

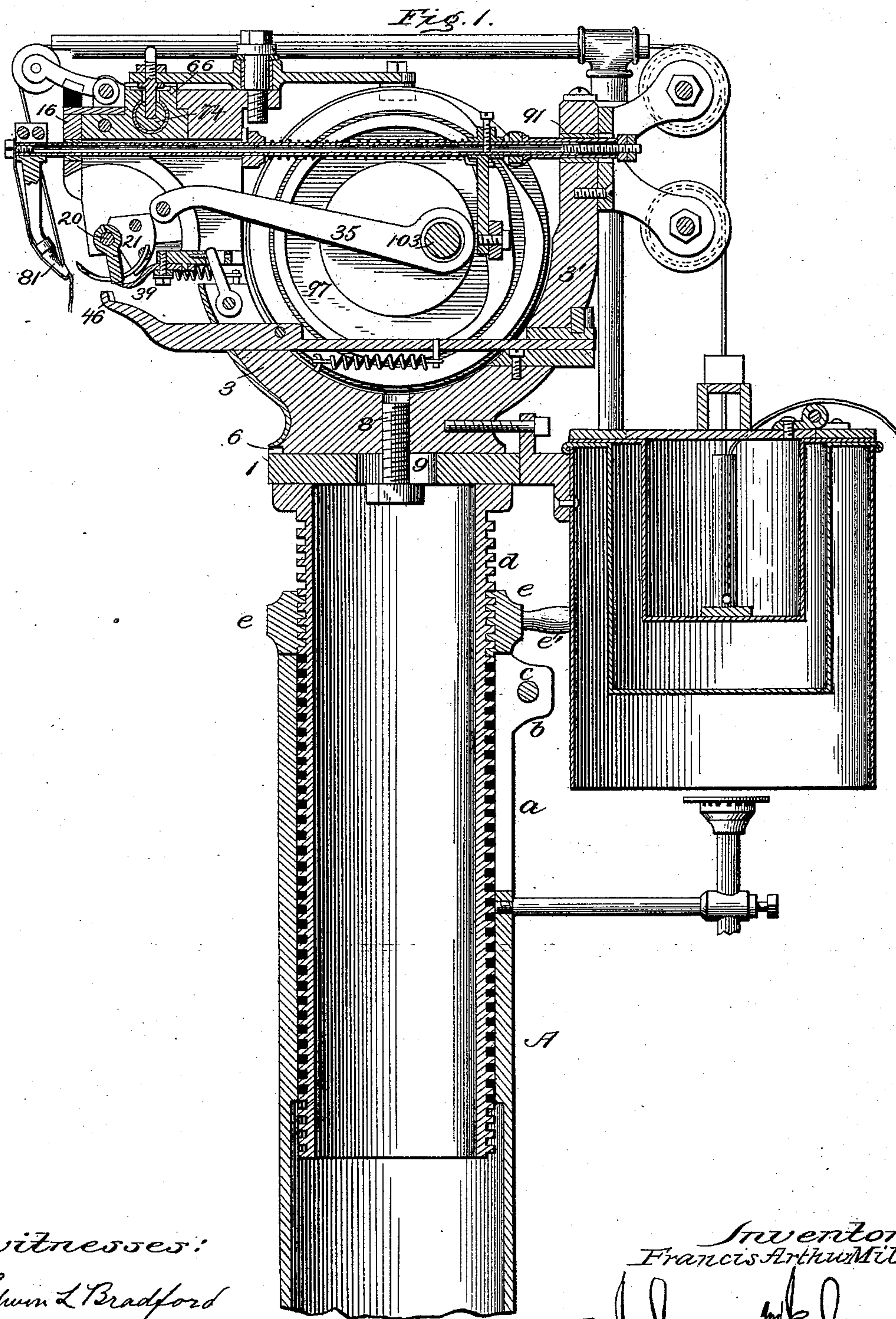
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5 Sheets—Sheet 1.

F. A. MILLS.
SHOE SEWING MACHINE.

No. 524,339.

Patented Aug. 14, 1894.



witnesses:

Edwin L. Bradford

Aug. H. Johnson

Inventor:
Francis Arthur Mills.

By *Johnson*
his Attorneys.

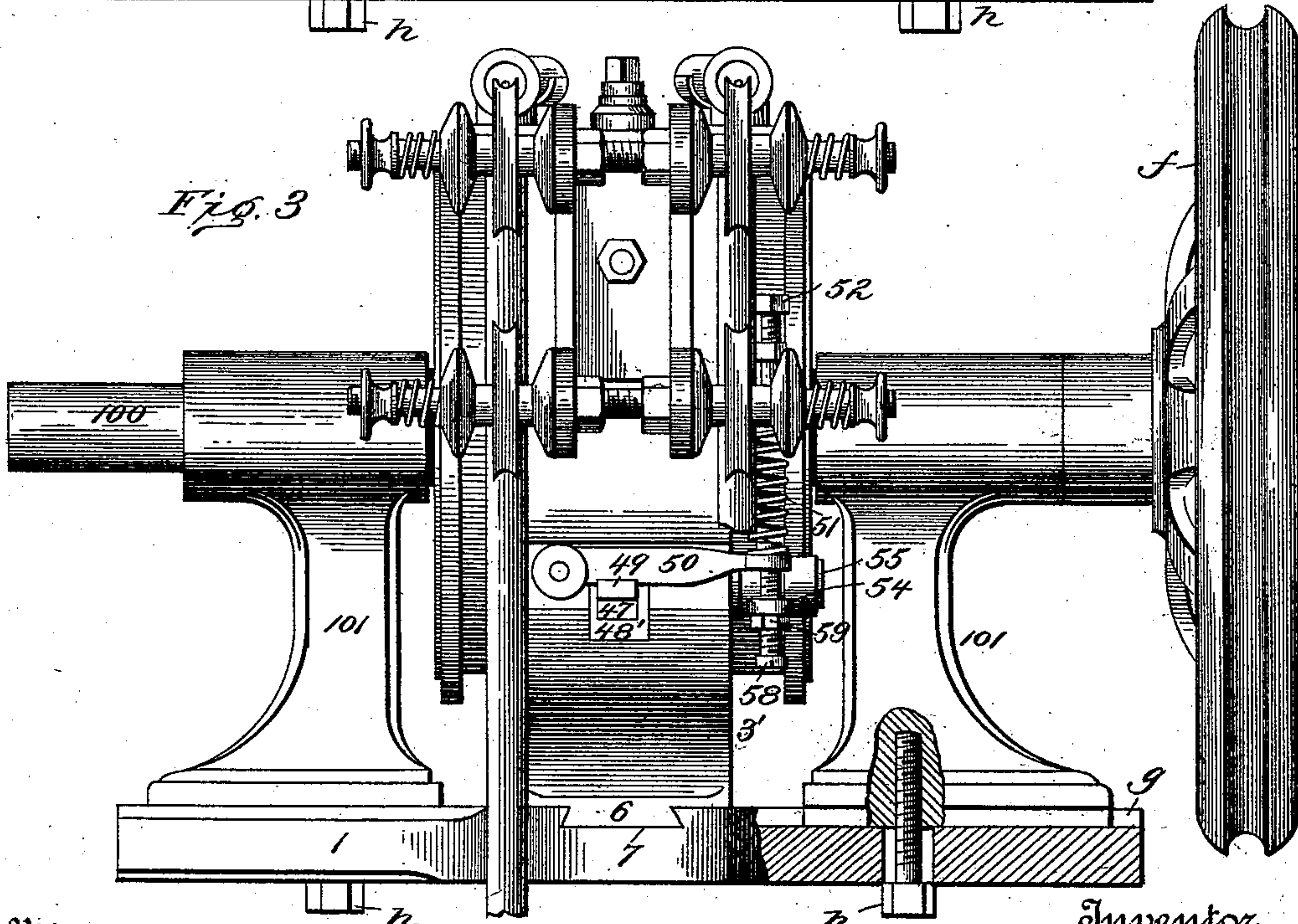
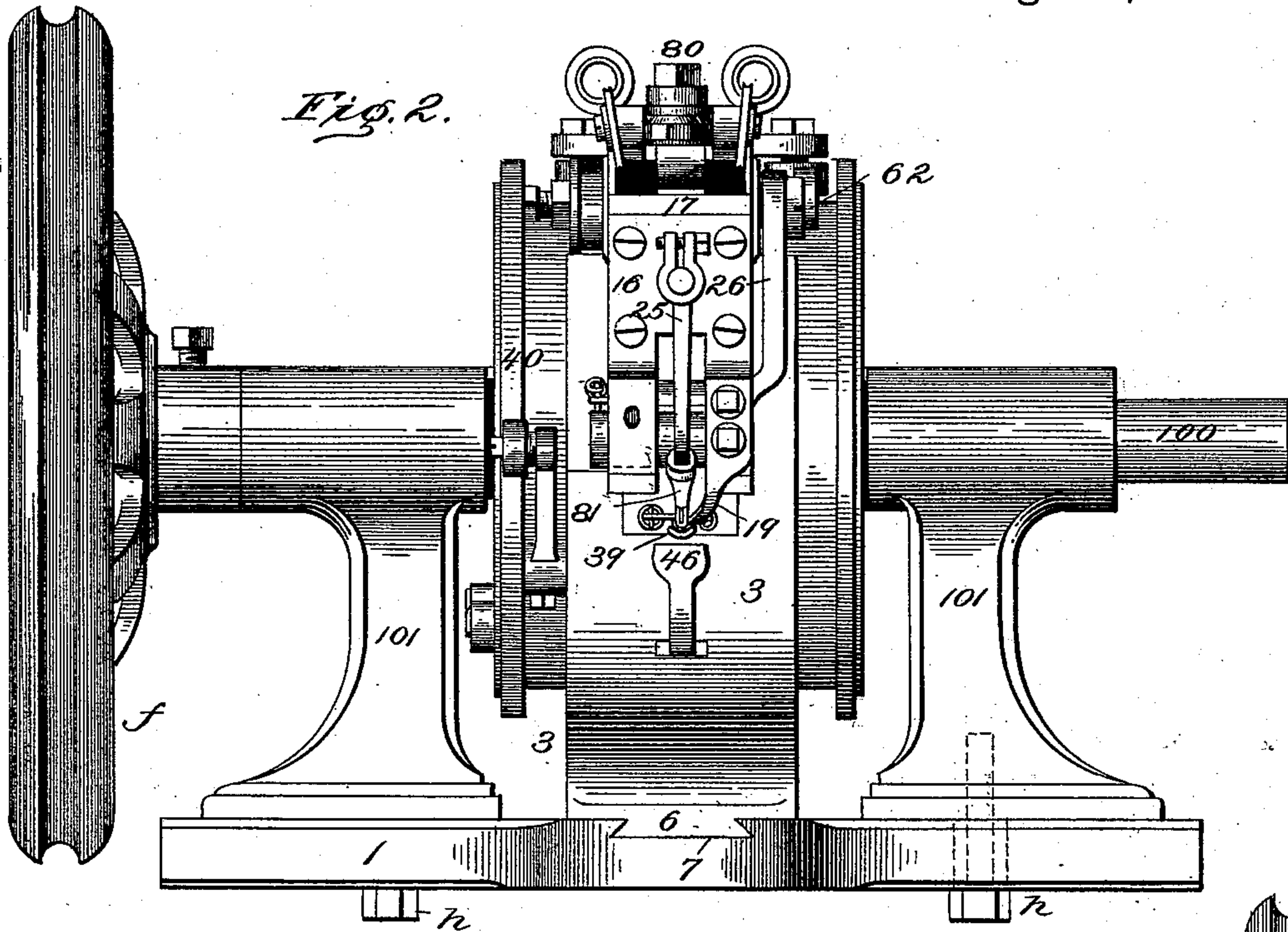
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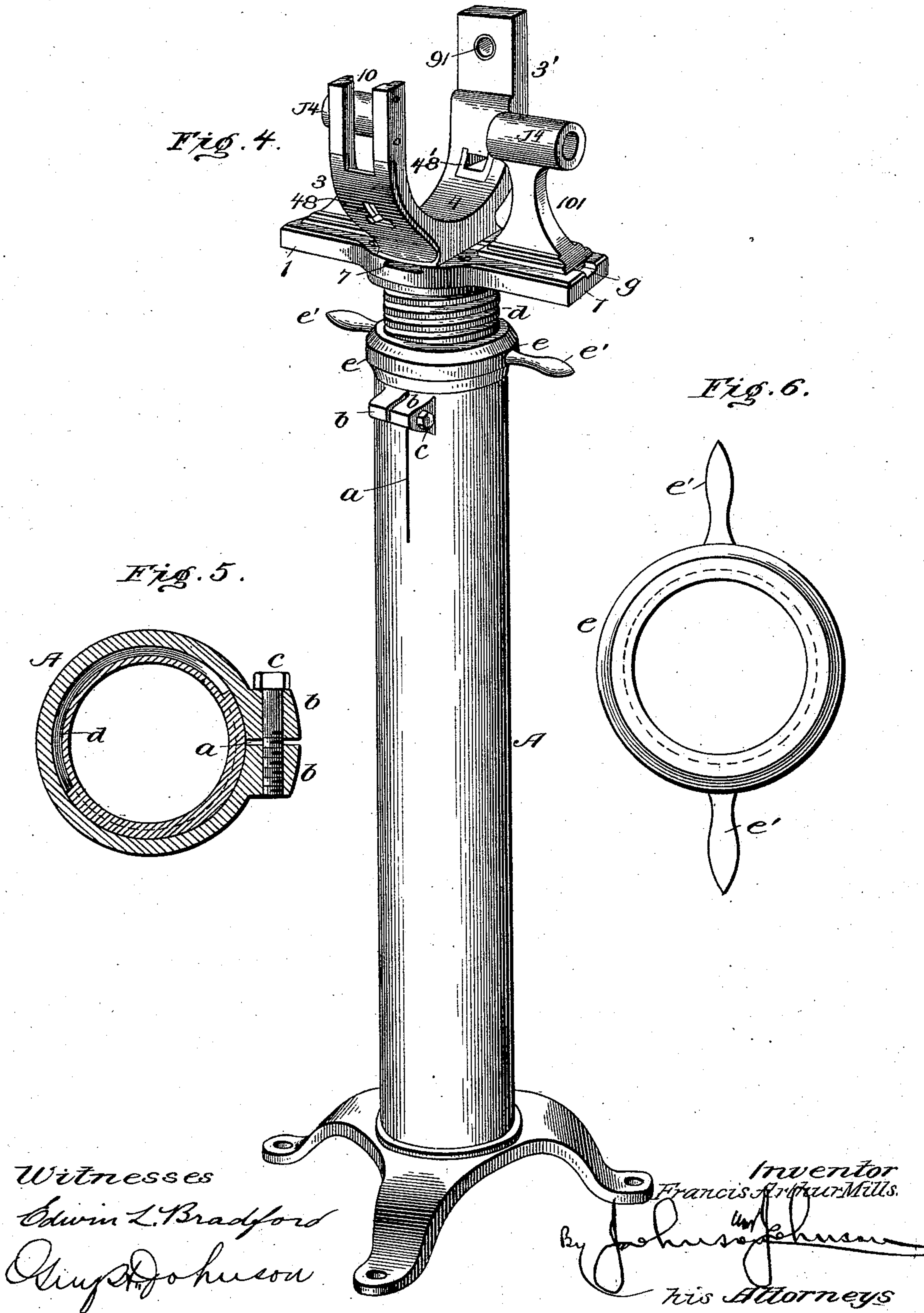
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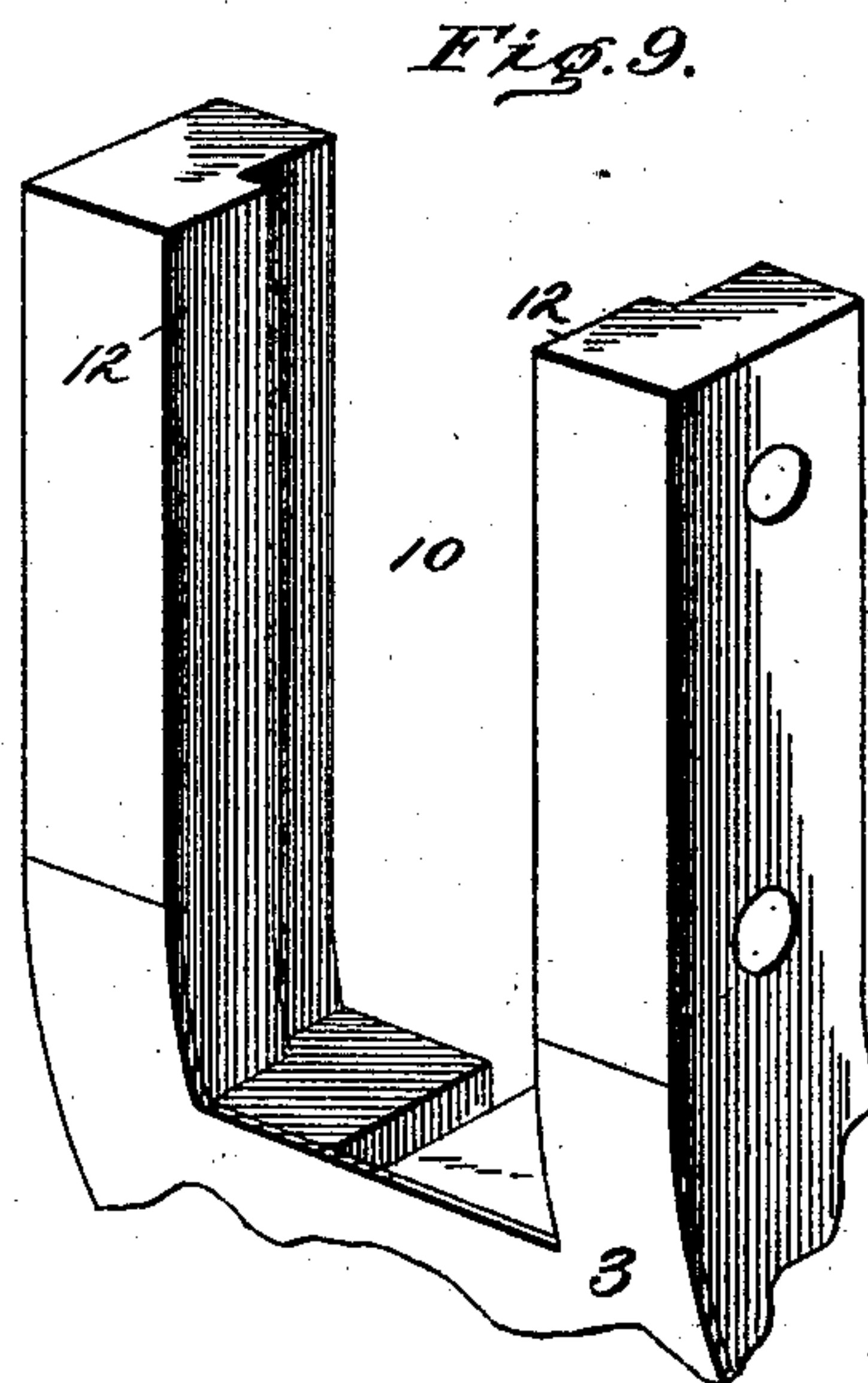
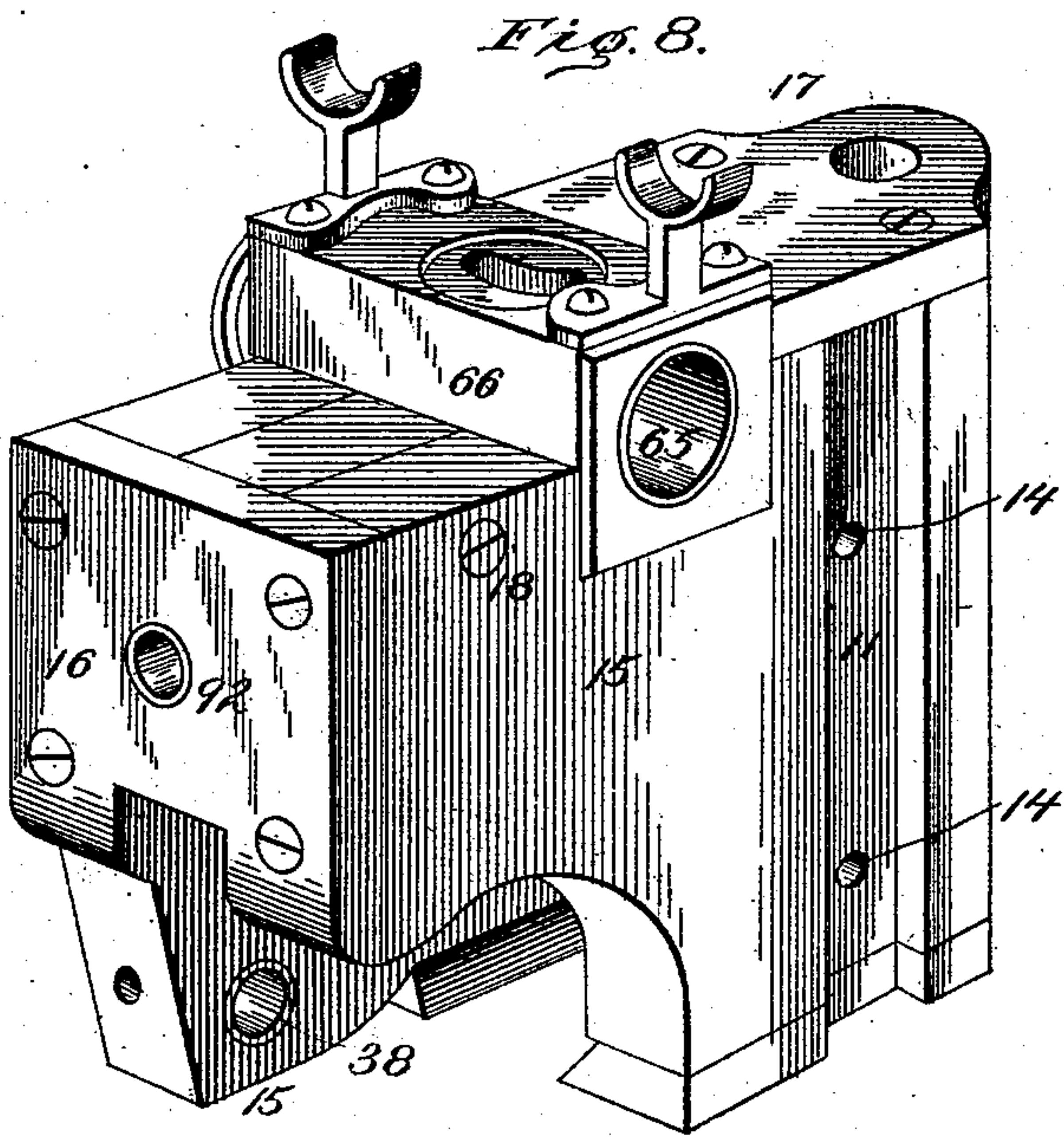
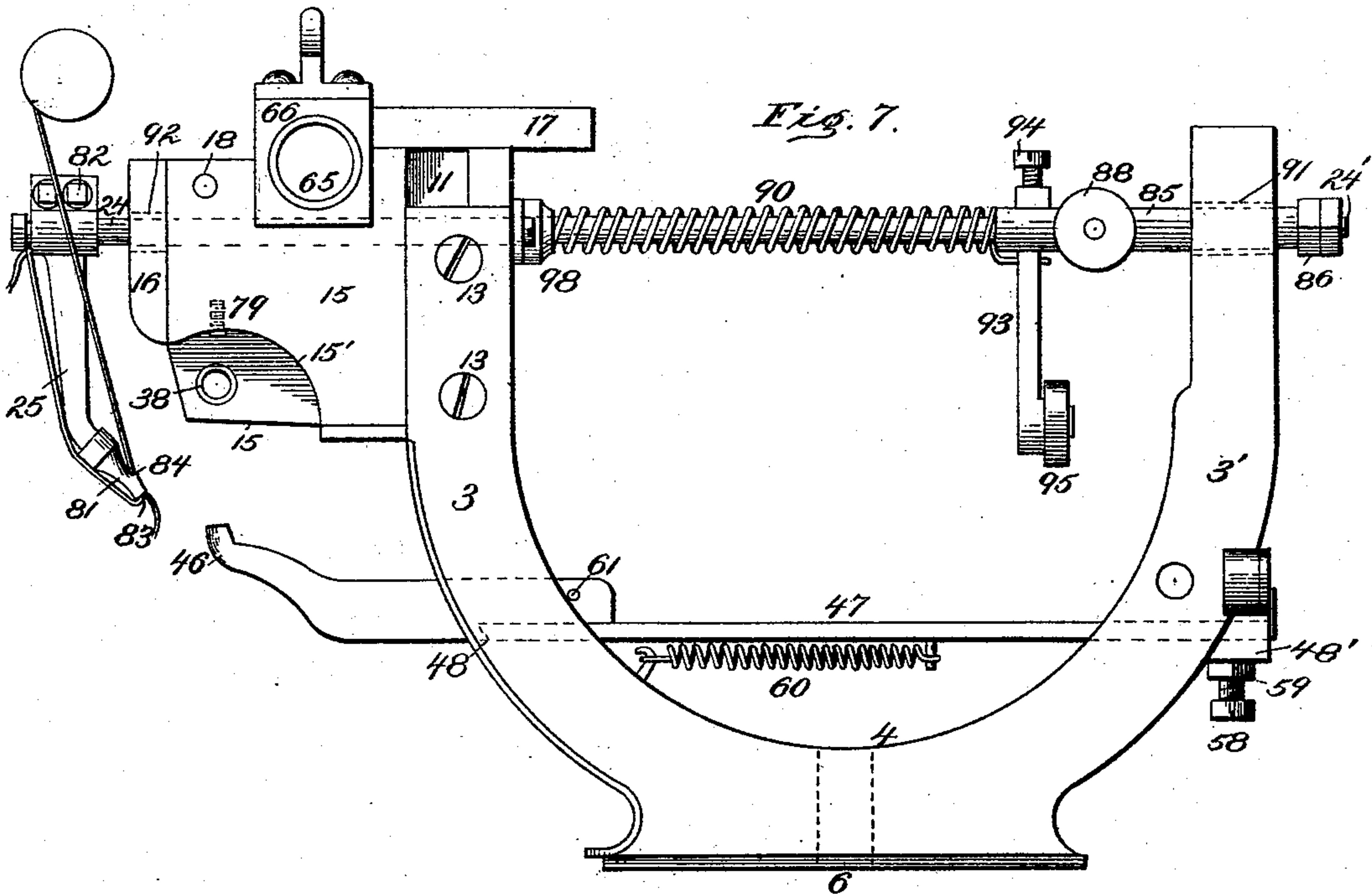
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5 Sheets—Sheet 5.

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Fig. 10.

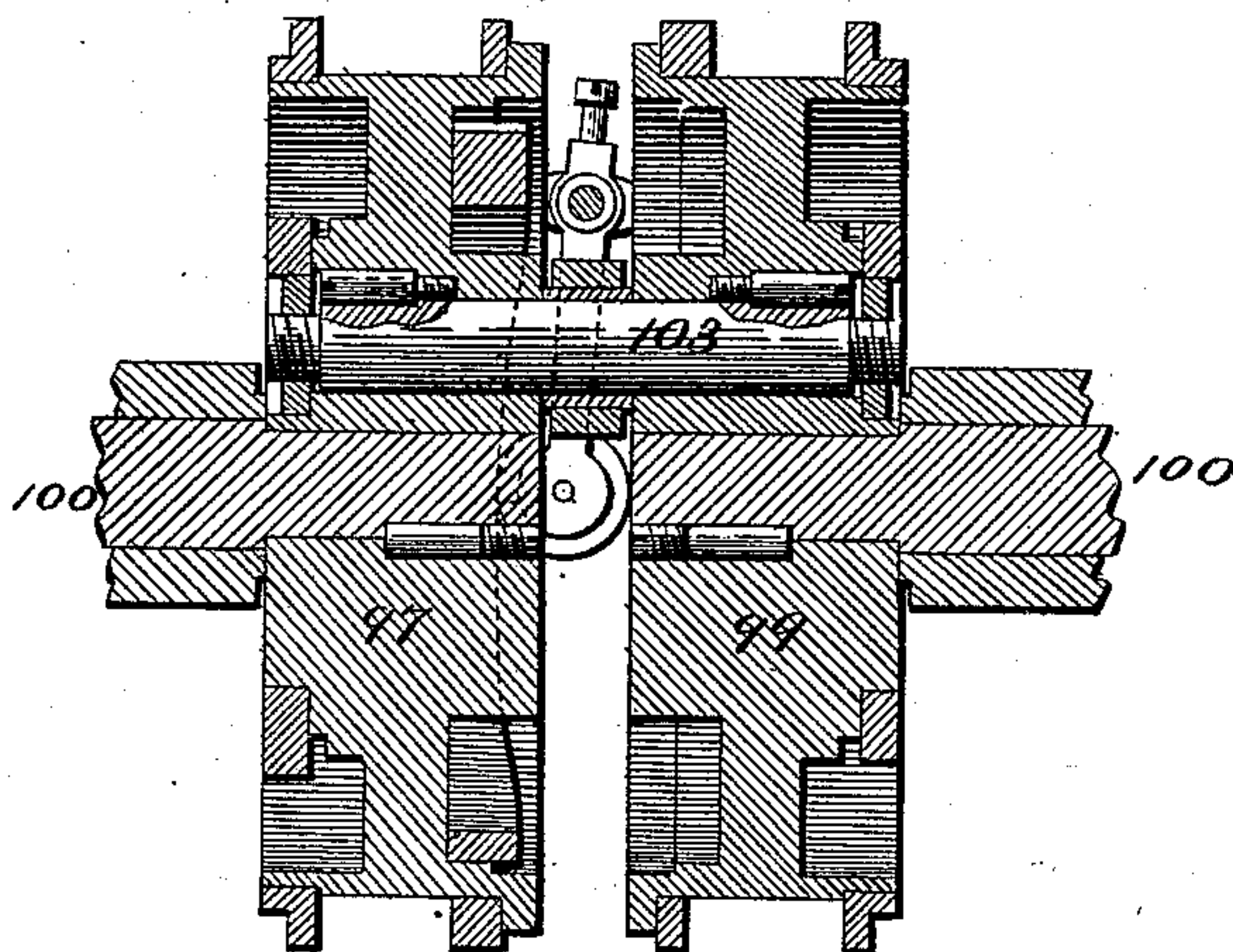
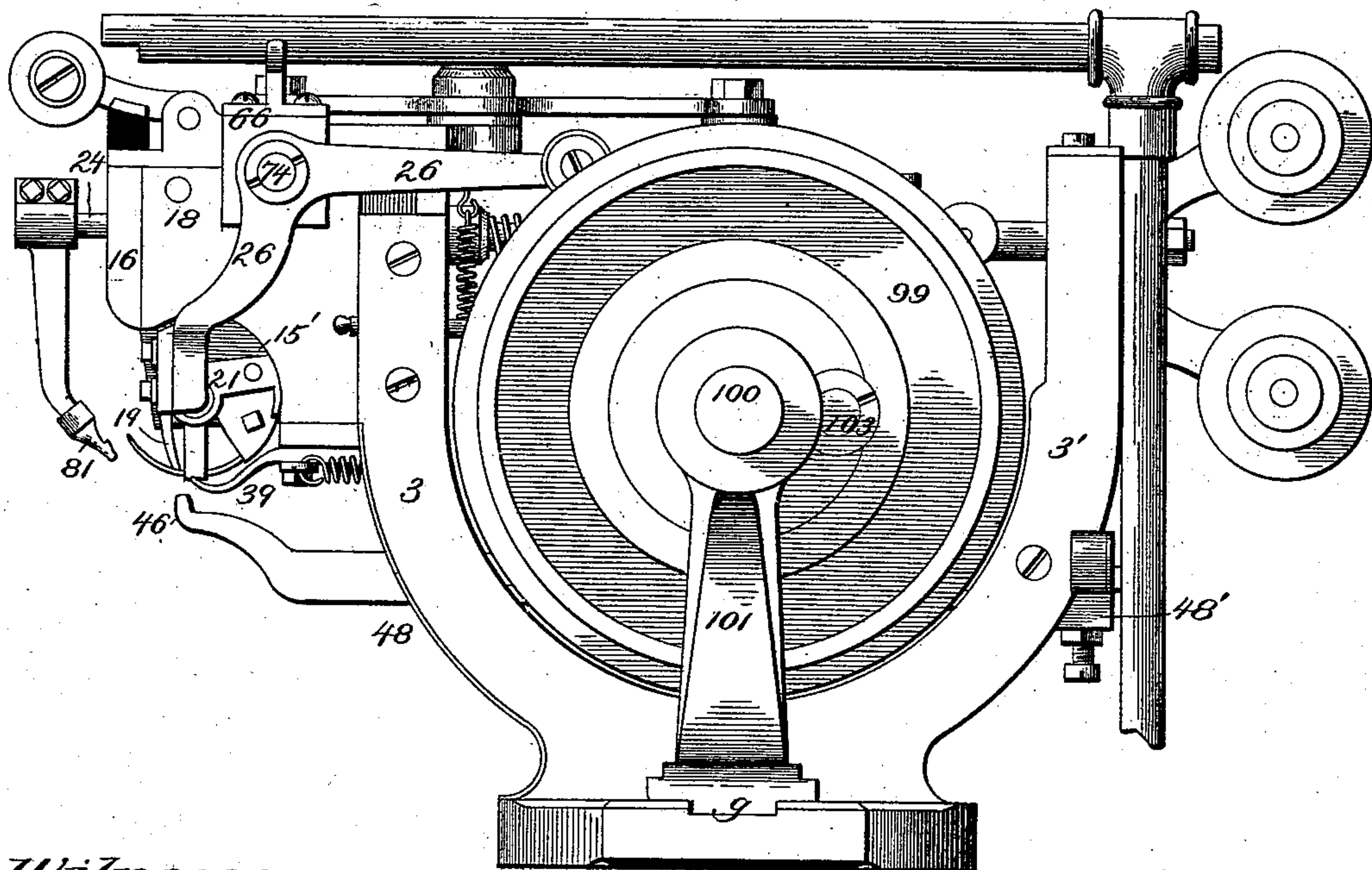


Fig. 11.



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Francis Arthur Mills.
By *Johnson*
His Attorneys

UNITED STATES PATENT OFFICE.

FRANCIS ARTHUR MILLS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR,
BY MESNE ASSIGNMENTS, OF ONE-HALF TO JAMES MUNDELL, OF SAME
PLACE.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,339, dated August 14, 1894.

Application filed January 28, 1893. Renewed November 20, 1893. Serial No. 491,443. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States, and a resident of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sole-Sewing Machines, of which the following is a specification.

The invention claimed herein is directed to a standard supporting structure and housing for shoe sewing machinery, in which the operator presents and manipulates the work to devices which support and feed it; and my said invention consists in certain novel parts and combinations of parts hereinafter specifically set forth in the claims concluding this specification. Before specifying such claims I will describe the structure illustrated in the drawings.

The following description read in connection with the drawings will enable any one skilled in the art to which my invention relates to understand its nature and to practice it in the form in which I prefer to employ it; but it will be understood that my invention is not limited to the precise form herein illustrated and described, as various modifications may be made without departing from its spirit and without exceeding the scope of the concluding claims.

Referring to the drawings: Figure 1 represents a vertical central section of a shoe sewing machine, showing the complete sewing mechanism as mounted upon my new supporting and housing structure. Fig. 2 is a front view of the same. Fig. 3 is a rear view of the same. Fig. 4 represents the standard structure and housing for the sewing machinery. Fig. 5 is a horizontal section of the upper clamping split end of the supporting standard; and Fig. 6 shows the screw-ring by which the housing of the sewing machinery is supported upon the standard. Fig. 7 is a side view of the centerhead and certain parts of the sewing machinery. Fig. 8 shows the housing of the sewing-head; and Fig. 9 shows the bifurcated pillar of the centerhead for receiving the sewing-head housing. - Fig. 10 is an axial section of the cam cylinders showing their separate connection by the crank pin and their separate supporting shafts; and

Fig. 11 shows the right side of the sewing-head structure.

The standard structure which I have produced has provision for supporting and adjusting a centerhead housing for sewing machinery to suit the height of the operator and for turning or swiveling it horizontally to allow him convenient access to every side of the machine. For effecting these objects I construct the standard A hollow and split its upper end at *a* vertically for about one foot. At each side of this split there is a strong lug *b*, one of which is screw threaded and through which a screw bolt *c* passes to clamp the split parts together.

The sewing machinery is mounted within and upon a housing structure, which is mounted upon a stem about six inches in diameter and about eighteen inches long and formed with a strong circumferential screw thread *d* which fits snugly within the smooth walls of the split standard so that the latter is firmly clamped upon the screw-stem when the sewing-head housing is adjusted. To support this housing structure upon the standard I provide a screw ring *e* fitted upon the screw-stem and resting upon the split end of the standard forms the swivel support for the sewing machinery and is provided with arms *e'* by which it is turned when it is desired to raise or to lower the sewing-head structure. When so adjusted the split end of the standard is clamped upon the screw-stem and the sewing-head structure is prevented from turning. When the standard is unclamped the sewing-head structure is free to be turned horizontally by freeing the driving belt from the pulley *f* which can be quickly done by a slight turning of the head to slacken the belt. The head can then be swiveled and raised and lowered for the purposes stated. In this way also the driving belt can be tightened when required. It will be understood that the screw ring *e* maintains its seat upon the standard in swiveling and in adjusting the height of the sewing-head structure, and affords a firm and durable support for the working structure.

The structure which contains the sewing, work supporting, and feeding mechanism, comprises a horizontal base-plate 1, a center-

head mounted at right angles thereon forming a bifurcated pillar 3 at its front and a pillar 3' at its rear ends connected by a semi-circular wall 4 making an inverted arch open at its base and at each side for the accommodation of cylinders having cams for operating the sewing and work supporting mechanism. The centerhead contains a separate nose part which I call the sewing-head mounted upon and overhanging the front pillar, for containing the sewing mechanism proper. The centerhead is firmly secured upon the base-plate by means of a bottom dove tail tongue 6 fitting in a corresponding groove 7 on the upper side of the base-plate and a center bolt 8 passing through a transverse slot 9 in said base-plate into the solid base of the center-head, whereby the center-head can be adjusted in relation to the crank operating pin 103 of the needle-carrier 21 to give the needle more or less front position with respect to the looper 81 to give the proper relation of the barb of the needle thereto. The front pillar 3 of the centerhead has a rectangular vertical opening 10 within which is mounted the sewing-head, which, for this purpose, has vertical co-incident recesses 11 on each side fitting corresponding tongues 12 on the inner walls of the opening 10 in the centerhead, and when seated in place within the latter is secured by screw bolts 13 passing through the vertical sides of the centerhead and into threaded holes 14 in the sides of the sewing-head. This sewing-head is constructed of vertical side plates 15 secured together so as to leave an intervening space by means of a front plate 16, a top box 66, and a screw 18. The right vertical side is arched at its lower front corner to leave an opening 15' within which the acting end 19 of the feed lever 26 works at the side of and under the head and which opening allows access to the needle carrier; see Figs. 2 and 11. In the other vertical side plate the needle-carrier is loosely mounted upon a horizontal rocking pin 20, so as to operate between the said side plates at the arched opening. Above the needle-carrier is arranged the rod 24 which carries the looper and this rod passes through a bushed-bearing, 92, Fig. 8, in the front plate of the sewing-head. The other end of the looper carrying rod has a bushed-bearing 91 in the upper part of the rear pillar of the centerhead. Above this looper-rod at the top of the sewing-head is mounted a box 66 for the pivot bearing 74 of the feed-lever device.

The back-gage 39 for supporting the edge of the sole at the point of stitching is fitted to slide in the bottom plate of the sewing-head; while the slide-rest 46 for supporting the lasted shoe in proper position to the sewing mechanism, is arranged below the back-gage and is fitted to slide horizontally in guide-ways 48 48' in the front and in the rear pillars of the centerhead. See Fig. 7.

The needle-carrier 21 is operated by a direct crank motion wherein the crank pin 103 is mounted in separate cam cylinders 97 and 99. These cam cylinders are each fixed upon a separate shaft 100 which is mounted in standards 101 on the base-plate 1 of the centerhead. The cam cylinders are separated to permit of the rotary movement of the pitman rod 35 between them and for access to the cams, which they contain, for operating the sewing mechanism, and the work supporting and feeding mechanism. The cam cylinders are united by the crank pin 103 and rotate together, and they are mounted by separate shafts, in standards which are fitted in grooved ways *g* on the base-plate and are secured and made adjustable by screw bolts *h* so as to bring the cam cylinders in equal relation to the centerhead and to the pitman-rod. In connection with this lateral adjustment of the cam cylinders I provide for adjusting the centerhead at right angles to the line of the shafts by the slot 9 in the base-plate and the screw-bolt 8 which secures the centerhead thereto. The object of this adjustment is to set the centerhead so that the needle shall have the proper relation to the work and to the looper, and, in connection with the side adjustment of the cam cylinders, all the working parts have a perfect central relation to each other. This supporting structure and housing give the advantage of disposing the crank operated pitman-rod, the needle-carrier, the back-gage, the slide-rest, the looper-device, and the feed-device, in lines parallel with each other and in direct longitudinal line in the structure, and the operator has thereby a free and clear front way for swinging the shoe while sewing.

Referring to Figs. 1 and 8 it will be seen that the sewing-head housing contains the bearing box 66 at its top, for the feed-lever device 26, the bearing for the looper device so that the looper-arm 25 depends in front of said housing, and the needle-carrier 21 which is pivoted in the latter; that the separate cam cylinders 97 and 99 are arranged to operate within the semi-circular open way of the center-head; that the crank operated pitman-rod 35 is arranged between the cam cylinders and within the unobstructed space of the sewing-head; that the back gage 39 is arranged in the centerhead just beneath the sewing-head; and that the looper actuating rod 24 and the slide-rest 46 are arranged to cross the semi-circular open way of the center-head (between the cam cylinders) for connection with the rear side thereof.

In Fig. 3, 91 is the bushed-bearing for the rear end of the looper-rod; 48' is the box for the rear end of the slide-rest; 48 is the guide bearing for the front end of the slide-rest; and 10 is the opening within which the sewing-head housing is secured to the center-head structure.

I make the supporting screw-stem for the

center-head hollow to afford access to the screw 8 and for adjusting the centerhead upon the base-plate; I make the base of the center-head flat to afford a firm seat upon the base-plate; and I make the standard open at its top and flat to form a seat for the screw-ring by which the center-head structure is supported, swiveled and adjusted.

It is evident that immaterial changes may be permitted from the general construction and arrangement of parts contributing toward my invention, and for this reason I do not wish to be understood as limiting myself in precise detail and construction. It will be understood that many of the details above described are not all essential to the several features of my invention separately considered. This will be indicated in the concluding claims, as in any given claim the omission of an element, or the omission of reference to the particular features of the elements mentioned is intended to be a formal declaration of the fact that the omitted elements or features are not essential to the invention covered therein.

I have illustrated in the drawings the invention claimed herein in connection with a complete shoe sewing machine, but as to all matters of devices and of the combination of such devices embraced in said machine other than those which belong to and are covered by the invention claimed herein, they are embodied in separate and distinct applications, Serial Nos. 491,159, 491,160, 491,442, 490,965, and 490,383, for patents filed by me and are therefore not claimed herein.

I claim as my invention in supporting and housing structures for shoe-sewing machinery—

1. In a shoe sewing machine, the combination with a centerhead structure for containing the operating mechanism, and a hollow supporting standard therefor, of a screw stem fixed to said centerhead and telescoping with said standard, a screw ring engaging said screw stem, seated upon said standard, and means for clamping said screw stem within and to said standard, for the purpose stated.

2. In a shoe sewing machine the combination with a centerhead structure for containing the operating mechanism, of a hollow standard split vertically at its upper end and having a clamp device at the split, a screw-stem fixed to said centerhead and telescoping with the split standard, and a screw-ring engaging said screw-stem and seated upon said standard, for the purpose stated.

3. A centerhead structure of a shoe sewing machine consisting of a base-plate, a semi-circular open body upon said base-plate, a sewing-head housing mounted upon and overhanging the front side of said semi-circular body, and standard bearings upon said base-plate, for containing and supporting in operative relation the sewing, feeding, work sup-

porting and operating devices, substantially as described.

4. A centerhead structure, consisting of a semi-circular open body forming front and rear pillars, the front pillar bifurcated, and the base having a tongue, a base-plate at right angles to said semi-circular body having a transverse groove for said base-tongue and longitudinal surface grooves, standard bearings adjustably fitted in said surface grooves, a cross-slot in said base-plate and a bolt passing through said slot for adjustably securing the centerhead structure upon said base-plate, and a sewing-head housing fitted in and overhanging the bifurcated pillar, the said semi-circular body and sewing-head housing adapted to contain the working mechanism in operative relation.

5. In a shoe sewing machine, a centerhead structure and housing, consisting of a semi-circular body having a flat-base, open at the top and at the sides, of greater length than width, having its front side bifurcated and formed with tongues on its inner walls, a base-plate at right angles to said semi-circular body, standard bearings on each end of said base-plate, in combination with a sewing-head housing having vertical recesses matching the tongues of the bifurcated front of the centerhead, and secured therein, whereby the sewing-head housing is supported in overhanging relation to the front end of the centerhead, for the purpose stated.

6. In a shoe sewing machine, a centerhead structure adapted to contain and support the operating mechanism and having a screw stem, in combination with a screw-ring engaging said stem, an expansible hollow cylindrical base-support on which said ring is free to be swiveled and forming a walled guide for said stem, and a device for clamping said base walls upon said screw stem, substantially as described.

7. In a shoe sewing machine, a hollow standard and a hollow screw-stem, in combination with a centerhead structure for containing the operating mechanism, and a screw-ring upon said screw-stem having a seat upon the open top of said standard, substantially as described.

8. In a sewing machine, a centerhead forming an inverted arch having a flat crown, and a supporting base-plate therefor, having bearing standards at the open sides of said arch, for containing the operating mechanism, in combination with a standard support, and a device for supporting, adjusting and swiveling the said centerhead, substantially as described.

In testimony whereof I have hereunto signed this specification in the presence of witnesses.

FRANCIS ARTHUR MILLS.

Witnesses:

A. E. H. JOHNSON,
PHILIP F. LARNER.