

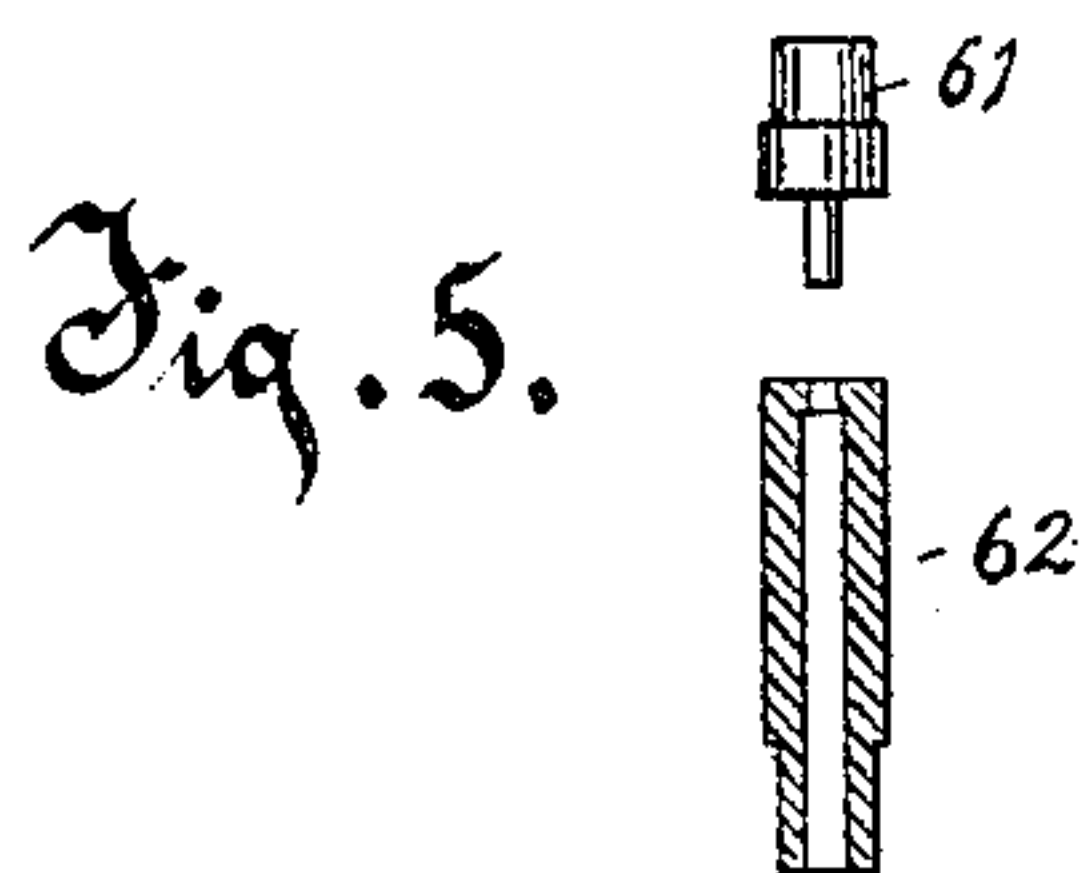
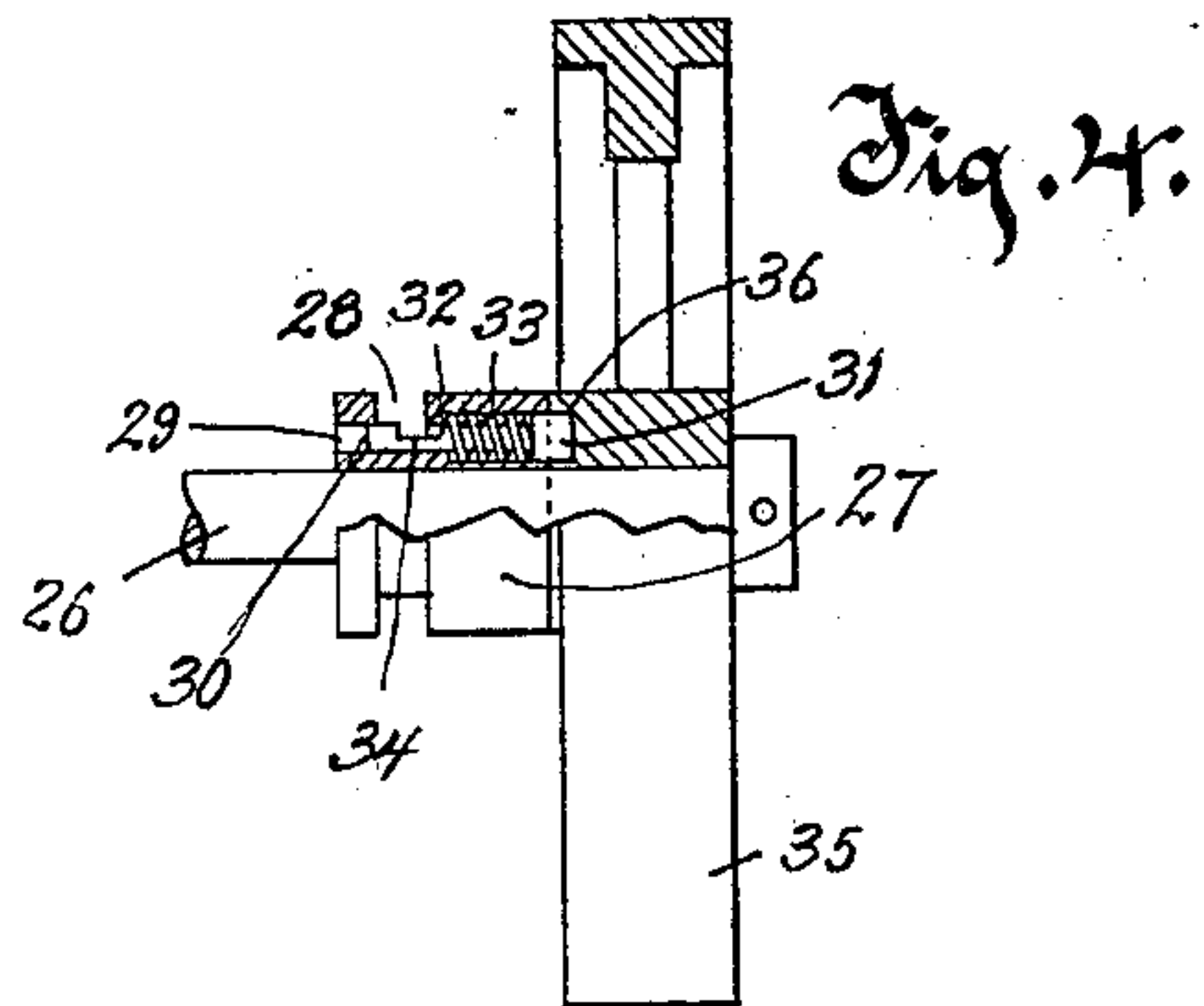
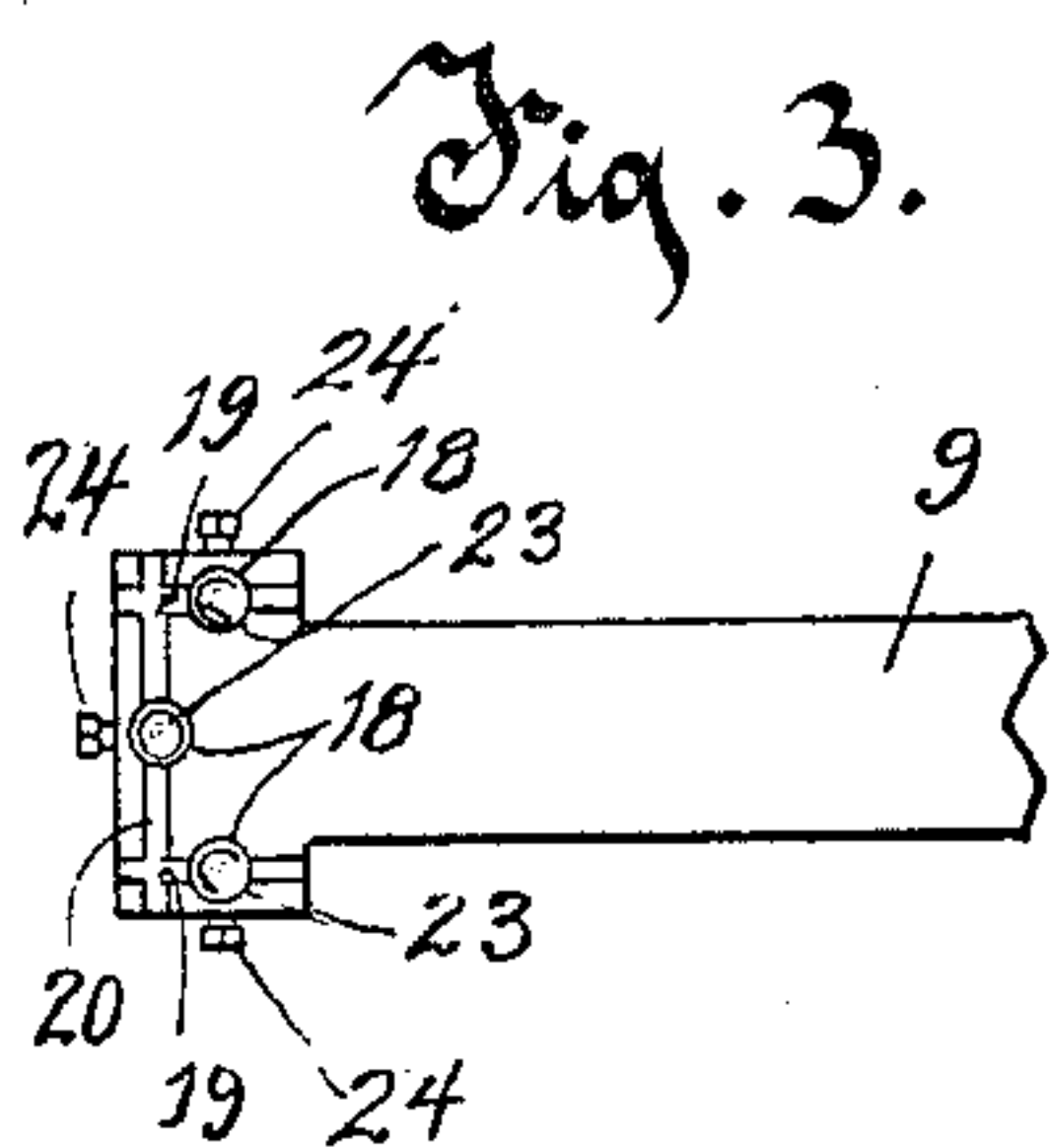
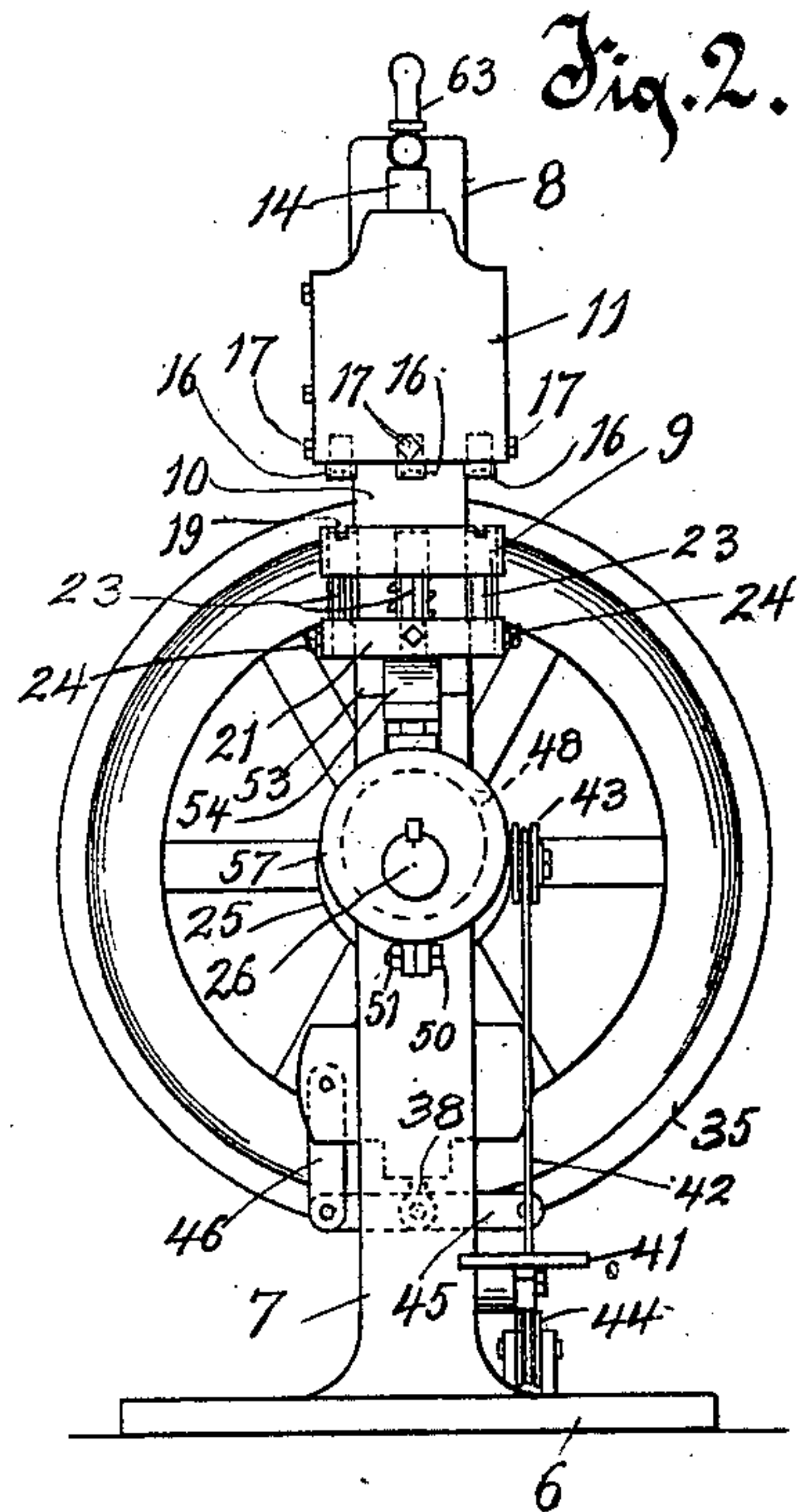
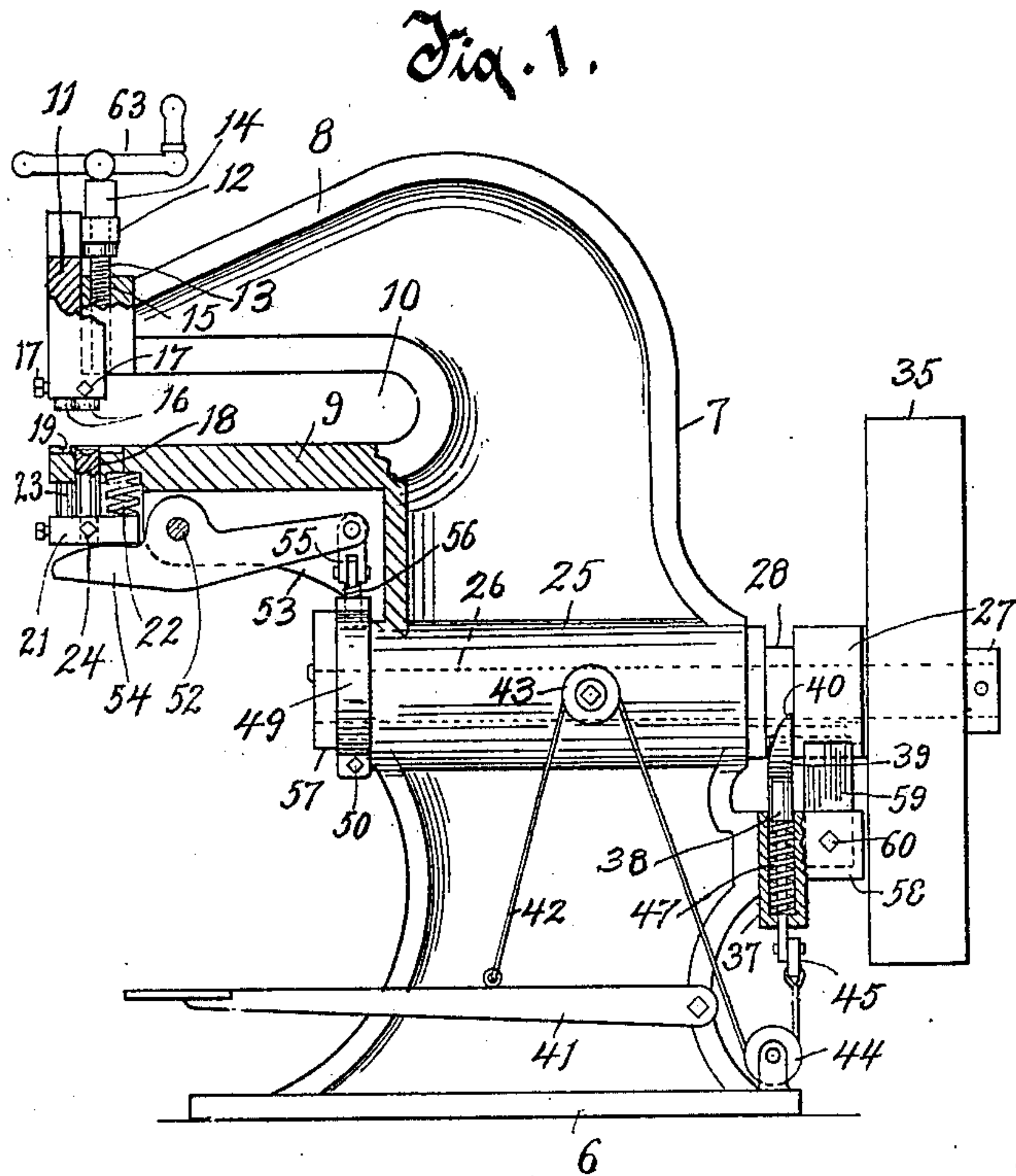
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Patented Aug. 27, 1901.

F. KOSSL & A. J. KRAFT.  
COMBINED PUNCHING AND RIVETING MACHINE.

(Application filed Apr. 11, 1901.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

FRANK KOSSL AND ANDREW J. KRAFT, OF MILWAUKEE, WISCONSIN.

## COMBINED PUNCHING AND RIVETING MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,328, dated August 27, 1901.

Application filed April 11, 1901. Serial No. 55,328. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK KOSSL and ANDREW J. KRAFT, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in a Combined Punching and Riveting Machine, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

Our invention has relation to an improved combined punching and riveting machine.

The primary object of the invention is to provide a form of construction capable of accomplishing in one and the same machine the punching and riveting in a simple and expeditious manner.

A further object is to provide an improved form of adjustment for regulating the throw of the lower movable jaw.

With the above and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a side elevation of our improved machine, parts being broken away and showing the pins employed for the riveting operation fitted to the machine. Fig. 2 is a front elevation. Fig. 3 is a fragmentary plan view of the lower forwardly-extending arm. Fig. 4 is a detail view of the fly-wheel and allied mechanism, parts being broken away to clearly show the clutch mechanism, said clutch mechanism being shown in clutching engagement with the belt-wheel; and Fig. 5 is a detail view showing the pins used for the punching operation.

Referring to the drawings, the numeral 6 indicates a base-plate, from which extends upwardly a standard 7, said standard being provided at its upper end with a forwardly-projecting arm 8 and below this arm and parallel therewith another forwardly-extending arm 9, the space between the two arms forming a mouth 10.

Movably fitted to the forward end of the arm 8, preferably by a dovetail connection, is an adjustable jaw 11. The rear side of this jaw, near the upper end thereof, is provided with an apertured lug 12, through which a screw 13 passes, an unthreaded portion of the screw fitting in the aperture of the

lug and said screw provided above the lug with an enlargement 14 to prevent vertical movement of the screw with respect to the adjustable jaw. The screw engages a vertical threaded opening 15 in the forward end of the arm 8, as clearly shown in Fig. 1. The lower end of the adjustable jaw 11 is adapted to carry a series of pins. The pins shown in Figs. 1 and 2 and designated by the numeral 16 are the pins employed in the riveting operation. Said pins are solid and each provided upon its lower end with a small recess or concavity. Three of these riveting-pins are shown, the central pin being slightly in advance forwardly of the two outer pins. Where it is desired that these riveting-pins should be removable, as in case of the machine being used, as it is primarily intended, as a combined punching and riveting machine, they are removably held in place in the adjustable jaw preferably by means of set-screws 17.

The lower forwardly-extending arm 9 is provided therethrough with a series of openings 18, corresponding in number to the number of the upper and lower pins employed. In the present illustration of the invention three of these holes are shown, said holes being in line with the pins 16. Extending from the front edge of the arm 9 on the upper surface of said arm, longitudinally thereof, and across the two outer openings 18 are recesses 19 19, and extending transversely of the upper surface of said arm 9 and across the central opening 18, which opening is arranged slightly in advance of the two outer openings, is a recess 20.

Beneath the lower arm 9 is a movable jaw 21, which is normally held downwardly, as shown in Fig. 1, by means of a coiled spring 22, interposed between the upper side of said jaw and the under side of the arm 9. This jaw carries pins corresponding in number to the number of upper pins employed and being also in line with said upper pins and in registration with the openings 18. In Figs. 1 and 2 of the drawings riveting-pins 23 are shown as extending upwardly from this movable jaw and into the openings 18. The upper end of each of these pins is concaved or recessed, the same as the lower end of each of the upper pins. Where the machine is



used as a combined punching and riveting machine, the pins 23 are removably held in the movable jaw, preferably by means of set-screws 24.

5 The numeral 25 indicates a bearing formed transversely of a medial portion of the standard 7. In this bearing is fitted revolubly a shaft 26. This shaft near one end thereof has mounted fast thereon a collar 27, (which  
10 of course could be an integral part of the shaft,) and this collar is provided with an annular groove 28. The groove 28 is intersected by a longitudinal spline-groove 29, which spline-groove extends to the outer extremity  
15 of the collar, the rear portion of the groove being of increased width, as most clearly shown in Fig. 4. In the spline-groove is fitted a feather 30. The rear end of this feather is formed with a head 31, and interposed be-  
20 tween this head and a shoulder 32, formed in the wall of the spline-groove and encircling the feather, is a coiled spring 33. The feather is furthermore provided with a transverse recess 34. Fitting loosely on the end of the  
25 shaft 26 is a belt-wheel 35. The inner side of the hub of this wheel is provided with a recess 36, which when brought into registration with the outer end of the spline-groove is adapted to be engaged by the head 31 of the  
30 feather 30.

Beneath the collar 27 is a box 37. In this box is fitted a rod or stem 38. The upper end of this rod is enlarged, and the extremity of the enlarged portion is formed with a yoke  
35 39, which engages the annular groove 28 of the collar. The inner edge of this yoke is beveled, as indicated by the numeral 40, and this beveled edge engages the recess 34 of the feather, and thereby normally holds the  
40 feather inwardly against the action of the spring 33, so that the head 31 of the feather cannot engage the recess 36 of the hub of the belt-wheel. Any desirable means for drawing the rod or stem 38 downwardly, so as to  
45 bring the yoke 39 out of engagement with the feather, may be adopted; but we prefer to employ the mechanism shown in the accompanying drawings, and which consists in a foot-lever 41, pivoted at one end and having con-  
50 nected to a medial point thereof a rope or cable 42. This rope is extended upwardly over a pulley 43, mounted loosely on an axis extending laterally from the bearing 25, and thence downwardly and beneath another pulley 44,  
55 the end of the rope being finally secured to one end of a lever 45. The other end of this lever is jointed to the lower end of a link 46, the upper end of said link being pivoted to the frame. The lower end of the rod 38 is ex-  
60 tended through the bottom of the box 37, and the extremity of said lower end is pivotally connected to a medial point of the lever 45. The rod or stem 38 is encircled within the box  
37 by a coiled spring 47, the lower end of said  
65 spring bearing against the bottom of the box and the upper end thereof against the upper enlarged end of the rod.

It will be evident that when the parts are in position shown in Figs. 1 and 2 the driv-  
ing-belt, (not shown,) which passes around 70 the wheel 35, will not impart rotation to the shaft 26. If, however, the foot-treadle 41 is depressed, a pull is exerted on the rope or cable 42, and this pull will cause a turning of the lever 45 and a consequent down move- 75 ment of the rod 38 sufficient to release the yoke of said rod from engagement with the recess 34 of the feather against the contrary force exerted by the spring 47, and the mo- 80 ment this release occurs the spring 33 acts expansively on the feather 30, and when the wheel 35 is rotated sufficiently to bring the recess 36 thereof into registration with the spline-groove 29 the head 31 of said feather will be forced into engagement with said re- 85 cess of the wheel, as shown in Fig. 4, and consequently the rotation of said wheel will be imparted to the shaft. When it is desired to unclutch the wheel from the shaft, all that is necessary to be done is to remove foot- 90 pressure on the treadle, and the spring 47 will then force the yoke 39 upwardly, the beveled edge 40 of said yoke engaging the wall of the recess 34 of the feather, and thereby moving said feather against the action of the spring 95 33 inwardly sufficiently far to release the head 31 of the feather from engagement with the recess 36.

The lower movable jaw 21 is moved upwardly by means of the rotation of the shaft 100 26, and any desirable connection may be employed between said shaft and the movable jaw for accomplishing this purpose. We prefer to use the mechanism illustrated in the accompanying drawings, and which mechan- 105 ism will now be described. The shaft 26 is provided on the end thereof opposite to the end on which the wheel 35 is mounted with an eccentric 48. Surrounding this eccentric is an eccentric-strap 49, advisably split at the 110 lower portion thereof, the split ends provided with depending lugs, which are held together by means of a short-headed bolt 50, the un-headed end of said bolt being threaded to receive a nut 51. By turning this nut the 115 proper fit of the eccentric-strap to the eccentric may be readily regulated. Pivoted medially on a transverse pivot 52 and between ears 53, depending from the underside of the lower arm 9, is a lever 54. The outer end of 120 this lever extends beneath the lower movable jaw 21, and the inner end of said lever is suitably connected to the eccentric-strap. The connection shown in the accompanying drawings consists of a link 55, pivotally con- 125 nected to the inner end of the lever. The lower end of this link is in the form of a yoke, and the arms of the yoke receive therebetween the upper end of an arm 56, extending upwardly from the eccentric-strap, the said 130 arm being pivotally connected by means of a transverse pivot-bolt extending through the yoke and through said arm. This arm 56 may be an integral part of the strap; but we



prefer to make it separate therefrom and thread the lower end thereof, said threaded lower end fitting in a threaded socket in the upper portion of the eccentric-strap, as clearly shown in Fig. 1. By this means the throw of the lever 54 may be readily regulated merely by taking out the pivot-bolt of said arm and screwing the arm either upwardly or downwardly in the socket, in accordance with the particular adjustment desired. To prevent the eccentric-strap from working off the end of the shaft 26, we form the outer end of the eccentric with an enlargement or head 57, which forms a shoulder or abutment, against which the eccentric-strap bears.

It is desirable that suitable brake mechanism should be employed for the shaft 26, and we therefore show a box 58, in which a brake-block 59 is adjustably held by means of a set-screw 60.

In Fig. 5 of the drawings we show the pins which are employed in the operation of punching. The numeral 61 indicates one of the upper pins and 62 one of the lower pins. Both these pins are held in place, respectively, in the upper adjustable jaw 11 and the lower movable jaw 21 by means of the set-screws shown in Figs. 1 and 2. The upper portion of the upper pin, which fits in a socket of the adjustable jaw 11, is enlarged, while the lower portion consists of a reduced solid pin. The lower pin 62, as clearly shown in Fig. 5, is tubular throughout.

Our invention is particularly adapted, although not necessarily, for punching and riveting plates used in the construction of steel ranges. The first operation to be performed is that of punching the holes through the plate. The pins 61 and 62 are properly adjusted to the respective jaws 11 and 21. The plate to be punched is then inserted into the mouth 10 and the handle 63 operated so as to turn the screw 13 downwardly until the lower ends of the pins 61 are just above the plate to be punched. The foot-treadle 41 is then depressed, and this will cause the belt-wheel 35 to be clutched to the shaft 26 in the manner hereinbefore fully pointed out. As the shaft is rotated the eccentric 48 thereof causes a turning, through the medium of the connection described, of the lever 54. When the outer end of this lever is forced upwardly, the movable jaw 21 is necessarily forced in the same direction, and the pins 62 bring the plates to be punched into forcible contact with the lower ends of the pins 61, and said pins are thereby driven through the plate. By reason of the fact that the lower pins 62 are tubular the small pieces of metal thereby punched out of the plate are free to pass through these tubular pins. It will be evident that the plate to be punched may be passed into the mouth either from the front end thereof or from either side. This completes the punching operation, and the punching-pins are then removed and the pins 16 and 23 adjusted to the respective jaws 11 and

21. Rivets are now passed through the two outer holes which were punched, the heads of the rivets being uppermost. The plate, with the rivets, is then passed into the mouth 10 and the heads of the rivets fitted in the recesses in the lower ends of the pins 16. By reason of the provision of the longitudinal recesses 19 19 in the arm 9, which recesses receive the lower ends of the rivets, there is no impediment to the free insertion of the plate between the jaws, as the lower ends of said rivets are received in the grooves. The same operation as before described is now repeated—that is to say, the foot-treadle 41 is depressed. This will cause an up movement of the movable jaw 21, and the upper recessed ends of the two outer pins 23 will thereby be brought into engagement with the lower ends of the rivets and said lower ends of the rivets will be upset. Pressure on the foot-treadle is now removed and the plate withdrawn from the mouth 10 and a rivet inserted in the central opening of said plate. The plate is now inserted into the mouth from the side thereof and the lower end of the rivet is received in the transverse groove 20. The foot-treadle 41 is again depressed and the lower end of this central rivet thereby upset.

While we prefer to employ our machine as a combined punching and riveting machine, yet we do not desire to be understood as limiting ourselves thereto, inasmuch as it is obvious that the machine may be employed solely as a punching-machine or solely as a riveting-machine. In the first instance the punching-pins 61 and 62 would be permanently fixed in the jaws and in the latter instance the riveting-pins 16 and 23 would be permanently fixed in the jaws.

What we claim as our invention is—

1. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, and means for removably fitting different forms of pins to the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of pins adapted to be forced through the openings formed in one of the arms.

2. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, the outer holes being out of line with the inner hole, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

3. The combination of a standard having



parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a hole and with a recess intersecting said hole, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of pins adapted to be forced through the openings formed in one of the arms.

4. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with holes and with recesses intersecting said holes, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

5. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, the outer holes being out of line with the inner hole, and said arm also provided with recesses intersecting the outer holes, and with a recess intersecting the inner hole, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of pins adapted to be forced through the openings formed in one of the arms.

6. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of the arms, a spring-pressed movable jaw fitted to the other of said arms, a lever adapted to act against the movable jaw, means for operating the lever, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

7. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of the arms, a movable jaw fitted to one of the arms, a lever engaging the movable jaw, a rotatable shaft, an eccentric carried by said shaft, an eccentric-strap surrounding the eccentric, a connection between the eccentric-

strap and the lever, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

8. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of the arms, a movable jaw fitted to the other of said arms, a lever engaging the movable jaw, a rotatable shaft, an eccentric carried by said shaft, an eccentric-strap surrounding the eccentric, an arm extending from the eccentric-strap, a link pivotally connected at one end to the arm and at its other end to the lever, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

9. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of said arms, a movable jaw fitted to the other of said arms, a lever engaging the movable jaw, means for operating the lever, means for adjusting the throw of said lever, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

10. The combination of a standard having parallel arms projecting therefrom with a space therebetween to form a mouth, one of said arms provided with a series of holes therethrough, an adjustable jaw fitted to one of the arms, a movable jaw fitted to the other of said arms, a lever engaging the movable jaw, a rotatable shaft, an eccentric carried by said shaft, an eccentric-strap surrounding the eccentric, an arm adjustably connected to the eccentric-strap, a link pivotally connected at one end to the arm and at its other end to the lever, and pins carried by the respective jaws, the pins of one set being in alinement with the pins of the other set, and one set of the pins adapted to be forced through the openings formed in one of the arms.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK KOSSL.

ANDREW J. KRAFT.

Witnesses:

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ANNA V. FAUST.