

No. 837,681.

PATENTED DEC. 4, 1906.

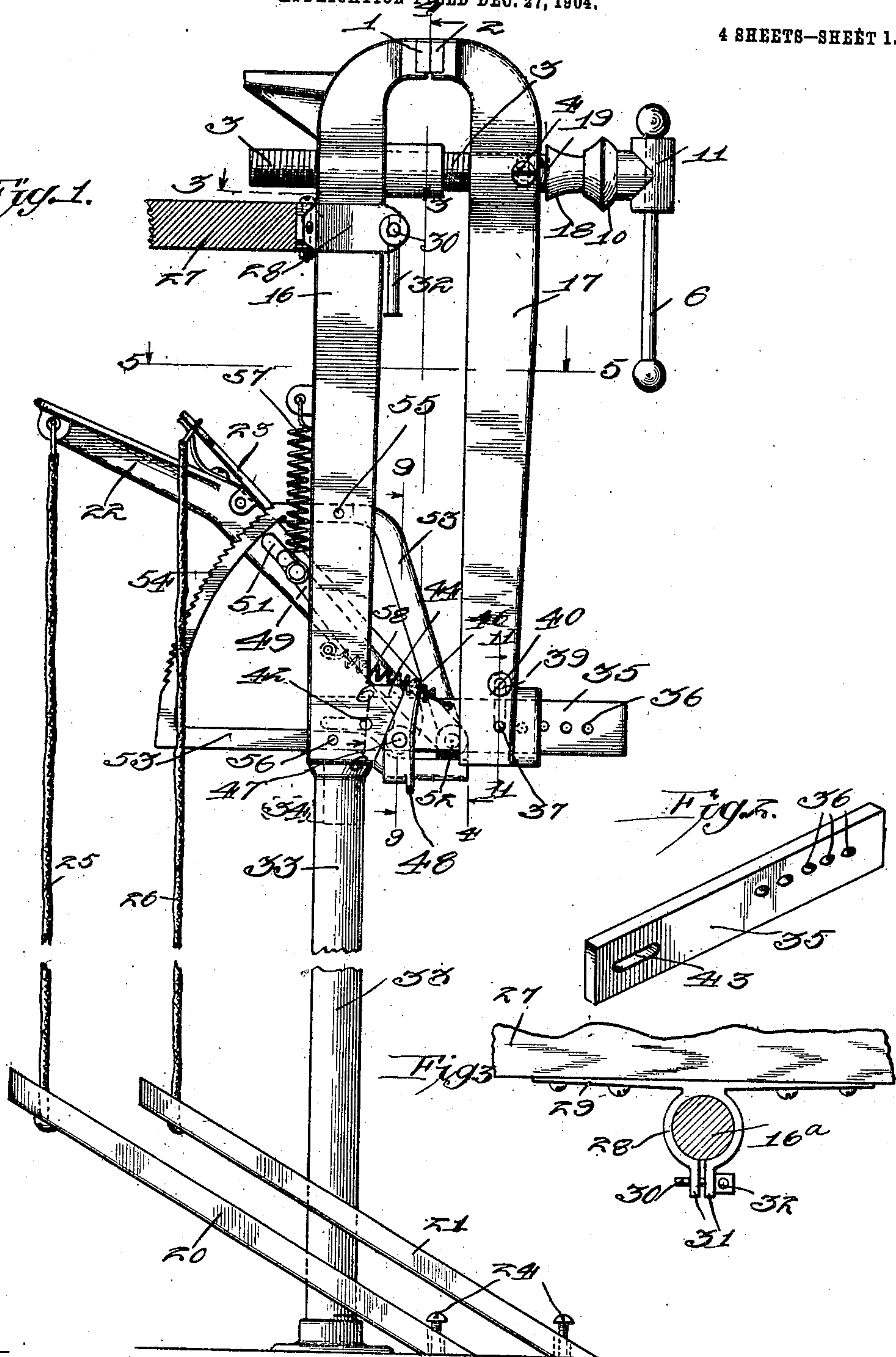
J. GOODRICH.

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APPLICATION FILED DEC. 27, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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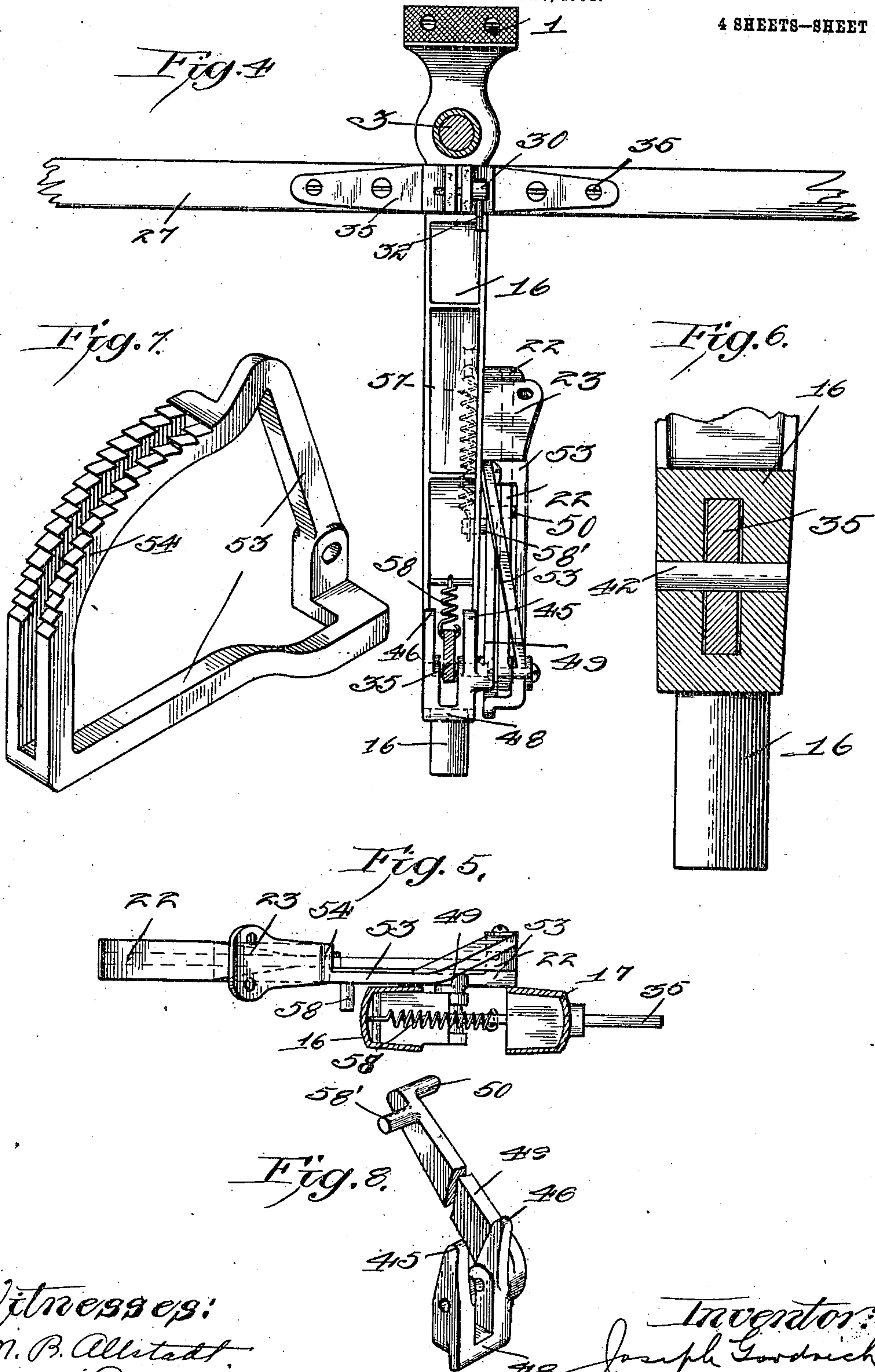
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 11.

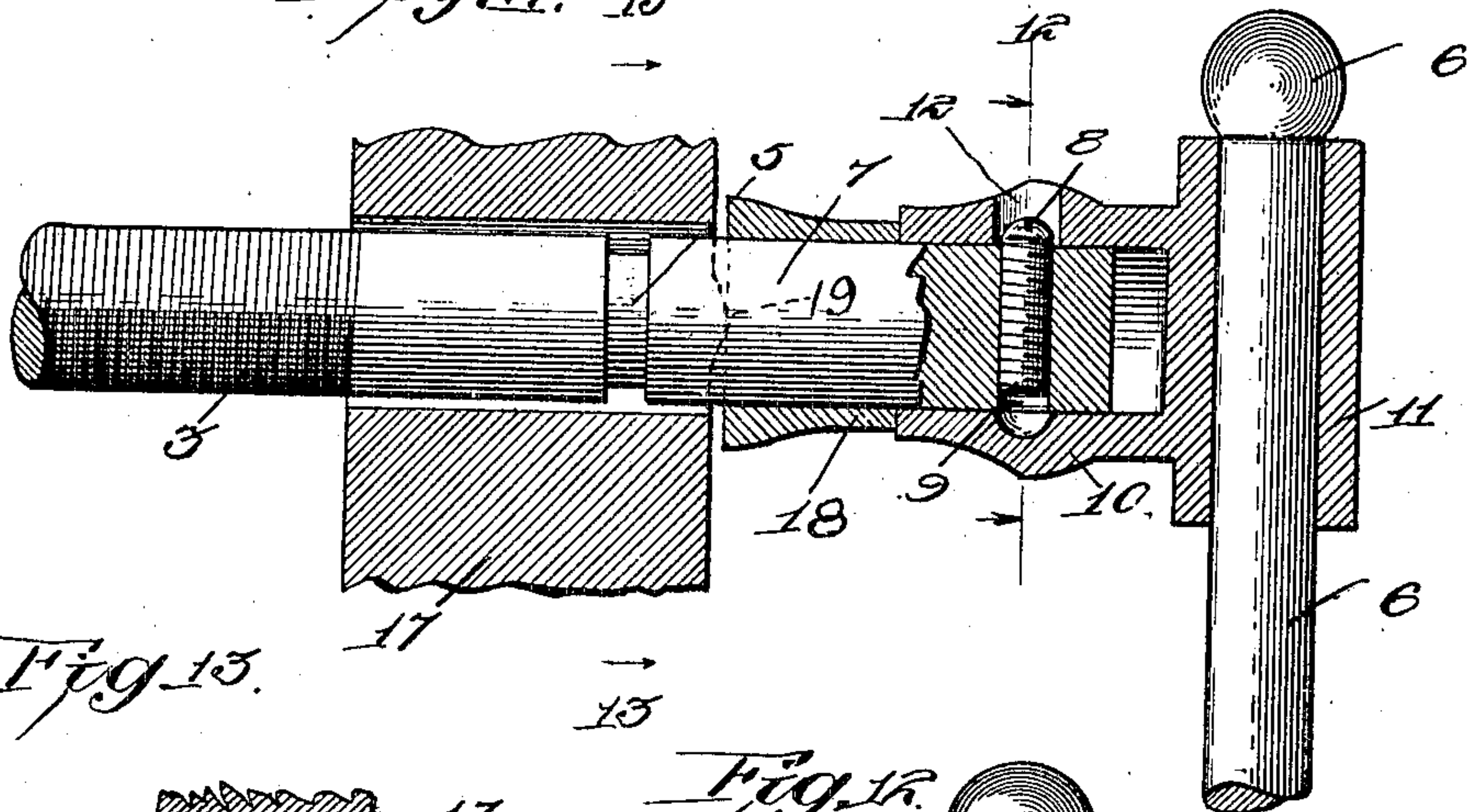


Fig. 13.

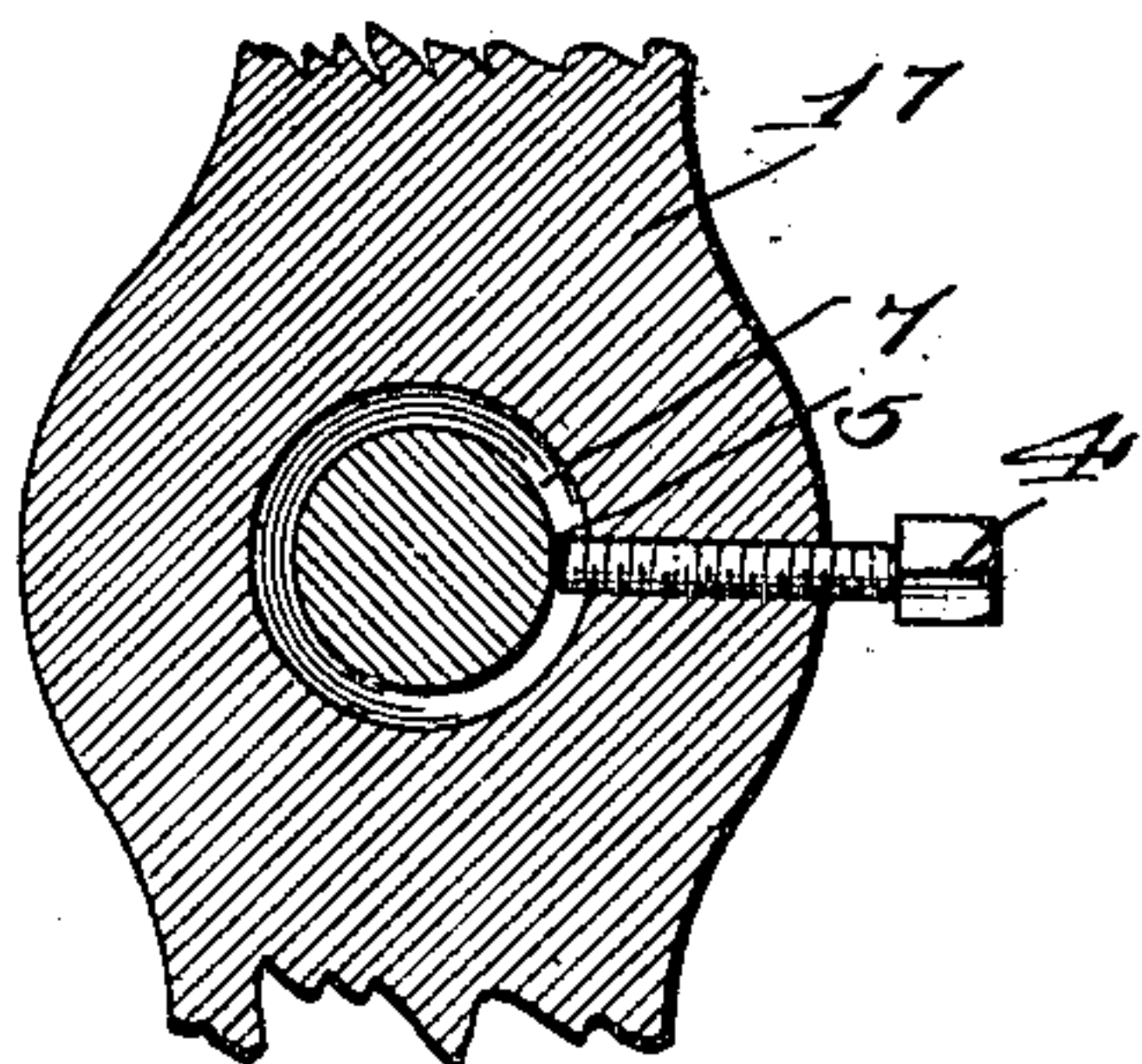


Fig. 12.

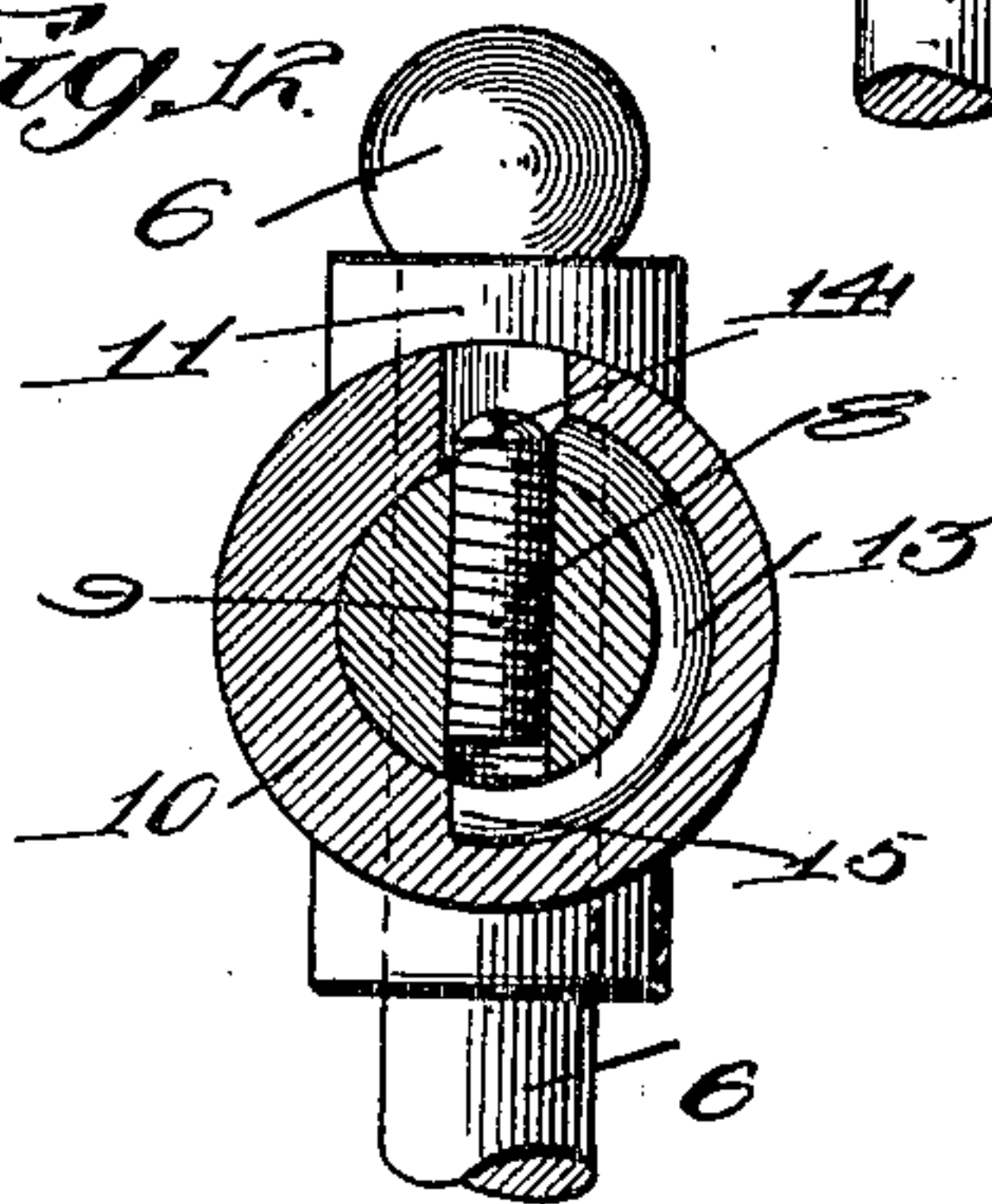


Fig. 9.

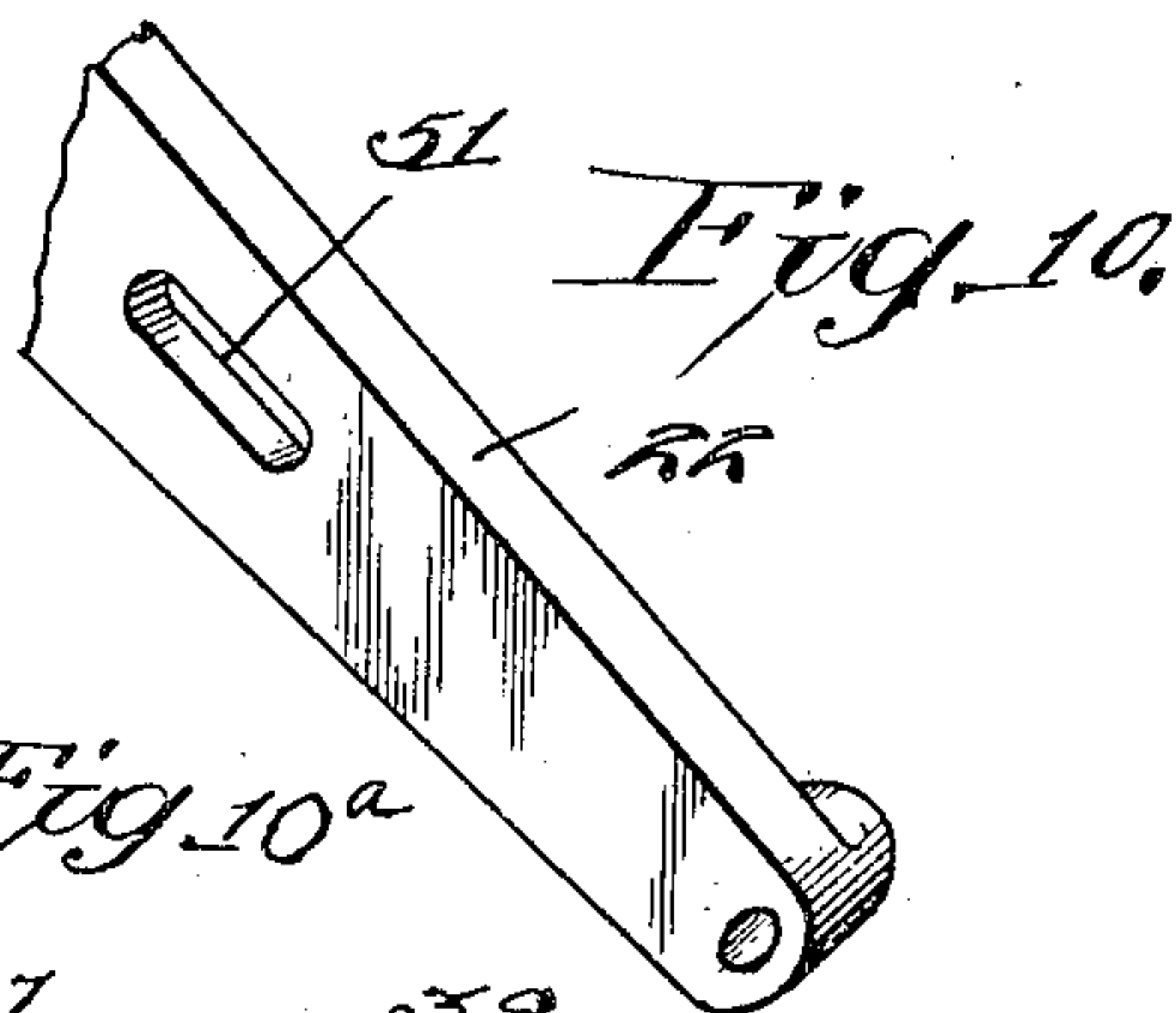
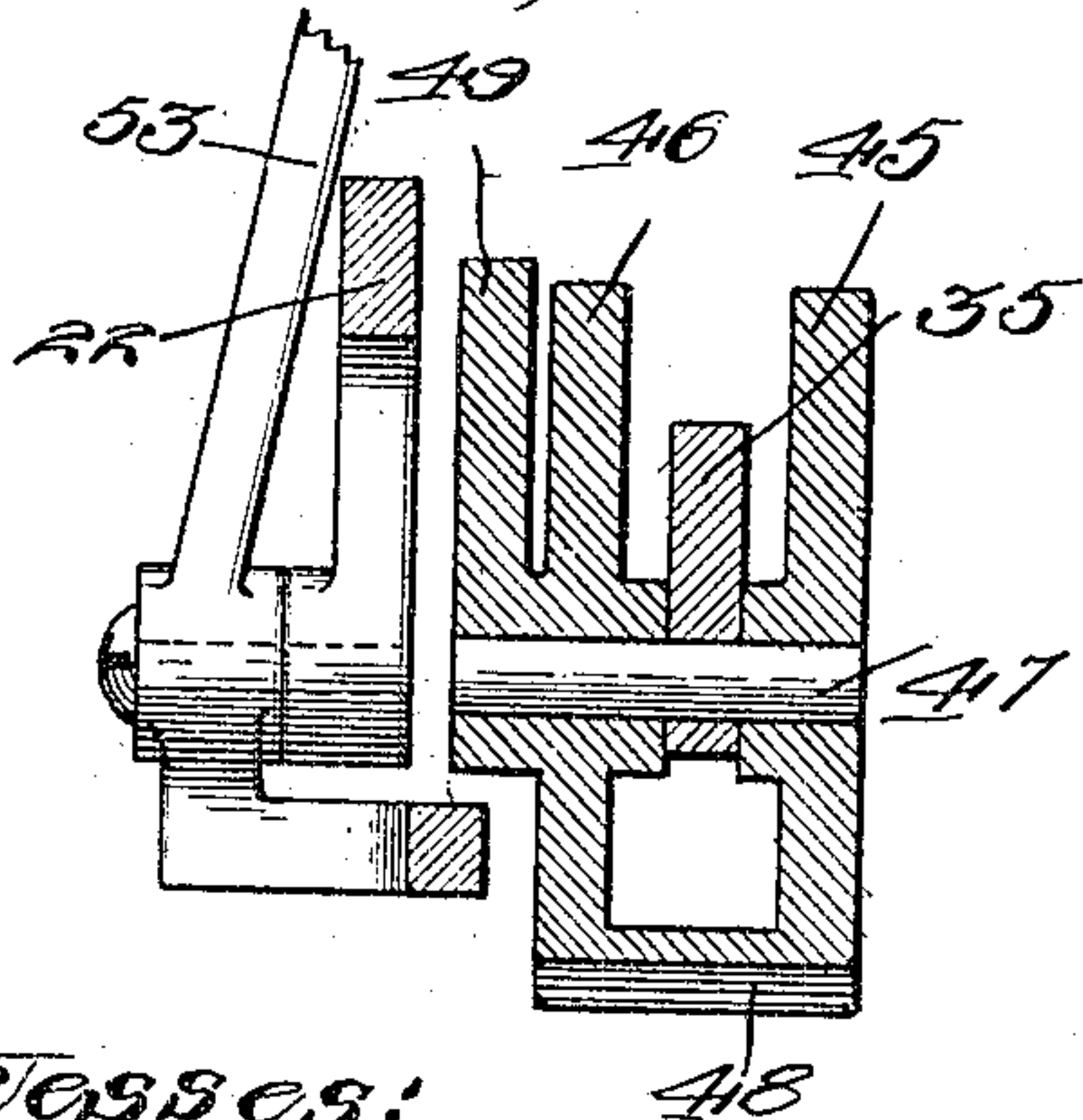
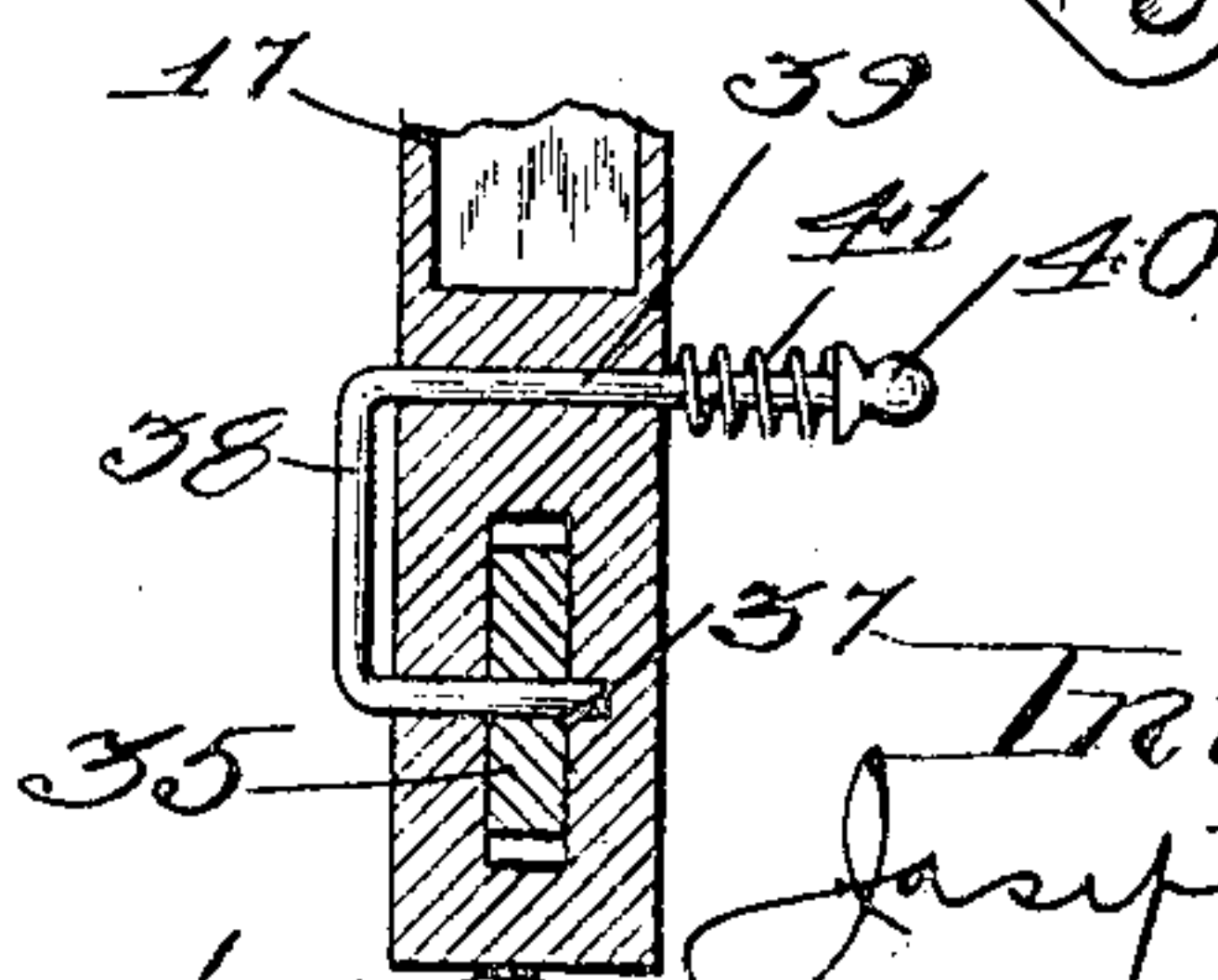


Fig. 10a



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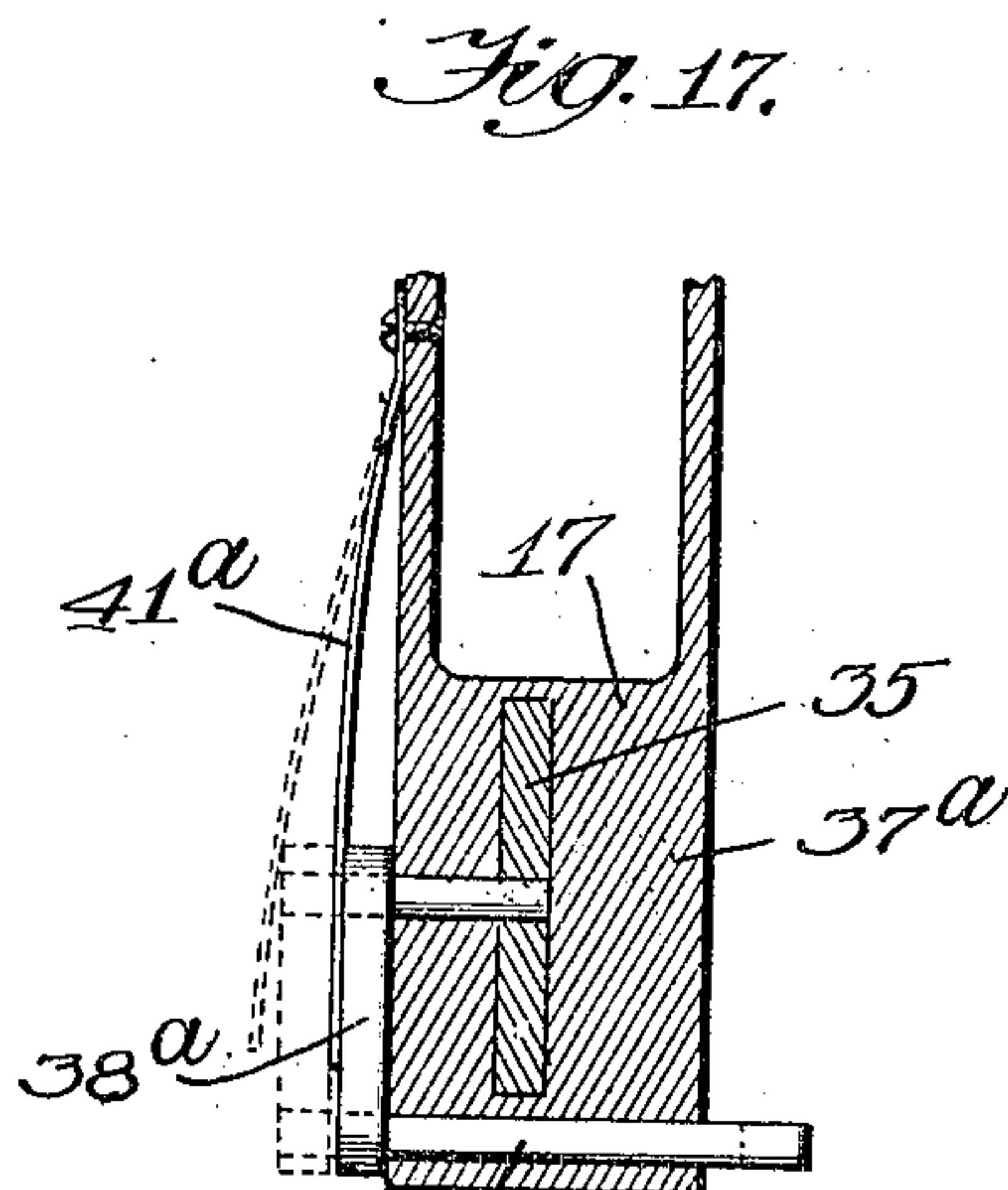
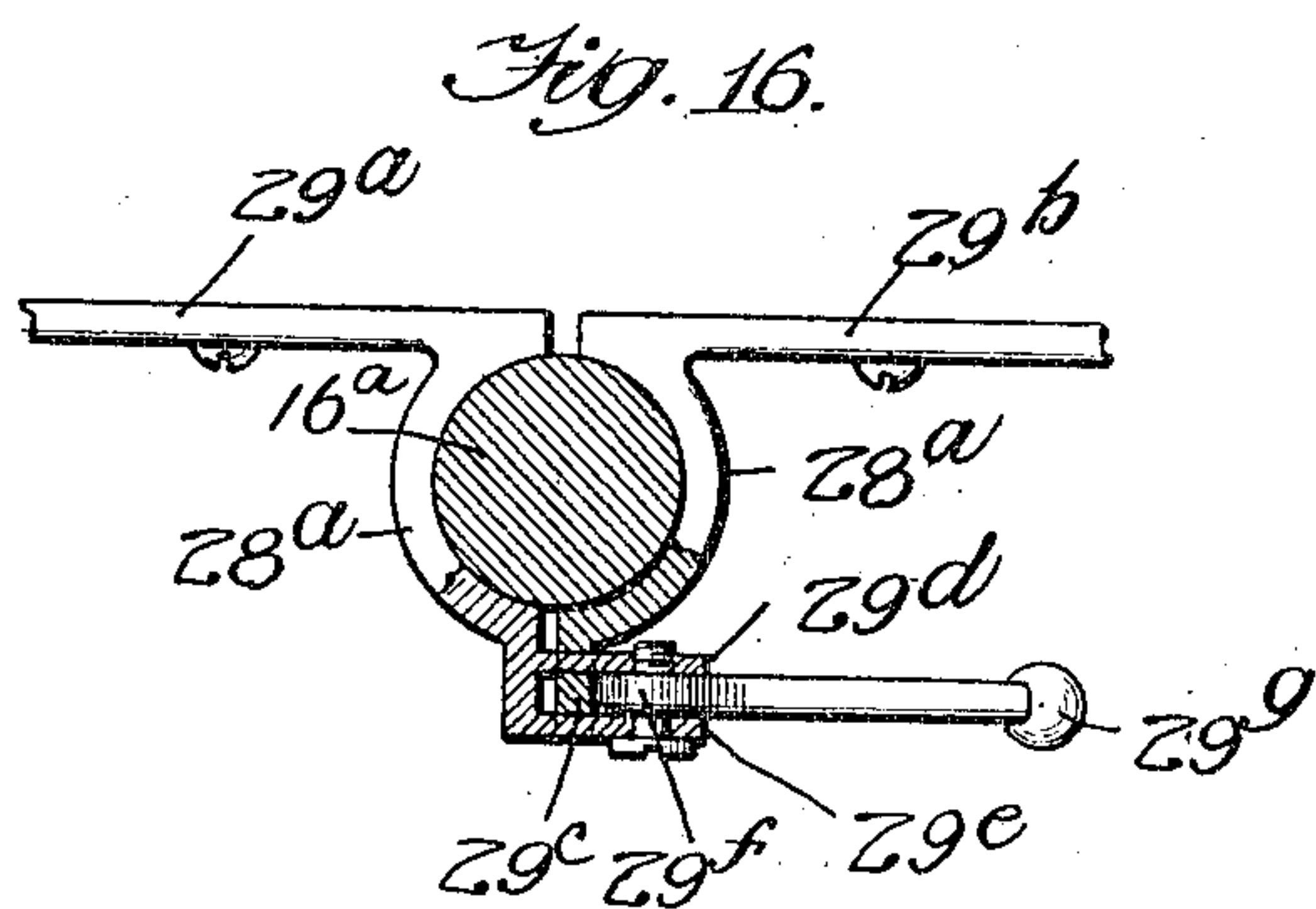
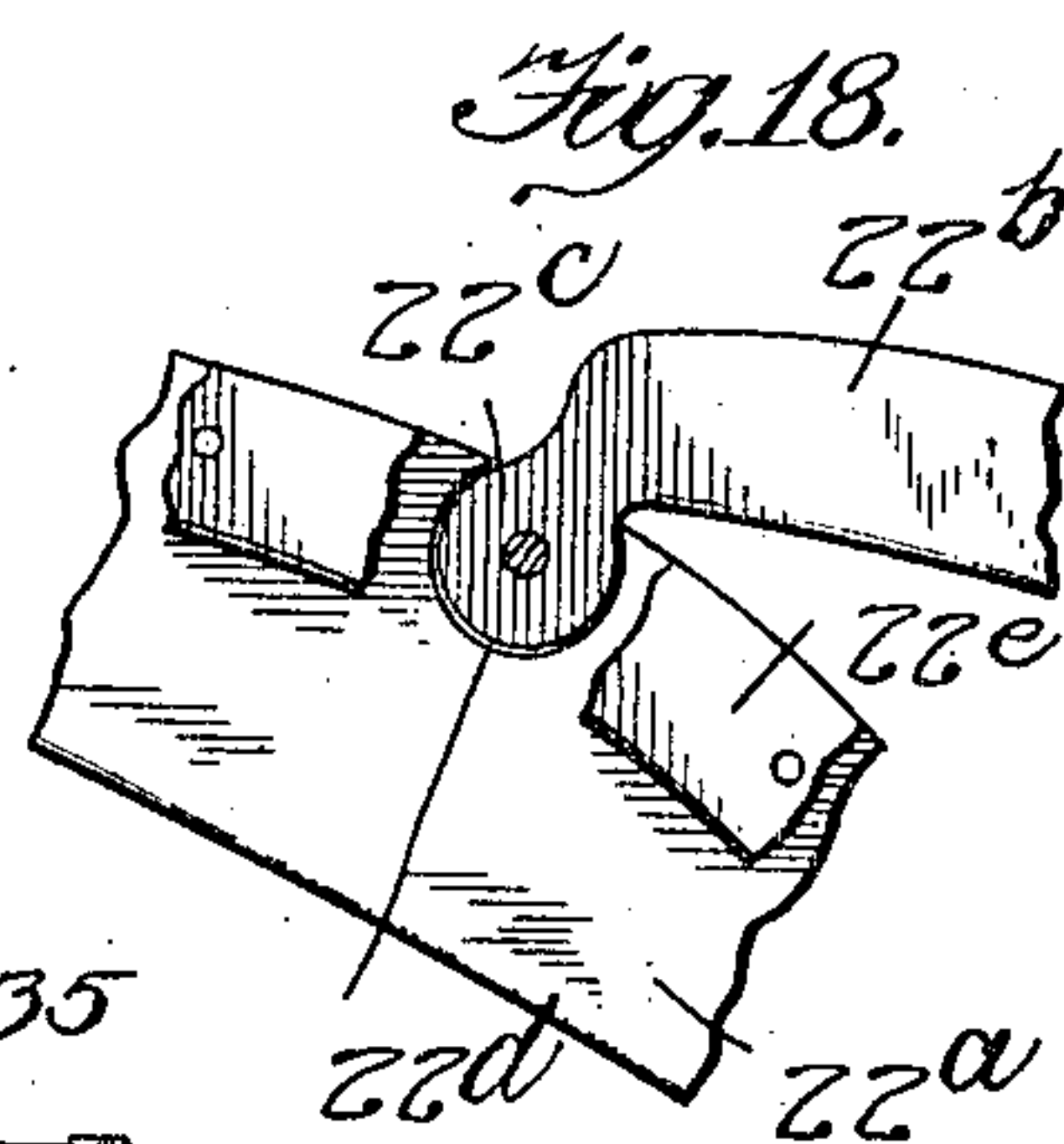
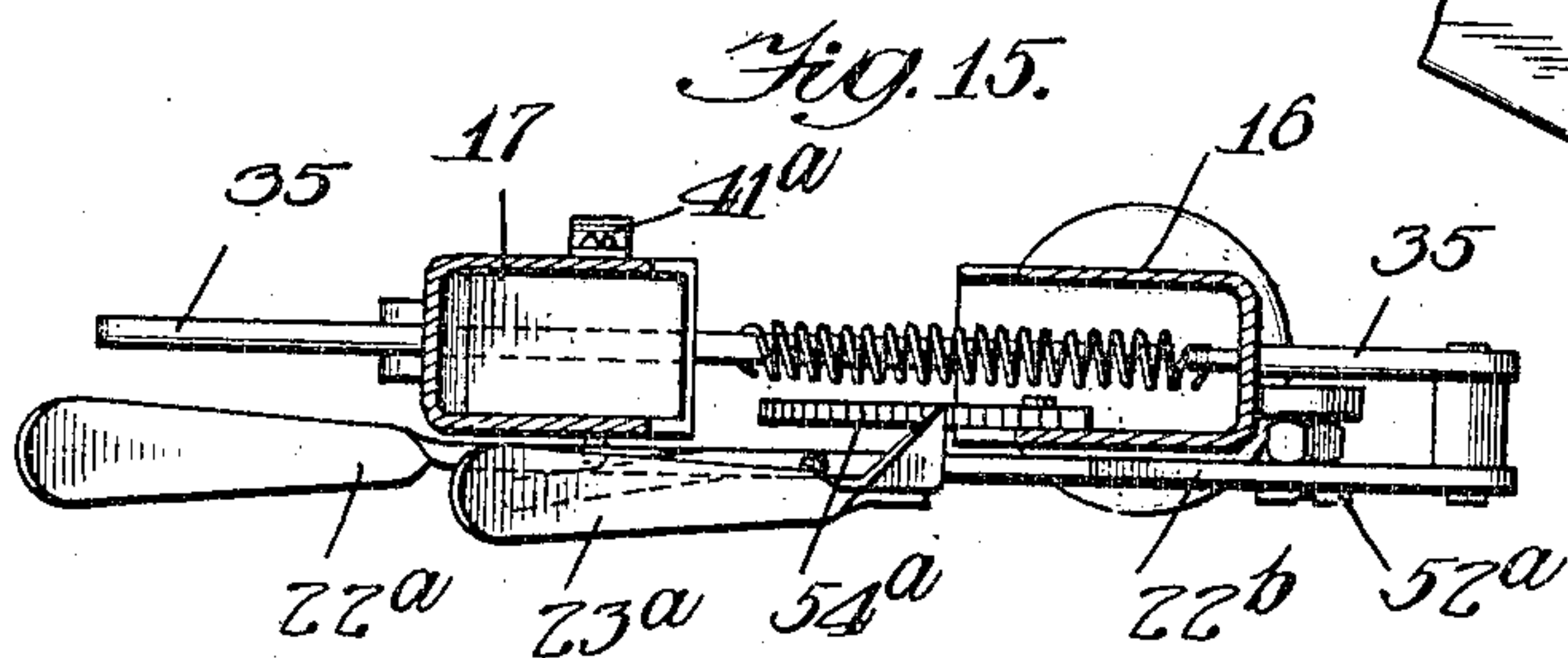
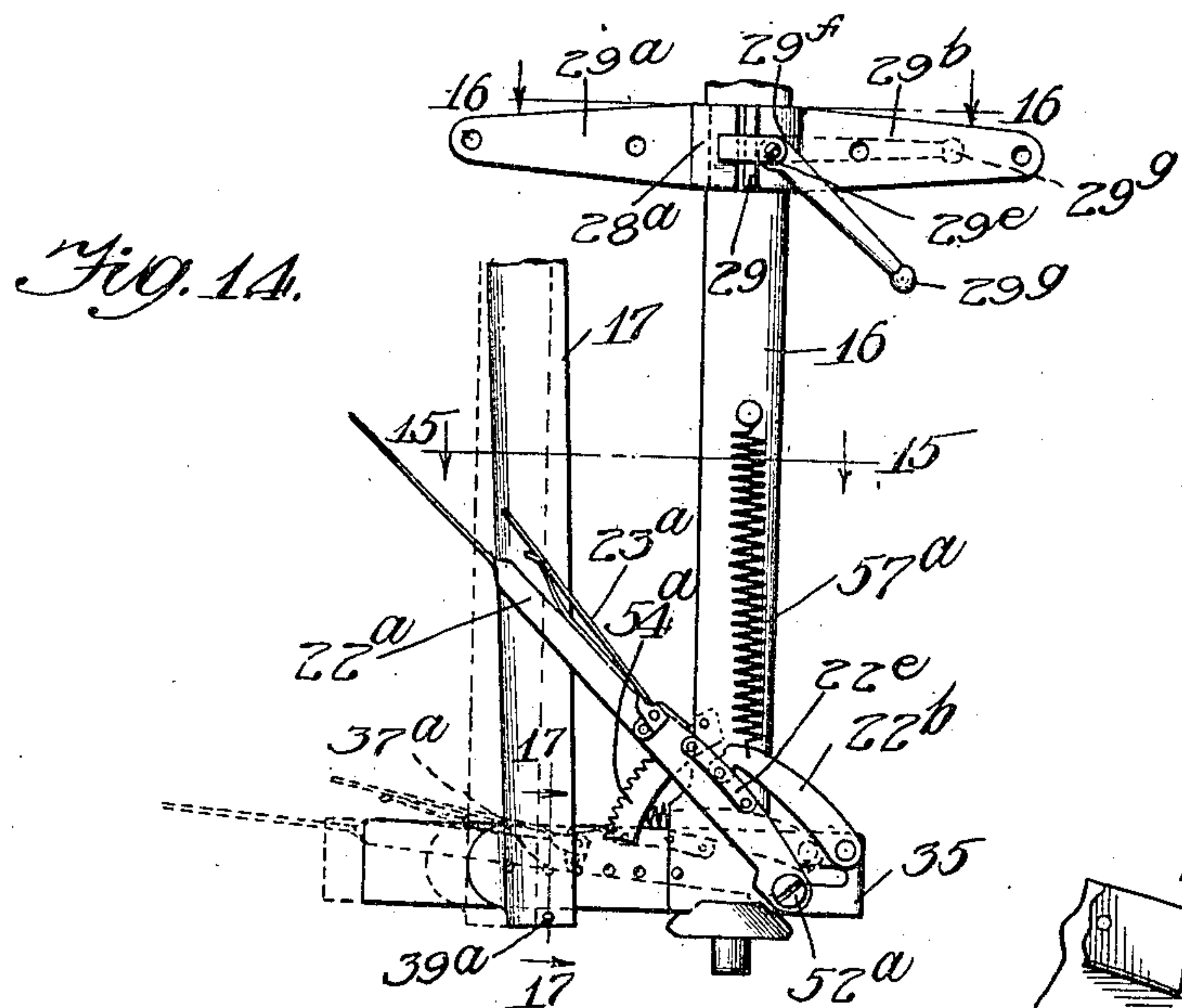
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· VISE.

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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

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## WISE.

No. 837,681.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed December 27, 1904. Serial No. 238,495.

*To all whom it may concern:*

Be it known that I, JOSEPH GOODRICH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vises, of which the following is a full, clear, and exact specification.

My invention relates to bench-vises designed for rapid manipulation; and it has for its primary object to provide improved and efficient means whereby the jaws may be rapidly manipulated and with great power from a floor connection or treadle accessible to the foot of the operator, thus leaving both hands of the operator free for the work to be done.

Another object of my invention is to provide improved means whereby the handle of the screw will always seek a perpendicular position when released, so as to be out of the way of the operator.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said object and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of my improved vise. Fig. 2 is a detail perspective view of the lower connecting-bar. Fig. 3 is a plan section on the line 3 3, Fig. 1, showing a detail hereinafter described. Fig. 4 is a vertical section on the line 4 4, Fig. 1. Fig. 5 is a plan section on the line 5 5, Fig. 1. Fig. 6 is an enlarged detail section on the line 6 6, Fig. 1. Fig. 7 is a perspective view of the segment on an enlarged scale. Fig. 8 is a detail perspective view of the cam and its operating-lever. Fig. 9 is an enlarged detail section on the line 9 9, Fig. 1. Fig. 10 is a detail perspective view of the slotted treadle-lever, partly broken away. Fig. 10<sup>a</sup> is a detail section on line 11 11, Fig. 1. Fig. 11 is an enlarged vertical longitudinal sectional view of the screw and handle with connected parts. Fig. 12 is a transverse section on the line 12 12, Fig. 11. Fig. 13 is a transverse section on the line 13 13, Fig. 11. Fig. 14 is a side elevation of the lower portion of the device, showing a modification in the operating mechanism hereinafter described. Fig. 15 is a plan section thereof on

the line 15 15, Fig. 14. Fig. 16 is an enlarged section on the line 16 16, Fig. 14. Fig. 17 is an enlarged section on the line 17 17, Fig. 14; and Fig. 18 is a detail hereinafter described.

1 is the fixed jaw, and 2 the movable jaw, and these are fulcrumed together by any suitable adjustable means, such as the usual screw 3, by the aid of which the jaws may also be forced together after the manner of operating the jaws of an ordinary bench-vise, the screw being threaded in one of the jaws, preferably the fixed jaw, and swiveled by means of pin 4 and groove 5 in the movable jaw.

The screw may be rotated by any suitable handle, such as a sliding bar or lever 6 of the usual form; but I prefer to employ the construction best illustrated in Figs. 11 and 12, whereby the handle or lever 6 will automatically drop to a perpendicular position independently of the screw. In accomplishing this object I provide the outer plain end 7 of the screw with a transversely-projecting pin 8, which for convenience of attachment and of assembling the parts is in the form of a screw screw-threaded in a transverse passage 9 in the end 7, and over this plain end 7 is placed a hub or socket 10, which is formed on or secured to the keeper 11, through which the handle or lever 6 slides. This hub is provided with an aperture 12, through which the screw-stud 8 may be introduced, and in line with this aperture is formed an internal groove 13, extending approximately half-way round, (see Fig. 12,) so that the hub will always be capable of a quarter-rotation no matter what the position of the stud 8 might be, the groove 13 during such rotation passing over the projecting end of the stud. The ungrooved part of the hub 8, however, forms two shoulders or lugs 14 15 at the extremities of the groove, and each of these is adapted to engage the stud when the hub is rotated a half-turn. Thus in the position shown in Fig. 12, where the handle is vertical, the screw 3 will be turned toward the right, if the hub 10 be rotated in that direction; but if the hub be turned to the left it will rotate a half-turn without moving the screw, but will begin to rotate the screw to the left when the shoulder 15 strikes the right-hand side of the stud 8. It is of course obvious that the handle 6 will always gravitate into its lower



vertical position if turned only a half-turn from a vertical position; but assuming that it be left in a horizontal position it would remain there but for the ability of the lug 51 to pass the present lower end of the stud 8, for, considering Fig. 1 2 in a horizontal position it is quite obvious that when the handle is released the preponderance of weight on the left-hand end will cause the hub 10 to rotate to the left, carrying lug or shoulder 14 away from the right-hand end of stud 8 until it arrives at a position perpendicular to the longitudinal axis of the stud 8.

The jaws 1 2 are provided with downward extensions 16 17, which are utilized as levers, or one of which, at any rate, is so employed for clamping the jaws together independently of the operation of the screw 3, which at that time serves merely as an adjustable fulcrum, and in order that the jaw 2, which is the movable one and which teeters during this clamping operation, may move freely or oscillate independently of the screw the screw 3 is formed with a shoulder 18 and the outer side of the jaw 2 with a fulcrum-bearing 19, which is rounded and which bears against the shoulder 18 during the oscillatory movement of the jaw 2 and extension 17. As before intimated, this oscillatory movement when produced independently of the screw 3 is effected by means of a treadle accessible to the foot of the operator at a point on or near the floor, so that the jaws may be manipulated or opened or closed, as desired, very rapidly without operating the screw 3, thus leaving both hands of the operator free for the work to be done.

Instead of carrying the two extensions 16 17 entirely down to the floor and there connecting them together by suitable operating mechanism comprising a treadle this operating mechanism is located at a higher elevation than the floor, so that it will not be in the way of the feet of the operator or liable to become entangled with the operator's clothing. Hence the mechanism which oscillates the extension or lever 17 with relation to the extension 16 is located considerably above the floor, as shown in Fig. 1, and is operatively connected with one or more floor-treadles 20 21, which in this exemplification of the invention are utilized, respectively, for operating the treadle-lever 22, whereby the jaws are forced together, and the treadle-locking dog 23, which holds said lever in position. These two treadles 20 21 are shown as two short sections of plank or other suitable members resting freely at their lower ends upon the floor and, if desired, held in place at their lower ends by screws 24 passing loosely therethrough, so that the position of the treadles may be readily shifted when desired and connected at their upper ends by any suitable connections 25 26, respectively, with the lever 22 and dog 23.

This form of treadle is preferable, for the reason that aside from being cheap and simple will readily adapt itself to different positions of the vise, which is preferably swiveled to the bench 27 on a vertical axis, so that it may be used as either a left or a right hand vise or directly in front of the operator. In thus swiveling the vise the extension 16 is encompassed by a clamping-collar 28, having flanges 29, whereby it may be secured to the bench 27, and a tightening device, whereby the collar may be clamped firmly around the cylindrical portion 16<sup>a</sup> of the extension 16. This tightening device is shown as comprising a screw 30, passing through two ears 31 on the separated ends of the collar 28 and having an operating-handle 32. In order, however, that the lower ends of the extensions 16 17 may be steadied, the swiveled extension 16 is stepped in the upper end of a standard 33, whose lower end is secured to the floor, the lower end of the extension 16 having a pivot 34, so that the vise may turn or swivel on the standard 33.

To one of the extensions 16 17, preferably the extension 17, is secured a connecting-bar 35, which is rendered adjustable with relation to the standard 17 by means of a series of holes 36, formed in the bar, and a pin 37, projecting through the extension 17 and one of said holes. In order that the pin 37 may be withdrawn readily and at the same time the expanding action of a coil-spring utilized for holding it in place, it is provided with an elbow 38, as shown in Fig. 11, having a branch 39, passing back through the extension 17 at a point above the bar 35 and provided with a button 40, between which and said extension is interposed coil-spring 41, which serves to hold the pin 37 in place, but which pin may be withdrawn by pressure against the button 40, compressing the spring 41.

The end of the bar 35 opposite that in which the holes 36 are formed is connected with capability of limited movement with the extension 16, so that the extension 17 may move the requisite distance for forcing the jaws together, while preventing the lower end of the latter extension from becoming unduly displaced with relation to the extension 16. This connection is effected through the agency of a pin 42, passing through extension 16 and through slot 43 in bar 35, whose end passes loosely through the lower end of extension 16 between two inclines 44, formed on extension 16 and adapted to be engaged by two cams 45 46, respectively, which are pivotally secured to bar 35 by means of pivot 47 and are yoked together below the bar by a cross connection 48, to one end of which is secured or formed a lever 49, which when depressed acts to force the cams 46 against the inclines 44, and thereby crowd the bar 35 outwardly away from ex-



tension 16 and pinch the jaws together. This lever 49 is provided on one side with a lug or pin 50, which engages in a slot 51 in the treadle-lever 22, and the treadle-lever 22 is pivoted at 52 to the arms 53 of a toothed segment 54, and this in turn is rigidly secured to the side of extension 16 by bolts or screws 55 56 passing through the arms 53. The lever-locking dog 23 is pivoted to and carried by the treadle-lever 22 and engages the segment 54 for holding lever 22 against upward movement, lever 22 being forced downwardly by treadle 20 in opposition to a spring or other yielding device 57, secured to lug 58' on lever 49 and to the extension 16, thus serving to restore the jaw-operating mechanism to its normal elevated position. The bar 35 is pulled inwardly or restored to its normal position for throwing the jaws open by means of the spring 58, secured at one end to the bar 35 and at the other end to extension 16.

With the jaw-operating mechanism arranged in the described manner with relation to the downward extensions 16 17 it will be seen that the vise is being used directly in front of the operator. This mechanism will be entirely out of the way under the bench, and when the vise is turned to be utilized either as a right-hand or a left-hand vise such mechanism will be still out of the way and on one side of the operator and always on the side opposite that on which the vise is projected with relation to its vertical axis.

In the modification shown in Figs. 14 to 18, inclusive, a lever 22<sup>a</sup> is pivoted at 52<sup>a</sup> to the side of the downward extension 16 and carries a spring-actuated locking dog or pawl 23<sup>a</sup>, arranged to engage the teeth of a segment-rack 54<sup>a</sup>, which is secured in any suitable way to the extension 16, and to the connecting-bar 35 is secured one end of a link 22<sup>b</sup>, whose other end is pivoted to the lever 22<sup>a</sup> in any suitable way—such, for example, as shown in Fig. 18—that is to say, by forming a round head 22<sup>c</sup> on the link and inserting the same in a circular socket 22<sup>d</sup> in the lever, the head 22<sup>c</sup> being held in place by a face-plate 22<sup>e</sup>, so that when the lever 22<sup>a</sup> is pushed downwardly it will exert great power against the bar 35 and will force the extension 17 outwardly, and when the lever 22<sup>a</sup> is elevated, dog 23<sup>a</sup> being released, the extension 17 will be drawn inwardly and the jaws 1 2 opened. The lever 22<sup>a</sup> may be raised to its elevated position when released by suitable spring 57<sup>a</sup>, attached to the extension 16 and the link 22<sup>b</sup>. The operating mechanism thus constructed possesses great power, and it is simple and entails but the minimum amount of friction. In this form of the invention the clamp for holding the extension 16 is also somewhat modified. It is shown composed of two members 29<sup>a</sup> 29<sup>b</sup>, upon one of which is formed a lug 29<sup>c</sup>, having a passage through

which passes a lug 29<sup>d</sup>, formed on the other one. The latter also has an additional lug 29<sup>e</sup>, similar to the lug 29<sup>d</sup>, which passes by the lug 29<sup>c</sup> on the outer side thereof, and between the two lugs 29<sup>d</sup> 29<sup>e</sup> is pivoted a cam 29<sup>f</sup>, having a handle 29<sup>g</sup>, the cam being adapted to bear against the lug 29<sup>c</sup> when it is rotated, and thereby pull the clamp members 28<sup>a</sup> toward each other.

In Fig. 17 is shown a slight modification in the pin-lock for the bar 35, which comprises a guide-pin 39<sup>a</sup> and a locking-pin 37<sup>a</sup>, secured to or formed on a head 38<sup>a</sup>, and against this head bears a leaf-spring 41<sup>a</sup>.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a bench-vise, the combination of two jaws having downward extensions, fulcrumed near their upper ends and terminating some distance above the floor, means operatively connecting said extensions together for forcing the jaws together, a foot-treadle adjacent the floor, a connection between said treadle and said first means, a locking-dog for said foot-treadle, a second foot-treadle adjacent the floor and a connection between said second foot-treadle and the dog for releasing said dog.

2. In a bench-vise, the combination of two fulcrumed jaws, a pivoted treadle-lever, means operatively connecting said lever with said jaws for forcing them together, a toothed segment, a locking-dog carried by said lever and engaging said segment for locking the lever in position, and floor connections for operating said dog and lever.

3. In a vise, the combination of two jaws, a rotary member by which said jaws are forced together, having a lateral projection, a handle for rotating said rotary member, rotatable independently of said rotary member a limited degree, and means connected with said handle for engaging said lateral projection.

4. In a vise, the combination of two jaws, a rotary member for forcing said jaws together comprising a laterally-projecting stud, a handle for rotating said rotary member comprising a socket in which the end of said rotary member and stud are situated and having independent rotation throughout a limited degree, and a lug or shoulder in said socket adapted to engage said stud.

5. In a vise the combination of two jaws, two downward extensions on said jaws respectively, a lever pivoted to one of said extensions, a link pivoted at one end of said lever, and a longitudinally-slidable bar secured to one of said extensions and pivoted to the other end of said link.

6. In a bench-vise, the combination of two jaws having downward extensions, fulcrumed near their upper ends and terminating some distance above the floor, means operatively



connecting said extensions together for forcing the jaws together, a foot-treadle adjacent the floor, a connection between the treadle and said first means, a locking-dog for said  
5 foot-treadle, a second foot-treadle adjacent the floor, a connection between said second foot-treadle and the dog for releasing said

dog, and a support to which one of the jaws is swiveled, whereby said jaw may be rotated on a vertical axis.

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