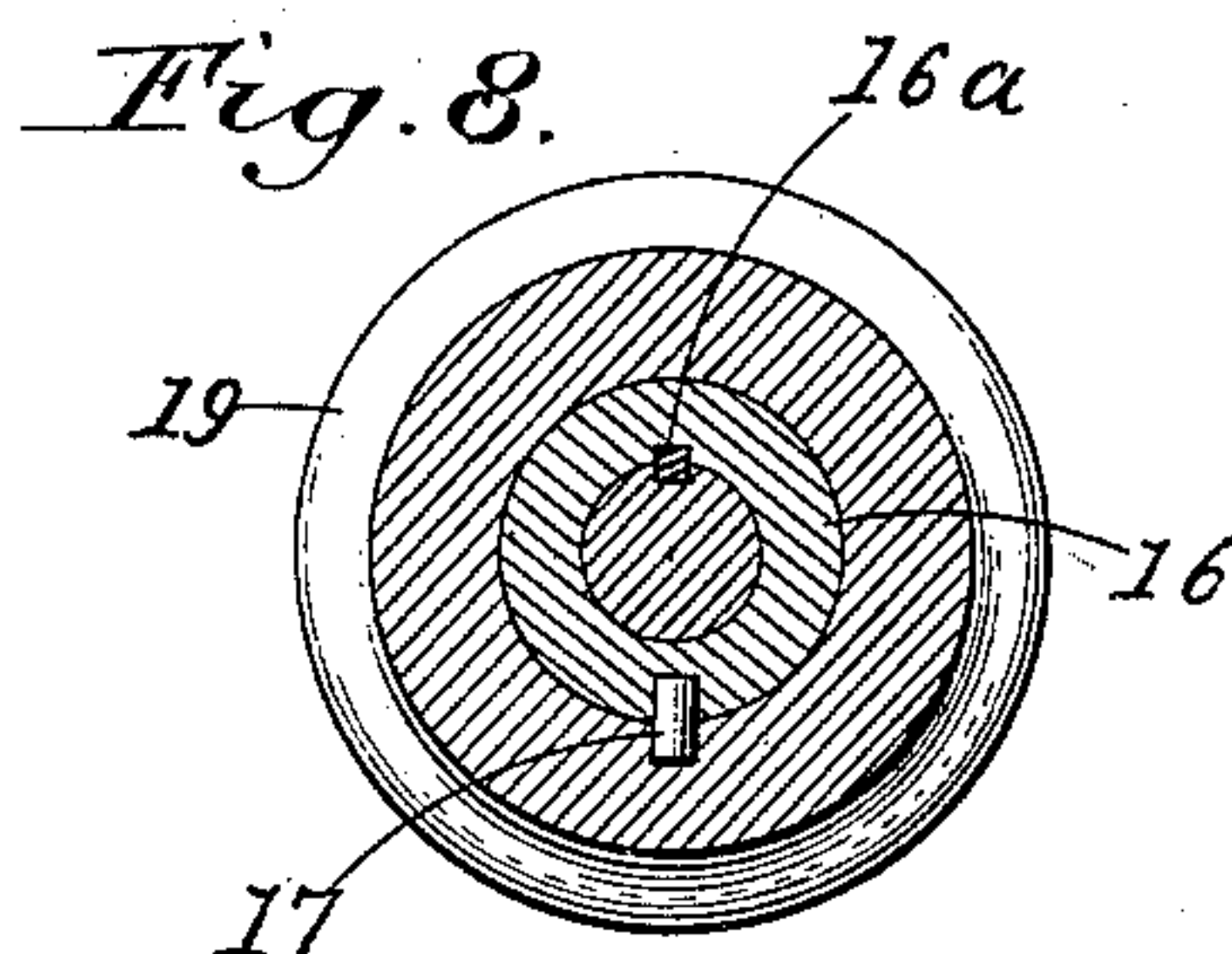
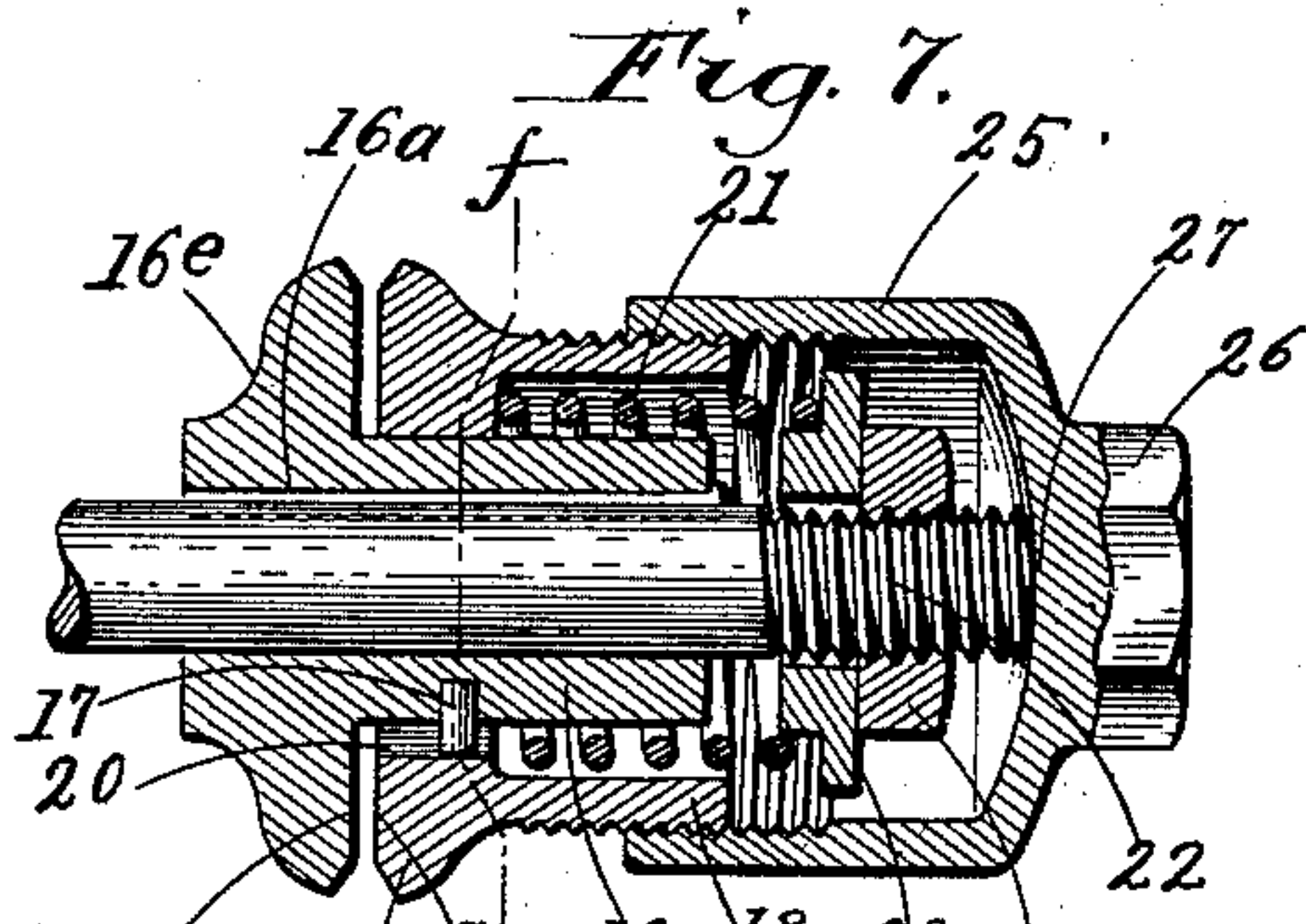
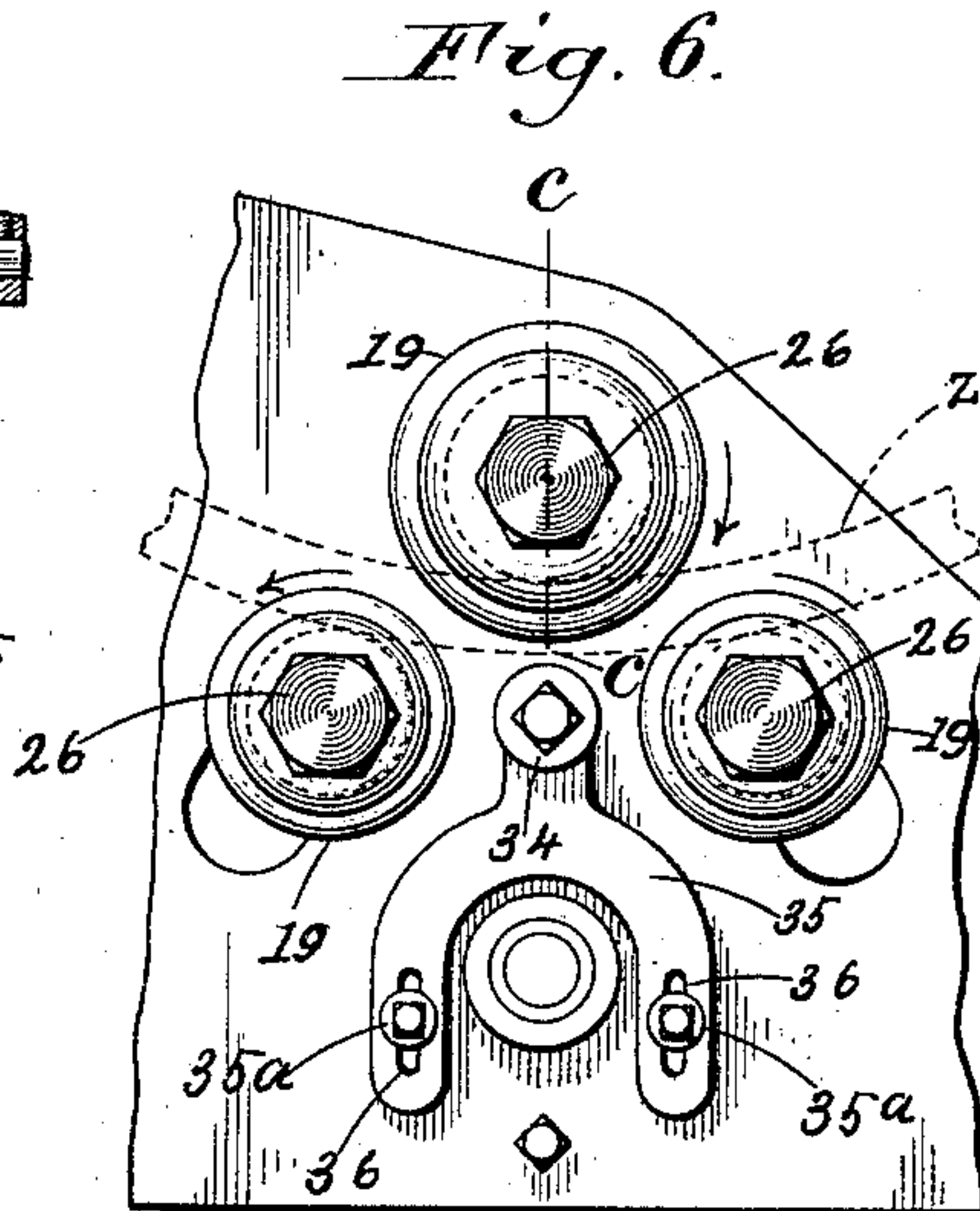
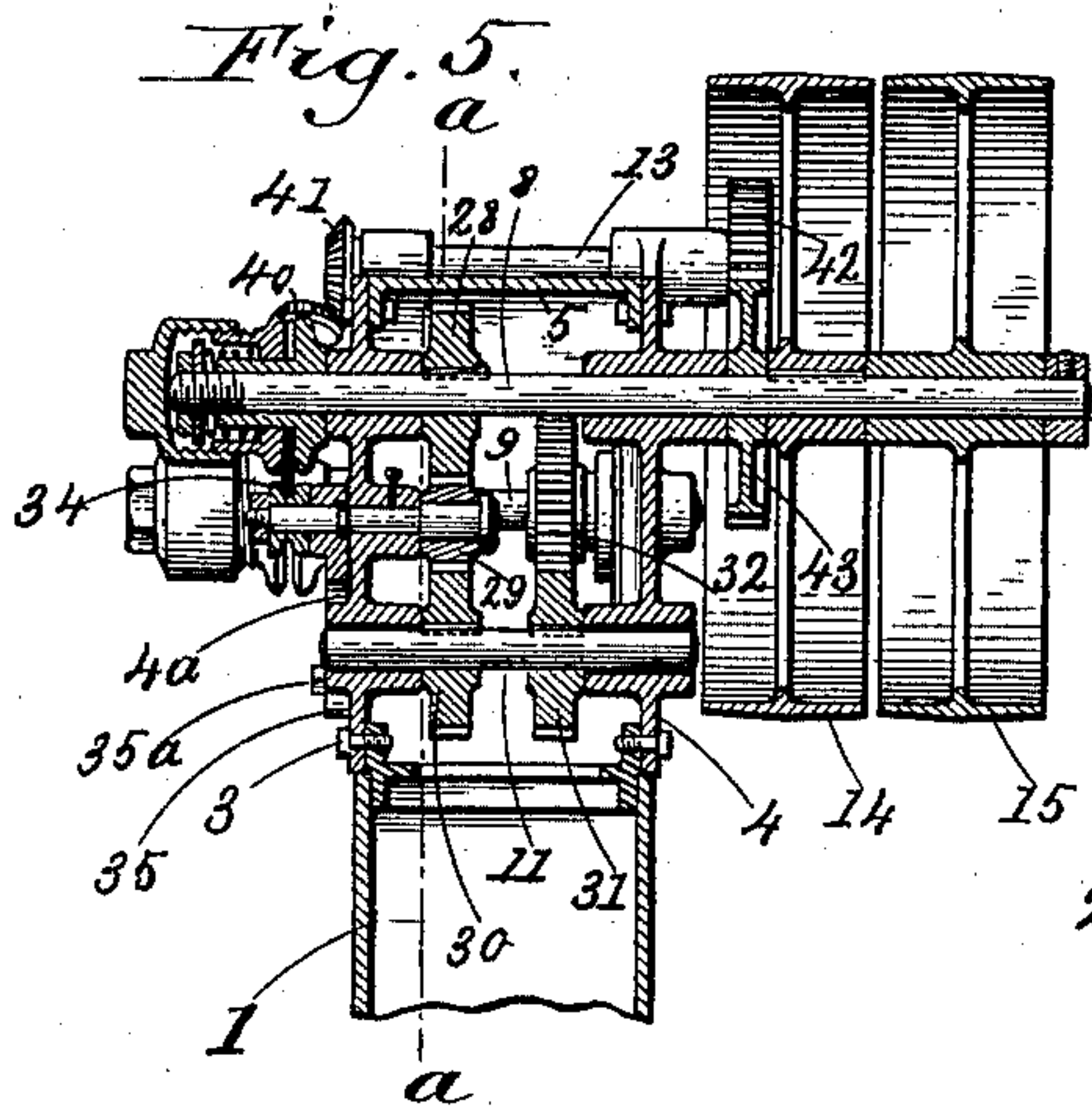
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UNITED STATES PATENT OFFICE.

EDWARD HOLMES AND BRITAIN HOLMES, OF BUFFALO, NEW YORK.

MACHINE FOR FLARING AND BENDING METAL HOOPS.

SPECIFICATION forming part of Letters Patent No. 609,807, dated August 30, 1898.

Application filed September 29, 1897. Serial No. 653,430. (No model.)

To all whom it may concern:

Be it known that we, EDWARD HOLMES and BRITAIN HOLMES, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Machines for Flaring and Bending Metal Hoops, of which the following is a specification.

Our invention relates to an improved means for flaring and bending metal hoops, and will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of the machine complete. Fig. 2 represents a rear elevation of the same. Fig. 3 is a vertical transverse section on or about line *a a*, Fig. 5. Fig. 4 represents a top plan view of the machine. Fig. 5 is a vertical transverse section on or about line *b b*, Fig. 1. Fig. 6 represents an enlarged side elevation showing a front view of the hoop-flaring rollers. Fig. 7 is an enlarged vertical longitudinal central section through one of the hoop-flaring rollers and its several parts on or about line *c c*, Fig. 6. Fig. 8 represents a transverse section on or about line *f f*, Fig. 7. Fig. 9 is a substantially horizontal section on or about line *d d*, Fig. 11, showing a top plan view of the delivery and bending mechanism. Fig. 10 represents a horizontal section on or about line *e e*, Fig. 11. Fig. 11 is a side elevation of a portion of the supporting-frame of the machine, showing a flaring-roller, one of the delivery-rollers, the bending-rollers, and their supporting parts.

Referring to the drawings in detail, the support for the machine-frame is preferably constructed of cast-iron in the form of a hollow vertical supporting-column 1, having an enlarged base provided with screw-bolts 2 for securing it. At the top of the supporting portion 1 is secured, by bolts 3, the machine-frame, consisting of the front and rear frame-pieces 4 and 4^a, in which are mounted the boxes carrying the shafting.

The top frame portion 5 may be formed in one piece with the portions 4 and 4^a, or it may be secured thereto by screw-bolts in the ordinary way. In the top frame portion 5 are two openings, in each of which is fitted a door 6 on hinges 7. The object of the doors 6 is

to provide a means for getting at the interior, either for oiling the journals or for any purpose that may be required.

In the frame portions 4 and 4^a are mounted in boxes the shafts 8, 9, 10, 11, 12, and 13. The shafts 8, 9, and 10 carry the hoop-flaring rollers, and on the opposite end of the shaft 8 are mounted the driving-pulley 14 and the loose pulley 15.

In describing the construction of the hoop-flaring rollers we will refer to the one on shaft 8 and to Figs. 5 and 7 for the details of construction, the other two hoop-flaring rollers being exactly the same in construction and operation, except they are a little less in diameter.

The cylindrical portion 16 is rigidly secured to the shaft by a key 16^a (see Fig. 7) or other well-known means to secure it and prevent it from turning on its shaft. It is provided with an enlarged or flanged portion 16^b, and rigidly secured to it is a pin 17, extending out from one side.

A cylindrical tubular portion or sleeve 18 is provided with an enlarged portion 19 and a reduced central opening adapted to fit over the cylindrical portion 16 and slide easily back and forth. It is prevented from turning thereon, while being free to slide easily back and forth, by the pin 17, which fits in a slot 20 in said enlarged portion 19. Extending out from the reduced opening which fits the shaft is an enlarged opening, leaving room to permit a spiral spring 21 to be fitted loosely on the cylindrical portion 16. At the end of the shaft is a screw-threaded portion 22, over which is loosely fitted a washer 23, which rests against the spring 21, and a screw-nut 24, adapted to fit the screw-threaded portion 22, is employed to compress the spring 21 more or less. The portion 18 is provided with an external screw-thread and a cap 25, having an internal screw-thread, (see Fig. 7,) adapted to engage therewith, and is provided with a nut-section 26, by which it may be screwed back and forth over the portion 18.

From the above construction it will be seen that by turning the cap 25 the opening between the faces *r* and *s* of the parts 16^b and 19 may be made greater or less and that the spring 21 will force the face *S* toward the face *r* until the inner side of the cap 25 comes

against the end of the shaft and stops it, as shown at 27 in said Fig. 7. The object of this construction will appear more clearly farther on.

5 Within the casing inclosed by the doors 6 (see Figs. 3 and 5) is rigidly secured to the driving-shaft 8 a spur gear-wheel 28, adapted to gear in with a pinion 29, mounted loosely on the short shaft or stud 12. Secured to the
10 shaft 11 is another spur gear-wheel 30, also in gear with the pinion 29. The shaft 11 is provided with a second spur gear-wheel 31. (See Fig. 5.) This gear-wheel 31 gears in with two spur gear-wheels, one, 32, on the shaft 9 and
15 the other one, 33, on the shaft 10, both firmly secured to said shafts. (See Fig. 3.)

As above mentioned, the shafts 8, 9, and 10 carry the hoop-flaring rollers. Consequently they rotate in the direction of the arrows
20 shown in Figs. 3 and 6, which operation will be understood by reference to Fig. 3. The driving-shaft 8 and its gear-wheel 28 turn in the direction of the arrow *i*, which would turn the pinion 29 in the reverse direction, and the
25 wheels 30 and 31 in gear with it would turn in the direction of the arrow *J*. This operation would cause the gear-wheel 31 to turn the two gear-wheels 32 and 33 in the direction of the arrow *K*. Consequently they all move in
30 the proper direction to carry the hoop into the machine.

To assist in keeping the lower edge of the hoop exactly in its proper position as it is passing through the machine, we employ a
35 small grooved roller 34. (See Figs. 5 and 6, also Fig. 1.) The grooved roller 34 is mounted in a supporting-frame 35, which is made vertically adjustable by means of bolts 35^a, which
40 pass through elongated openings 36 and screw into the side of the frame, thereby allowing said frame to be adjusted up or down and then rigidly secured by said bolts.

The reason for the vertical adjustment of the grooved roller 34 is to provide the means
45 for adjusting the machine for hoops of different widths.

The wheels 32 and 33 are made adjustable toward or from each other in the line of a circle of which the shaft 11 is the center by means
50 of the screw-bolts 37 37^a, (see Fig. 3,) said shafts being fitted in boxes in curved slide-ways constructed in the well-known manner, the object being to provide a suitable means for adjusting the lower hoop-flaring rollers
55 toward or from the hoop-flaring roller on the shaft 8, and thereby regulate the bending of the hoop edgewise, so as to give it the proper taper or flare when bent at right angles to the edgewise bend.

60 In Figs. 6 and 11 the dotted lines *z* represent the hoop-band as being bent as above described or in the direction of its width. This edgewise bending is comparatively a slight bend, being just sufficient only to give the
65 required taper to the hoop when formed ready to be put onto a barrel or keg.

The object of the flaring-roller faces *r* and

the yielding faces *S* and their means of adjustment is to provide the means for keeping the hoop-band in its proper position while receiving its flaring bend, and the object in the
70 means of adjustment and the spring 21 is to provide for forming hoops of different thicknesses of metal.

In describing the mechanism for forming
75 the band into a hoop or bending it in the direction of its thickness reference is had to Figs. 1, 4, 9, 10, and 11, especially Figs. 9, 10, and 11.

Two side frame-pieces 38 38^a are securely
80 bolted to the frame-piece 4^a and carry in fixed bearings a feed-roller 39, slightly inclined from the perpendicular. To the upper portion of the feed-roller 39 is rigidly secured a bevel gear-wheel 40, which gears in with a bevel
85 gear-wheel 41 on the shaft 13. At the back end of the shaft 13 is secured a spur gear-wheel 42. (See Figs. 1, 3, and 5, where this gear-wheel is shown.) On the shaft 8 is rigidly secured a gear-wheel 43, adapted to gear
90 in with the gear-wheel 42, (the wheel 43 is shown in Fig. 5,) and thereby give motion to the feed-roller 39. The companion feed-roller 39^a is mounted in two frame-pieces 44, which
95 are pivoted to the supporting frame-pieces 38 and 38^a by pivotal pins 45.

The free ends of the two pivoted frame-pieces 44 and the roller 38^a are kept with a spring force up to or near the roller 39 by means of two bolts 46, which are rigidly se-
100 cured to the frame-pieces 38 and 38^a and pass loosely through the pivoted frame-pieces 44, substantially as shown by dotted lines in Figs. 9 and 10. A metal washer 47 is then put
105 over each of the screw-bolts 46, so as to rest against the pivoted frames 44. Then a rubber spring 48, a metal washer 47^a, and a screw-nut 49 are placed upon each bolt, by which the whole are secured and by means of which the
110 force of the rubber spring may be adjusted. (See Figs. 9, 10, and 11.)

The above provides a suitable means for adjusting the force of the forming-rollers, which also assist in carrying the strip for the
115 hoop through the machine.

The bending and delivery roller 51 is mounted in bearings in a supporting-frame 52.
120 (See Figs. 9, 10, and 11.) To the frame-piece 38^a is rigidly secured an arm 53, extending diagonally to the center of the supporting-frame 52, (see Fig. 11,) where this arm is shown in dotted lines. Other views of it are shown in Figs. 9 and 10. The arm 53 terminates in a hub-shaped portion 54, having an
125 opening through which a bolt 55 passes. (See Figs. 9 and 10.)

The frame 52 is provided with a ball portion at the point 56. The ball 56 is also provided with a hole through it made to flare out
130 or enlarge from each side, (see Fig. 10,) the object being to allow for an oscillating movement of the frame and its bending-roller for adjusting the roller to the hoop to be bent. One side of the ball 56 (which acts as a uni-

versal joint) is placed in the concave portion of the hub 54, and then the bolt 55 is passed through the ball 56, the hub 54, a rubber spring 58, and washer 59 until stopped by the head 57^a of the bolt 55. A nut 60 is then put on the screw-threaded portion of the bolt and screwed up until the parts are held sufficiently secure, a set-screw 61 passing through the arm 53 until its end reaches the pivoted supporting-frame 52, thereby providing the means for adjusting the roller 51 to bend the hoop bar or band more or less.

The operation of the machine is as follows: A strip of iron or other metal *z*, being put into the machine, is started in between the flaring-rollers, which bend it edgewise substantially as shown in Fig. 6, said rollers being adjusted to give it the required flare or taper when formed into a hoop. The strip passes from the flaring-rollers into and through the forming-rollers and leaves the machine in the form of a hoop ready to be riveted together and having the required size and flare to fit the barrel or keg.

We claim as our invention—

1. In a hoop-flaring roller, the combination with an operating-shaft, of a flanged roller secured to said shaft, a flanged sleeve mounted on the flanged roller so as to be longitudinally movable thereon and so that the side faces of the flanges face each other, means for holding the movable flanged portion toward the other with a yielding force, and means for adjusting the distance it shall move toward the other flanged portion.

2. In a hoop flaring and bending machine, the combination with an operating-shaft, of a flanged roller, a flanged sleeve mounted on said roller so as to be longitudinally movable thereon, and so that the side faces of the flanges will face each other and allow the hoop-forming strip to pass between them, and means for holding one face toward the other with a spring force.

3. In a hoop-flaring roller, the combination with the operating-shaft of a flanged roller

rigidly secured to it, a cylindrical tubular flanged portion mounted on the flanged roller and adapted to move easily toward or from the flanged portion of said roller, means for preventing it from turning on said roller, a spring for keeping it and its flanged portion in their normal position near the roller-flanged portion, and means for adjusting the distance the two flanges shall come toward each other for the purposes described.

4. In a hoop flaring and bending machine, the combination with a flaring-roller shaft of a cylindrical portion, 16, rigidly secured to said shaft and having a face *r*, a tubular portion or sleeve provided with a reduced central opening adapted to fit and slide on the portion, 16, means for preventing it from turning thereon, an enlarged opening extending from said reduced opening through the sleeve and an exterior screw-thread, a spiral spring within the enlarged opening and surrounding the portion, 16, a screw-threaded portion and nut at the end of the flaring-roller shaft for adjusting the force of said spring, and a cap adapted to screw onto said sleeve for adjusting the distance the faces *r* and *s* shall come together, as above set forth.

5. In a hoop flaring and bending machine, the hoop-flaring rollers mounted on the machine and connected by gearing, for bending the hoop in an edgewise direction, their operating mechanism connecting with the driving-shaft, and means for adjusting them in the line of a circle toward or from each other, in combination with two rollers for bending the hoop in a transverse direction, gearing connecting said rollers with the driving-shaft for operating them, and means for adjusting said rollers toward or from each other for regulating the size of the hoop to be bent, as above set forth.

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