2 Sheets--Sheet 1.

E. SHAW.

Machines for Making Chains.

No. 150,898. Patented May 12, 1874.

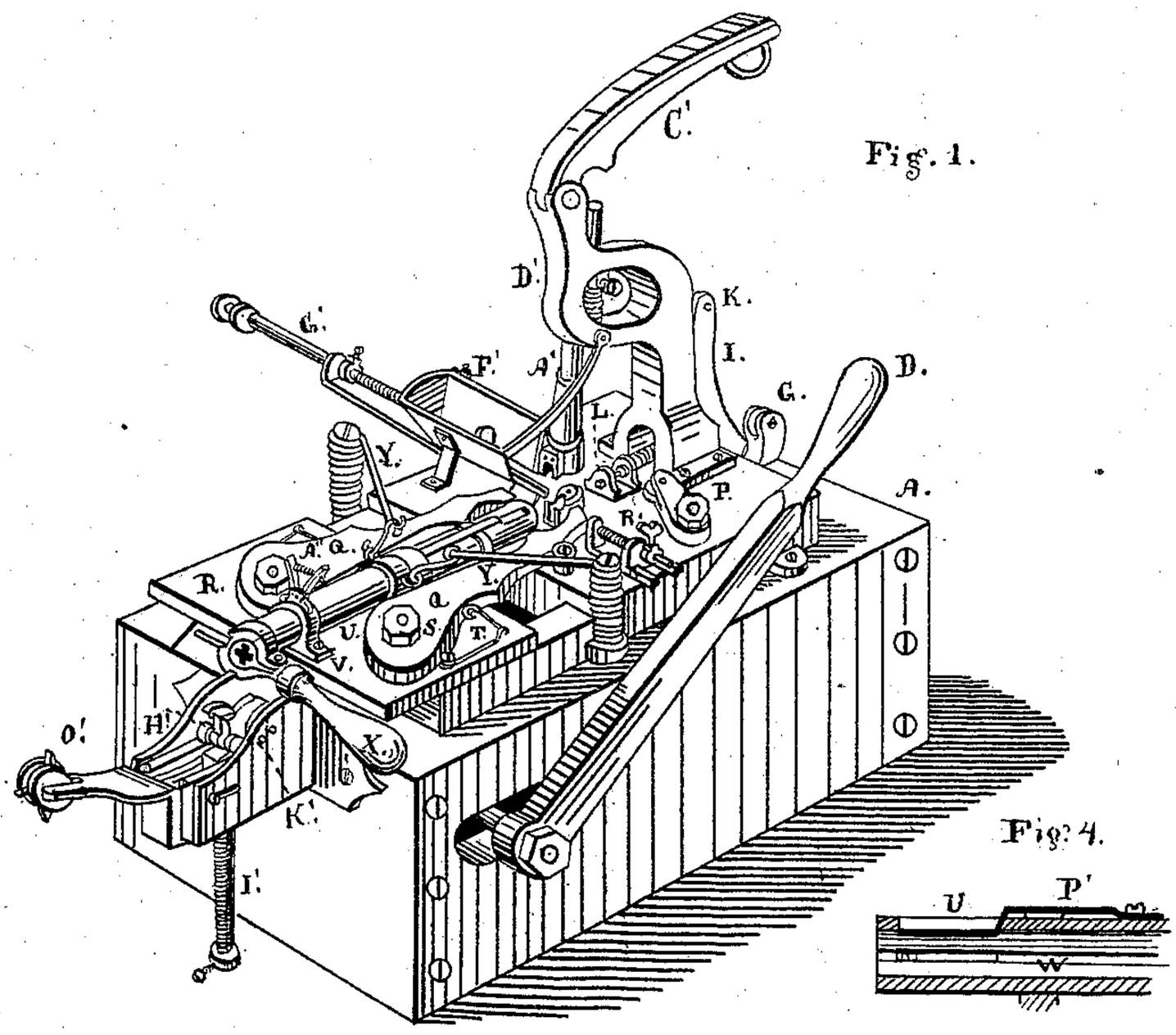


Fig. 1.

Fig. 4.

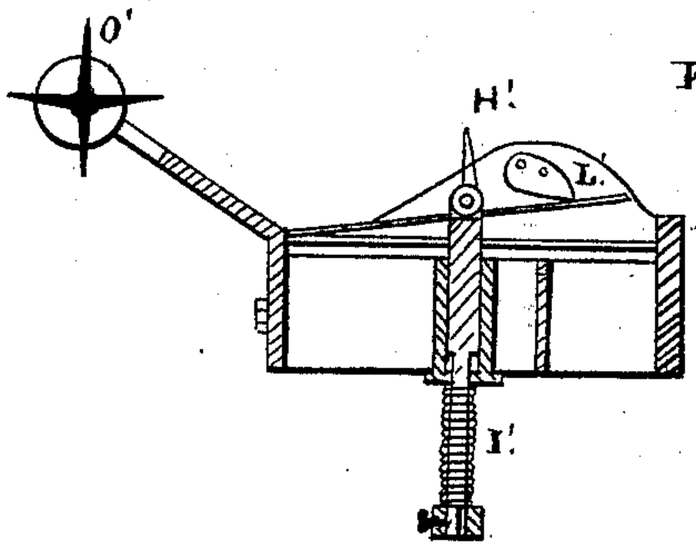
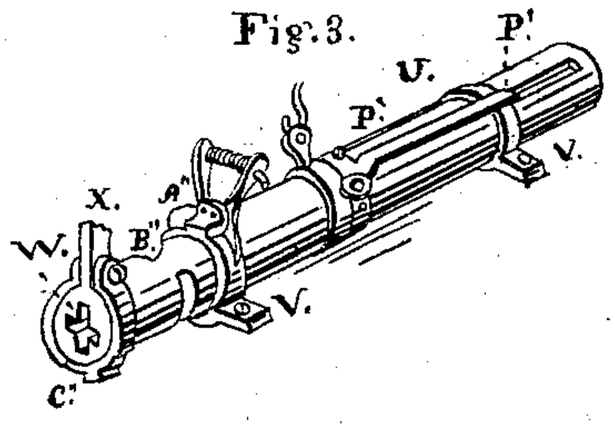


Fig. 2.

Fig. 3.



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2 Sheets--Sheet 2.

E. SHAW.

Machines for Making Chains.

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Fig. 9.

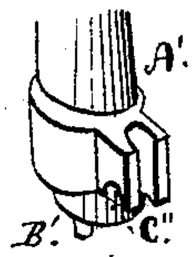


Fig. 8.

Fig. 5.

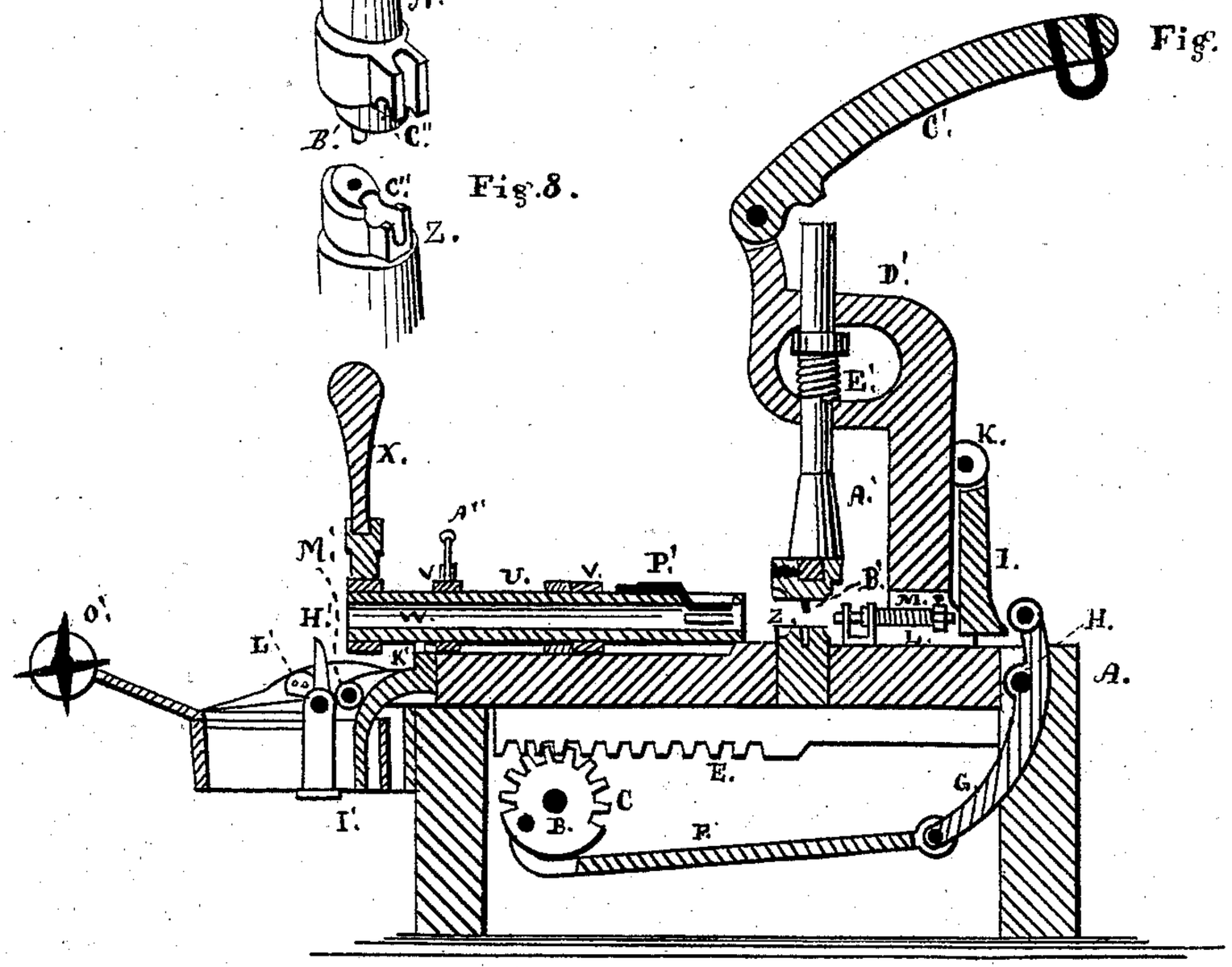


Fig. 6.

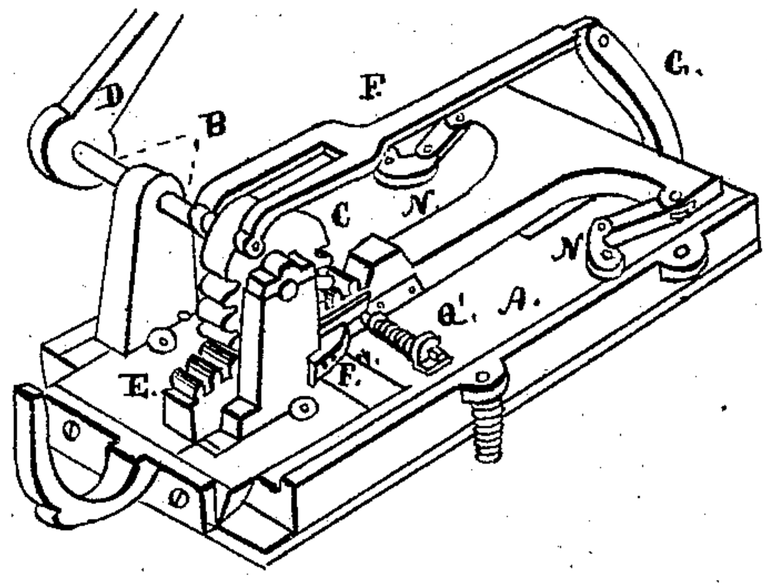
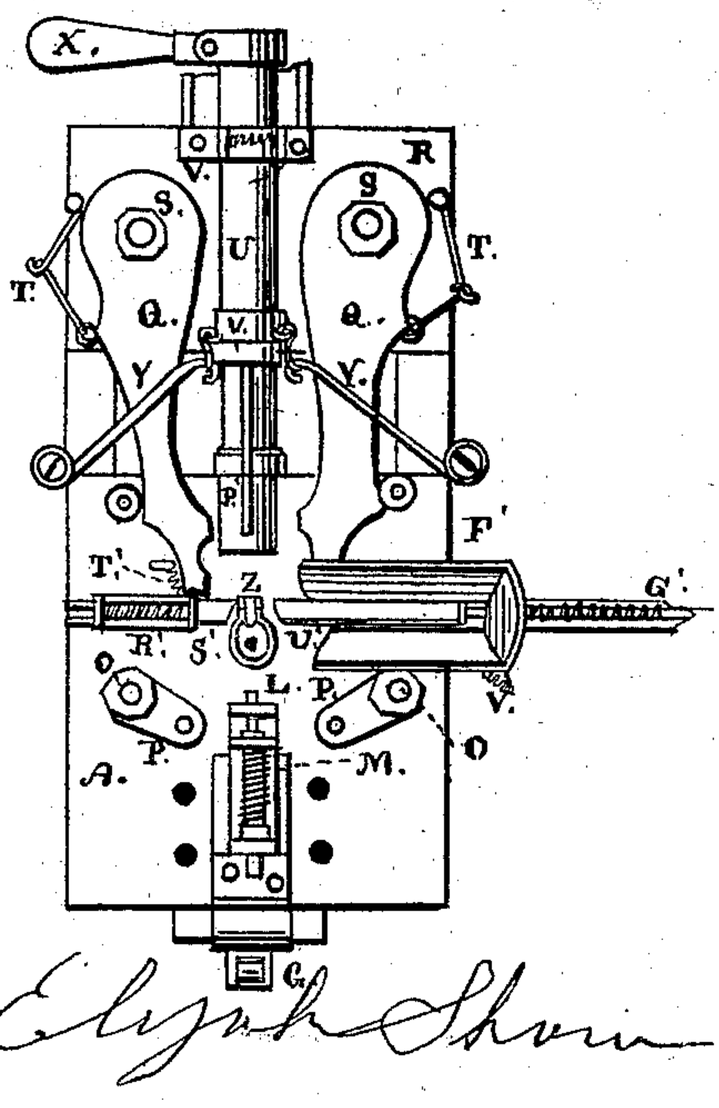


Fig. 7.



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UNITED STATES PATENT OFFICE.

ELIJAH SHAW, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN MACHINES FOR MAKING CHAINS.

Specification forming part of Letters Patent No. **150,898**, dated May 12, 1874; application filed August 30, 1873.

To all whom it may concern:

Be it known that I, ELIJAH SHAW, of Milwaukee, in the county of Milwaukee, in the State of Wisconsin, have invented certain Improvements in Chain-Making Machines, of which the following is a specification:

The object of my invention is to manufacture chains by machinery; and is arranged in a novel manner, so that the work is facilitated, and it is thought that a much better chain can be produced, and much quicker than in the ordinary manner.

Figure 1 is a perspective view of my invention; Fig. 2, a view of the end of the machine which holds the chain up after it is made; Fig. 3, a view of the hollow shaft which holds the chain; Fig. 4, end view of the hollow shaft. These views are all on Sheet 1. Fig. 5, Sheet 2, a side sectional view; Fig. 6, Sheet 2, a view of the bottom of the machine; Fig. 7, Sheet 2, top view of the machine; Fig. 8, a view of the bottom of the shaft, making half of the former; and Fig. 9 the lower half of the former.

A is the frame of the machine; B, the shaft with which the machine is operated; C, cog-wheel on shaft B; D, lever on shaft B, by which the machine is operated; E, rack into which cog-wheel C is geared; F, lever, attached to cog-wheel C at one end, and the other end to lever G, which is hung by pin H near its center. The upper end of this lever G strikes against the lower end of lever I, which is hung at its top by pin K, and forces the lower end of lever I against welding-lever or bar L, which is held back by spring M; N N, are levers or connections attached to the back end of rack E, and also attached to arms on pins O O, which run up through the machine, with arms and rollers P P attached to their top ends, which strike against the ends of jaws Q Q and force them together when jaws Q Q are thrown forward by the plate R, which is operated by bearings on shaft B, and the bolts on which jaws Q Q swing are attached to plate R; S S, bolts secured to plate R, and on which jaws Q Q swing; T T, springs attached to jaws Q Q, to hold them out when they are drawn back; U, hollow shaft attached to the machine, and sliding in keepers V V. This shaft has a hollow, W, through it, for the chain to pass through, made in the form of a cross, and with a handle, X, on its end, with which it is turned a quarter turn and back again, so that the iron, to make a link of the chain, may pass through the link held by the hollow shaft already made. Y Y, springs attached to hollow shaft U, to bring it forward again after it is drawn back by the operation of plate R. This hollow shaft is drawn back, after a link is made, by one of the keepers V, attached to plate R, striking against the ring on the shaft to which the springs Y Y are attached. When the handle X is turned so as to make a quarter turn, a spring, A″, is turned out of a notch, B″, in the shaft, and the shaft is left free to be moved back to place the last link made edgewise in the notch C″, ready for another piece of iron to make a link to be thrust through. Z, a hub or half-former, round which the iron is bent to form a link the right shape; A′, lever, with pin B′ in its lower end, which fits into a hole in hub Z, and the foot or lower end of shaft A′ is made so as to form the other half of the former for the link. The two, the foot of shaft A′ and hub Z, when the two come together make a perfect former for a link. C′, lever hung by one end to standard D′; E′, spring to hold shaft A′ up when lever C′ is lifted off of it; F′, hopper to hold the heated iron to make links; G′, a rod with which to force the iron forward to form a link; H′, a pointed standard, for the purpose of moving the chain back a link each time a link is made; I′, a spring on the lower end of standard H′, to hold it down; K′, a projection bolted onto body A; L′ L′, two cams on the inside of the projection K′, which, when the machine is in operation, a couple of shoulders, M′ M′, on standard H′, pass under, and when they get to the front end of these cams a couple of springs catch under these shoulders and raise the standards up, so that as it is forced back it will pass over the cams, and the point will catch in a link, and move the chain back till it gets to the back side of the cams, when the shoulders will be relieved from the cams, and the standard will fall low enough for the shoulders to be ready to pass under again. This standard H′ is attached to plate R, and moves with it. O′, a sprocket-wheel, over which the chain moves; P′ P′, springs in

the end of hollow shaft U, to hold the chain, and keep the last-made link one-half of it out of the hollow shaft, so that as the shaft is forced back the link will be placed standing up edgewise in the notch in the former, ready to receive the iron for another link; Q′, spring-stop, to hold the rack E in position till the right time for it to move, when the slide F″ throws it out of place, and the rack moves on; R′, stop to prevent the iron from being shoved too far, a gage to even the iron for a link, and keep it, so that the jaws Q Q shall strike the ends even, and bend it round the former; S′, shoe to hold the point of the iron the right height to pass through the link already made, and at the proper point in front of the former, and is forced down under jaws Q Q, when they are moved forward, and is raised back again by spring T′ when the jaws are run back again; U′, shoe under hopper, to keep the iron up so as to pass into the notch in the former, and is pressed down by one of the jaws Q when it comes forward, and is raised up again when the jaw is removed from it by spring V′.

To operate this machine, first cut the iron the proper length to make a link; then heat it to a welding-heat; then place it in the hopper F′; then shove it up in front of the former; then bring lever C′ down onto shaft A′, which will set the foot of shaft A′ firmly on to former Z, making a full form for the link, and holding the iron in position. Then take hold of lever D and turn it back, which will revolve cog-wheel C, and as rack E is held firmly by stop Q′ the cog-wheel and shaft will move forward, and force plate R forward, and force jaws Q Q against the iron, and bend it round the former. The stop will then release the rack, and the cog-wheel will then move the rack back and turn up the arms P P, which will force jaws Q Q together, bringing the ends of the iron round the back side of former Z, and forcing up welder L, making a firm weld, and thus the link is formed. Then relieve C′ and spring E′ will raise the shaft A′; then turn lever D back again, which will reverse the motions made when the lever was moved in the first instance, and the standard I′ will be raised and catch in a link of the chain, and draw it back one link. Then take hold of lever X and turn the shaft U a quarter turn, which will turn the chain enough so that as the shaft is pulled back by the springs the shaft being released from the holding-spring will place the half of the link which is sticking out of the hollow shaft in the notch in the former, so that the iron for the next link will pass through it, and so on. When the machine is first put in operation a piece of manufactured chain is put into the hollow shaft to work onto.

I claim as my invention—

1. The two-part forming-device, the one part on the lower end of the reciprocating shaft A′, and the other, Z, on the bed-plate, as shown and described.

2. The jaws Q Q, in combination with the reciprocating bed-plate R, and the two-part forming device, as shown and described.

3. The combination of the reciprocating plate R, the rotatable hollow shaft U, and devices for connecting said shaft to said plate, as shown and described.

4. The combination of the reciprocating plate R and standard H′ with the cams and springs for operating said standard, as shown and described.

5. The combination of the wheel C, levers F, G, and I, and welder L, as set forth.

6. The combination of the hopper F′, hinged shoes S′ and U′, pusher G′, and gage R′, as shown and described.

7. The combination of the rack E, connection N, bolts O, arms P, and jaws Q, as shown and described.

ELIJAH SHAW.

Witnesses:

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A. SCHUTTENBERG.