

No. 747,582.

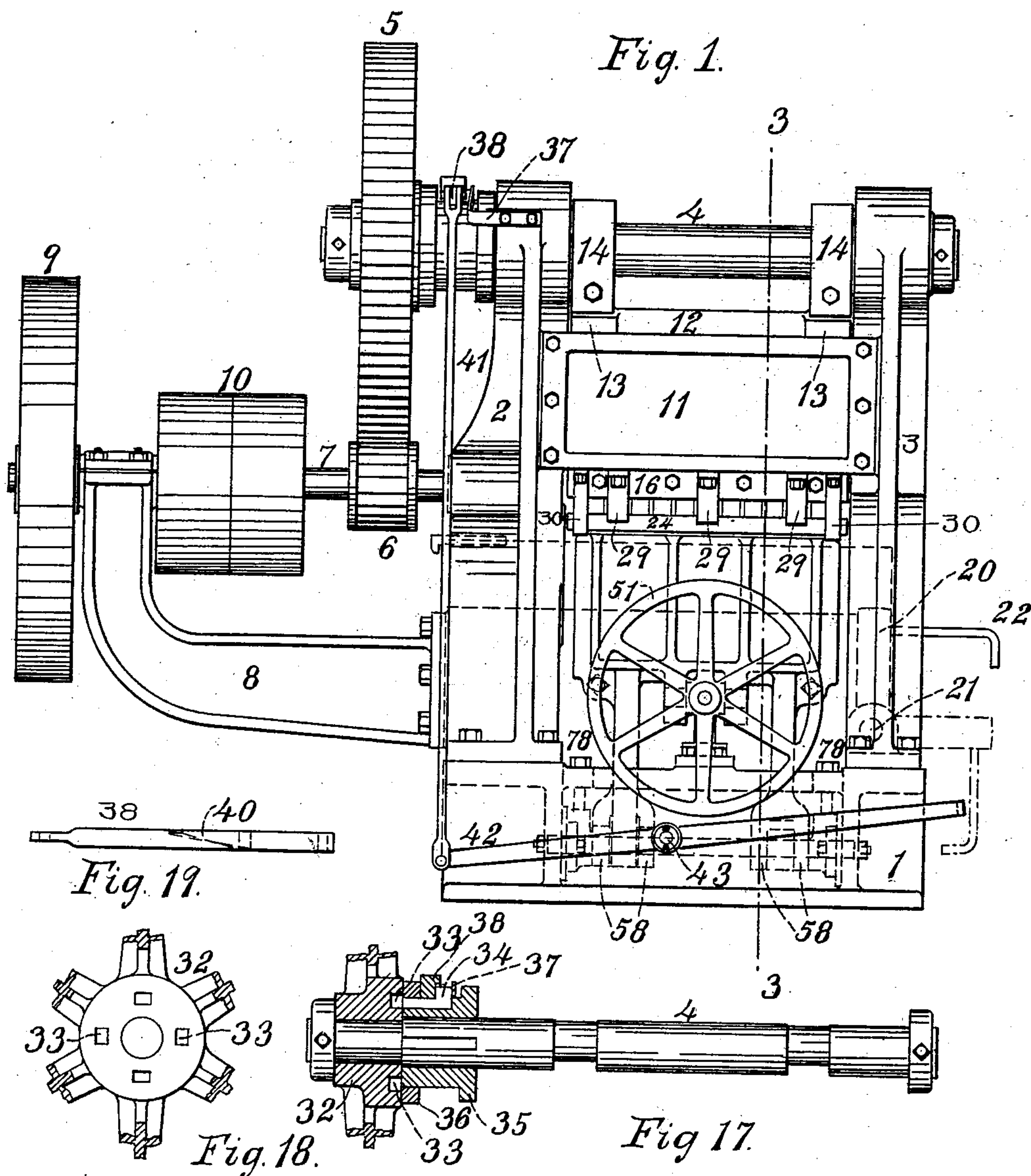
PATENTED DEC. 22, 1903.

J. L. BOYLE & H. E. BRETT.
MACHINE FOR PERFORATING CYLINDERS.

APPLICATION FILED SEPT. 13, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES.
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Frank H. Crowder

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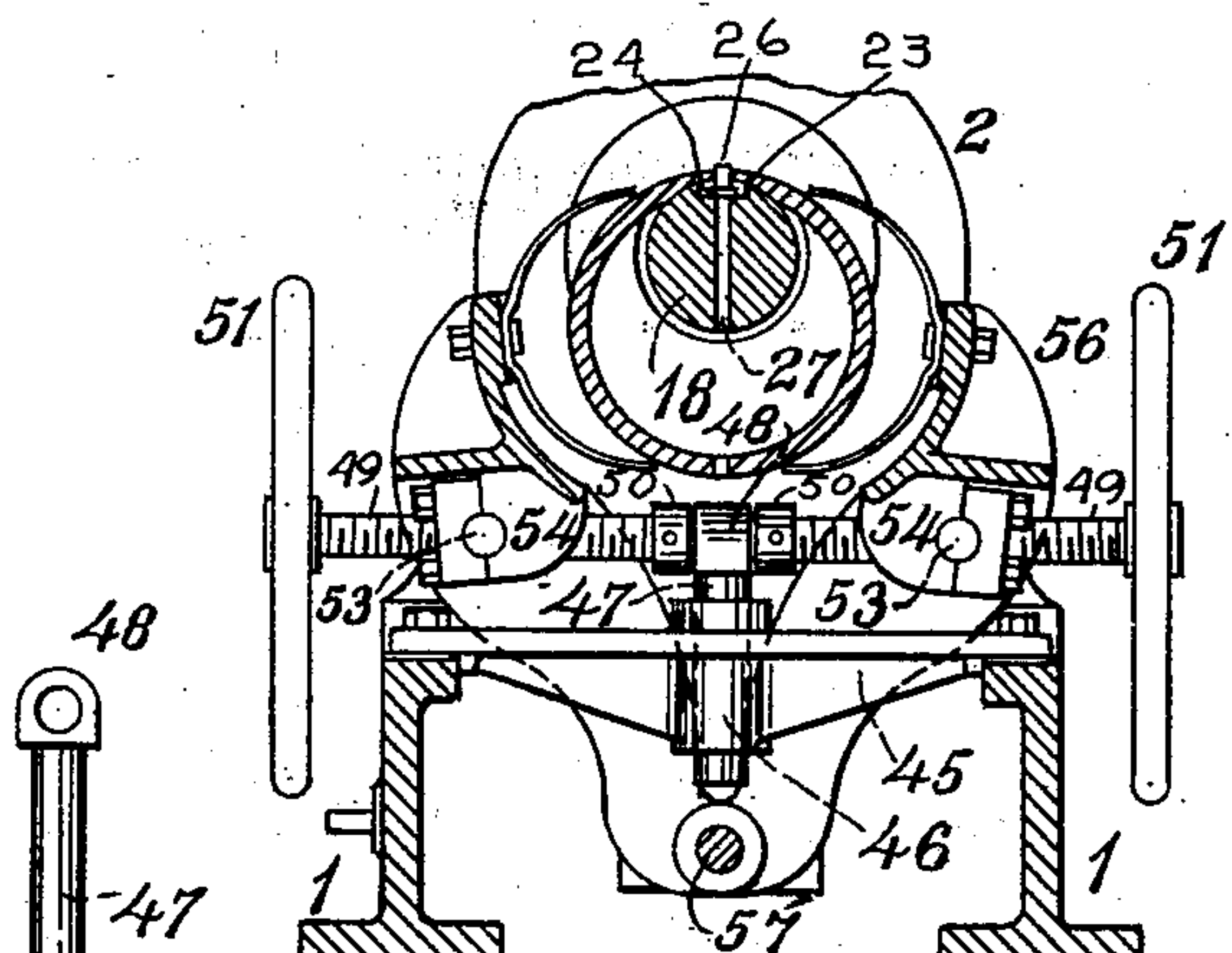
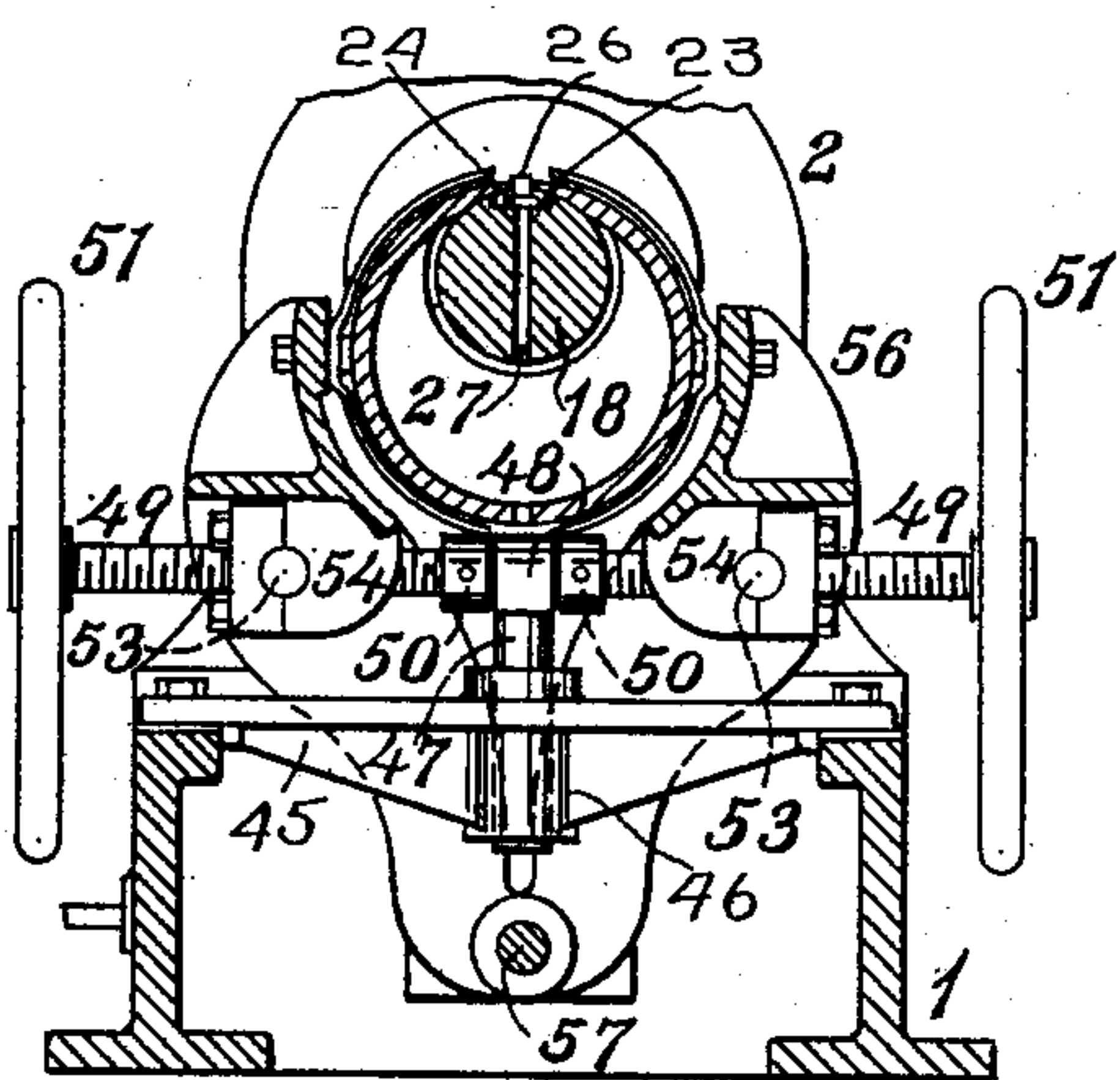
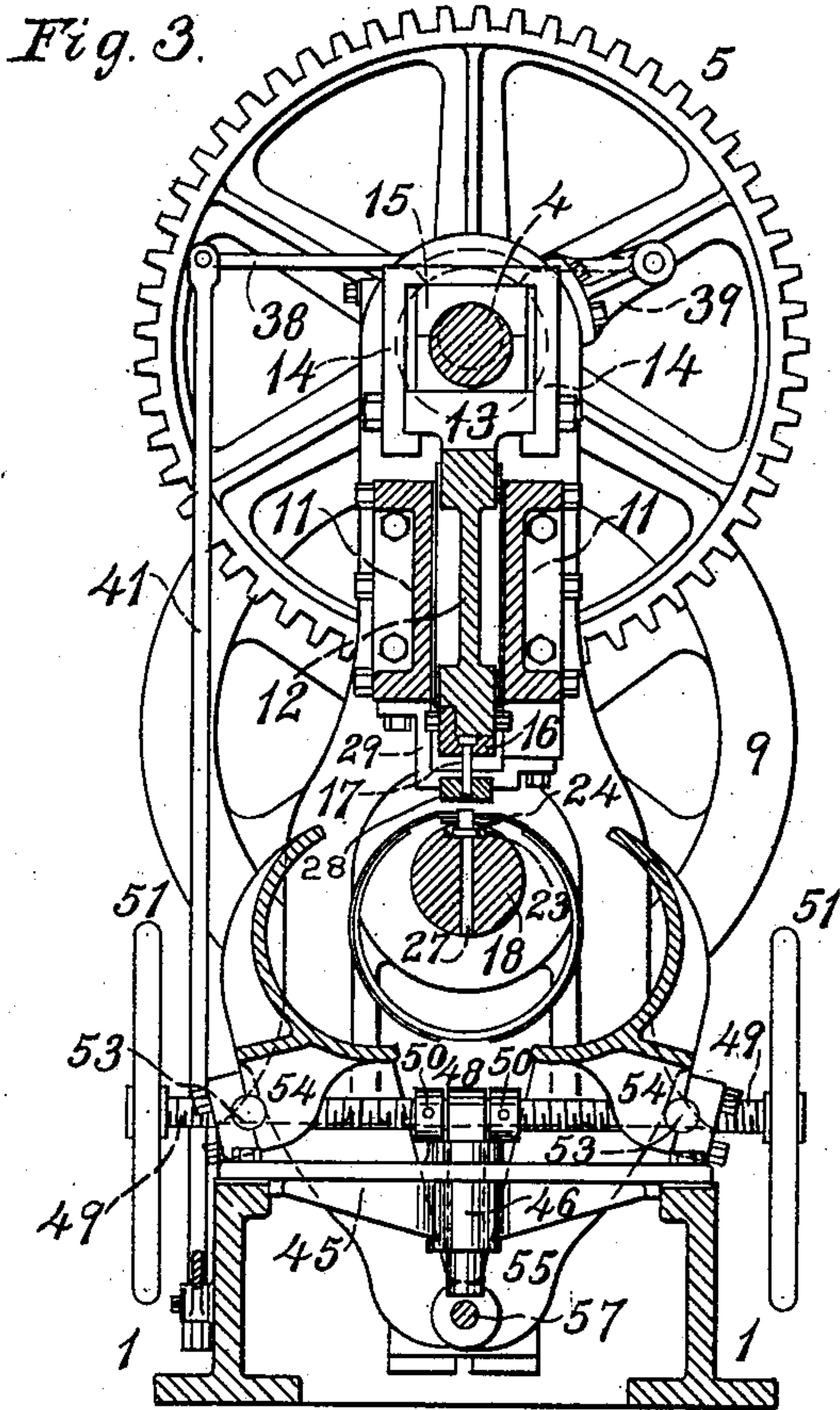
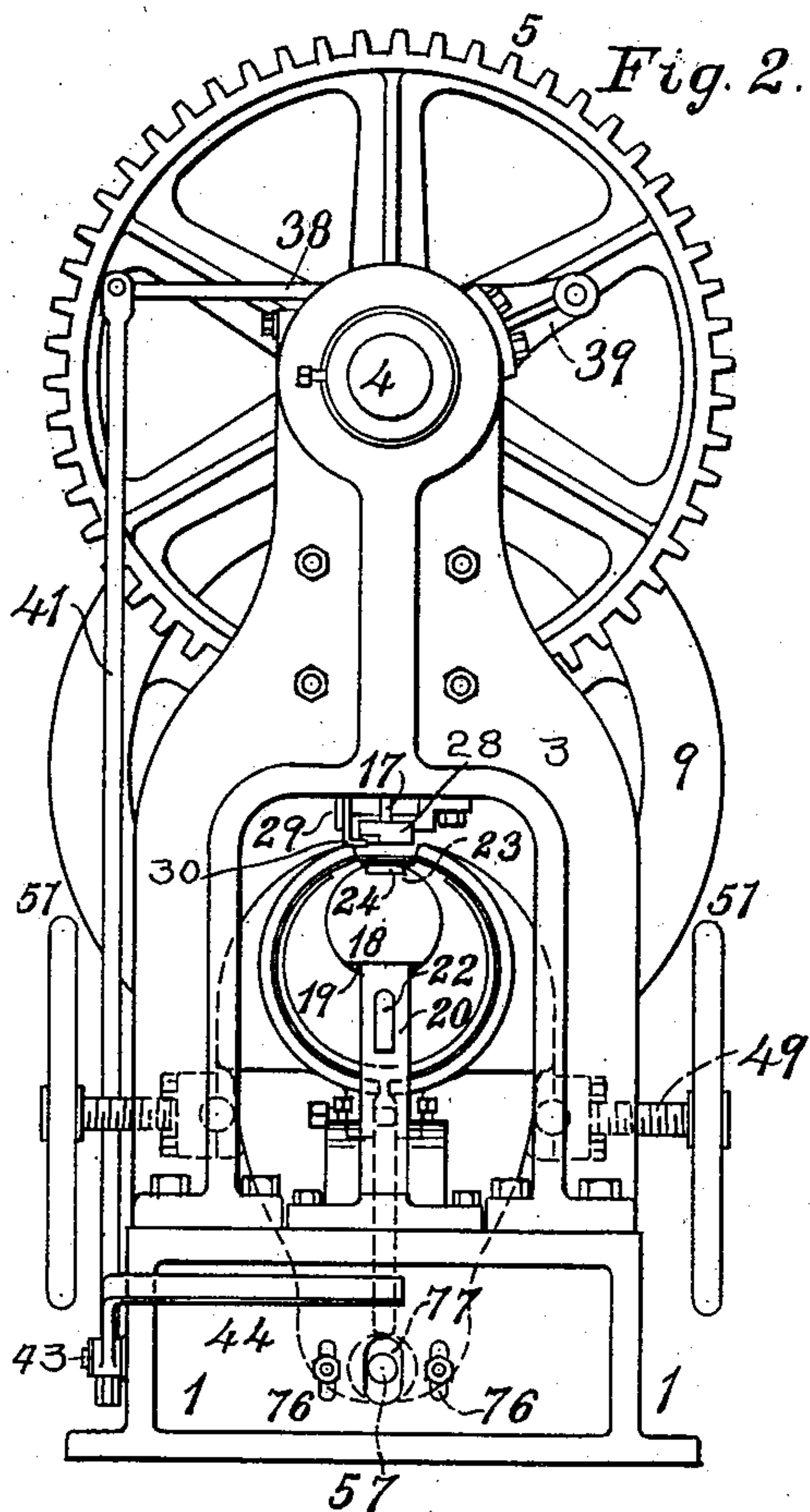


Fig. 4.

Fig. 5.

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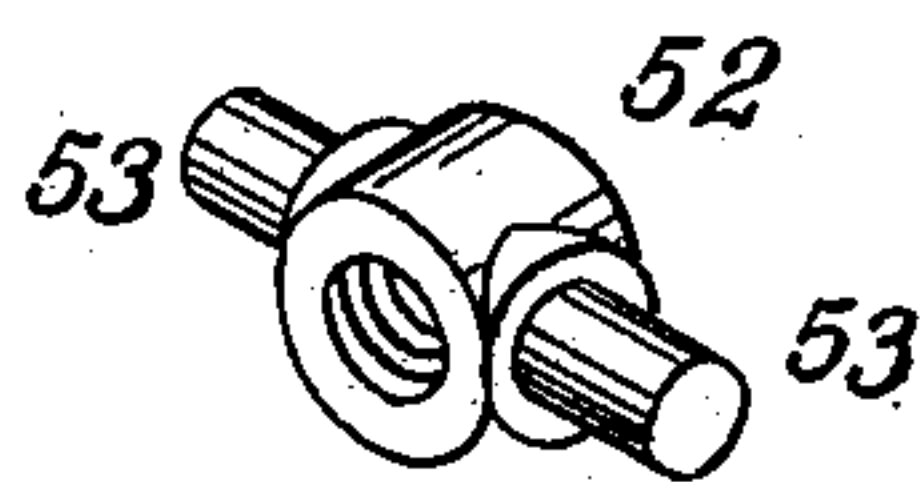
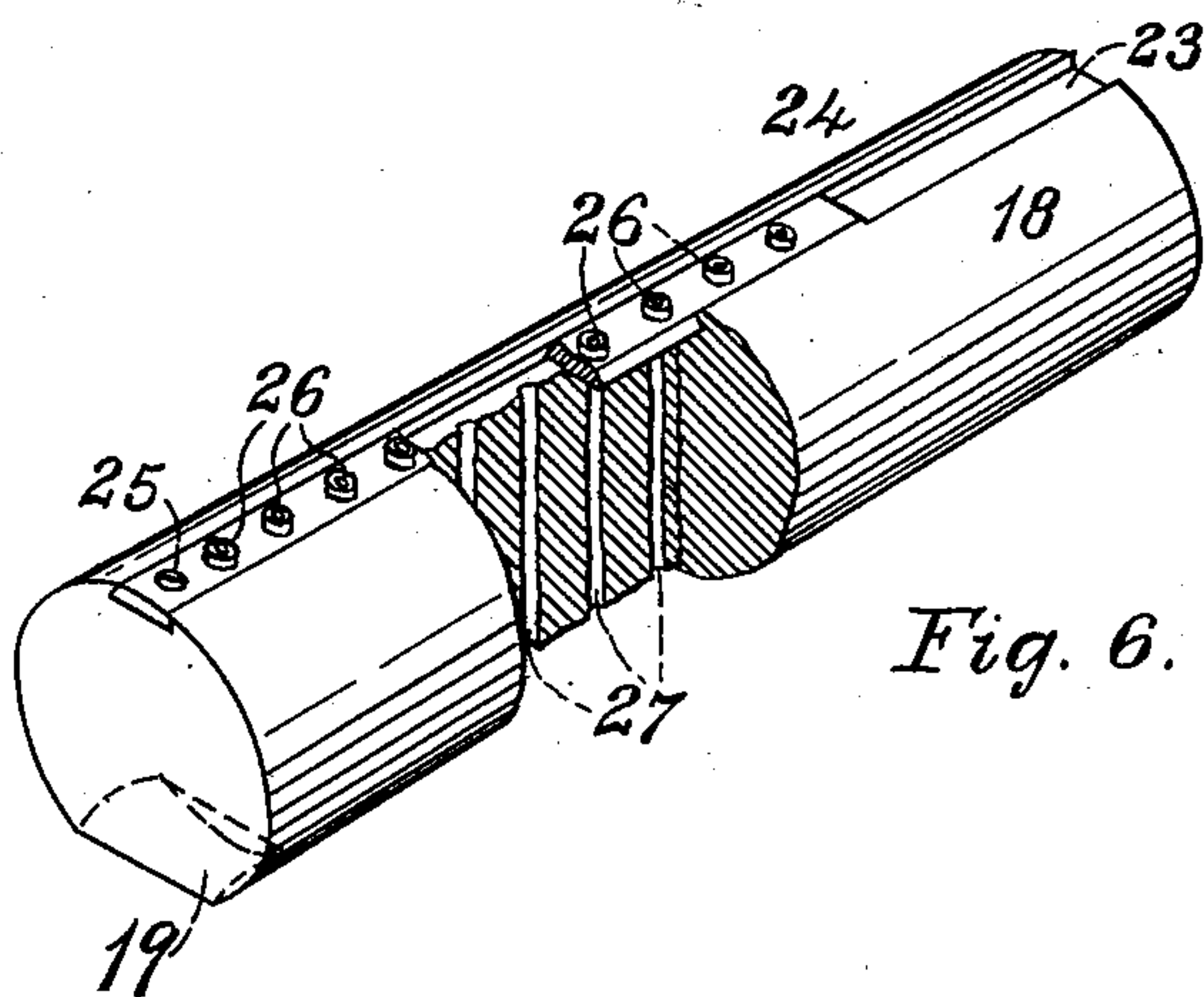
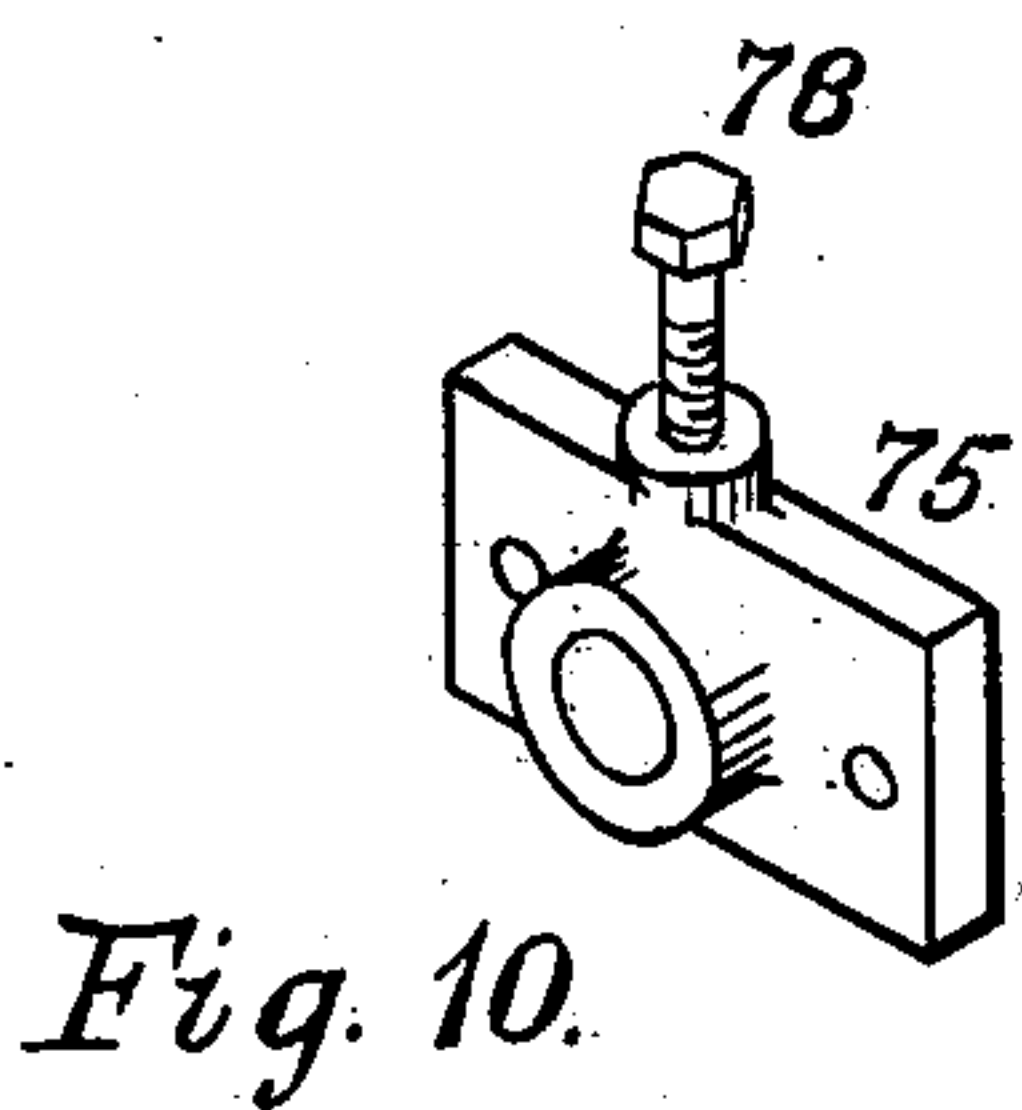
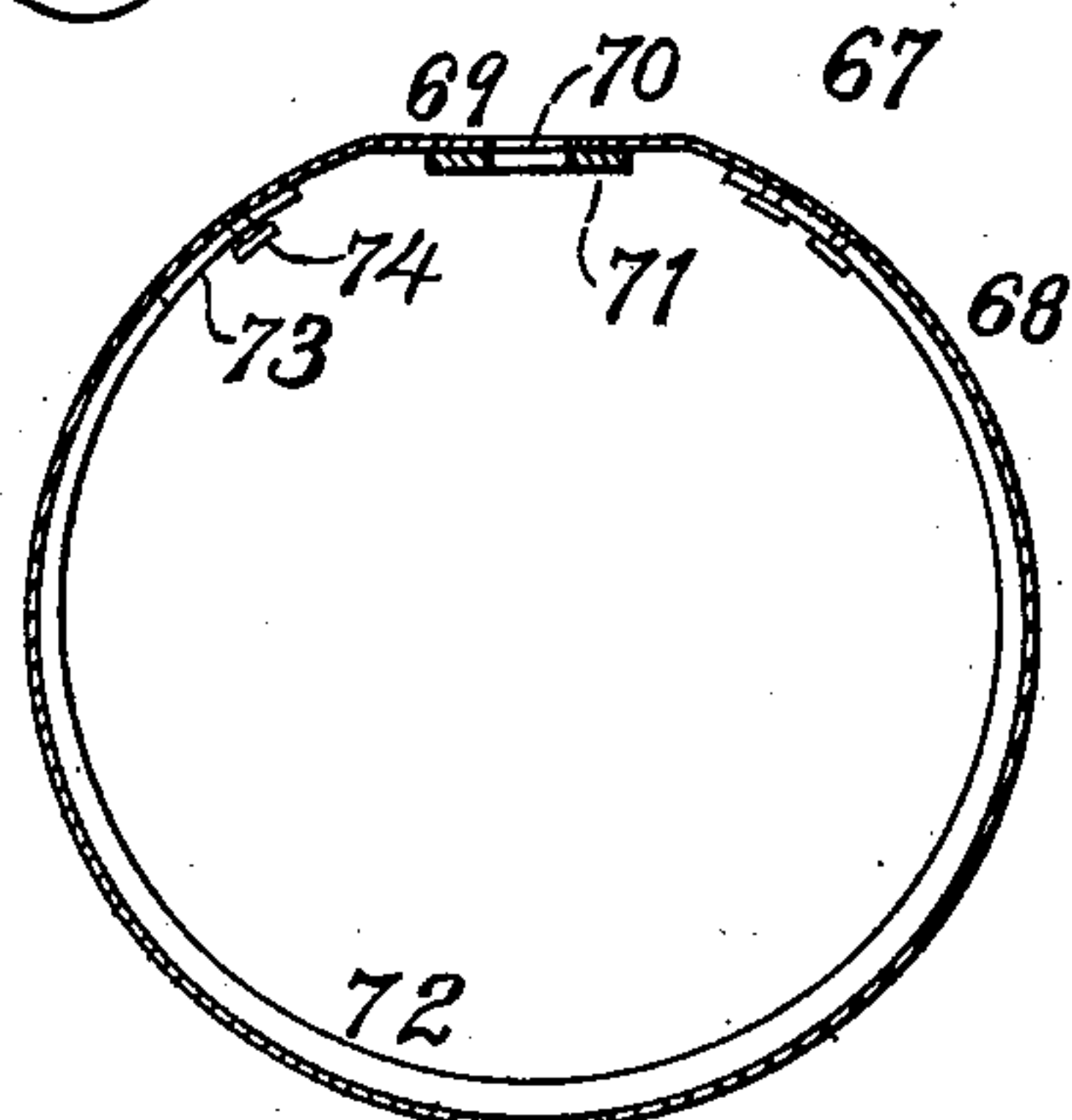
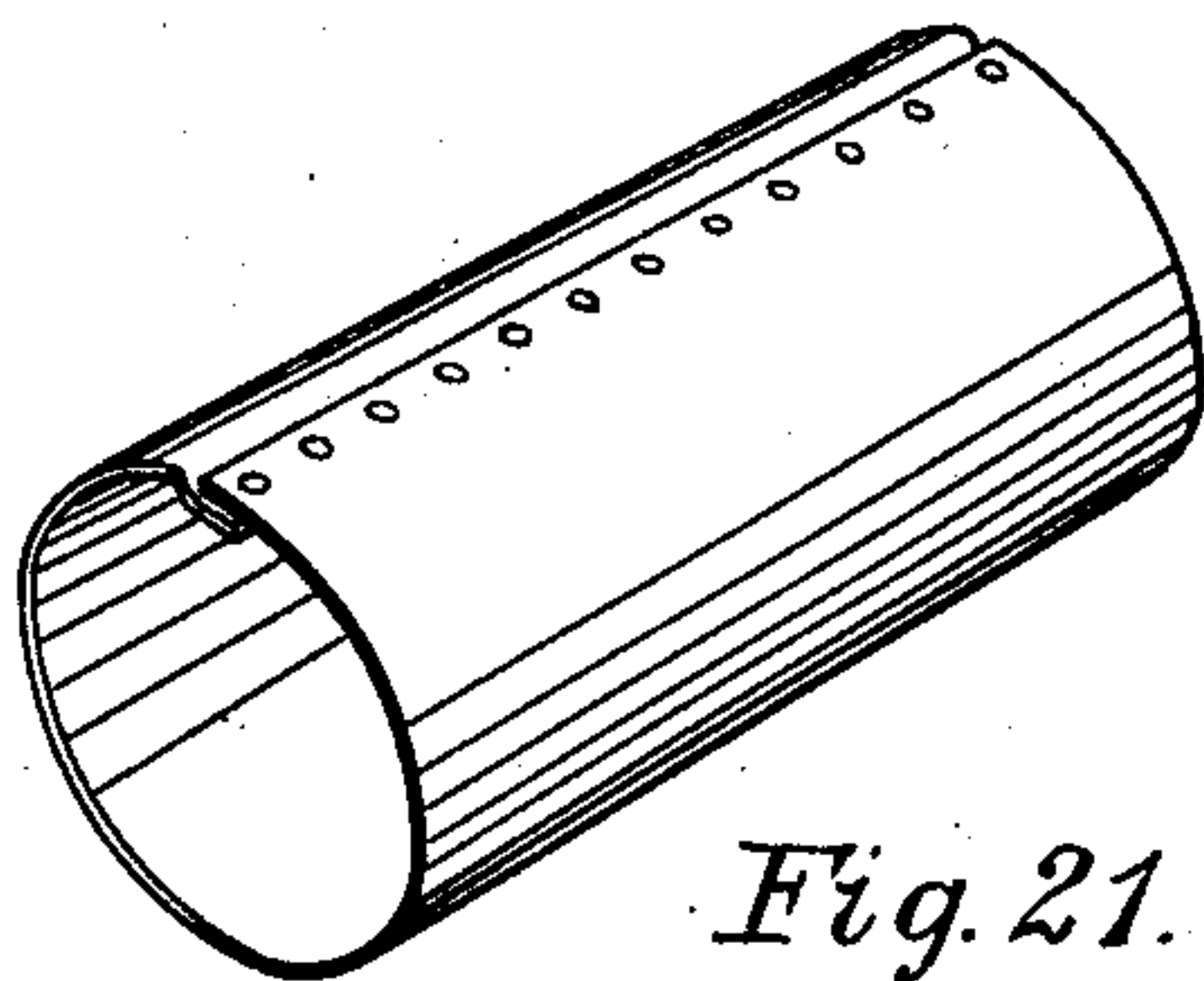
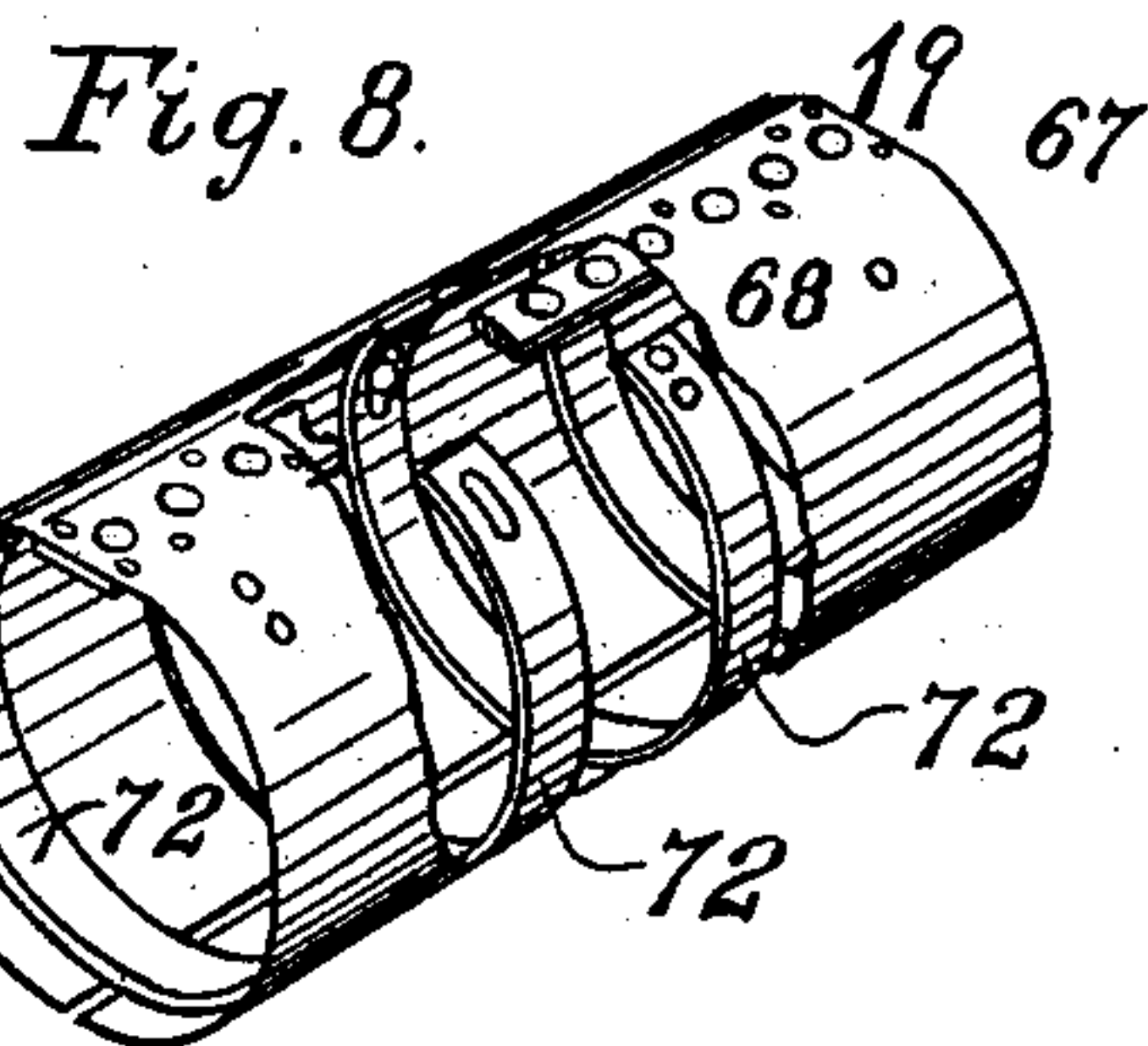
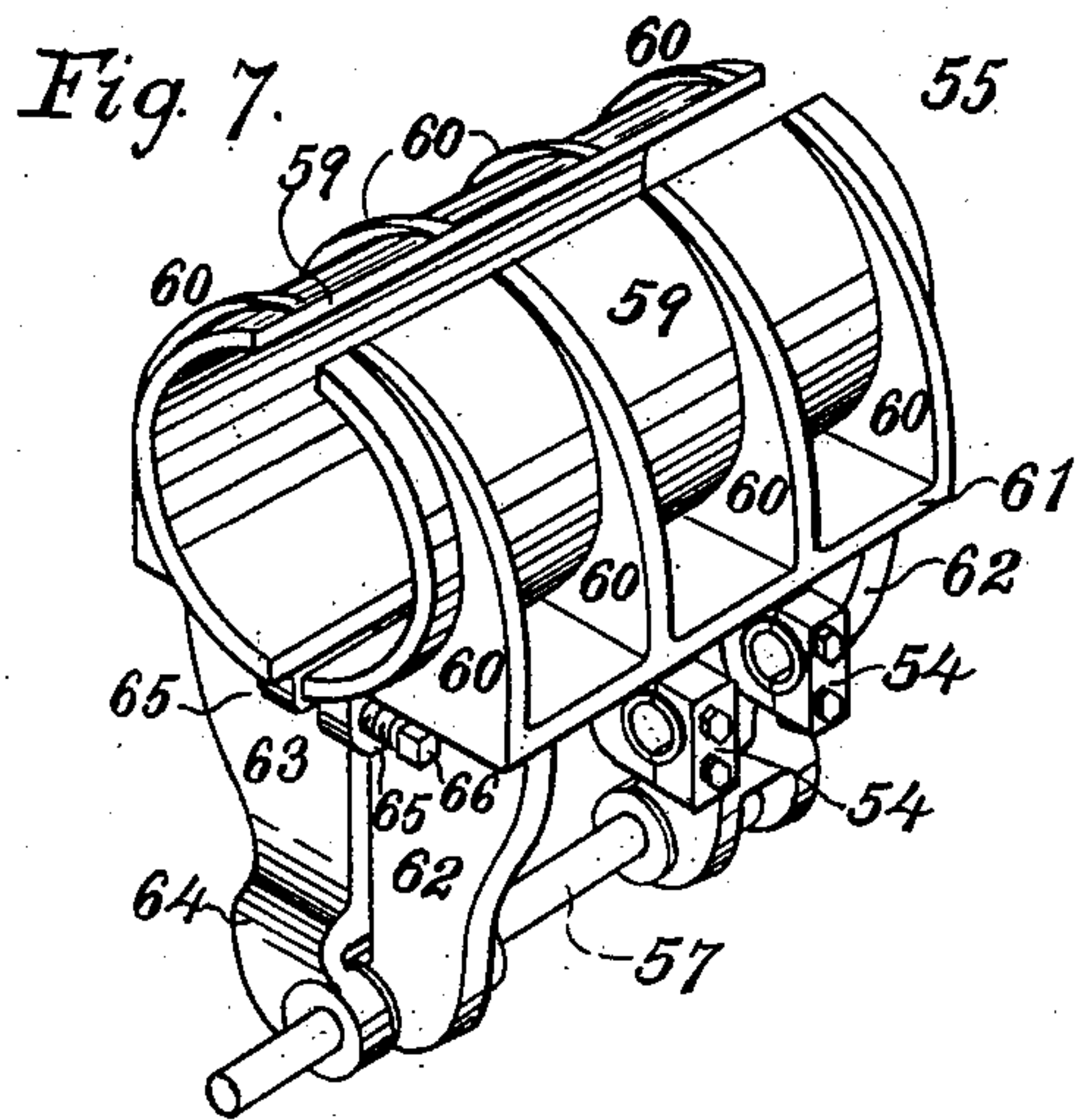
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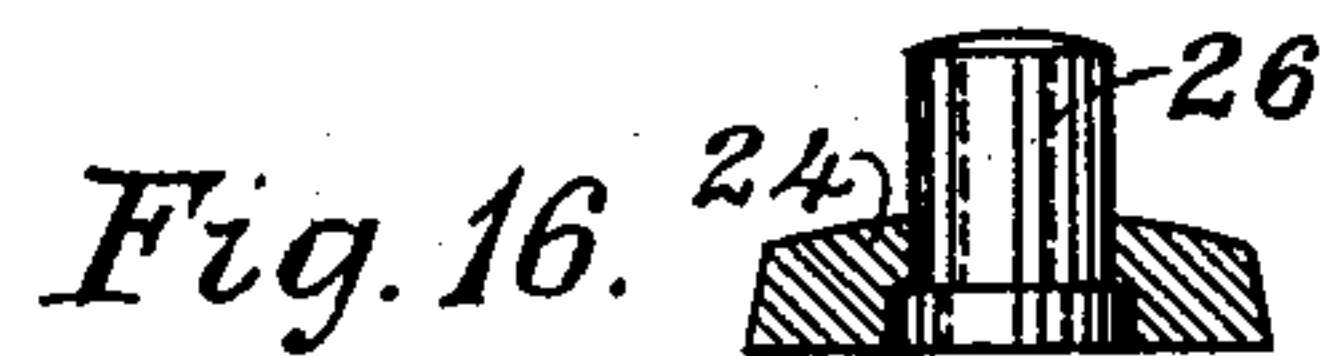
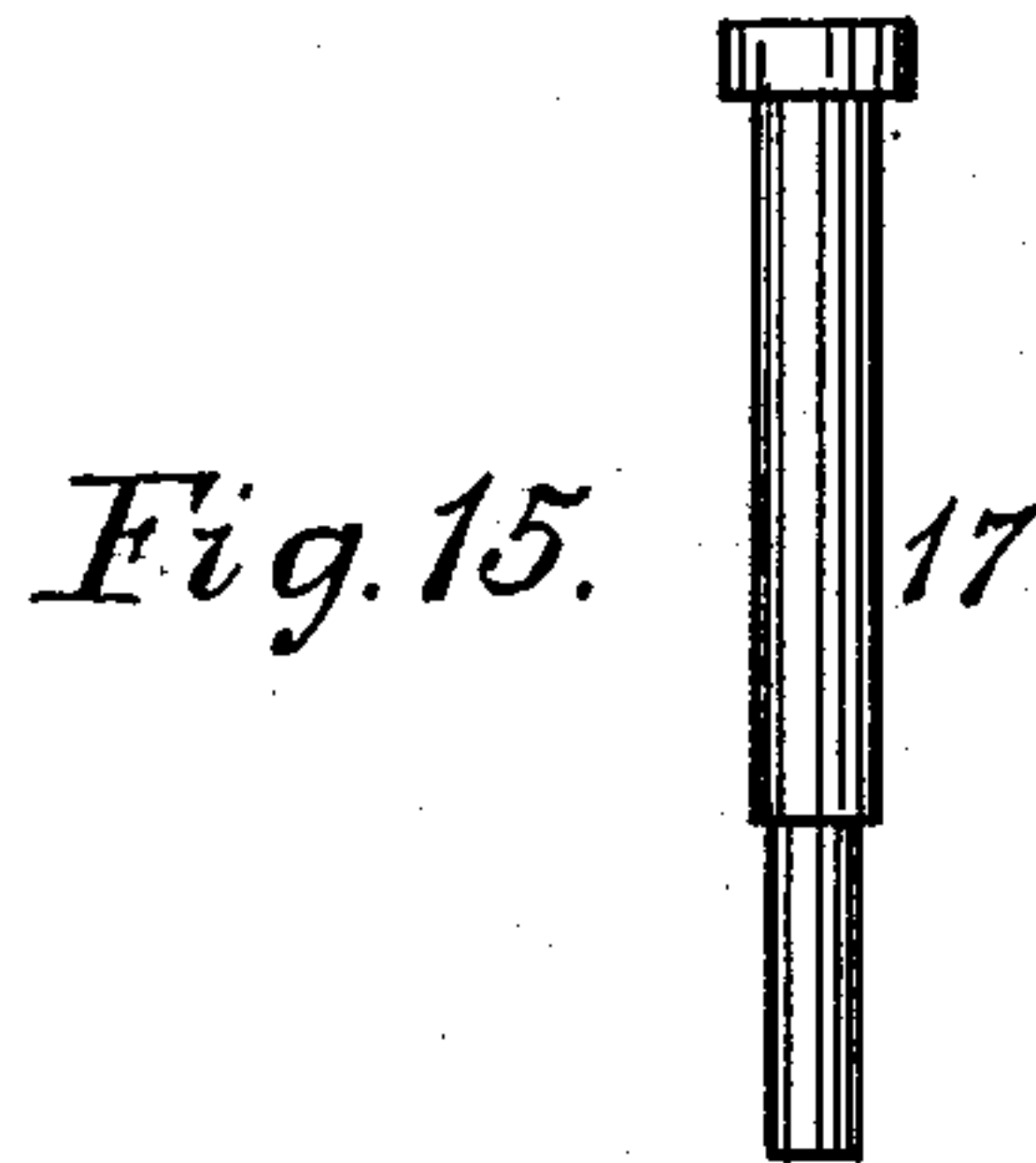
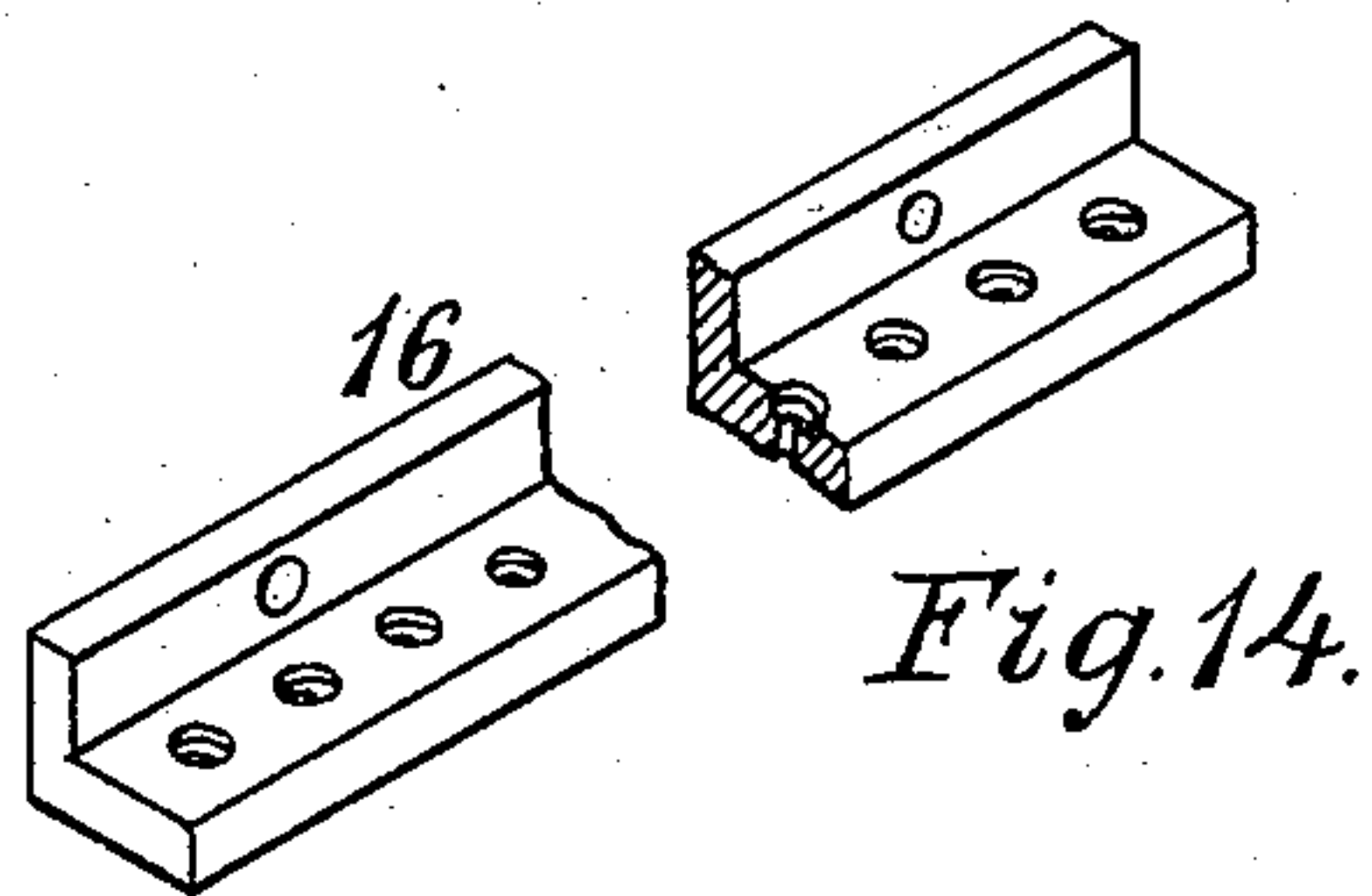
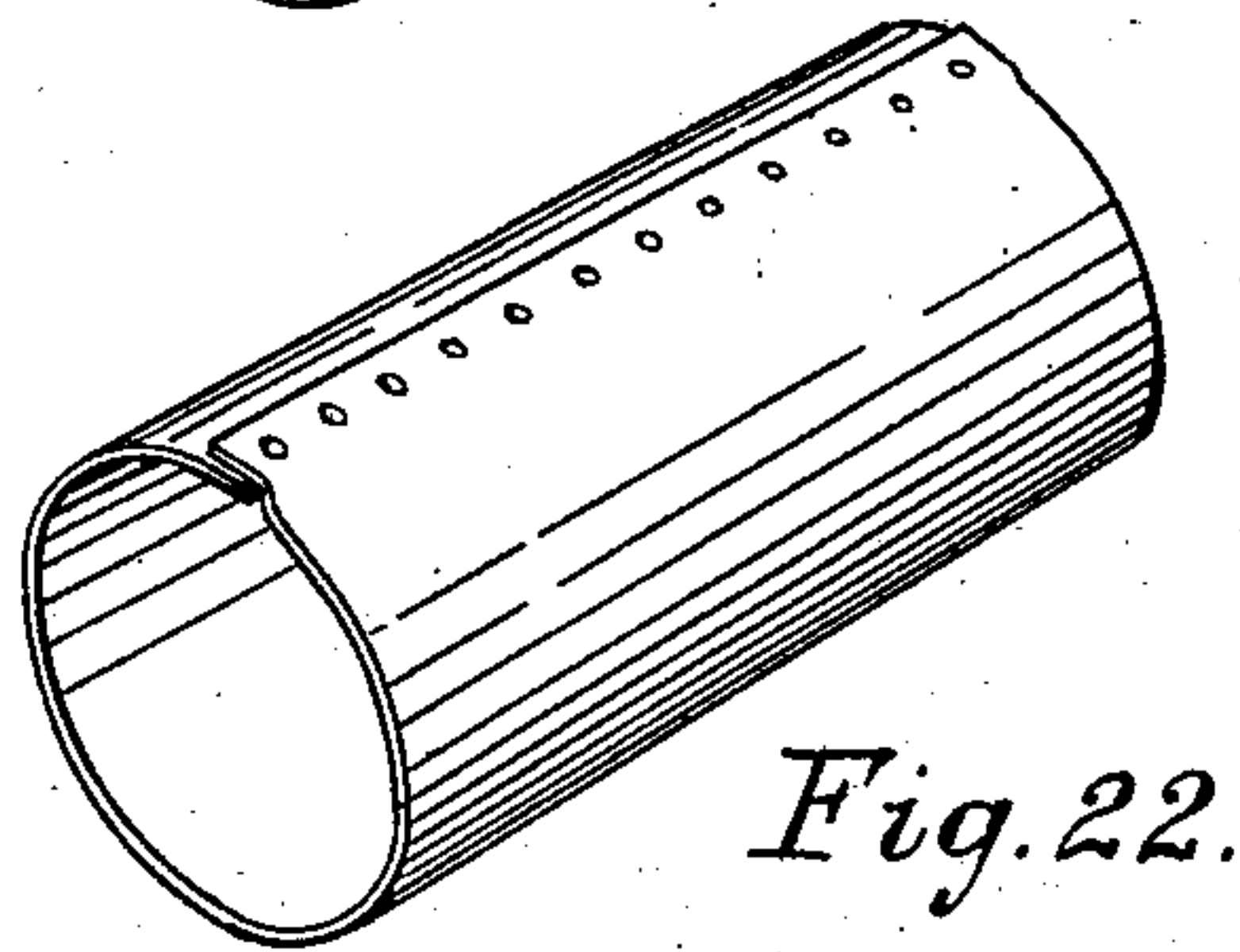
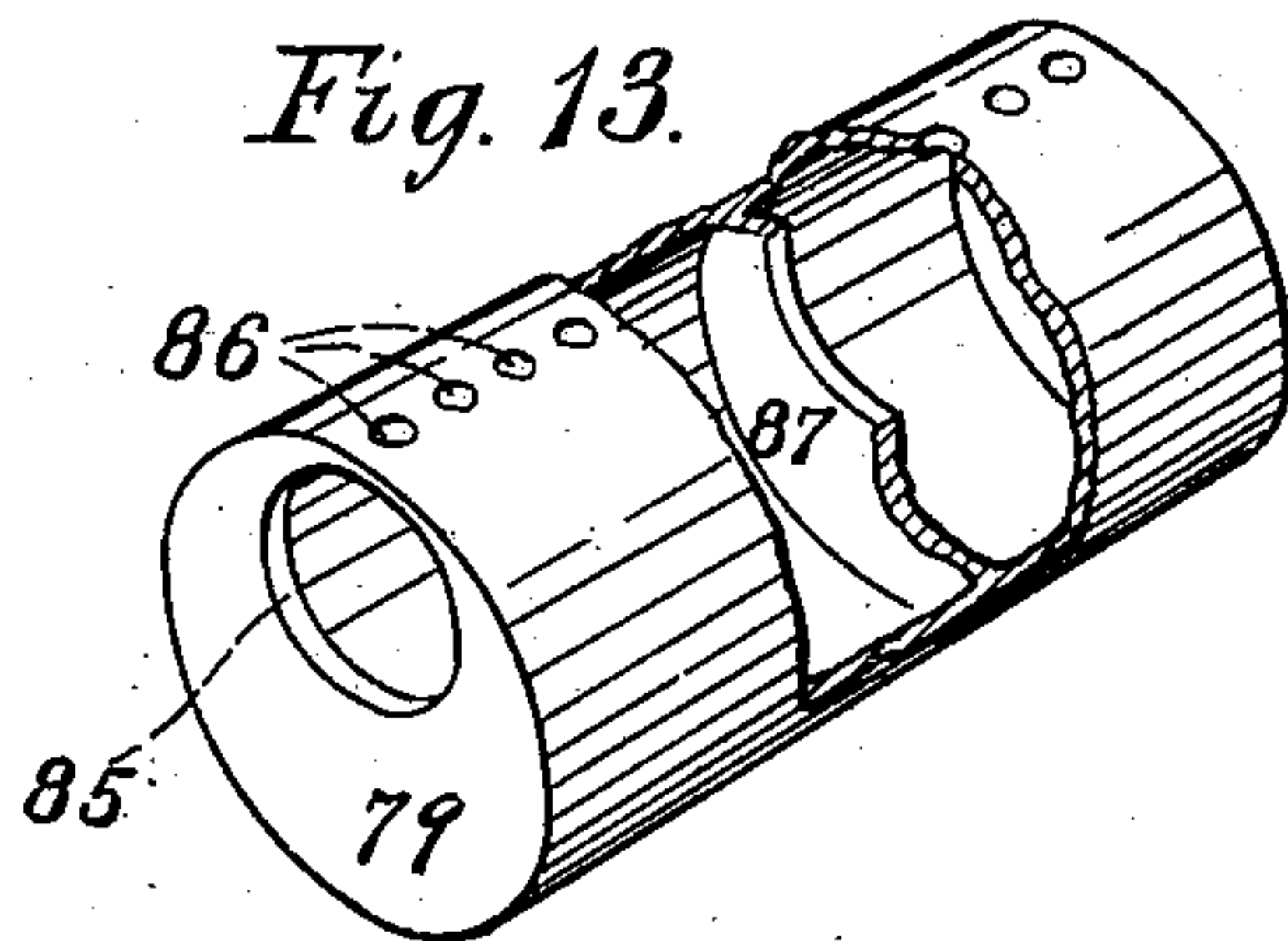
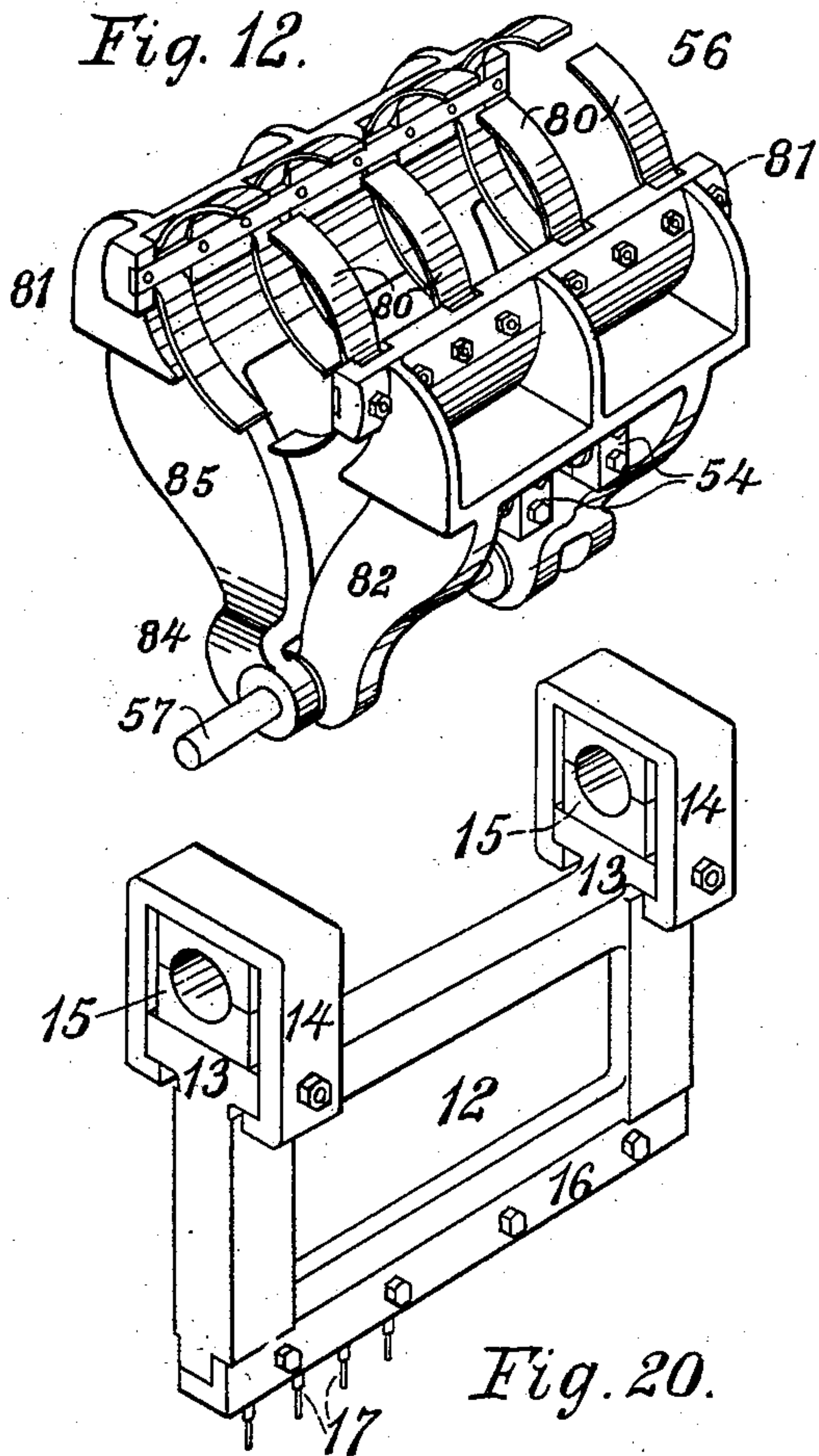
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UNITED STATES PATENT OFFICE.

JAMES L. BOYLE AND HENRY E. BRETT, OF LOS ANGELES, CALIFORNIA;
SAID BRETT ASSIGNOR TO SAID BOYLE.

MACHINE FOR PERFORATING CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 747,582, dated December 22, 1903.

Application filed September 13, 1902. Serial No. 123,321. (No model.)

To all whom it may concern:

Be it known that we, JAMES L. BOYLE and HENRY E. BRETT, citizens of the United States, both residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Machine for Perforating Cylinders, of which the following is a specification.

This invention relates to machines for perforating cylinders, and particularly to a machine for punching well-casing, and some of the objects of the invention are to provide a machine of this general character which will be comparatively simple and cheap in construction and at the same time positive and effective in operation.

Another object of the invention is to produce a machine by the use of which great accuracy as to the size or diameter of the product is attained, together with rapidity of operation, and whereby a better product or article is rendered possible.

It is also an object of this invention to produce a machine whereby both edges of the material or sheet can be punched simultaneously.

With these and other objects in view the invention consists, essentially, in the construction, combination, and arrangement of parts, substantially as more fully described in the following specification, and illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is side elevational view of a machine embodying the main part of this invention. Fig. 2 is an end elevational view of the same, showing the machine employed in the construction of an internal section or joint of pipe or casing, the mold being shown in closed position. Fig. 3 is a vertical transverse sectional view of the machine, taken on line 3 3 of Fig. 1, illustrating the mold in the open position. Fig. 4 is a partial sectional view showing the clamp in closed position for forming the external section or joint of the pipe or casing. Fig. 5 is a similar view showing the clamp open. Fig. 6 is a perspective view, partly broken away, of the stake employed, illustrating the die-plate in position therein. Fig.

7 is a perspective view of the mold for forming the internal section or joint of pipe or casing. Fig. 8 is a perspective view, partly broken away, of the pressure-plate employed. Fig. 9 is a cross-sectional view of the same on an enlarged scale. Fig. 10 is a detail view of the bearings employed. Fig. 11 is a similar view of the nut employed. Fig. 12 is a perspective view of the clamp used in forming the external section or joint of pipe or casing. Fig. 13 is a perspective view, partly broken away, of a mandrel employed in constructing or forming the external section. Fig. 14 is a perspective view, partly broken away, of the punch-holder. Fig. 15 is a detail view of a punch. Fig. 16 is a similar view of the die, part of the die-holder being shown in section. Fig. 17 is a detail view of the eccentric shaft, illustrating the hub of the gear-wheel and the clutch in section. Fig. 18 is a detail view, partly broken away, of the hub of the gear-wheel. Fig. 19 is a detail view of the clutch-lever. Fig. 20 is a perspective view of the cross-head and adjacent parts. Fig. 21 is a perspective view of an internal section or joint of pipe or casing after the same has been punched, and Fig. 22 is a perspective view of an external section or joint of pipe or casing after having been punched.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, and particularly to Figs. 1 to 3 thereof, the reference character 1 designates a bed-plate of any suitable construction whereon are mounted housings 2 and 3, in the free end whereof is mounted an eccentric shaft 4, Fig. 17, carrying a gear-wheel 5, which meshes with a pinion 6 on a shaft 7, journaled in the housing 2 and in an arm or bracket 8, said shaft carrying a fly-wheel 9 and band or pulley wheels 10, adapted to be driven by any suitable agency.

Formed on or connected with the upper portion of the housings 2 and 3 are guide-plates 11, between which is mounted a cross-head 12, Fig. 20, having T-shaped ends 13 to receive straps 14, encircling sliding bearings

15, working on the eccentric shaft 4, to impart a reciprocating motion to the cross-head, and removably secured to one edge of the cross-head is a punch holder or plate 16, carrying punches 17, Figs. 15 and 20 of the drawings.

Movably mounted in the housings 2 and 3 is a stake 18, Figs. 1, 2, 3, 4, 5, and 6, cut away at one end, as at 19, to receive a support or block 20, Fig. 2, which is hinged to the housing 3, as at 21, Fig. 1, so as to fold outwardly, as shown in dotted lines in said figure, and said support is preferably provided with an arm 22, by means of which it is operated and to prevent the operation of the clutch when the support is down, as will be hereinafter more fully explained. The stake is preferably provided with a dovetail channel or way 23, Figs. 2, 3, 4, 5, and 6, to receive the die plate or holder 24, which may be secured therein by a screw or bolt 25 and which is provided with dies 26, Figs. 6 and 16, and the stake is desirably constructed with transverse bores or openings 27 to permit the discharge of the punched-out metal, as will be readily understood.

In order to insure the proper alinement of the punches 17, a perforated guide-plate 28 is preferably mounted below the cross-head by means of brackets 29, secured to the guide-plates 11, Figs. 1, 2, and 3 of the drawings, and for the purpose of securing the proper adjustment of the article to be punched depending stops 30 may be provided.

The hub 32, Figs. 17 and 18, of the gear-wheel 5 is preferably provided with recesses or sockets 33 to receive a key 34, slidably mounted in a hub or sleeve 35, keyed upon the eccentric shaft 4, and said key is forced into the socket 33 of the hub 32 by means of a spring or other device 37, secured upon the housing 2, as shown in Fig. 1 of the drawings, and a collar 36 may be mounted outside of the sleeve 35 to retain the key in position and to facilitate the action of the clutch-lever 38, Figs. 1, 2, 3, and 19, fulcrumed in a bracket 39 upon the housing 2 and preferably constructed with a beveled or inclined face 40, Fig. 19, adapted to enter between the head of the key 34 and the collar 36 to force the former out of engagement with the hub or the gear-wheel 5, thereby stopping the action of the machine, which is only in operation when the key 34 is in engagement with the hub of the gear-wheel 5, which latter travels constantly. The free end of the lever 38 is movably connected with a link or bar 41, which is in turn connected with one end of a treadle or foot-lever 42, fulcrumed at 43 to the bed-plate of the machine and preferably having the free end thereof deflected laterally, as at 44, Fig. 2, to be engaged by the arm 22 of the support 20 in order that the treadle cannot be depressed and the machine started while the support 20 is out of engagement with the stake 18, thereby preventing injury to the machine.

Suitably secured upon the bed-plate is a plate or frame 45, Figs. 3, 4, and 5 of the drawings, having a socket or bearing 46 to receive a post 47, having an apertured end 48, constructed to receive the intermediate smooth portion of a right and left threaded screw 49 and to be retained in position thereon by collars 50, carrying set-screws, while each end of the screw 49 is preferably provided with a hand-wheel 51 to rotate the screw, or any other suitable means may be employed for that purpose. Mounted upon the screw 49, on each side of said posts 47, are nuts 52, Fig. 11, having trunnions 53, constructed to work in the two-part bearings 54 upon the mold 55 and the clamps 56, respectively, substantially as illustrated in Figs. 2 to 5 of the drawings. By means of this construction either the mold or the clamp can be easily and rapidly operated and either can be removed and the other substituted in its place with great rapidity, and various sizes of molds and clamps can be used, with the corresponding changes in the size of the pressure-plate and mandrel, respectively, while utilizing the main portion of the machine.

A pintle or fulcrum-shaft 57 may be removably mounted in the bed-plate in any suitable manner, and the respective jaws of the mold and clamp will be constructed with an opening through which said shaft 57 can be passed, and one of the jaws may be bifurcated to straddle the other jaw, substantially as illustrated at 58 in Fig. 1 of the drawings.

Referring now particularly to Figs. 2, 3, 7, 8, 9, and 21 of the drawings, the parts employed in the construction of the inner or internal section or joint of casing will be specifically described, which parts consist in a mold 55, embracing two substantially semi-cylindrical portions 59, supported and reinforced by ribs 60, extending from a head or plate 61, provided with extensions or arms 62 and 63, respectively, the former having an opening for the passage of the fulcrum-shaft 57, Fig. 7 of the drawings, and the latter being bifurcated at 64 and straddling or spanning the arms 62, and formed on or connected with the head 61 are the two-part bearings 54 for the trunnions of the traveling nuts 52, as before described. In order to provide for accurate adjustment of the separate parts of the mold 55, the same may be provided with threaded lugs or ears 65 to receive stop-screws 66, which regulate the position of the parts of the mold when the latter is closed and which can be set to any desired length, as will be readily understood. In order to force the section or joint of casing tightly against the mold 55 throughout all parts thereof, there is employed a pressure-plate 67, Figs. 2, 3, 8, and 9 of the drawings, preferably embodying a split cylinder 68, desirably flattened longitudinally, as at 69, Figs. 8 and 9, and provided with openings 70 to receive the dies 26, which pass therethrough and through a

subjoined strip or plate 71, secured upon the interior of the cylinder, and a plurality of curved springs 72 are riveted at one end upon the interior of the cylinder 68 and are slotted
 5 at the other end at 73 to move upon the guide-pins 74 in the cylinder in order to allow for the expansion and contraction of the latter, and the springs are preferably rigidly connected alternately, substantially as shown in
 10 Fig. 8 of the drawings.

Having described the parts employed in the construction of an internal section or joint of casing, the operation of the machine during such construction will now be described
 15 and is substantially as follows, to wit: After the blank has been cut, rolled, and provided with the necessary longitudinal offset the same is introduced within the machine and encircling and placed on the pressure-plate
 20 67, which has been previously secured in position, so that the openings 70 therein register with the dies 26 upon the stake inclosed thereby, whereupon the mold is closed upon the section. By means of the screw 49, operated by the hand-wheels 51, during which
 25 process the pressure-plate 67 forces the section or joint to be formed outwardly against the mold 55 throughout all parts of the section or joint, thereby insuring the accuracy
 30 of the size of the section throughout all parts thereof as well as insuring the proper alignment between the holes in the two edges of the joint or section. After the mold shall have been completely closed the treadle 43
 35 is depressed, thereby disengaging the clutch-lever 38 from the spring-actuated key 34, allowing the latter to be forced into the next approaching recess 33 in the hub of the gear-wheel 5, thereby imparting motion to the
 40 eccentric shaft 4, which reciprocates the cross-head 12, carrying the punches 17, which latter descending upon the edges of the section or joint perforate the same throughout in one operation, and the treadle having
 45 been released by the operator the clutch-lever 38 descends and disengages the key 34 upon the completion of one revolution of the eccentric shaft, thereby stopping the machine. The mold is then opened, as in Fig.
 50 3 of the drawings, by the reverse operation of the hand-wheels and screw. The section is removed from the machine and is then ready to be finally riveted without any necessity for taking up and fitting the joint or section
 55 thus prepared, as is now required in the manufacture of joints or sections of well-casing, as before stated. Thus the great advantage attained from the use of this invention will be appreciated by those skilled in the
 60 art to which the same appertains.

When it is desired to form an external joint or section of casing, the mold 55 is removed by withdrawing the fulcrum-shaft 57 from the bearings 75, Fig. 10, which are bolted
 65 upon the bed-plate in slots 76, Fig. 2, in order

to permit the adjustment of the fulcrum-shaft 57 within the slot 77 in the bed-plate, such adjustment being effected by means of adjusting-screws 78, Figs. 1 and 10 of the drawings. After the clamp 56 shall have
 70 been substituted for the mold 55 and the mandrel 79 shall have been secured in position upon the stake, as before described, the external section or joint of casing, having been previously prepared, is secured in position upon the mandrel, and the operation
 75 just described is repeated. By means of the spring-arms 80 of the clamp the casing is pressed closely upon the mandrel throughout the entire surface thereof and the holes are
 80 punched in the casing with great exactness. The clamp preferably embodies spring-arms 80, carried by a frame 81, having arms or extensions 82 and 85, respectively, the former
 85 having an opening in the end thereof to receive the fulcrumed shaft 57, and the latter being bifurcated and perforated, as at 84, Fig. 12, to receive said shaft and the bridge
 90 the arm 82, and the frame 81 also carries the two-part bearings 54, for the trunnions 53 of the traveling nuts 52 on the screw 49, substantially as before described.

The mandrel 79 is preferably provided with an eccentric bore or opening 85 in the ends thereof and with a plurality of openings 86
 95 to permit the passage of the dies when the mandrel is in position upon the stake 18, and the mandrel may be provided with internal reinforcing disks or ribs 87, if found desirable in practice.

The operation of this invention will be readily understood by those skilled in the art to which it appertains by recourse to the foregoing description, when taken in connection
 105 with the accompanying drawings, and further explanation thereof will not be required.

It is not desired to confine this invention to the specific construction, combination, and arrangement of parts herein shown and described, and the right is reserved to make all
 110 such changes in and modifications of the same as come within the spirit and scope of the invention.

We claim—

1. A machine for perforating cylinders provided with a support, devices for retaining the edges of the cylinder in position, punching means for perforating both edges of the cylinder simultaneously throughout the entire length thereof and mechanism for actuating the parts.

2. A machine for perforating cylinders provided with a support, devices for retaining the edges of the cylinder in position, punching means for perforating both edges of the cylinder throughout the entire length of such edges and mechanism for actuating the parts.

3. A machine for perforating cylinders provided with a support, a movable post for supporting one end thereof, devices for retain-

ing the edges of the cylinder in position, punching means for perforating both edges of the cylinder simultaneously and mechanism for actuating the parts.

- 5 4. A machine for perforating cylinders provided with a device for shaping the cylinder, means for forcing the cylinder into contact therewith throughout the entire surface thereof to produce exactness of size, and mechanism for punching the edges of the cylinder
10 while in such position.
5. A machine for perforating cylinders provided with a device for shaping the cylinders, means for forcing the cylinder into contact
15 therewith throughout the entire surface thereof to produce exactness of size, and mechanism for punching both edges of the cylinder simultaneously while retained in such position.
- 20 6. A machine for perforating cylinders provided with a support for the cylinder, means therearound to expand the cylinder, a mold to form the cylinder to an exact size, devices to perforate the cylinders and mechanism for
25 actuating the parts.
7. A machine for perforating cylinders provided with a support for the dies, a mold around the support and a pressure device constructed to bear the cylinder into contact with
30 the mold throughout the entire surface of the cylinder and punches operating with said dies to perforate the edges of the cylinder.
8. A machine for perforating cylinders provided with a die-support, a mandrel around
35 the same, clamps constructed to bear upon the entire surface of the cylinder to force the same in contact with the mandrel and mechanism for operating the punches.
9. A machine for perforating cylinders provided with a support rigidly fixed at one end, devices for retaining the edges of the cylinder in position around said support, means
40 for perforating both edges of the cylinder and mechanism for actuating the parts.
- 45 10. A machine for perforating cylinders provided with a support fixed at one end, a device to uphold the free end of said support, devices for retaining the edges of the cylinder in position around said support, punching
50 ing means for perforating both edges of cylinder simultaneously and mechanism for actuating the parts.
11. A machine for perforating cylinders provided with a support fixed at one end and
55 having a notch or recessed free end, a post movably mounted beneath the free end of said support and constructed to enter said recess in the end thereof, devices for retaining the edges of the cylinder in position
60 around said support, means for perforating both edges of the cylinder around said support and mechanism for actuating the parts.
12. A machine for perforating cylinders provided with means for determining the size
65 thereof, devices for exerting pressure upon

the cylinder throughout the entire surface thereof to make the same conform with said means and mechanism for operating said devices and for perforating cylinders.

13. A machine for perforating cylinders
70 provided with a device for determining the size thereof, means for pressing the entire surface of the cylinder against said device and a screw to operate said means.
14. A machine for perforating cylinders
75 provided with a device for determining the size of the cylinder, means for pressing the entire surface of the cylinder against said device, adjusting devices for said means and a screw to operate said means.
- 80 15. A machine for perforating cylinders provided with a device for determining the size of the cylinder, jaws operating therewith and a screw to actuate said jaws.
16. A machine for perforating cylinders
85 provided with a device for determining the size of the cylinder, interhinged adjustable jaws operating therewith and a screw to actuate the jaws.
17. A machine for perforating cylinders
90 provided with clamping-jaws carrying traveling nuts and a right and left threaded screw engaging said nuts to open and close the jaws.
18. A machine for perforating cylinders
95 provided with a threaded screw working in a moving bearing, interhinged adjustable clamping-jaws carrying nuts engaging said screw and means for operating the screw.
19. A machine for perforating cylinders
100 provided with an eccentric shaft, punching means operated thereby, a die-support with which said means operate, clamping-jaws to hold the cylinder upon said support and mechanism for operating said shaft.
- 105 20. A machine for perforating cylinders provided with housings, a shaft mounted therein, mechanism for operating the shaft, a device for throwing the mechanism out of engagement with the shaft, a die-support,
110 punching means carried by the shaft, means for determining the size of the cylinder, clamping-jaws operated therewith and a screw to actuate said jaws.
- 115 21. A machine for perforating cylinders provided with housings, an eccentric shaft therein guides in the housings, punching means upon shaft within said guides, a die-support fixed at one end, a movable element to uphold the other end and mechanism for
120 operating said shaft.
22. A machine for perforating cylinders provided with housings, an eccentric shaft therein, guides in the housings, punching means upon said shaft within said guides, a
125 die-support fixed at one end, below said means, a punching-guide plate and mechanism for operating said shaft.
23. A machine for perforating cylinders provided with housings, an eccentric shaft
130

therein, guides in said hot rings, a cross-head
within said guides operated by said shaft, a
die-support below said cross-head and fixed
only at one end thereof, mechanism for oper-
5 ating said shaft and a device for throwing
said mechanism into and out of engagement
with said shaft.

In testimony whereof we have signed our

names to this specification in the presence of
two subscribing witnesses.

JAMES L. BOYLE.
HENRY E. BRETT.

Witnesses:

J. W. KEMP,
L. B. ALDERETE.