

H. J. BOWMAN.
HARNESS MAKER'S STITCHING HORSE.
APPLICATION FILED NOV. 20, 1906.

912,795.

Patented Feb. 16, 1909.

4 SHEETS—SHEET 1.

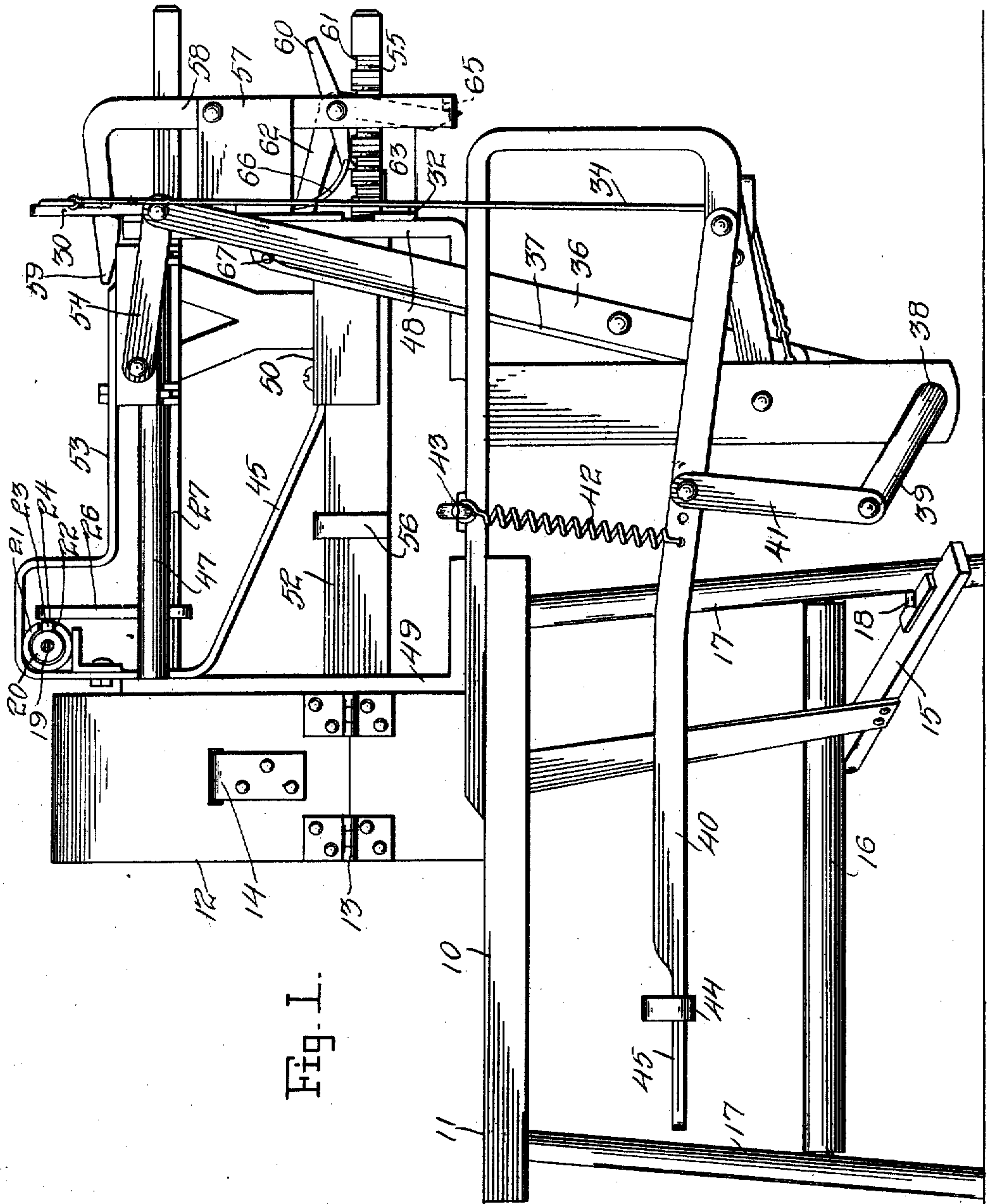


Fig. 1.

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Witnesses

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By

Charles E. Canale.

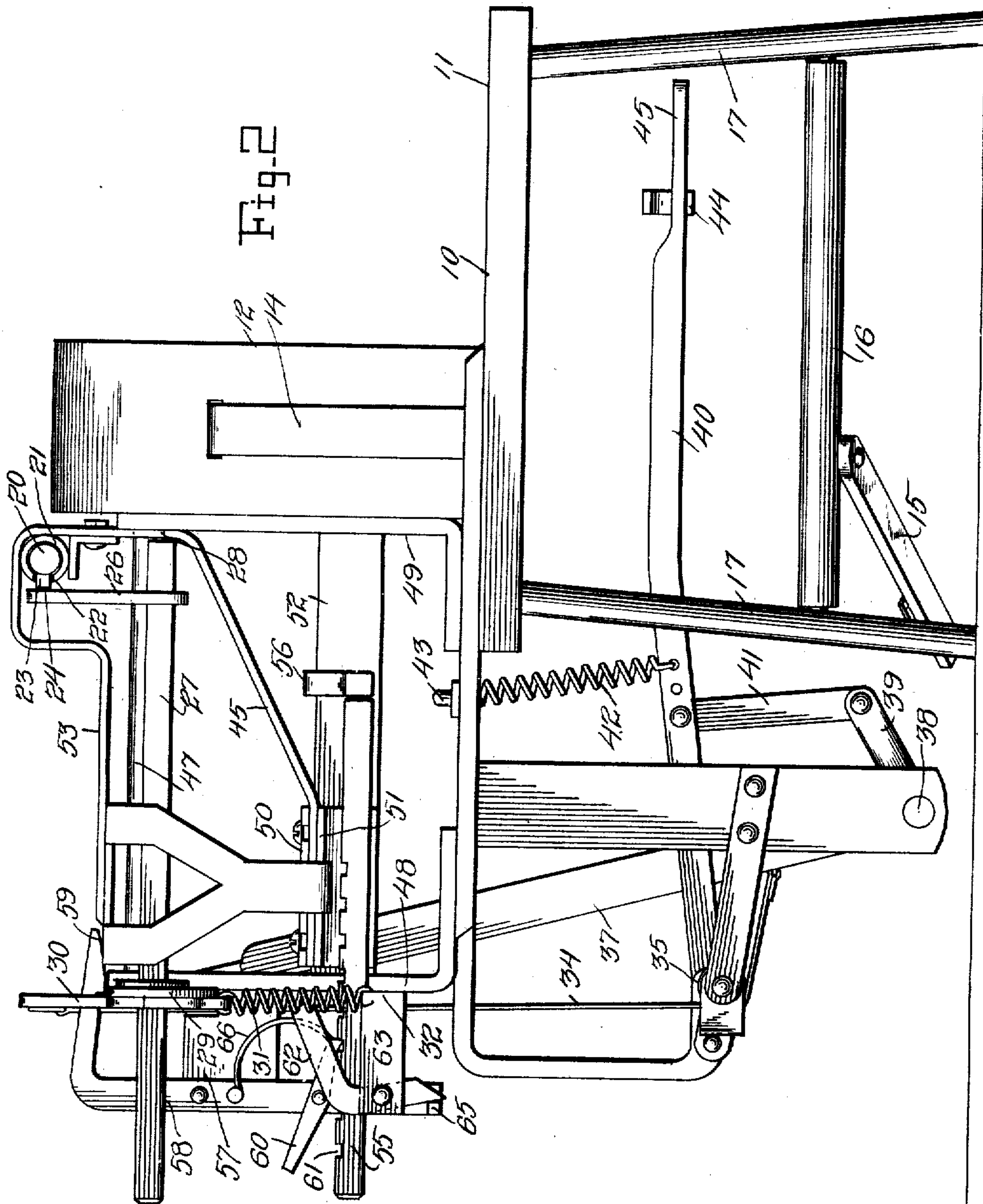
Attorney

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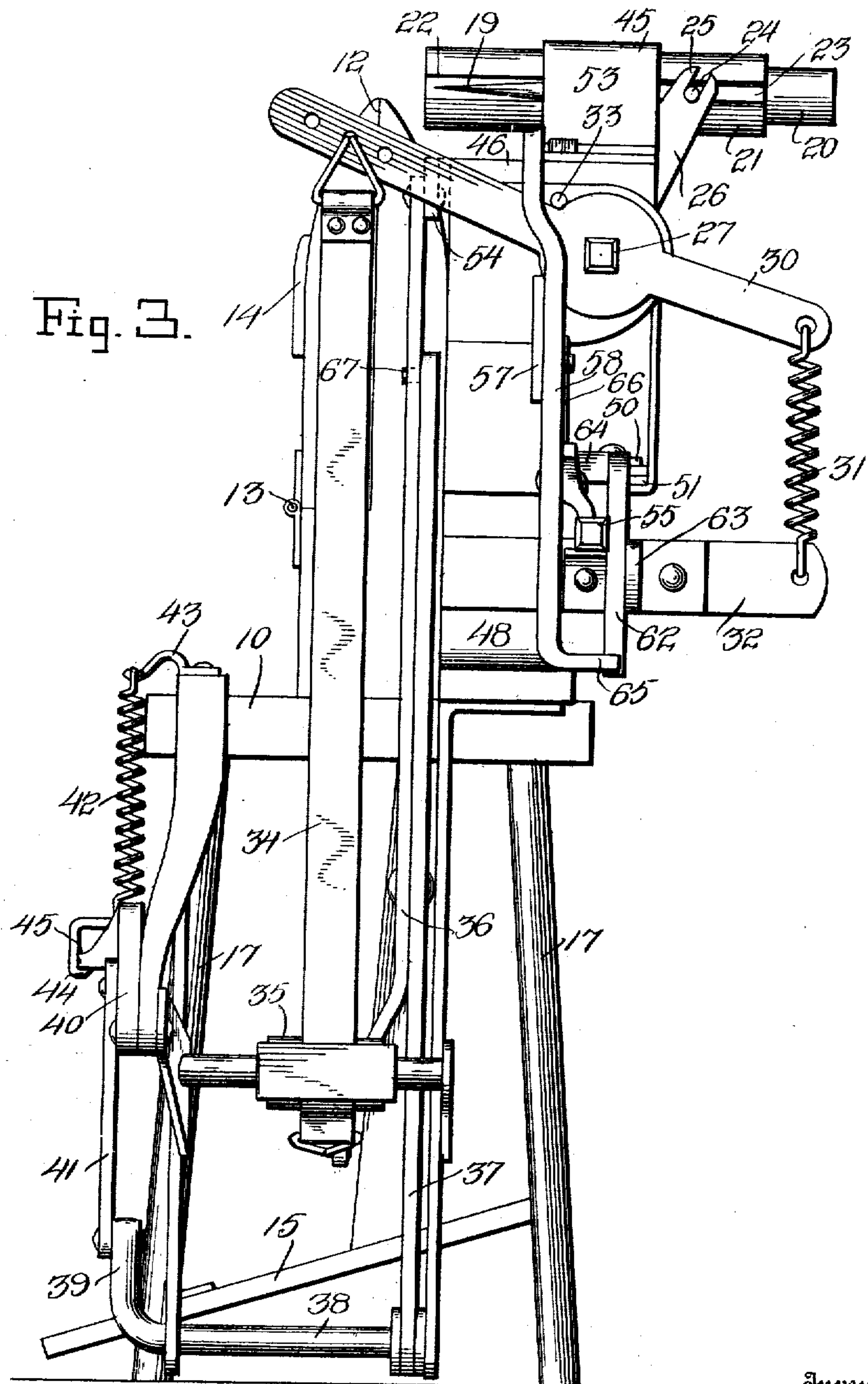
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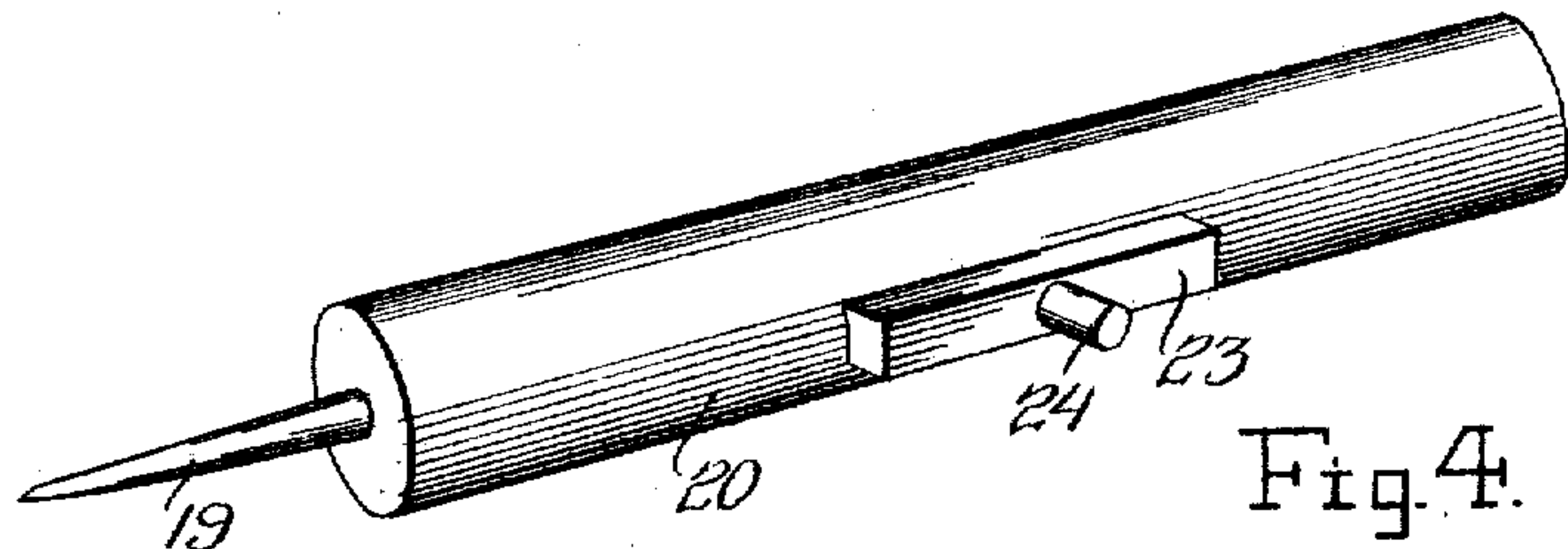


Fig. 4.

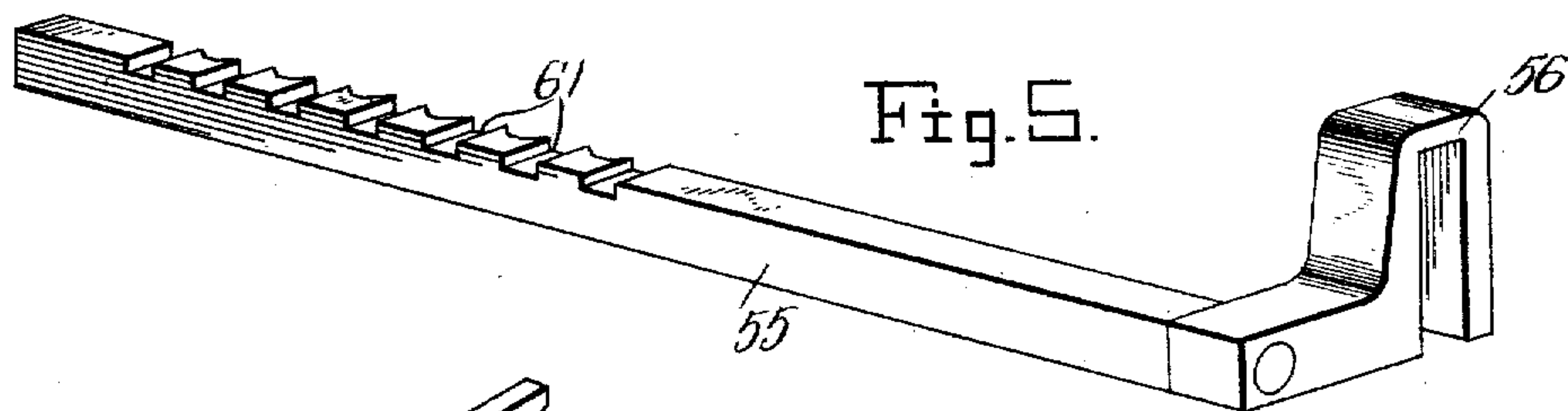


Fig. 5.

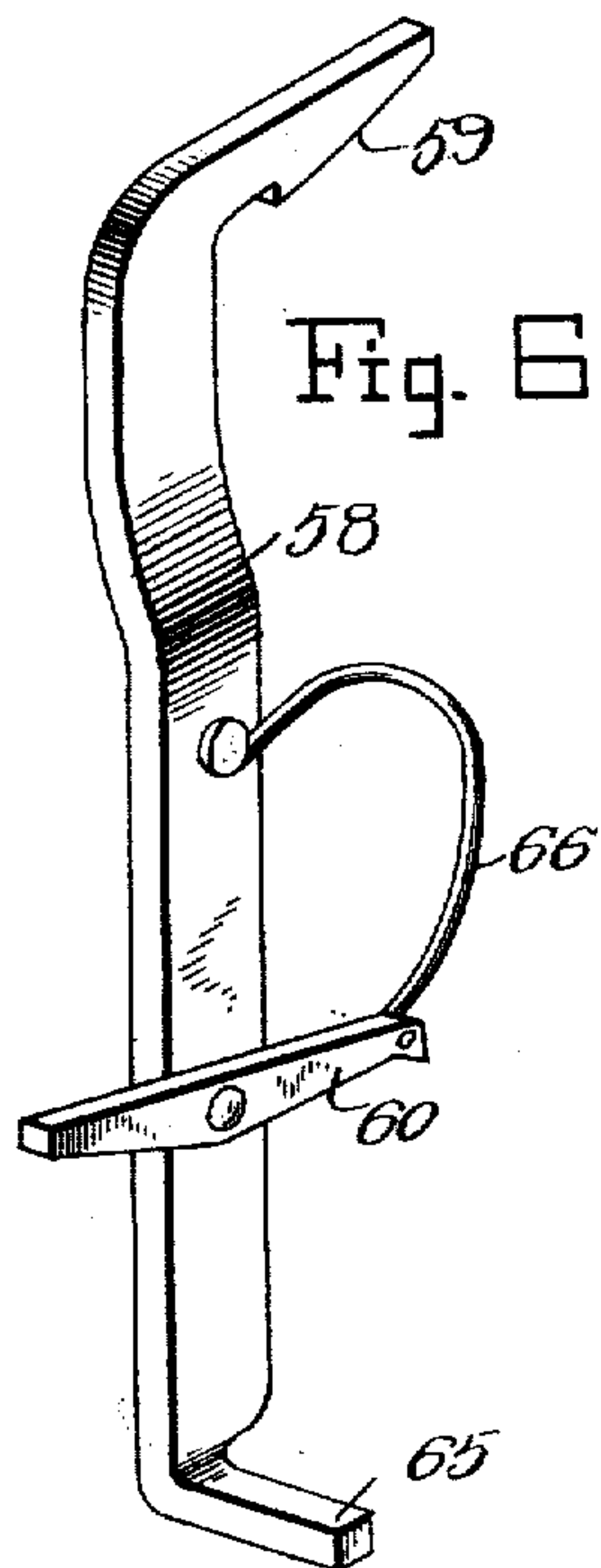


Fig. 6.

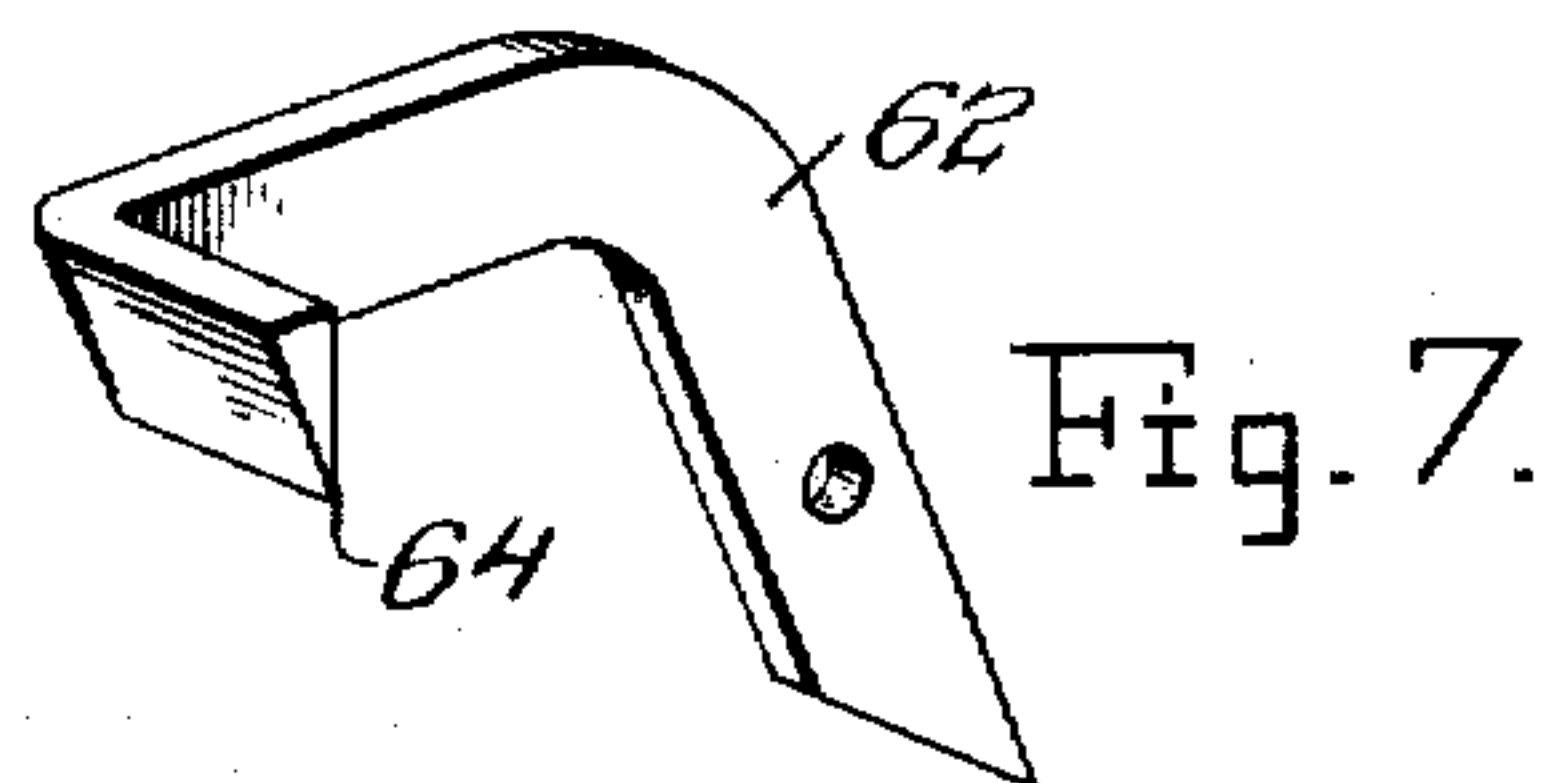


Fig. 7.

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UNITED STATES PATENT OFFICE.

HULLBERT J. BOWMAN, OF NODAWAY, IOWA.

HARNESS-MAKER'S STITCHING-HORSE.

No. 912,795.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed November 20, 1906. Serial No. 344,284.

To all whom it may concern:

Be it known that I, H. J. BOWMAN, a citizen of the United States, residing at Nodaway, in the county of Adams, State of Iowa, have invented certain new and useful Improvements in Harness-Makers' Stitching-Horses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to stitching horses for manufacturers of leather goods, and it is particularly adapted for use by harness makers.

It is the object of the invention to equip a stitching horse with means that will operate the awl that pierces the leather with certainty and uniformity, through the intervention of means connected with a lever that may be actuated by the foot of the operator, the work-holding clamp being also operated and controlled through the medium of a foot lever and connecting means, all to the end of saving both time and labor in the work of stitching harness, and other manufactures of leather and like substances.

The nature of the invention comprises a stitching-horse mechanism consisting, among other things, of a reciprocatory awl that is adapted to be primarily operated to pierce the work held in the clamps, by the depression of a foot-lever, which also acts to move the awl-carrying means along intermittingly and regularly so as to secure uniformity in the length of the stitches made as well as to render the stitches symmetrical and facilitate the work.

The invention is embodied in the machine portrayed in the annexed drawings forming a part of this specification, in view of which the said invention will first be described with respect to its construction and mode of operation, and then be pointed out in the subjoined claims.

Of the drawings:—Figure 1 is a side elevation of the machine. Fig. 2 is a side elevation of the opposite side of the machine. Fig. 3 is an end elevation. Fig. 4 is a detail perspective of the awl-bar. Fig. 5 is a detail perspective view of the rack bar. Fig. 6 is

a detail perspective view of the cam lever. Fig. 7 is a detail perspective view of the angular dog.

Similar numerals of reference designate similar parts or features, as the case may be, wherever they occur.

In carrying out my invention, I provide a bench or horse proper, designated by the numeral 10 in the drawing, which may be of the construction shown or of any other suited to form a seat 11, astride of which the operator may sit, and to support the operative parts of the machine.

Having further reference to the drawings, 12 designates the work-clamp consisting of two members upstanding from the bench 10 and adapted to clamp the work to be stitched between their upper edges, as is common in the art. One of the said clamp-members is hinged at its lower portion, as at 13, so that the clamp may be opened and closed for the purpose of manipulating the material acted upon and to be stitched. A strap, 14, extends through a horizontal slot in the clamp members and is fastened at its upper end to the outside of the hinged member, the other part of the strap passing down along the outside of the stationary member of the clamp and through a slot in the bench, to a foot-lever, 15, pivotally secured at its outer end to a rock-rod, 16, pivoted at its ends in two of the legs 17 of the horse. The free end of the said lever extends a little beyond the opposite side of the horse, so that the operator can put his right foot upon it and by pulling it back from under the pin 18 projecting from one of the legs, slacken the strap 14 and allow the work-clamp to open, and after the material has been arranged in the latter, the operator will depress the outer end of the lever 15, drawing upon the strap which the said lever will be pushed under and closing the clamp on the material, after the pin 18 again, to retain it in depressed position and hold the clamp closed.

The work-clamp 12 may be as broad as is necessary or desired, and an awl, 19, secured in the forward end of the reciprocatory awl-rod 20 pierces the work above the edges of the clamp at the farther side from the operator and is worked along intermit-

tingly and uniformly until the nearer side of the clamp is reached when another section or piece of work is put in the clamp and the awl and its immediately-operating means 5 is pushed back to be actuated to repeat its work.

The support 21 for the awl-rod 20 has a slot 22 formed through one side, through which a rib, 23, on the awl-rod projects, and 10 from the said rib a pin, 24, projects outward into an elongated notch, 25, formed in the upper end of a vertically arranged arm, 26, secured at its lower end on a horizontal shaft, 27, square in cross section, which lat- 15 ter shaft is constructed to rock in bearings 28 and 29 forming a part of the carriage and machine frame. The rear end of the said shaft extends through a square hole formed centrally in a transversely disposed 20 walking lever, 30, having a spring, 31, connected at one end with its outer left-hand end, and the other end fastened on the end of a laterally projecting bar, 32, below, drawing the said left-hand end of the walk- 25 ing lever down and raising the opposite end of the lever until stopped by a pin, 33, engaging its upper side. This may be said to be the normal position of the parts just described, by which the awl will be held back 30 from the work in the clamp.

34 designates a chain, or it might be a flexible strap, connected at its upper end to the right-hand end of the walking lever 30 and passing down about a pulley, 35, and in- 35 ward horizontally to the lower end of a vertically disposed lever, 36, to which its lower end is connected. The said lever 36 is pivoted or fulcrumed some distance above its lower end on a lever, 37, arranged alongside 40 of it and normally in the same vertical plane. The lower end of the said lever 37 is secured on a rock-shaft, 38, having bearings in the machine frame, its outer end being bent at substantially a right angle to its 45 body portion forming thereby a substantial crank 39. A foot-lever, 40, pivoted at its front end on the machine frame and extending rearward to the side of the seat of the horse, is connected to the crank 39 through 50 the medium of a link, 41, which is pivotally adjustable longitudinally of the foot-lever 40 so as to vary the extent of movement of the rock-shaft 38. A spring, 42, connected at its lower end to the lever 40 and at its 55 upper end to a hooked projection, 43, on the machine frame operates to hold the foot-lever 40 in normally raised position. A plate, 44, connected to the under side of the foot-rest 45 at the rear end of the lever 40 is 60 curved over and above the said foot-rest, so that the operator placing his foot on the said lever 40 may extend the toe of his boot under the curved-over end of the plate 44 and assist the spring 42 in raising the lever

to insure prompt action of the same. It 65 will now be seen that the operator, by depressing the foot-lever 40, will rock the shaft 38 through the link 41 and crank 39, moving the upper portions of the levers 36 and 37 forward and drawing on the chain 70 34, which will operate to draw down the right-hand end of the walking-lever 30, secured on the squared rock-shaft 27, moving the upper end of the notched arm 26 inward, and moving the awl and its rod in the same 75 direction by reason of the engagement of the pin 24 in the notch in the upper end of said arm.

When the awl is moved inward it will pierce the material in the clamp, and when 80 the lever 40 is raised a reverse movement of the parts mentioned in the immediately explained operation will take place, drawing the awl back and allowing the operator to make a stitch through the awl-hole just 85 made; and after this the awl will be operated as before, but before this is done the carriage bearing the support 21 for the awl and awl-rod will be shifted back to the extent of the length of the stitch to be made, 90 thus spacing the awl-holes in the material accordingly. The means by and manner in which this is accomplished will next be described. The awl-carriage 45 which also carries the squared rock-shaft 27, through 95 which the awl is moved consists of a frame having at its upper end two arms, 46, that extend inward laterally and are slidably connected at their inner ends with a rod 47 extending between the upper ends of two 100 frame uprights, 48 and 49. The lower part of the carriage comprises two adjustable flanged plates, 50 and 51, extending inward laterally with their respective flanges depending on the opposite sides of a flat bar, 105 52, supported between the uprights 48 and 49, below the rod 47. A strap, 53, of iron is connected to the top of the carriage, extends forward over the bearing for the awl-rod, is connected with and supports the 110 same, turns down and affords a bearing 28 for the rearward end of the squared shaft 27, and is inclined forwardly and then horizontally the latter portion extending between the plates 50 and 51 and is there held 115 by the bolts and nuts holding the said plates in proper position. The strap 53 may be made as one integral part or it may be made of a plurality of parts with their ends spliced by overlapping and riveting. The 120 upper end of the lever 36 is pivoted at its upper end to one end of a link, 54, the other end of which is pivotally connected to the carriage 45, so that as the said lever 36 is operated from the foot-lever 40, the said car- 125 riage and its equipments will be moved forward and back on the rod 47 and bar 52.

A rack-bar, 55, arranged longitudinally of

the machine is supported at its rearward part on the outwardly projecting bar 32 and at its forward end it is provided with a finger, 56, which catches over the top of the bar 52, so that the said rack-bar, which is below the lower part of the carriage 45, may be moved lengthwise—backwardly intermittently, or step-by-step, until the stitching has been accomplished along the width of the clamp, and then forward its full stroke, at one operation. The carriage 45 will move forward to its fullest extent after each withdrawal of the awl, and it will be moved backward at each operation to the extent allowed by the position of the finger 56 extending over the bar 52, which finger acts as a stop to the said backward movement of the carriage by reason of the flanges of the carriage plates 50 and 51 on opposite sides of said bar coming in contact with said finger.

It will now be observed that when the rack-bar 55 with its finger 56 is moved backward step-by-step the length of the stitches to be made, the carriage and consequently the awl will be allowed to move backward in the same way to the same extent. The intermittent movement of the parts just specified is accomplished by the means now to be described.

Pivoted centrally upon a forward projection, 57, of the machine frame is a vertically disposed lever 58 carrying upon its upper end a rearwardly extended incline cam, 59, that as the carriage moves forward has its inclined face engaged by the forward rod 46 of said carriage, which passes under the cam and raises it, moving the upward arm of the lever outward and its lower arm inward. On the lower arm of said lever is pivoted a spring pressed pawl, 60, that engages the teeth or notches 61 on the rack-bar, and operates to move the said rack-bar backward to an extent according with the length of the stitches to be made. An angular dog, 62, pivoted centrally on a projection, 63, of the machine frame, is provided on its upper end with a finger, 64, extended inward in position to also engage the teeth 61 of the rack-bar and hold it stationary with the machine frame, after the pawl 60 has shogged it backward a step. The dog 62 is disengaged from the rack-bar to allow the pawl to move it, as described, by a laterally extended lug 65 coming into contact with the tail or lower arm of the dog, when the lower arm of the lever is moved backward, causing the finger 64 of the dog to be lifted out of engagement with the teeth of the rack-bar. The instant the carriage moves backward from under the inclined cam 59 the lever 58 will be restored to normal position and the finger of the dog will drop by gravity into engage-

ment with the teeth of the rack-bar and hold its stop finger 56 rigid with the frame, but nevertheless in position so that the awl carriage will be allowed to move back a step further than in its previous movement in that direction. The spring 66 that presses the pawl 60 into engagement with the teeth of the rack-bar also acts on the lower arm of the lever 58, through the pawl to press said arm outward and its upper arm inward keeping the cam 59 down.

The lever 37 is fulcrumed or pivoted at such point on the lever 36, with respect to the distance from the rock-shaft 38, that, with the chain and its connections holding back on the lower end of the lever 37, the upper end or arm of the latter lever will be moved rearward with the lever 36, carrying the awl carriage with it until the latter is stopped, when the further movement of the lever 37 will be stopped also, while the lever 36 will be still further moved without effect through the continued movement of the rock-shaft, rocking the squared shaft 27 will advance the awl to perforate the material; and when the squared shaft first rocks back the awl will be withdrawn from the material, and a pin 67 projecting outwardly from the upper end of the lever 37 will engage the rearward side of the lever 36 and carry its upper arm and the carriage forward to have the rack-bar shogged rearward again a step as before.

The link 41 is adjustable along the lever 40, so that the operation of the latter will operate the rock-shaft 38 to a greater or less extent and so vary the extent to which the awl carriage may be shogged backward by the extent of the throw of the pawl 60. If the shogging of the rack-bar is greater than has been explained the stitches will be longer, and the teeth on the rack-bar wider apart. To provide for this I have provided the rack-bar on its sides with teeth of varying distances apart as shown in Figs. 1 and 5 and when the throw of the pawl 60 is greater in extent the rack-bar will be turned axially in its bearings, which can be done, to bring the more widely spaced teeth in position to be acted upon by the pawl, and vice versa.

The operation or mode of using the invention has been so fully set forth in the description of the structural characteristics that no further explanation thereof is deemed necessary.

It is recognized that changes may be made in the form and arrangement of parts comprising the invention without departing from its general nature or spirit.

What is claimed is:—

1. In a stitching-horse, the combination, with a movable carriage, and a slotted awl-rod support mounted thereon, of an awl-rod

provided with a rib extending through the slot in said support, a pin carried by said rib, a horizontal rock-shaft supported in said carriage and movable therewith, a laterally-projecting arm secured to said rock-shaft and provided with a slotted free end adapted for engagement with said pin, a walking lever carried by the rock-shaft for rocking the latter, to reciprocate the awl-rod, a flexible element connected at one end to said lever, and means connected to the other end of said flexible element, for imparting movement thereto, to operate said lever.

2. In a stitching-horse, the combination, with a reciprocatory awl-carriage including a pair of vertical arms, and an awl-rod carried by one of said arms, of a rock-shaft mounted in said arms and movable with the carriage, means for rocking said shaft, to operate said awl-rod, and means independent of the first-mentioned means, for reciprocating the carriage.

3. In a stitching-horse, the combination, with a reciprocating awl-carriage including a pair of vertical arms, and a slotted awl-rod, support carried by one of said arms, of an awl-rod provided with a rib extending through the slot in said carriage, a pin carried by said rib, a horizontal rock-shaft supported in said arms and movable with the carriage, an arm carried by said rock-shaft and provided with a slotted free end adapted for engagement with said pin, means for rocking said shaft to operate said awl-rod, and means independent of the first-mentioned means, for reciprocating the carriage.

4. In a stitching horse, the combination, with the awl-carriage, the awl and means for reciprocating it, of means for moving the carriage forward and back, a rack-bar, a dog

supported on the carriage and adapted to engage the rack-bar, and means for operating the dog to stop and release the carriage.

5. In a stitching-horse the combination, with the awl-carriage, the awl and means for reciprocating it, of means for moving the carriage forward and back, a longitudinally movable rack-bar, a pawl for holding and shogging the rack-bar, and a dog supported on the carriage and adapted to engage the rack-bar for holding the carriage against movement.

6. In a stitching-horse, the combination, with the movable awl-carriage, a rotary rack-bar square in cross section provided with a stop to limit the movement of the awl carriage, and with teeth of varying gage on a plurality of its sides, a pawl to engage the said rack-teeth, means to actuate the pawl with a varying throw, and the shaft being adjusted to have the teeth of a gage corresponding to the throw of the pawl operated upon the latter.

7. In a stitching-horse, the combination, with the awl-carriage, and the reciprocatory awl carried by it, of a foot-lever and intermediate operative mechanism for moving the carriage and operating the awl, and an adjustable stop for stopping the carriage in one direction of its movements, the said adjustable stop being actuated by the movements of the carriage, and the awl being operated after the carriage has stopped by a continuous movement of the foot-lever.

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

HULLBERT J. BOWMAN.

Witnesses:

F. S. BOWMAN,

H. J. SIMPSON.