

No. 704,049.

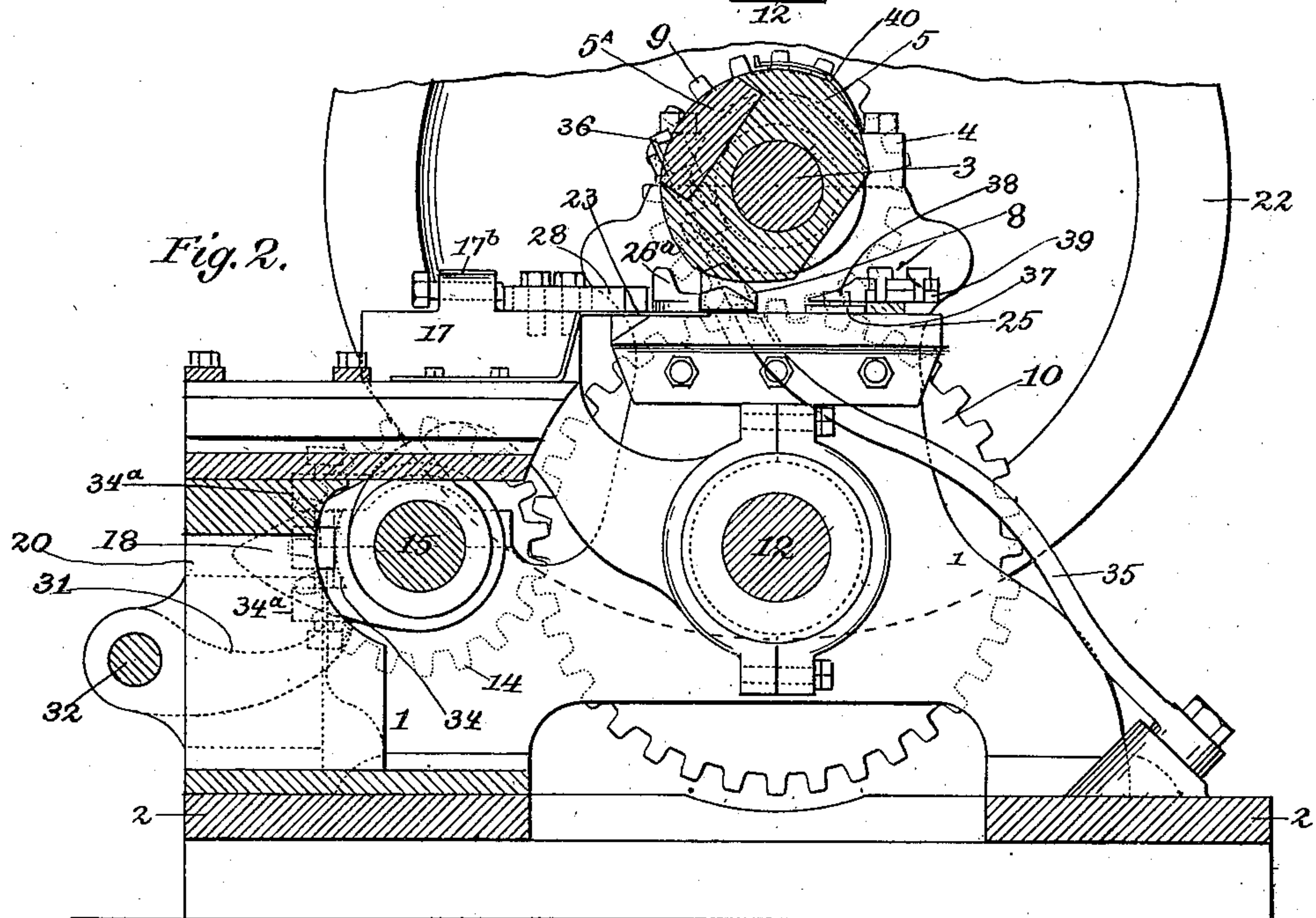
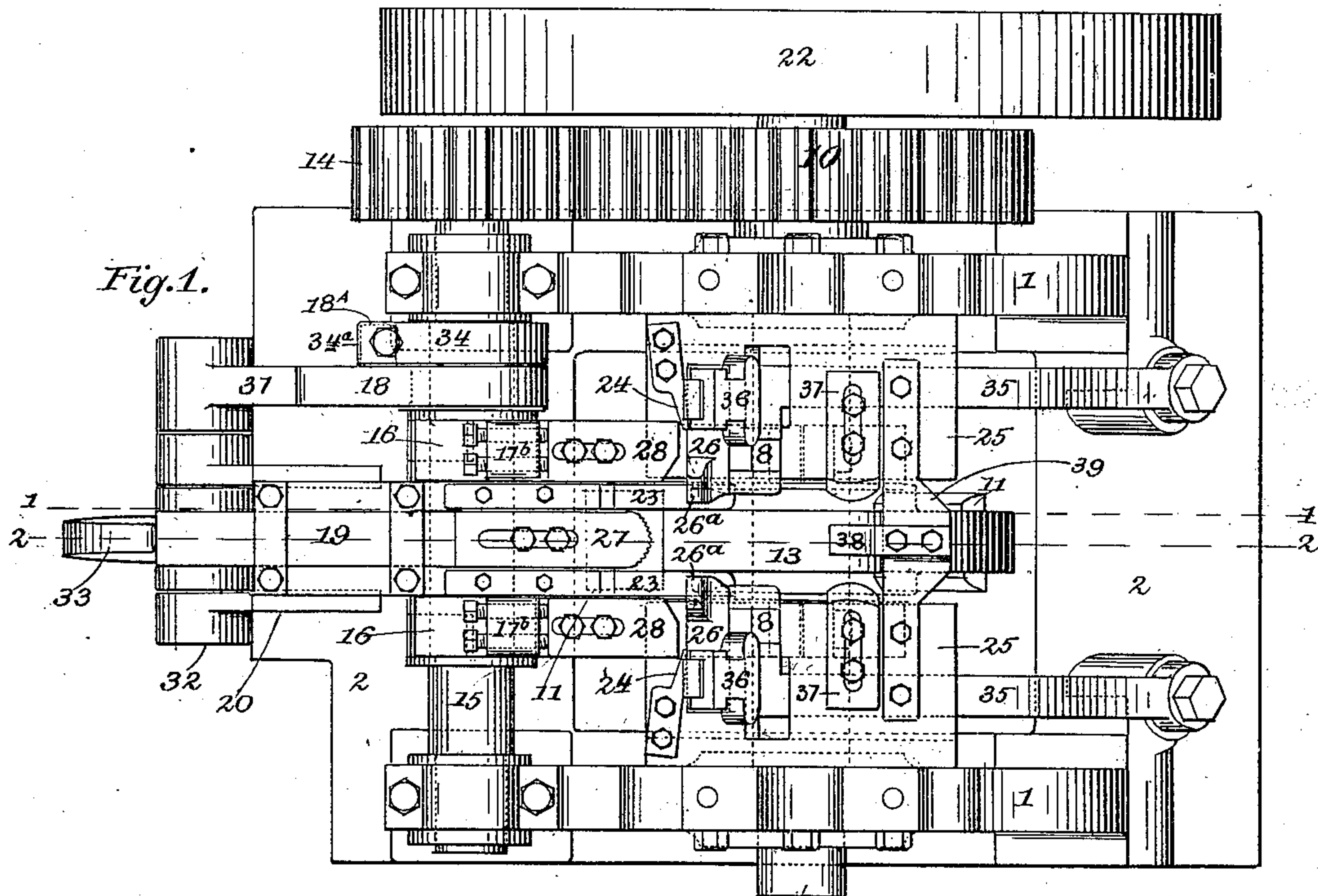
Patented July 8, 1902.

M. J. KELLY.
HORSESHOE MACHINE.

(Application filed Nov. 20, 1900.)

(No Model.)

4 Sheets—Sheet 1.



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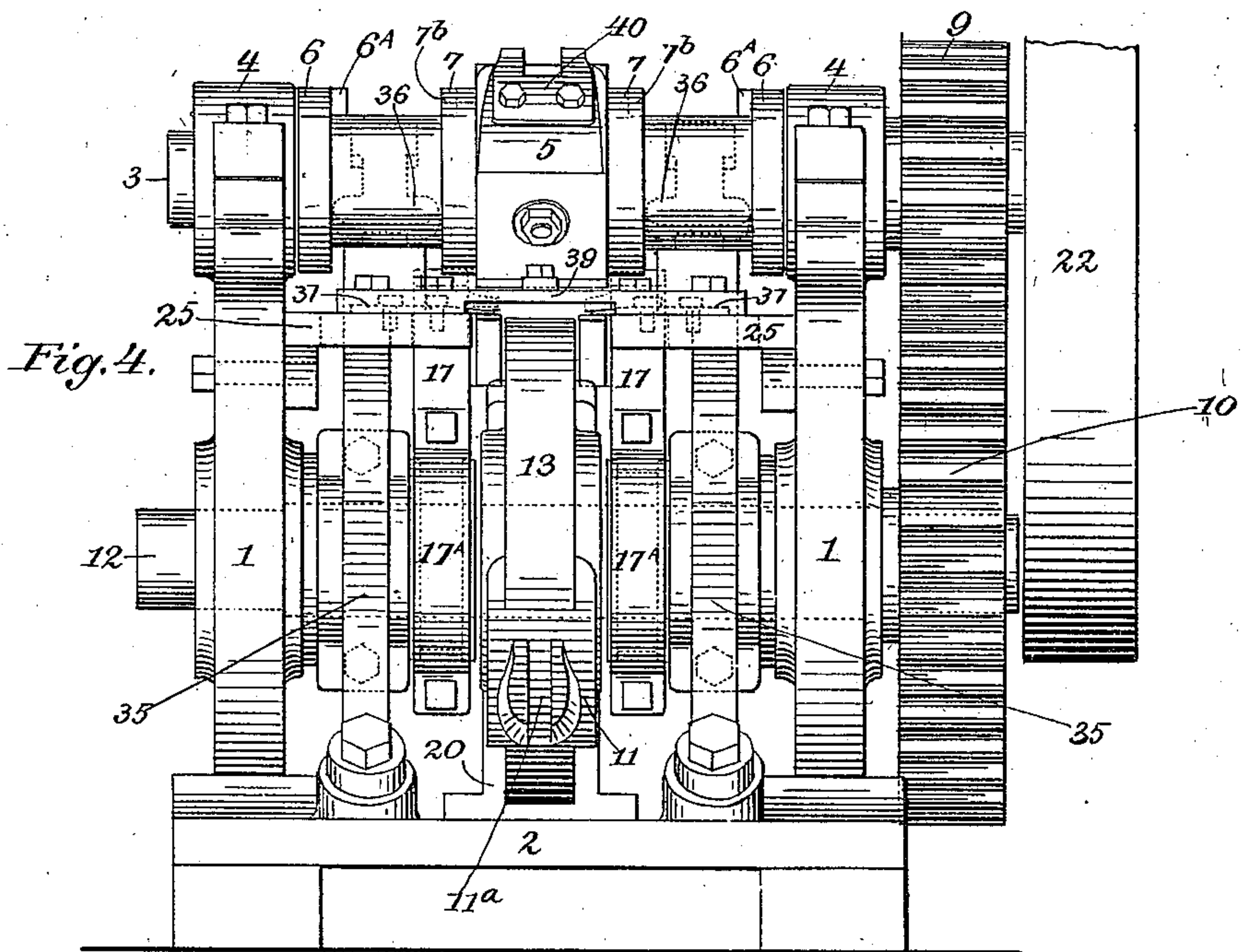
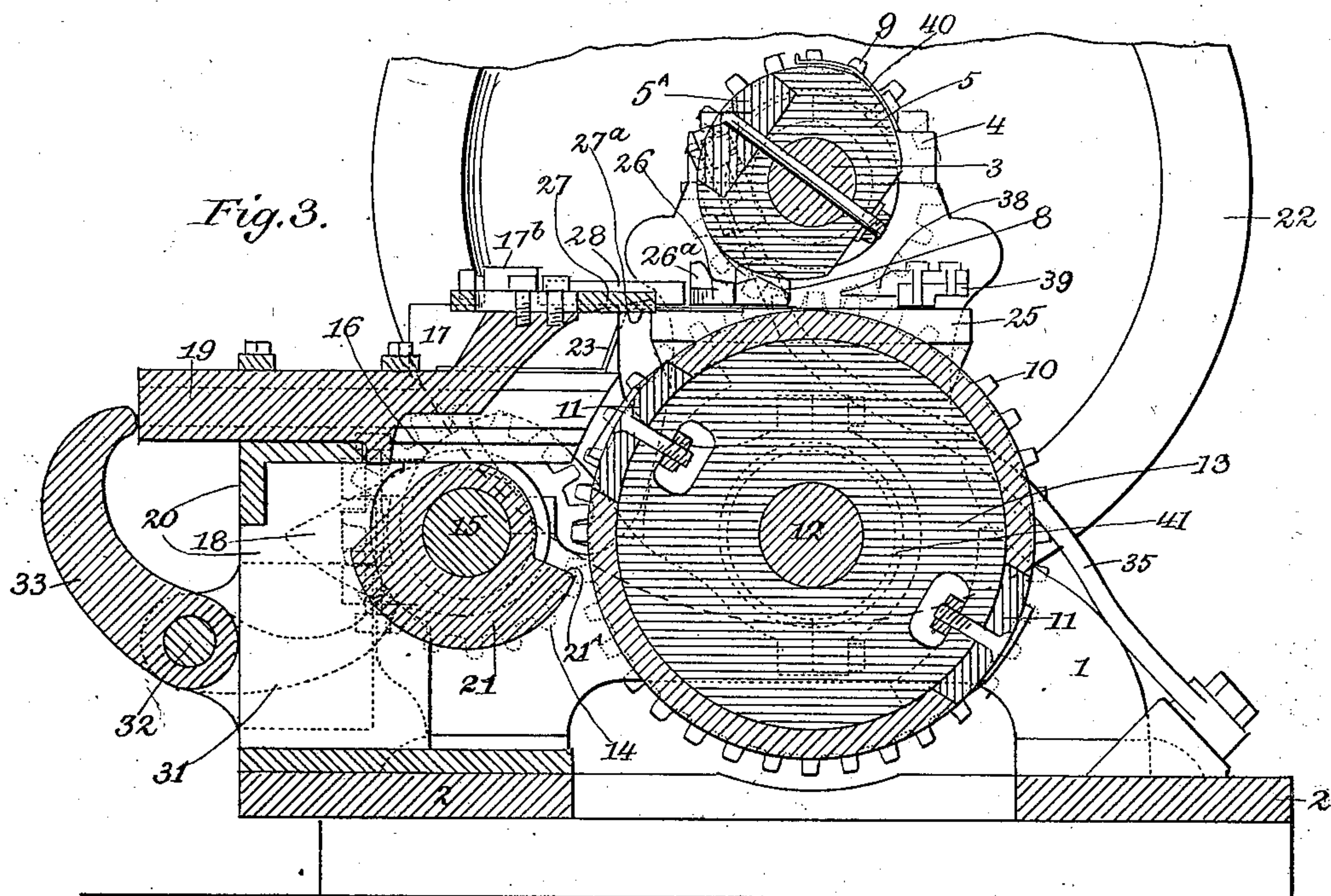
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4 Sheets—Sheet 2.



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4 Sheets—Sheet 3.

Fig. 5.

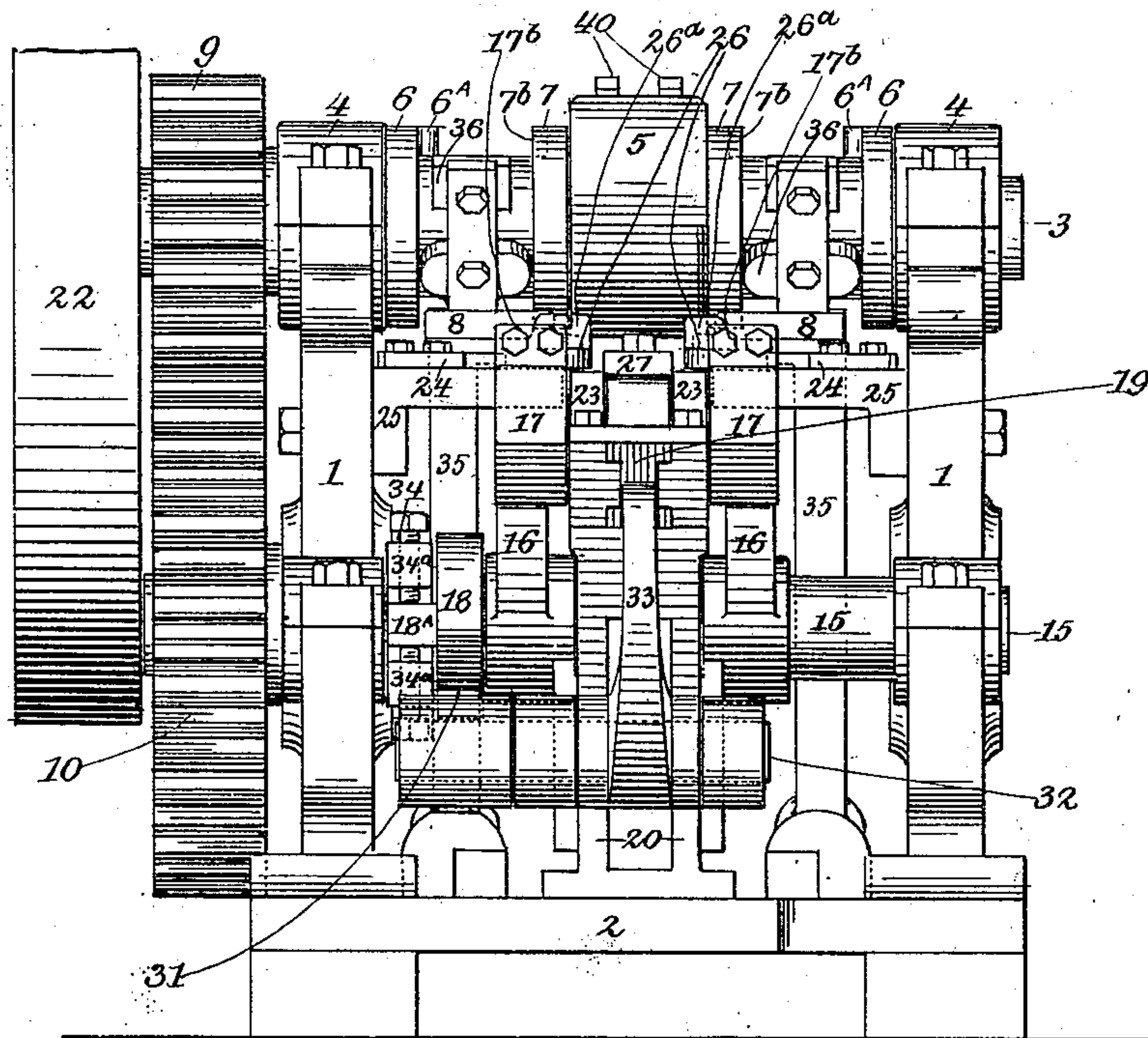
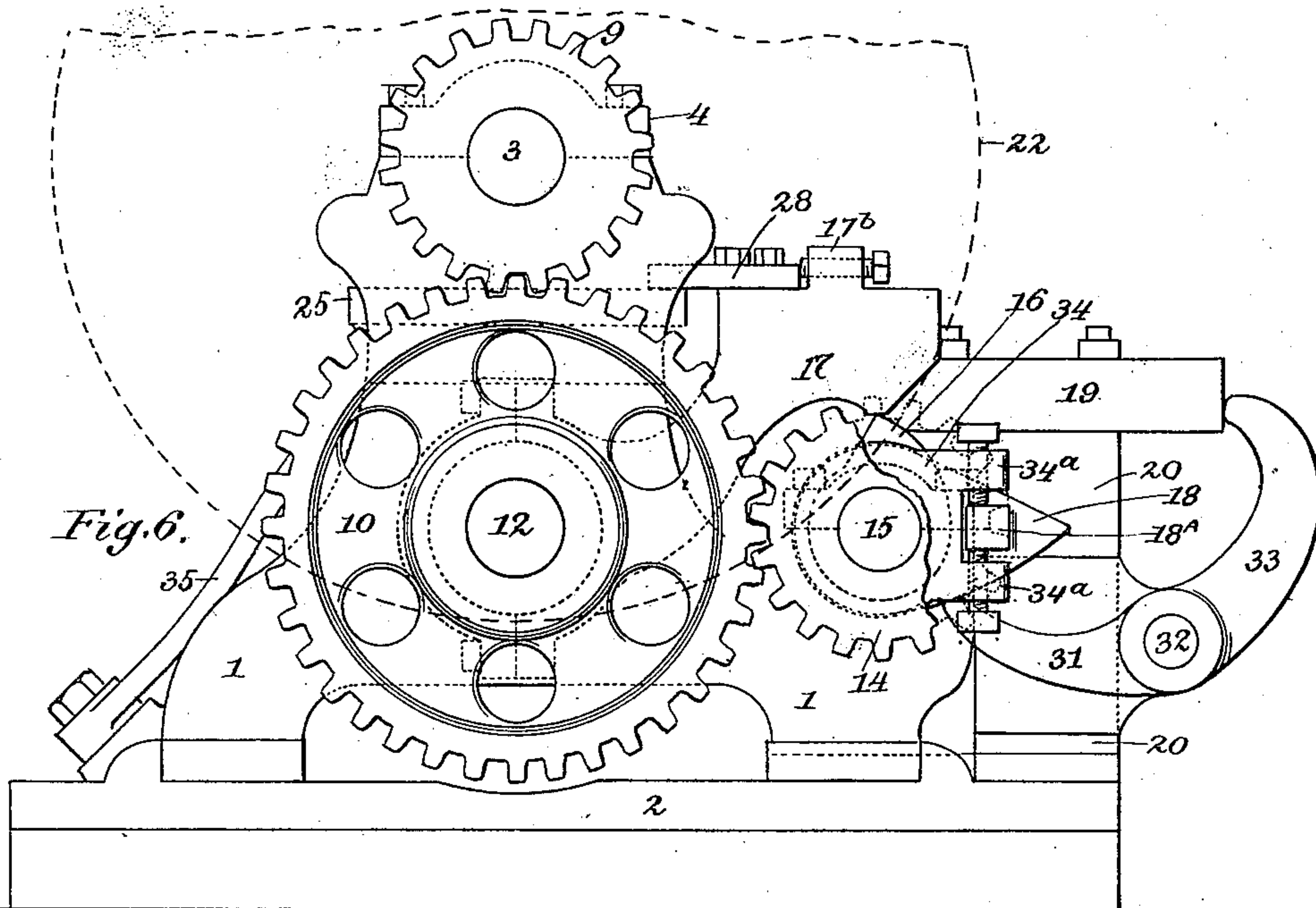


Fig. 6.



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4 Sheets—Sheet 4.

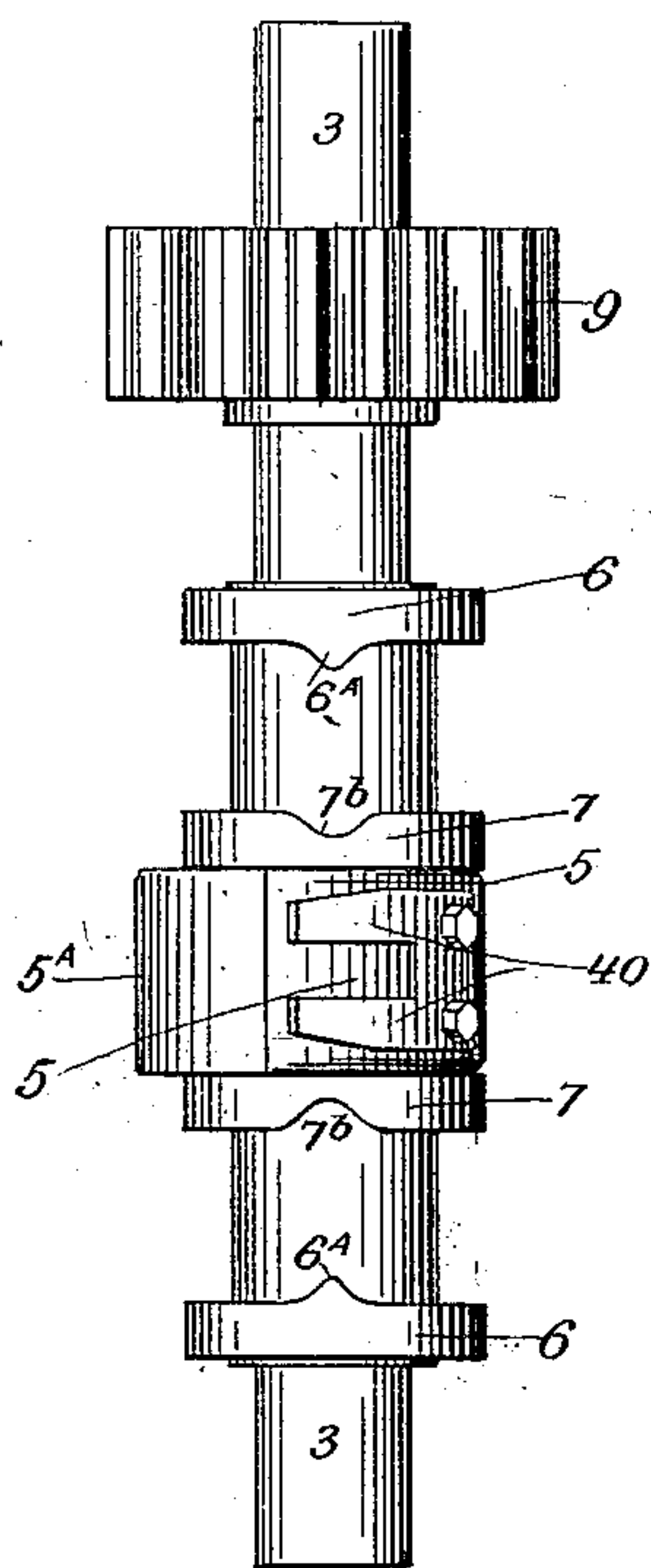


Fig. 7.

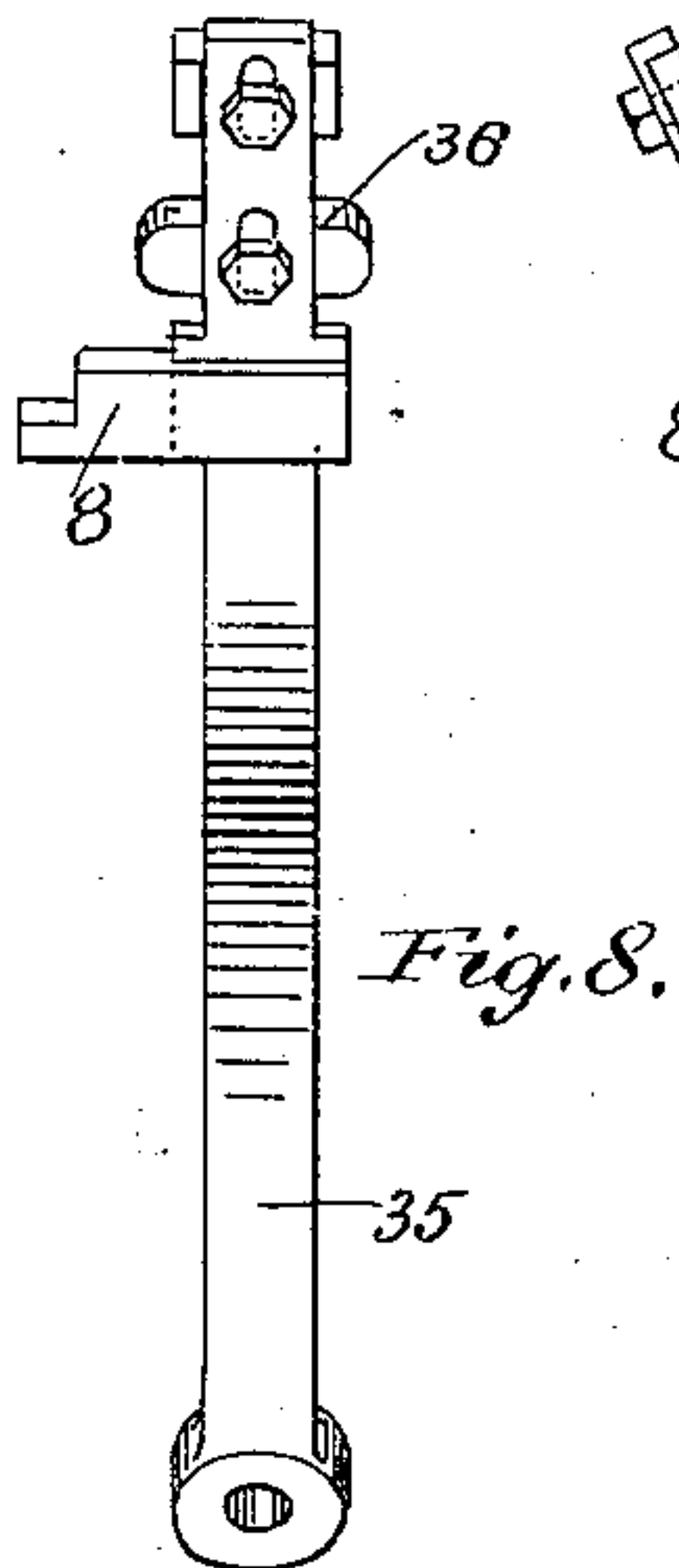


Fig. 8.

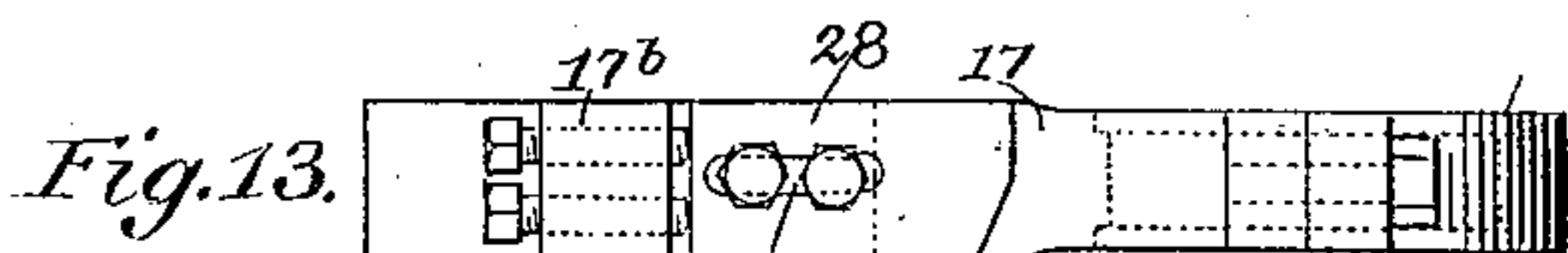


Fig. 13.

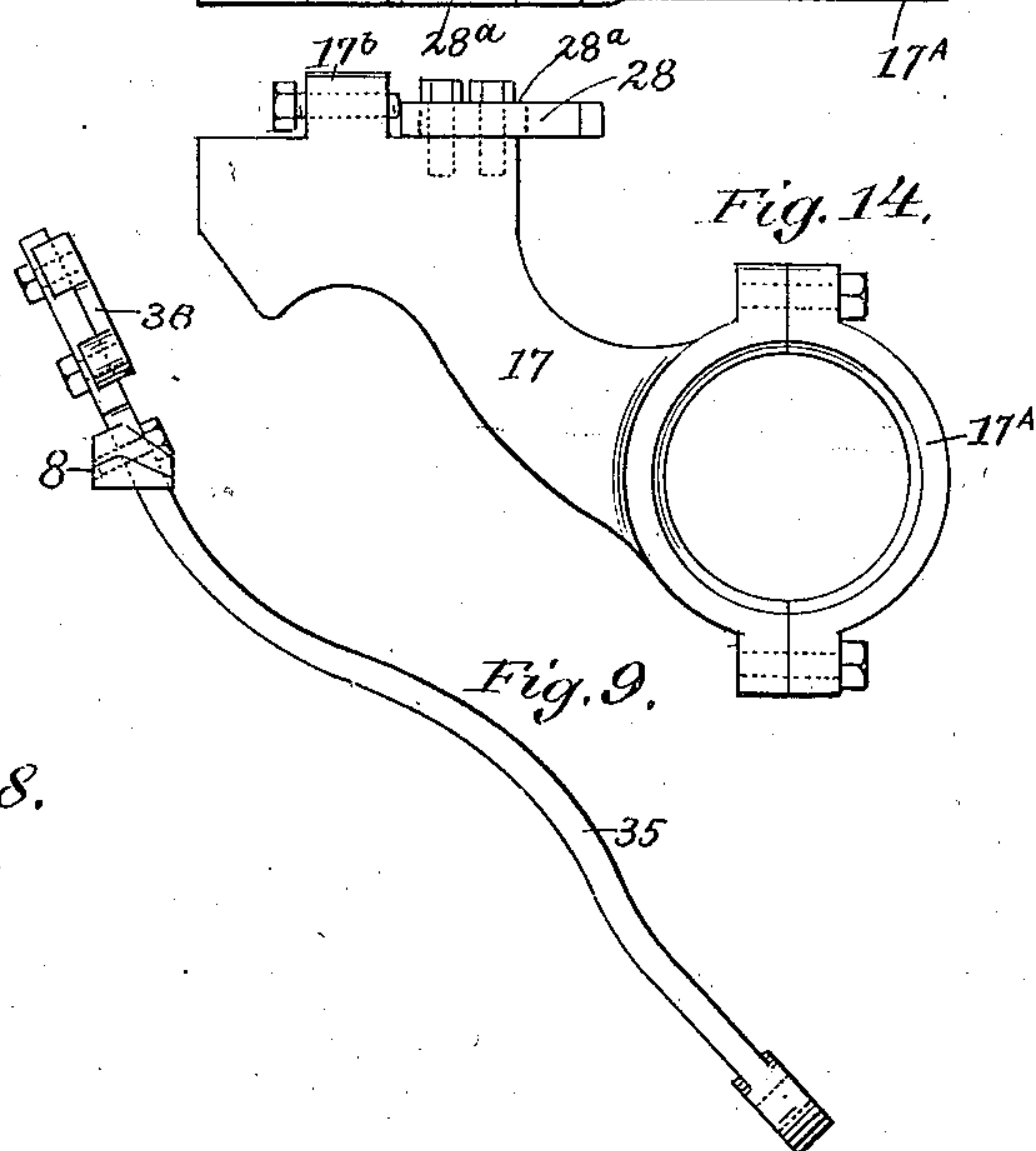


Fig. 14.

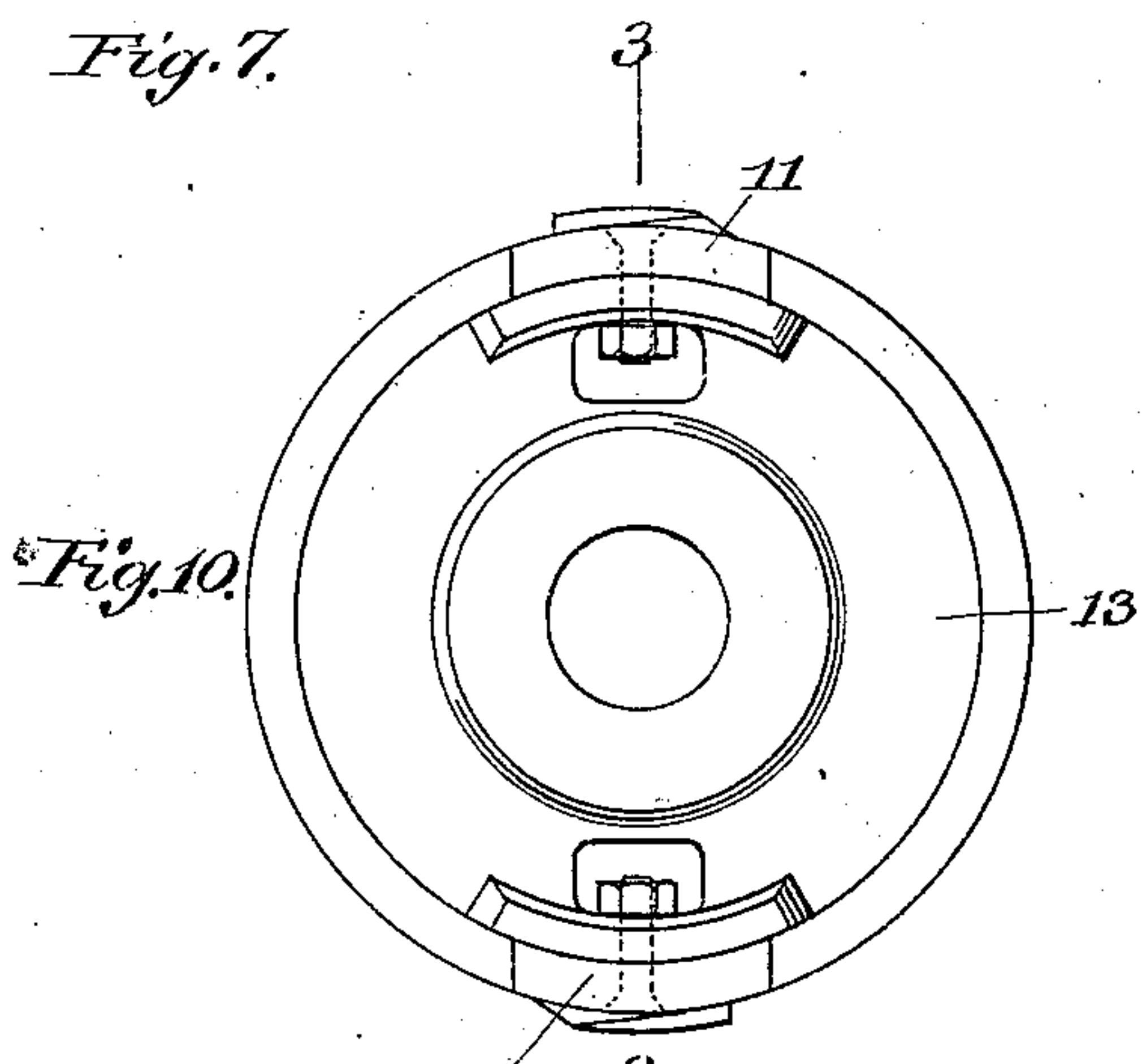


Fig. 10.

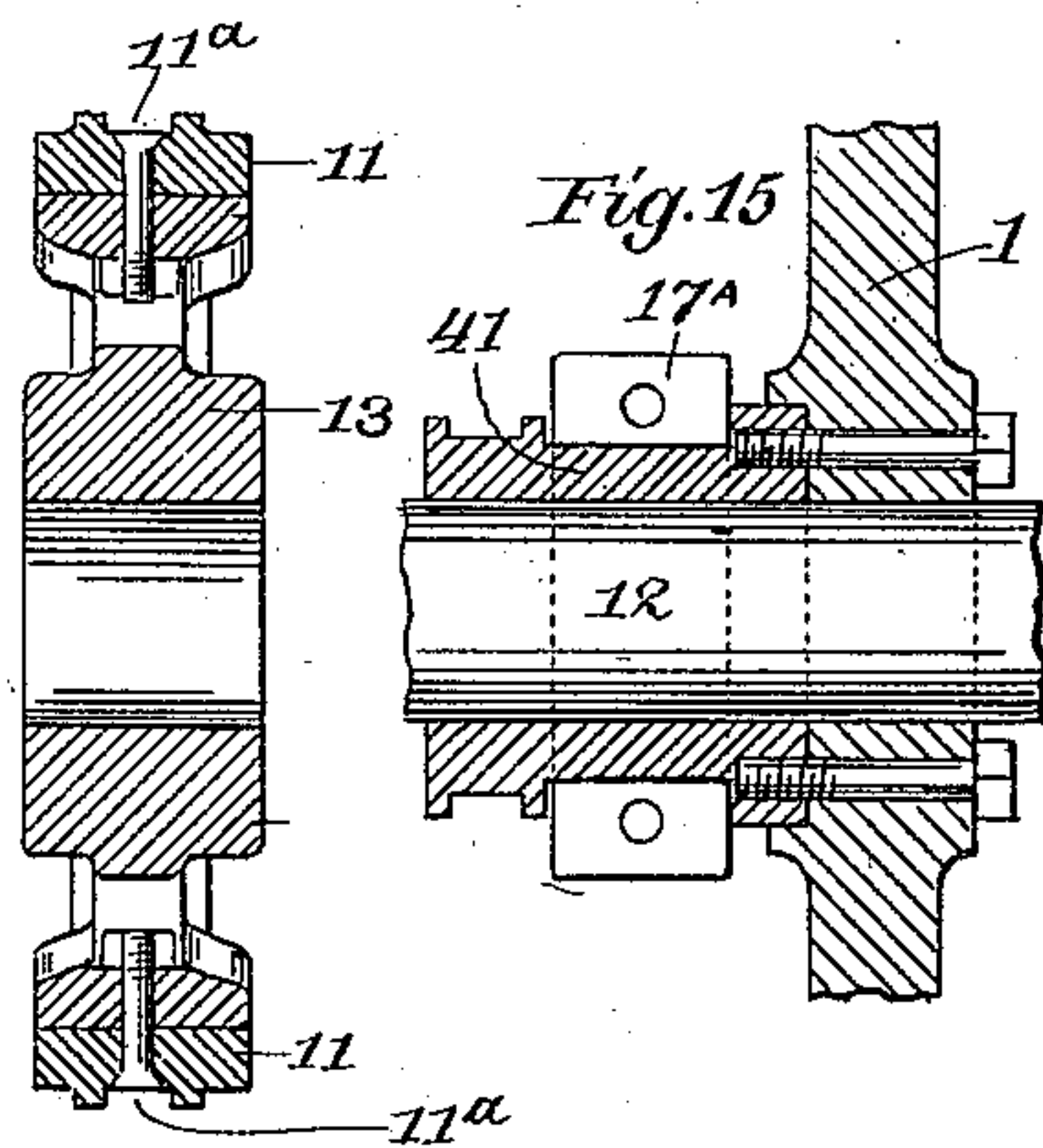


Fig. 11.



Fig. 12.

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UNITED STATES PATENT OFFICE.

MICHAEL J. KELLY, OF TROY, NEW YORK.

HORSESHOE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,049, dated July 8, 1902.

Application filed November 20, 1900. Serial No. 37,114. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL J. KELLY, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Horseshoe-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to construct for making horseshoes a machine which shall be strong and simple in construction and effective in operation. These objects I accomplish by the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a horseshoe-machine embodying my invention with the top die-shaft removed. Fig. 2 is a vertical longitudinal section of said machine, taken on line 1 1 of Fig. 1, with top die-shaft. Fig. 3 is a vertical longitudinal section of said machine, taken on line 2 2 of Fig. 1, with top die-shaft included. Fig. 4 is a rear elevation of the machine. Fig. 5 is a front elevation of the same. Fig. 6 is a side elevation of the same, partly in section, showing in dotted lines the belt-wheel broken away, as in Figs. 2, 3, 4, and 5. Fig. 7 is a plan view of the top die-shaft detached. Fig. 8 is a front elevation of one of the heel-formers. Fig. 9 is a side elevation of the same. Fig. 10 is a side elevation of the main die-wheel detached. Fig. 11 is a vertical transverse section of the same, taken on line 3 3 of Fig. 10. Fig. 12 is a plan view of said die-wheel. Fig. 13 is a plan view of one of the heel-swagers detached. Fig. 14 is a side elevation of the same. Fig. 15 is a vertical transverse section of part of a housing and of a sleeve attached to the inner side of said housing with a portion of the main shaft and one-half of a strap mounted on said sleeve.

As illustrated in the drawings, the main frame of my device is composed of housings 1, secured to a base-plate 2. A driving-shaft 3, journaled upon the upper end of the housings 1 in bearing-boxes 4, is provided with a top die-roll 5 and collars 6 and 7, which operate heel-formers 8. This shaft is provided

also with a gear 9, which engages a larger gear 10, secured to the main shaft 12, journaled in suitable bearing-boxes mounted on said housing and provided with a main die-wheel 13. The gear 10 of the main shaft 12 engages a smaller gear 14, secured to the auxiliary shaft 15, which is journaled in said housings 1 at the front of the machine. This auxiliary shaft 15 is also provided with cams 16 for operating the oscillating levers 17, supporting the heel-swagers 28, and with an adjustable cam 18 for moving inward the reciprocating bending-bar 19, mounted on an auxiliary frame 20 at the front of the machine. A segmental collar 21 is also attached to this shaft 15, adapted to move the reciprocating bending-bar 19 backward after it has pressed inward and bent the blank and placed it between the lower die 11, secured to the main die-wheel 13, and the upper die 5^A, secured to the die-roll 5. While the blank is in such position the ends forming the heel of the shoe are bent inward by laterally-reciprocating formers 8, and the shoe is then removed from the die-wheel at the rear of the machine by means of strippers 37, which are reduced to a knife-edge at the point of contact with the die, so that the shoe may be removed or stripped from the die without injury.

Attached to the auxiliary frame 20 are tines or fingers 23, made of thin metal, preferably curved on their inner ends and extending to the die-wheel 13, so as to support the blank while being bent. The blank when placed upon such supports is adjusted in position by means of guides 24, secured to the shelves 25, attached to the inner side of the upper portion of the housings 1. Such guides 24 are provided with slots or enlarged holes by means of which they may be adjusted longitudinally, so as to bring the center of blanks of different lengths in line with the center of the die-wheel 13. The rear edge of the blanks when placed upon the supports 23 bears against the forward edge of the anvils 26, also attached to said shelves. When the blank is in such position, the ends of the blank are swaged or squared by means of swagers 28, secured to the oscillating levers 17, which are journaled on sleeves 41, secured to the sides of the housing 1, as shown in Fig. 15. These

sleeves are preferably made in halves, bolted together, and provided with a flange, which is set into an annular recess made in the sides of the housing 1, so as to insure accuracy of adjustment. The forward ends of such oscillating levers 17 have a movement in the arc of a circle with the distance from the center of the sleeve 41 as a radius. The swaging-blocks 28, secured to the upper end of each of the oscillating levers 17, are preferably provided with a slot 28^a, by means of which such swaging-blocks may be adjusted in the direction of their length. The upper end of each of the oscillating levers 17 is provided with an offset or boss 17^b, provided with an adjusting-screw bearing against the rear edge of the swaging-blocks 28, so as to provide an accurate adjustment of such swaging-blocks. The oscillating levers 17 are preferably each constructed with a detachable strap 17^a, whereby such oscillating levers may be readily detached or applied to the sleeves 41, upon which they are mounted. The upper ends of the oscillating levers 17 and the swaging-blocks 28 are moved forward by means of cams 16, secured to the auxiliary shaft 15, which cams bear against the lower portion of the upper end of such oscillating levers 17 and raise and press them forward, so that said swaging-blocks bear against the ends of such blank. After such swaging-blocks 28 have squared the ends of the blank the cams 16 recede from the under side of such oscillating levers 17, and these levers drop backward, carrying the swaging-blocks 28 away from such blanks. A spring may, however, if desired, be secured to the upper end of each of such oscillating levers, so as to produce a quick and positive return movement of the upper ends of said levers and avoid any vibration from such parts. After such operation the tongue 27, preferably serrated at its forward end and secured to the reciprocating bar 19, moves forward and bears against the front edge of the central part of such blank and forces it inward against the inner ends of the anvils 26, which are curved on their inner ends, so as to permit such blank to be bent around the tongue 27 without marring or indenting the outer edge of such blank. The upper portion of such anvils is thickened, so as to form projections 26^a, which extend above the curved ends of the anvils and prevent such blank from twisting while the blank is being carried inward by the tongue 27 and bent against the curved edges of the anvils. The tongue 27 is provided with a slot by means of which and engaging bolts it may be adjusted as desired upon the reciprocating bar 19. The reciprocating bar 19 is moved inward by means of a cam 18, attached to the auxiliary shaft 15, which cam comes in contact with and bears against an arm 31, secured to the front oscillating shaft 32, which shaft is also provided with an upwardly-extending arm 33, which bears against

the rear end of the reciprocating bar 19. The cam 18 is loosely journaled on the shaft 15, which shaft is provided with a collar 34, having lugs 34^a extending laterally and provided with set-screws which bear against a lug 18^a, formed on the cam 18. By means of such construction the lug 18^a, and consequently the cam 18, may be adjusted relative to its position on the shaft 15, so as to properly time the inward movement of the reciprocating bar 19. When such reciprocating bar has been forced inward to its full extent, the blank has been carried forward until it is grasped by the lower die 11, secured to the die-wheel 13, and the upper die 5^a, secured to the roll 5, mounted on the shaft 3. As soon as such upper and lower dies have grasped the blank the reciprocating bar 19, carrying the tongue 27, is brought back to its original position, as shown in Fig. 1, by means of a segmental collar or flange 21, secured to the shaft 15, and provided with a shoulder 21^a, which comes in contact with the rear end of the lower portion of the reciprocating bar 19, preferably provided with a lip or equivalent construction to form a suitable shoulder on said bar. This segmental collar 21 may be made adjustable, so as to regulate the time when the shoulder of such collar shall bear against the sliding bar and compensate for any irregularity or wear of such parts by means of an auxiliary plate screwed or bolted to the shoulder 21^a of the collar and be readily renewed or adjusted by inserting packing between said auxiliary plate and said shoulder. After the tongue 27 has receded from the blank, the blank, then U-shaped in formation corresponding to the outline of such tongue, is held and carried forward by the upper and lower dies. The heel-formers 8 are then forced inward by means of lateral projections on the blocks 36, adjustably secured to the upper ends of the rods 35, supporting such heel-formers, which projections bear against the edges of the collars 6 and 7 and engage the projections 6^a and depressions 7^b of the edges of said collars, thereby giving an intermittent lateral movement to the upper end of such rods, which are held in a steady position at other times by means of the otherwise parallel opposite edges of the collars 6 and 7. The rods 35 are provided with forming-blocks 8, which when the blank is held between the upper and lower dies come in contact with the edges of the blank at the heel and force such ends inward against the sides of the frog form of the die 11, secured to the die-wheel 13, thereby giving the desired shape to the heel of the shoe. These blocks may be made adjustable laterally on the bars 35, if desired, by means of slots and engaging studs. The lower ends of the bars 35 are pivotally attached to the base-plate or frame of the machine in any desired manner. The blocks or projections 36 are made adjustable longitudinally of the bars 35, so as

to come into accurate adjustment with the projections 6^a and the depressions 7^b on the edges of the collars 6 and 7. The dies 11, mounted upon the wheel 13, are preferably provided with a longitudinal groove 11^a, corresponding with a rib 27^a, formed on the under side of the tongue 27, which permits said tongue to be made thicker at its forward edge, and thereby obtain a firm hold on the blank, whereas if made thin such tongue would cause the blank to rock and twist. The forward portion of such die is inclined, as shown in Figs. 4 and 10, to give the desired concavity to the upper surface of a shoe. After the inner heel ends of the blanks have been bent inward and the blank passed between the upper and the lower dies it is then moved on to strippers 37, arranged at the rear of the machine and provided with slots adapted to adjust the same, and the shoe is then thrown off the strippers 37 by means of the lips 40, secured to the upper die-roll 5. A back plate 39 is attached to the rear of the machine and provided with a guard 38, arranged between said knives 37 to guide the shoe horizontally as it leaves the dies and keep the shoe straight.

The dies 11 (shown on the die-wheel 13) may, if desired, be attached to the roll 5 of the upper shaft 3, and the die 5^a on the upper shaft 3 may be attached to the lower die-wheel 13, in which case the center guard 38 may be extended so as to engage the groove 11^a in the frog-form die and remove the shoe from the die when completed, and the tongue 27 may be reversed, so that the rib 27^a of the tongue may engage the groove 11^a of the die 11 in its changed position on the upper die-shaft.

In the drawings I have herein shown and described the best means known to me for carrying out my invention. I do not desire, however, to be limited to the details of such construction, as other devices having similar capabilities may be employed without departing from my invention.

Having described my invention, what I claim by Letters Patent is—

1. In a horseshoe-machine, the combination with upper and lower rotating dies, of stationary anvils, a blank-support, a reciprocating bar provided with a bending-tongue, and means for operating said reciprocating bar and dies, substantially as shown and described.

2. In a horseshoe-machine, the combination with upper and lower rotating dies, of a blank-support, stationary anvils, swaging-blocks secured to oscillating levers, a reciprocating bar provided with a bending-tongue, and means for operating said dies, reciprocating bar and swaging-blocks, substantially as shown and described.

3. In a horseshoe-machine, the combination with a rotating die-wheel having frog-form dies provided with a longitudinal groove, of an upper die mounted upon a rotating shaft,

a reciprocating arm provided with a bending-tongue and a longitudinal rib adapted to engage the groove of said dies, stationary anvils and means for operating said dies and bar, substantially as shown and described.

4. In a horseshoe-machine, the combination with upper and lower rotating dies, of a blank-support, stationary anvils, a reciprocating bar provided with a bending-tongue, a cam adjustably mounted upon a rotating shaft, and an oscillating shaft provided with an upper lever adapted to bear against said reciprocating bar and a lower lever adapted to engage said adjustable cam, substantially as shown and described.

5. In a horseshoe-machine, the combination with upper and lower rotating dies, of a blank-support, stationary anvils, a reciprocating bar provided with a bending-tongue, a collar or hub rigidly secured to a rotating shaft, a cam loosely mounted upon said shaft and adjustably secured to said hub, an oscillating shaft provided with the levers adapted to engage said cam and reciprocating bar, substantially as shown and described.

6. In a horseshoe-machine, the combination with upper and lower rotating dies, of a blank-support, stationary anvils, a reciprocating bar provided with a bending-tongue, means for moving said bar forwardly and a segmental collar mounted upon a rotating shaft adapted to bear against said bar and move it backwardly, substantially as shown and described.

7. In a horseshoe-machine, the combination with a main die-wheel provided with frog-form dies, of an upper die mounted upon a rotating shaft, stationary anvils and a reciprocating arm provided with a bending-tongue movable in a line tangential to said die-wheel, substantially as shown and described.

8. In a horseshoe-machine, the combination with a main die-wheel provided with frog-form dies, of an upper die mounted upon a rotating shaft, stationary anvils, a reciprocating bar provided with a bending-tongue having a slow forward movement by means of upper and lower levers mounted on an oscillating shaft and a cam mounted upon a rotating shaft, and a quicker return movement by means of a segmental collar mounted upon said rotating shaft and provided with a shoulder, substantially as shown and described.

9. In a horseshoe-machine, the combination with upper and lower rotating dies, of stationary anvils provided with curved ends and flanges projected horizontally from their upper surface, a blank-support, a reciprocating bar provided with a bending-tongue, and means for operating said reciprocating bar, substantially as shown and described.

10. In a horseshoe-machine, the combination with a die-wheel provided with frog-form dies having a longitudinal recess in the frog of each die, a reciprocating tongue having a rib adapted to engage the recess of said dies, stationary anvils and means for moving said

reciprocating tongue inward and outward, substantially as shown and described.

11. In a horseshoe-machine, the combination with upper and lower rotating dies, of stationary anvils, a blank-support, a reciprocating bar provided with a bending-tongue, means for operating said reciprocating bar, and heel-swagers, cams secured to a rotating shaft arranged to operate said swagers in advance of

the movement of said bar, substantially as is shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL J. KELLY.

Witnesses:

JOHN FLYNN, Jr.,

ROBERT W. HARDIE.