

No. 654,434.

Patented July 24, 1900.

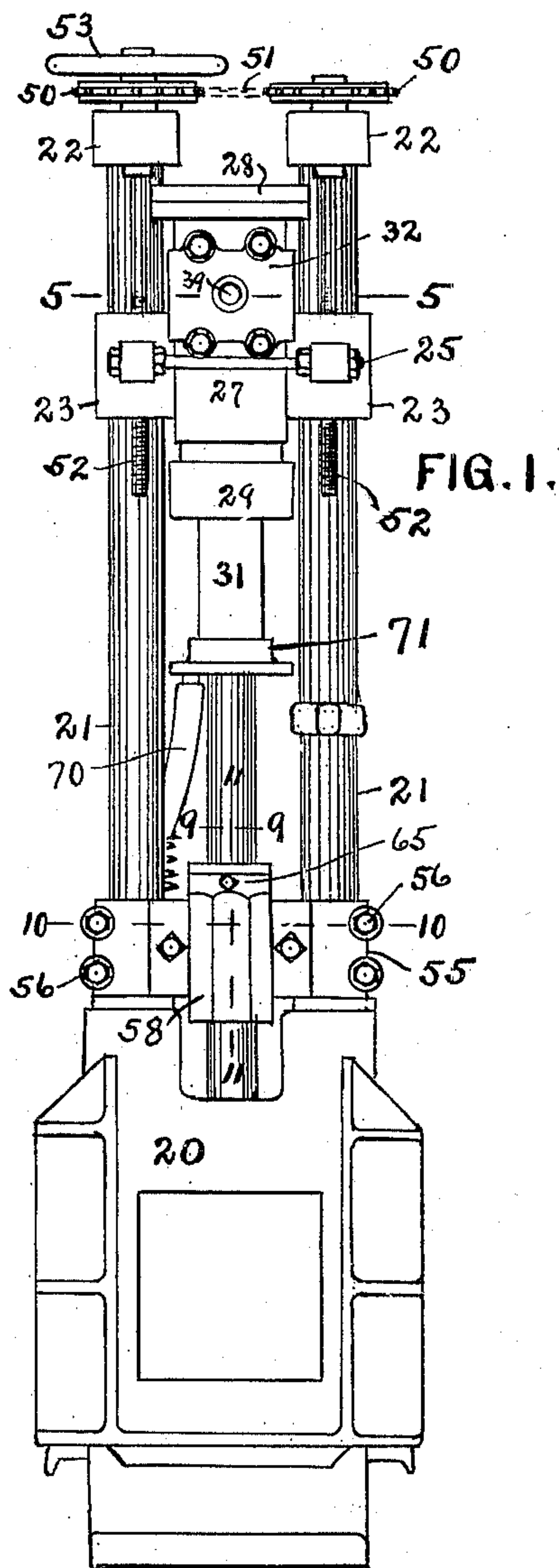
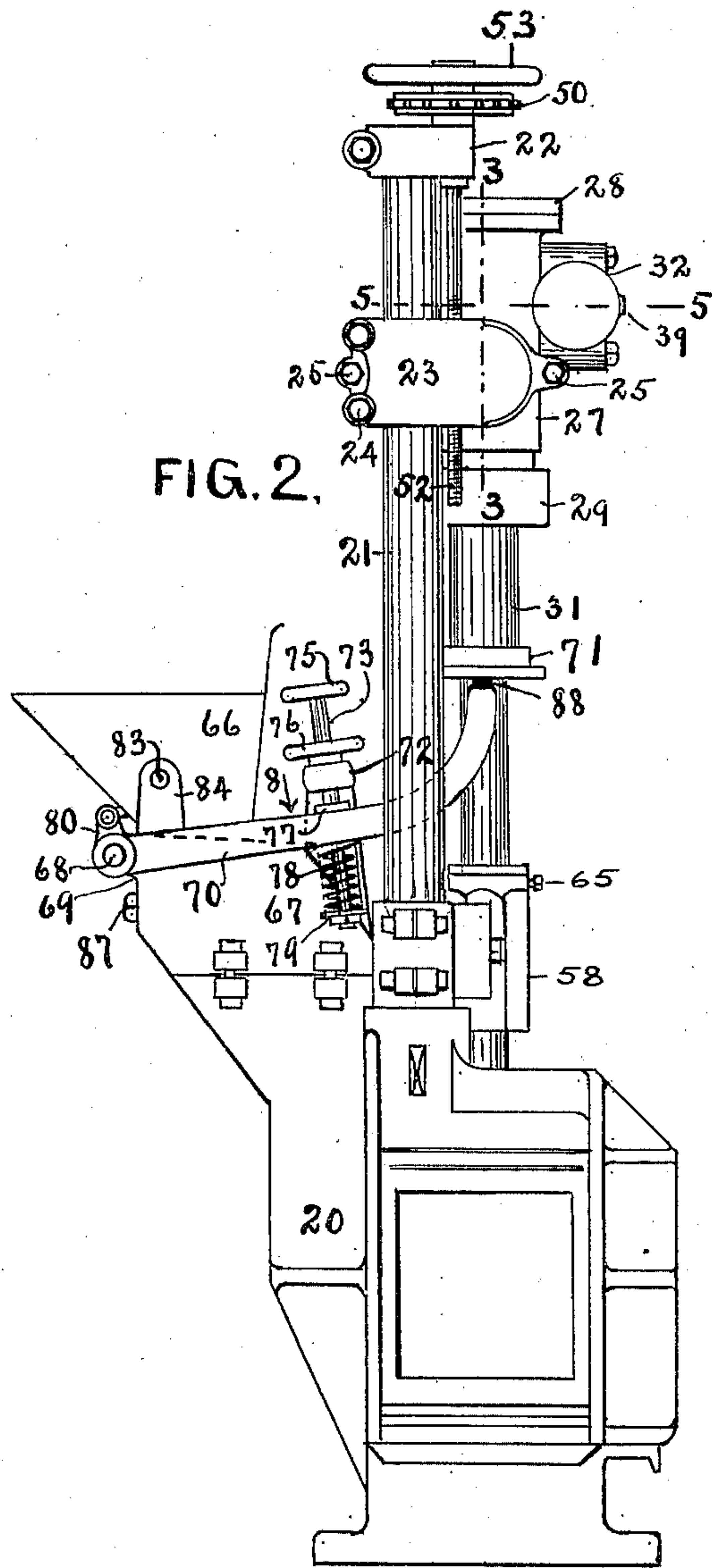
J. J. BREWIS.

STEAM ENGINE FOR ORE STAMPS.

(Application filed June 22, 1898.)

(No Model.)

3 Sheets—Sheet 1,



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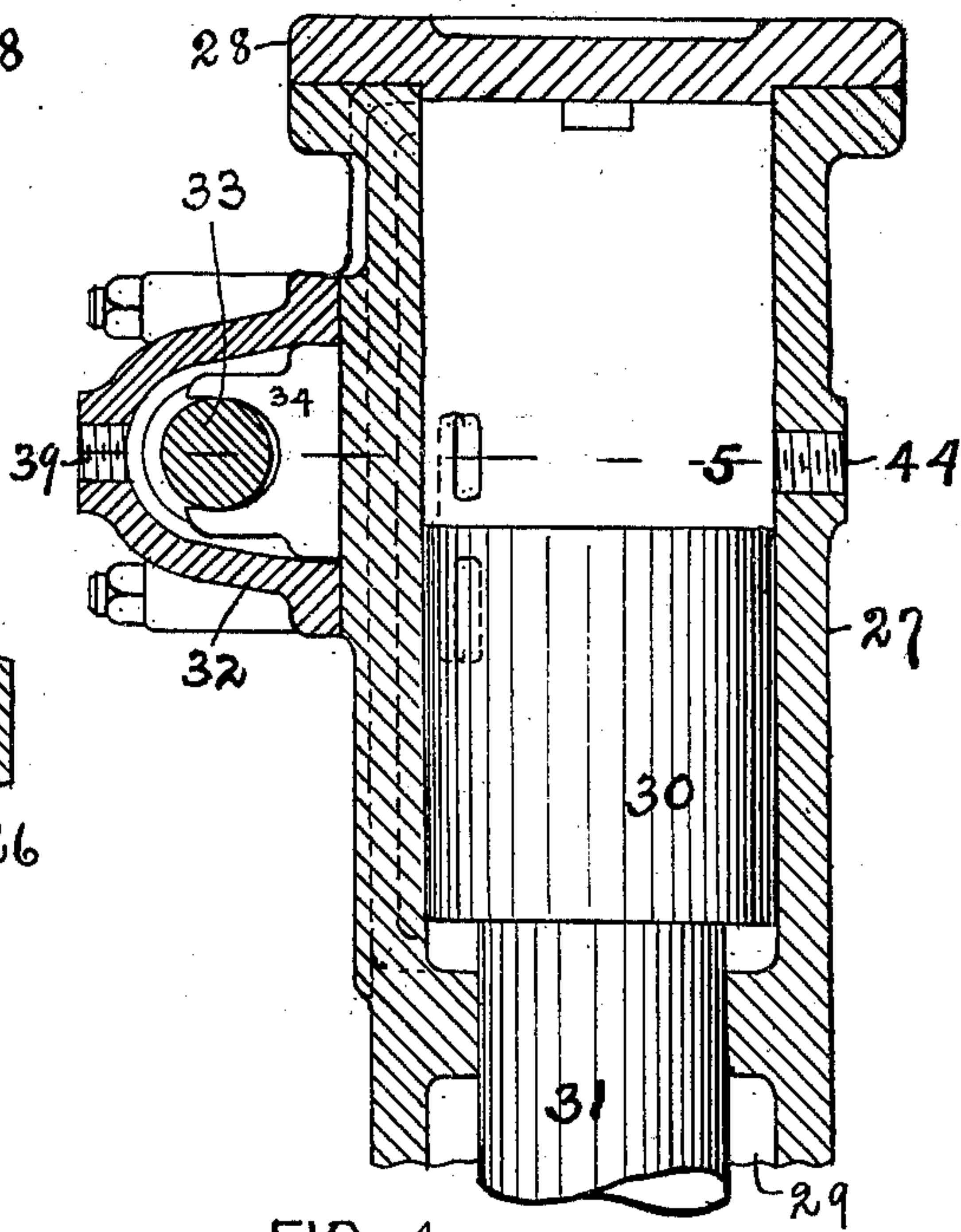
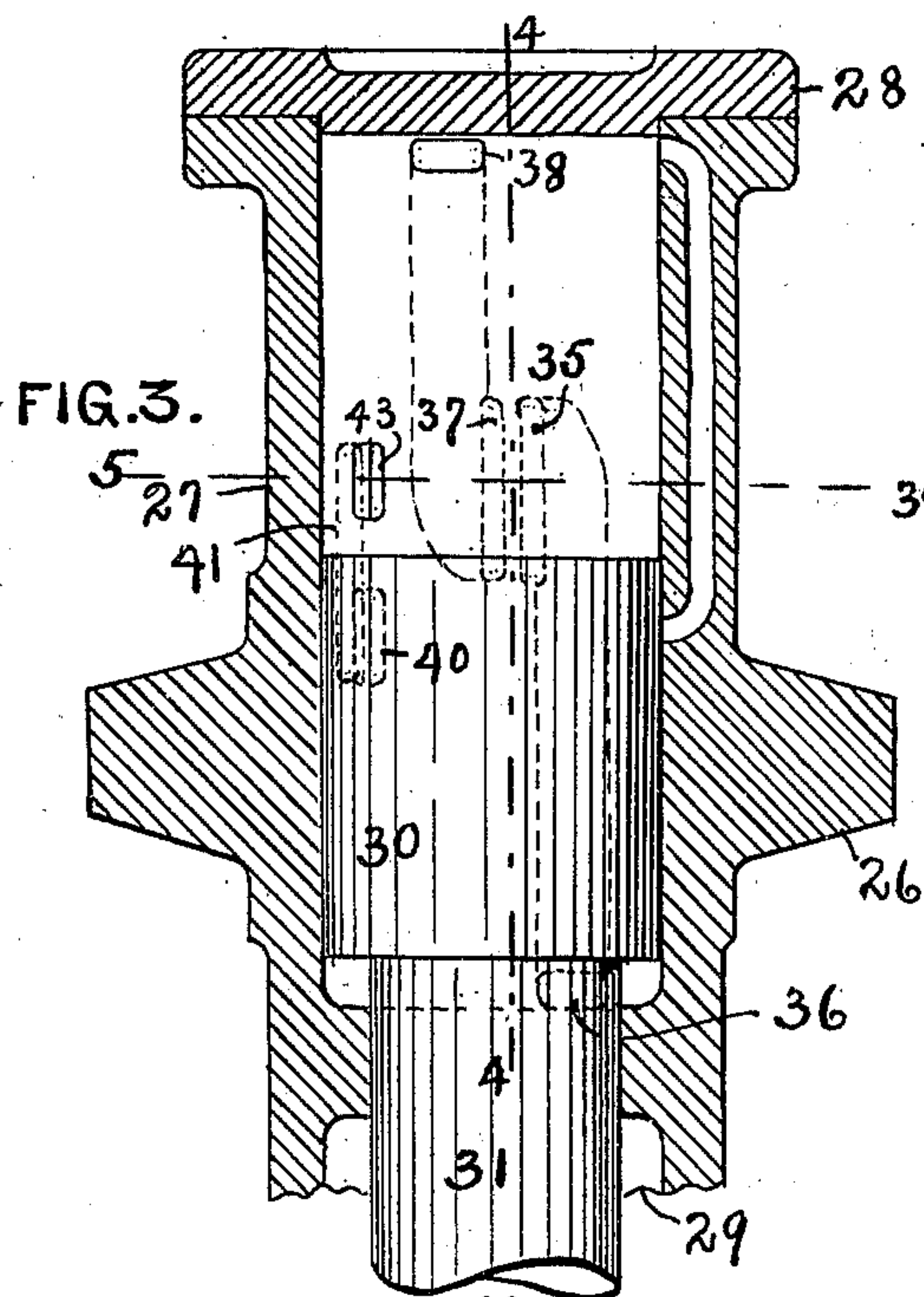


FIG. 4.

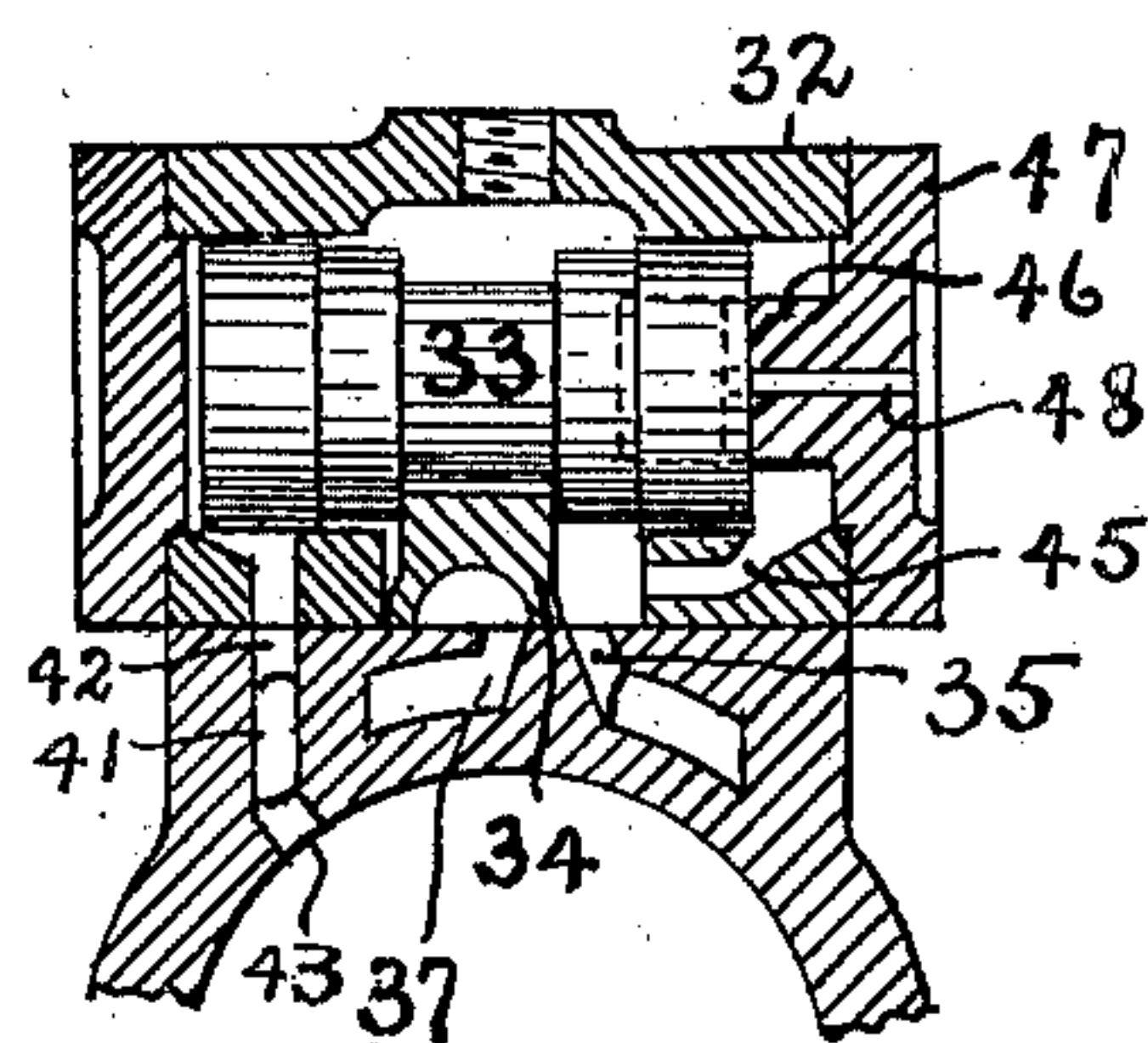
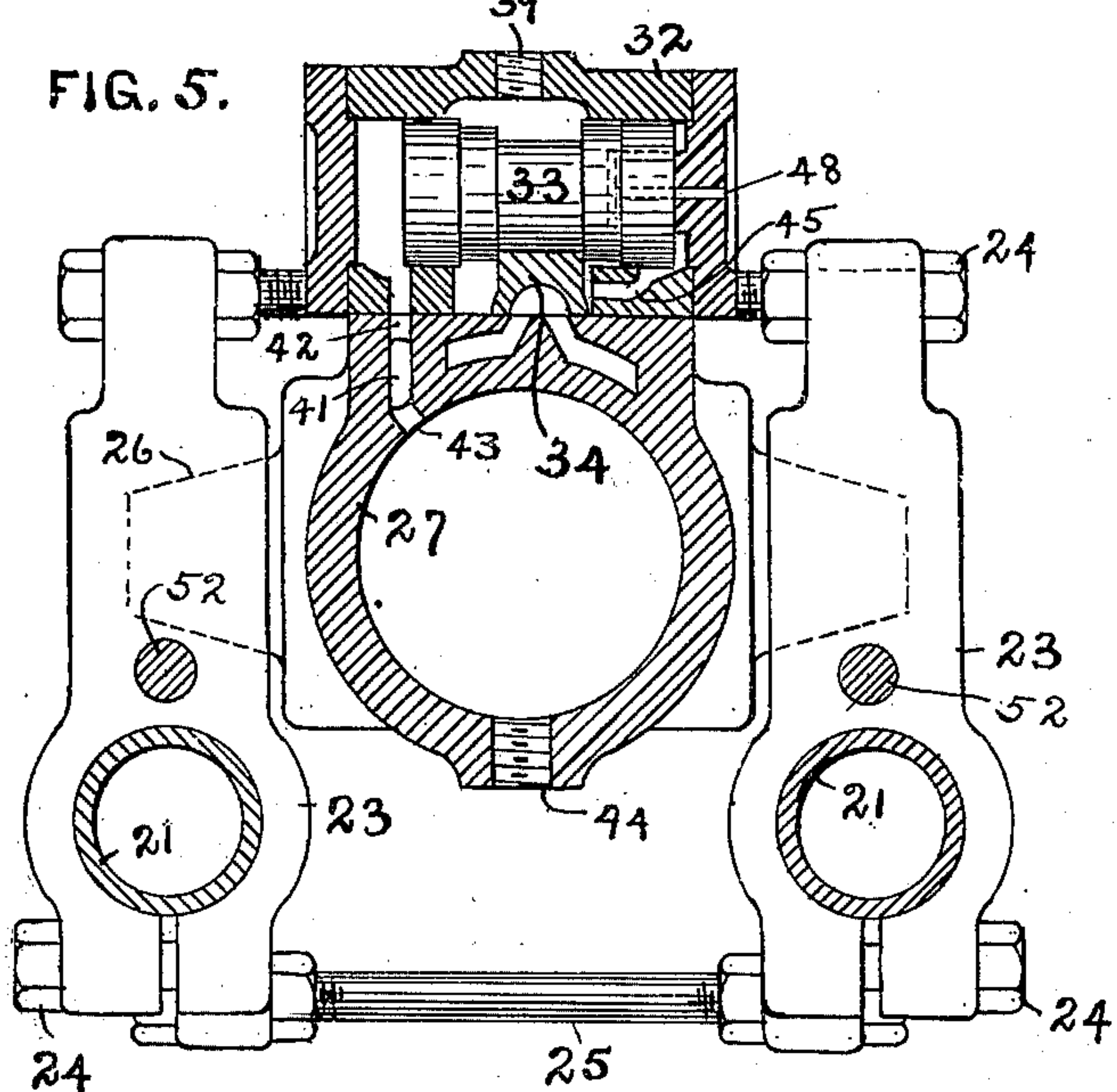


FIG. 6.

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3 Sheets—Sheet 3.

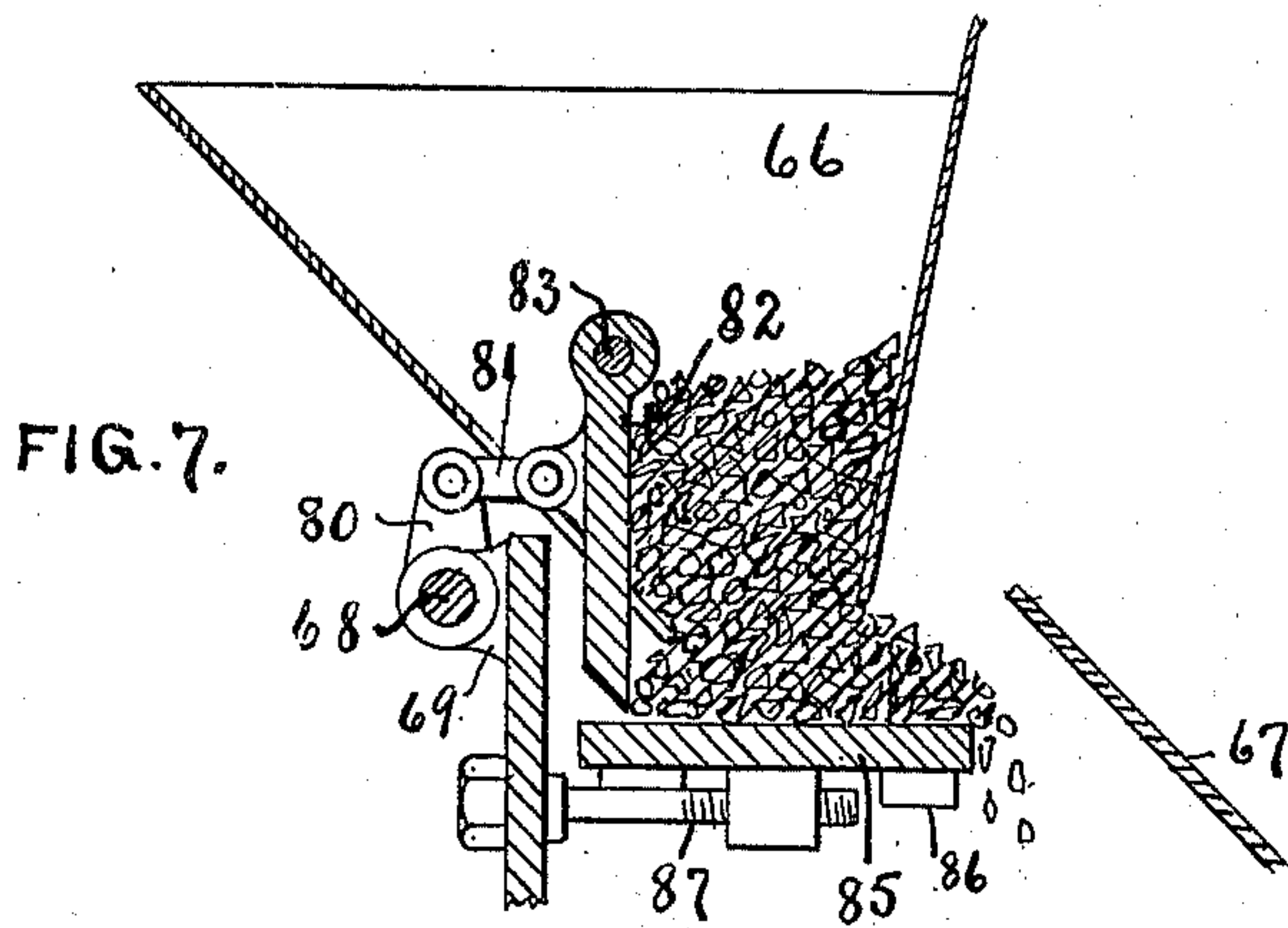


FIG. 8.

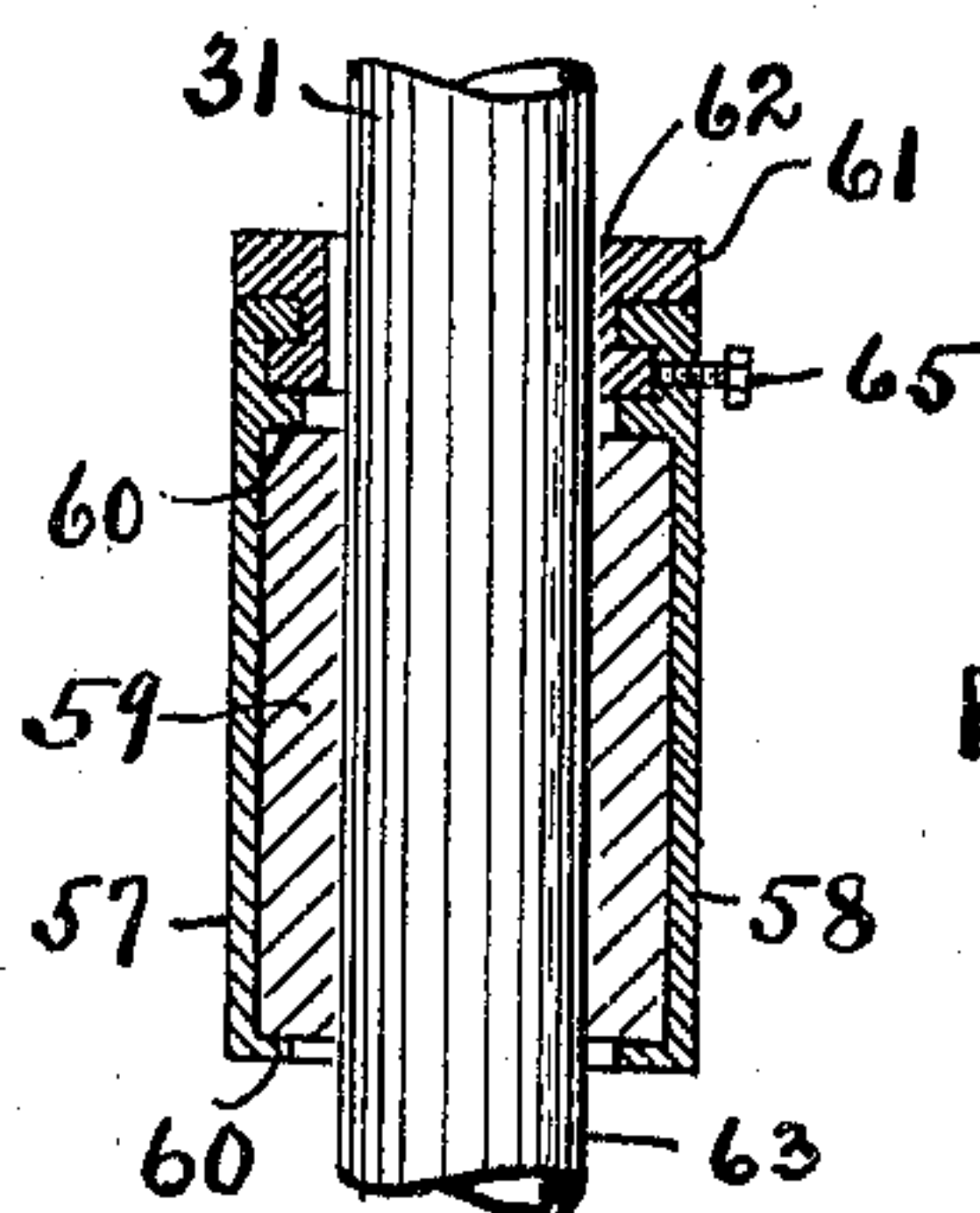
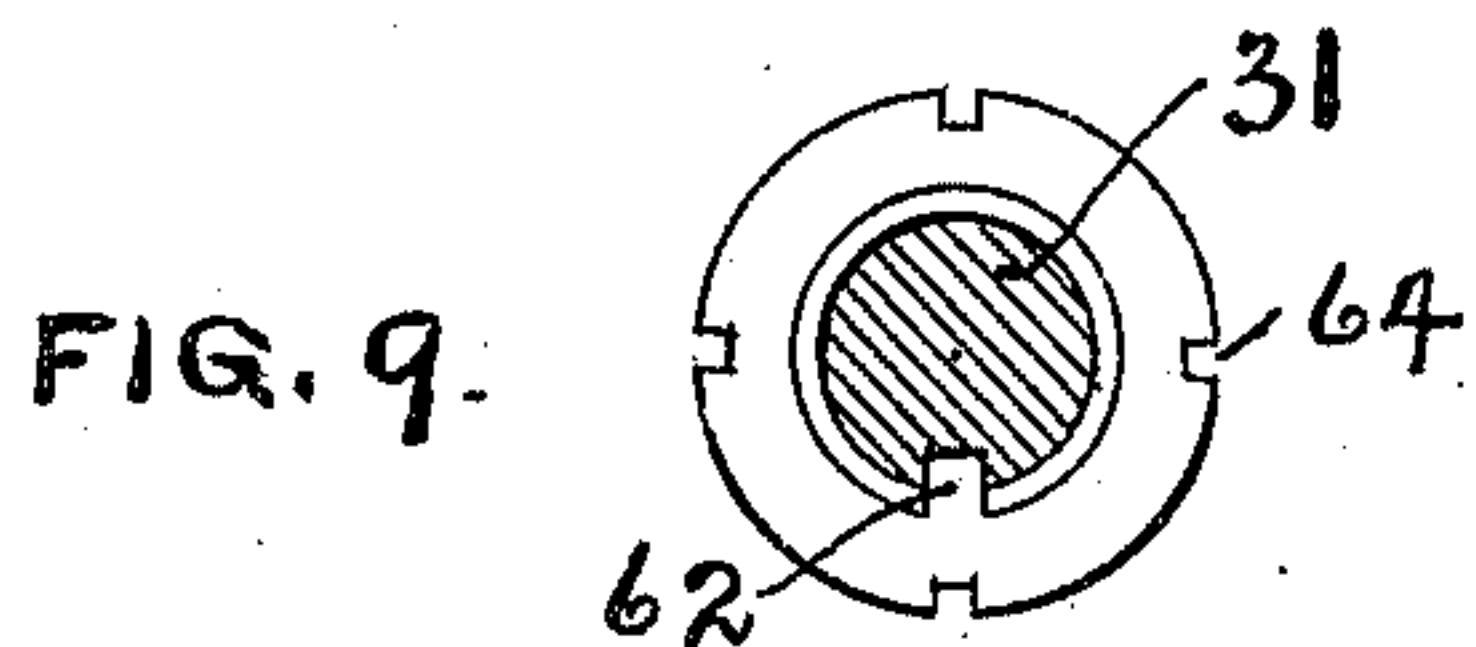
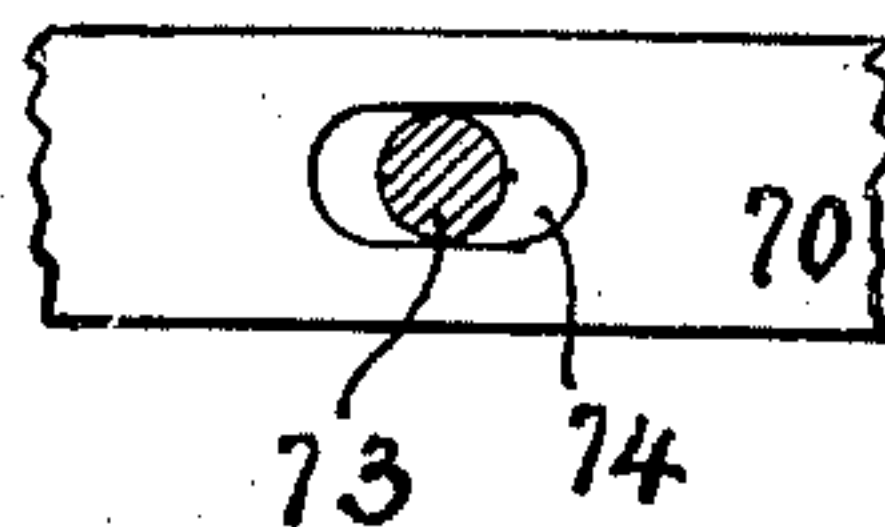
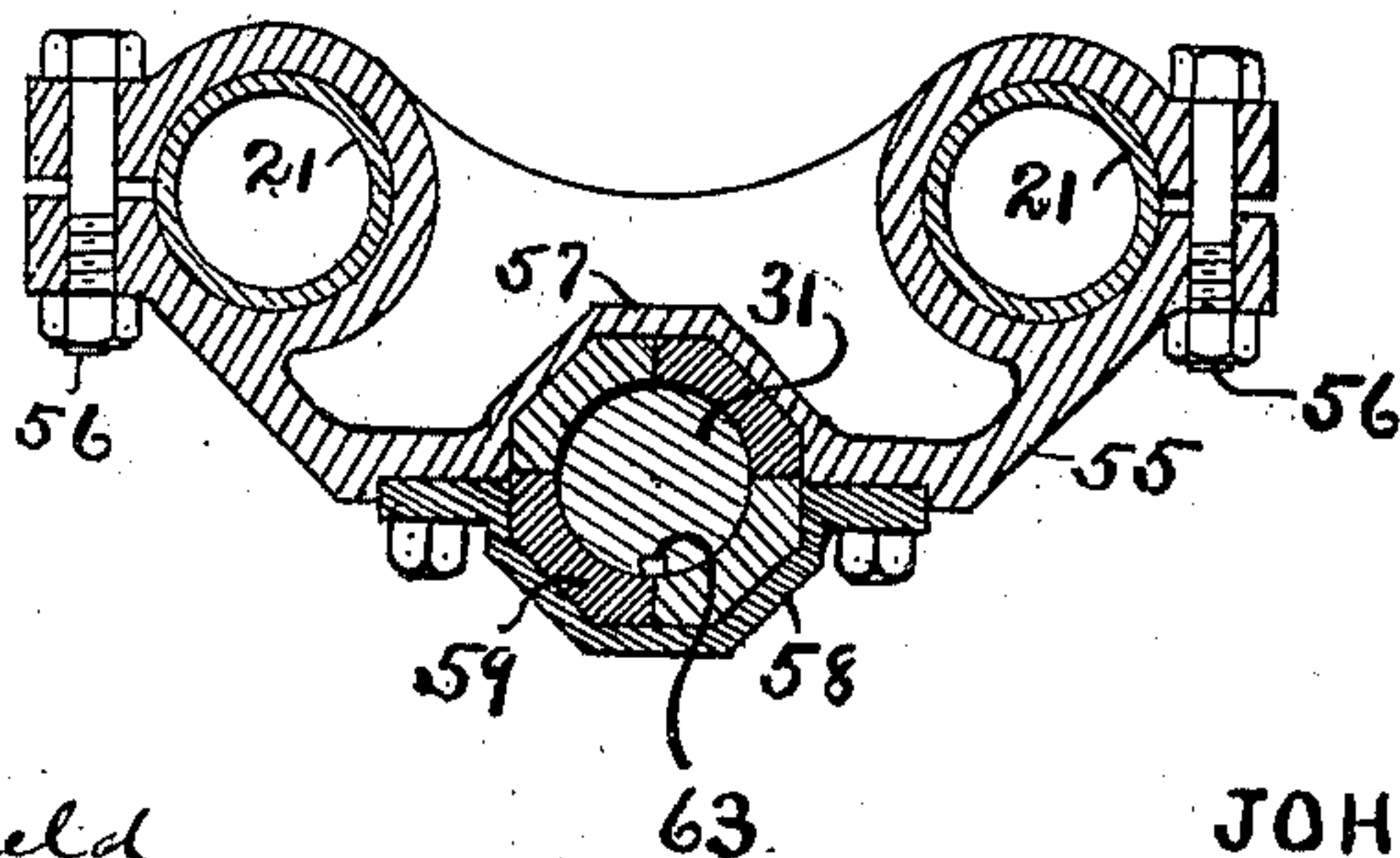


FIG. 11.

FIG. 10.



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UNITED STATES PATENT OFFICE.

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STEAM-ENGINE FOR ORE-STAMPS.

SPECIFICATION forming part of Letters Patent No. 654,434, dated July 24, 1900.

Application filed June 22, 1898. Serial No. 684,123. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. BREWIS, a citizen of the United States, residing in the city and county of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Steam-Engines for Ore-Stamps, of which the following is a specification.

My invention relates to stamps used for crushing ore, and has for its object certain improvements in construction and conveniences for adjusting.

In the accompanying drawings, Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is an enlarged longitudinal section of the cylinder on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 3. Fig. 5 is a transverse section on line 5 5 of Figs. 2, 3, and 4. Fig. 6 is a partial view similar to Fig. 5, showing the valve in a different position. Fig. 7 is an enlarged section of the hopper, showing the feeding device. Fig. 8 is a partial view of the lever in the direction 8 of Fig. 2. Fig. 9 is a section on line 9 9 of Fig. 1. Fig. 10 is a section on line 10 10 of Fig. 1. Fig. 11 is a section on line 11 11 of Fig. 1.

In the said drawings, 20 represents the stamp-box, from which rise two tubular standards 21, on the top ends of which are clamped the collars 22. Also on the standards 21 and a little below the collars 22 are two brackets or frames 23, which are secured by the clamping-bolts 24 and tie-rods 25. Pivoted in the frames 23 by means of the trunnions 26 is the steam-cylinder 27, provided with a head 28 at the upper end and a stuffing-box 29 at the lower end. In the cylinder 27 is a piston 30, provided with a piston-rod 31, on the lower end of which is the ordinary stamp. On the front of the cylinder is a steam-chest 32, in which is a piston-valve 33, that carries and operates a D-valve 34. Under the valve 34 are two ports. One, 35, passes downward and enters the cylinder at 36 near the lower end. The other, 37, passes upward and enters the cylinder at 38 near the top. Steam enters the chest 32 at 39 and, assuming the valve in the position shown in Fig. 6, passes through port 35 and entering the cylinder at 36 below the piston raises it until the bottom of the piston 30 passes the port 40, which is connected by the channel 41 in the cylinder-wall

with the port 42, opening into the chest 32 at the left end of the valve 33, and a port 43, opening into the cylinder. This permits the steam to pass through these ports and throw the valves 33 and 34 into the position shown in Fig. 5. The steam under the piston 30 then flows through 36, 35, 37, and 38, entering the cylinder over the piston, when the larger area of the upper face of the piston and the weight of it and its connecting parts serve to move it downward with considerable force and velocity. At the back of the cylinder, opposite the ports 35, 37, and 43, is an exhaust-opening 44, and when the top face of the piston 30 passes below this opening the steam over the piston is permitted to escape. At the same time the steam at the left of the valve 33 passes through 42 and 43 and also escapes through 44. By means of a by-pass 45 at the right-hand end of the steam-chest 32 the right-hand end of the valve 33 is kept always under steam-pressure. To enable the steam at the left-hand end to force the valve 33 to the right, I make the right-hand end of less area than the left-hand end. This may be done by any suitable means. I show a plug projection 46 on the head 47 and a small hole 48 for a vent. The plug 46 fits in a suitable counterbore in the end of the valve 33, and consequently the area of steam-pressure is the annular surface around this plug 46. It will therefore be seen that when the steam is exhausted from the left-hand end of the valve 33 the steam on the right-hand end forces the valves 33 and 34 to the left and permits the steam to again pass through 35 and 36, raising the piston 30, as before.

Mounted on the collars 22 are two sprocket-wheels 50 and a chain 51. Secured to these wheels 50 and provided with bearings in the collars 22 are two screws 52, which engage screw-threads in the brackets 23. A hand-wheel 53 on one of the screws 52 serves to turn it, which motion is transmitted by the wheels 50 and chain 51 to the other screw. This construction enables me to raise or lower both frames 23 simultaneously and in doing so to carry the cylinder 27 with them. It will be observed that I may do this at any time without stopping the operation of the stamp. The screws 24 serve to secure (by clamping)

the frames 23 firmly to the standards 21, and the tie-rods 25 serve to draw the frames 23 and the free ends of the standards toward each other enough to firmly clamp the cylinder 27. It will be observed by inspection of Fig. 5 that the clamping action on the standards 21 may be relieved by loosening screws 24, so as to permit of vertical adjustment of the cylinder 27 without releasing the clamping action of the frames or brackets 23 on the cylinder 27.

Located just above the stamp-box 20 is a bridge 55, secured to the standards 21 by the clamping-screws 56. Carried on the bridge 55 is a guide-box 57, provided with a cap 58 and lined with blocks of wood 59. The box 57 58 is octagonal and the wood lining is in quarter-blocks, preferably with end of grain against the rod 31. This permits the guiding-surface for the lower part of the rod 31 to be easily renewed and also permits the blocks 59 to be shimmed up as they wear. Lips 60 on the box 57 58 serve to prevent the blocks 59 from longitudinal displacement. Secured by the halves 57 and 58 and on the top thereof is a ring 61, which has a large enough internal diameter to clear the rod 31 except at the feather 62, which engages a keyway 63 in the rod 31. Notches 64 in the ring 61 serve as a means of turning said ring 61, and consequently the rod 31 and its stamp-head, so as to insure uniform wear in the stamp-box or mortar 20. A set-screw 65 serves to hold the ring 61 in any particular position.

Supported by the stamp-box 20 and located at the rear of the machine are a hopper 66 and a chute 67. A shaft 68 is supported in brackets 69, and to this shaft is secured a lever 70, that reaches forward under a collar 71, secured to the rod 31. Another bracket 72 on the chute 67 is threaded for the screw 73, that passes through a slot 74 in the lever 70. A hand-wheel 75 on the screw 73 serves as a means of turning it, and another wheel 76 serves as a lock-nut for securing the screw at any required adjustment. A collar 77 on the screw 73 serves to prevent the lever from rising above a certain point, and a spring 78, supported by a nut and washer 79 on the lower end of screw 73, serves to hold the lever 70 against the collar 77. Also secured to the shaft 68 is another lever 80, which connects by link 81 through the back of the hopper 66 to a plate 82, journaled on the shaft 83, that is supported in brackets 84 on the chute 67. Below the plate 82 is a horizontal plate 85, supported on lugs 86 and adjustable by means of the screw 87. The lever 70 has a cushion 88 on its free end, and the collar 71 is so located on rod 31 that when said rod is near its lowest point the collar 71 will strike the cushion 88 and depress the lever 70 by compressing the spring 78. The depression of the lever 70 communicates power through shaft 68, lever 80, and link 81 to the plate 82, which pushes material forward on plate 85 until it falls over the edge and passes down chute 67

to the stamp-box 20. When the rod 31 and collar 71 rise again, the spring 78 raises the lever 70 and retracts the plate 82. It will be observed that by this construction each reciprocation of the rod 31 causes some material to be fed to the stamp; also, that by the arrangement of the screw 73 and the parts connected thereto I can at any time adjust the amount of the feed without stopping the operation of the stamp. The nut and washer 79 permit me to adjust the tension of the spring 78, which adjustment I can also make while the stamp is running.

What I claim is—

1. In a steam-stamp, a pair of vertical standards, a bracket mounted on each standard, a steam-cylinder supported on pivots between said brackets, bolts for clamping said cylinder securely between said brackets, screws for adjusting the vertical position of said brackets on said standards, and connections between said screws so as to cause them to turn together.

2. In combination with a steam-cylinder provided with a piston and a valve mechanism adapted to admit steam to said cylinder so as to cause vertical reciprocation of said piston, a pair of brackets and means for securely clamping said cylinder between them, a separate standard for each bracket, a screw supported on each standard and passing through each bracket for adjusting the position of the same, connections between the upper ends of said screws for causing them to turn together, and means for clamping said brackets to said standards.

3. A pair of cylindrical standards each of which is without screw-threads, a bracket on each standard adapted to slide freely thereon, an adjusting-screw for each bracket supported on the respective standards and parallel thereto, connections between the two screws for causing them to turn together, clamps for securing said brackets at any required adjustment on said standards, and a steam-cylinder supported by and clamped between said brackets.

4. A vertical steam-cylinder provided with trunnions, a pair of brackets in which said cylinder is pivoted, a tubular standard for each bracket, a screw supported adjacent to each standard for adjusting the vertical position of said brackets, and connections between said screws for causing them to turn together.

5. In combination with a steam-cylinder and a piston adapted to reciprocate therein, a pair of brackets in which said cylinder is pivoted and between which it is securely clamped, a tubular standard for each bracket, a screw supported on and adjacent to each standard for adjusting the vertical position of said brackets, connections between said screws for causing them to turn together, and means for clamping the brackets to said standards.

6. A piston provided with a stamp-head, a

cylinder for said piston provided with trunnions by which it is supported, a pair of brackets each of which is provided with a socket for receiving one of the trunnions of said cylinder, a standard for each bracket and upon which it is vertically adjustable, a screw supported on and adjacent to each standard for adjusting the position of said brackets, and bolts for clamping said brackets to their respective standards.

7. In a steam-stamp provided with a vertically-reciprocating piston and a steam-cylinder therefor, a pair of brackets for supporting said cylinder and provided with means for clamping it securely between them, a pair of cylindrical standards passing through similarly-shaped openings in said brackets, a cap or collar secured to the upper end of each standard, a screw supported by each collar and engaging screw-threads in the brackets, and connections between said screws for causing them to turn together.

8. In a steam-stamp, a steam-cylinder, a pair of brackets adapted to engage opposite sides of said cylinder and provided with means for securely clamping it between them, a pair of cylindrical standards passing through circular openings in said brackets, a cap or collar secured to the upper end of each standard, a screw supported by each collar and engaging screw-threads in the brackets so as to raise and lower them, connections between said screws for causing them to move so as to raise and lower said brackets together, and bolts

for clamping said brackets to their respective standards.

9. In a steam-stamp, a pair of cylindrical standards, a bracket mounted on each standard and provided with a clamping device for securing it at any desired position by frictional contact with the cylindrical surface of its standard, a screw supported upon and parallel with each standard and engaging screw-threads in the brackets upon their respective standards, means for causing said screws to turn together so as to raise and lower said brackets uniformly, and a steam-cylinder supported by and clamped between said brackets.

10. In a steam-stamp, a steam-cylinder, a pair of cylindrical standards, a bracket mounted upon each standard, bolts for clamping said brackets to their respective standards by causing them to grip the cylindrical surface thereof, and tie-rods for clamping said cylinder between said brackets.

11. In a steam-stamp, a steam-cylinder, a pair of cylindrical standards, a bracket mounted upon each standard, a screw independent of and supported by each standard for adjusting the vertical position of said brackets, bolts for clamping said brackets to their respective standards by frictional contact with the cylindrical surface thereof, and tie-rods for clamping said cylinder between said brackets.

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Witnesses:

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