

F. L. CHENEY.
MACHINE FOR SETTING LACING HOOKS.
APPLICATION FILED FEB. 6, 1909.

948,268.

Patented Feb. 1, 1910.

4 SHEETS—SHEET 1.

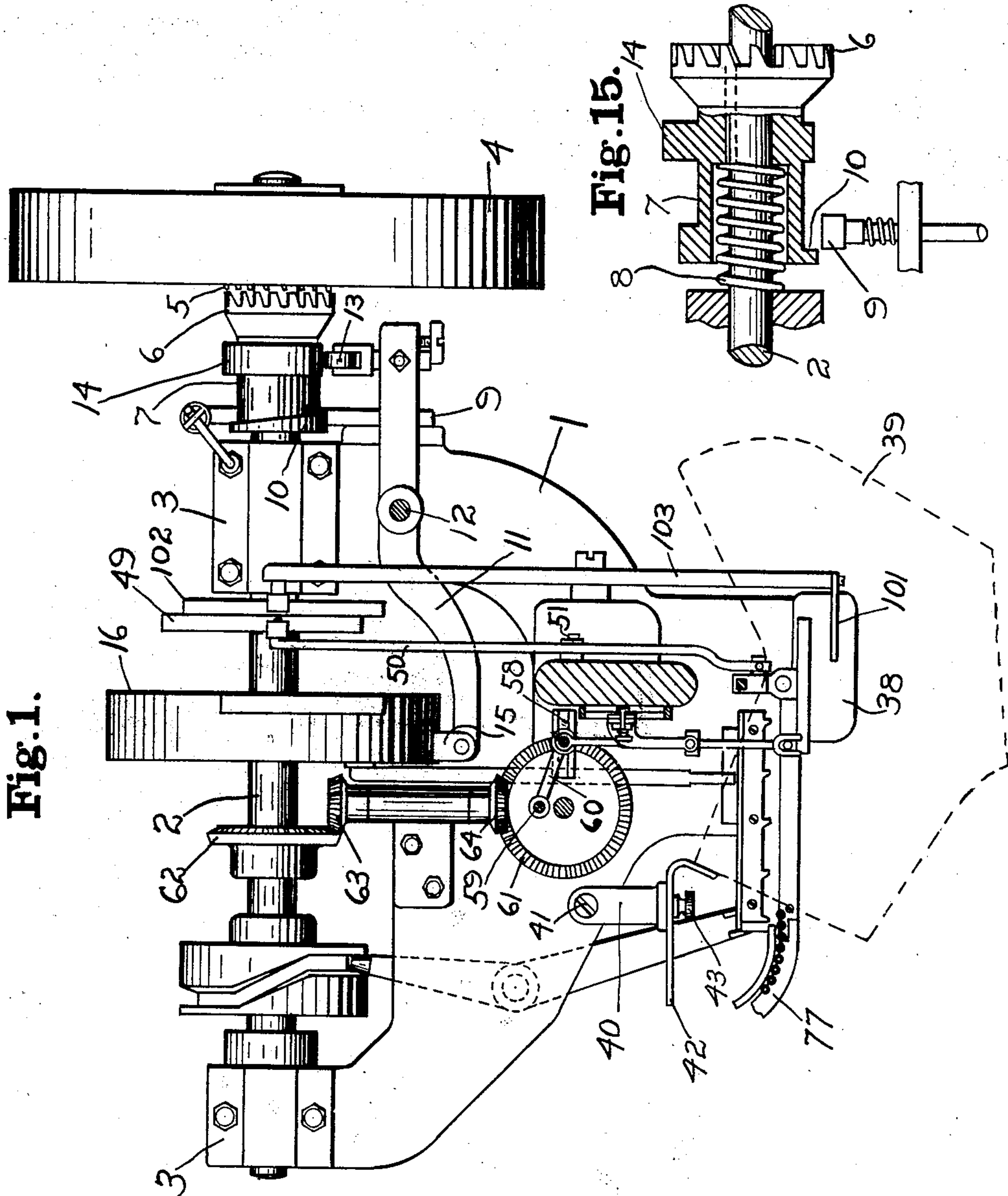


Fig. 1.

Fig. 15.

WITNESSES
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E. J. Ogden

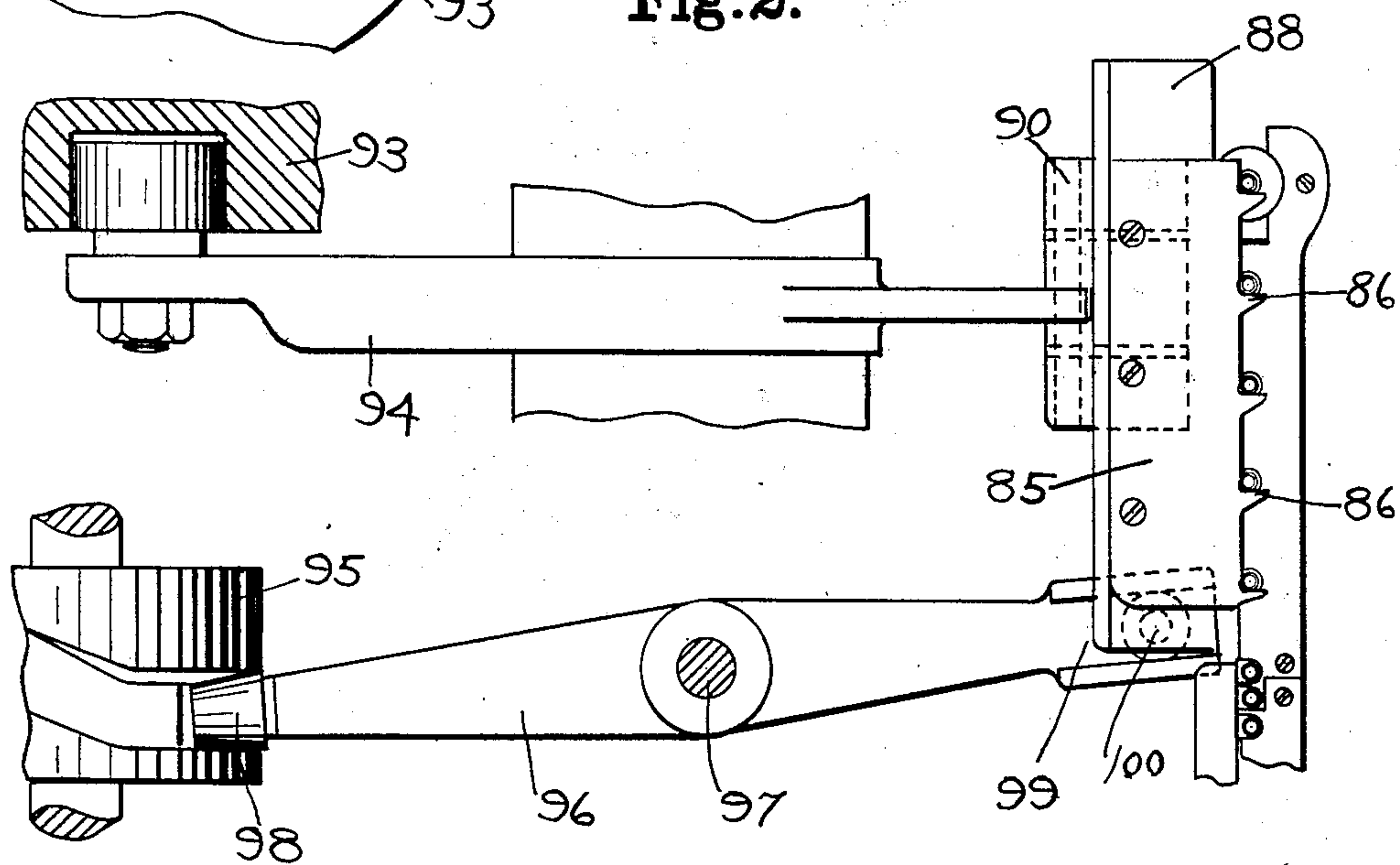
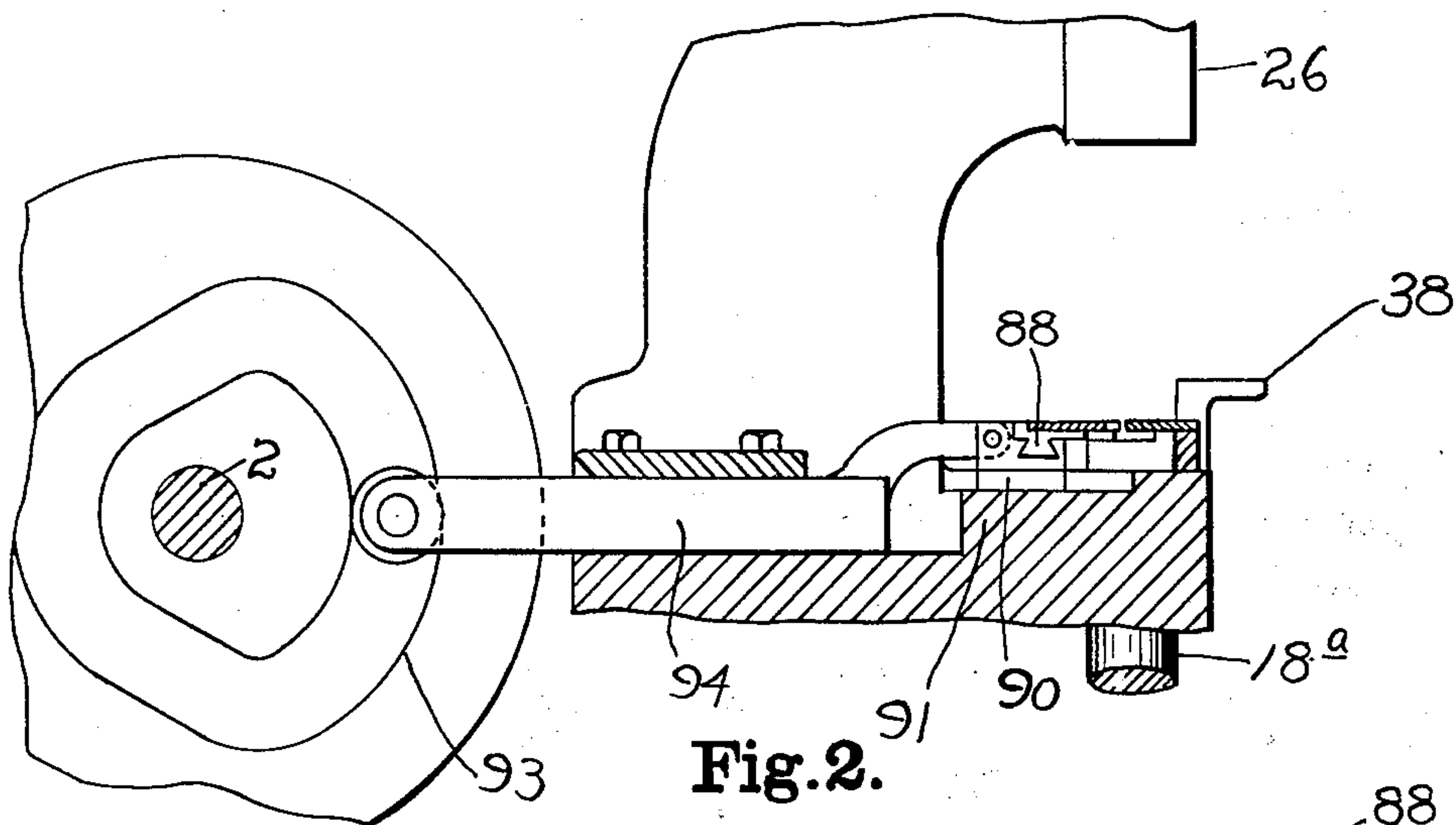
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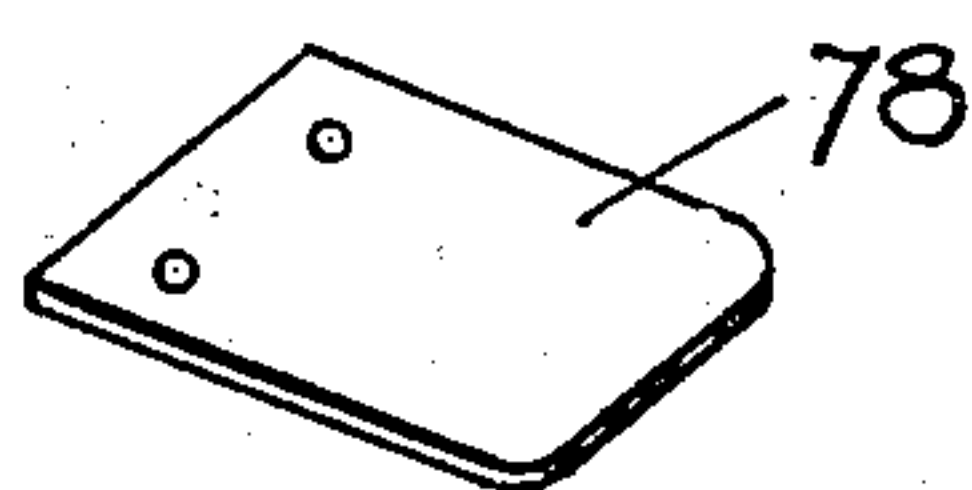
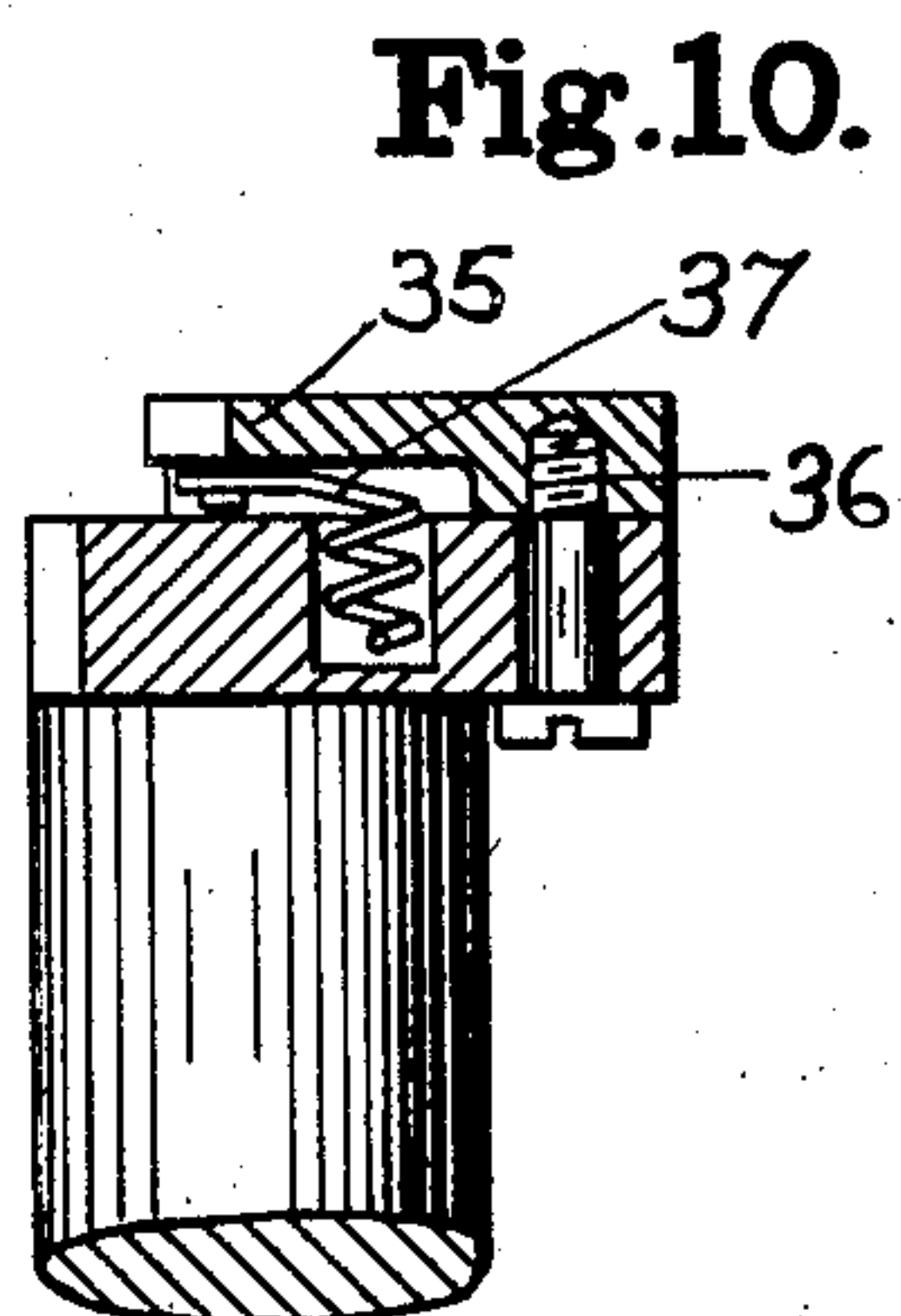
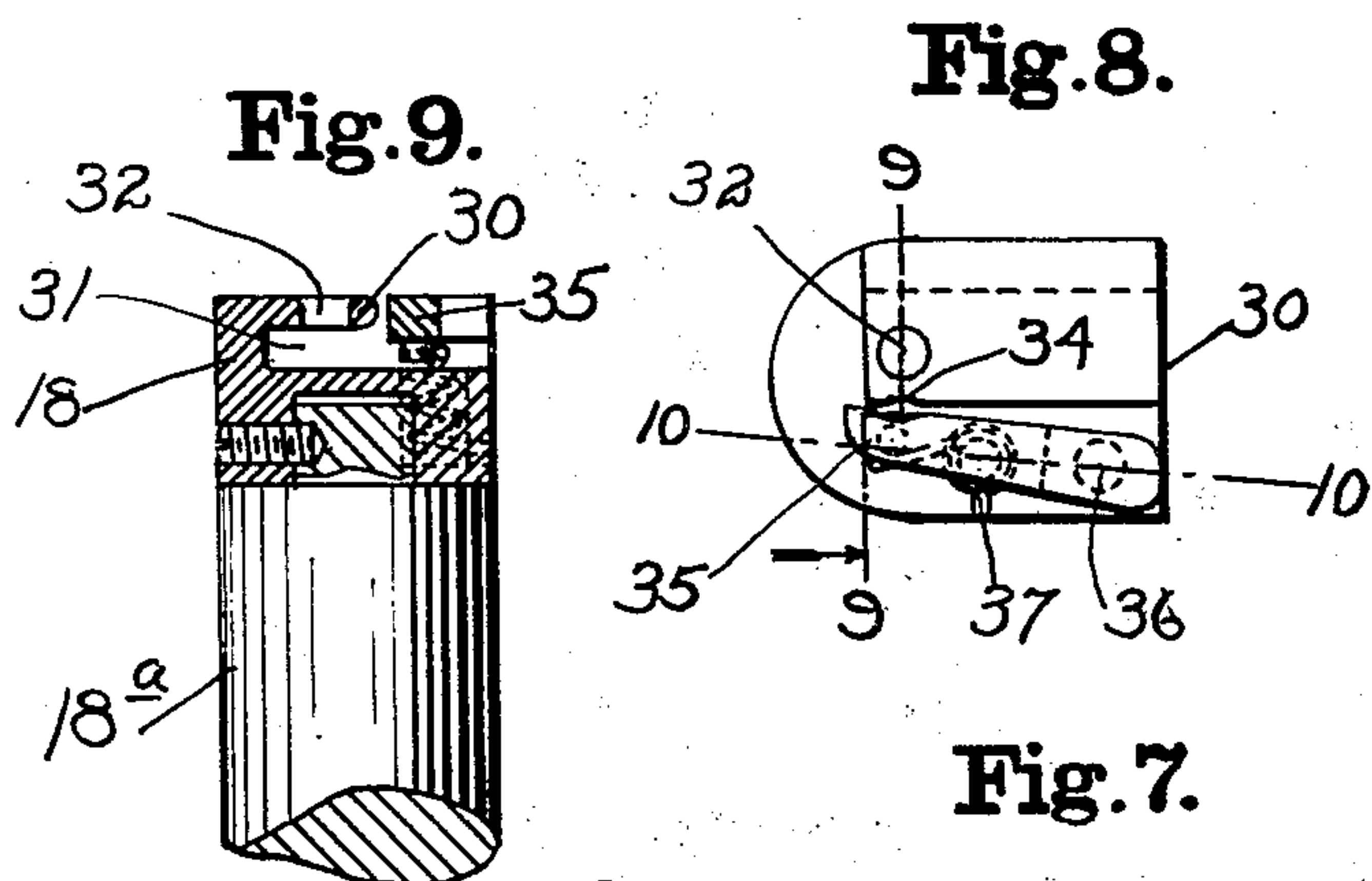
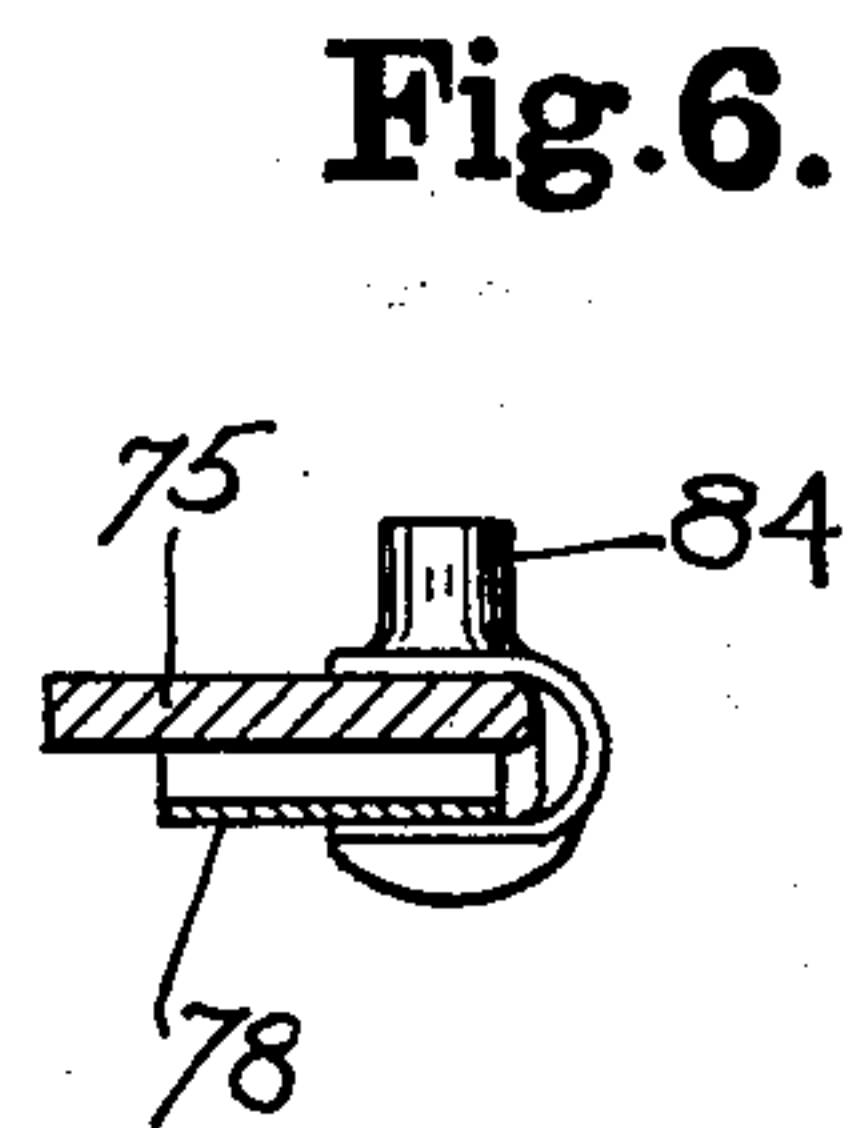
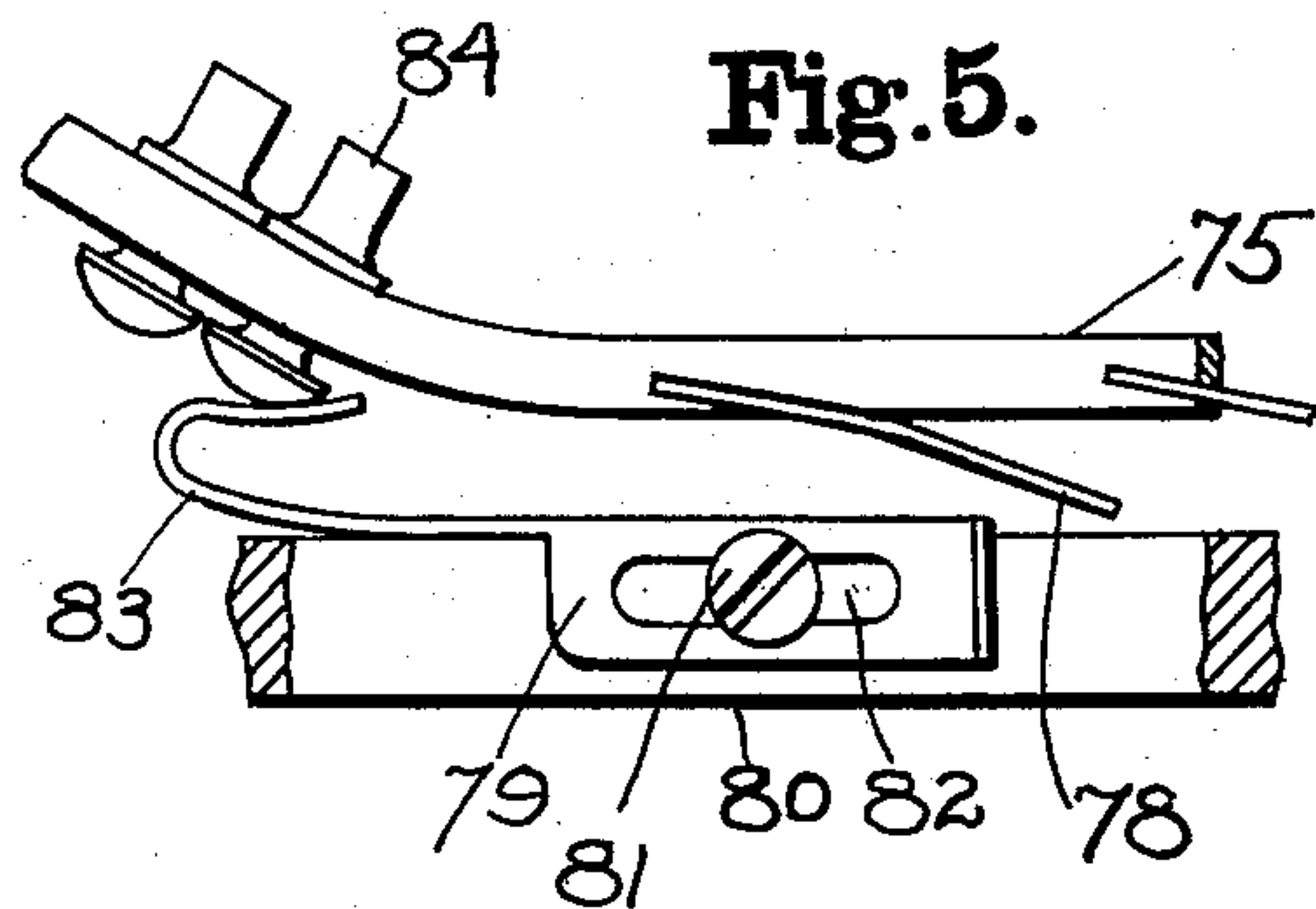
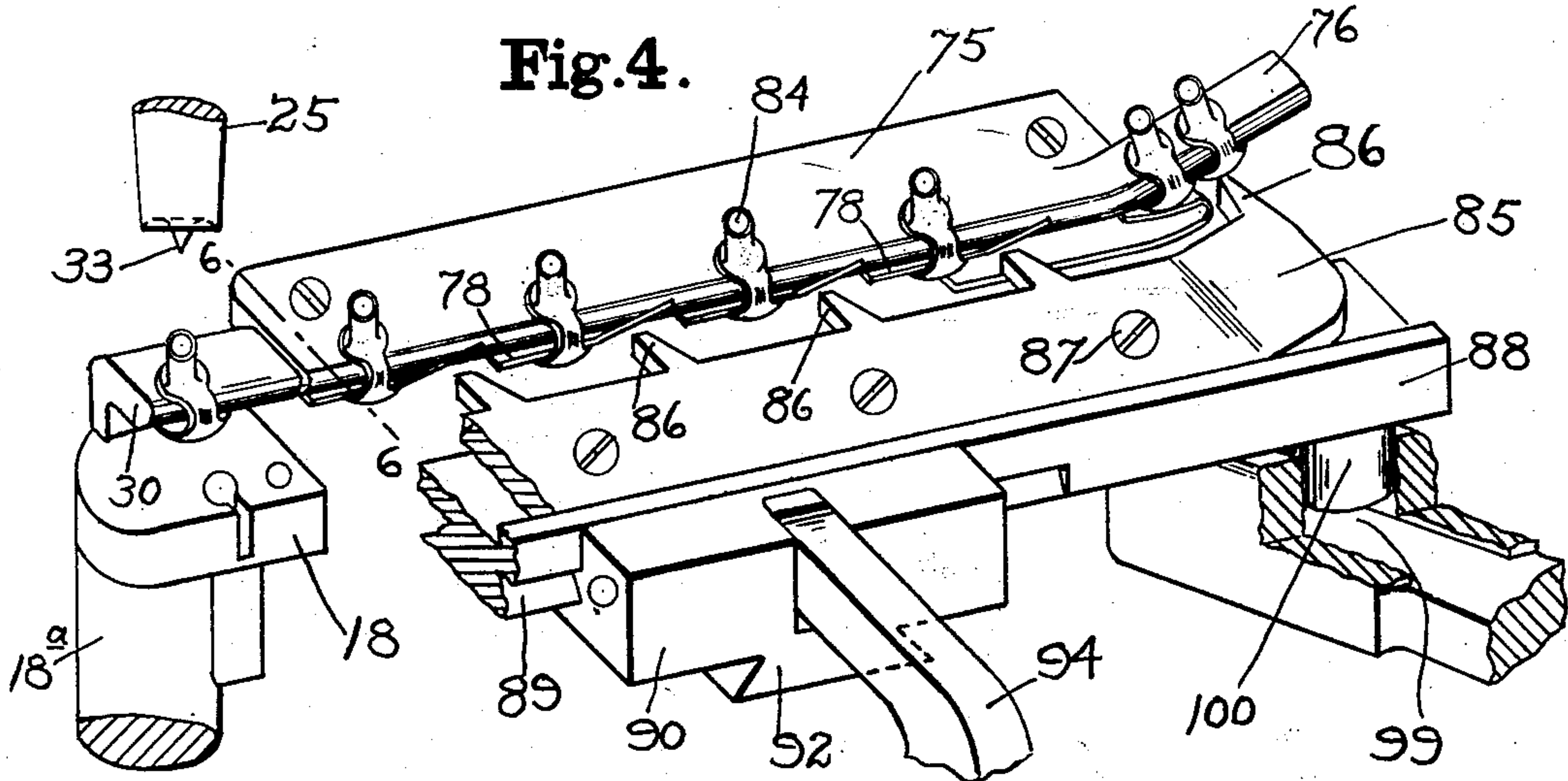
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4 SHEETS—SHEET 3.



WITNESSES
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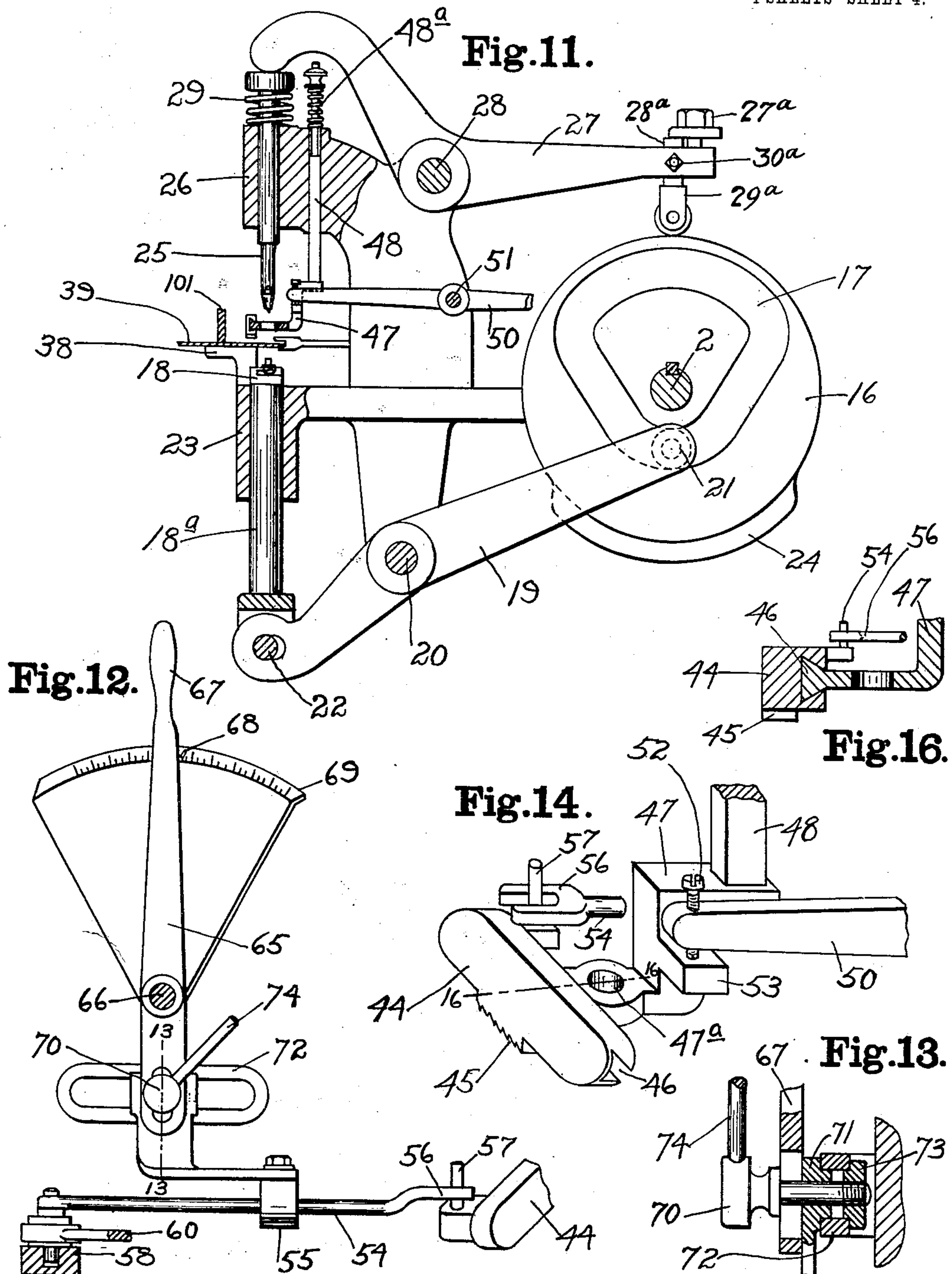
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

FERN L. CHENEY, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL SHOE SUPPLY COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF SOUTH DAKOTA.

MACHINE FOR SETTING LACING-HOOKS.

948,268.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed February 6, 1909. Serial No. 476,393.

To all whom it may concern:

Be it known that I, FERN L. CHENEY, a citizen of the United States, residing at the city of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Setting Lacing-Hooks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to machines for feeding and setting lacing hooks, rivets and the like, into pieces of sheet material, such as leather, and more particularly into the uppers of shoes, and the object of this invention is to provide a machine for this purpose that performs its work rapidly and accurately, feeds the hooks positively to the die or holder, and is simple and practical in construction.

In carrying out my invention I provide a positive means for feeding the quarters or work to be operated upon, also simple and effective means for regulating this feed to vary the spacing in setting the hooks into the work.

Another feature of the invention is that the table is fixed and that the riveter or anvil, as well as the holder or die, are both arranged to reciprocate vertically, said holder being carried down into alinement with the raceway to receive a hook at each stroke, which hook is positively fed to the said holder.

The invention consists of other novel features and parts and combinations of the same as will be fully described hereinafter and then pointed out in the appended claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

In the accompanying drawings: Figure 1—is a plan view of my improved machine showing a quarter dotted in position therein. Fig. 2—is a side elevation showing the frame partly in section and illustrating the cam for imparting a forward and back reciprocating motion to the hook feeding plate. Fig. 3—is a plan view of the mechanism illustrated in Fig. 2, also showing the

cam and connection for imparting longitudinal reciprocating motion to the hook feeding plate. Fig. 4—is a perspective view taken from the rear of the machine illustrating the hook feeding plate as withdrawn from the raceway, which latter is shown as retaining the hooks preparatory to being fed one at a time to the holder, also showing the relative position of the holder when in its receiving position, the end of the anvil or riveter showing above it. Fig. 5—shows a portion of the raceway with the adjustable stop spring in position to retain the hooks until they are engaged and moved positively along by the said plate. Fig. 6—is a cross section taken on line 6—6 of Fig. 4 of the raceway showing one of the hooks retained in the desired position by the friction of the thin spring plate. Fig. 7—is a detail showing one of these thin spring plates. Fig. 8—is a top view of the hook holder or die. Fig. 9—is a section on line 9—9 of Fig. 8 showing the spring actuated hook retaining finger. Fig. 10—is a section on line 10—10 of Fig. 8 illustrating the action of the spring on the pivoted hook retaining finger. Fig. 11—is a side elevation showing the reciprocating riveting anvil and holder or die, and the cam and levers for operating the same. Fig. 12—is a side elevation of the adjustable feed or spacing mechanism. Fig. 13—is a section on line 13—13 of Fig. 12 showing the means for setting up and retaining the spacing lever to give the desired stroke. Fig. 14—is a side elevation showing the feeding block and the levers which impart to the same the downward and longitudinal motions. Fig. 15—is a detail illustrating the action of the main clutch member. Fig. 16—is a section on line 16—16 of Fig. 14.

Referring to the drawings, 1 designates the frame of the machine which may be made in the shape of a yoke, or any other convenient form, and supported on suitable standards, not shown. The main driving shaft 2 is journaled at 3—3 in this frame and receives its motion through the driving pulley 4, the hub of which pulley is provided with teeth 5 forming a clutch to engage the corresponding teeth 6 in the slidable clutch member 7 when it is desired to connect said pulley to said shaft. This clutch member 7

is held in engagement with the opposite clutch member 5 by the pressure of a spring 8, see Fig. 15, and may be withdrawn from engagement with said clutch 5 by means of a lever 9 which may be released by a foot treadle, not shown, or any other suitable means to engage the side bearing cam 10 on the clutch member to withdraw the same from engagement with the rotating pulley 4 to stop said shaft. In order to effect a positive and quick stopping of this shaft I have provided a brake bar 11 which is pivoted at 12, and has a roller 13 at one end which engages the cam 14, whereby the rotation of said cam causes the shoe 15 at the opposite end of the lever to be set firmly against the periphery of the main cam disk 16 and prevent the mechanism from further action. This main cam disk 16 is fixed to the main shaft 2 and is provided with a groove 17, see Fig. 11, in one of its side faces for the purpose of imparting a vertically reciprocating motion to the hook holder or die 18, the shank 18^a of which works in its bearing 23, said motion being imparted through the lever 19, which is pivoted to the frame at 20, one end of said lever engaging said cam at 21 and the opposite end engaging the lower end of the die shank at 22.

The anvil or riveter 25, which coöperates and works in unison with the hook holder, is held to reciprocate vertically in its bearing 26, the same being pressed downward by means of the cam 24, on the periphery of the disk 16, through the lever 27, which is pivoted at 28, the riveter and the lever both being returned by means of the spring 29. The lower limit of the stroke of the anvil may be nicely regulated by means of the screw 27^a which is threaded into the end of the lever 27, the collar of which is adapted to act upon the end of the shank 28^a of the roll bearing 29^a. After the same has been adjusted to the desired position in the lever 27 it is firmly gripped and retained by the set screw 30^a.

The hook holder or die 18, which is supported in the upper end of its shank 18^a, is provided with a flange portion 30 which is undercut at 31 for the purpose of receiving the head of the hook. This flange portion is provided with a small hole 32 through which the point 33 of the riveting anvil 25 passes when the riveter and the holder come together to fasten or rivet the hook into the work. This flange portion 30 is also provided with a small notch 34 which has a tendency to center or locate the hook in the proper position on the flange. In order to bind and secure the hook to this flange a movable finger 35 is pivoted at 36 to the face of the holder and is pressed with a flexible tension against the flange 30 by means of the coil spring 37.

A table 38 is fixed to the framework of the machine on a plane above the hook supply raceway, on which table the quarters, as shown in section at 39, are supported and manipulated while the hooks are being set therein.

The bracket 40 secured to the frame at 41 supports a slidable plate 42 which is secured in the desired position therein by means of the thumb screw 43. This plate serves as a gage against which the edge of the quarter is set when positioning the same in the machine.

A feed block 44 is provided to feed the quarters automatically forward at each withdrawing stroke of the riveter, said block being provided with teeth or corrugations 45 on its lower face, and is also provided with a dove-tailed groove 46 in its rear face to receive a correspondingly shaped portion on a supporting member 47 whereby said block may slide endwise thereon. This said supporting member is provided with a square stem 48 extending upward and receiving a bearing in the framework, and a spring 48^a is arranged to hold said feed block normally out of engagement with the work. This supporting member 47 is also provided with a central hole 47^a through which the riveting plunger 25 reciprocates. This feed block is arranged to be pressed downward at the proper time onto the work by means of the cam 49, see Fig. 1, through the lever 50, which is pivoted at 51 to the frame, the forward end of said lever being provided with an adjusting screw 52 adapted to engage the projection 53 on the supporting member whereby the pressure of said feed block upon the work may be nicely regulated. In order to move this block 44 longitudinally to feed the quarter forward toward the riveter at the proper time, a connecting rod 54 fulcrumed at 55 is forked at one end 56 to engage the pin 57 on the feed block. The opposite end of said connecting rod is moved back and forth in the guide-way 58, see Fig. 1, by means of the crank pin 59 through the connection 60. This crank pin is fixed in the face of the gear 61 and is caused to rotate continuously and at the desired speed from the main shaft 2 through the gears 62, 63 and 64.

The number of hooks, as well as the distance they are set apart in the uppers varies with the styles and sizes of the shoes, and therefore it is necessary to provide means for regulating the spacing of the hooks in the work. To accomplish this I have mounted the fulcrum 55 and connected the same to the lower end of the lever 65, which lever is pivoted at 66, the upper end being provided with a handle 67 for manipulating the same, and also with an outwardly extending pointer 68, which when

moved over the graduated arc 69 indicates and controls the exact spacing of the hooks. In order to lock the lever and its fulcrum in the desired position a bolt 70 is passed through a block 71 in a grooved plate 72 and a nut 73 is secured therein whereby a movement of the handle 74 will bind and hold the lever and fulcrum.

One of the essential features of my improved device is my improved means for positively feeding the hooks from the raceway, where they collect from the hopper, to the riveting dies. In order to feed the hooks positively to the work and also provide sufficient room for easy manipulation of the quarter, I have provided a plate 75 fixed to the frame and having an upwardly projecting end piece 76 adapted to form the continuation of the raceway for the reception of the hooks therefrom, as illustrated at 77 in Fig. 1. This plate is adapted to extend longitudinally along the front of the machine on a plane below that of the table 38, see Figs. 2 and 11. The underside of this plate is provided at intervals with thin flat springs 78—78, see Figs. 4, 5 and 6, which are for the purpose of engaging the hooks 84 as they are fed along and retain them in position by friction when released by the feed plate to take another stroke. One end of these springs is set on an angle into the plate where they are secured by solder, rivets, or other suitable means, the free end pointing downward at a slight angle in the direction of travel of the hooks.

A spring finger 79, mounted on the frame 80, is secured by means of a screw 81 which extends through a slotted portion 82 therein, whereby this finger may be adjusted longitudinally. The free end of this finger is bent back as at 83 and is for the purpose of engaging the hooks as they descend from the raceway to retain them in the proper position to be engaged by the feed plate.

The hook feed plate 85 is provided on its front edge with a plurality of forwardly extending fingers 86—86 which are adapted to engage the hooks and feed them along on the plate 75 to the holder or die. This plate is fixed, by means of screws, to the movable bed 88, which bed is held to slide longitudinally on its dove-tailed tongue 89 through the block 90, which block in turn is adapted to be reciprocated forward and back in a similar groove in the bed 91 guided by its dove-tailed tongue 92, said reciprocating motion being imparted to the block by means of the cam 93, see Fig. 2, through the connection 94. A cam 95 is provided to impart a longitudinally reciprocating motion to said hook feed plate through the lever 96 pivoted at 97, one end of which 98 engages said cam while the opposite end, which is forked at 99, engages a pin 100 in the bed 88.

The operation of my improved hook setting machine may be further described as follows: The hooks are fed to the machine from any suitable hopper, not shown, down the usual raceway on which they are retained by the guard strip. In order to positively transfer these hooks from this raceway to the die or holder a reciprocating hook feed plate 85 is provided with a plurality of fingers, each of which is adapted to engage one of the hooks that are held by the frictional springs on the hook supporting plate 75. At each forward stroke of the feed plate 85 the first finger thereon engages a fresh hook on the raceway, while the last finger, as the plate is fed longitudinally along, carries a hook into position on the hook holder 30, the under friction springs 78 preventing the hooks from being fed too far at each rapid stroke of the feed plate. After the hook has been fed onto the holder both the die and the anvil are operated, bringing them both together on a line with the table 38 on which is held the quarter or work into which the hook is to be set, these two members meeting at this point forces the shank of the hook through the material and rivet it firmly on the upper side. The die and anvil are then at once removed and the stock is fed forward by means of the feed block 44, which block is brought down in contact with the goods by the action of the cam 49, and then fed forward longitudinally by the mechanism and crank motion illustrated in Figs. 1 and 12. A presser foot 101 operated from the cam 102 through the lever 103 now engages the work, pressing and holding it securely against the table, while the feed block released by the cam 49 is raised by the spring 48^a and carried back by means of the crank motion, above described, to take another bite to again feed the work forward.

My improved machine is automatic in its action, all of the essential movements of the same are positive, thereby allowing great speed and accuracy to be obtained in the operation of the same.

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

1. In a hook setting machine, the combination of setting means with means for engaging a plurality of hooks and moving the same toward said setting means, and means for retaining said hooks while the moving means is making another stroke.

2. In a hook setting machine, the combination of setting means with means for engaging a plurality of hooks and moving the same toward said setting means, and yieldable frictional means for retaining said hooks while the moving means is making another stroke.

3. In a hook setting machine, the combination of setting means with a reciprocating plate for engaging a plurality of hooks and moving the same longitudinally toward said setting means, and means for moving said plate transversely for engaging and releasing said hooks.

4. In a hook setting machine, the combination of setting means with a reciprocating plate for engaging a plurality of hooks and moving the same longitudinally toward said setting means, means for moving said plate transversely for engaging and releasing said hooks, and means for retaining said hooks while the moving means is making another stroke.

5. In a hook setting machine, the combination of setting means with means for engaging a plurality of hooks and moving the same toward said setting means, and frictional means for engaging and retaining each hook independently while the moving means is making another stroke.

6. In a hook setting machine, a hook supply raceway, the combination of setting means with means for engaging a plurality of hooks and moving the same toward said setting means, yieldable frictional means for retaining said hooks while the moving means is making another stroke, and adjustable spring means for controlling the position of the hooks on said raceway to be engaged by the feed plate.

7. In a machine of the character described, a vertically reciprocating supporting member, a feed block supported by and adjusted to be reciprocated longitudinally on said member, a cam for operating said members to cause said block to engage the work, a crank motion for reciprocating said block longitudinally to feed the work step by step to the hook setting means, and adjustable means for regulating the stroke of said feed to control the spacing of the hooks in said work.

8. In a machine of the character described, the combination of a hook supply raceway, a hook feed plate having a plurality of fingers adapted to engage a corresponding number of hooks, means whereby the first finger engages a fresh hook from said raceway and the last finger moves a hook to the setting means at each stroke of said plate, and frictional means for retaining the hooks that are being intermittently fed toward said setting means while the feeding plate is taking another stroke.

9. In a machine of the character described, the combination of a hook supply raceway, a hook feed plate having a plurality of fingers adapted to engage a corresponding number of hooks, means whereby the first finger engages a fresh hook from said raceway and the last finger moves a

hook to the setting means at each stroke of said plate, means for moving said plate forward and backward to engage and release the hooks, and means for moving said plate longitudinally to feed said hooks and return for another stroke.

10. In a machine of the character described, the combination of a hook supply raceway, a hook feed plate having a plurality of fingers adapted to engage a corresponding number of hooks, means whereby the first finger engages a fresh hook from said raceway and the last finger moves a hook to the setting means at each stroke of said plate, a slidable block and means for moving the same forward and backward, said feed plate being mounted to slide longitudinally in said block, and a cam for controlling the movement of said plate.

11. In a machine of the character described, the combination of a hook supply raceway, a hook feed plate having a plurality of fingers adapted to engage a corresponding number of hooks, means whereby the first finger engages a fresh hook from said raceway and the last finger moves a hook to the setting means at each stroke of said plate, adjustable spring means for controlling the position of the hooks on said supply raceway to be engaged by the feed plate, and frictional means for retaining the hooks that are being intermittently fed toward said setting means while the feeding plate is taking another stroke.

12. In a machine of the character described, a reciprocating hook holding die having a laterally extending flange adapted to receive each hook as fed to it from the raceway, and a spring pressed member pivoted at its entering end, the free end engaging the back of the hook to retain the same in position on the die.

13. In a machine of the character described, a reciprocating hook holding die having a laterally extending flange adapted to receive each hook as fed to it from the raceway, a finger pivoted at its entering end, a spring pressing its free end against the back of the hook to retain the same in position on the die, and a reciprocating co-operating anvil adapted to descend to meet the hook, and rivet the same in the work when said hook is raised and positioned by the die.

14. In a machine of the character described, a reciprocating hook holding die having a laterally extending flange adapted to receive each hook as fed to it from the raceway, spring means for pressing against the back of the hook to retain the same in position on the die, cam operated means for reciprocating said die, a reciprocating co-operating anvil adapted to descend to meet the hook and rivet the same in the work

when said hook is raised and positioned by the die, cam operated means for forcing the anvil downward, and spring means for returning the same.

5 15. In a machine of the character described, a reciprocating hook holding die having a laterally extending flange adapted to receive each hook as fed to it from the raceway, spring means for pressing against
10 the back of the hook to retain the same in position on the die, cam operated means for reciprocating said die, a reciprocating co-operating anvil adapted to descend to meet the hook and rivet the same in the work
15 when said hook is raised and positioned by the die, cam operated means for forcing the anvil downward, spring means for returning the same, and adjustable means for regulating the limit of the downward stroke of said
20 anvil for properly setting the hook in the work.

16. In a hook setting machine means for setting the hooks, a fixed work supporting table, a vertically reciprocating supporting
25 member, a feed block supported by said member, cam actuated means for causing said block to engage the work and press the same against said table, means for adjusting the supporting members to control the pressure of said feed block on the work, and
30 means for reciprocating said feed block to

move the work longitudinally step by step to said hook setting means.

17. In a stud setting machine means for setting the studs, an anvil, a vertically re- 35 ciprocating supporting member extending forward from the rear beyond said anvil and the stud setting line, a feed block supported by and adapted to be reciprocated longitudinally on said member, means for operating 40 said members to cause said block to engage the work, and means for operating said block longitudinally to feed the work step by step to said stud setting means.

18. In a stud setting machine means for 45 setting the studs into the work, an anvil, a vertically reciprocating supporting member extending forward from the rear beyond said anvil and the stud setting line, a feed block supported by and adapted to be re- 50 ciprocated longitudinally on said member, means for operating said members to cause said block to engage the work, and a gear driven crank for positively operating said block longitudinally to feed the work step 55 by step to said stud setting means.

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

FERN L. CHENEY.

Witnesses:

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