

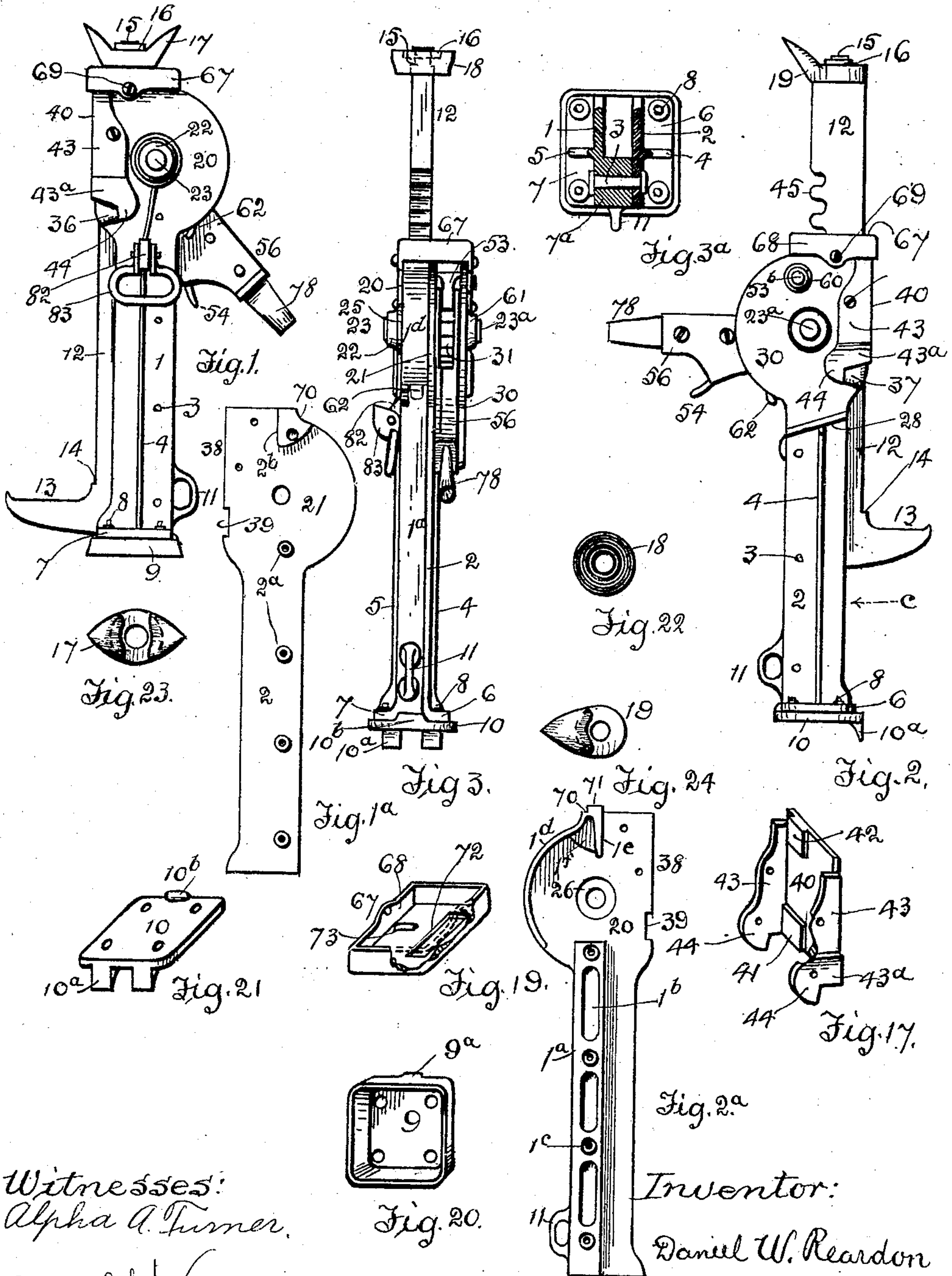
No. 879,673.

PATENTED FEB. 18, 1908.

D. W. REARDON.
LIFTING JACK.

APPLICATION FILED JAN. 2, 1906. RENEWED JUNE 21, 1907.

2 SHEETS—SHEET 1.



Witnesses:
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Jas. H. Kouns.

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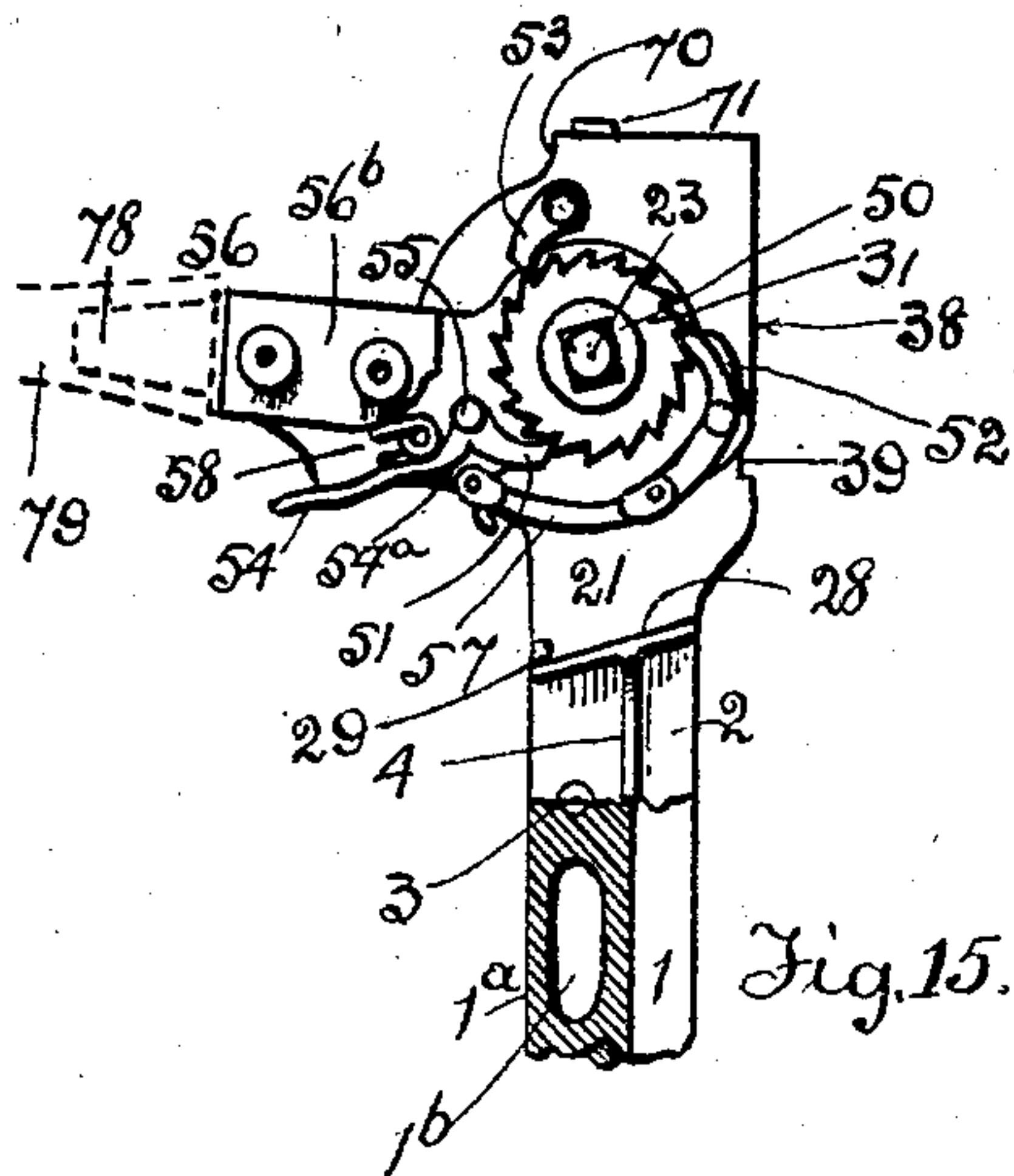


Fig. 15.

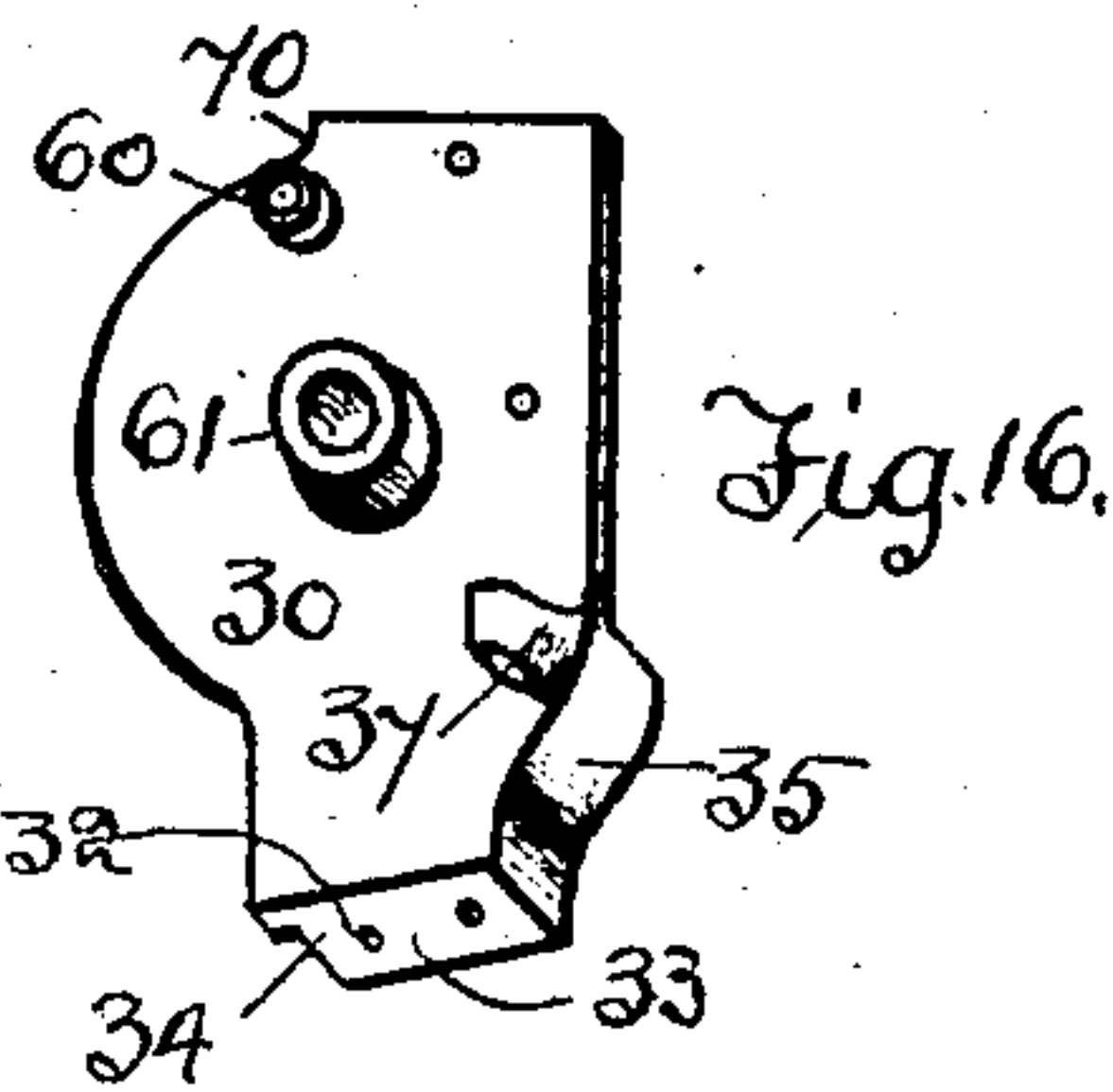


Fig. 16.

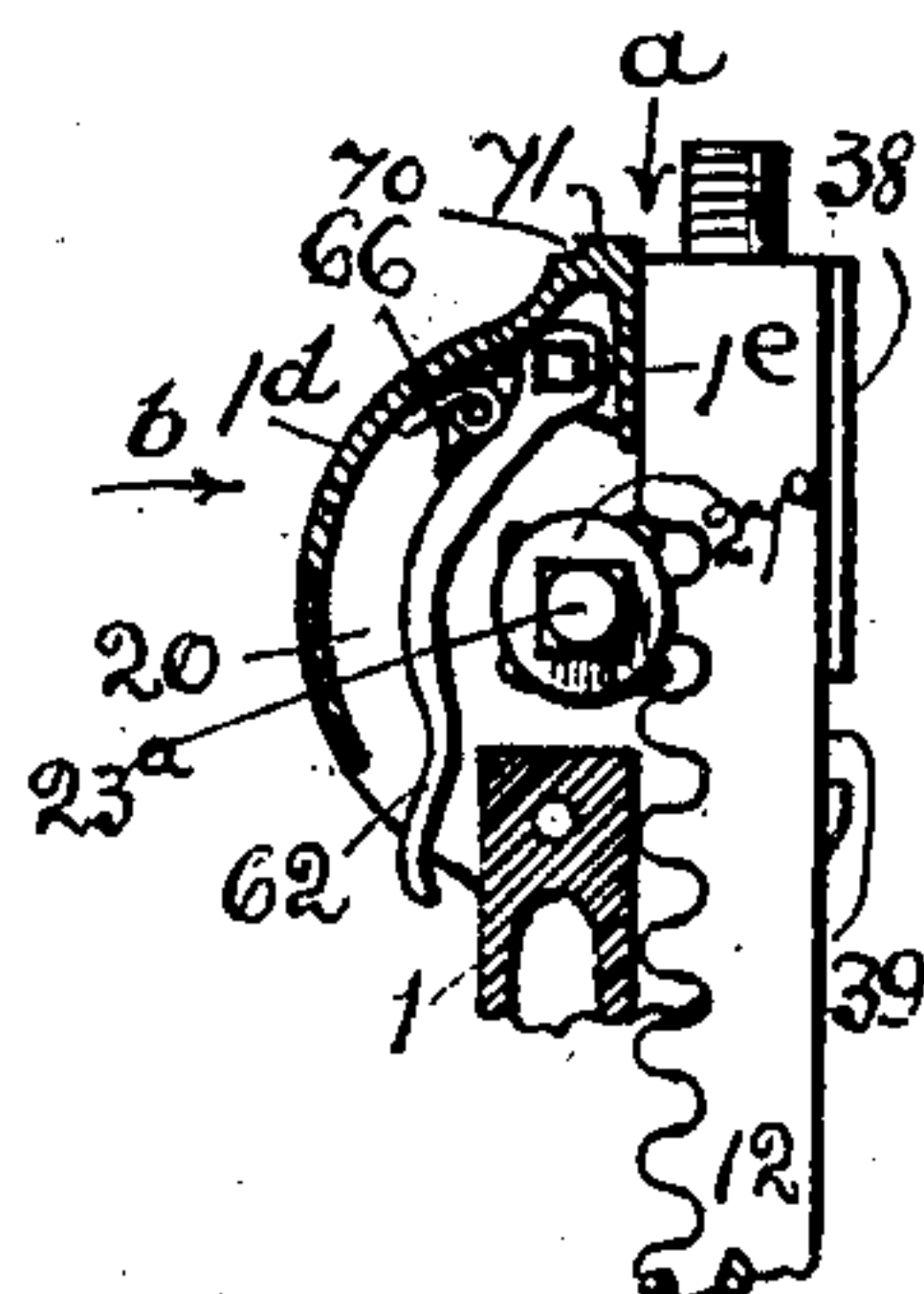


Fig. 4.

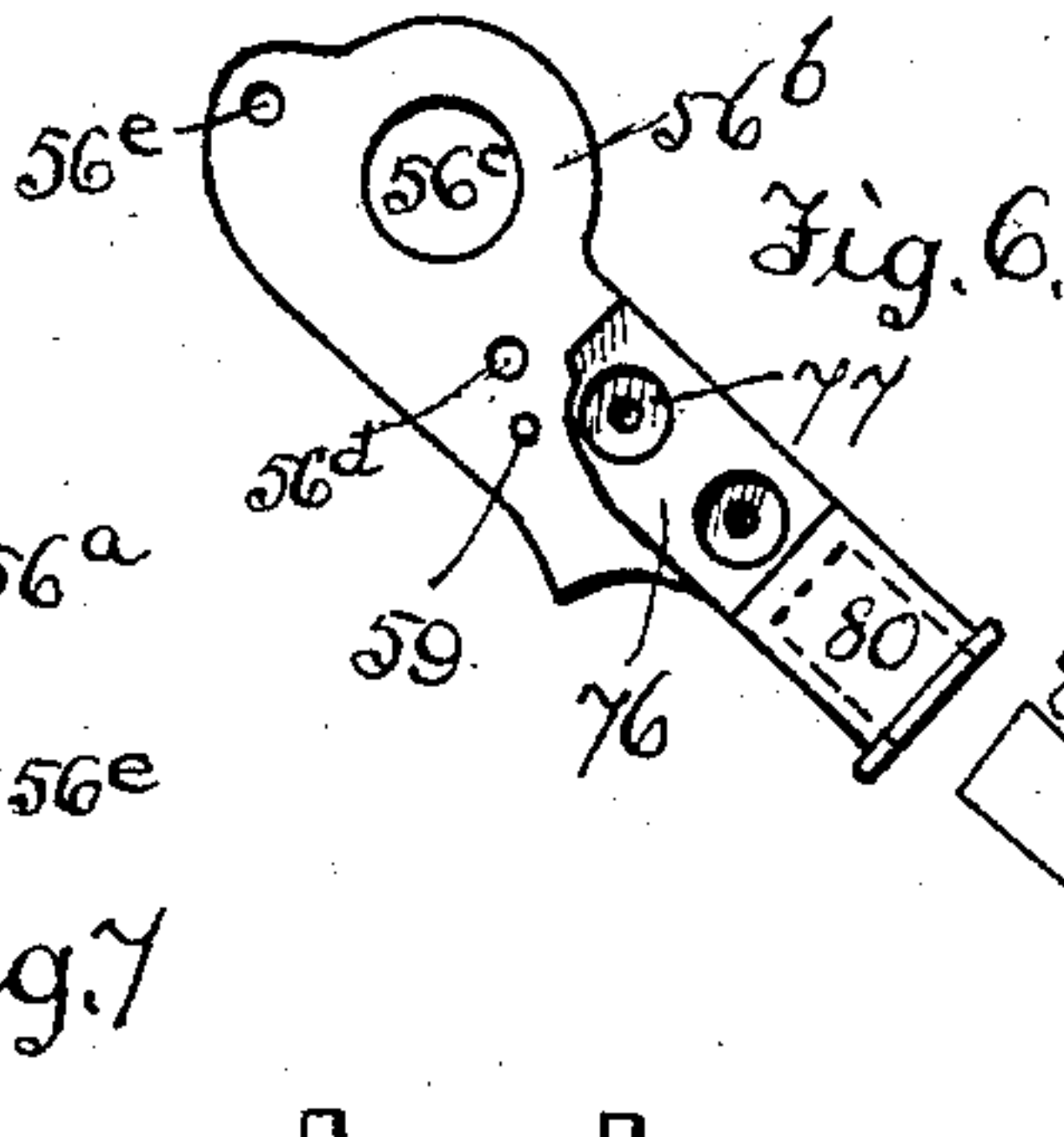


Fig. 6.

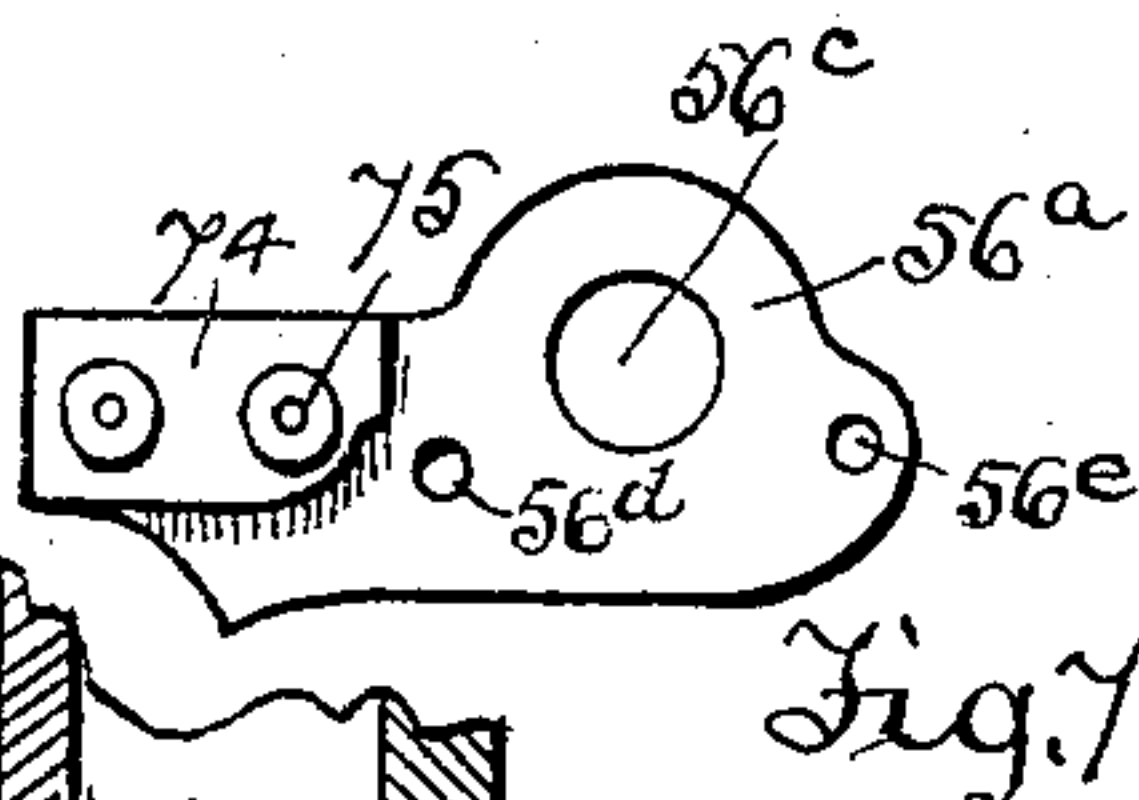


Fig. 7.

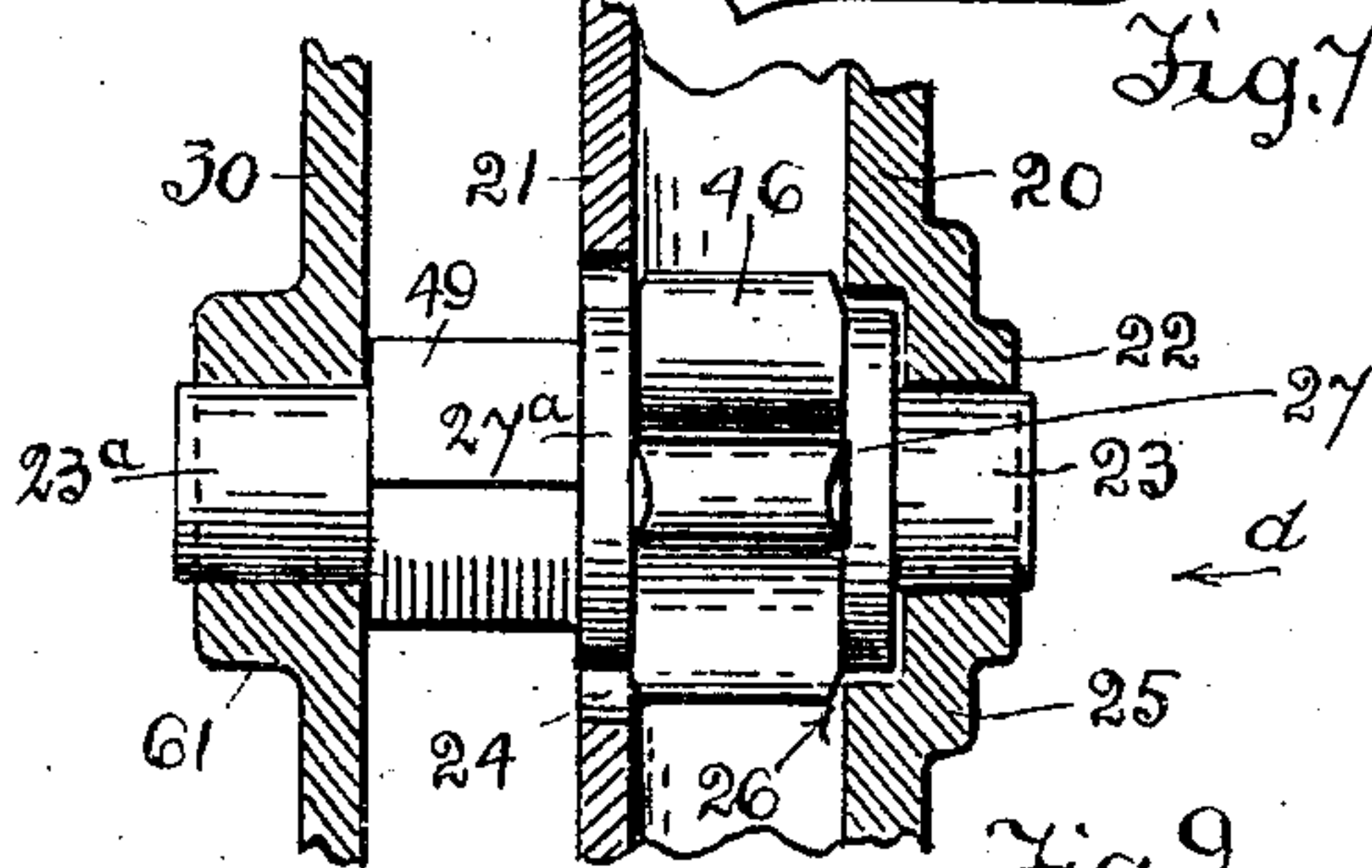


Fig. 9.

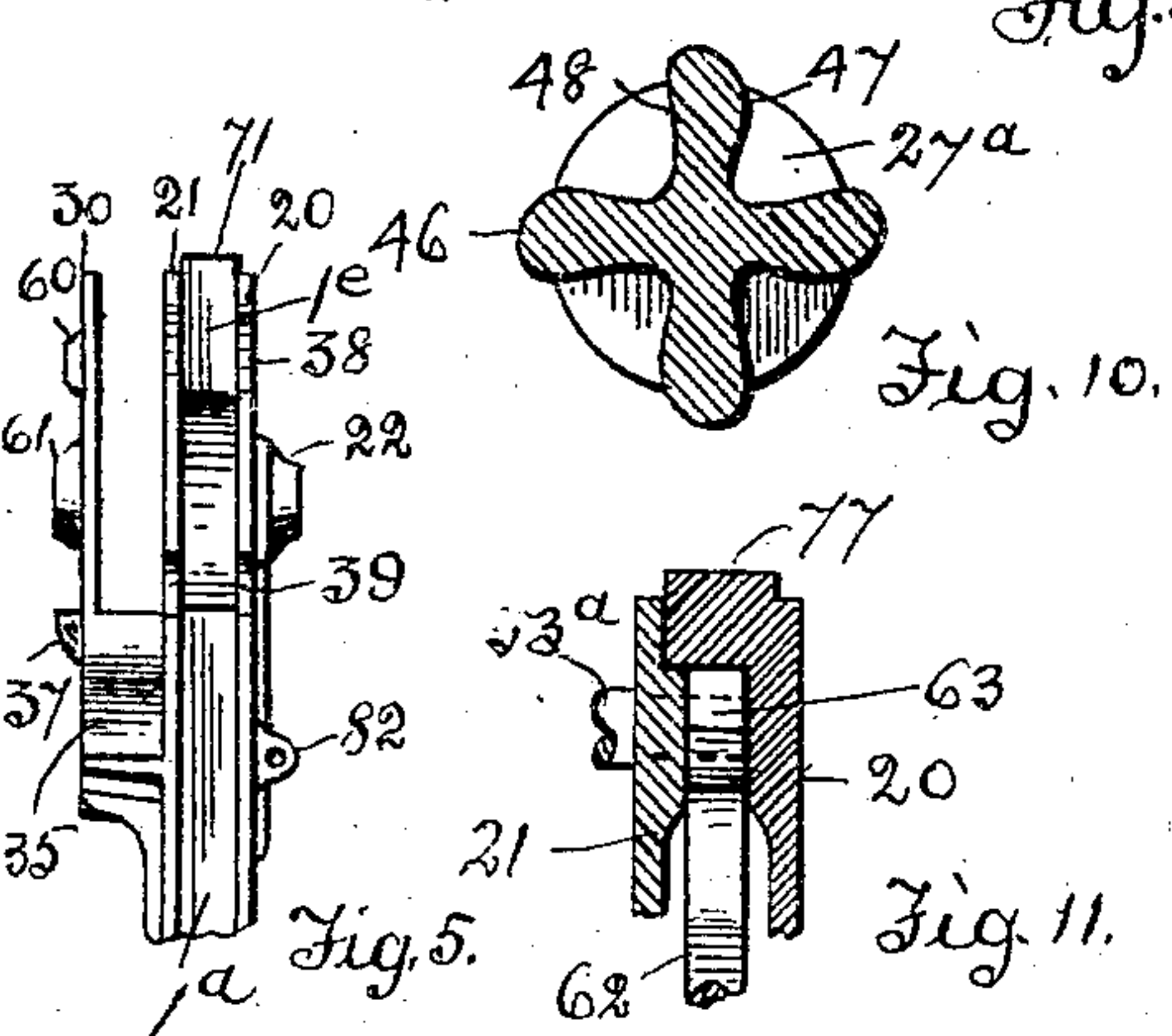


Fig. 10.

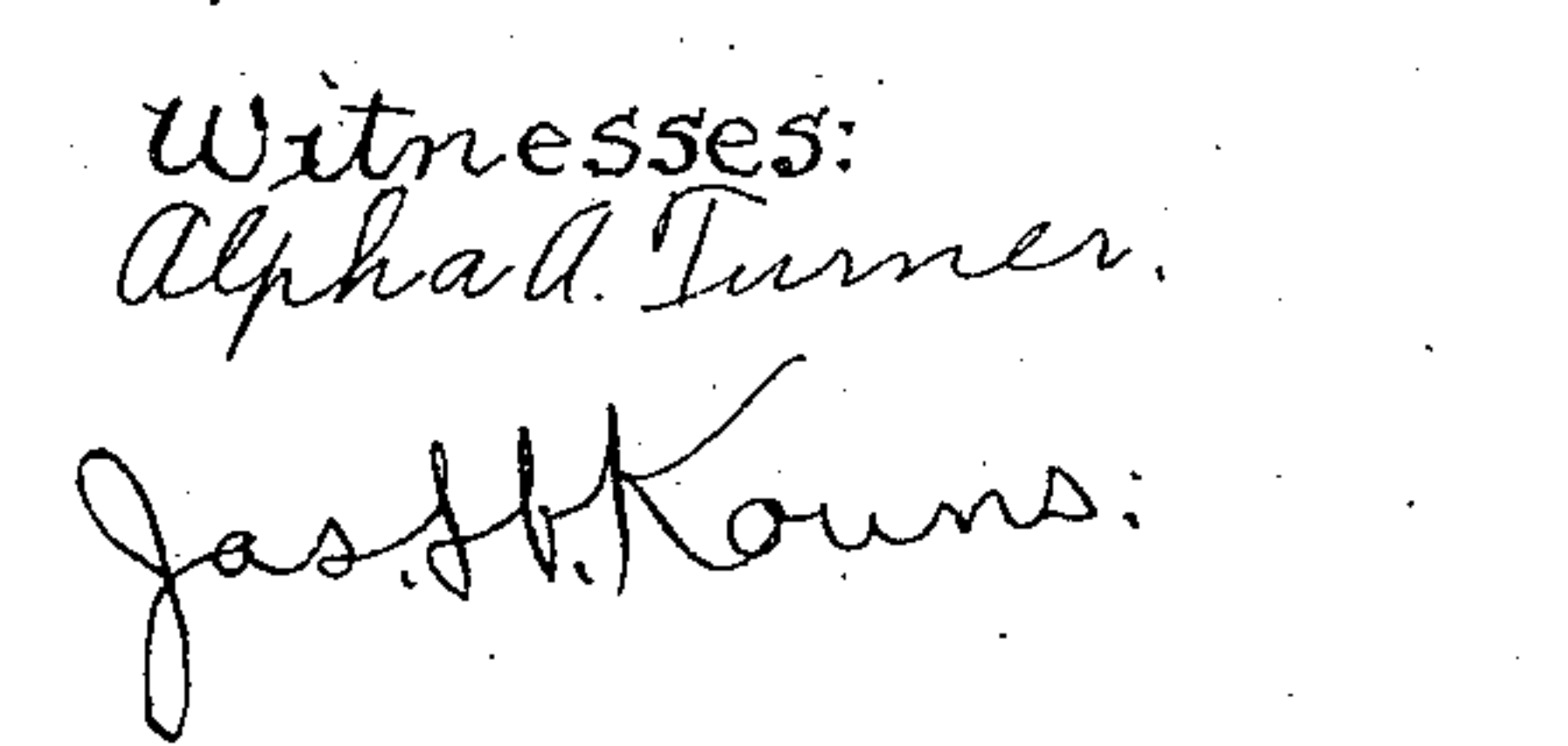


Fig. 11.

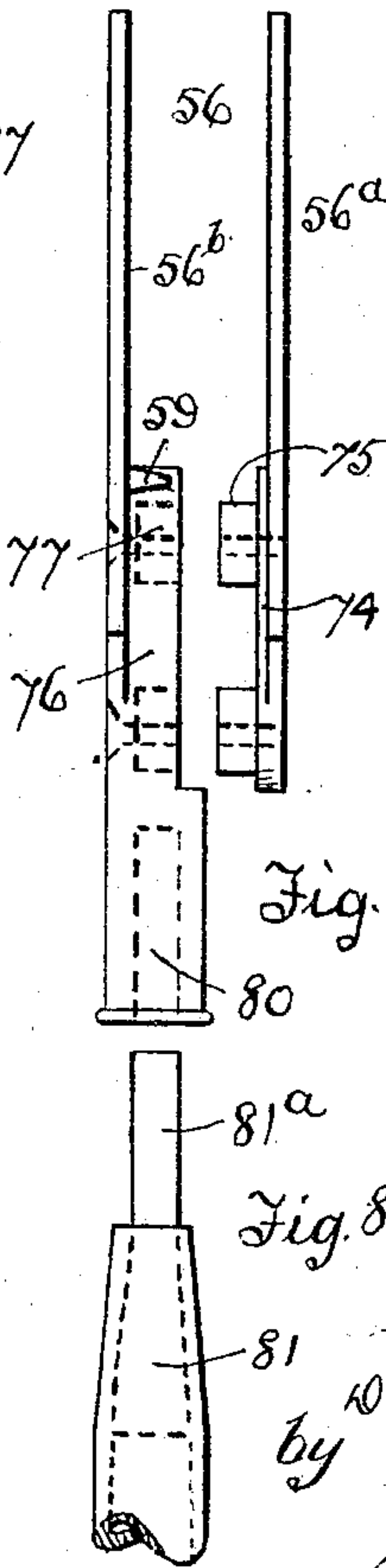


Fig. 8.

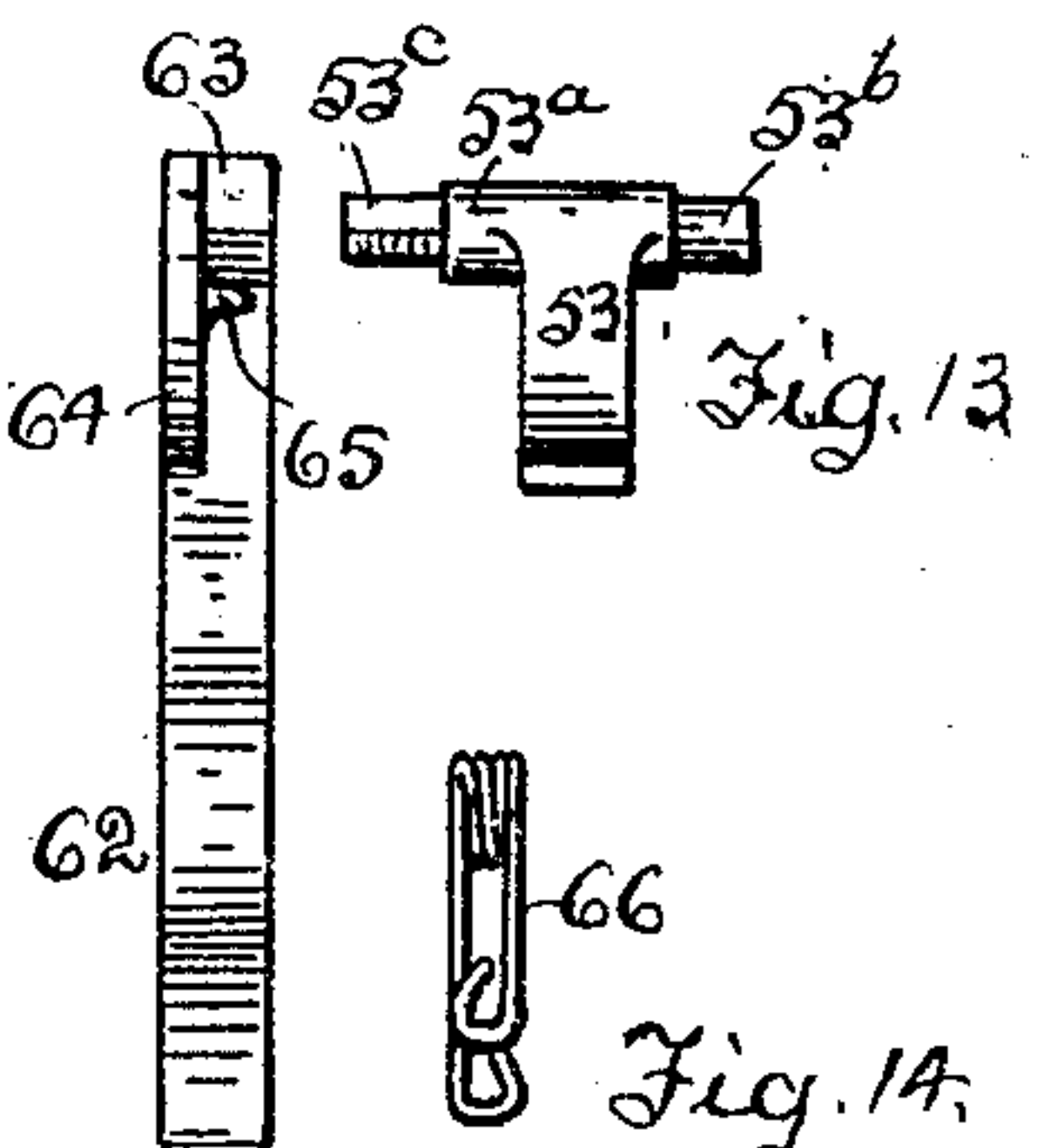


Fig. 13.

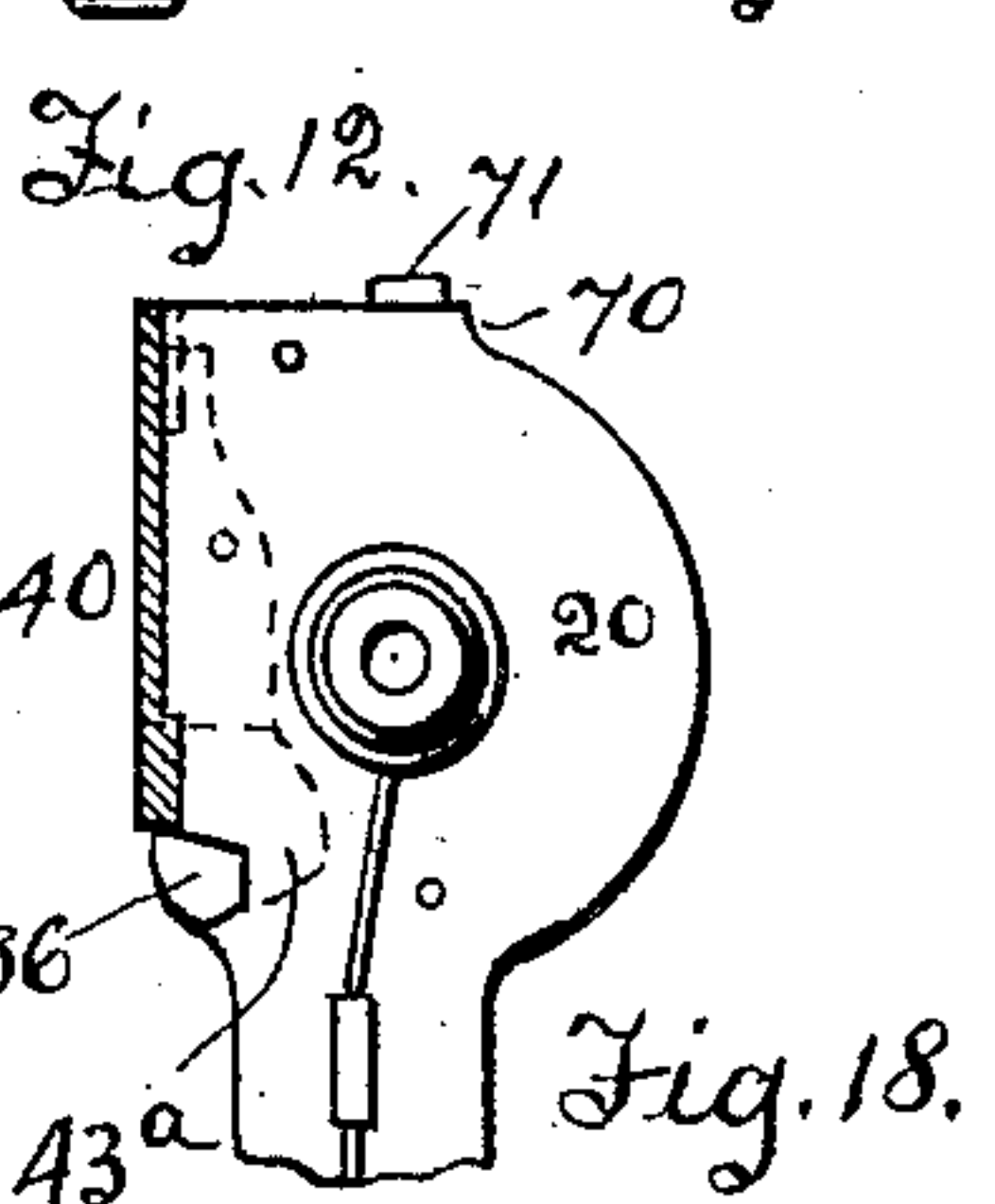


Fig. 12.

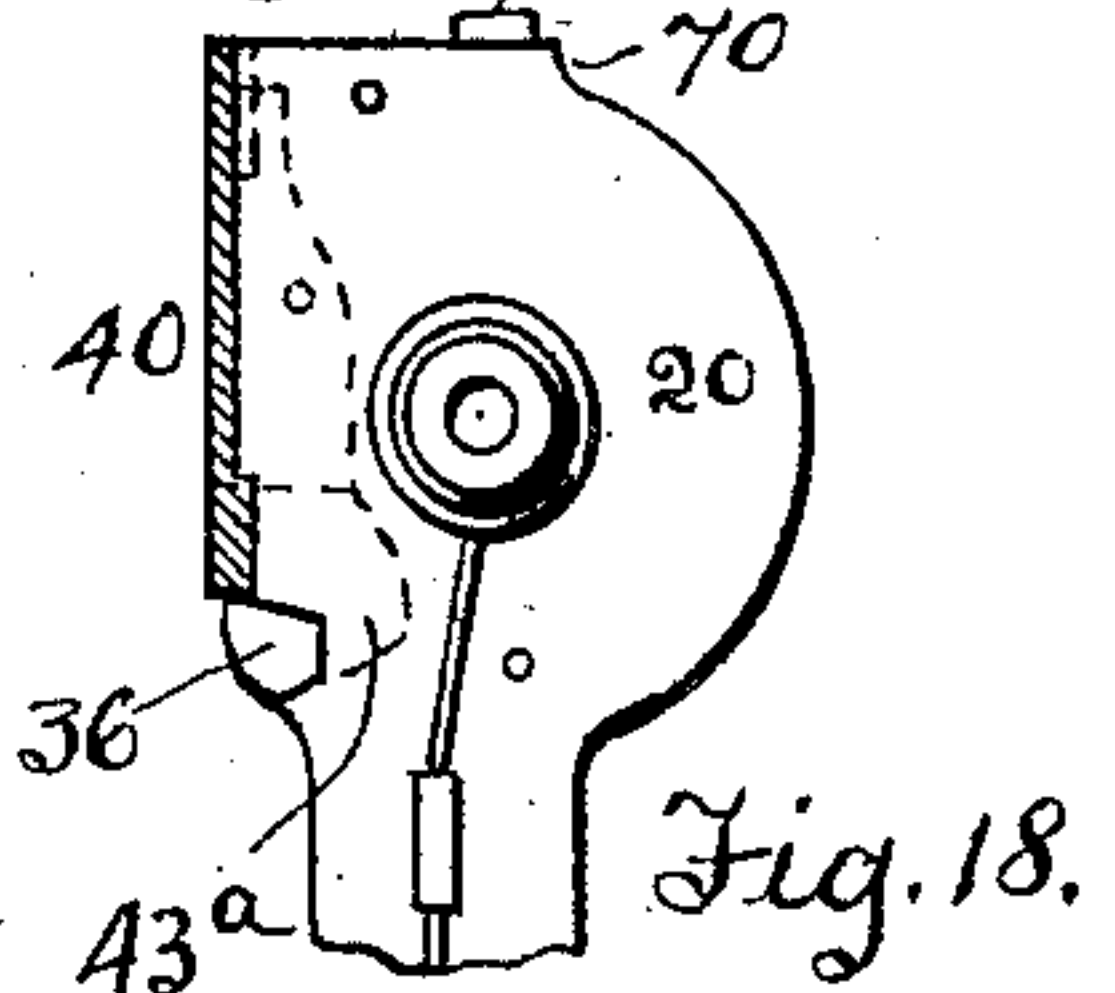


Fig. 18.

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UNITED STATES PATENT OFFICE.

DANIEL W. REARDON, OF PORTLAND, OREGON, ASSIGNOR, BY MESNE ASSIGNMENTS, OF THREE-FOURTHS TO ALBERT E. HOLMES AND JAMES McNAUGHTON, BOTH OF CREIGHTON, OREGON.

LIFTING-JACK.

No. 879,673.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed January 2, 1906, Serial No. 294,252. Renewed June 21, 1907. Serial No. 380,178.

To all whom it may concern:

Be it known that I, DANIEL W. REARDON, a citizen of the United States, and resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

This invention is an improvement in "lifting jacks" and has for its object to so contrive and assemble the parts as to offer the greatest strength where subjected to the greatest strain and wear. Furthermore, to so arrange the whole as to make the same simple of construction, and more durable and convenient to operate than the prior existing devices.

It is also my special object that the parts of my jack are so arranged that the pieces thereof which are most liable to be broken, may be inexpensively replaced.

To this end the construction and arrangement of my jack is as shown in the accompanying drawings, hereby referred to as a part of this specification, and representing as follows: Figure 1 is a side elevation (of the near side) showing my jacket complete; Fig. 1^a is an elevation of the inner face of the left wall or side of the standard; Fig. 2 is an exterior elevation of the opposite side; Fig. 2^a is an elevation of the inner face of said opposite side; Fig. 3 is an elevation of the rear; Fig. 3^a is a cross section, on larger scale, on line *c* of Fig. 2; Fig. 4 is a sectional detail of one division of the housing containing part of the devices for lifting the lifting-bar; Fig. 5 is an elevation of the near face of the upper part of my lifting jack, with the outer housing plate removed, so as to disclose those portions of the devices for lifting and lowering the lifting jack which are contained in the division of the housing disposed opposite to that shown in Fig. 4. Figs. 6, 6^a, 7, 8 and 8^a are details of the construction of the operating lever or handle-bar, the handle portion being shown in Figs. 6^a and 8^a as made to be withdrawn; Fig. 9 is a detail of the construction of my improved pinion by which the lifting-bar is lifted, showing the bearings for said pinion; Fig. 10 is a cross section of my pinion; Fig. 11 is a sectional detail, on a larger scale, taken on

a line *a* of that part of the housing shown in Fig. 4. Fig. 12 is a detail of the spring-controlled lever constituting a part of the dogging mechanism, viewing such lever as pointed out by the arrows *b* in Fig. 4; Fig. 13 is a detail of the pawl constituting a part of said dogging mechanism and operated by the lever shown in Fig. 12; Fig. 14 is an elevation of the spring controlling the lever last referred to; Fig. 15 is a detail showing a section of the upper part of the standard constituting the housing in which the lifting devices are contained; Fig. 16 is a perspective detail of the right or removable plate of the said housing; Fig. 17 is a perspective detail of the front plate of said housing; Fig. 18 is a detail showing said front-plate in its position, and in particular the provision for the interlocking of the lower part of said front plate with the wall plates of the housing; Fig. 19 is an inverted perspective view, with parts broken away, of the cap affixed on the top end of my jack; Fig. 20 is a bottom perspective view of the removable foot shown in Fig. 1; Fig. 21 is a perspective top view of the type of removable foot shown in Figs. 2 and 3, interchangeable with the style of foot shown in Fig. 1; and Figs. 22 to 24 are details of interchangeable heads for my jack, showing in the order named, heads made with a flat upper surface, or a single horn or a double horn.

The numerals refer to the parts described.

My jack comprises a standard made of two parts or castings 1, 2, riveted together by rivets 3. Bolts may be used in place of said rivets. The parts are respectively cast with integral strengthening ribs 4, 5 and foot-ports 6, 7; the latter are provided with screw-holes to receive bolts 8, by which the foot-plate is secured in place. The particular construction and fitting together of the two sides of the standard may be better observed from the inner face elevations, Figs. 1^a and 2^a and cross-section, Fig. 3^a thereof. It will be noted the side 1 is cast with a bridge-web, 1^a cored out in parts, 1^b to reduce weight, and has cavities 1^c in which to receive studs 2^a projecting from the inner face of the side 2; it also has a web 1^d and partition 1^e. The opposite side 2 is made with studs 2^a, by the aid of which the two sides are readily assembled, and are given

rigidity when put together. The two sides have further features which will be described below.

I provide two types of foot plates 9, 10, the former being particularly shown in Fig. 20, and having a flat base, and the latter being particularly shown in Fig. 21, and having calk-like toes on the bottom. These foot-plates may be used interchangeably, as convenient. The type provided with toe-calks is useful to hold the jack against slipping when using the same on inclined skids or logs, in which case the toe-calks are necessary to give a firm hold to the base of the standard. Both types are made with ribs 9^a or 10^a to interlock with the base of the foot or the standard. The bottom end of the standard is further made with an integral ear 11 to which to fasten a rope, by which to secure the jack against falling into the water, and being lost, while working on a log jam for example.

Vertically sliding in the standard is a rack, or lifting bar 12, the bottom end of which is made with a projecting foot 13, and a shoulder 14. The function of the latter will be later described.

The head-end of the lifting-bar 12 is provided with a threaded stud 15, to receive a nut 16, by which any one of head-plates 17, 18, 19, shown in Figs. 1, 2, 3, and also in Figs. 22, 23, 24, and representing a flat head (18) and heads made with one (19) or two (17) horns, may be interchangeably used, as convenient. The upper section of the standard constitutes the housing for the devices by which the lifting-bar 12 is lifted, and lowered and to this end the upper sections of the parts 1, 2, are made with protruding portions 20, 21. The portion 20 is made with a boss 22, constituting a bearing for one trunnion-end of the pinion 23, and the portion 21 is merely made with an opening 24 (see Fig. 9) through which to insert the pinion 23. It is to be observed from Fig. 9 that the portion 20 is made with a thickened part 25, and an annular cavity 26, in which to receive the annular integral plate 27 of the pinion 23, thereby allowing the housing for said pinion to be made narrower, and, furthermore, the cavity 26 provides an additional bearing for the pinion 23 and relieves the strain on the bearings 22, 23.

The side 2 of the standard is provided with a bracket 28, having a transverse rib 29. On the bracket 28 is set the side-plate 30 which constitutes the outer wall of the housing inclosing the ratchet 31 and cooperating devices by which the pinion 23 is rotated. The base 33 of the housing plate 30 has a portion 34 cut away to adapt the same to be set up against the transverse rib 29 and such base is made with holes 32 to receive screws to secure the plate 30 in position. The front end of the base 33 of said plate 30 is con-

tinued in the form of a web 35, by which the plate 30 may be properly set up against the middle wall 21. Incidentally the web 35 also materially strengthens the parts. For in the jacks heretofore in use it frequently happened that the housing of the rack-pinion was broken, in case of an inadvertent forcible upward movement of the lifting-bar, after the same had already attained its extreme up-position. In my construction such accident is impossible. The portion 20, and the plate 30 are each made with lugs (36, 37) and the front perpendicular edges 38 of the walls 20, and 21 are respectively made with recesses 39. Embracing the plate 30, and the wall portion 20 is a front plate 40 which guides the upper end of the lifting-bar. Said front plate is made with a protuberance 41, (see Fig. 17) extending across the wall portions 21, 20 and lying in the recesses 39 thereof. The top of the web 35 of the plate 30 abuts against the bottom of the protuberance 41, and the exterior lugs 37, 38 reinforce those portions of the walls 20, 30 which may be subjected to severe strain.

The bottom portions 43^a of the sides 43 of the front plate 40 are also given more metal and are made with lugs 44 interlocking with the lugs 36, 37 on housing plates 20, 30. The upper portion of the front wall of the plate 40 is made with an inner protuberance 42, which fits between the wall-portions 20, 21, and provides a bearing surface for the lifting bar to slide against, in the same vertical plane as the surface of the protuberance 41.

The lifting-bar 12 is made with a series of cogs 45, engaging with the teeth or cogs 46 of the pinion 23. The journaling of the latter is shown in Fig. 9. I prefer to use a four-toothed pinion, but have ascertained that unless the same is of the construction shown in the section Fig. 23 (viewing the same as indicated by the arrow *d* in Fig. 9) the same will not act freely in lowering the lifting-bar; that is, the pinion frequently "bucking" or getting on the center while the bar is being lowered. To avoid this, the teeth 46 of the pinion are made with lifting (47) and lowering (48) faces, the former being convexed and the latter almost flat or straight. The pinion is cast with annular side-plates 27, 27^a, which strengthen the pinion. The square portion 49 of the shaft of the pinion 23 is made somewhat tapering, and is adapted to fit the square central hole of the ratchet-wheel 31, which is made with a boss 50.

The dogging devices of the ratchet-wheel are so contrived as to act equally well in lowering as in raising the lifting-bar. To this end the ratchet wheel is engaged by three pawls, or detents 51, 52, 53. The first mentioned two are operated by a lever 54, having laterally projecting lug-pins 55 by

which it is pivoted in the holes 56^d between the two sides 56^a, 56^b, of the inner or box-end of the handle-bar or lever 56, by which the jack is operated. The ratchet-wheel 31 is also mounted on the square shaft-portion 49, of the pinion 23 between the sides 56^a, 56^b; and the pawl 53 is pivoted in holes 56^e between said sides. The lever 54 has a web 54^a to which is connected one end of a link 57; and the latter is connected with the pawl 52. The lever 54 is controlled by a spring 58, held on a lug-pin 59 cast integrally on the side 56^b of the lever 56. It is to be noted that the head of the pawl 51 is made of sufficient length to engage with the ratchet wheel 31 as illustrated in Fig. 5. However, this pawl may be cut away or omitted because said pawl was intended primarily to partially rotate the pinion past its "centering" position, which with the described improved construction of my pinion is no longer to be apprehended. By operating the lever 54 both pawls, 51, 52 may be simultaneously released. The pawl 52 may also be omitted since the pawl 51 will do the detent work alone.

The pawl 53, is of the construction shown in Fig. 13. The shaft-end 53^b thereof has its bearing in a boss 60 cast on the plate 30, the shaft end 53^a has its bearing in the reinforced portion 2^b of the housing-wall 21; and the end of the square shank 53^c bears against the reinforced part 1^f of the housing wall 20. The housing plate 30 is made with a boss 61 for the trunnion-end 23^a of the pinion 23.

On the square shaft-end 53^c of the pawl 53 is affixed the head 63 of the lever 62; the latter has a web 64 and a stud-pin 65. On the stud-pin 65 is mounted a spring 66 by which the lever 62 is so controlled as to normally hold the pawl 53 in engagement with the ratchet-wheel 31. The webs 1^d and 1^e (see Fig. 4) form a pocket facilitating the arranging of the lever 62 in place, when assembling the parts. Incidentally they strengthen the housing of the ratchet or dogging mechanism, and the reinforcement 2^b (see Fig. 1^a) gives a greater bearing surface for the axle-end 53^a of the pawl 53.

On the upper end of the jack is affixed a top-plate 67 (see Figs. 1, 2 and 19) by which the upper ends of the housing of the pinion and the dogging-mechanism is closed. To give sufficient strength, the top-plate 67 is made with a rim flange 68, adapted to receive screws 69, such rim flange fitting over the shoulders 70 formed on the wall-portions 20, 21, 30, and the wall-part 21 is made with a projecting square stud or head 71, which is a part of the web 1^e, and is inserted in one end of the long slot 72 through which the lifting bar rises. On the inner face of the top-plate is cast a rib 73 adapted to be positioned between the wall portions 20, 21.

The whole arrangement being contrived to give ample strength to the head-end or top of my jack.

The described dogging-mechanism is contained in the inner, box-like end of the lever or handle bar 56. Such box-end may be provided with a fixed or a removable handle, and the same consists of two parts 56^a, 56^b shown in Figs. 6, 6^a, 7, 8 and 8^a. Said parts are respectively so contrived that they may be readily put together, and thereafter secured in place by ordinary flat-headed machine screws. The latter have not to bear any of the working strain, but the part 56^a is made with a thickened portion 74, provided with integral studs 75, and the part 56^b is made with a thickened part 76 having sockets 77 in which to receive the studs 75. The portion 76 of the part 56^b is made of sufficient thickness to allow for the sockets 77, and the two protuberances 74, 75 are arranged to hold the parts 56^a 56^b the distance apart required to accommodate the dogging-mechanism. Both pieces 56^a 56^b are made with eyes 56^c to receive the bosses 50 on the exterior of the ratchet-wheel 31. The outer part of said box-end of the handle-bar or lever 56 may, as mentioned, be made either with a fixed handle or a removable handle, as convenient. A type of the first mentioned kind is shown in Fig. 5, and comprises an integral stud 78, on which is welded the end of a length of pipe, as indicated by broken outline 79 in Fig. 5, the other type of handle-bar is shown in Figs. 6, 6^a, 8 and 8^a and comprises a socket 80 in which to receive the integral stud 81^a of a detachable handle 81.

In putting my lifting jack together the parts are assembled in the following order: Fit and secure the two parts of the standard together and affix the particular foot desired to the base of the standard; insert the lever 62 placing the spring 66 on the stud 65 through the eye 24 of the housing wall 21; insert the pinion 23 and place the box-end of the lever 56 on the square shank-portion 49 of the pinion; it being understood that the ratchet and coöperating devices have been previously inserted in said box-end; the ratchet-wheel 31 being held in place as already mentioned, by the bosses 50 on both faces being inserted in the eyes 56^c of the lever portions 56^a, 56^b. Next secure the housing plate 30 in place on the bracket 26; then insert the lifting bar, affix the front plate 40; affix the head plate 67, and finally affix the particular style of head (17, 18, 19) desired on the head of the lifting-bar.

The standard section 1 is made with an integral ear 82, in which is pivoted a ring-handle.

I claim—

1. In a lifting-jack, the combination of a standard consisting of two parts, one thereof

being made with a web spacing the parts apart and having sockets in such web, and the other being made with studs positioned to enter said sockets, and there being perforations through said sockets and studs to receive bolts or screws to secure the parts together.

2. In a lifting-jack the combination of a standard comprising wall-portions 20, 21 made with recesses 39 respectively in their rear edge-faces, a wall-plate 30 affixed to the exterior of the wall portion 21, and having a web 35, lugs 36, 37 integrally formed on the exterior of the wall portions 20, 30, and a front plate provided with sides, straddling and fastened to the walls 20, 30, and having lugs interlocking with the lugs on the exterior of such walls, and further made with a protuberance inserted in said recesses of the walls 20, 21 in contact with the web 35 of the wall 30.

3. In a lifting-jack, the combination of a standard comprising wall-portions 20, 21 made with recesses 39 respectively in their rear edge-faces, a wall-plate 30 affixed to the exterior of the wall portion 21, and having a web 35, lugs 36, 37 integrally formed on the exterior of the wall portions 20, 30, a front plate provided with sides, straddling and fastened to the walls 20, 30, and having lugs interlocking with the lugs on the exterior of such walls, and further made with a protuberance inserted in said recesses of the walls 20, 21 in contact with the web 35 of the wall 30, and a lifting-bar, having a shoulder near the base thereof, adapted to abut against the base of said web 35 when the lifting-bar has been raised to its highest position.

4. A lifting-jack comprising a standard made of two parts, one part having a web 1^a provided with a series of sockets and a square stud or head 71, and the other part having a series of studs positioned to be inserted in said sockets, and there being perforations through the studs and sockets to lock the parts together, and said parts having wall portions 20, 21 respectively made with recesses 39 in their rear edge faces, a wall-plate 30 affixed to the exterior of the wall portion 21 and having a web 35 lugs 36, 37 integrally formed on the exterior of the wall-portions 20, 30, a front plate provided with sides straddling and fastened to the walls 20, 30 and having lugs interlocking with the lugs on the exterior of such walls, and further made with a protuberance inserted in said recesses of the walls 20, 30, in contact with the web 35 of the wall 30, and a protuberance of like thickness near its upper end, a cap having a flange rim encompassing the upper ends of the standard parts, and made with an elongated opening 72 into which the stud 71 projects, and a lifting bar

rising through said opening 72, of the cap and having a shoulder near the base thereof adapted to abut against the base of the web 35 when the lifting-bar has been raised to its highest position.

5. In a lifting-jack, in combination with the pinion, and the pinion operating devices of housing wall-portions 20, 21, the former being made with integral webs 1^a 1^e, constituting a pocket, a trip lever, controlling in part the pinion operating devices and a spring comprising a coiled central part and expanding arms, which spring is secured in said pocket in position to cause the arms thereof to bear against the web 1^a and said trip lever, to control the latter as described.

6. In a lifting-jack the combination of a standard comprising wall-portions 20, 21, 30 constituting part of the housing for the pinion and pinion-operating devices, the outer wall portions being apertured to provide bearings for the axle-ends of the pinion, the wall-portion 20 being made with an annular chamber, 26, and the wall-portion 21 with an aperture through which extends the body of the pinion; and a pinion made with annular flange-plates 27, 27^a disposed exterior of the cogs thereof, the flange plate 27 having a bearing in said chamber 26 of the wall-portion 20.

7. In a lifting-jack, in combination with the standard, a toothed lifting-bar, and co-operating devices, a pinion made with four cogs, each of which is made with a convex lifting-face, as 47, and a substantially flat lowering-face as 48, whereby the pinion is adapted to be operated as freely to lower the lifting-bar as to raise the same.

8. In a lifting jack an operating lever the inner end of which comprises two parts, adapted to be affixed on the shank of the pinion and to contain the ratchet mechanism of the pinion, one part having a protuberance 74 provided with sockets 75 and the other part having studs inserted in said sockets, and whereby the working strain on said lever is sustained there being perforations through the studs and sockets to fasten the parts together.

9. In a lifting jack an operating lever the inner end of which comprises two parts, adapted to be affixed on the shank of the pinion and to contain the ratchet mechanism of the pinion, one part having a protuberance 74 provided with sockets 75 and the other part having studs positioned to be inserted in said sockets, and there being perforations through the studs and sockets to fasten the parts together, and one of said parts being further made with a socket as 80 in which to receive a handle-bar.

10. In a lifting jack the combination with the pinion and the ratchet-wheel mounted on the axle thereof, of an operating-lever the

inner end of which comprises two members
mounted astride of the ratchet wheel, a de-
tent pivoted between said members in en-
gagement with the ratchet and having an
5 extending arm, and a spring comprising a
coiled central part and expanding arms
which spring is secured between said lever

members and arranged to bear upon the arm
of the detent to control the latter as de-
scribed.

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