

Nov. 18, 1924.

1,515,739

J. T. HOLTFOOTH
METAL WORKING MACHINE

Filed Oct. 21, 1922

3 Sheets-Sheet 1

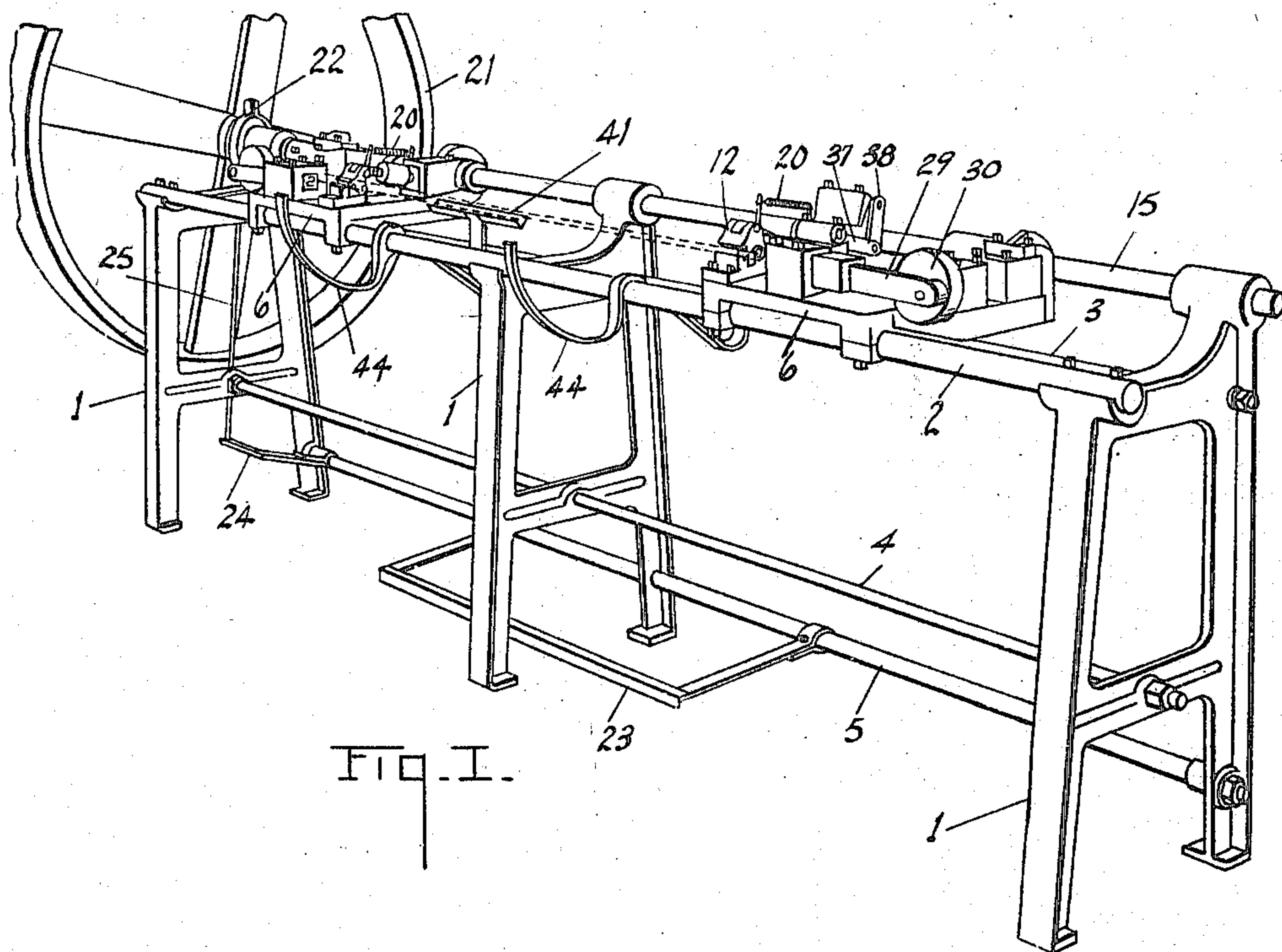


FIG. I.

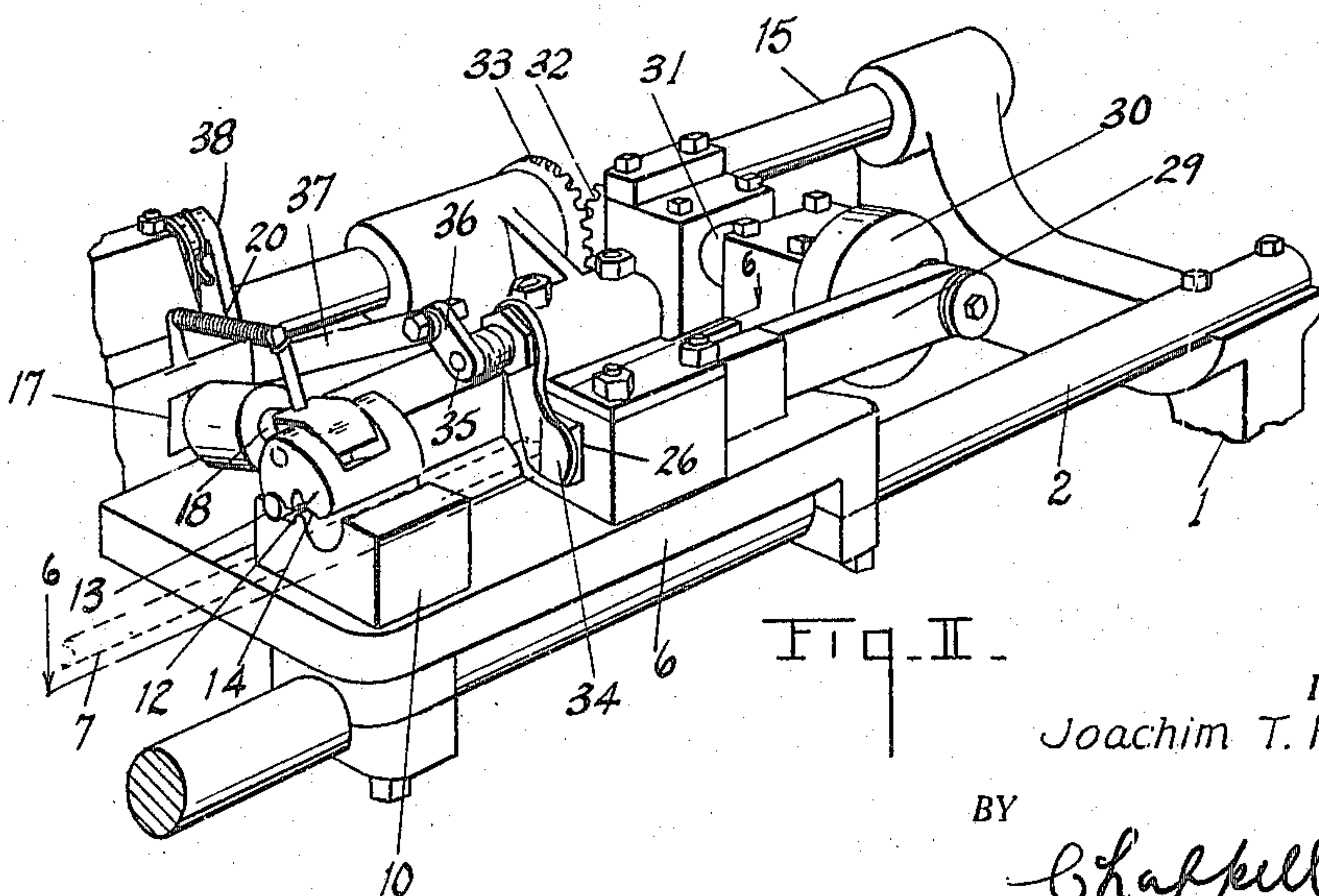


FIG. II.

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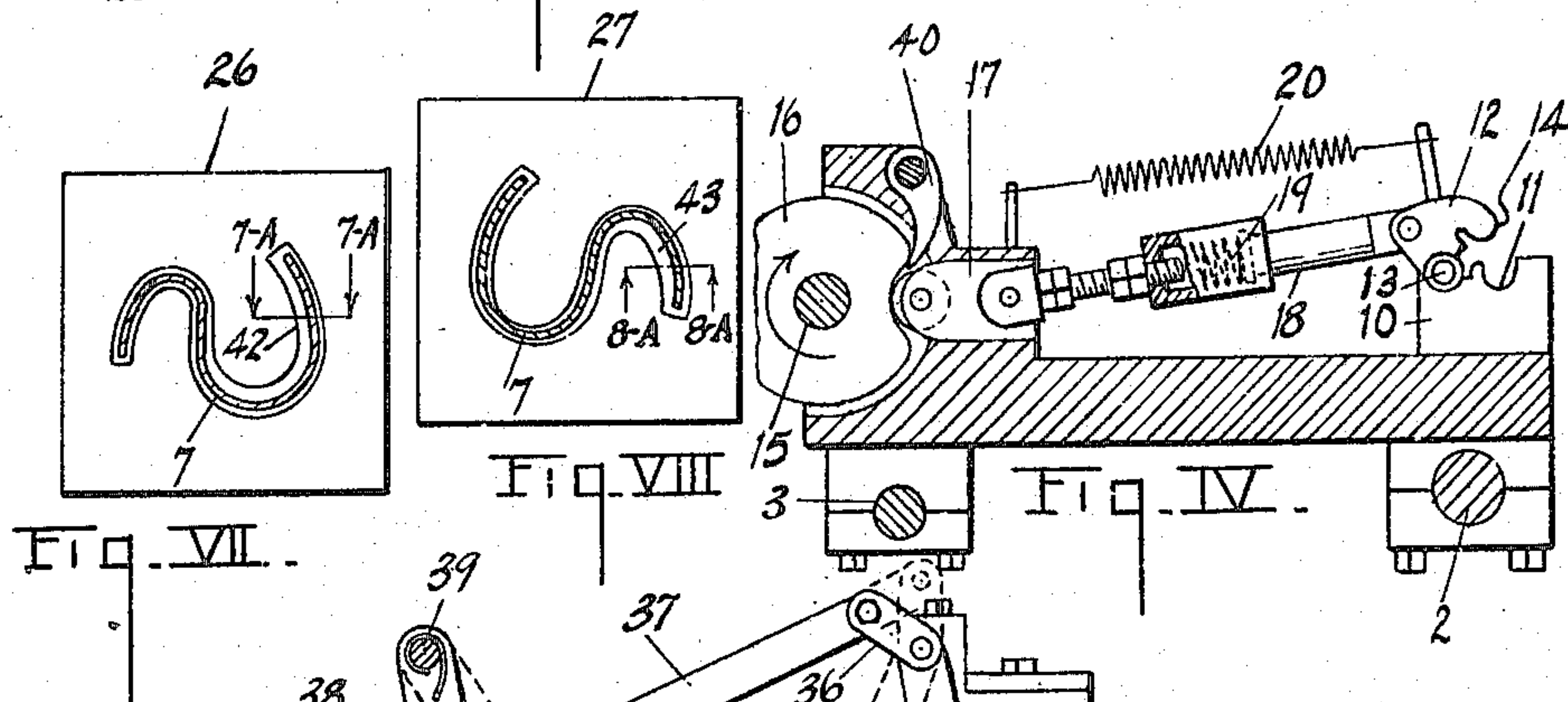
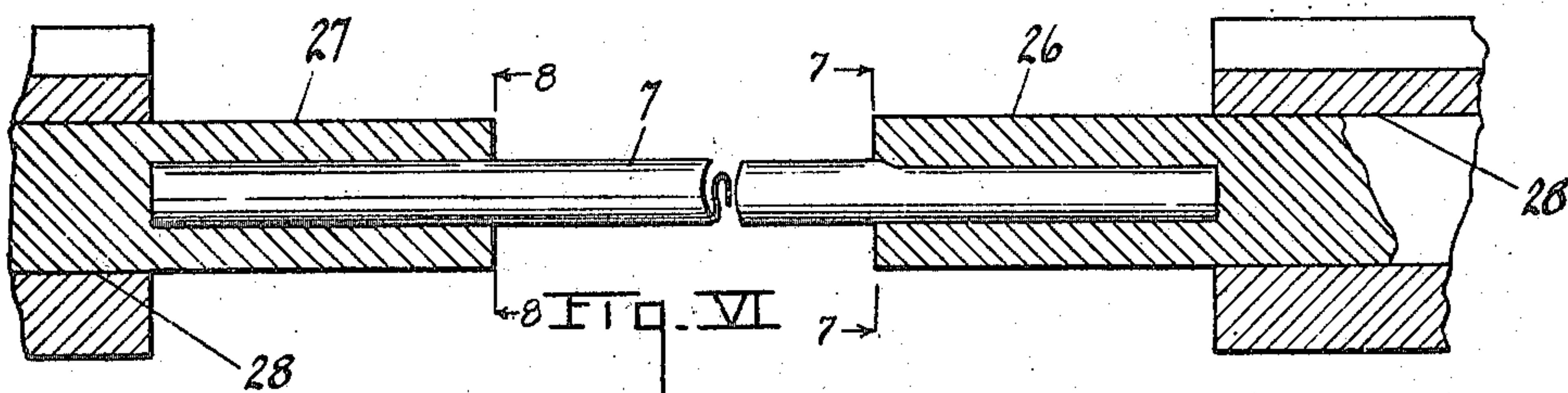
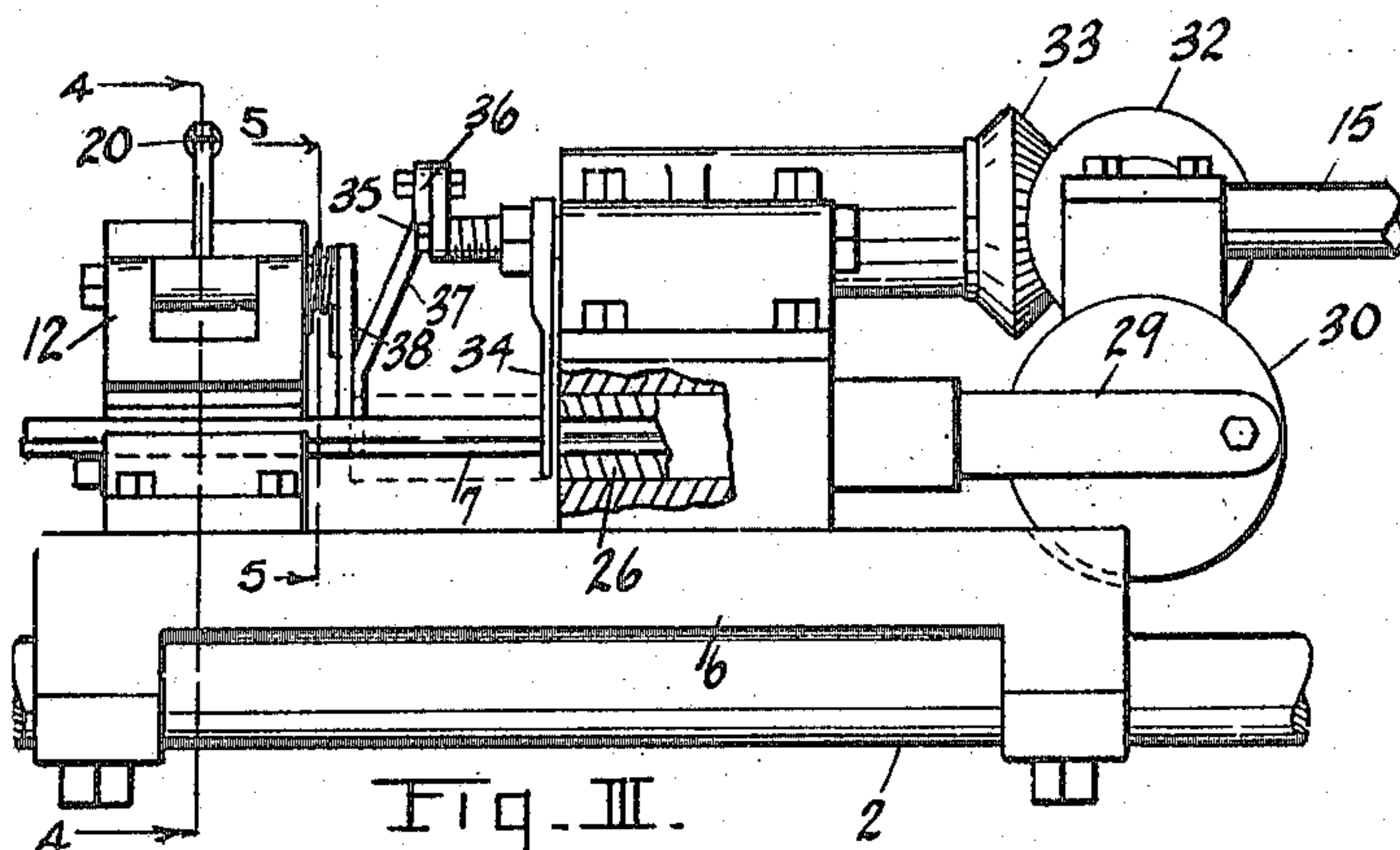
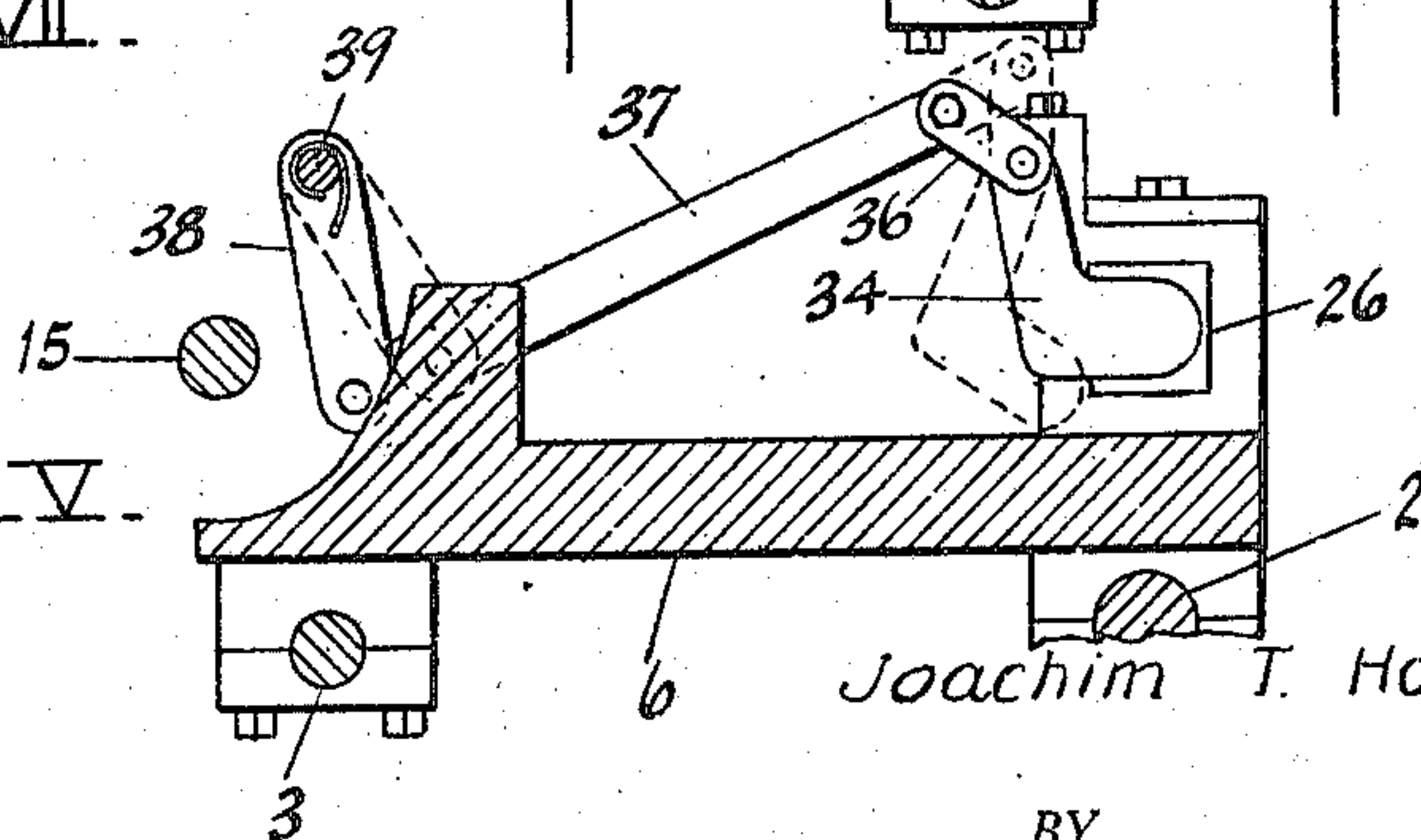


FIG. VII.

FIG. VIII.

FIG. IV.

FIG. V.



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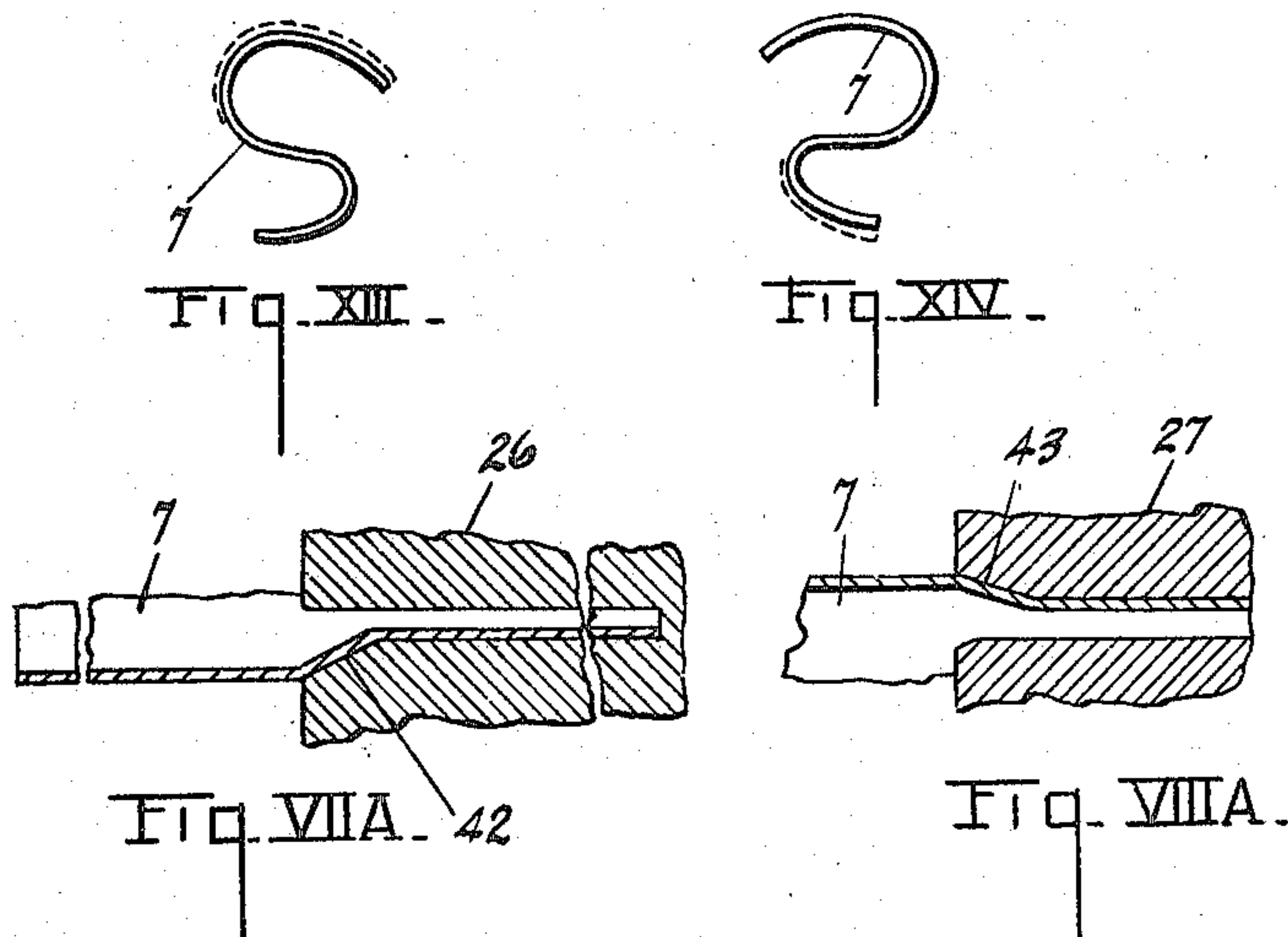
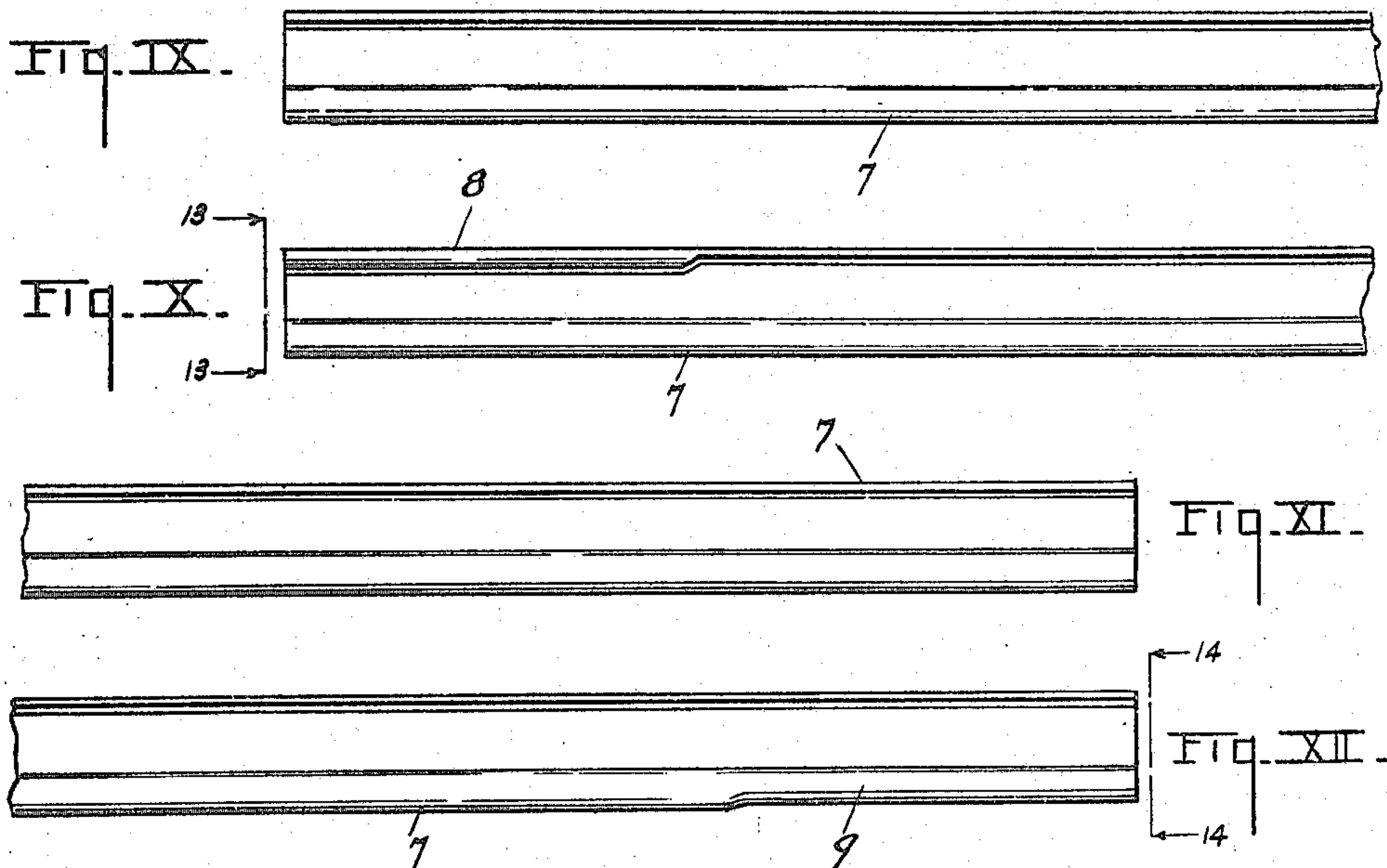
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

JOACHIM T. HOLTFOOTH, OF HIGHLAND PARK, MICHIGAN, ASSIGNOR TO L. A. YOUNG INDUSTRIES, INC., OF DETROIT, MICHIGAN.

METAL-WORKING MACHINE.

Application filed October 21, 1922. Serial No. 595,990.

To all whom it may concern:

Be it known that I, JOACHIM T. HOLTFOOTH, a citizen of the United States, residing at Highland Park, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a specification.

This invention relates to improvements in metal working machines.

I have illustrated my improvements in the accompanying drawing as I have embodied them in a machine for conforming the ends of S-shaped sheet metal strips or members employed in border frames of spring cushion structures, such as illustrated in my Patent No. 1,439,891, dated December 26, 1922, in which the border rim is made up of two similarly shaped sections joined by telescoping the ends thereof, one channel of the S-shaped frame being contracted to fit within the corresponding channel of the coacting telescoping end part. My improvements are, however, desirable and readily adapted for other shapes, or the contracting or expanding of the ends of sheet metal strips of other cross sections.

The main objects of the invention are:

First, to provide a machine for operating upon the ends of strips of S cross section for contracting or expanding parts thereof.

Second, to provide an improved machine of the class described which is effective for the purpose and does not deform or distort parts of the strip other than the parts acted upon.

Third, to provide a machine of the class described which is of very large capacity.

Fourth, to provide an improved machine of the class described which is simple in structure, easy to operate, and not likely to get out of repair.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this application, in which:

Figure I is a front perspective of a metal

working machine embodying the features of my invention, a portion of the driving pulley being broken away for convenience in illustration.

Fig. II is a fragmentary front perspective of the right hand end of the machine.

Fig. III is a fragmentary front elevation, the die member and its guide being partially sectioned.

Fig. IV is a transverse section on a line corresponding to line 4—4 of Fig. III.

Fig. V is a transverse section on a line corresponding to line 5—5 of Fig. III, the frame being omitted.

Fig. VI is a detail longitudinal section on a line corresponding to line 6—6 of Fig. II through the die members, the same being shown in actuated position and in relation to a piece of work.

Fig. VII is a sectional view on a line corresponding to line 7—7 of Fig. VI showing the form of the die and the relation of the work thereto.

Fig. VII^A is a detail longitudinal section on a line corresponding to line 7^A 7^A of Fig. VII.

Fig. VIII is a sectional view on a line corresponding to line 8—8 of Fig. VI illustrating the form of die.

Fig. VIII^A is a detail section on a line corresponding to line 8^A 8^A of Fig. VIII.

Figs. IX and XI are fragmentary side elevations of the ends of the work prior to the machine operating thereon.

Figs. X and XII are fragmentary elevations of the ends of the work after it has been operated upon.

Figs. XIII and XIV are end elevations of the work on line 13—13 of Fig. X and line 14—14 of Fig. XII, respectively.

In the drawing similar reference numerals refer to similar parts throughout the several views and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, in the embodiment illustrated I provide a frame comprising pedestals 1, there being three pedestals illustrated, and the longitudinal frame members 2, 3, 4 and 5. On the frame members 2 and 3 at the top of the pedestals I mount bed members 6 for adjustment towards and from each other. The operating parts being carried on these bed members, the adjustment of the bed members accom-

modates work of different lengths. As stated, the particular machine illustrated is designed to operate on the work 7 of S cross section, shown in Figs. IX and XI, the same being parts of cushion border frames such as illustrated in my said patent. The particular purpose of the machine is to contract one flange at 8 and the opposite flange at 9.

To support the work in the machine I provide rests 10, the faces of the rests being conformed at 11 to the shape of the work. Clamping jaws 12 are pivoted at 13 on the rests and have faces 14 which are complementary to the faces of the rests so that the work is embraced on both sides.

At the rear of the machine is a driving shaft 15 provided with a cam 16 acting upon a plunger 17 which is connected by the links 18 to the clamps,—see Fig. IV. These links have springs 19 therein of such strength as to exert a yielding clamping action upon the work, thereby accommodating variations in the gage of the work and avoiding the necessity of great accuracy in the parts. The spring 20 normally holds the jaw in retracted position. The shaft 15 is driven from the pulley 21 through a clutch 22 controlled from the foot lever 23 on the rod 5 which serves as a rock-shaft, the rod having an arm 24 connected by the link 25 to the clutch. The details of the clutch are not shown as they form no part of my invention.

Die members 26 and 27 are mounted in the ways 28 in alignment and reciprocate toward each other. These die members are connected by the pitmen or connecting rods 29 to the crank disks 30 of shafts 31 which have gears 32 thereon meshing with gears 33 on the shaft 15. A positioning stop 34 is carried by the rock-shaft 35 having an arm 36 thereon connected by the link 37 to an arm 38 on the rock-shaft 39. This rock-shaft has an arm 40 disposed to be engaged by the cam 16 as shown in Fig. IV, the cam acting to retract the stop as the jaw is closed, the jaw remaining closed or in clamping position during the reciprocation of the dies. A rest 41 is disposed intermediate the rests 10 to assist the operator in locating the work which is located with one end against the positioning stop. The recesses of the dies are conformed to the reduced or conformed cross section of the work, the die 26 being beveled at 42 while the die 27 is beveled at 43 so that as the dies close upon the work the work is contracted as indicated in Figs. X and XII. The die members operate simultaneously upon opposite sides of the work, the work being supported and gripped so that it is not buckled or deformed except as it is conformed by the dies. The machine illustrated is provided with holders 44 adapted to receive a quantity of the strips constituting the work.

The operator standing in front of the machine places the work in the rests 10, the intermediate rest 41 being provided to assist in the location of the work, one end of the work being positioned against the stop 34, although it will be understood that the work is not pressed against the stop but merely positioned with the end at the side of the stop. The operator throws in the clutch by means of the foot treadle 23. The operation of the machine being automatic it is only necessary for the operator to place and remove the work and actuate the machine through the treadle 23. The cams and other connections on the driving shaft are so positioned and arranged that the clamping jaws 12 are actuated to clamp the work in the rests, the stop 34 retracted, and then the dies are actuated simultaneously through the connections described, the parts being retracted so that the operator may lift the work from the machine.

This machine is of large capacity and the parts are simple in structure and are not likely to get out of repair in use.

I have illustrated and described my improvements in an embodiment which I have found very practical, I have not attempted to illustrate or describe other modifications or adaptations as I believe the disclosure made will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired.

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

1. In a machine of the class described, the combination of bed members, a driving shaft, a manually controlled driving clutch for said shaft, work rests on said bed members, coacting pivotally mounted work clamping jaws, springs acting to hold said jaws normally open, means for actuating said jaws comprising cams on said driving shaft, plungers coacting with said cams and links connecting said plungers to said jaws, said links having springs interposed therein, opposed aligned die members reciprocatingly mounted on said bed members to act on the work supported by said rests, and means for simultaneously reciprocating said die members.

2. In a machine of the class described, the combination of bed members, a driving shaft, a manually controlled driving clutch for said shaft, work rests on said bed members, coacting pivotally mounted work clamping jaws, means for actuating said jaws comprising cams on said driving shaft, opposed aligned die members reciprocatingly mounted on said bed members to act on the work supported by said rests, means for simultaneously reciprocating said die members comprising driven shafts mounted on said bed members transversely of said driv-

ing shaft and geared thereto, said driven shafts having crank disks at the forward ends thereof, connecting rods connecting said die members to said crank disks, a pivotally mounted work positioning stop lying normally in front of said die members, and means for retracting said stop comprising said driving shaft.

3. In a machine of the class described, the combination of bed members, a driving shaft, a manually controlled driving clutch for said shaft, work rests on said bed members, coacting pivotally mounted work clamping jaws, means for actuating said jaws comprising cams on said driving shaft, opposed aligned die members reciprocatingly mounted on said bed members to act on the work supported by said rests, means for simultaneously reciprocating said die members comprising driven shafts mounted on said bed members transversely of said driving shaft and geared thereto, said driven shafts having crank disks at the forward ends thereof, and connecting rods connecting said die members to said crank disks.

4. In a machine of the class described, the combination of bed members, a driving shaft, a manually controlled driving clutch for said shaft, work rests on said bed members, coacting work clamping jaws, means for actuating said jaws comprising cams on said driving shaft, opposed aligned die members reciprocatingly mounted on said bed members to act on the work supported by said rests, means for simultaneously reciprocating said die members driven by said shaft, a pivotally mounted work positioning stop lying normally in front of one of said die members, means for retracting said stop comprising one of said cams on said driving shaft, a rock-shaft disposed parallel to said driving shaft and having an arm thereon coacting with such cam, a return spring for said rock-shaft, and a link connecting said stop to an arm on said rock-shaft, said cams being adapted to hold the clamps in closed position during the work stroke of the dies and to withdraw the stop from the path of the die with which it is associated.

5. In a machine of the class described, the combination of work rests conformed to work of **S** cross section, coacting complementary work clamping jaws, aligned die members mounted for longitudinal reciprocating movement to simultaneously act on the ends of the work supported by said rests, said die members being recessed to receive the ends of the work, one recess being conformed at its outer end to contract one flange of the work whereby the ends are adapted for telescoping engagement with a duplicate member, means for simultaneously actuating said die members, a work posi-

tioning stop normally lying in front of one of said die members, and means for actuating said jaws and retracting said stop timed so that the jaws are held in closed position during the work stroke of the dies and the stop is withdrawn from the part of the die with which it is associated.

6. In a machine of the class described, the combination of work rests conformed to work of **S** cross section, coacting complementary work clamping jaws, aligned die members mounted for longitudinal reciprocating movement to simultaneously act on the ends of the work supported by said rests, said die members being recessed to receive the ends of the work, one recess being conformed at its outer end to contract one flange of the work and the other being adapted to contract the other flange of the work whereby the ends are adapted for telescoping engagement with a duplicate member, means for simultaneously actuating said die members, and means for actuating said jaws timed so that the jaws are held in closed position during the work stroke of the dies.

7. In a machine of the class described, the combination of work rests conformed to the work, coacting work clamping jaws, aligned die members having longitudinal conforming recesses mounted for longitudinal reciprocating movement to simultaneously act on opposite ends of the work supported by said rests, means for simultaneously actuating said die members, a work positioning stop normally lying in front of one of said die members, and means for actuating said jaws and retracting said stop timed so that the jaws are held in closed position during the work stroke of the dies and the stop is withdrawn from the path of the die with which it is associated.

8. In a machine of the class described, the combination of work rests conformed to work of **S**-cross section, coacting work clamping jaws, aligned die members having longitudinal conforming recesses mounted for longitudinal reciprocating movement to simultaneously act on opposite projecting ends of the work supported by said rests and jaws, means for simultaneously actuating said die members, and means for actuating said jaws timed so that the jaws are held in closed position during the work stroke of the dies.

9. In a machine of the class described, the combination of a work rest conformed to work of **S** cross section, a coacting complementary work clamping jaw, means for actuating said jaw to clamping engagement with the work in said rest, a die member mounted for longitudinal reciprocating movement to act on the end of the work supported by said rest, said die member being recessed to receive the end of the work, the

recess being beveled at its outer end to contract one flange of the work, means for actuating said die member, a work positioning stop normally lying in front of said die member, and means for actuating said jaw and retracting said stop timed so that the jaw is held in closed position during the work stroke of the die and the stop is withdrawn from the path of the die with which it is associated.

10. In a machine of the class described, the combination of a work rest conformed to work of S-cross section, a coacting complementary work clamping jaw, means for actuating said jaw to clamping engagement with the work in said rest, a die member mounted for longitudinal reciprocating movement to act on the end of the work supported by said rest, said die member being recessed to receive the end of the work, means for actuating said die member, and means for actuating said jaw timed so that the jaw is held in closed position during the work stroke of the die.

11. In a machine of the class described, the combination of a work rest conformed to work of S-cross section, a coacting complementary work clamping jaw, said jaw and rest being adapted to support the work with its end projecting therefrom, and a die member mounted for longitudinal reciprocating movement relative to the work to act on the projecting end of the work while supported by said rest and jaw, said die member being recessed to receive the end of the work, the recess being beveled at its outer end to contract one flange of the work.

12. In a machine of the class described, the combination of work holders conformed

to work of S-cross section disposed in spaced relation to support the work adjacent its ends and with its ends projecting at the outside of the holders, aligned die members mounted for longitudinal reciprocating movement to simultaneously act upon the projecting ends of the work supported by said rests, said die members being recessed to receive the ends of the work, one recess being conformed at its outer end to contract one flange of the work whereby the ends are adapted for telescoping engagement with a duplicate member, and means for simultaneously actuating said die members.

13. In a machine of the class described, the combination of work holders conformed to work of S-cross section disposed in spaced relation to support the work adjacent its ends and with its ends projecting at the outside of the holders, aligned die members mounted for longitudinal reciprocating movement to simultaneously act upon the projecting ends of the work supported by said rests, and means for simultaneously actuating said die members.

14. In a machine of the class described, the combination of work supporting means adapted to support work of S-cross section with the end of the work projecting therefrom, and a die member mounted for reciprocating movement longitudinally of the work to act on the projecting end thereof, said die member being recessed to receive the end of the work, the recess being beveled at its outer end to contract one flange of the work.

In witness whereof, I have hereunto set my hand and seal.

JOACHIM T. HOLTFOTH. [L. S.]