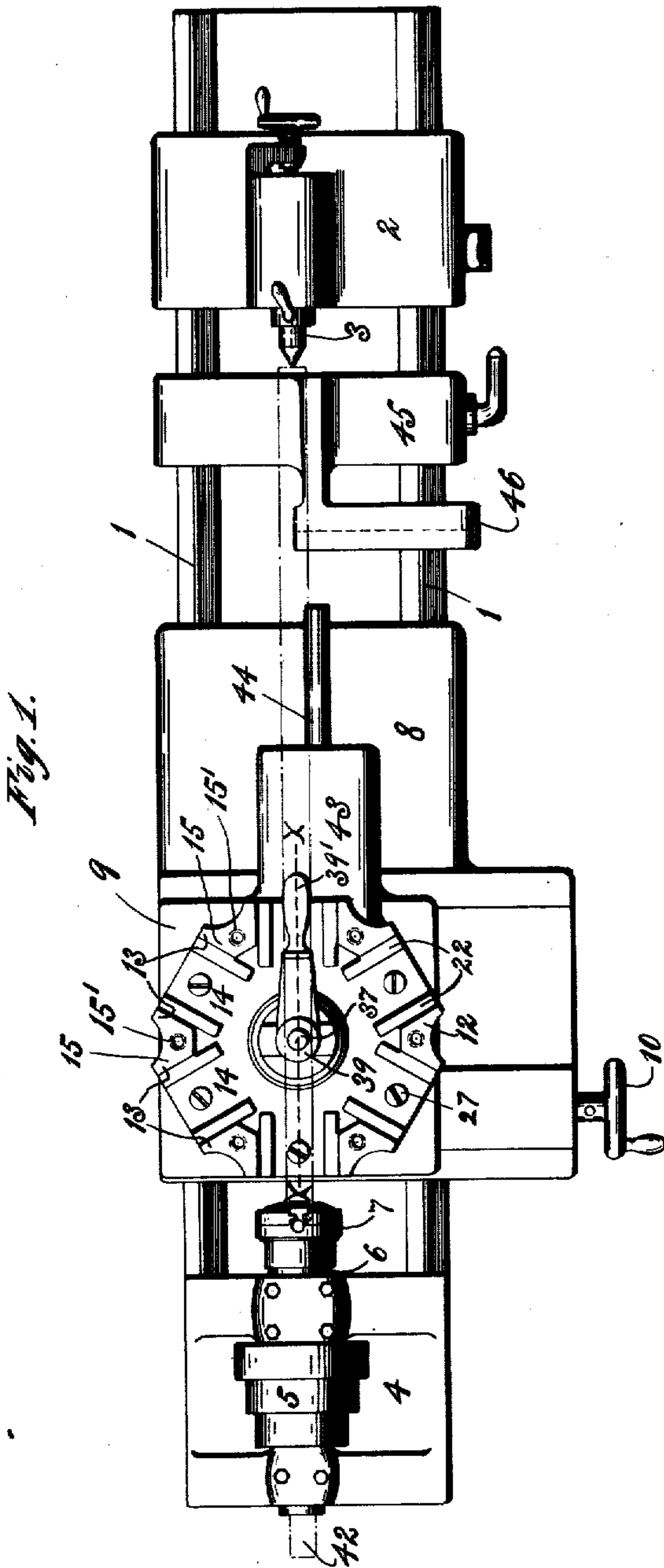


B. M. W. HANSON.
TURRET LATHE.
APPLICATION FILED MAY 11, 1905.

921,984.

Patented May 18, 1909.
5 SHEETS—SHEET 1.



Witnesses:

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F. E. Anderson.

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5 SHEETS—SHEET 2.

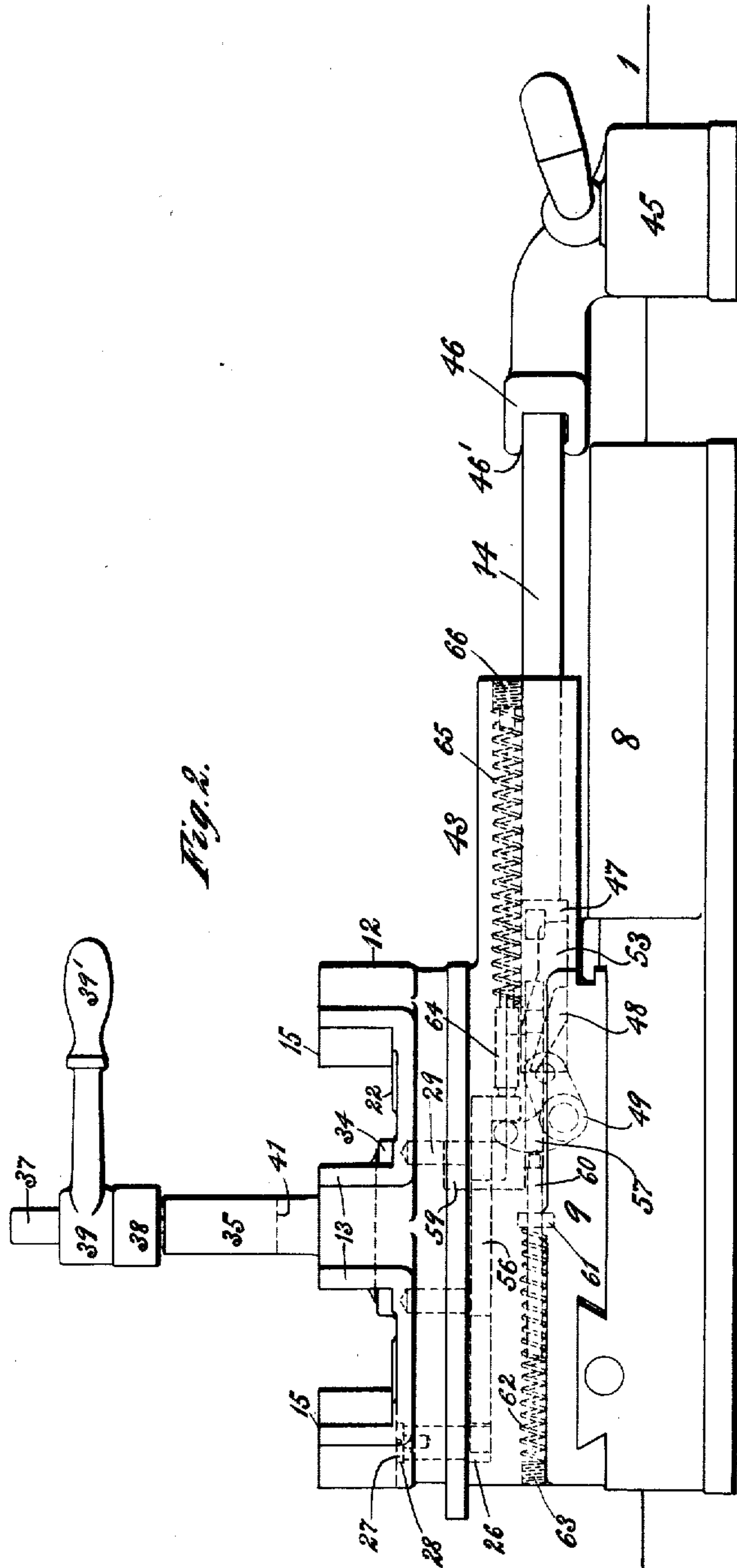


Fig. 2.

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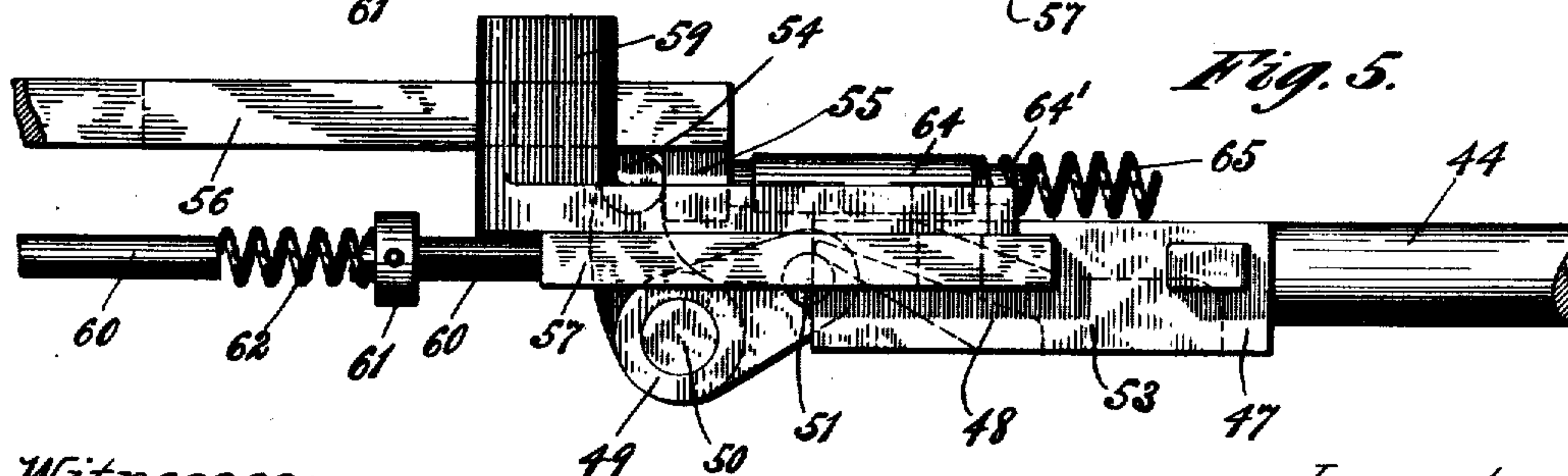
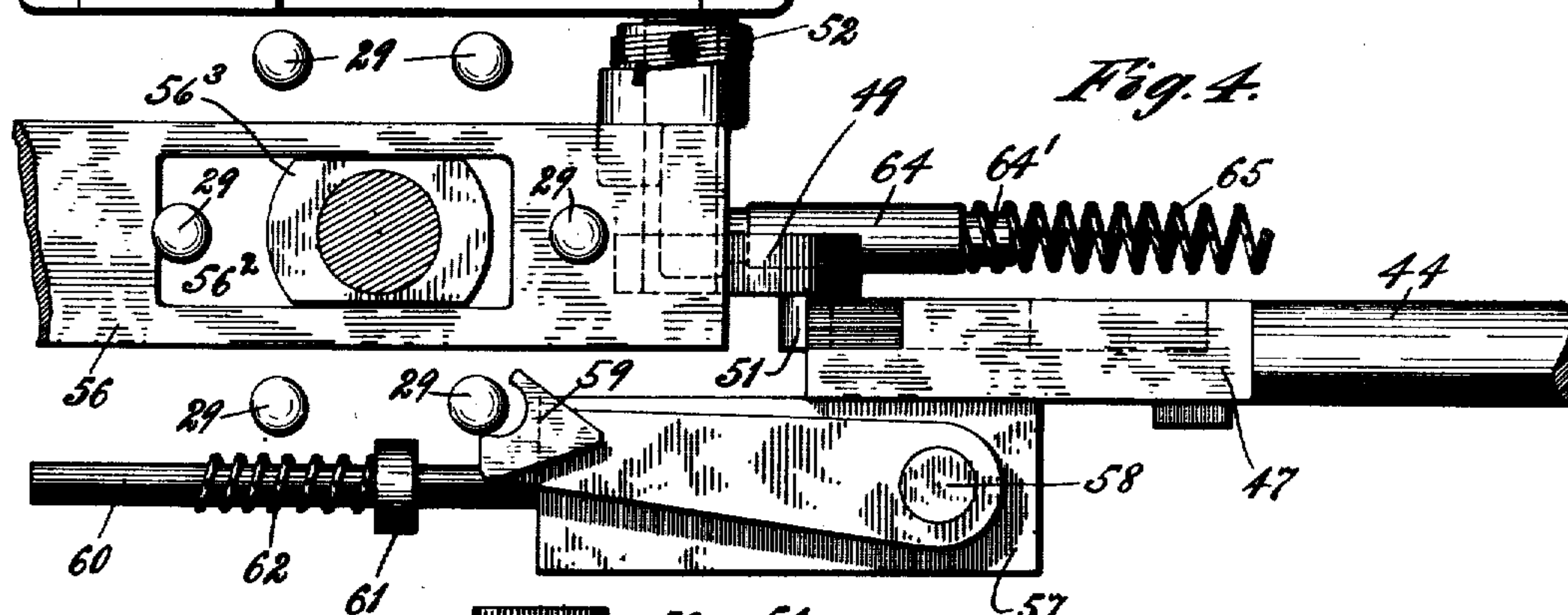
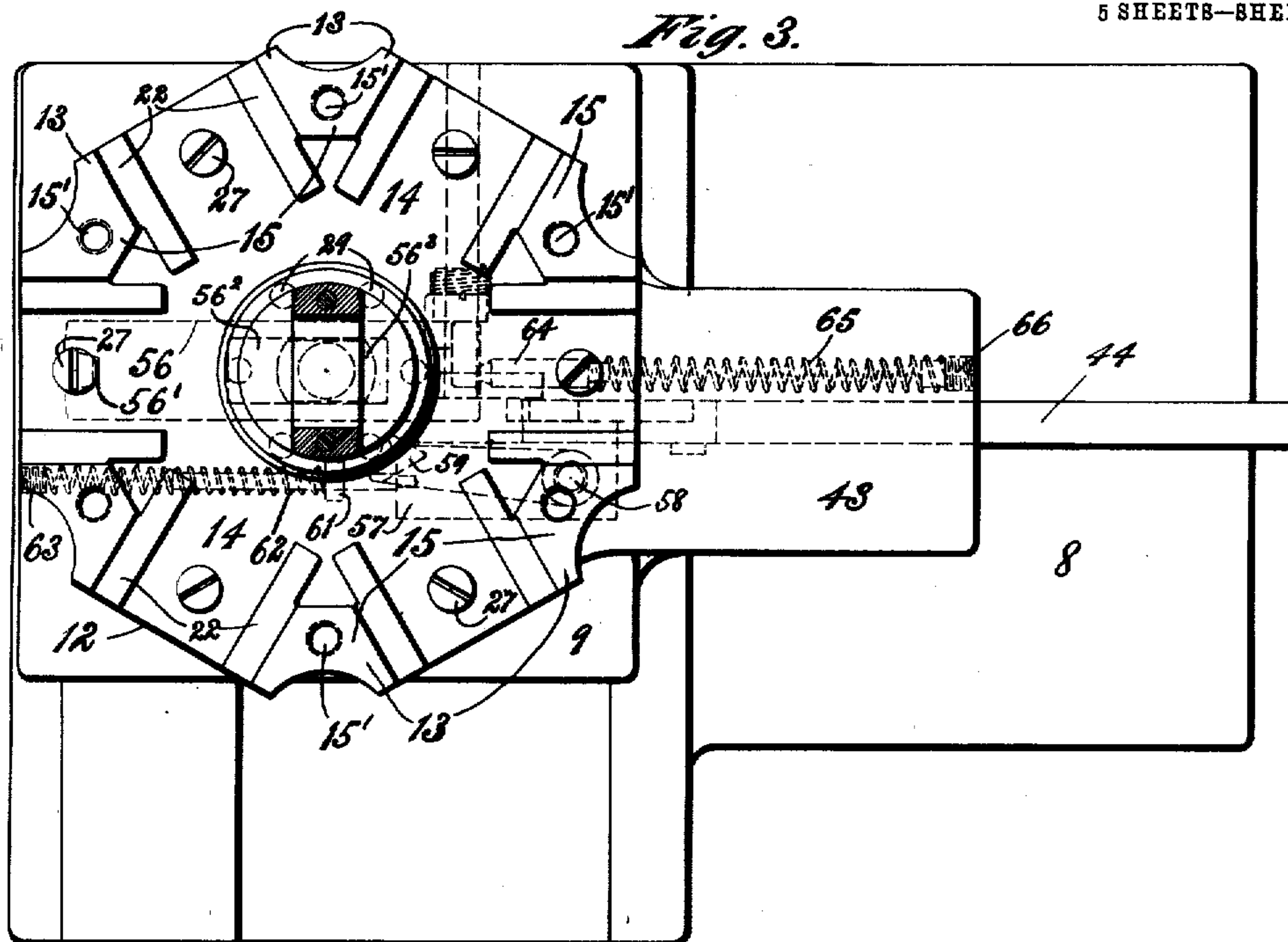
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5 SHEETS—SHEET 3.



Witnesses:

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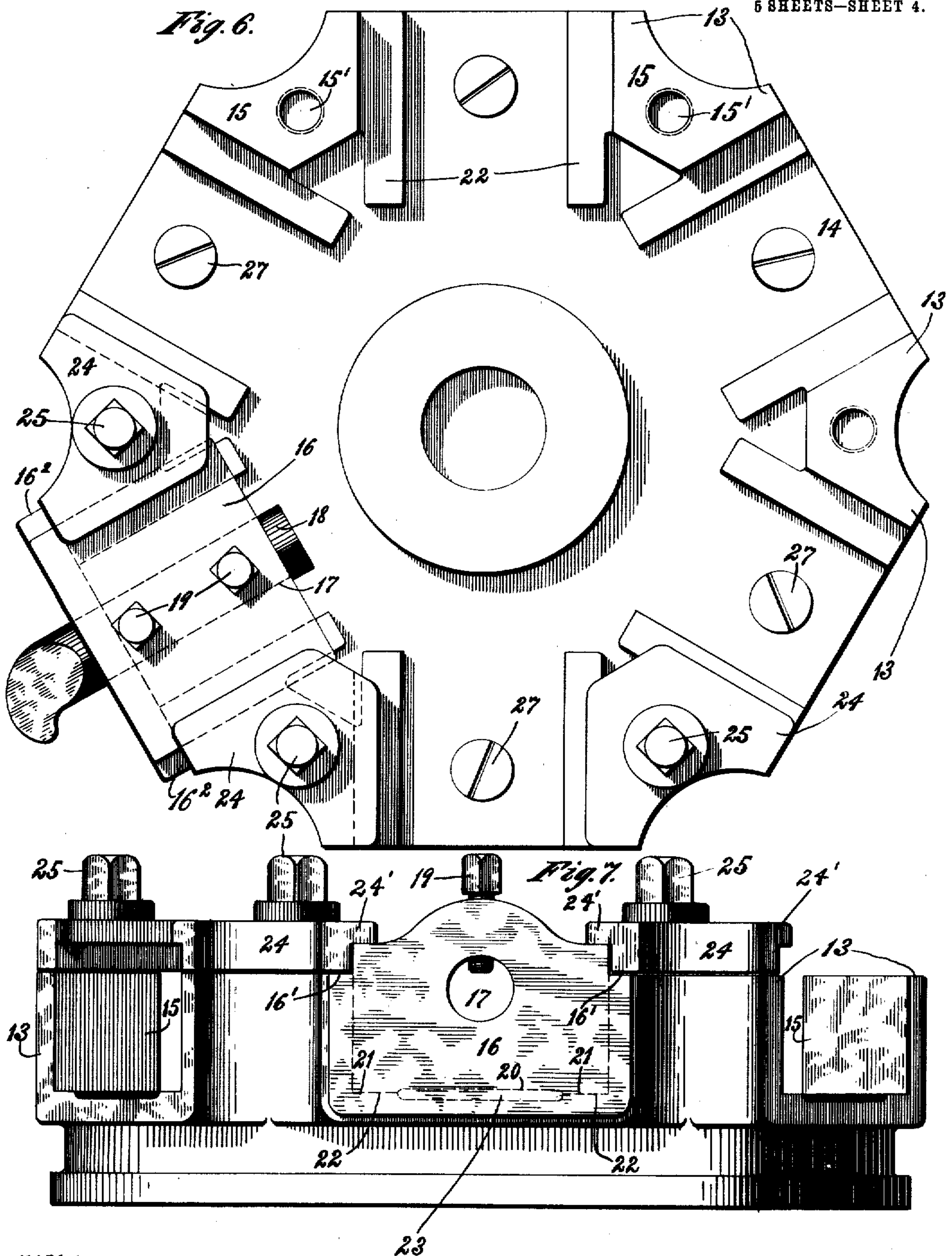
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5 SHEETS—SHEET 4.



Witnesses:
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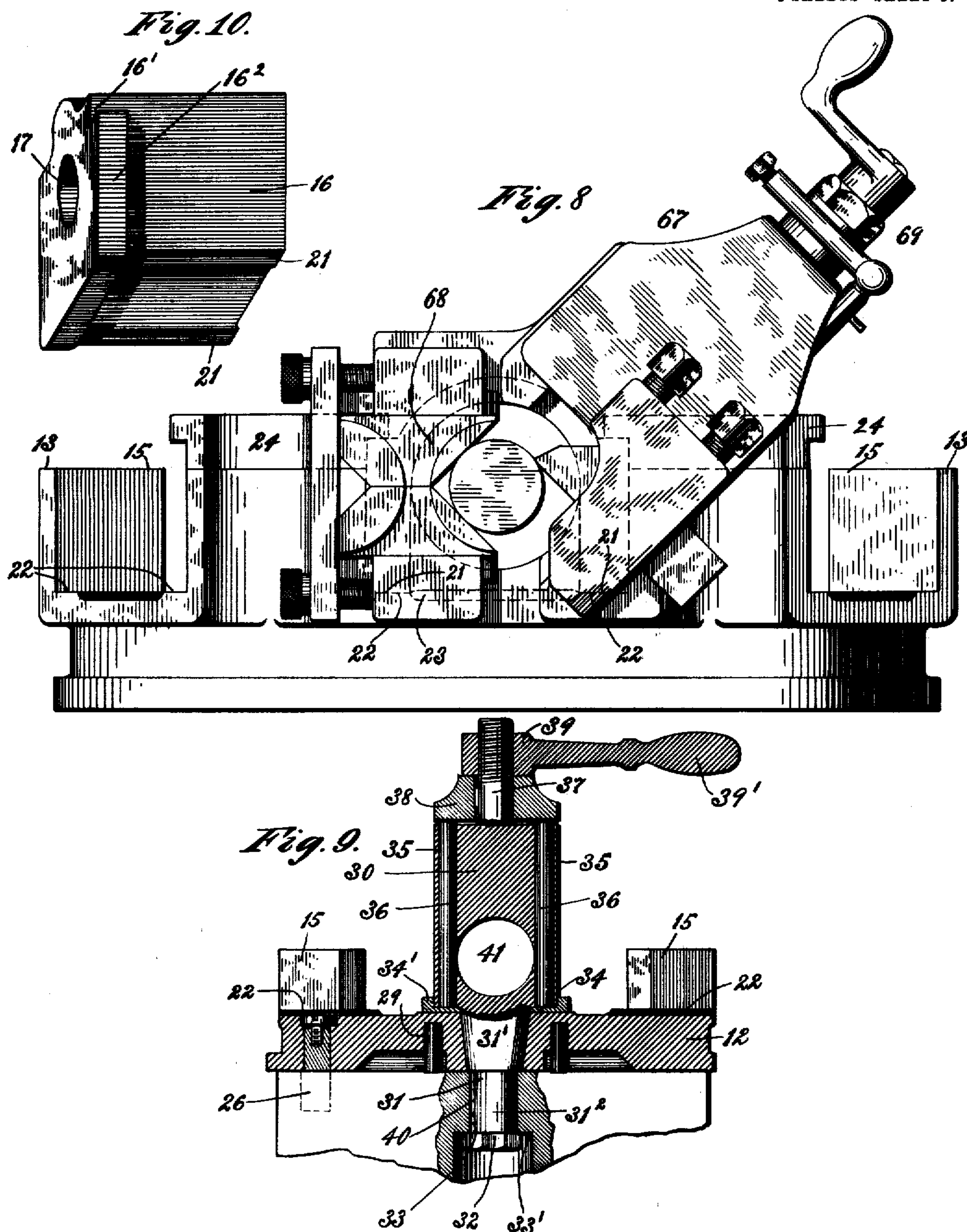
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APPLICATION FILED MAY 11, 1905.

921,984.

Patented May 18, 1909.

5 SHEETS—SHEET 5.



Witnesses:

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UNITED STATES PATENT OFFICE

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TURRET-LATHE.

No. 921,984.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Turret-Lathes, of which the following is a specification.

This invention relates to lathes of that class in which an intermittingly rotating tool-carrier is employed, said lathes being known technically as "turret-lathes".

In the preferred embodiment of the invention the tool-carrier comprises a flat, disk-like plate of polygonal shape—shown as hexagonal—from the various angles of which rise a series of pairs of short standards, the inner walls of which are parallel to the axis of the carrier, and alined pairs of which, are, when the carrier is indexed to bring a tool into position, parallel to the axis of the chuck-spindle,—the space between each pair of standards constituting a seat for the reception of a tool-holder, as will be hereinafter explained.

Primarily the object of the invention is the provision of a tool-carrier of improved construction.

A further object of the invention is the provision with the improved carrier of tool-blocks or holders of peculiar construction.

A further object of the invention is the provision of improved devices for holding the tool-carrier in place on the cross-slide of the machine.

Other objects of the invention will be hereinafter set forth.

In the accompanying drawings, Figure 1 is a plan view of a machine showing my invention applied thereto. Fig. 2 is a side elevation of the carriage and indexing and locking devices, parts being illustrated by dotted lines. Fig. 3 is a plan view, partially in section and dotted lines of the carriage, and the improved tool-carrier. Fig. 4 is a plan view of the parts employed for indexing the tool-carrier. Fig. 5 is a side elevation of the parts illustrated in Fig. 4. Figs. 6 and 7 are respectively, plan and edge views of the tool-carrier, each figure showing the improved tool-block or holder. Fig. 8 is a view similar to Fig. 7, and illustrating a peculiar kind of tool. Fig. 9 is a longitudinal, vertical sec-

tion on line $x-x$ of Fig. 1; and Fig. 10 is a perspective view of the preferred form of tool-holder.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates the shears of a machine-frame, 2 a tail-stock adjustable longitudinally thereof, 3 the usual dead-center, 4, the head-stock, 5 the belt-cone, 6 the chuck-spindle, 7, the chuck, and 8 the carriage, all of which may be of any desired shape and construction. On the carriage is fitted a cross-slide 9 actuated by usual means, for instance, a screw and nut (not shown), operated by a hand-wheel 10.

Designated by 12 is the improved tool-carrier shown of flat, polygonal shape, although it may be of any form desired without departure from the invention. Rising from the top of the carrier at spaced intervals are short standards 13, between each pair of which a seat 14 is formed for the reception of a tool-holder hereinafter described. Substantially triangular lugs or bosses 15 are provided at intervals on the top of the carrier and each has an internally-threaded seat 15' for a purpose hereinafter described.

Any suitable forms of tool-holders may be located in the seats 14 between the standards 13, and tools of any required kind may be carried by said tool-holders without departure from the invention. A preferred form of tool-holder is, however, illustrated in Figs. 6, 7 and 10, and it consists of a block 16, perforated at 17 to receive a tool-shank 18 secured in place by screws 19,—said block being grooved or recessed on its under side at 20 to form bearing-surfaces 21, which rest upon like surfaces or ways 22 separated by a recess 23 in the top of the carrier between each pair of standards 13. (See dotted lines Fig. 7, and Fig. 10). By thus grooving the engaging surfaces of the tool-holders and seats the necessity of planing the entire bottoms of the tool-holders and the entire tops of the seats on the carrier is avoided, and a receptacle is formed by said recesses for dirt etc., which might otherwise interfere with the proper seating of the tool-holders. On its upper surface each tool-holder is flanged at its outer end at 16², the flange constituting

a stop to limit the inward movement of said tool-holder by contact with the lugs or bosses 15, and said flange being rabbeted at 16' for a purpose hereinafter stated.

5 For clamping the tool-holder in place between the standards 13, any desired means may be employed and flanged, triangular plates 24 having flanges 24' are shown for this purpose said plates being secured to the lugs 15, and the flanges thereof being forced upon the adjacent sides of two tool-holders by bolts 25 entering the threaded seats 15', as shown in Figs. 6 and 7.

15 Pins 26, cooperating with a locking-slide hereinafter described, are disposed at intervals apart on, and depend from, the tool-carrier, and these pins are secured to said carrier by screws 27, the heads of which are received in countersinks 28, as shown by dotted lines in Fig. 2. Indexing-pins 29 also depend from the tool-carrier, as illustrated by dotted lines in Fig. 3, and by full lines in Fig. 4.

20 To secure the tool-carrier in place on the cross-slide 9 any means may be employed, but shown for this purpose are peculiar devices now to be described.

Referring to Fig. 9 the numeral 30 represents an angular head having an integral shank 31, formed with a conical part 31' and a reduced stem 31², threaded to receive a nut 32, said stem being inserted in a bore 33 of the cross-slide 9, and said nut bearing against a shoulder 33' formed on the cross-slide. A conical seat is formed in the tool-carrier 12 for the reception of the corresponding part of the shank, and between the head 30 and the top of said tool carrier is a washer 34 having a vertical flange 34' closely embracing the lower end of said head. Extending longitudinally of the head are bores 35 in which are placed rods or long pins 36, the lower ends of which rest upon the washer 34, and the upper extremities of which extend slightly above the top of the head. Projecting from the top of the head at about its central portion is a stem 37 threaded for a portion of its length, and upon the unthreaded part of said stem is splined a cap 38 which rests upon the upper ends of the pins 36. A lever-nut 39 having a handle 39' is threaded upon the stem above the cap, and by adjusting said nut the cap 38 may be forced against the pins 36, and as the latter bear against the washer 34 this action will result in clamping the head rigidly in place on the cross-slide the conical part 31' forming a bearing upon which the tool-carrier is indexed, and the head being prevented from rotation by a key 40 of stem 31² entering a groove in the wall of the bore 33. Adjacent to its base portion the head is provided with a bore 41 of area sufficient to receive the largest size of standard stock within the capacity of the machine, said bore being located in the head on a line coinciding with

the axis of the chuck-spindle and of the dead-center as illustrated in Fig. 1, in which a stock-bar 42 is shown passing through said bore. Integral with the cross-slide is a grooved extension 43, and in said extension is mounted a sliding-rod 44. Adjustably secured to the bed, and movable upon the shears thereof, is a slide 45, having a laterally-extending abutment 46 integral therewith, said abutment being grooved at 46' to receive the end of the rod 44, and extending laterally far enough to always receive the impact of the rod, no matter what may be the adjustment of the cross-slide.

Rigid with the inner end of rod 44 is a head 47 having an inclined cam 48, and in the chamber of the cross-slide is an angle-lever 49 rigid with a short shaft 50, said angle lever having a stud or pin 51 in one of its arms bearing against the cam 48. Secured at one end to the shaft 50 and at its other end to the slide is a torsion-spring 52, the tendency of which is to hold the pin 51 against the cam 48. A slot 53 in the head 47 permits the rocking of said angle-lever under the stress of spring 52 after the pin passes off the end of the cam. In the other arm of the angle-lever is a pin 54 which bears against a lug 55 depending from a locking-bolt or slide 56, the latter being notched at its inner end at 56' to engage the pins 26. In the body of the locking-bolt is a slot 56² in which is fitted a guide-block 56³ of the cross-slide. Rigid with the head 47, and extending inward therefrom, is a broad flange or shelf 57, upon which is pivoted at 58, an arm carrying at its inner end a dog 59, grooved on its face to engage the indexing-pins 29. Extending from this flange or shelf is a spindle 60 having a collar 61, and surrounding said spindle is a coiled spring 62, one end of which bears against said collar and the other extremity against a screw 63, as illustrated, in Figs. 2 and 3. Projecting from the lugs 55 of the locking-bolt is a plunger 64, reduced and collared at 64' to receive one end of a coiled spring 65, the other end of said spring bearing against a screw 66, as illustrated in Fig. 3.

Normally the locking-bolt is in engagement with one of the pins 26, and it is, therefore, necessary to withdraw it before the tool-carrier can be indexed. As the carriage 8 moves rearward the rod 44 will move with it until arrested by the abutment 46, and as said carriage continues its rearward movement, the rod 44 is held stationary, and the pin 51 rides up the inclined cam 48 and rocks the angle-lever 49, thereby causing the pin 54 of said lever to engage the lug 55 and withdraw the locking-bolt 56, said bolt being held in its withdrawn position until the tool-carrier is indexed by the engagement of one of its pins 29 with the dog 59. After the pin 51 leaves the cam 48 it enters the slot 53 of

head 47, and the spring 65 shoots the bolt forward to cause it to again lock the tool-carrier.

While particular locking and indexing mechanism is shown and described it is distinctly to be understood that the invention is not limited thereto, for any suitable devices may be substituted for those illustrated, if desired.

Any desired tool may be employed with the improved tool-holding blocks 16, and in Fig. 8 I have shown what is known as a "universal turning-tool" designated in a general way by 67, as carried by one of said blocks. This tool is provided with a back-rest 68 and with suitable stop and adjusting devices 69, and the illustration is for the purpose of showing how the blocks are adapted to receive any peculiar kind of appliance useful with the machine.

As will be seen the tool-holders or blocks fill their seats, are strong and rigid, and can not be deflected or broken under strain due to the stress of the work upon the tool, and as said blocks fit snugly between the standards 13 they are held in fixed position, with no possibility of lateral movement.

Changes may be made in the various details of the machine, and in their form and proportions, without departure from the invention, which is not limited to the exact devices shown and described.

Having thus described my invention, what I claim is—

1. The combination, with a carrier having seats with parallel walls, of rectangular tool-holding blocks fitted in the seats, and supported laterally by the walls thereof; and means for securing said tool-holding blocks in place.

2. A rectangular tool-holding block combined with a carrier having a rectangular seat open at its end, and shaped to receive and inclose a block on its bottom and sides; and means for clamping the block in its seat, said means overlapping the top of the block adjacent to the edges thereof.

3. A carrier having pairs of standards; a plurality of tool-holding blocks inserted one between the standards of each pair; plates on the carrier between the pairs of standards; and means for forcing the plates against the tool adjacent the tool-holding blocks.

4. The combination, with a carrier having pairs of separated standards, each located parallel to the axis of rotation of the carrier, of tool-holders mounted between the standards; plates on the carrier between each pair of opposing standards and means for forcing each plate against two of said tool-holders.

5. The combination, with a rotatable carrier, of standards; tool-holders located in the

passages between the standards; a plate having double clamping surfaces; and means for securing said plate to a part of the carrier between two standards, and for forcing it upon the tops of a pair of tool-holders.

6. The combination, with a slide of a cross-slide; a turret carried by said cross-slide; indexing-devices; means for actuating said indexing-devices; and an abutment carried by the frame, and with which said means will engage on the return of the slide at any point of adjustment of the cross-slide.

7. The combination, with a rotatable carrier having pairs of separated standards, of rectangular blocks, each block having a socket for the reception of a tool-shank, and also having a flange on its outer end; and means for clamping said blocks in place.

8. The combination, with a machine-bed having ways, of a slide mounted for longitudinal movement upon said ways; a cross-slide carried by the first-mentioned slide; a turret mounted for intermittent rotation on the cross-slide; means for indexing the turret; a rod for actuating the indexing-means; an abutment with which the end of said rod may engage in any position of the cross-slide; and a support for said abutment on said ways.

9. The combination, with a machine-bed having ways, of a slide mounted for longitudinal movement upon said ways; a cross-slide carried by the first mentioned slide; a turret mounted for intermittent rotation on the cross-slide; means for indexing the turret; a rod for actuating the indexing means; a grooved abutment, with which the end of said rod may engage in any position of the cross-slide; and an adjustable support for said grooved abutment.

10. The combination, with a carrier, of a head having longitudinal perforations, and a bearing upon which said carrier is mounted; rods in the longitudinal perforations; a washer between the lower ends of the rods and the carrier; and means for applying pressure to said rods.

11. The combination, with a carrier having an axial opening, of a perforated head provided with a stem having a bearing for said carrier; means for securing the head in place; a flanged washer on which the base of the head is seated; rods in the perforations of the head, and bearing against said washer; and means for applying pressure to said rods.

12. The combination, with a carrier, of a longitudinally and transversely-perforated head, provided with a stem having a bearing; a cross-slide; means for securing the stem to the cross-slide; a washer between the base of the head, and the carrier; rods in the longitudinal perforations of the head; a cap

splined to an extension of the head; and a nut threaded on said extension, and bearing against the cap.

5 13. The combination, with a rotatable tool-carrier having triangular bosses, the sides of which serve as standards and are located parallel to the axis of rotation of the carrier, of tool-carrying blocks mounted in the seats formed by said bosses; clamping-plates; and

means carried by the bosses for forcing each 10 clamping-plate against two tool-carrying blocks.

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

BENGT M. W. HANSON.

Witnesses:

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S. E. DAVIS.