

(No Model.)

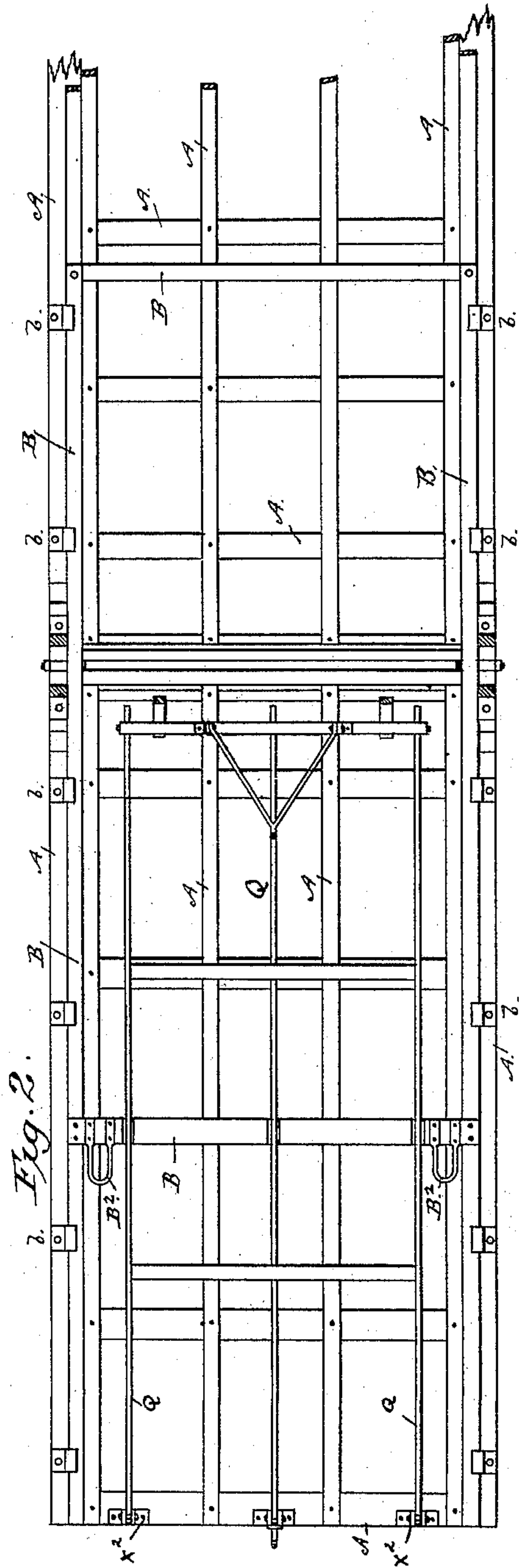
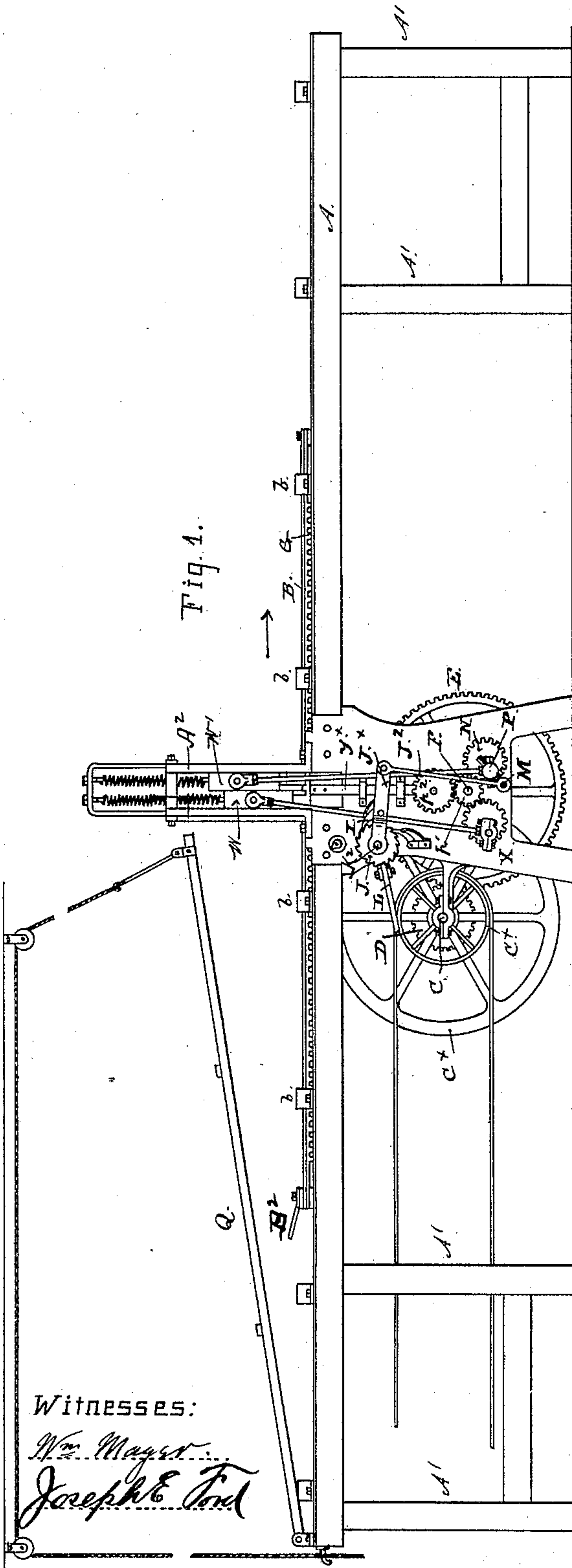
2 Sheets—Sheet 1.

J. WEICHHART.

MACHINE FOR FORMING SHEET METAL LATHING.

No. 401,522.

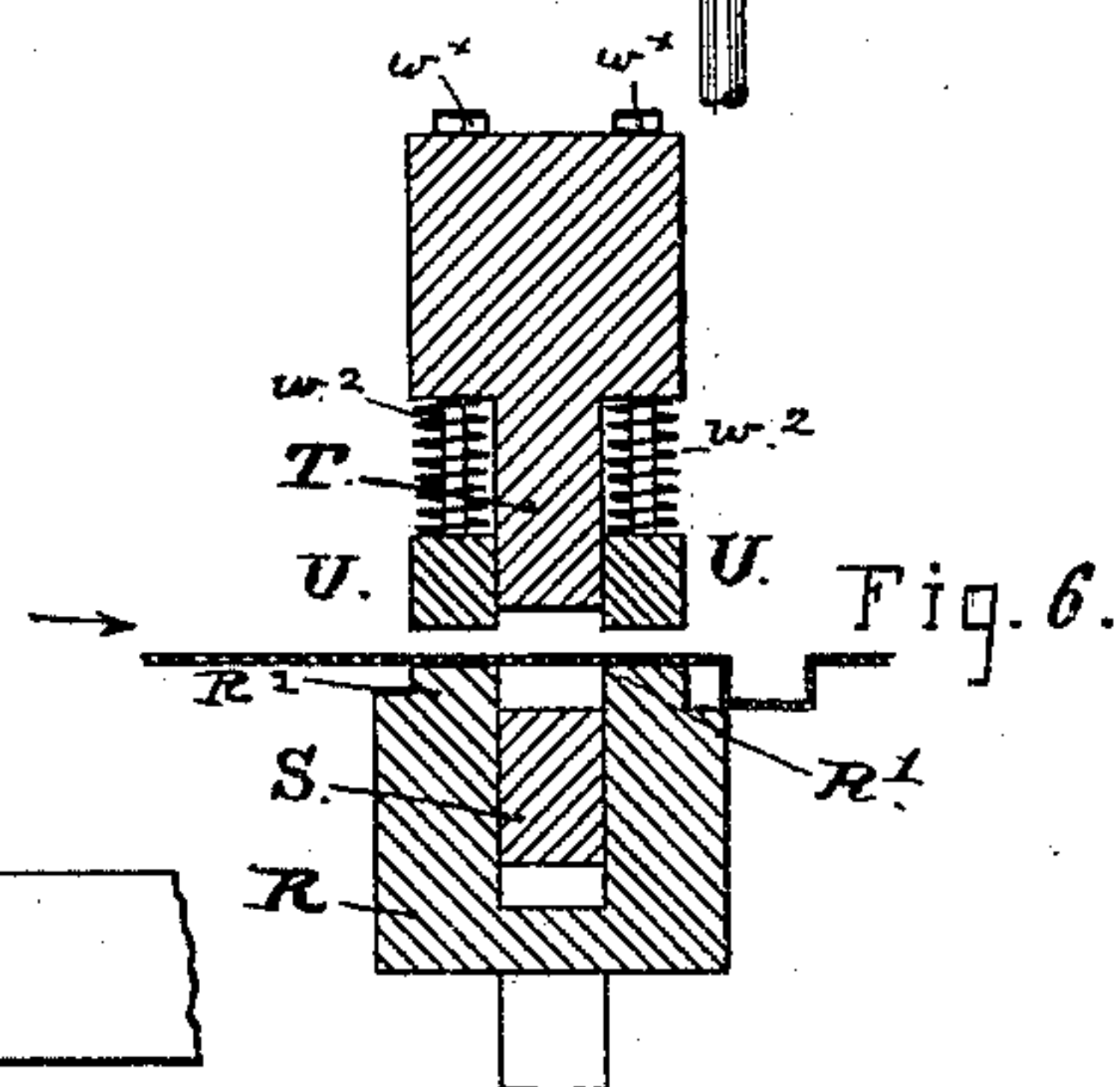
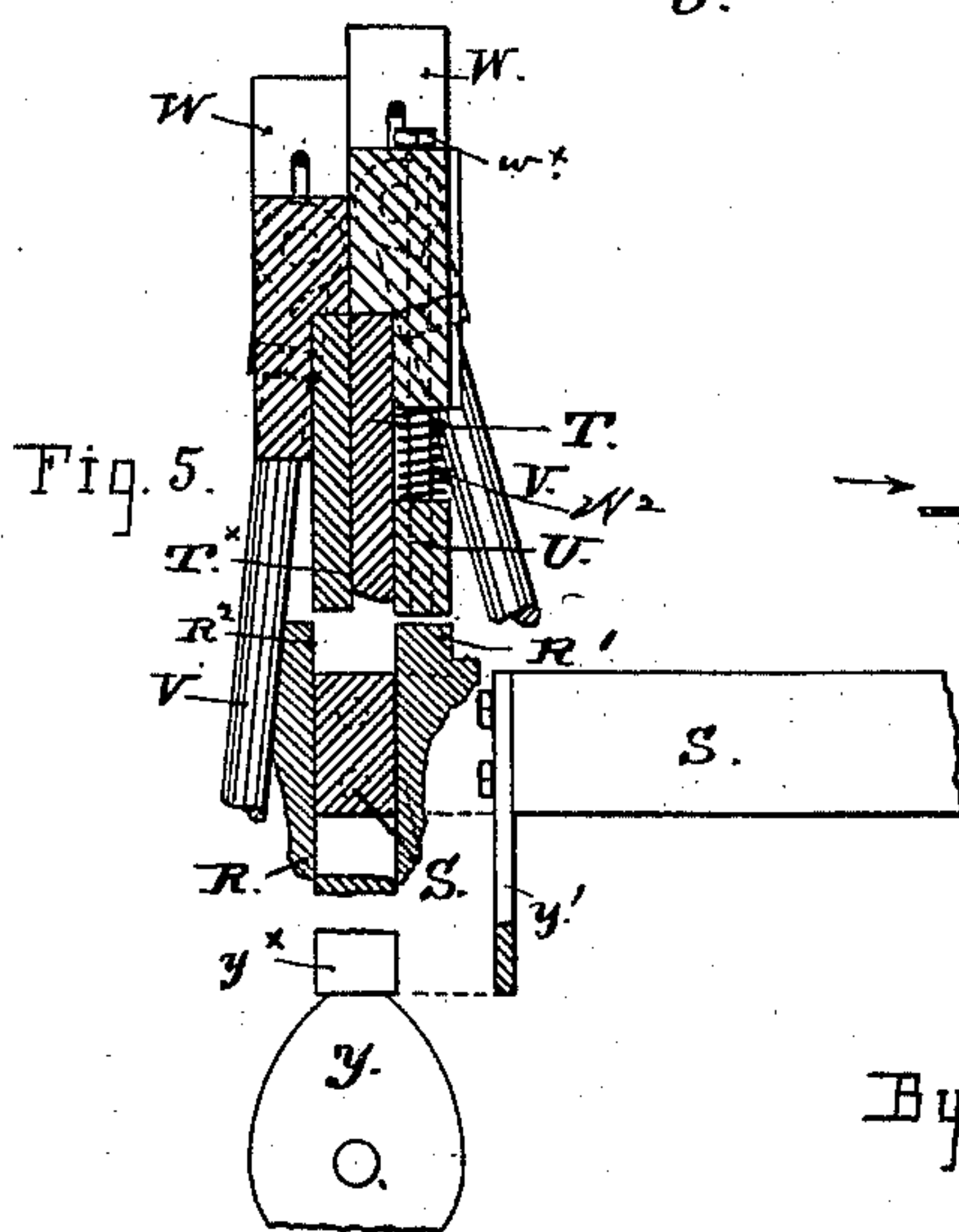
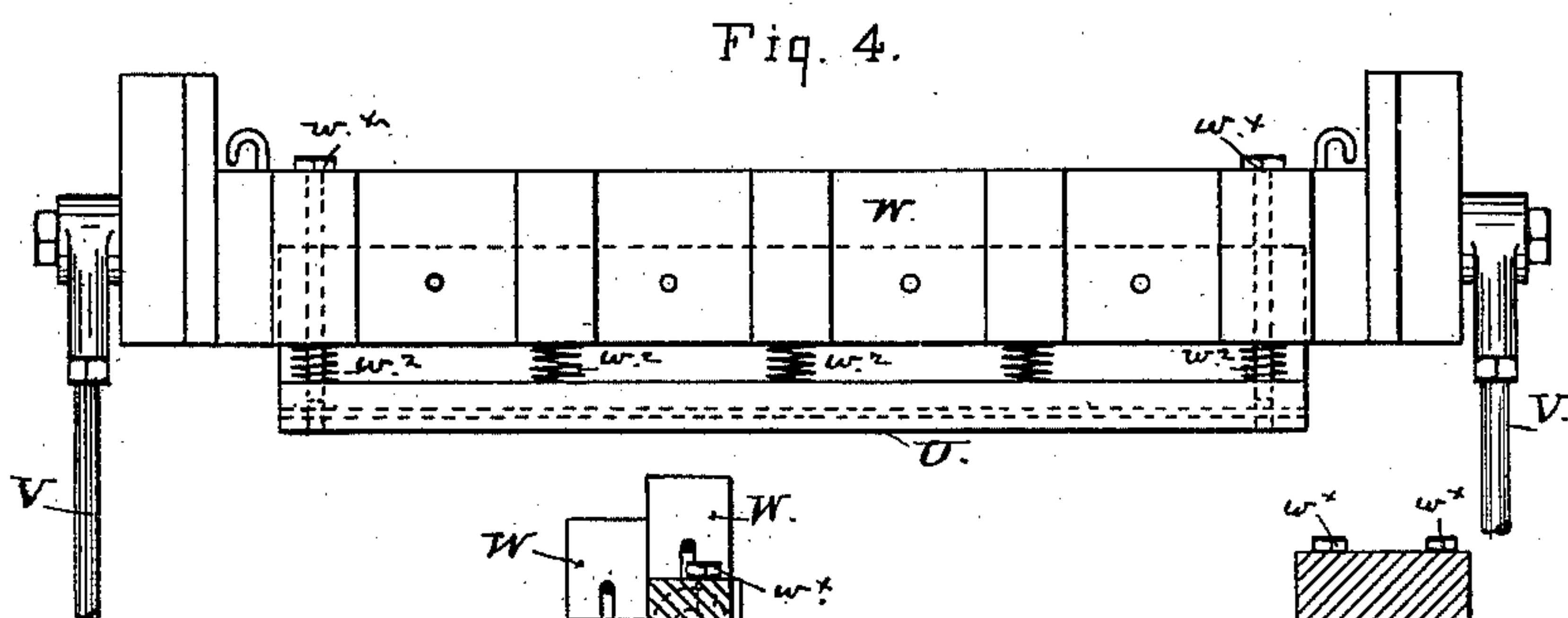
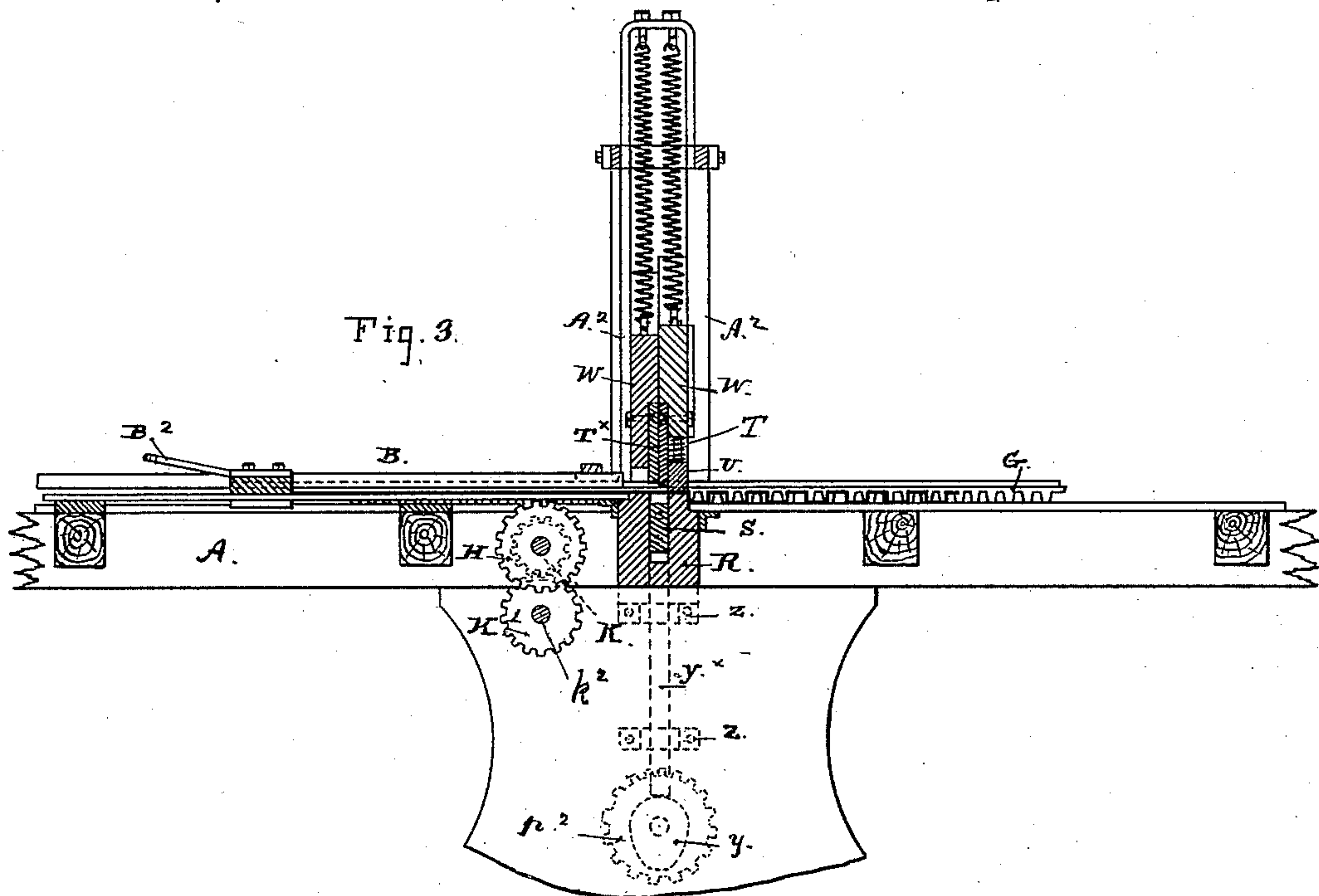
Patented Apr. 16, 1889.



2 Sheets—Sheet 2.

MACHINE FOR FORMING SHEET METAL LATHING.

Patented Apr. 16, 1889.



Inventor:

By John Reichart  
Smith Osborn  
Atty.



# UNITED STATES PATENT OFFICE.

JOHN WEICHHART, OF SAN FRANCISCO, CALIFORNIA.

## MACHINE FOR FORMING SHEET-METAL LATHING.

SPECIFICATION forming part of Letters Patent No. 401,522, dated April 16, 1889.

Application filed April 18, 1887. Serial No. 235,255. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WEICHHART, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Machines for Forming Sheet-Metal Lathing; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object to form grooves or corrugations in sheet metal for the manufacture of metal lathing; and it consists in certain novel construction and combination of dies or punches with feeding devices and mechanism, producing a machine for crimping or bending up sheet metal into suitably grooved or corrugated form for the manufacture of metal lathing in sheets or strips, as hereinafter described, and pointed out in the claims.

The following description explains the nature of these improvements and the manner in which I construct, apply, and control the same for the desired object, the drawings being referred to by figures and letters.

Figure 1 represents the machine in side elevation. Fig. 2 is a plan of the stationary bed and intermittently-moving carriage. Fig. 3 represents, on a larger scale, a section taken vertically through the crimping-dies, bed, and carriage. Fig. 4 is a side view of the punch and presser-bar as seen at the right-hand side of Fig. 3. Fig. 5 is a detail view, on a larger scale, of the movable die and fixed die that coact to produce a crimp of rectangular form across a sheet of metal. Fig. 6 is a modified construction, in which a single punch is substituted for the two-part punch or die employed in the other construction.

This machine, as before stated, is designed for the production of metal lathing in sheet form, and the sheets of metal, after they are acted on by the bending dies, are subjected to a second operation in another machine, by which the rectangular corrugations are pressed or upset into dovetail form to adapt them the better for holding the plaster; but while the present machine is complete and independent in its operation to produce square or rectan-

gular crimps the sheet requires to undergo a subsequent operation to give the required dovetail form to the corrugations. To perform this second operation, I have produced separate mechanism, for which a separate application for Letters Patent, No. 235,256, is filed jointly with this application; and by the conjoint action of the two machines metal lathing in sheets of any desired length and of a width that is only limited by the width of the machines is produced.

A A represent the bed, and A' A' uprights to elevate it from the floor.

B is a sliding carriage movable in guides or ways *b b*, provided along the sides of the bed from end to end, this bed receiving and presenting the sheet of metal to the action of the crimping mechanism. The carriage is moved by rack and pinion, step by step, intermittently with the movements of the reciprocating punch, and provision is made for throwing off the feed to run the carriage back to the starting-point after it has completed its movement forward. Handles B<sup>2</sup> on the end of the carriage are provided for drawing the carriage back, and a clutch between the feed-pinion and its actuating mechanism are provided for this purpose.

C is a driving-shaft with a fly-wheel, C<sup>x</sup>, and pulley C<sup>2</sup>, receiving continuous rotation from suitable power-shaft beyond the machine.

D and E are spur-wheels connecting the shaft C with a shaft, F. From this last-named shaft both the carriage-feed and the dies are operated.

The carriage-feed consists of the rack G on the bottom of its side rails, the feed-pinion H, the pawl and ratchet I and J, and the intermediate gears, K K', Fig. 3. The ratchet-wheel I is connected to the shaft K<sup>2</sup> of the gear K' by a clutch, L, of any well-known form, the lever of which is seen in Fig. 1.

J<sup>x</sup> is the pawl-lever, and J<sup>2</sup> a rod connecting it with a crank, M, on the face of a spur-gear, N.

The bending mechanism consists of a stationary grooved or slotted die, R, with a movable bottom, S, to eject the crimp from the slot, a reciprocating punch or die, T, and a yielding presser-bar, U. These parts are ar-



ranged for operation above and below the carriage, as shown more particularly in the detail views, Figs. 3, 5, and 6.

In some cases I use a single punch with 5 double presser-bars, as shown in Fig. 6, which would work well on thinner and lighter grades of sheet metal, while for heavier grades the die shown in Figs. 3 and 5, formed of two separately-moving parts, would be used. In the 10 one case the sheet requires to be fed at each step a short distance in excess of the amount required to space the corrugation, in order that the last-formed corrugation shall be set ahead of the outer edge,  $R'$ , of the die, as 15 illustrated in Fig. 6, in which position there is sufficient metal thrown beyond the punch at that side to give the required depth of corrugation, and as the plate is pressed into the groove under this operation the last-formed 20 corrugation will not be drawn out of shape.

To work the two-part punch, there are two reciprocating cross-heads,  $W W$ , held in the guide-frame  $A^2$  over and in line with the stationary die and connected with the cranks  $P$  25 and  $X$  below the table by rods  $V V V V$ , through which reciprocating movement is given. One part of this double punch is set ahead of the other part, and, while they move generally together at the same time toward or 30 away from the fixed die, it will be noticed that the inside or right-hand part,  $T$ , first meets and bends down that portion of the plate next to the die  $R'$ , and then the other part,  $T^x$ , completes the corrugation by drawing in the plate 35 and pressing it down into the groove over the other side,  $R^2$ . The presser-bar  $U$  is set to work along side of the punch and directly in line with the face  $R'$  of the fixed die. It is held by guide-rods  $w^x w^x$ , that pass up through 40 the cross-head, and between it and the cross-head stiff coil-springs  $w^2$  are interposed. This presser is set ahead of the punch in both constructions, so that it brings the sheet down against the face of the die before the punch 45 strikes it. With a single-acting punch I place a presser-bar on each side and also regulate the amount of pressure to such degree that while the sheet is held flat against the forming-faces  $R' R^2$  and over the groove between 50 them the sheet can at the same time be drawn under the presser-bars from each side to enter the groove and properly form the crimp; but where the sheet is drawn from one side only it will not be necessary to employ more than 55 one presser-bar, and in such case this is set, as shown in Figs. 3, 4, and 5, alongside of the inner or first acting section of the double punch. The part  $S$  sets into the groove or space between the stationary formers  $R' R^2$  60 for the full length of the groove and is moved by face-cams  $y y$  and upright bars  $y^x y^x$ , one on each side resting in its cam and held in slotted guides  $z z$ . The cams are actuated from the shaft  $F$  by the gears  $p' p^2$  and are 65 so shaped and turned with respect to the reciprocations of the cross-heads  $W W$  and the movement of the carriage that the bar  $S$  is

moved just after the punch is raised from the metal. Then as the die leaves the groove the bar follows to throw out the finished crimp. 70 This takes place before the feed begins to act.

The top frame,  $Q$ , (seen at the left-hand end of the machine in Figs. 1 and 2,) is attached by hinged connection  $X^2 X^2$  and is supported at the outer end by a rope and overhead 75 pulleys. Its office is to hold the sheet of metal flat on the carriage until it passes under the dies.

In the operation of this machine as thus constructed the carriage is thrown out of gear 80 and is run back clear of the dies to receive the sheet of metal. This when laid on the carriage is held down and prevented from curling up at the ends by means of the hinged top frame,  $Q$ . The feed is then thrown into 85 action, and the movement of the carriage brings the metal step by step underneath the dies until the crimping operation is completed. In the action of the mechanism the presser-bar first descends to hold the sheet flat against 90 the top face of the fixed dies, and immediately following it the punch strikes the metal over the edge of the die and into the groove until the bottom of the crimp is set against the face of the bar  $S$ , after which, as the punch 95 withdraws from the groove, the bar forces out the crimp. Then the feed mechanism moves forward the carriage.

Having thus fully described my invention, what I claim, and desire to secure by Letters 100 Patent, is—

1. In a machine for corrugating or bending sheet metal, the combination of a fixed die,  $R$ , having a groove, a bar,  $S$ , lying in and forming the bottom of said groove, and means, 105 substantially as described, for elevating said bar by positive mechanical action, a reciprocating die,  $T$ , a yielding presser-bar,  $U$ , and mechanism, substantially as described, adapted to move said bar and reciprocate said die 110 with respect to each other, as set forth.

2. In a machine for corrugating or bending sheet metal, the combination of a sliding carriage, feed mechanism by which said carriage is moved intermittently step by step, a stationary die having a groove, a vertically-movable bar forming the bottom of said groove, and means, substantially as described, for elevating said bar by positive mechanical action, a reciprocating die, a spring presser-bar adapted to coact with said die to produce 120 crimps or corrugations in the metal, and mechanism adapted to reciprocate said movable die and move said vertically-acting bar with respect to each other and between the 125 intervals in the feed of the carriage, as set forth.

3. The combination, with the sliding carriage  $B$ , of the stationary grooved die or former  $R$ , having the faces  $R' R^2$  and the 130 movable bar  $S$  between them, the reciprocating die  $T$ , composed of two parts or sections, one of which is set to act in advance of the other, the spring presser-bar  $U$ , and mechan-



ism, substantially as described, adapted to move the carriage step by step and to actuate the movable die and the bar with respect to each other between the movements of the carriage, as set forth.

5 4. The combination of a suitable frame or bed, the sliding carriage B, pawl-and-ratchet feed G H I J J<sup>x</sup> K K', cross-heads W W, cranks M P X and connecting-rods, the bar  $y^x$ , cam

$y$ , and connecting-gears, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

JOHN WEICHHART. [L. S.]

Witnesses:

C. W. M. SMITH,  
CHAS. E. KELLY.