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PUNCH PRESS GAUGE ACTUATOR

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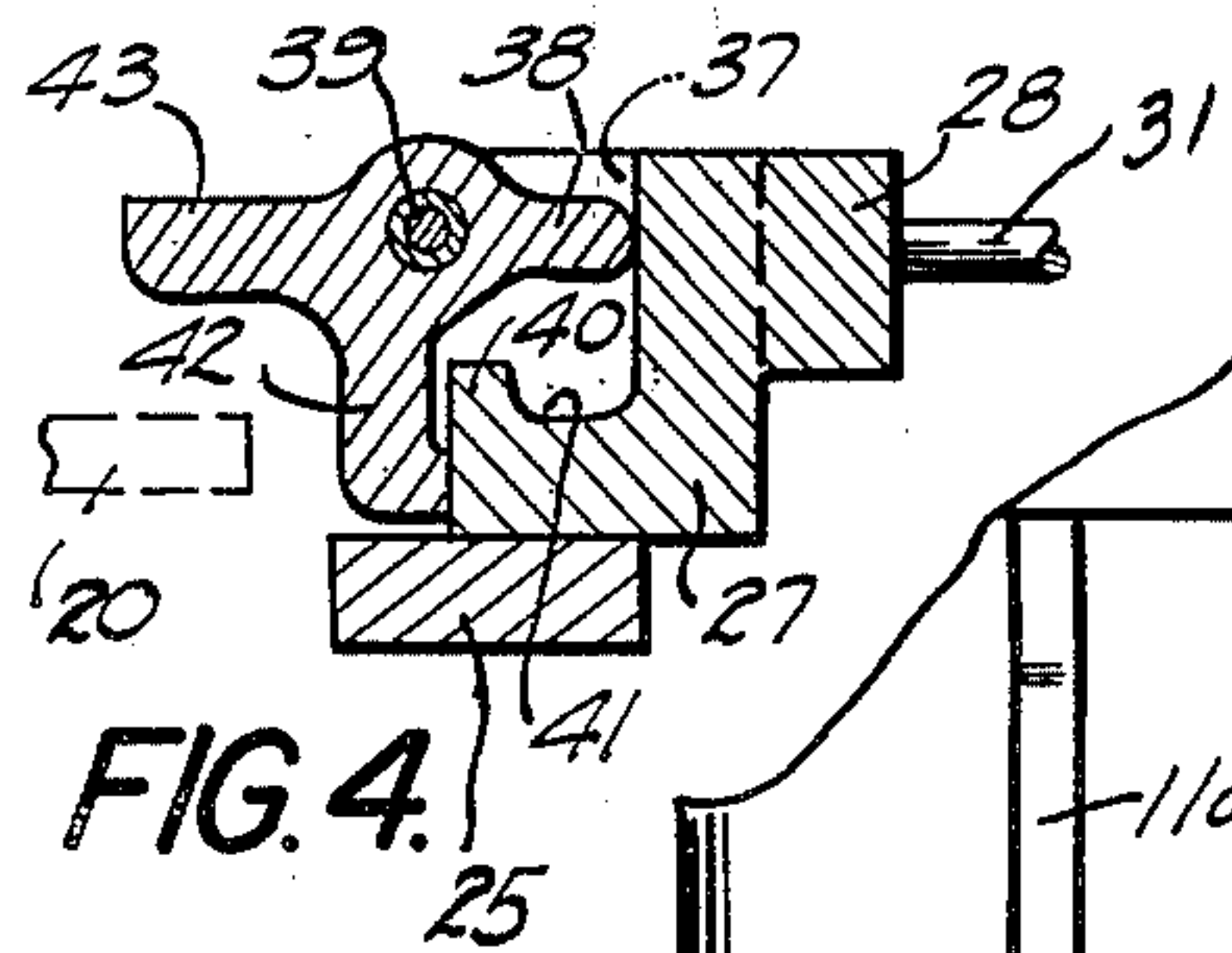


FIG. 4.

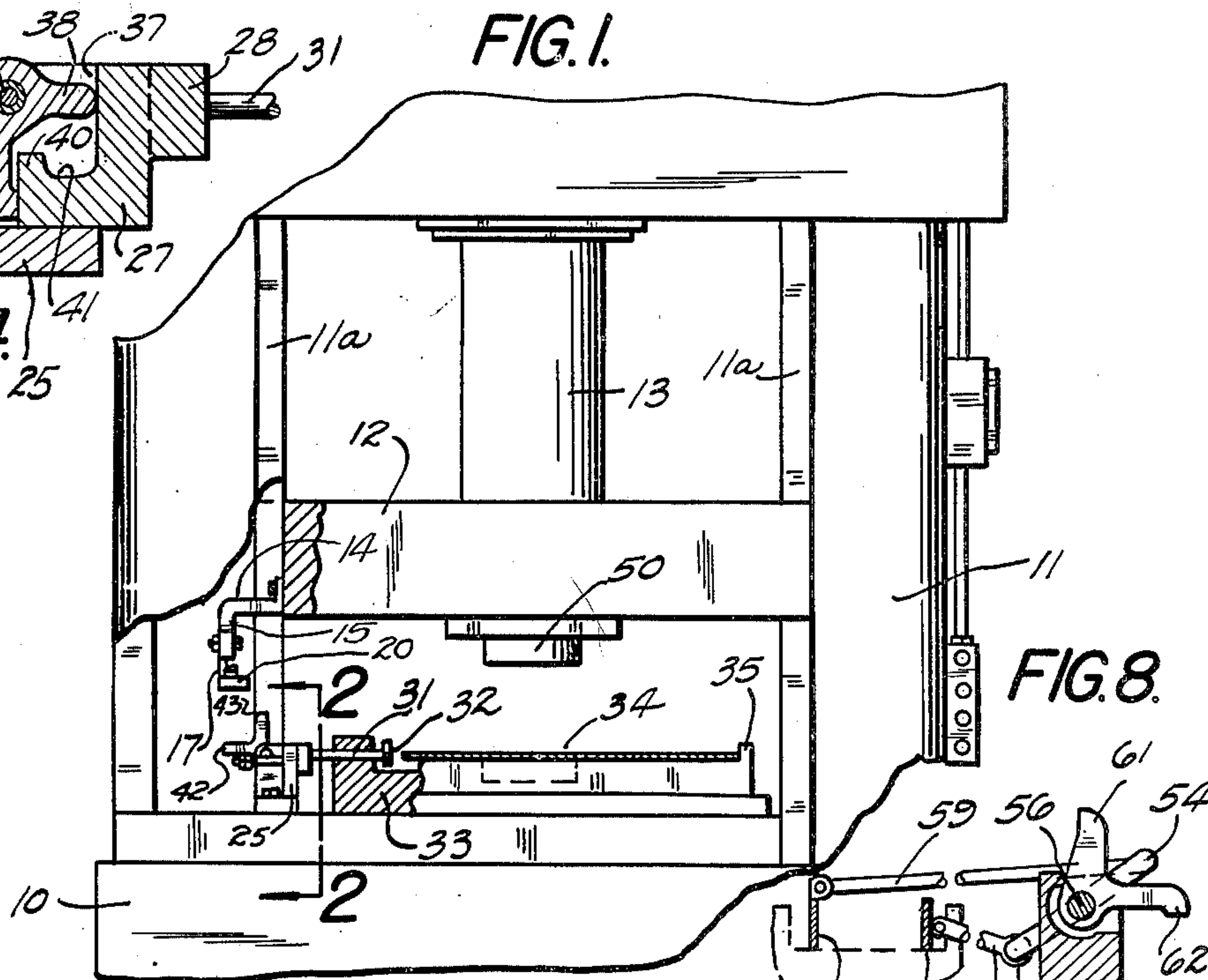


FIG. 1.

FIG. 2.

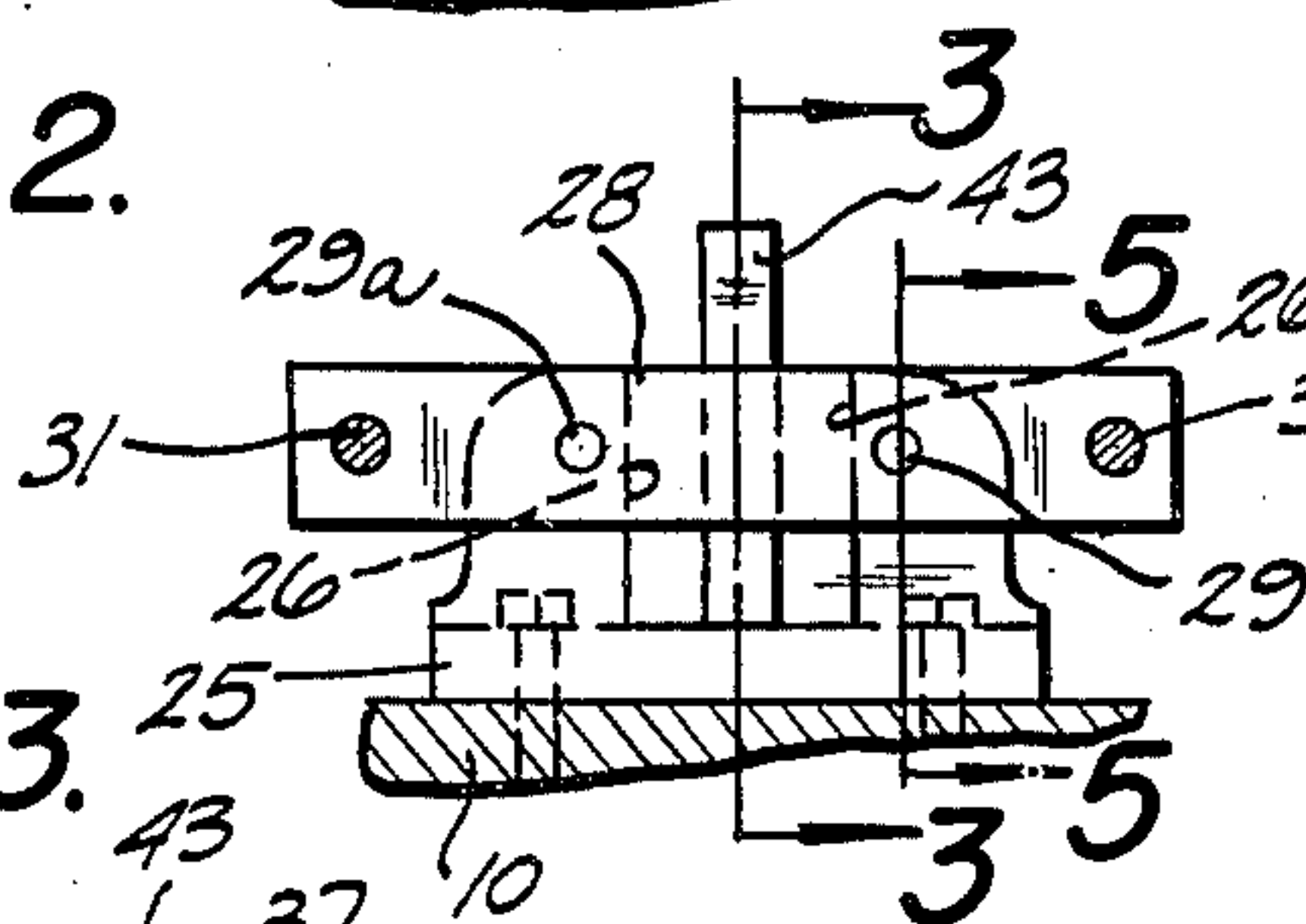


FIG. 5.

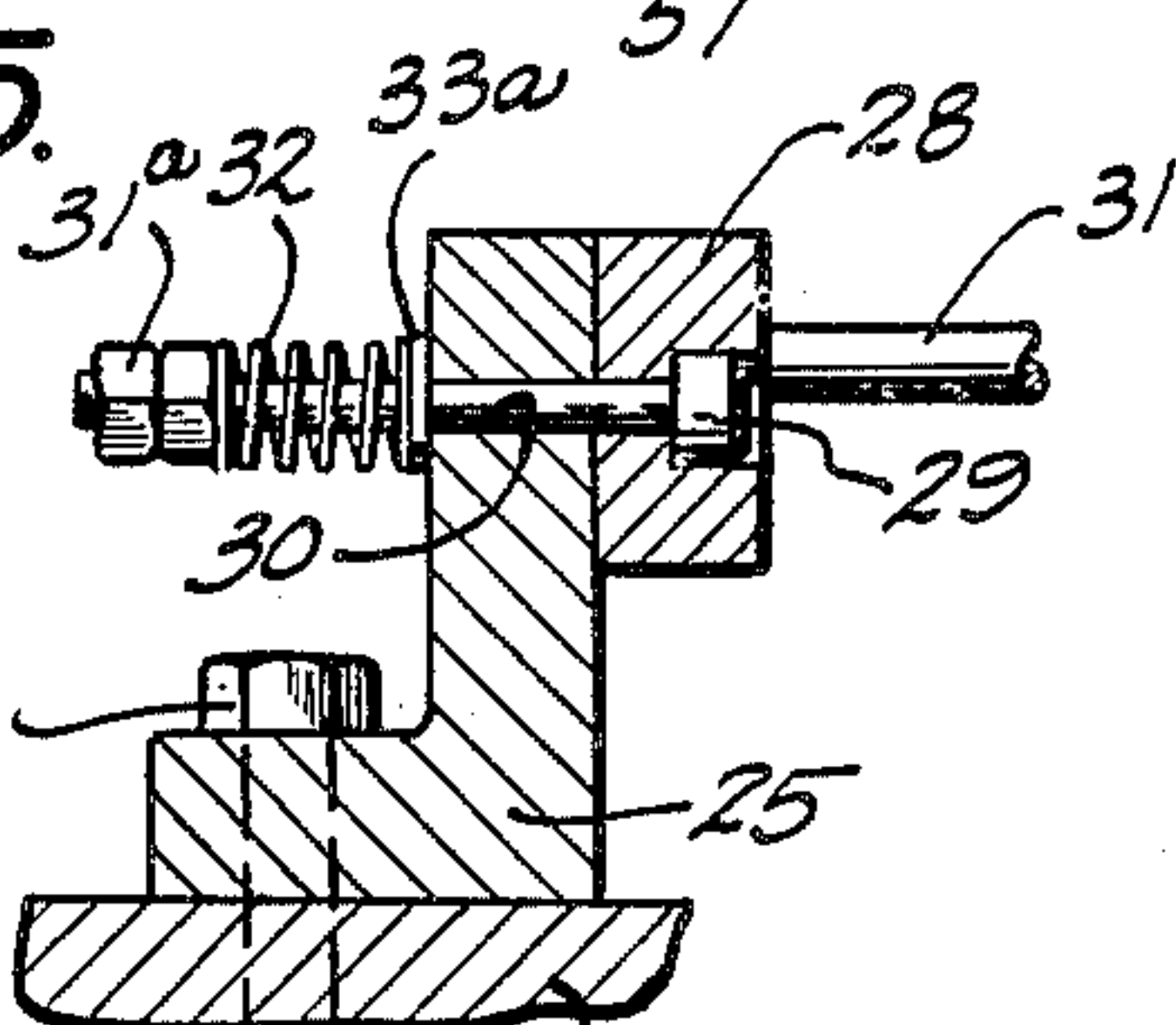


FIG. 3.

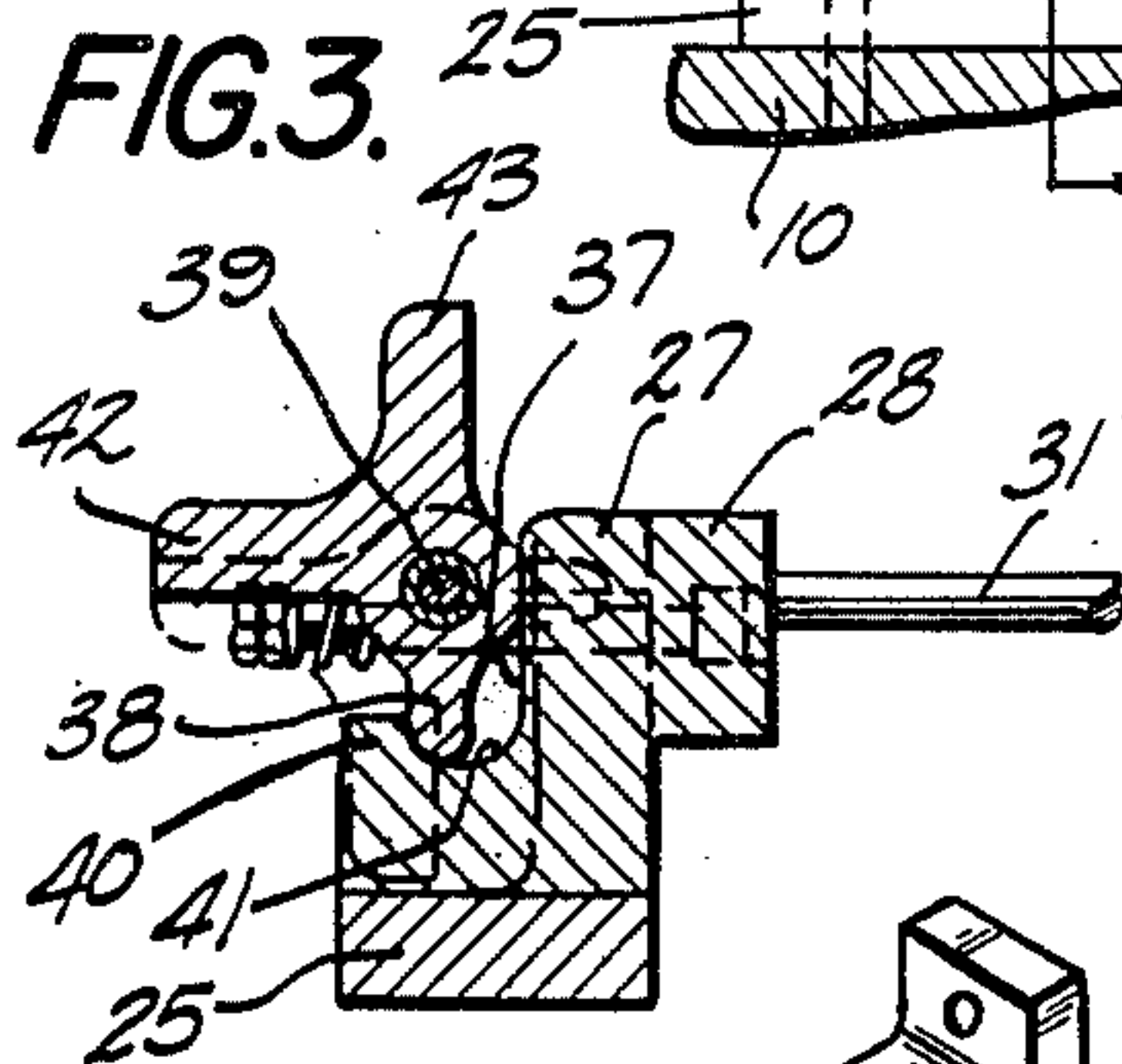


FIG. 7.

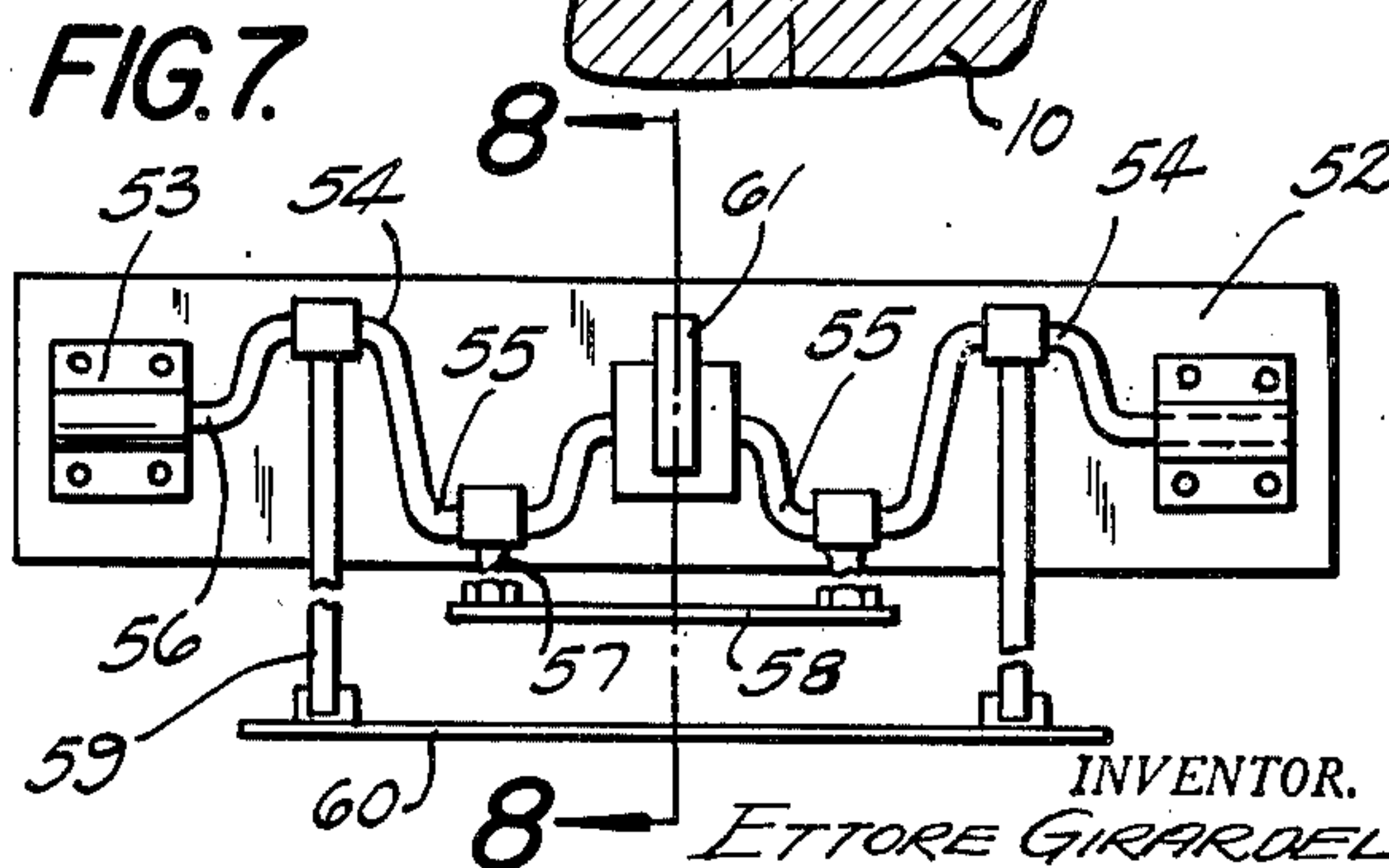
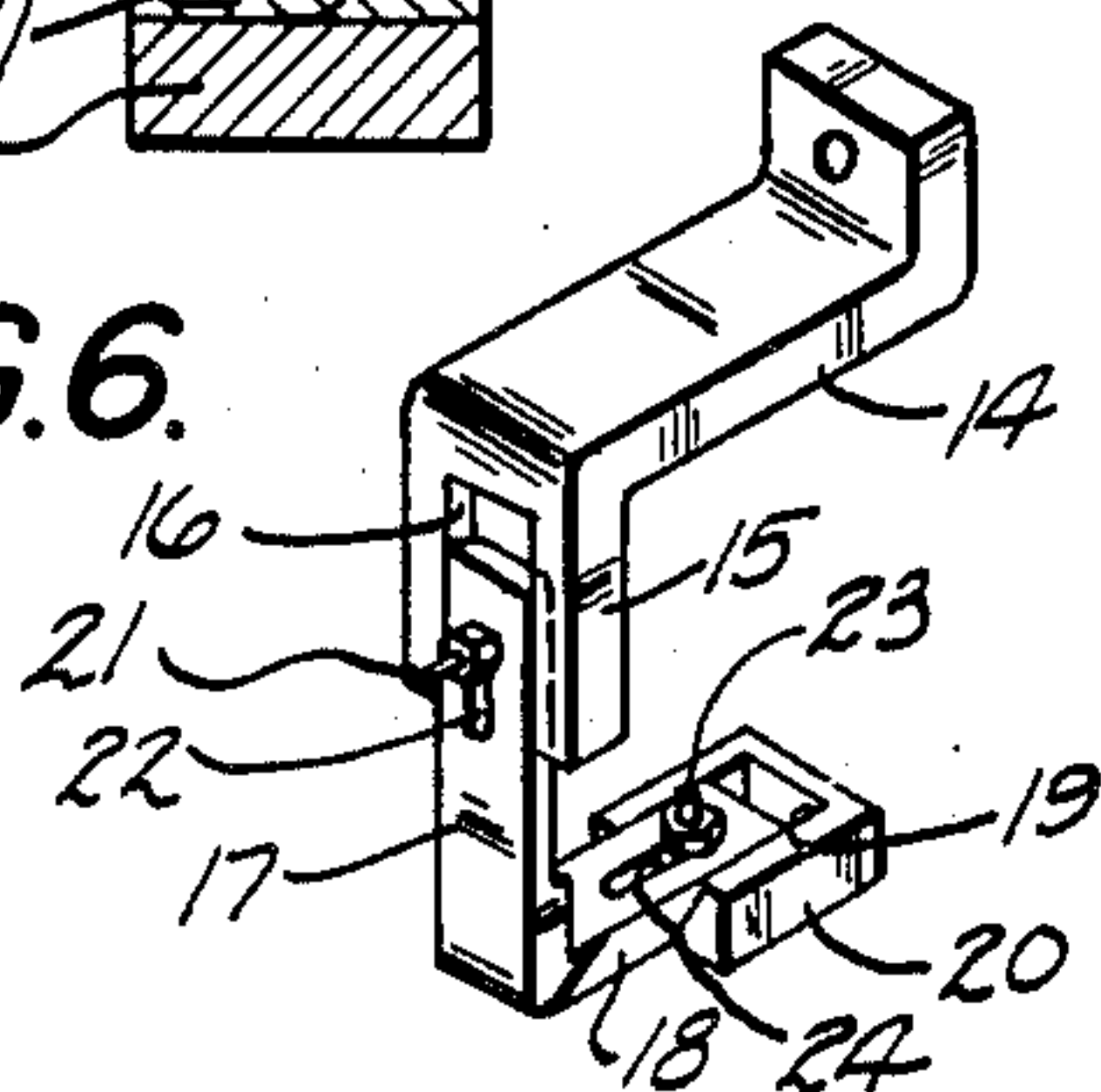


FIG. 6.



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PUNCH PRESS GAUGE ACTUATOR

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2 Claims. (Cl. 164—110)

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My invention relates to a new and useful improvement in a punch press gauge actuator adapted for punch presses and the like.

In feeding of strip sheet stock into punch presses for the shearing and forming of articles therefrom, it is necessary that the stock be properly aligned between the male and female dies so that when the dies nest together, the sheet stock therebetween will be properly formed or stamped. It is highly desirable that the dies strike the feeding strip at the same point intermediate its side edges and that the sheet does not shift to one side so as to leave bare a portion of the dies which will result in the forming of a scrap piece. It is also necessary that the feeding of the strip sheet stock be free and easy and that there be no binding action with the sides of the gauges due to variations in the width of the stock or to cause slight misalignment or twisting of the stock as it is fed to the press. Under present practices, the die is provided with a stationary or fixed gauge against which one edge of the stock is guided and the opposite side edge of the stock bears against a yieldably mounted gauge which tends to press the stock against the stationary gauge or strip. The yieldably mounted gauge bar is adjusted for a definite width stock and often times the stock varies in width beyond the limited yieldable movement of the gauge bar causing either a binding action in the feeding in of the stock or failure to properly hold the stock on the die, and this generally results in a necessity of stopping the press for re-adjusting the gauge bar thereby causing a loss in time and use of the press. The present invention is directed to overcome these objectionable features.

It is an object of the present invention to provide a gauge actuator of the class described having a gauge bar that travels towards and against the side edge of the stock for moving it to abut against the stationary guides or stops as the ram of the press moves downwardly towards the stock, holding the stock in fixed position until the dies are nested and have formed the material, and which will be retracted from the edge of the stock or material as the ram moves upwardly.

It is another object of the present invention to provide a gauge actuator of the class described whereby the movable gauge bar is retracted sufficiently from the stationary fixed guide for a free and easy feeding of the stock to allow for the usual stock width variations.

It is another object of the present invention

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to provide a gauge actuator of the class described which can be installed on a press and readily adapted to function with any dies set in the press, or be built into as an integral part of the die and operate with the movement of the ram of the press.

A further object of the present invention is to provide a gauge actuator of the class described which is simple in structure, and operation, durable, economical of manufacture, and highly efficient in use.

Other objects will appear hereinafter.

It is recognized that various modifications and changes may be made in the detail of structure illustrated without departing from the invention itself and it is intended that such shall be embraced within the scope of the claims which form a part hereof.

Forming a part of this specification are drawings in which,

Fig. 1 is a side elevational view of the invention illustrating it mounted with a die set in a press,

Fig. 2 is an elevational view taken on line 2—2 of Fig. 1,

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a sectional view similar to Fig. 3 with the parts rocked and moved to its other position,

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 2,

Fig. 6 is a perspective view of the striking finger carried on the ram on the press,

Fig. 7 is a top plan view of a modified form of the invention,

Fig. 8 is a sectional view taken on line 8—8 of Fig. 7.

Shown in the drawings is a press having a bed 10 from which extend the vertical posts 11 having the guide rails 11a for the guidance of the head 12 of a ram 13. Secured to, for movement with the head 12, is an arm 14 having a downwardly projecting head 15 which is provided with a dovetail recess 16 adapted to receive the end of leg 17 of an L-shaped extension, the other leg 18 of the extension being received in a dovetail recess 19 of the striker plate 20. The leg 17 is slidable in the dovetail recess 16 for relative length adjustment to the portion 15 and is locked thereto by the bolt and nut 21, the bolt extending through a slot 22 formed in the leg 17. The leg 18 is slidable in the dovetail recess 19 for relative length adjustment with the striker plate 20 and is locked in fixed relation by the bolt and

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nut 23, the bolt extending through the slot 24 formed in the leg 18.

Secured by bolt 25a to the bed 10 is a supporting standard 25 having a slot 26 formed there-through. Slidable in the slot 26 is a rib or plate 27 which is integral with and extends transversely of the bar 28 to which is attached the stud 29 that extends through the bore 30 formed in the standard 25, and having on its end the threadable nut 31a against which bears one end of the spring 32, its opposite end bearing against the washer 33a which rests against a face of the standard 25. A similar stud 29a, together with the stud 29, serve to slidably mount and support the bar 28 to the standard 25. Secured adjacent each end of the bar 28 are the rods 31 which extend through openings formed in a wall of a die 33 and the ends of which are secured to the gauge bar 32. If desired, the dies may be suitably sleeved with bushings to properly align the guiding movement of the rods 31 in the die. The plate or rib 27 is provided with a cavity or recess 41 and the stop abutment 40 and a face 37 adapted to be engaged by a finger 38 that is pivotally mounted on the pin 39 journaled in the supporting standard 25. Formed integrally and extended diametrically opposite to the finger 38 is the finger 43, and a finger 42 which extends outwardly at right angles to the finger 43. The finger 42 forms an L with the finger 43, between which is adapted to move the striker plate 20 for engaging the finger 42 as the ram moves downwardly and the finger 43 when the ram moves upwardly.

In operation, the bar 28 responding to the pressure of the spring against the face of the standard 25, maintains the gauge bar 32 withdrawn relatively to the opposed guide rail 35 that is formed integral with the die 33. Thus, as the sheet stock 34 is fed over the face of the die 33, sufficient space will be allowed between the edge of the stock and the gauge bar 32 to permit an easy feeding of the stock. As the ram 13 moves downwardly carrying the punch or die 50, which is mounted on the head 12 directly over the die 33, the striker plate 20, carried by the head 12, will strike the finger 42 prior to the punch die 50 reaching the material or stock 34. As the striker plate 20 engages and rocks the finger 42 and moves on downwardly, it will rock the finger 38 so as to engage against the face 37 of the rib or plate 27 moving the bar 28 outwardly against the tension of the spring 32 and effecting axial movement of the rods 31 so that the gauge bar 32 will bear against the edge of the sheet 34 moving it so that the opposite edge of the sheet will abut against the stop or guide 35 of the die. The gauge bar 32 will remain in its holding position with the sheet 34 until the guide or punch 50 forms the sheet 34 into its desired shape in the die 33. When the finger 38 is moved into this position, it will be on center and remain in this position until moved out of this position, thus securely holding the member 27 in pressing position. Upon completing its operation, the ram 13 will move upwardly carrying with it the striker plate 20 which will then engage and rock the finger 43, which is in a horizontal position (see Fig. 4), causing the finger 38 to rock in a counterdirection coming to rest against the stop 40 of the plate 27. The bar 28 will retract against the face of the supporting standard 25 carrying with it the gauge bar 32 away from the edge of the material 34.

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In the modified form shown in Fig. 7 and Fig. 8, there is provided a base 52 having the journals 53 in which are journaled the ends of a crank shaft 56 having the oppositely disposed cranks 54 and 55. The cranks 54 are connected by links 59 to a gauge bar 60, and the cranks 55 by links 57 to a gauge bar 58. The sheet material is adapted to be guided between the gauge bars 58 and 60 which are oppositely disposed and as the cranks 54 and 55 are rocked, it will tend to move the gauge bars 58 and 60 towards and away from each other as the case may be. When moved towards each other, they serve as a jaw for vise-like holding the sheet material therebetween as the punch is descending prior to the forming operation and moving apart after the operation has been completed. Secured on crank shaft 56 is the L-shaped member having the fingers 61 and 62 which are extended at right angles to each other and adapted to be engaged by a striking plate 20 as described in the preferred form, for effecting a rocking of the cranks 54 and 55.

What I claim as new is:

1. A punch press gauge actuator adapted for use with a punch press having a reciprocating ram, a head carried by and movable in unison with said ram, a punch carried by said head, a die-supporting bed and a die mounted on said bed for cooperating with said punch and adapted for supporting a work piece to be operated upon, comprising: a stationary work piece abutment projecting upwardly at one side of said die for engaging one side of the work piece to be operated upon; a movable gauge bar at the opposite side of said die and movable into engagement and out of engagement with the opposite side of said work piece; an arm mounted on said head and projecting outwardly therefrom and thence downwardly thereof; an extension adjustably mounted on said arm, said extension having an angularly turned portion extending substantially parallel to said bed; a striker mounted on said angularly turned portion of said extension and movable inwardly and outwardly thereof; securing means for securing said striker in fixed relation to said angularly turned portion of said extension; a supporting standard on said bed projecting upwardly therefrom; a rockable member rockably mounted on said supporting standard; a plurality of circumferentially spaced, outwardly projecting fingers on said rockable member; a bar slidably mounted on said standard and movable inwardly and outwardly of the opposite side of said die; rods connecting said bar to said gauge for moving said gauge in unison with said bar, one of said fingers being in the path of movement of said striker and engageable therewith, upon movement of said head into approach relatively to said die, for rocking said rockable member in one direction, another of said fingers upon said rocking movement, effecting a movement of said bar toward said die and a movement of said gauge bar into engagement with the opposite side of said work piece, and a third finger on said rockable member engageable with said striker, upon withdrawal of said head from said die, for rocking said rockable member in the opposite direction.

2. A punch press gauge actuator adapted for use with a punch press having a reciprocating ram, a head carried by and movable in unison with said ram, a punch carried by said head, a die-supporting bed and a die mounted on said

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bed for cooperating with said punch and adapted for supporting a work piece to be operated upon, comprising: a stationary work piece abutment projecting upwardly at one side of said die for engaging one side of the work piece to be operated upon; a movable gauge bar at the opposite side of said die and movable into engagement and out of engagement with the opposite side of said work piece; an arm mounted on said head and projecting outwardly therefrom and thence downwardly thereof; an extension adjustably mounted on said arm, said extension having an angularly turned portion extending substantially parallel to said bed; a striker mounted on said angularly turned portion of said extension and movable inwardly and outwardly thereof; securing means for securing said striker in fixed relation to said angularly turned portion of said extension; a supporting standard on said bed projecting upwardly therefrom; a rockable member rockably mounted on said supporting standard; a plurality of circumferentially spaced, outwardly projecting fingers on said rockable member; a bar slidably mounted on said standard and movable inwardly and outwardly of the opposite side of said die; rods connecting said bar to said gauge for moving said gauge in unison with said bar, one of said fingers being in the path of movement of said striker and engageable therewith, upon movement of said head into approach relatively to said die, for rocking said rockable member in

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one direction, another of said fingers upon said rocking movement, effecting a movement of said bar toward said die and a movement of said gauge bar into engagement with the opposite side of said work piece, and a third finger on said rockable member engageable with said striker, upon withdrawal of said head from said die, for rocking said rockable member in the opposite direction; and resilient means for, upon rocking of said rockable member in the opposite direction, moving said bar away from said die for disengaging said gauge bar with said work piece.

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