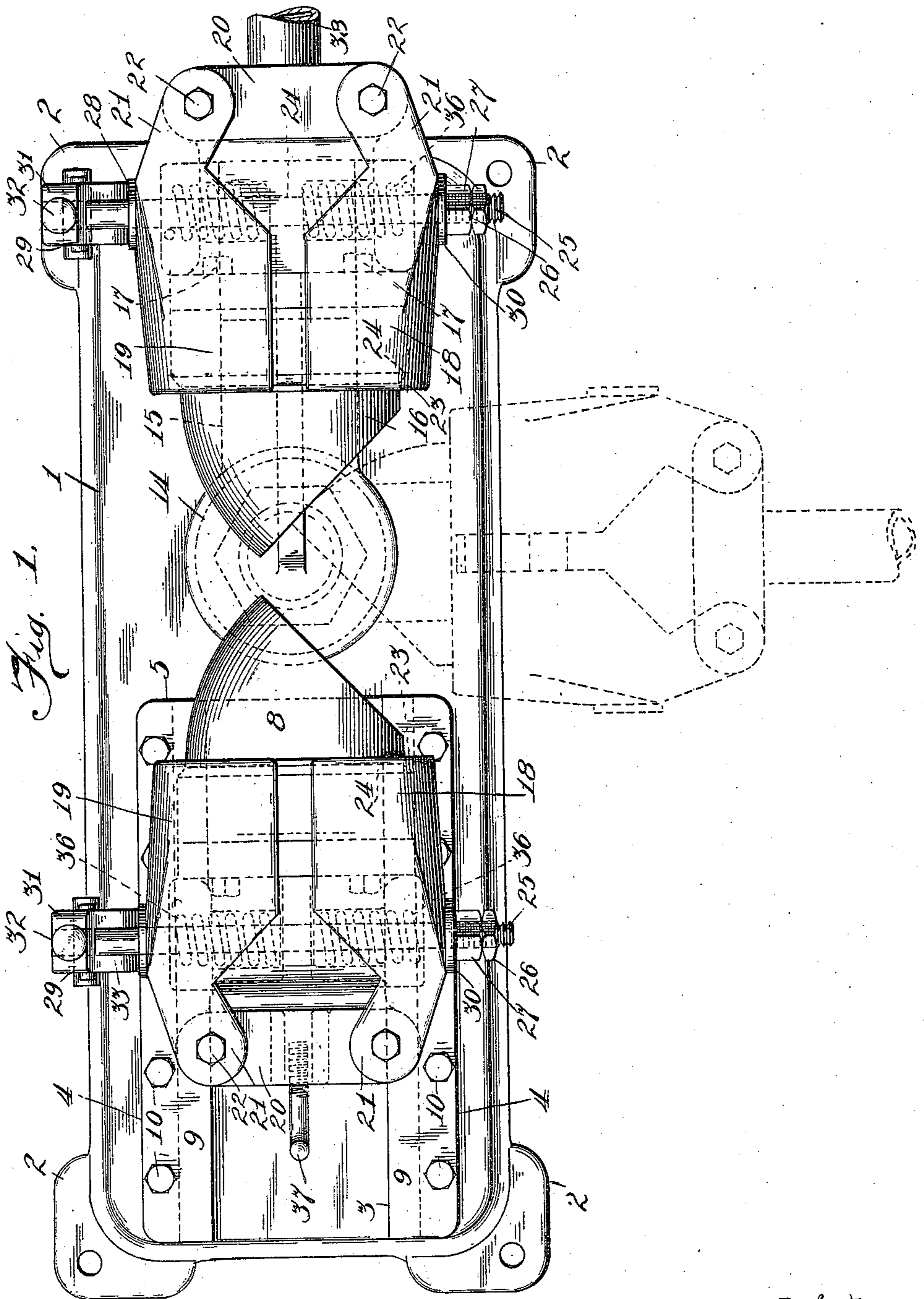


H. C. H. WALSH.
ELBOW BENDING MACHINE.
APPLICATION FILED APR. 19, 1909.

975,184.

Patented Nov. 8, 1910.

3 SHEETS—SHEET 1.



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Fig. 3.

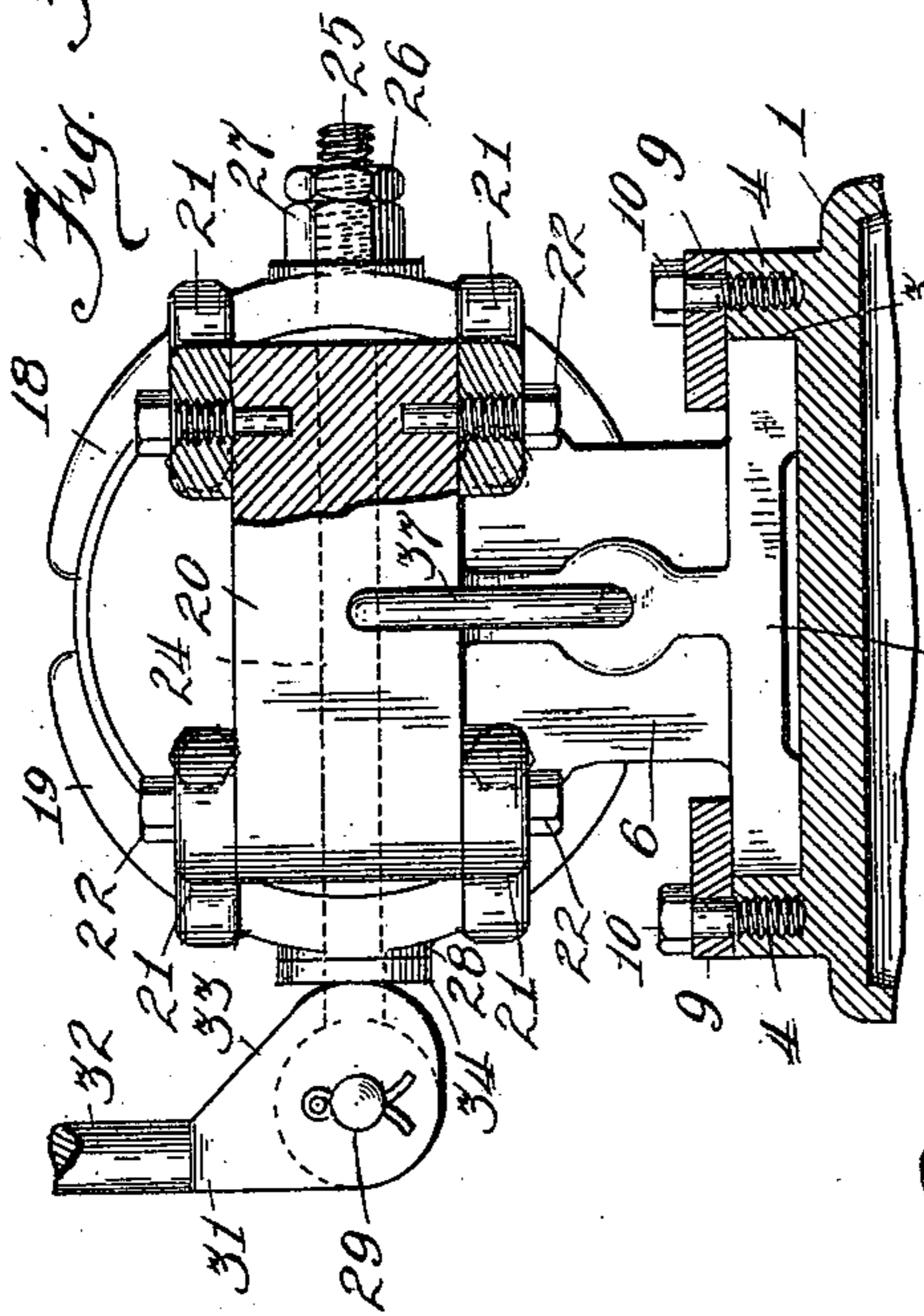
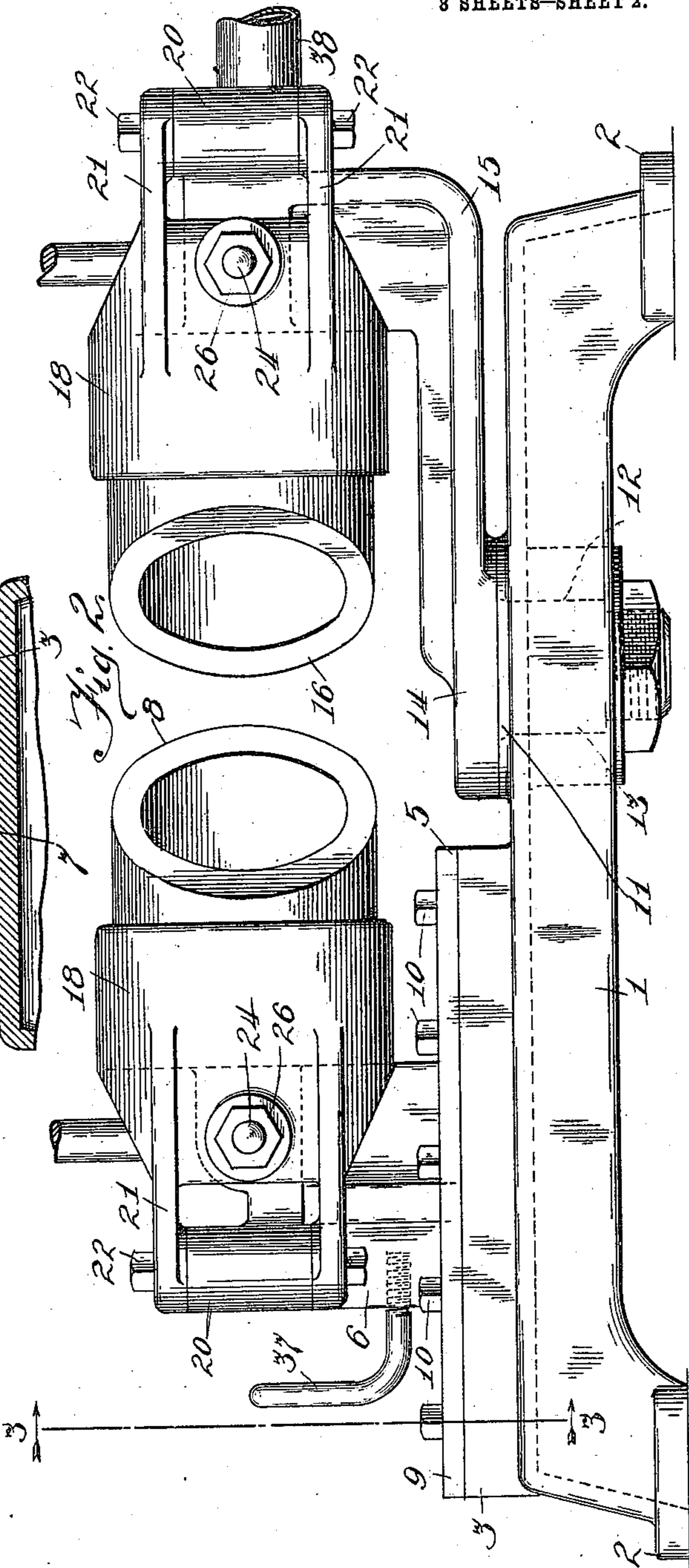


Fig. 2.

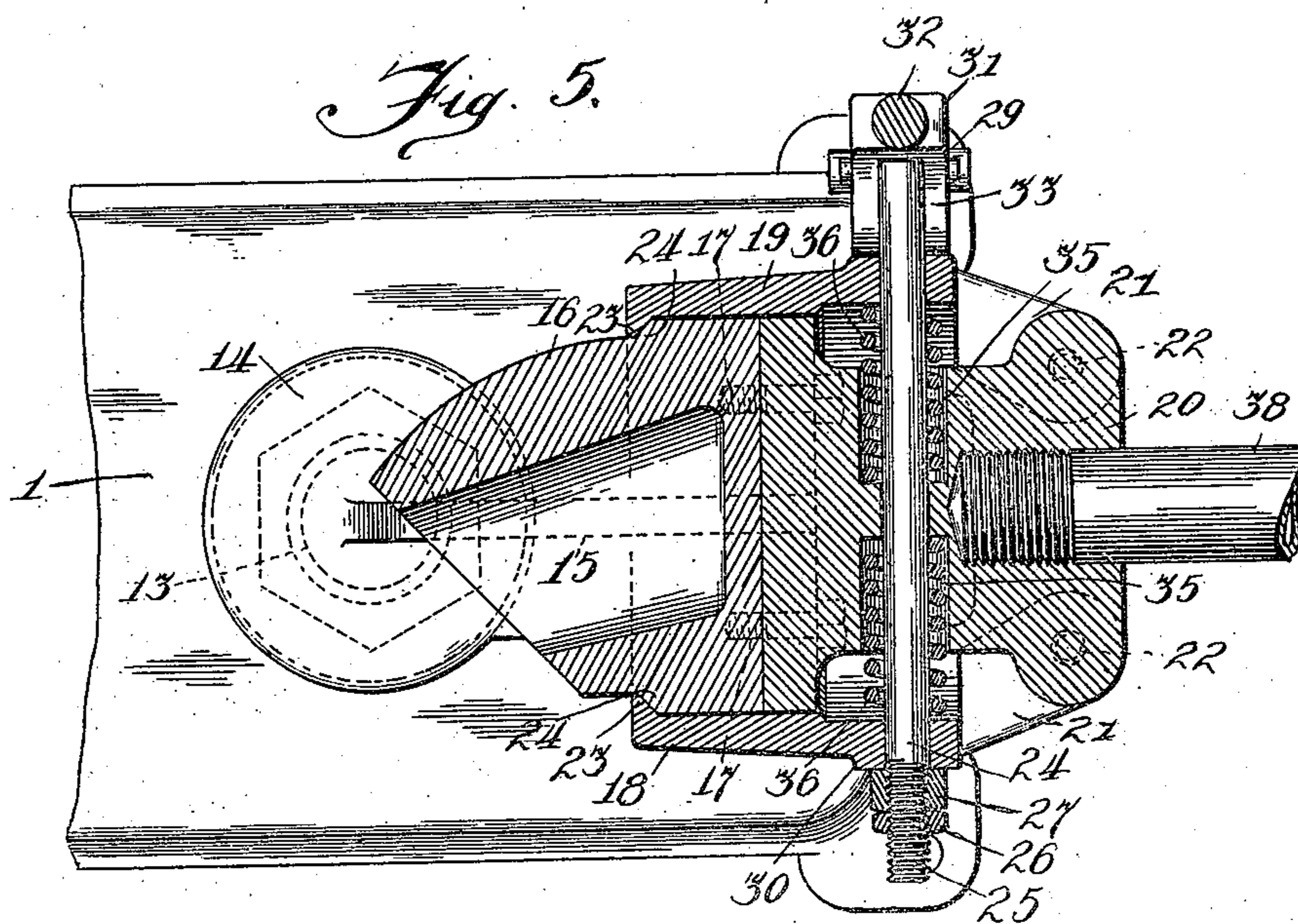
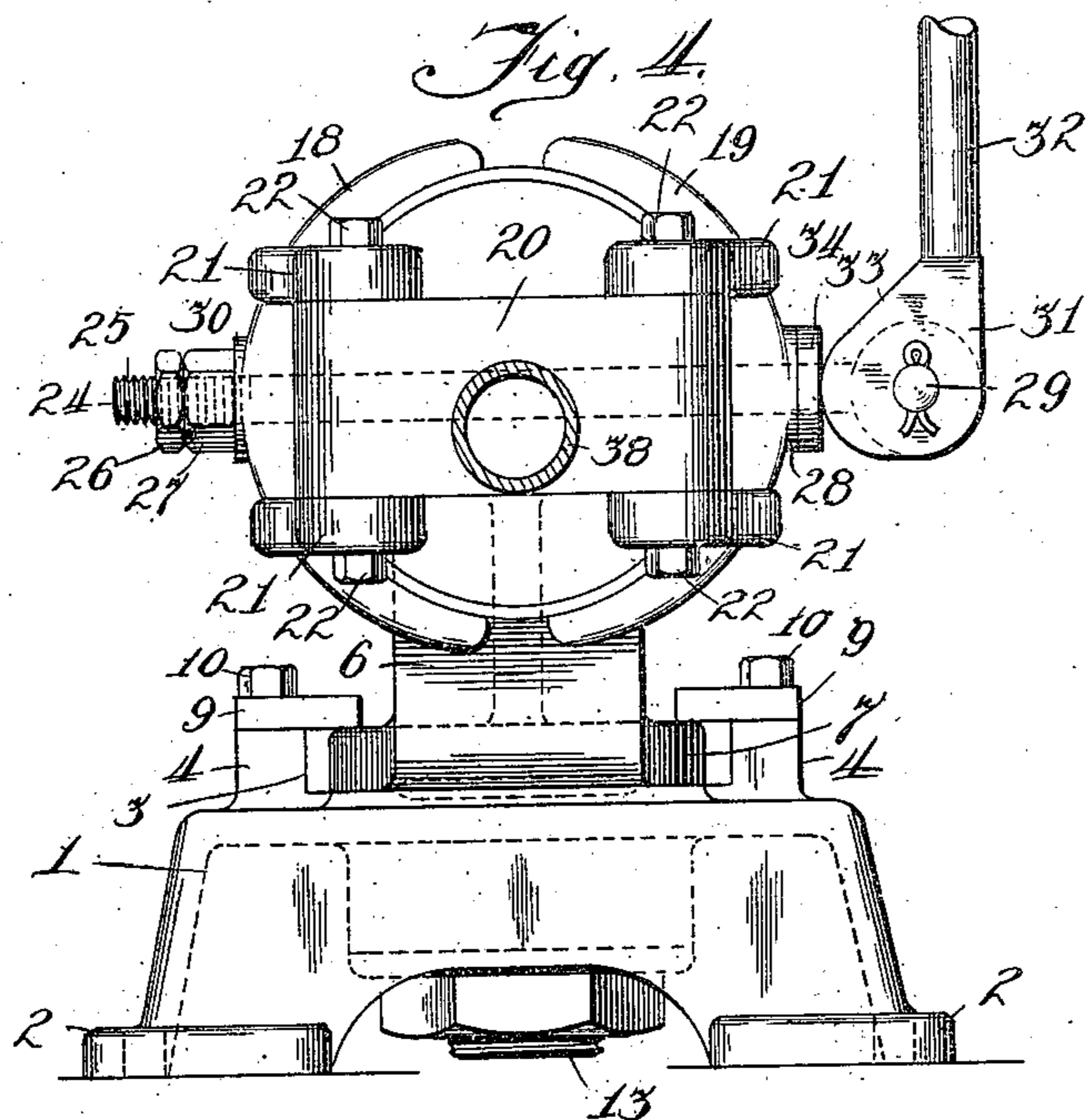


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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HARRY C. H. WALSH, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO A. A. KINNE,
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ELBOW-BENDING MACHINE.

975,184.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed April 19, 1909. Serial No. 490,679.

To all whom it may concern:

Be it known that I, HARRY C. H. WALSH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elbow-Bending Machines, of which the following is a specification.

This invention relates to improvements in elbow bending machines and has among its salient objects to provide a machine for forming an elbow on a flat curve or curve of relatively long radius whereby the stretching or torturing the metal at the upper radius of the curve is distributed over substantially the entire surface of the metal instead of being localized; to provide a construction in which one of the mandrels reciprocates toward the pivoted mandrel during the operation of bending the pipe in order to accomplish the above stated object; to provide a construction which permits of the pipe being readily inserted upon the mandrels or removed therefrom; to provide improved means for clamping the metal in place upon the mandrels; to provide a device which is durable and economical in construction and simple and reliable in operation; and in general to provide an improved construction of the character referred to.

The invention consists in the matters hereinafter described and more particularly pointed out in the appended claims.

In the drawings—Figure 1 is a top plan view of the machine with certain parts shown in dotted lines in order to more clearly bring out the details of construction. Fig. 2 is a side elevation of the same with the mandrels shown in normal position. Fig. 3 is an end elevation partly in section taken on lines 3, 3 of Fig. 2 and looking in the direction of the arrows. Fig. 4 is an end elevation of the other end of the machine the operating handle or lever being shown in section. Fig. 5 is a fragmentary horizontal section and showing more particularly the construction of the pivotal mandrel.

Referring to the drawings 1 designates the base casting or bed plate provided at either corner with an ear like extension 2 whereby it may be mounted upon any desired supporting frame (not shown). At one end this casting is provided at opposite sides with a pair of up-standing guides 4, 4

and a stop 5. Within this guide-way is slidably mounted a mandrel support 6 provided with an enlarged base 7 and carrying a mandrel 8 of well known construction. The base member 7 is secured between the guides 4 by means of confining plates 9 fixed to the respective guides 4 by means of suitable screw bolts 10. Near the inner end of the guide-way 3 the bed plate 1 is apertured as shown at 12 to receive the journal stud 13 of a turret member 14. At its upper face the bed plate is provided with an annular base 11 upon which the turret member turns. The latter is provided with a rearwardly extending supporting bracket 15 which carries a mandrel 16. Each of these mandrels preferably takes the form of a hollow casting slightly bent inwardly in order to more accurately conform to the curvature of the elbow when the latter is being formed. As shown more clearly in Fig. 5 the mandrels are secured to their supporting brackets by means of suitable bolts 17, 17.

In order to lock the pipe upon the mandrels the latter are each provided with a pair of clamping jaws 18 and 19. Upon the rear end of each of the respective castings 6 and 15 is secured a journal block 20 at either end of which is pivotally connected a forked extension 21 of the respective jaws by means of pivot pins 22 screw threaded through the rear ends of the forks and engaging suitable apertures formed in the upper and lower sides of the journal block as shown more clearly in Fig. 3. Each pair of jaws is provided at its outer end with intumed lips 23 which fit over inclined shoulders 24 formed upon the opposite surfaces of the mandrel whereby the pipe may be more securely clamped in position.

To clamp the jaws to the mandrels, through the respective bracket members 6 and 15 is loosely mounted a pin or rod 24 which also extends through the rear end of the corresponding clamping jaws 18 and 19. That end of the rod 24 which extends through the clamping jaw 18 is screw threaded as shown at 25 and is provided with a confining nut 27 which engages an annular boss 30 formed upon the opposed face of the jaw 18. This nut 27 is further locked in position by means of a jam nut 26. To the other end of the rod 24 is pivotally connected as shown at 29 a cam lever 31 having an operating handle 32. The cam surface 33

of this lever actuates a collar 34 loosely mounted upon the rod 24 and adapted to engage the boss 28 carried by the clamping jaw 19. The bracket members 6 and 15 are
 5 each counter-bored to provide socket members 35, 35 in each of which is seated a coiled expansion spring 36. These springs engage the clamping jaws and automatically force the latter out of engagement with the man-
 10 drel when the cam surface 33 is swung out of engagement with the locking ring 34. The sliding bracket 6 carrying the mandrel 8 is provided at its rear end with a handle 37 whereby it may be bodily reciprocated in
 15 the guide way. Similarly the pivoted bracket 15 is provided with an operating lever 38 which is screw threaded as shown at 39 into the journal block 20.

The operation of the device may be briefly
 20 described as follows: The mandrel 8 is reciprocated toward the rear end of the guide way 3 by means of the handle 37 and the pipe placed in position upon the mandrels, the ends of the pipe extending, of course,
 25 between the clamping jaws. The latter are then forced into clamping engagement with the mandrels and locked in this position by means of the cam levers 31. The mandrel 16 is then swung on its pivot by means of
 30 the operating lever 38 and the pipe bent. It is to be noted however that the bracket 6 carrying the mandrel 8 is free to slide forwardly in its guide way. Accordingly the strain upon the upper periphery of the pipe
 35 due to the stretching of the metal will be distributed over substantially the entire upper surface of the pipe. This results from the fact that the pipe is bent on a curve of relatively large radius rather than on a curve
 40 of small radius as is the case when one of the mandrels is held positively in fixed position during the bending of the pipe.

While I have herein shown a preferred embodiment of my invention it is apparent
 45 that it may be more or less varied in details of construction without departing from the spirit thereof.

I claim as my invention:

1. In a pipe bending machine, the combi-
 50 nation with a main frame provided with a

guide way extending longitudinally thereof, of a bracket having sliding movement in said guide-way, a second bracket pivotally connected to the main frame by a fixed pivot, a mandrel rigidly mounted in each
 55 bracket, means for clamping a pipe on said mandrels, and leverage mechanism for rotating the second bracket, said parts being so arranged that the first bracket has sliding movement and the second bracket rotary
 60 movement during the operation of bending the pipe.

2. In a pipe bending machine, the combination with a main frame having a guide-way extending longitudinally thereof, of a
 65 bracket mounted to slide freely in said guide-way, a second bracket pivotally connected to the main frame by a fixed pivot, a mandrel carried by each bracket, means for clamping the pipe to each mandrel comprising
 70 a journal pin extending transversely through each bracket, a pair of clamping jaws carried by opposite ends of said pin, cam leverage mechanism for shifting said rod to force the jaws into clamping engage-
 75 ment with the mandrel, and springs seated in sockets formed in each bracket and normally forcing the clamping jaws out of engagement with the mandrel, and leverage mechanism for rotating the pivot bracket, 80
 said parts being so arranged that the first bracket slides freely in its guide-way and the second bracket rotates on its pivot during the operation of bending the pipe.

3. In a pipe bending machine, the combi-
 85 nation with a main frame, of a mandrel having free sliding movement therein, a second mandrel pivotally mounted to the main frame by a stationary pivot, and locked against sliding movement, means for clamp-
 90 ing a pipe to said mandrels, said parts being so arranged that said mandrels have different movements during the operation of bending the pipe, the first mandrel having slid-
 95 ing movement and the second rotary movement.

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Witnesses:

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