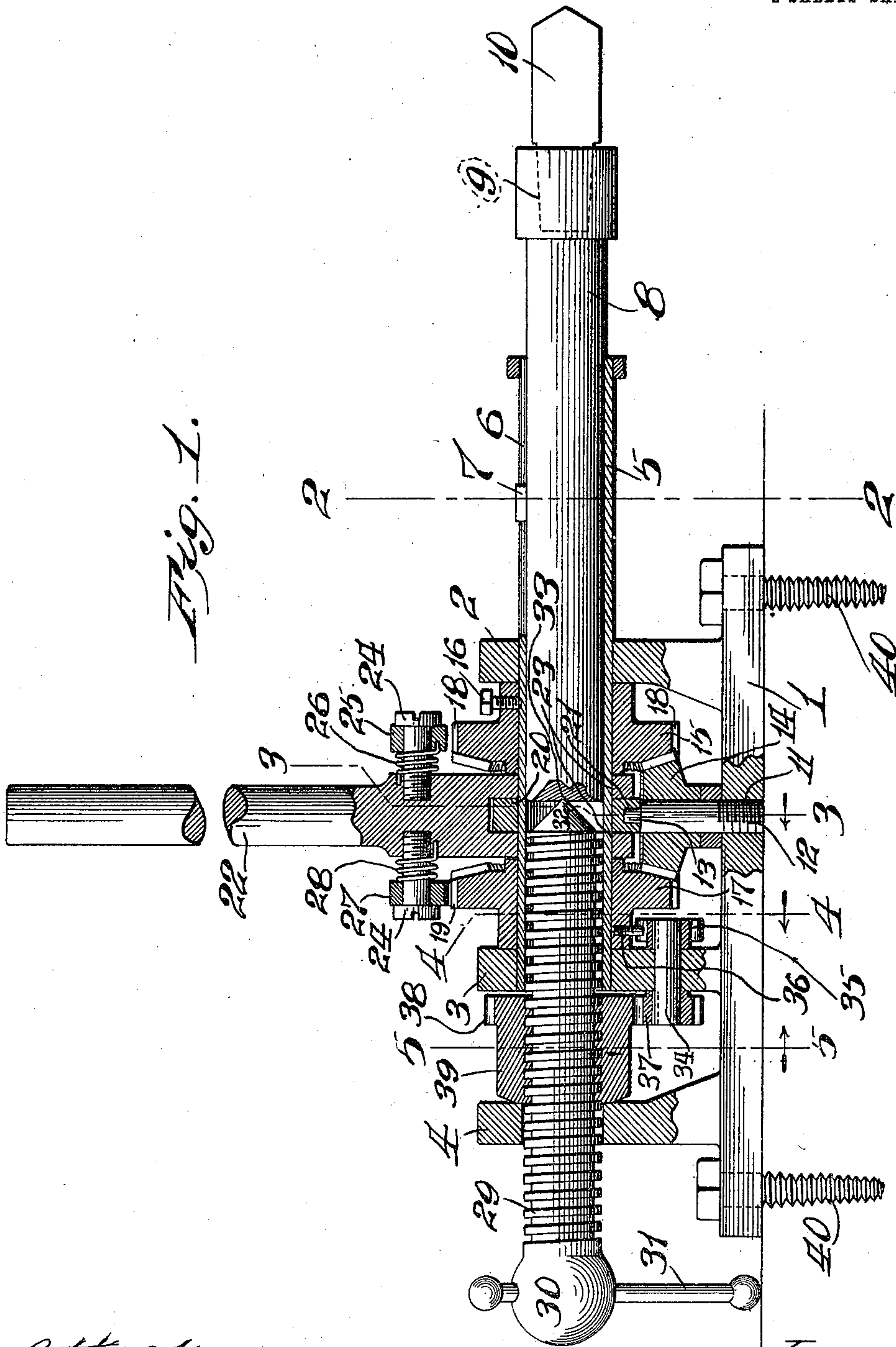


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 DOUBLE ACTING SELF FEEDING DRILL.
 APPLICATION FILED AUG. 12, 1909.

974,978.

Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.



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 By Higdon & Longan,
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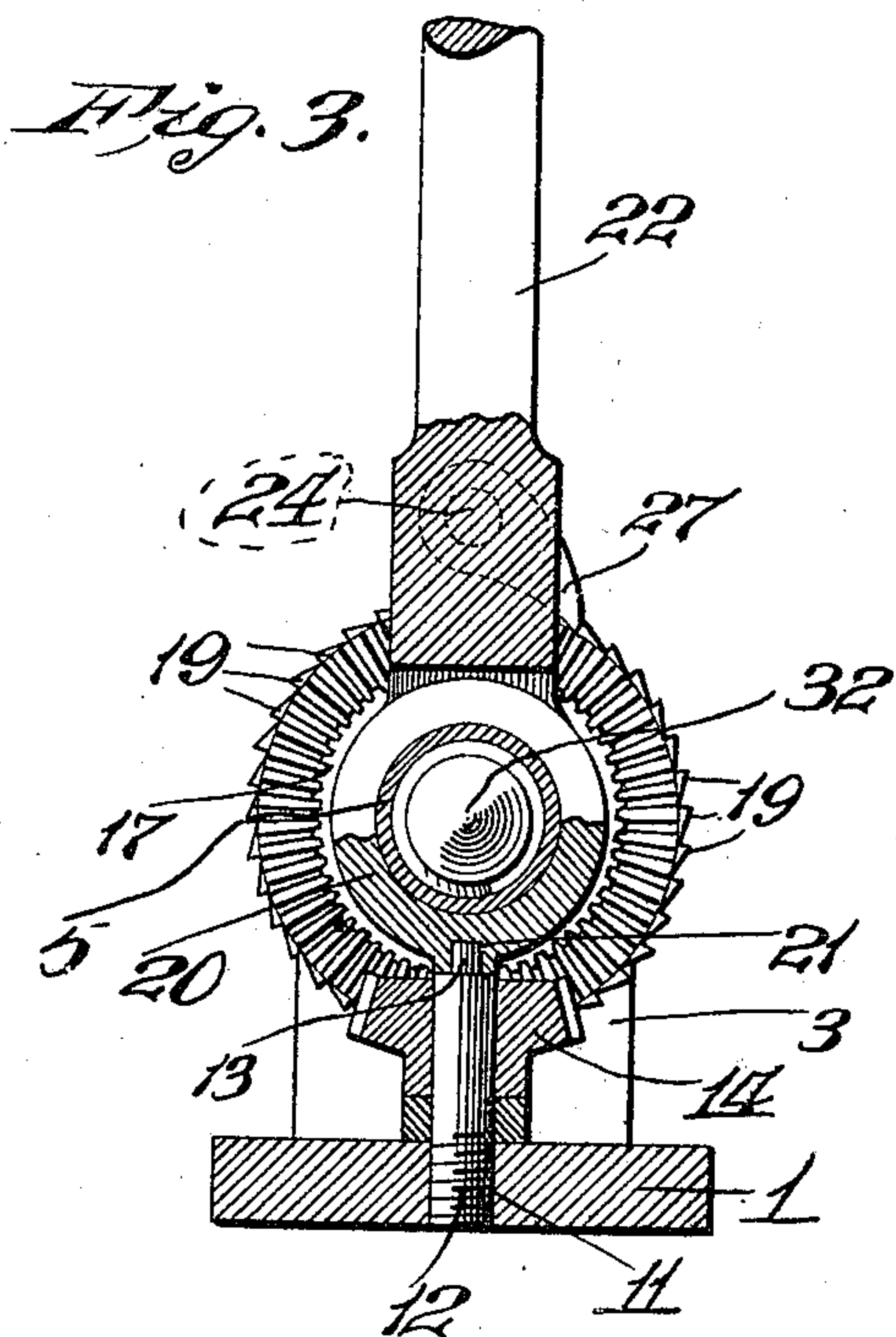
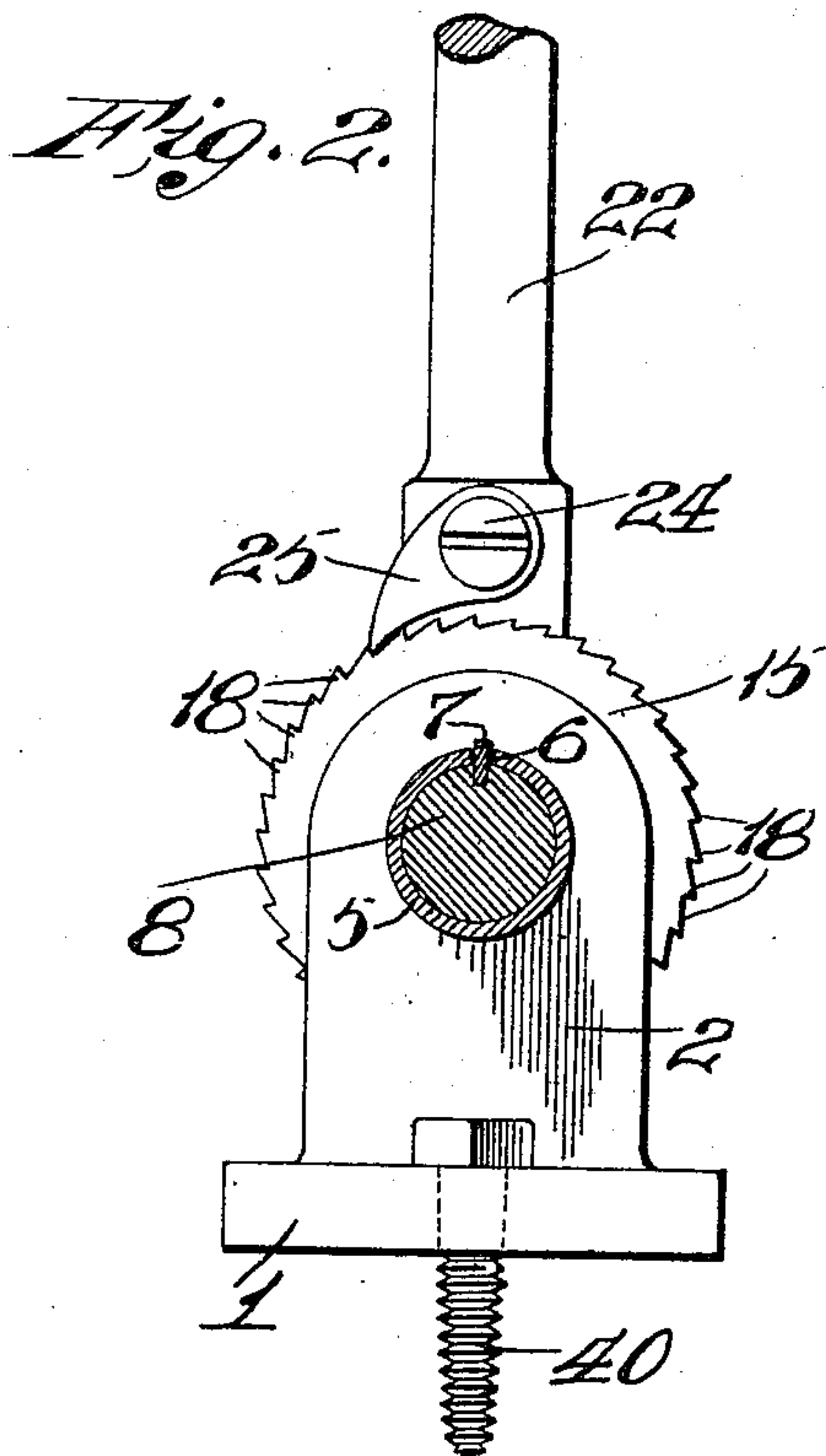


Fig. 4.

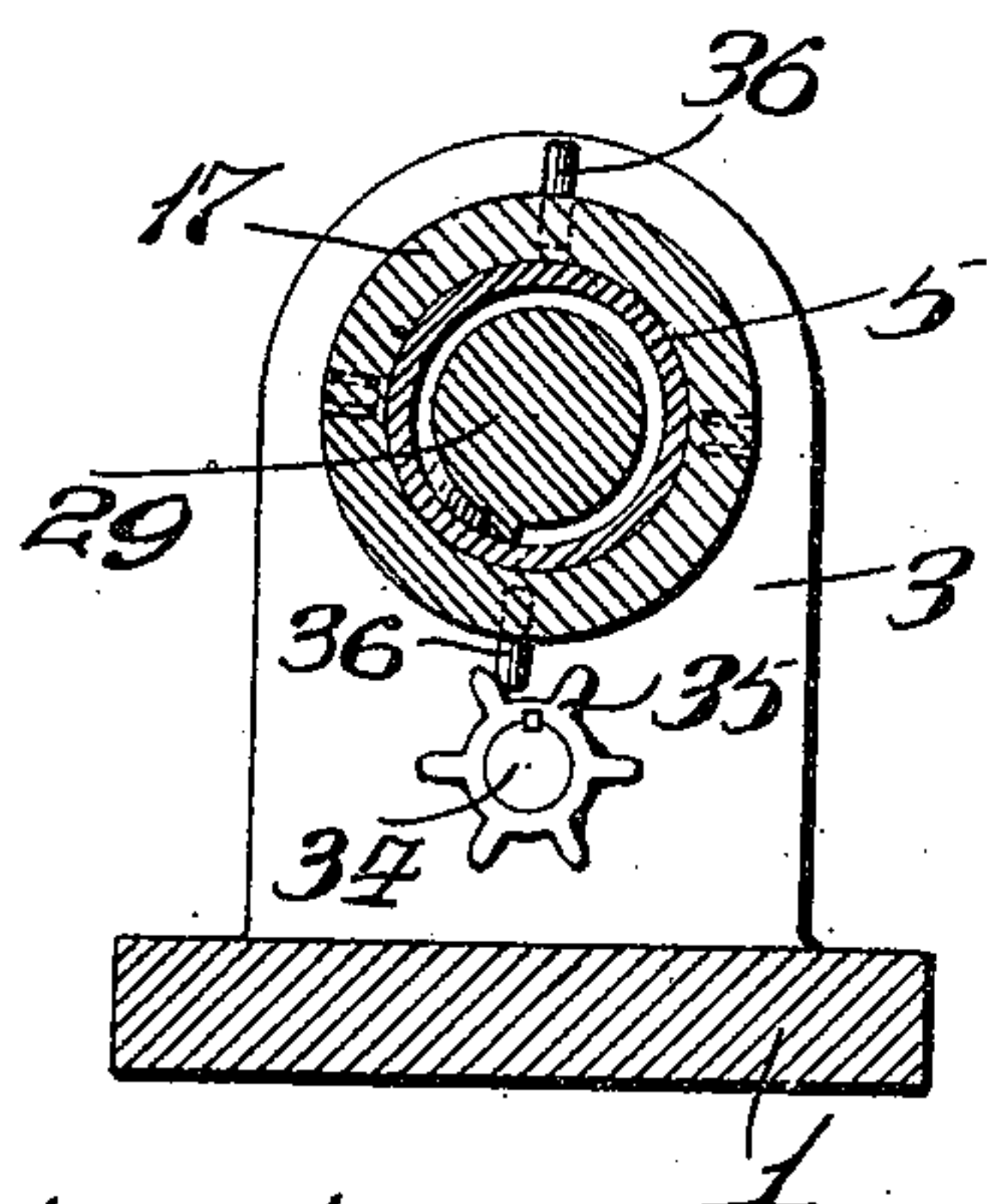
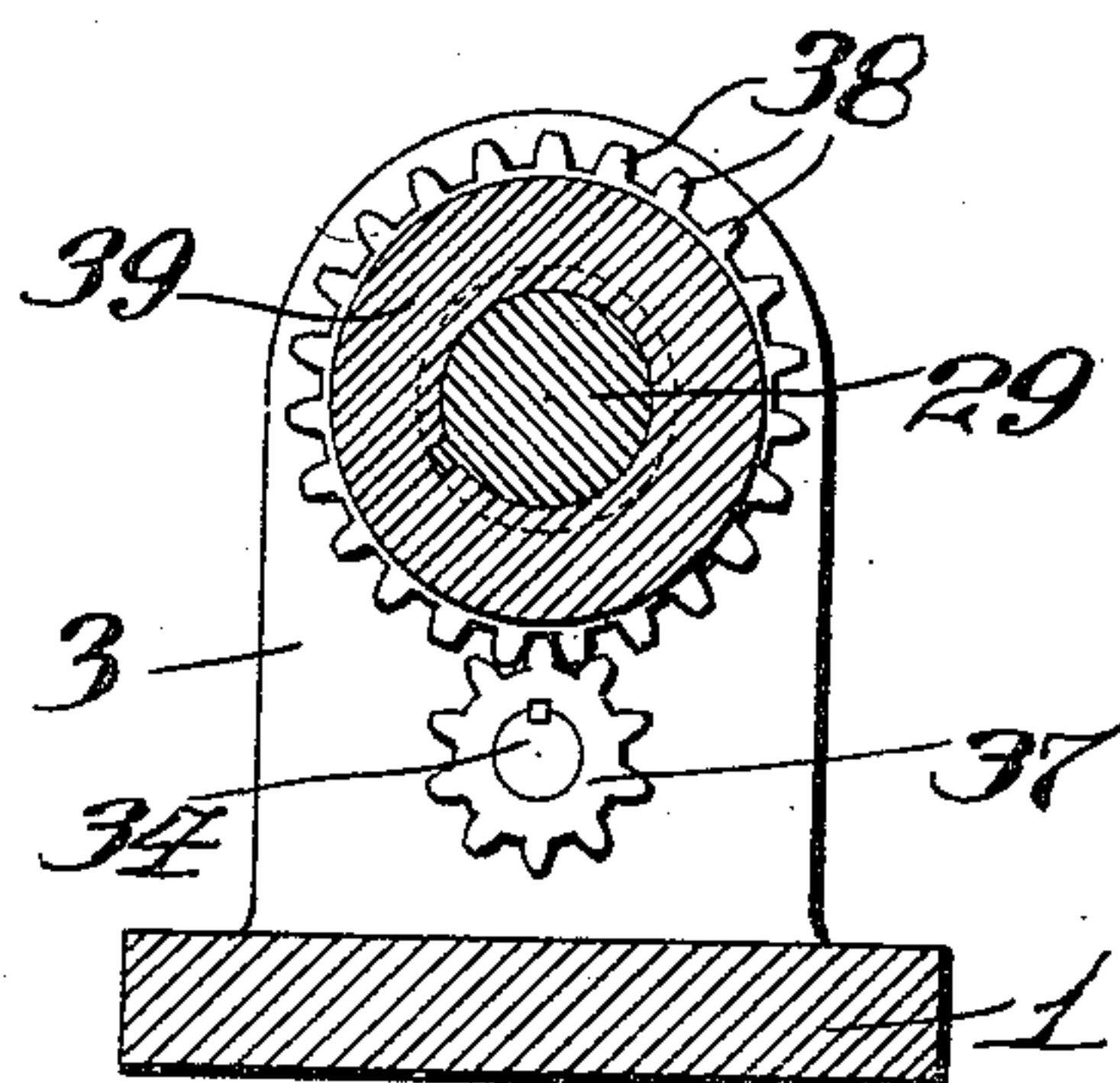


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT W. KREIS, OF JENNINGS, MISSOURI.

DOUBLE-ACTING SELF-FEEDING DRILL.

974,978.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed August 12, 1909. Serial No. 512,514.

To all whom it may concern:

Be it known that I, ROBERT W. KREIS, a citizen of the United States, and resident of Jennings, St. Louis county, Missouri, have
5 invented certain new and useful Improvements in Double-Acting Self-Feeding Drills, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

10 My invention relates to double acting self-feeding drills.

The object of my invention is to construct a lever operated drill in which either stroke
15 of the lever will rotate the drill in an effective direction.

A further object of my invention is to construct a lever operated drill in which either stroke of the lever will actuate a feeding
20 device for the drill.

For the above purposes my invention consists in certain novel features of construction and arrangement of parts as will be hereinafter more fully described, pointed
25 out in my claims and illustrated in the accompanying drawing, in which:

Figure 1 is an elevation of the complete drill having parts broken away to more clearly illustrate the construction and arrangement of parts; Fig. 2 is a transverse sectional elevation taken on the line 2—2 of Fig. 1; Fig. 3 is a similar view taken on the line 3—3 of Fig. 1; Fig. 4 is a transverse sectional elevation taken on the line 4—4 of
30 Fig. 1 illustrating a part of the feeding mechanism; and, Fig. 5 is a similar view taken on the line 5—5 of Fig. 1.

Referring by numerals to the accompanying drawings: 1 designates the base and 2,
40 3 and 4 designate standards which are preferably cast integral with the base.

5 designates a sleeve in which the drill stem operates, which is supported in the standards 2 and 3; and 6 designates a slot
45 formed in the sleeve 5 which co-acts with a key 7 carried by the drill stem 8. A socket 9 is formed in the outer end of the drill stem 8 and is adapted to receive and hold the angular end of a drill point 10.

50 Formed in the base 1, between the standards 2 and 3, is a screw seat 11 and seated in the screw seat 11 is a stub shaft 12 having a reduced upper end 13.

Rotatably carried by the stub shaft 12 is
55 a beveled gear wheel 14. A beveled gear wheel 15 is carried by the sleeve 5 and is

secured non-rotatably thereto by means of the set screw 16 and in mesh with the beveled gear wheel 14. A second beveled gear wheel 17, identical in construction with the
60 wheel 15, is loosely mounted upon the sleeve 5. Formed on the periphery of the wheel 15 are the ratchet teeth 18 and formed on the wheel 17 are the ratchet teeth 19.

Embracing the sleeve 5 is a collar 20 which
65 is provided with an aperture 21 in its periphery, which aperture embraces the reduced extension 13 of the stub shaft 12 thus preventing movement of the collar 20 longitudinally relative to the sleeve 5.

70 A lever 22, has a bifurcated lower end provided with openings 23 through which the sleeve 5 is inserted to carry the lever in an operative position, the bifurcated lower end embracing the collar 20 thereby preventing
75 movement of the lever relative to the sleeve 5 so as to permit movement of the lever and hold it out of engagement with the beveled gear wheels 15 and 17. Set screws 24 are carried by the lever 22 and
80 carried by the right hand screw is a pawl 25 which engages the ratchet teeth 18 of the beveled gear wheel 15 and carried by the set screw 24, having its one end seated in the lever and its opposite end in the pawl
85 25, is a coil spring 26. Carried by the left hand set screw 24 is a pawl 27 engaging the ratchet teeth 19 of the wheel 17 and a coil spring 28, having its one end secured to the lever 22 and its opposite end to the pawl 27,
90 normally tends to cause the pawl to engage the teeth 19. The teeth 18 formed on the periphery of the wheel 15 incline in a direction opposite the teeth 19 of the wheel 17 so that when the lever 22 is moved in a right
95 hand direction the pawl 25 will engage the teeth 18 and the pawl 27 will ride over the teeth 19 without effect. A reverse or left hand movement of the lever 22 will cause the pawl 27 to act on the teeth 19 of the
100 wheel 17 and permit a non-effective action of the pawl 25 on the teeth 18. In this manner it is obvious that a right hand movement of the lever 22 through the pawl 25 and ratchet teeth 18, the wheel 15 will be
105 rotated in a right hand direction, and, by reason of the wheel 15 being secured to the sleeve 5 and by reason of the key and slot connection between the sleeve 5 and drill stem 8, the drill will be moved in an oper-
110 ative or right hand direction. It is obvious further that by reason of the connection be-

tween the wheels 15 and 17 by the beveled gear wheel 14, this right hand movement of the lever will rotate the wheel 17 in a left hand direction and by reason of the wheel 17 being loosely mounted on the sleeve 5, this left hand travel of the wheel 17 will be non-effective. A reverse or left hand movement of the lever 22 will, by reason of the pawl 27 acting on the ratchet teeth 19 of the wheel 17, cause the wheel 17 to rotate in a left hand direction and by reason of the intermediate gear 13, the wheel 15 will rotate in a right hand or effective direction, the pawl 25 being inactive when moving in a left hand direction. In this manner it is obvious that the drill point will be turned in a right hand or effective direction by either stroke of the lever 22.

Carried by the left hand end of the sleeve 5 and the standard 4 is a threaded feed shaft 29 having an enlarged head 30 at its left hand end, and carried by the head 30 is a lever 31 arranged for the locking of the feed shaft 29 against rotary movement in a direction opposed to the feed. In the drawing this lever 31 is resting against the ground line but it is obvious that any means might be employed to secure the feed shaft against rotary movement in a non-feeding direction. The inner end of the feed shaft 29 impinges against the drill stem 8 and is preferably provided with a point 32 which seats in a depression 33 in the end of the drill stem 8.

Carried by the standard 3 is a shaft 34 and keyed to the right hand end of said shaft is a toothed wheel 35, and, carried by the hub section of the wheel 17 is a pin 36 which engages one of the teeth of the wheel 35. Carried by the opposite end of the shaft 34 is a gear wheel 37 which meshes with the gear teeth 38 formed integral with the nut 39 which nut is internally threaded and acts on the feed shaft 29. As shown in Fig. 4 there may be a number of the pins 36 according to the feed desired. In other words when the wheel 17 is provided with one pin only the rotation of the wheel 35 will be equal to the number of rotations of the wheel 17. If a faster feed is desired the number of pins carried by the wheel 17 is increased dependent upon the feed desired.

To secure the drill against movement relative to the object to be operated upon, I have provided the lag screws 40 which may be secured to any suitable support adjacent the object to be operated upon.

In the practical operation of the drill the base is secured adjacent the object to be operated upon and a drill of the desired size seated in the socket of the drill stem and the lever is then grasped and reciprocated from right to left. Each right hand stroke of the lever will impart a direct rotary movement to the drill point, and each left hand movement of the lever will impart a right hand movement to the drill point through the wheel 17, wheel 13 and wheel 15. By reason of the ratchet teeth on the wheels 15 and 17 being oppositely formed the pawls 25 and 27 will only be active in the direction of the stroke of the lever.

I claim:

1. In an apparatus of the class described, a base section, bearings carried by the base section, a sleeve carried by the bearings, a drill stem operating in said sleeve, a gear wheel secured to the sleeve, a gear wheel loosely carried by the sleeve, a gear wheel in mesh with each of the aforesaid gear wheels, a lever for actuating the gear wheels, means for connecting the gear wheels with said lever, whereby either stroke of the lever will rotate the drill stem in an effective direction, and means for automatically moving the drill stem longitudinally as it is being rotated.

2. In an apparatus of the class described, a base section, bearings carried by the base section, a sleeve carried by the bearings, a drill stem operating in said sleeve, a gear wheel secured to the sleeve, a gear wheel loosely carried by the sleeve, a gear wheel in mesh with each of the aforesaid gear wheels, a bifurcated lever embracing said sleeve, means carried by the lever for actuating the gear wheels whereby either stroke of the lever will rotate the drill stem in an effective direction, means for automatically moving the drill stem longitudinally as it is being rotated, a ring embracing the sleeve and occupying the bifurcated end of the lever, and means connecting the ring and the base to prevent movement of said ring, whereby the lever is held out of engagement with the gear wheels carried by the sleeve.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

ROBERT W. KREIS.

Witnesses:

H. G. FLETCHER,
E. L. WALLACE.