

H. L. EWING.
SCREW JACK.
APPLICATION FILED MAY 2, 1918.

1,298,316.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 2.

Fig. 5.

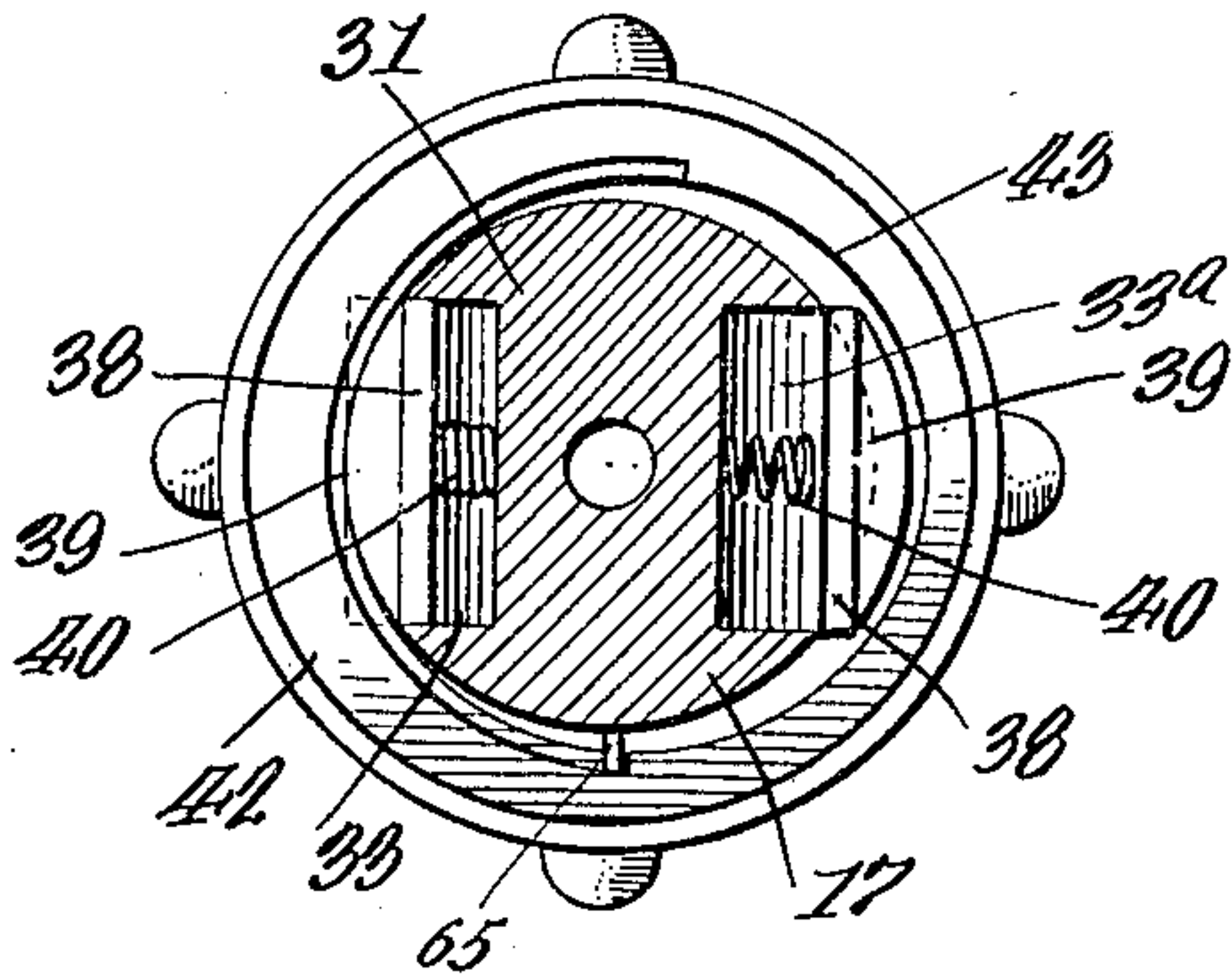


Fig. 6.

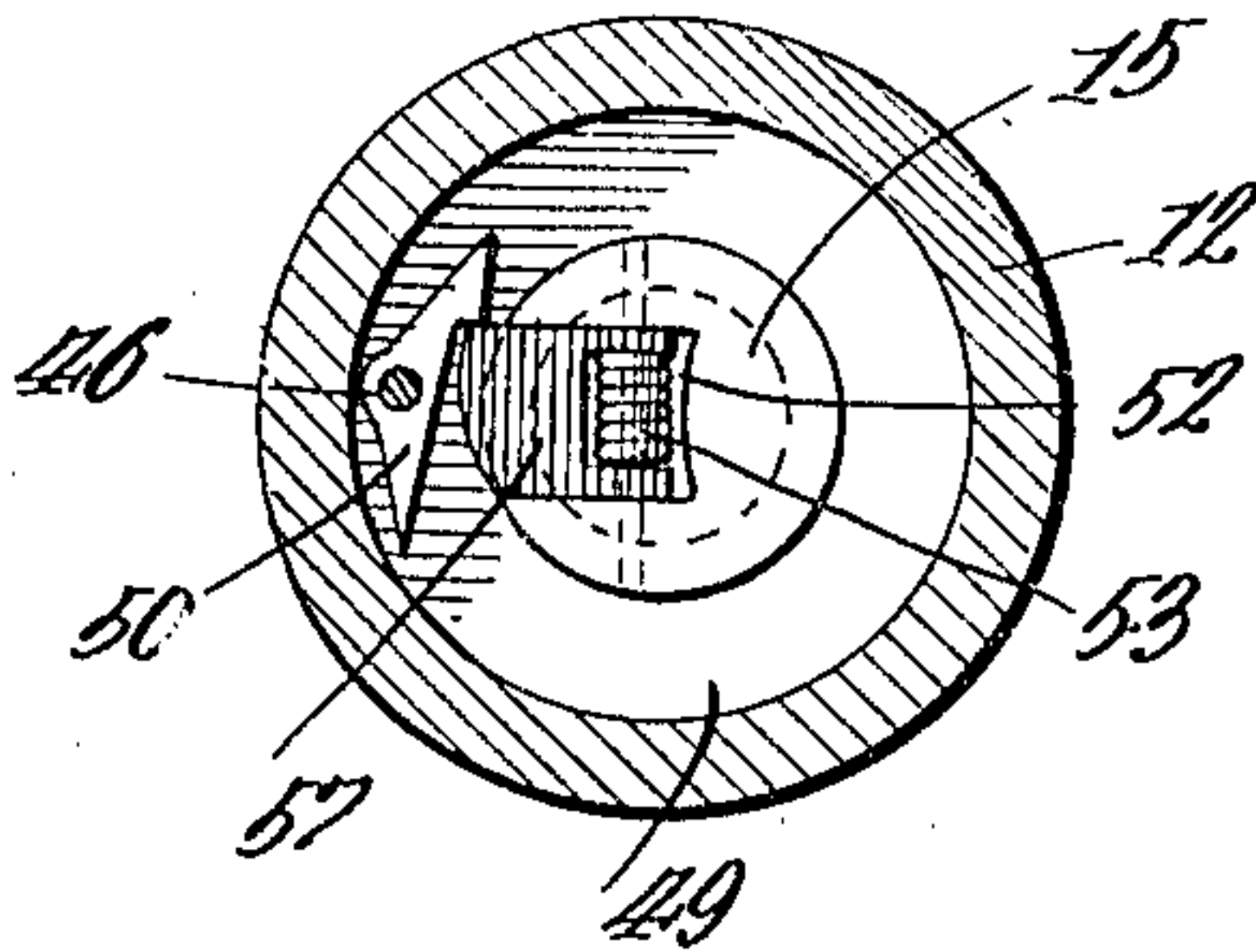


Fig. 7.

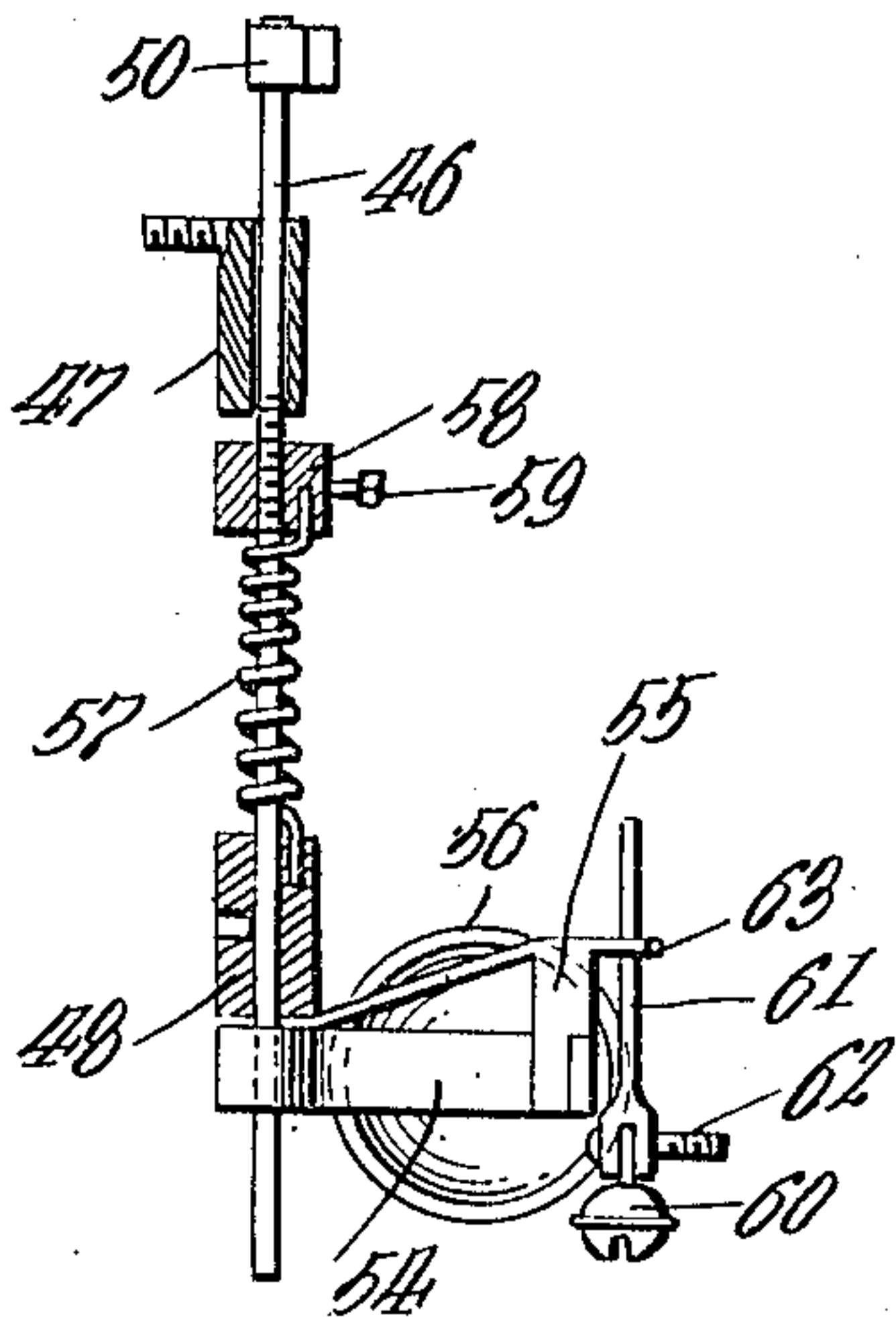


Fig. 8.

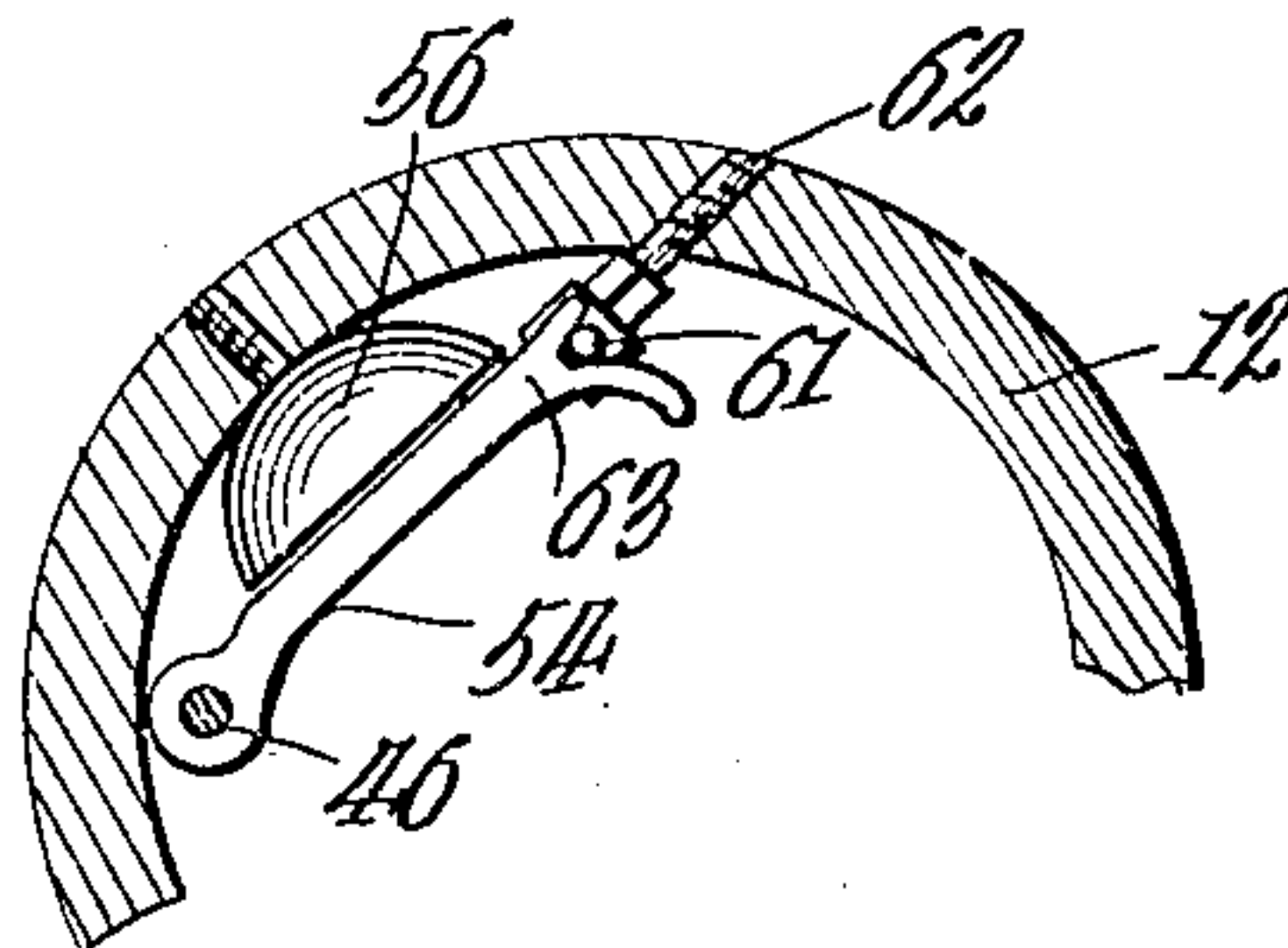
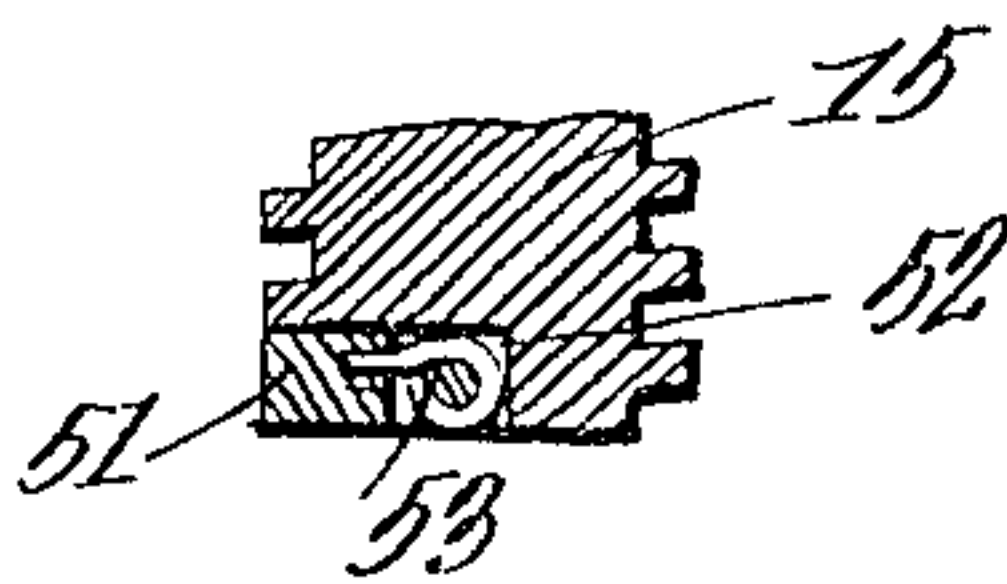


Fig. 9.



WITNESSES

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SCREW-JACK.

1,298,316.

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To all whom it may concern:

Be it known that I, HARRY L. EWING, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Screw-Jacks, of which the following is a specification.

This invention relates to jack screws and tools of like type, and has for its object to provide a tool of this character with a simple, strong and efficient means for raising and lowering the screw by an operating handle movable transversely of the axis of the screw and adapted to actuate the screw when the tool is placed in more or less inaccessible positions such as below a building, in a corner or close to a wall. Between the screw and handle are placed oppositely engaging pawl and ratchet devices by which the screw is turned when the swing of the handle is limited and so insure extension or retraction of the screw.

A further object of the invention is to provide within the base of the jack screw an alarm mechanism, preferably of an audible character which will automatically indicate to those using the jack screw when the screw has reached the safe limit of extension and thus prevent the danger of projecting the screw to an unsafe distance whereby it becomes disengaged from the base and is liable to fall and so endanger the lives of the persons within the vicinity through the possibility of the object that is being raised, falling when the screw becomes released.

With these objects in view, together with others which will appear as the description proceeds, the invention resides in the novel formation, combination, and arrangement of parts, all as will be described more fully, hereinafter, particularly pointed out in the claims, and illustrated in the accompanying drawings, in which,

Figure 1 is a side elevation of the jack screw complete.

Fig. 2 is a central vertical sectional view of the same.

Fig. 3 is a horizontal sectional view through the head of the jack screw on the line 3—3 of Fig. 2.

Fig. 4 is a cross sectional view of the head on the line 4—4 of Fig. 3.

Fig. 5 is a similar view on the line 5—5 of the same figure.

Fig. 6 is a horizontal sectional view of the

base on the line 6—6 of Fig. 2, the coupling screw being shown in its elevated position.

Fig. 7 is an elevation partly in section of the audible alarm device used with this invention.

Fig. 8 is a horizontal sectional view on the line 8—8 of Fig. 2, and,

Fig. 9 is a vertical sectional view of the lower end of the operating screw.

In the drawings, 12 indicates the base of the tool made as usual with an expanded foot and an upwardly inwardly tapering body provided at one side with a grip or handle 13 by means of which the tool may be transported from place to place and adjusted in position below an object to be moved. Through the top or smaller end of the base is formed a threaded opening extending longitudinally thereof in the axial line to receive the actuating screw 15 which passes downwardly into the body when the jack is in its lower position. At the extreme end of the top 14 is a cylindrical projection 16, shouldered where it joins the base to form a support and bearing for a laterally swinging head 17 when in its lowest position, said head serving to rotate the screw 15 so that it may be projected and retracted.

The screw 15 at its upper end is provided with a ratchet disk 18 having peripheral V-shaped teeth as shown in Fig. 3, said ratchet being rotatable within the head 17 between a flange 19 in said head and the top of the base. Above the ratchet 18 is a slightly reduced cylindrical bearing 20 around which the flange 19 turns. Extending upwardly from the bearing 20 is a square projection 21 over which is placed a second ratchet disk 22 of similar shape to the ratchet disk 18. Preferably the ratchet disk 18, bearing 20 and projection 21 are integrally formed with the screw 15, while an integral stem 23 projects from the part 21 and has a screw thread formed on its outer end. The head 17 is rotatable or adapted to swing upon the bearing 20, being supported by the annular flange 19 resting upon the top of the ratchet disk 18 so that when the screw is rotated to move it longitudinally, the head 17 will move with it.

The ratchet disk 22 bears upon the top of the flange 19 and is held thereon by an anti-friction bearing 24 placed between the upper surface of the ratchet disk 22 and the under-surface of a bearing cap 25 that

is placed against the object to be lifted. The cap is held in place upon the stem 23 and against the anti-friction bearing 24 by a nut 26 threaded on the outer end of the stem.

One end of the head 17 projects beyond the base 12 and in each side of the head are formed two horizontal notches 27 and 28 on each side in line with the ratchet disks 18 and 22, the outer ends of the notches on each side being united to form recesses 29 and 30 between which recesses is a vertical septum or wall 31 having a central longitudinal opening therein for the insertion of a rod or bar 32 by means of which the head is operated. Within the notches 27 and 28 and the recess 29 on one side of the head 17 is a pawl 33 formed with two fingers 34 and 35 seated in said notches and pivotally held therein by a vertical pin 36, said fingers each having a toe 37 adapted to engage one of the ratchet disks to turn the screw 15 in one direction. The tail of the pawl is made with a vertically curved shoulder 39 for a purpose soon to be described. A coil spring 40 between the wall 31 and the tail of the pawl 33 tends to maintain the toes of the pawls in engagement with the teeth of the ratchet disks. On the opposite side of the head 17 is a similar pawl 33^a, the fingers of which under certain conditions, engage the ratchet disks and reverse the movement of the screw.

Near its outer end, the head 17 is of circular cross section, as shown at 41 Fig. 5, to provide a bearing for a cam ring 42 which encircles the tails of the pawls 33 and 33^a and by means of which ring the pawls are disengaged from the ratchet disks. This ring has an eccentric or cam portion 43 on its inner circular face at a greater distance from the axis of rotation of the ring than the remainder of said inner face by which means when the cam portion 43 aligns or is brought opposite one of the pawls, the spring 40 presses the tail of said pawl outwardly into this cam portion and causes the toes on the fingers to engage the teeth of the ratchet disks. A half turn of the ring will carry the cam surface thereof to the opposite side and permit the pawl on said side to engage the ratchet disks. This movement of the ring brings the concentric surface of its inner face into engagement with the curved shoulder 39 on the tail of the pawl previously in engagement with the ratchet disk and causes said pawl to become disengaged. Means are provided to limit the movement of the ring 42 to a semi-rotation, said means comprising a pin 65 projecting radially from the head 17 into a semi-circular slot on the outer side of the ring 42. By this means the operator will at all times be aware of the condition of his tool and know which of the pawls 33, 33^a are

in engagement. The extreme end of the head 17 is threaded at 44 to receive a threaded retaining ring 45 for holding the cam ring 42 in place.

In connection with this tool is an alarm, preferably, audible, which is operated by the screw when in its highest or most extended position, compatible to safety, and comprises a longitudinal shaft 46 carried in bearings 47 and 48 bolted or screwed against the wall of the base 12 within a cavity 49 formed therein. At the upper end of the shaft is affixed a latch 50 that extends crosswise of the shaft and adapted to be engaged by a pawl 51 pivoted in a groove 52 formed in the bottom of the screw 15, the pawl projecting a short distance beyond the side of the screw so as to engage the trigger 50 and rock the shaft 46. A coil spring 53 is suitably fitted to the pawl 51 for the purpose of normally maintaining it in a horizontal position with its end projecting beyond the screw, but which will swing downwardly and out of the way when the screw is to be entirely removed from the base. Near the lower end of the shaft 46 is secured an arm 54 extending outwardly from said shaft and is provided on its free end with a hammer 55 to strike a bell 56 and give an alarm. The arm 54 is retracted or moved away from the bell when the trigger is rocked by the pawl 51 and moved toward the bell to cause the hammer to strike, by a spring 57 coiled around the shaft 46 above the bearing 48 and secured at one end to the bearing, its opposite end being attached to a collar 58 threaded on the shaft and provided with a screw 59 for holding said collar against movement after the spring has been properly adjusted.

In addition to the bell 56 which is of the gong type there is also employed a second bell 60 of a continuously ringing or jingling type which is mounted on the lower end of an arm 61 pivoted at 62 to the base 15 and having a free upwardly extending end that is embraced by a fork 63 on the end of the hammer arm 54, the arrangement being such that when the shaft 46 is moved away from the bell 56, the bell 60 will ring through the action of the fork 63 on the arm 61, and on the return or striking movement of the arm 54, the bell 60 will also ring.

The operation of the tool is self evident. When in position, a semi-rotation of the cam means 42 will disengage one of the pawls 33, 33^a from the ratchet disks and permit the other pawl under tension of its spring 40 to engage said disks and upon movement of the head 17 the screw 15 will be turned in one direction; if however, the ring 42 be given a semi-rotation in the opposite direction, the pawls heretofore free of the ratchet disks will be engaged therewith and the opposite pawl released. In this position move-

ment of the head 17 turns the screw in the opposite direction. The screw rotated in one direction or the other as described will cause it to be projected from or retracted
5 into the base 12 in well known manner.

When the screw 15 has been projected from the base 12 as far as it is safe for it to go, the pawl 51 on the lower end of the screw will engage the trigger or latch 50 and rock
10 the shaft 46, thereby swinging the arm 54 and the hammer 55 away from bell 56 which as soon as the pawl 51 passes the latch are forcibly returned to normal position by the spring 57 and the hammer caused to strike
15 the bell 56, giving a signal that may be audible at some distance from the pack. In addition to the alarm from bell 56 the jingling bell 60 is also caused to ring by the fork 63 rocking the arm 61, to which the bell is at-
20 tached. The alarm will be operated several times if the screw continues to be rotated, so should the first signal be unheeded the second or third will be sufficient warning.

The foregoing description and the draw-
25 ings have reference to what may be considered the preferred, or approved form of my invention. It is to be understood that I may make such changes in construction and arrangement and combination of parts, ma-
30 terials dimensions, et cetera, as may prove expedient and fall within the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by
35 Letters Patent, is:

1. In a tool of the kind described, the com-

bination of a base, a screw longitudinally threaded into said base, a pawl on the lower end of said screw projecting laterally from the side thereof, a vertical shaft within said
40 base at one side of said screw, a lug on the upper end of said shaft adapted to be engaged by the pawl on said screw when raised to its highest position for rocking said shaft, an audible alarm within said base, and a
45 hammer on the lower end of said shaft for striking said alarm when said shaft is rocked.

2. In a tool of the kind described, the combination of a base, a screw longitudinally
50 threaded into said base, a pawl on the lower end of said screw projecting laterally beyond the side thereof, a vertical shaft journaled within said base substantially parallel to said screw and at one side thereof, a lug
55 on the upper end of said shaft in position to be engaged by the pawl on the screw when the latter is raised to its highest position and rock said shaft, an audible alarm secured within said base, a hammer carried by
60 the lower end of said shaft for striking said alarm when the shaft is rocked, a second alarm within the base carried by a pivot arm for actuating said alarm, and a finger on the
65 aforesaid hammer for striking said arm when the hammer is operated.

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

HARRY L. EWING.

Witnesses:

S. C. FOOTER,
JNO. CLARK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."