

Aug. 27, 1963

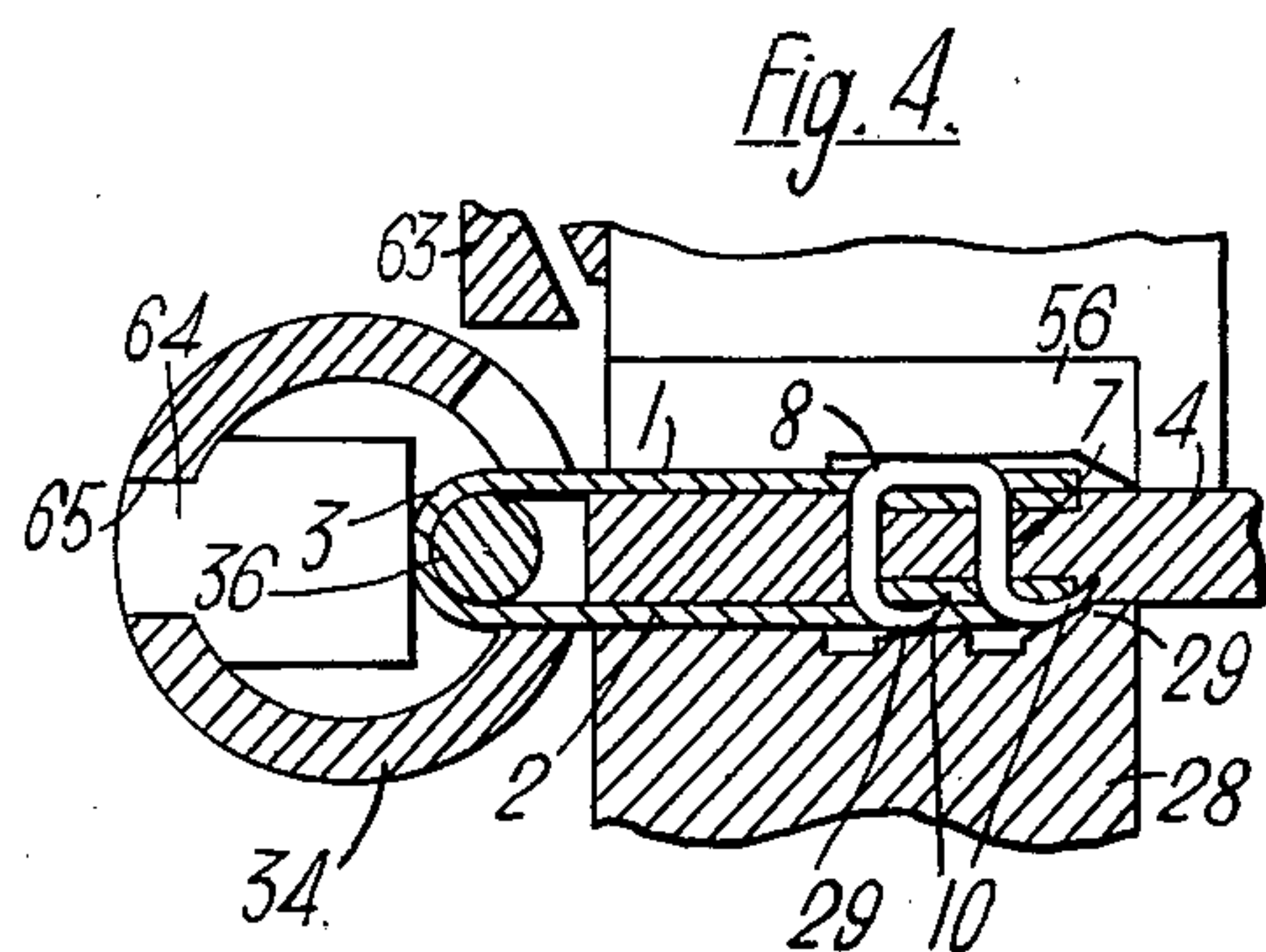
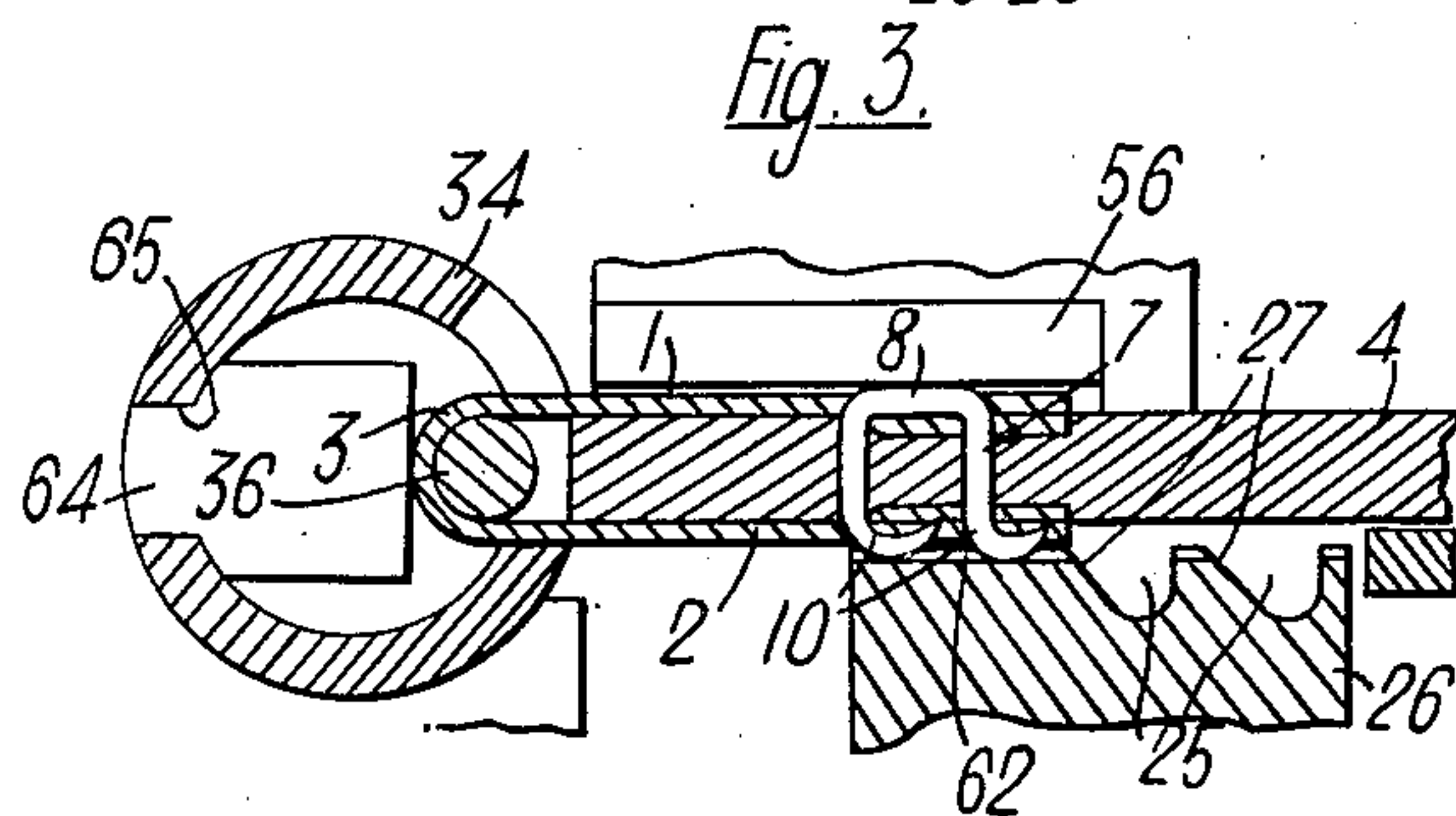
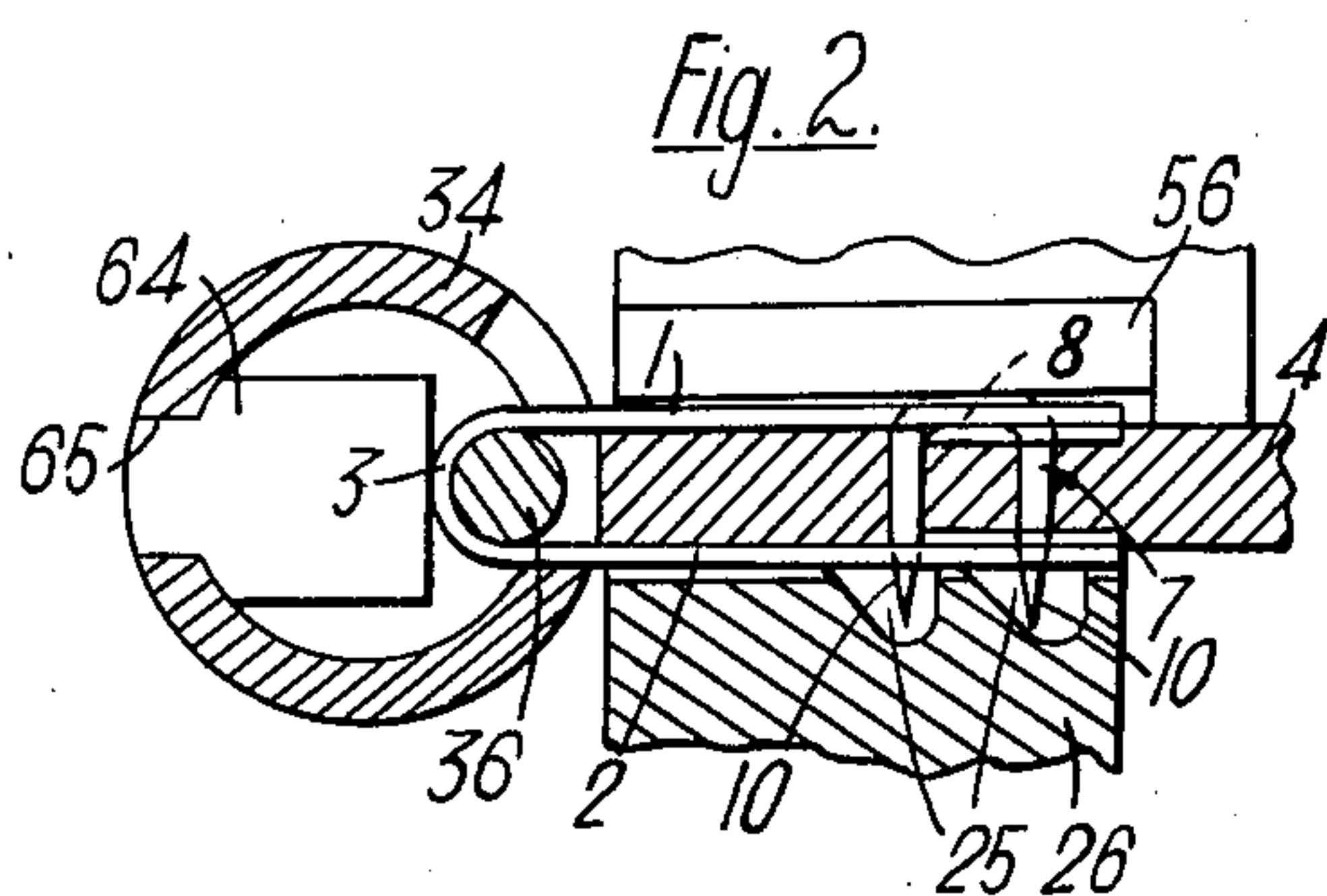
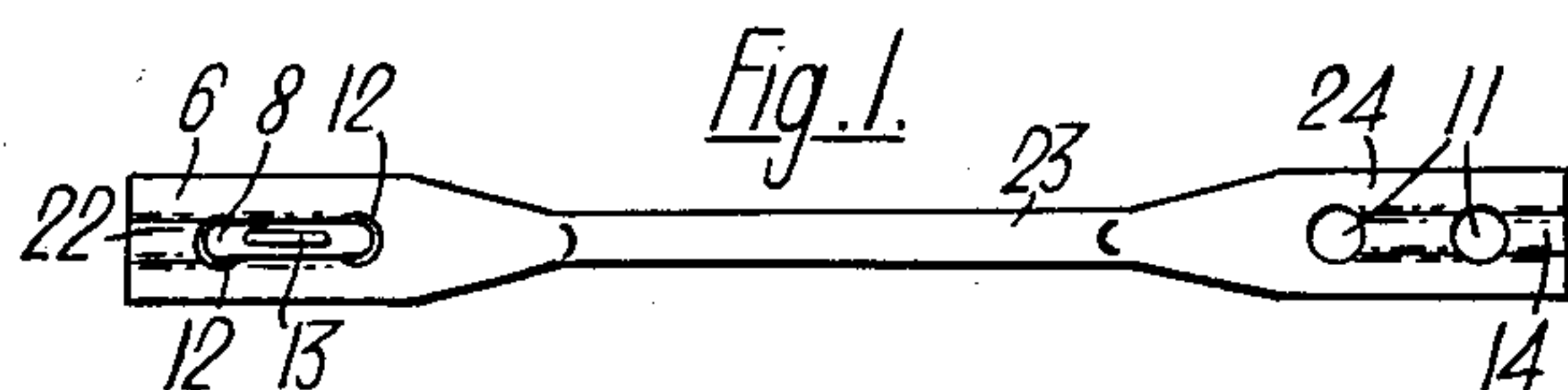
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3,101,481

BELT-FASTENING MACHINES

Filed Jan. 25, 1962

3 Sheets-Sheet 1



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BELT-FASTENING MACHINES

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3 Sheets-Sheet 2

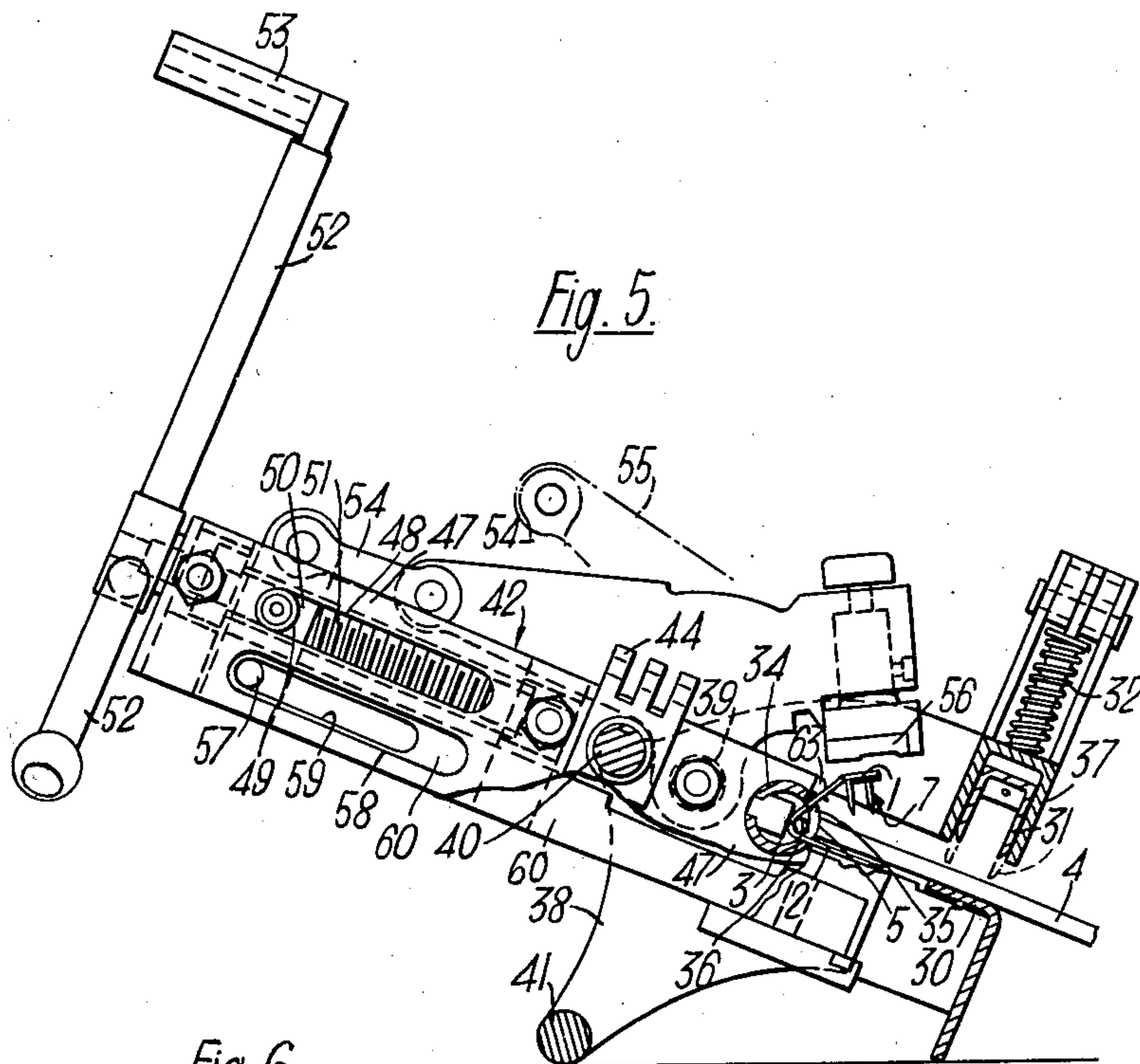


Fig. 5.

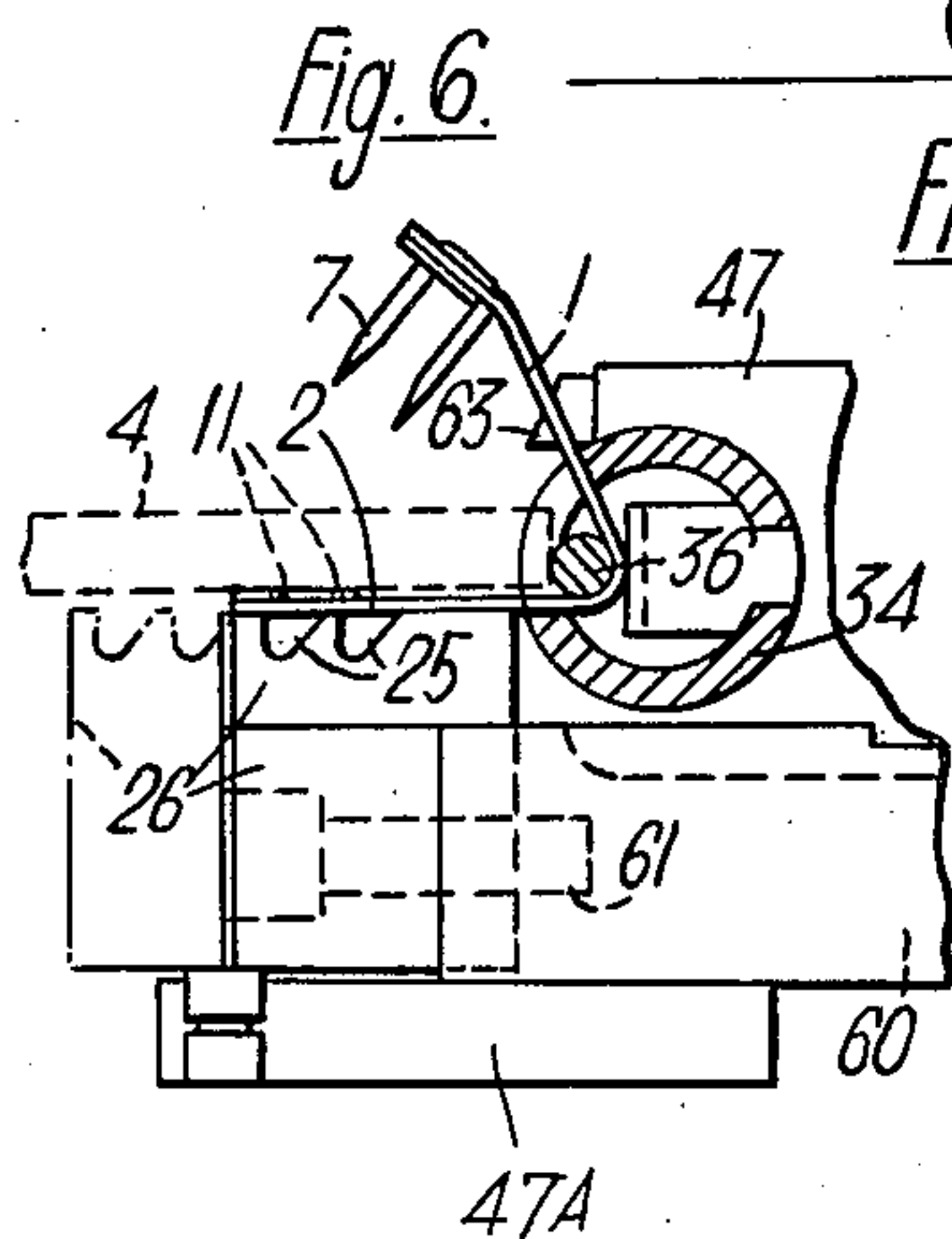


Fig. 6.

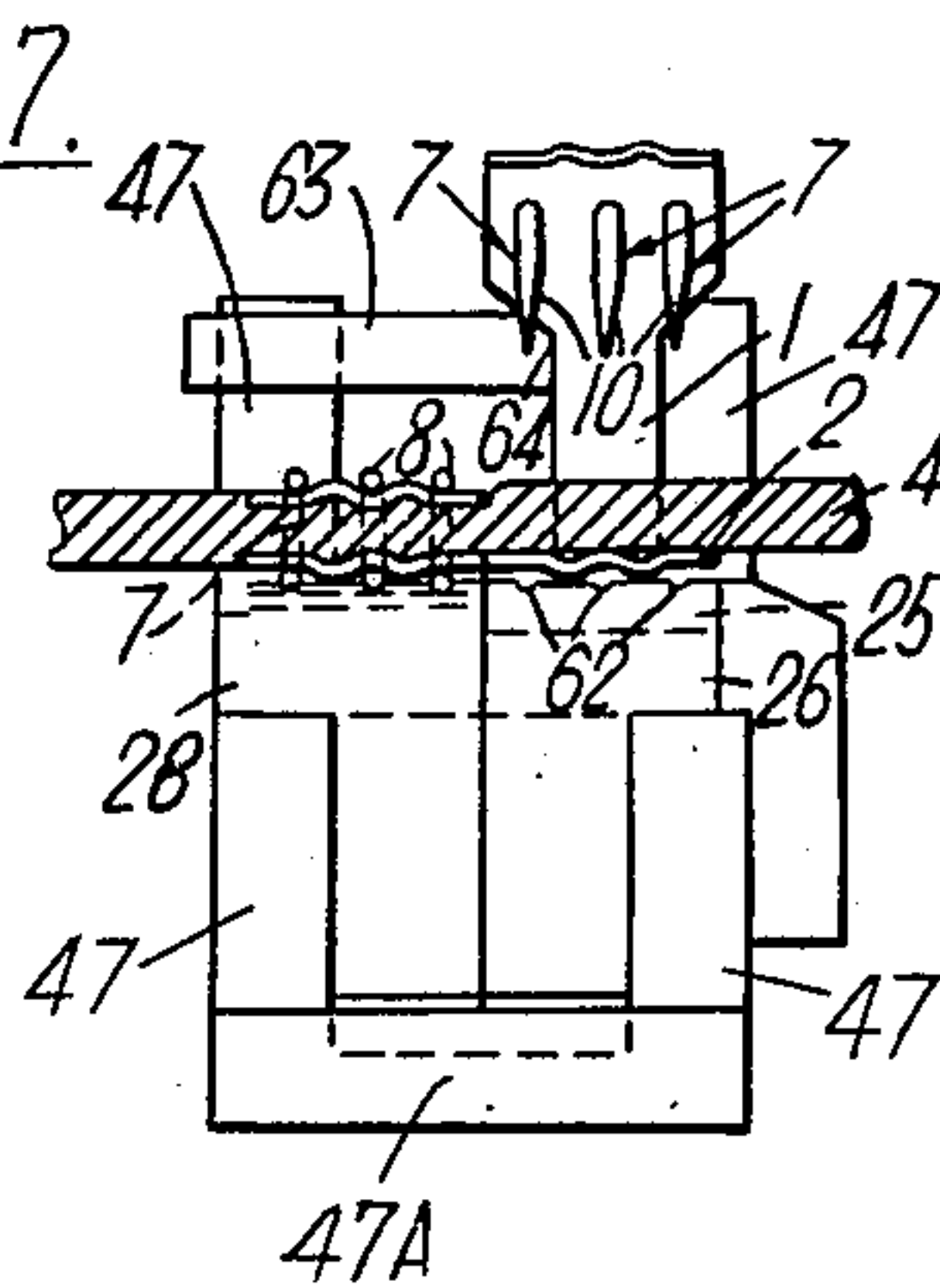


Fig. 7.

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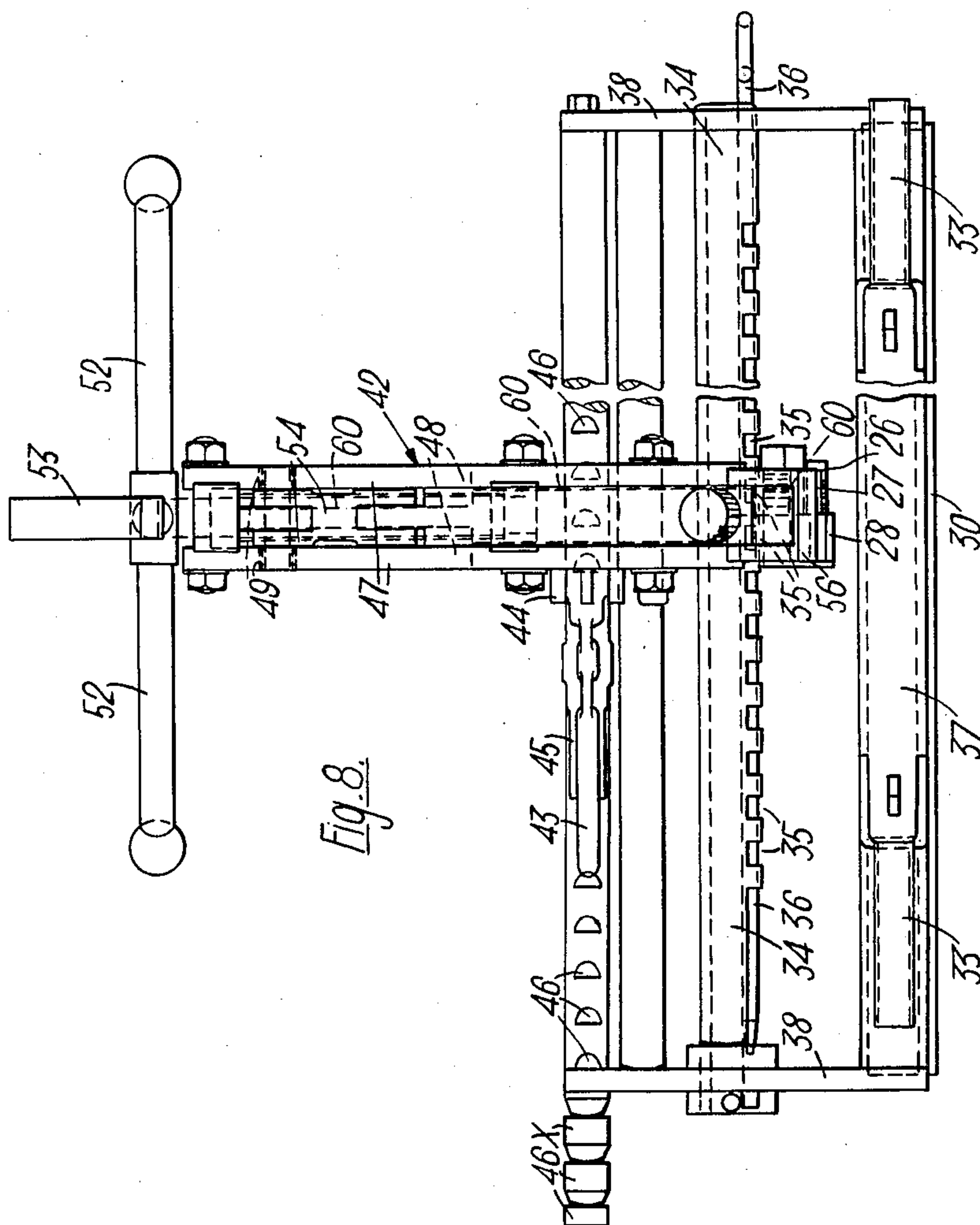
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BELT-FASTENING MACHINES

Filed Jan. 25, 1962

3 Sheets-Sheet 3



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3,101,481

BELT-FASTENING MACHINES

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6 Claims. (Cl. 1—342)

This invention relates to belt-fastening machines for the application to the end of a conveyor or like belt of fasteners comprising U-shaped metal members to be closed on to the faces of the belt, with pointed lengths carried by the limbs of the members at one face and directed towards holes in the other limbs for the passage of the points after the pointed lengths have been caused to penetrate the belt by the closing of one limb towards the other, the points then being bent to the external faces of those other limbs.

One object of the invention is to provide the machine with means for bending the points in a direction away from the end-edge of the belt.

Another object is to provide that this bending of the points takes place automatically in the operation of the machine to press the points through the belt.

Yet another object is to provide point-bending means that utilize the power of the means for effecting penetration of the belt to effect the bending of points of heavy-gage wire.

A still further object is to utilize that same power to effect, in a repeated operation on the points, a close flattening of the points to one limb of the fastener.

With these objects in view, the invention consists primarily in the provision in a belt-fastening machine of one pivoted jaw lever only, with a pressing cheek, the usual counter-lever with pressing cheek being replaced by a block slidable towards and away from the lever pivot, with recesses to receive the points pressed through the belt by the cheek, the block being operable by the same means as used to rock the jaw, those means including lost motion so that the block only slides away from the lever pivot after the cheek has pressed the points through the belt. The final operation of the operating means thus compels the protruding points, even of thick wire, to be bent over.

The invention further comprises a fixed re-pressing block alongside the slidable block, the pressing cheek being wide enough to cover both, the fixed block having a surface to flatten the bent points of a hook in a subsequent pressing operation of the cheek to press adjoining hook points into the recesses of the slidable block.

An embodiment of a machine for progressively inserting either single-hook fasteners or multiple-hook fasteners from a row of such fasteners is shown in the drawings, in which

FIGURE 1 is a plan view of a single-hook fastener opened out flat;

FIGURES 2, 3, and 4 are sectional views of details of the machine showing the progressive application of a fastener to a belt;

FIGURE 5 is a part-sectional side elevation of the machine, partly in section and with parts broken away, showing an open fastener ready for insertion;

FIGURE 6 is a fragmentary section, to a larger scale, of part of the machine of FIGURE 5, viewed from the opposite side;

FIGURE 7 is an elevation of FIGURE 6 viewed from the left-hand side; and

FIGURE 8 is a plan of the machine of FIGURE 5.

As already indicated, each fastener may have one hook or more. Whatever the number of hooks in a fastener, the part or parts forming the round base for linking to the fasteners must occupy no more than half

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the width of the flattened portion secured to the hook or hooks. Thus, FIGURE 10 shows a fastener with a single hook (the base 8 of which, visible between the holes 12, is secured by spotwelding 13) at a flattened plate-end 6, preferably corrugated or recessed at 22 for bedding of the base 8, that end 6 having twice the width of a shank 23 connecting it to a correspondingly wide plate-end 24 containing the holes 11 and corrugated or recessed at 14 for the bent pointed end of the hook. FIGURE 7 shows a fastener with three hooks 7.

FIGURE 2 shows the upper limb 1 of a fastener closed to the upper surface of a belt 4 so that the points 10 of the hook 7 have passed through the belt and through the holes in the bottom limb 2, to enter recesses in a slidable preliminary pressing block 26, here shown in a retracted position, by which the bottom limb is supported.

FIGURE 3 shows the block 26 advanced along the bottom limb 2 so that inclined sides 27 of the recesses 25 have turned the points 10 in the same direction, viz., away from the rounded base 3 of the fastener.

FIGURE 4 shows the bottom limb 2 supported by a re-pressing block 28 with inclined surfaces 29 that press the already bent points 10 more firmly, when the limbs 1, 2 are pressed finally to the surfaces of the belt 4. If the tip of the right-hand point 10 extends beyond the end of the limb 2, it is turned into the belt 4.

The blocks 26, 28 lie alongside each other.

In FIGURE 5, the belt 14 is about to be clamped to a lower clamping bar 30 by an upper clamping bar 31 by the release of strong springs 32 (one only shown) by hand-levers 33. The end edge 5 of the belt lies against the front of a comb bar 34, which is slotted at 35 along its length (see FIGURE 8) to position a series of fasteners by engaging their limbs 1, 2. The fasteners are retained in the comb bar 34 by a locking rod 36, which passes inside their rounded bases 3. The lower clamping bar 30, a support 37 for the upper bar 31, and the comb bar 34 extend between side frames 38 of the machine. A pivot bar 39 and a rack bar 40 also extend between the plates 38, as also does a support bar 41, which enables the machine (which is portable in character) to be supported in the angular position shown in FIGURE 5 by the bar 41 and the lower edge of the bar 30.

The pivot bar 39 and the rack bar 40 serve to support and guide a jaw unit 42 transversely across the machine, a lever 43 pivoted at 44 serving to move a pawl 45 from one notch 46 of the bar 40 to another, the notches 46 having the same spacing as the slots 35 of the comb bar 34. Extension notches 46X enable the jaw unit 42 to start from close to the left-hand side of the machine.

The jaw unit 42 has side plates 47, the ends of which embrace the comb bar 34. Slots 48 guide rollers 49 on a slider nut 50 through which passes a screw 51 rotated by three arms 52 and a handle 53, to propel the slider nut 50 along the slots, so that toggle links 54 rock a jaw lever 55 about the pivot bar 39 to close an upper jaw cheek 56 on to the upper limb 1 of a fastener.

A pin 57 on the slider 51 moves along clearance slots 58 co-extensive with the slots 48 in the plates 47 and fits a shorter slot 59 providing lost motion in a pusher bar 60 slidable between the plates 47. The bar 60 is identified in outline by heavy broken lines in FIGURE 8. During the major closing movement of the jaw lever 55, the pin 57 moves idly along the slot 59, so that the pre-pressing block 26 (FIGURES 2 and 6) secured by a screw 61 to the bar 60 remains retracted, close to the comb bar 34 while the hooks 7 are caused to penetrate the belt 4, pass through the holes 11 in the lower limb 2, and enter the recesses 25 in the block 26, as shown in FIGURE 2.

In the final closing movement of the jaw lever 55, the pin 57 reaches the right-hand end (FIGURE 5) of

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the slot 59 and advances the pusher bar 60 until the pin reaches the end of the slots 58. The block 26 has then reached the advanced position i.e., further away from the pivot bar 39, shown in broken lines in FIGURE 6 and in full lines in FIGURE 3 to bend the points 10 by the action of the inclined faces 27 of the recesses 26. The arms 52 are now rotated in the reverse direction to lift the jaw cheek 56, and eventually to retract the pusher bar 60 and the block 26 towards the pivot bar 39 when the pin 57 reaches the left-hand end of the slot 59.

The pawl lever 43 is now operated to move the jaw unit 42, so that the next fastener comes below the jaw cheek 56. As appears from FIGURE 8, the cheek 56 embraces two slots 35 in the comb bar 34, with the slidable pre-pressing block 26 opposite one slot and the fixed re-pressing block 28 opposite the next slot. When, therefore, the jaw lever 55 is next operated to close the succeeding fastener, the upper cheek 56 presses the previously closed fastener to the block 28, for the inclined faces 29 (FIGURE 4) to effect final pressing of the bent points 10. FIGURE 7 (with the jaw cheek 56 omitted) shows a right-hand fastener with three hooks 7 above the block 26 and about to be closed on the belt 4 and a left-hand fastener already closed and above the block 28, ready to be finally pressed. FIGURE 7 also shows grooves 62 in the face of the block 26 along which the points 10 of one length of each hook 7 move when bent by the inclined faces 27 of the recesses 25 in the block (see also FIGURE 3). A stop 63 (FIGURES 4 to 7) carried by one side plate 47 (FIGURE 7) of the jaw unit 42 has its end face 64 meet an edge of the limb 1 of an open fastener awaiting insertion when the jaw unit is moved to a fresh position, so that the fastener, itself located by the comb bar 34, serves to locate the jaw unit.

The rounded bases 3 of the two fasteners at any one time being pressed by the cheek 56 are supported by a block 64 inside the comb bar 34 and projecting into a rear slot 65 of that bar to allow the jaw unit to take the thrust on the rounded bases 3.

FIGURE 7 shows the slidable block 26 and the fixed block 28 lying alongside each other, between the forward ends of the side plates 47 of the jaw unit, which ends are connected by a bottom plate 47A. Whereas the block 26 is slidable, the push rod 60 resting on the plate 47A, the block 28 is fixed (by screws, not shown).

What I claim is:

1. A belt-fastening machine for the application of fasteners to the end of a continuous belt, comprising U-shaped members with at least two registering pairs of holes in their limbs and at least one U-shaped hook with pointed lengths to pass through the pairs of holes in turn and the interposed thickness of the belt, the machine comprising a jaw unit, a jaw lever, a transverse pivot for the lever, a pressing cheek mounted on one end of the lever located on one side of said U-shaped member for pressing said U-shaped hook through said pairs of holes and belt, means for rocking said jaw lever, a block located in the jaw unit and longitudinally slidable towards and away from a position on the opposite side of said U-shaped member, said block having at least one pair of recesses in the side of the blocking facing the cheek to receive the two points of said U-shaped hook pressed by the cheek through the pairs of holes and the belt upon pivoting the jaw lever

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in one direction and means for sliding said recessed block parallel to said belt, after said jaw lever has been pivoted to press said U-shaped hook through said pairs of holes and belt, to bend the points of the hook in a direction parallel with said belt.

2. A belt-fastening machine as claimed in claim 1, wherein the trailing sides of the recesses in said block are inclined.

3. A belt-fastening machine as claimed in claim 1, wherein the recesses in said block are constituted by transverse grooves to permit each recess to receive simultaneously points of more than one U-shaped hook.

4. A belt-fastening machine comprising a frame, a slotted transverse comb-bar to receive U-shaped fastener members having U-shaped wire hooks projecting from one limb towards holes in the other limb, a jaw unit movable transversely of the frame, a transverse pivot in the unit, a jaw lever mounted on the pivot, a jaw cheek on the jaw lever forwardly of the pivot, a screw lengthwise of the jaw unit having a slider nut mounted thereon, manually operated means for rotating the screw in either direction, toggle links connecting said nut to the jaw lever, a pusher rod lengthwise of the jaw unit, a lost-motion pin-and-slot connection between the nut and the pusher rod, and a slidable presser block secured to the pusher rod below the jaw cheek, the side of the slidable block facing the cheek having recesses to receive the points of said U-shaped hooks, said hooks being forced through said belt and the holes in one limb of the fastener by the closing movement of the jaw lever and jaw cheek in response to rotation of said screw in one direction, the lost-motion connection from the nut providing for advance of said slidable block to bend the points by turning them out of the recesses by sliding of the pusher rod in the final movement of the screw in that direction.

5. A belt-fastening machine comprising a frame, a slotted transverse comb-bar to receive U-shaped fastener members having U-shaped wire hooks projecting from one limb towards holes in the other limb, a jaw unit movable transversely of the frame, a transverse pivot in the unit, a jaw lever mounted on the pivot, a jaw cheek on the lever forwardly of the pivot, a slidable block and a fixed block alongside each other in the jaw unit and both lying below the jaw cheek, the side of the slidable block facing the cheek having recesses to receive the points of a belt fastener forced through said belt and the holes in one limb of the fastener by the jaw cheek, and common manually operated means for rocking the jaw lever and sliding the slidable block, with a lost-motion connection to the slidable block to delay sliding until the jaw lever has brought the cheek towards its nearest approach to both blocks, the sliding of the sliding block serving to bend the fastener points out of the recesses and the fixed block serving simultaneously for final pressing of the points of an adjacent fastener forced through the belt and bent in a previous operation of the jaw lever and brought over the fixed block by a movement of the jaw unit transversely of the frame.

6. A belt-fastening machine as claimed in claim 5, wherein the fixed block has inclined surfaces to turn the previously bent points towards the belt.

No references cited.