

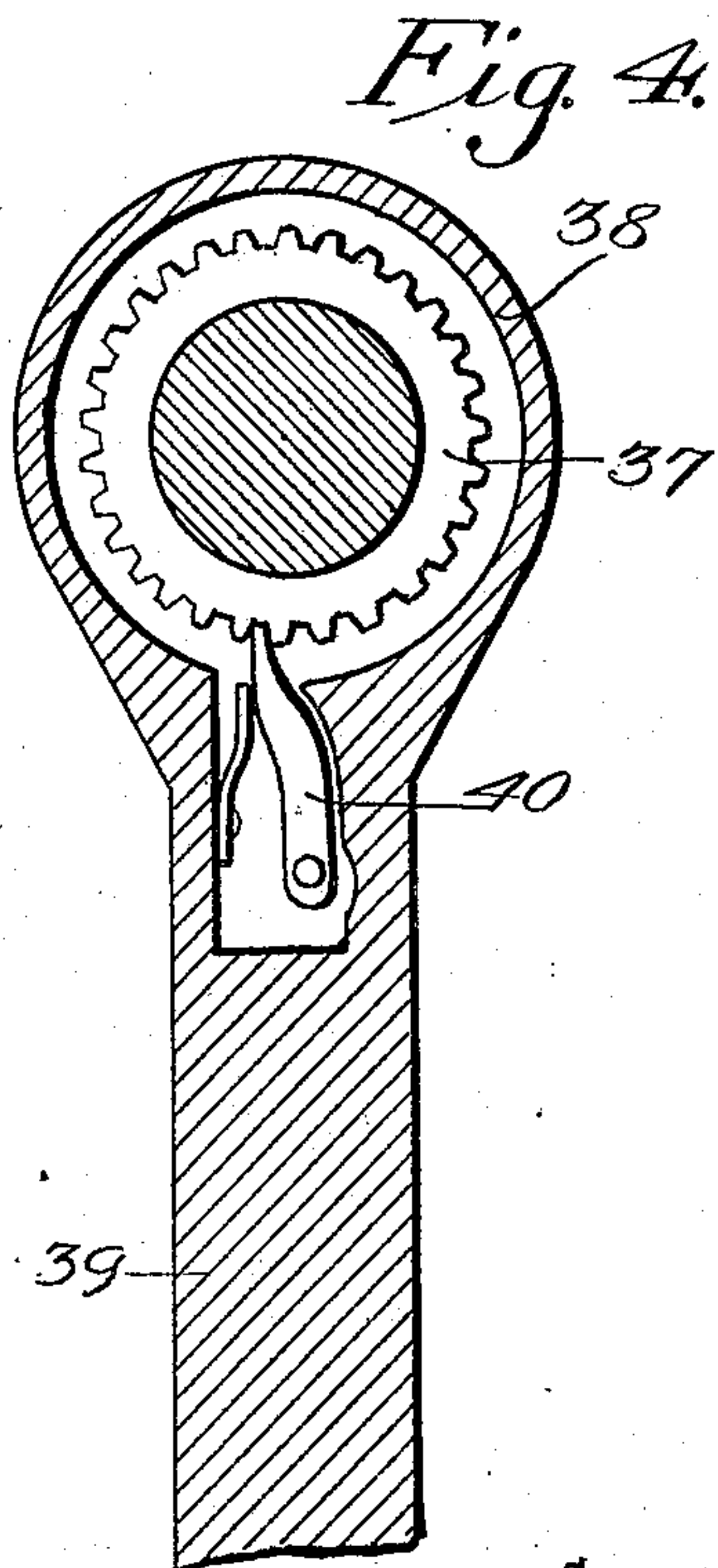
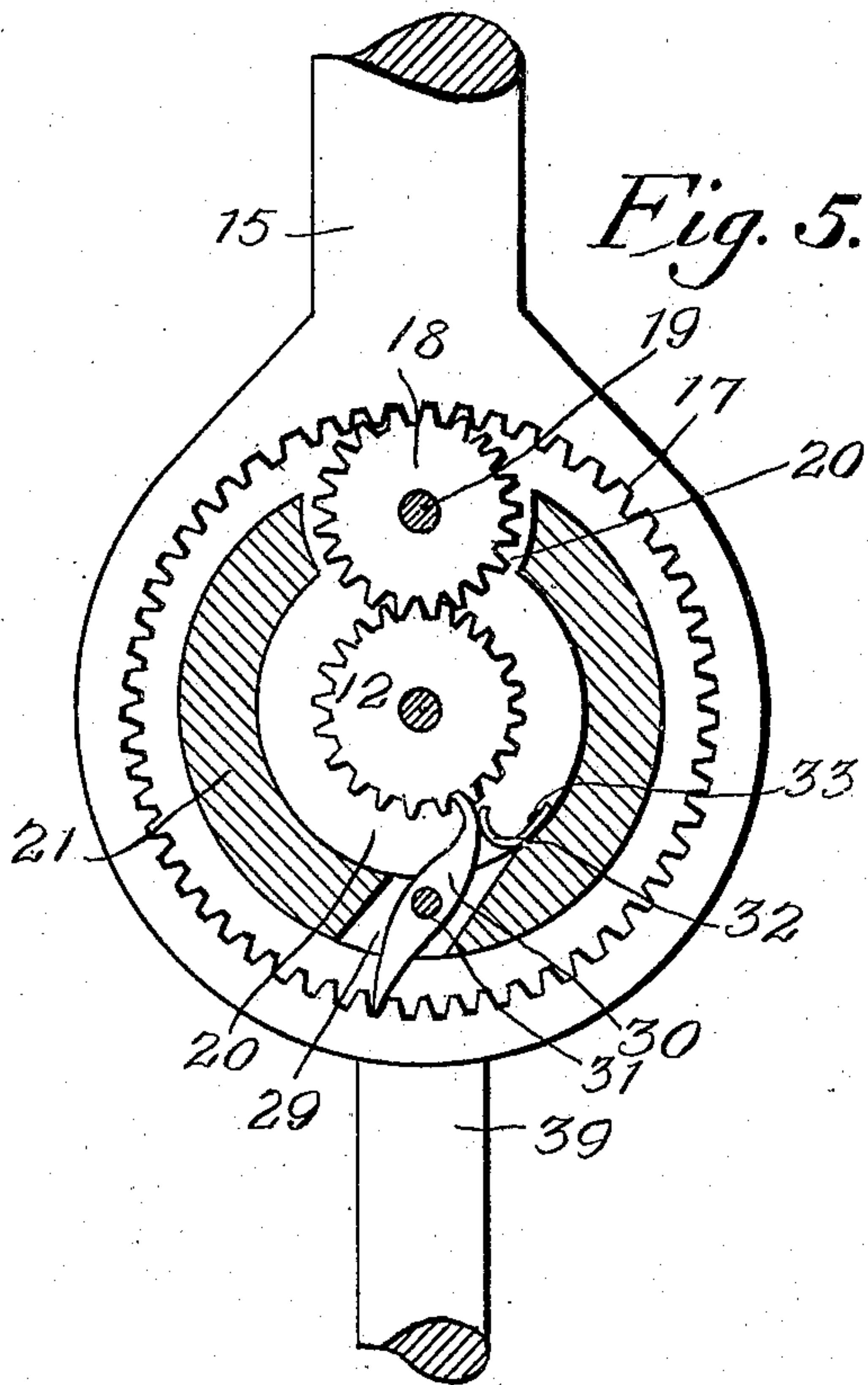
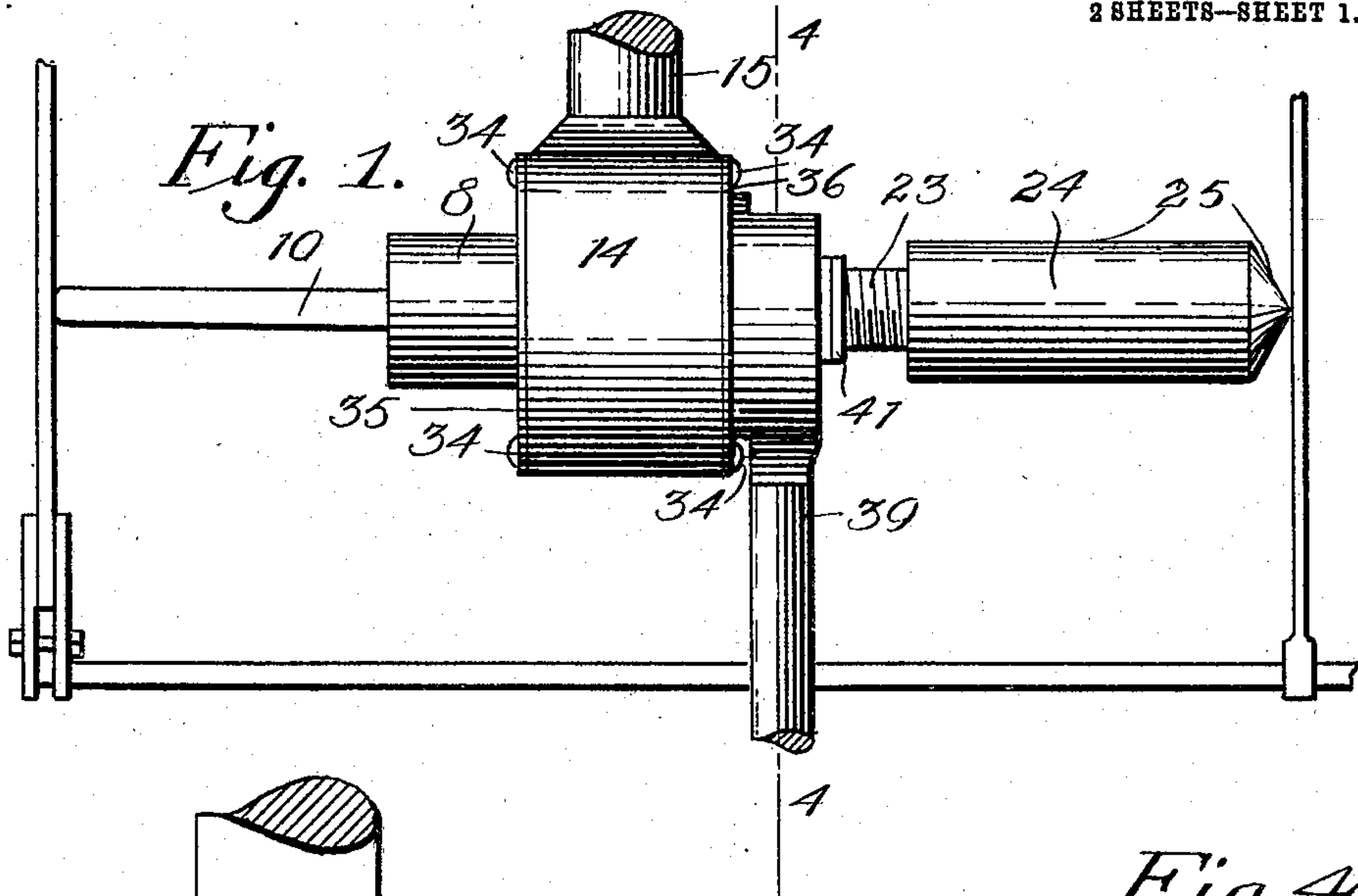
J. R. GILMAN.  
RATCHET DRILL.

APPLICATION FILED SEPT. 28, 1908.

919,712.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



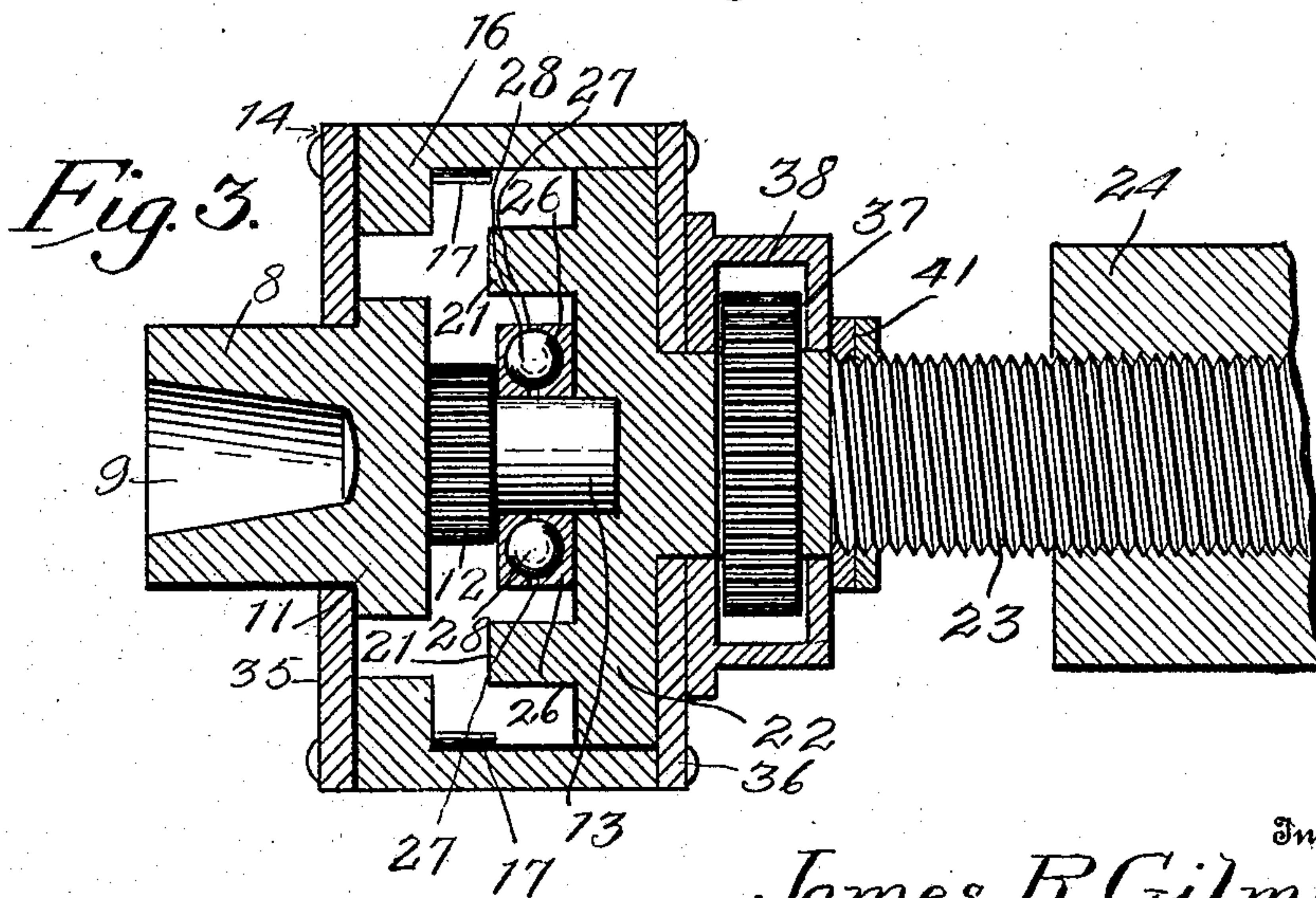
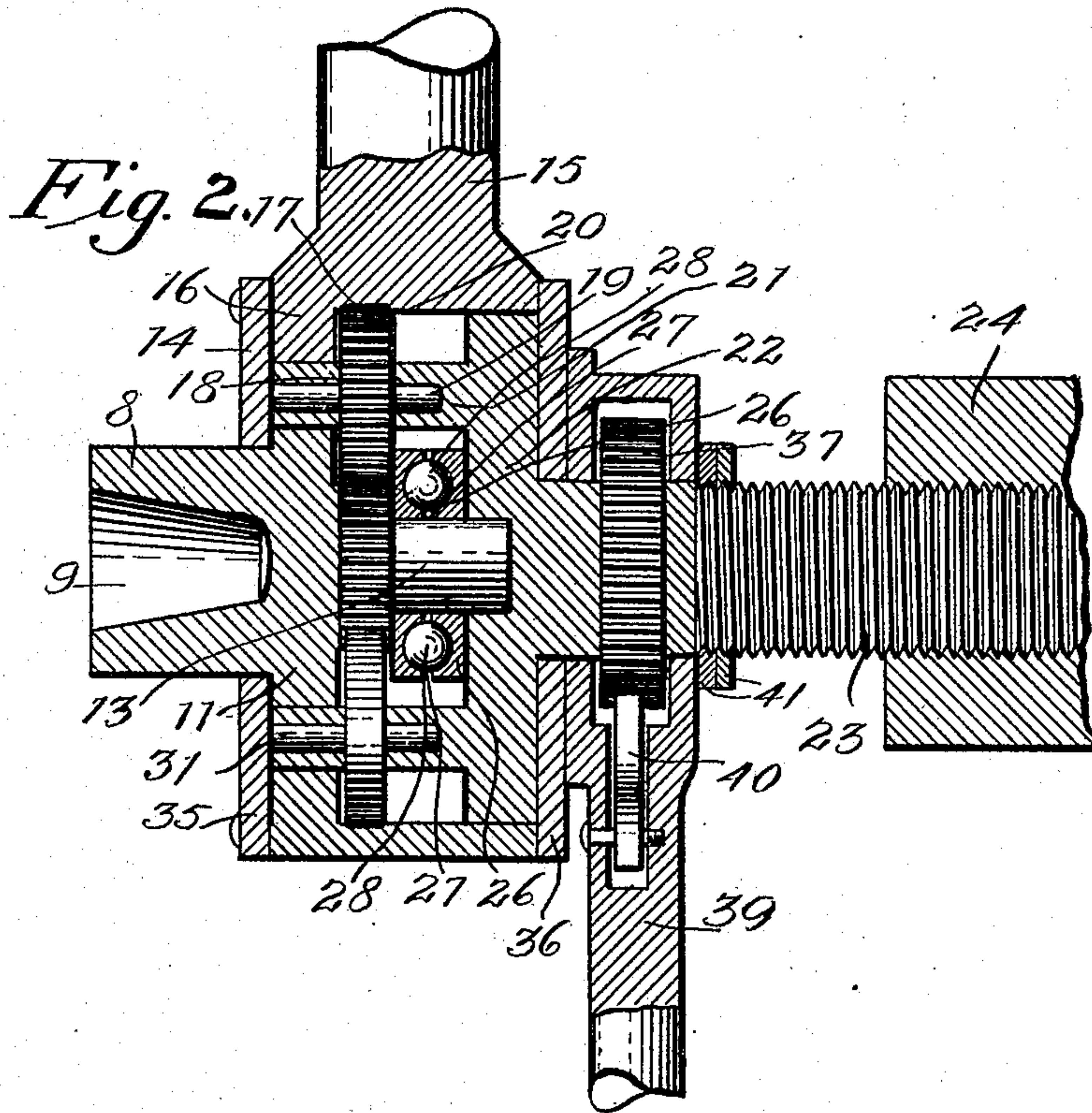
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# UNITED STATES PATENT OFFICE.

JAMES R. GILMAN, OF LOUISVILLE, KENTUCKY.

## RATCHET-DRILL.

No. 919,712.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed September 28, 1908. Serial No. 454,959.

*To all whom it may concern:*

Be it known that I, JAMES R. GILMAN, a citizen of the United States, residing at Louisville, in the county of Jefferson, State of Kentucky, have invented certain new and useful Improvements in Ratchet-Drills; 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.

The invention relates to ratchet drills and more particularly to the class of double acting or continuous ratchet drills.

The primary object of the invention is the provision of a ratchet drill having mechanism by which a continuous forward rotation of the drill is effected upon the forward stroke and the back stroke of the operating lever or handle of the drill so that the bit will be driven continuously forward into the work operated upon with a more positive and effective movement.

Another object of the invention is the provision of a ratchet drill which is simple and durable in construction, very effective in operation and adapted to drive the bit continuously forward on both the forward and backward stroke of the handle thereof.

In the drawings accompanying and forming part of this specification is illustrated one form of embodiment of the invention which to enable those skilled in the art to practice the invention will be set forth at length in the following description while the novelty of the invention will be included in the claims succeeding said description. However, it is to be understood that changes, variations and modifications may be made such as come properly within the scope of the claims hereunto appended without departing from the spirit of the invention.

In the drawings, Figure 1 is a side elevation of the ratchet drill in position for drilling. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a transverse sectional view. Fig. 4 is a sectional view on the line 4—4 of Fig. 1. Fig. 5 is a front view of the ratchet drill with its front plate partly broken away.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

In the drawings the ratchet drill comprises a chuck 8 having a central squared tapering socket 9 to receive the end of a bit

10 in one end thereof and formed with an annular flange 11 and with a gear wheel 12 having a central shank 13 in rear of the annular flange of the chuck. The said chuck 8 is mounted within a casing 14 having an operating handle 15 and which casing is provided at its front edge with an inwardly directed annular rim or flange 16 and in rear thereof are internal gear teeth 17 which mesh with the teeth of a gear wheel 18 journaled upon a pin 19 intersecting an opening or space 20 accommodating the gear wheel 18 and contained in an annular shell 21 projecting from one side and integral with a circular plate 22 mounted within the casing.

Projecting outwardly centrally from the plate 22 is a threaded feed screw 23 having mounted thereon a threaded sleeve 24 formed with a closed beveled end 25 to engage a fixed part to hold the bit in working position with the material operated upon.

Between the gear wheel 12 and the plate 22 and surrounding the shank 13 of the chuck are opposed cones 26 having annular grooves in adjacent faces to form race-ways 27 in which are disposed ball-bearings 28 to minimize friction during the rotation of the chuck. The said gear wheel 18 meshes with the gear wheel 12 formed on the chuck 8 so as to forwardly rotate the bit 10 upon moving the handle 15 in a forward direction which is termed the forward stroke thereof. At a diametrically opposite point with respect to the opening or space 20 in the shell 21 is a further opening or space 29 receiving a dog or pawl 30 the latter mounted upon a pin 31 intersecting the said opening or space 29 and having its bearing in the said shell and which dog or pawl 30 is disposed diagonally within the casing and normally engages the teeth of the gear wheel 12 and the internal teeth 17 of the casing so as to lock the said casing 14 with the gear wheel 12 of the chuck upon manipulating the handle 15 to impart a back or return stroke to the drill, however upon this back or return stroke due to the locked condition of the casing with the chuck the bit 10 mounted in the latter will be forwardly advanced. To maintain the dog or pawl 30 in engagement with the said internal teeth 17 and the teeth of the gear wheel 12 on the drill chuck there is provided a flat curved spring 32 having one end fixed by a fastener 33 to the inner face of the shell



21 adjacent the opening or space 29 and its opposite free end playing against the said dog or pawl.

Detachably secured by fasteners 34 to the casing 14 are front and rear closing plates 35 and 36 and keyed to the feed screw or threaded screw 23 is a gear wheel 37 abutting against the said rear closing plate 36 and surrounding the gear wheel 37 is a shell head 38 of an auxiliary handle or operating lever 39 and within the shell head 38 is mounted a locking dog 40 to engage the gear wheel 37 so that upon operating the auxiliary handle 39 in one direction will rotate the drill chuck 8 to forwardly advance the bit 10 carried thereby.

To maintain the shell head 38 of the auxiliary lever in a position to surround and inclose the gear wheel 37 there are provided jam lock nuts 41 engaging the threaded screw 23 of the ratchet drill.

In operation the ratchet drill is arranged to cause a continuous forward movement of the drill chuck 8 by intermittent, forward and backward strokes of the operating lever 15. For instance, when the operating lever 15 is moved forward to complete a forward stroke the gear wheel 18 is rotated by being in mesh with the internal gear teeth 17 and by this rotary movement and the said gear wheel 18 enmeshing with the gear wheel 12 of the chuck 8 the latter will be caused to rotate in an opposite direction thereby rotating the bit 10 for cutting action upon the work operated upon. Now upon manipulating the operating lever or handle 15 to complete a back stroke the double acting dog or pawl 30 will automatically be brought into locking engagement with the teeth of the gear wheel 12 and the internal teeth 17

of the casing 14 so as to lock the latter with the drill socket 8 to rotate with the latter and cause a continuous forward feed of the bit 10 into the work operated upon.

What is claimed is—

1. A drill of the class described comprising a casing having an operating lever, a bit chuck mounted within the casing, a gear wheel formed on the chuck, a plate within the casing and having an annular shell, an internal gear formed on the casing, a gear wheel rotatably supported by the shell and in mesh with the internal gear and gear wheel on the chuck, and a dog engaging the internal gear and the chuck gear wheel to permit continuous rotation in one direction of the chuck upon forward and backward strokes of the operating lever.

2. A drill of the class described comprising a casing having an operating lever, a bit chuck mounted within the casing, a gear wheel formed on the chuck, a plate within the casing and having an annular shell, an internal gear formed on the casing, a gear wheel rotatably supported by the shell and in mesh with the internal gear and gear wheel on the chuck, a dog engaging the internal gear and the chuck gear wheel to permit continuous rotation in one direction of the chuck upon forward and backward strokes of the operating lever, and feed mechanism projecting outwardly from the said plate.

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

JAMES R. GILMAN.

Witnesses:

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JOHN SAMPLE.