H. A. HOUSE.

MECHANISM FOR MAKING SHEET METAL LINKS.

APPLICATION FILED APR. 8, 1913.

1,167,073.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

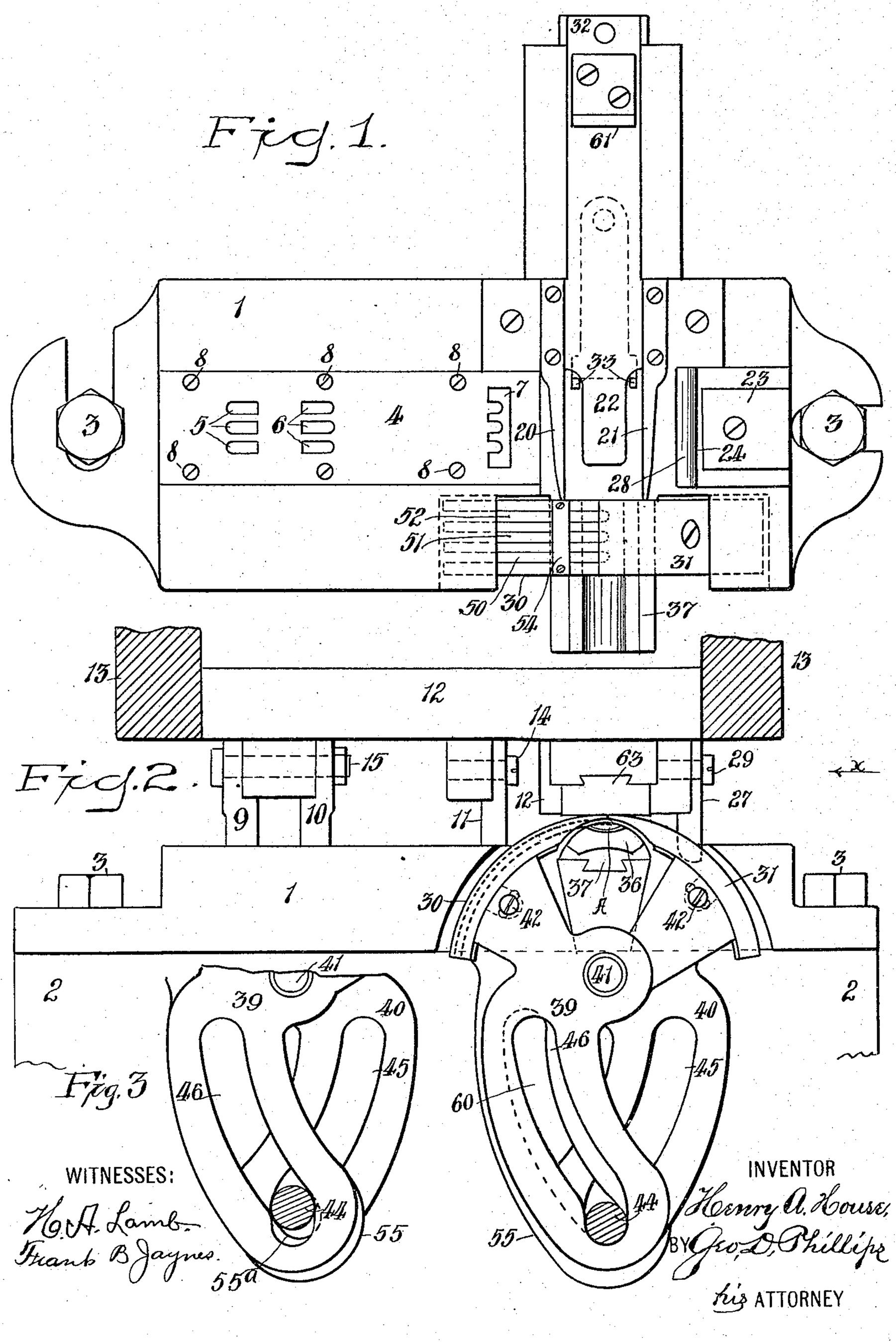

Fig. 3

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3 SHEETS—SHEET 2.

Fig. 4

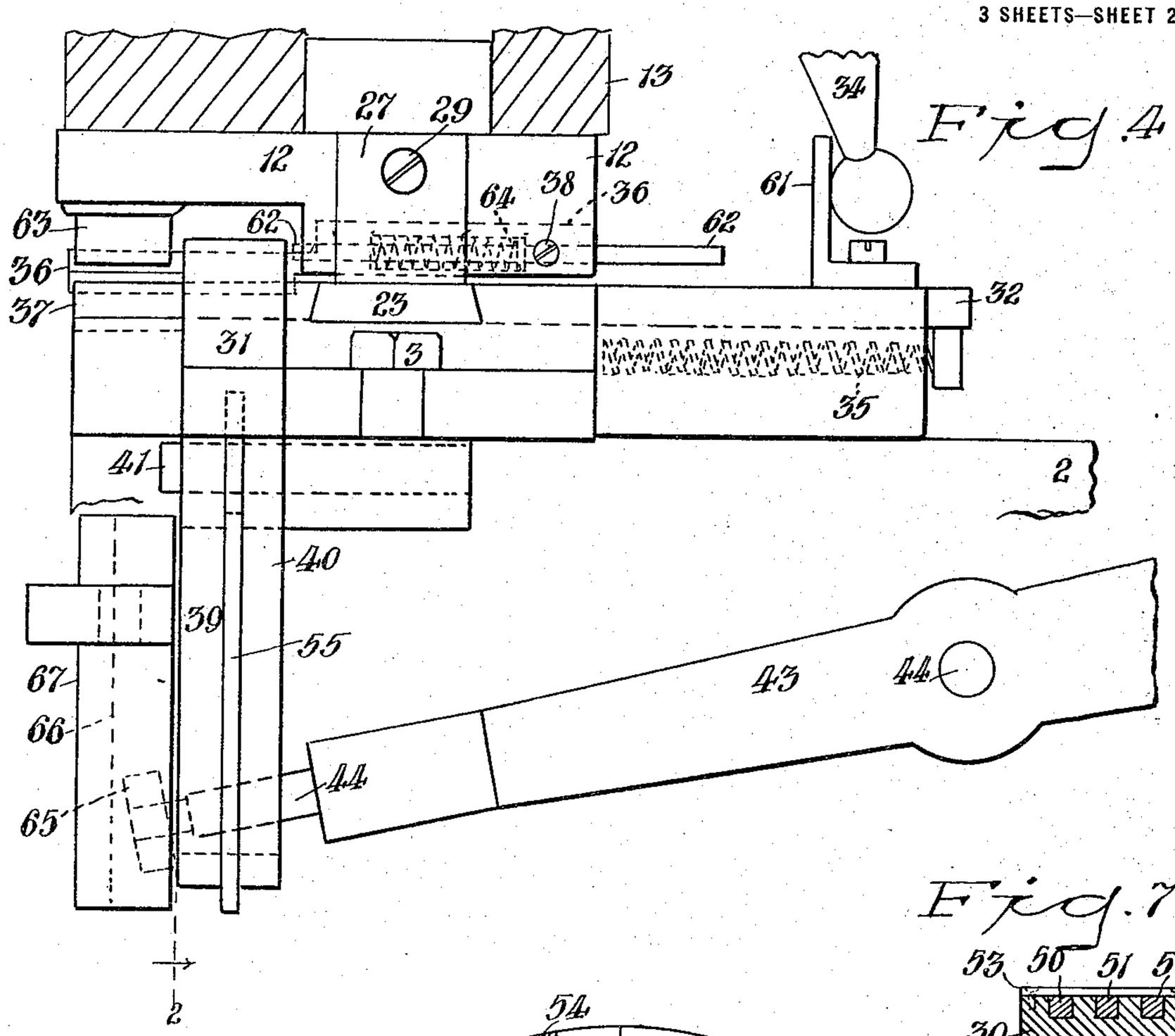


Fig. 7.

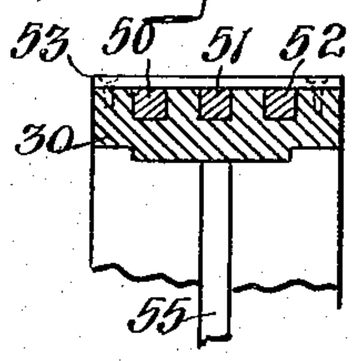


Fig. 5.

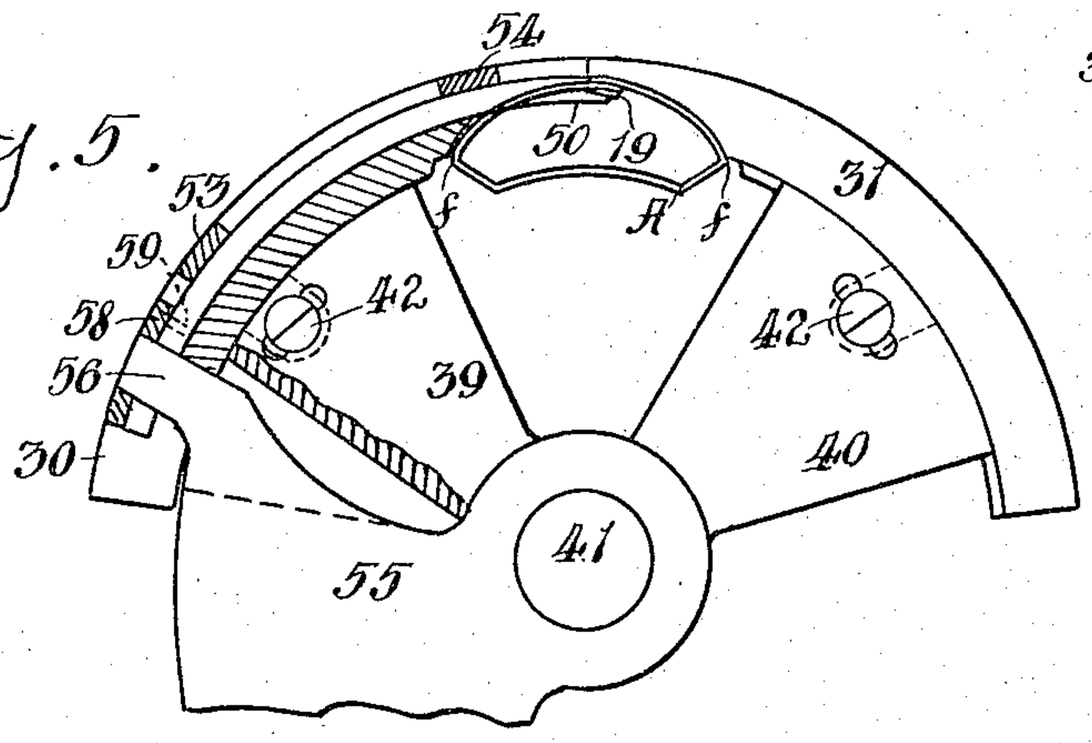
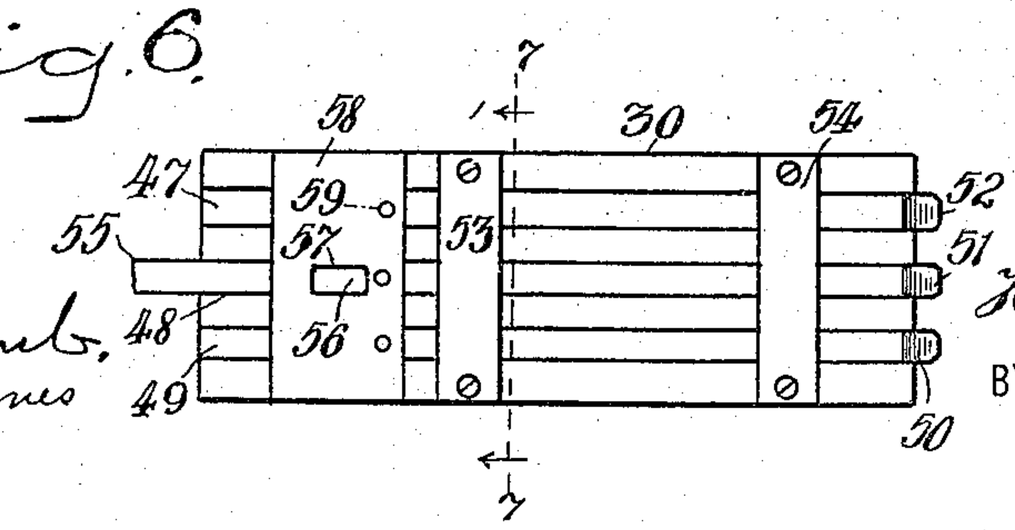


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 8.

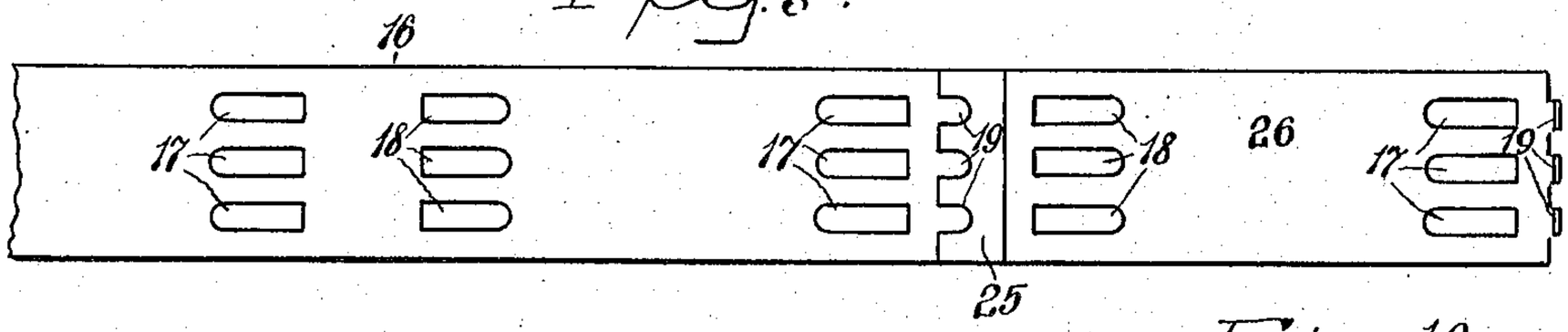


Fig. 10

Fig. 9.

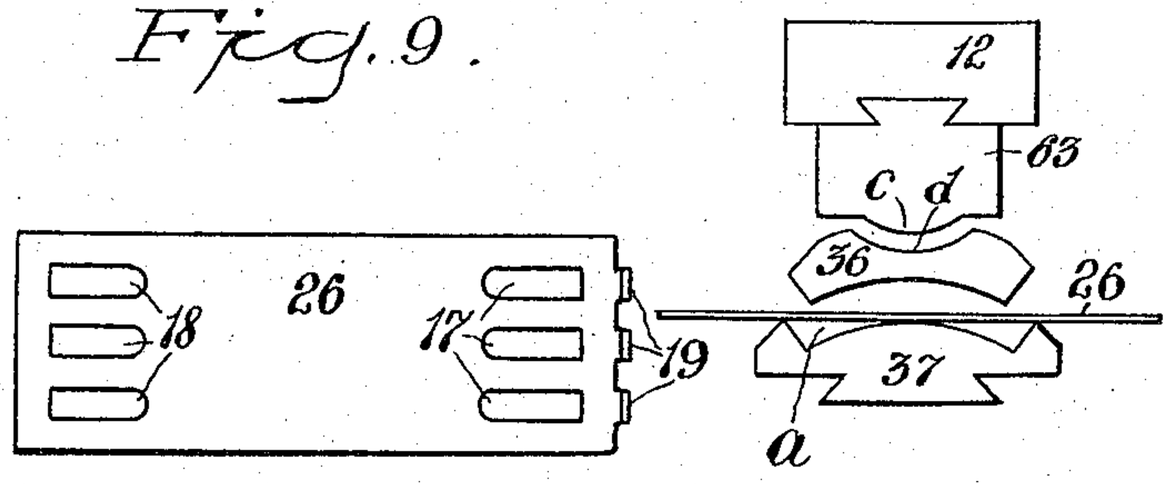


Fig. 11

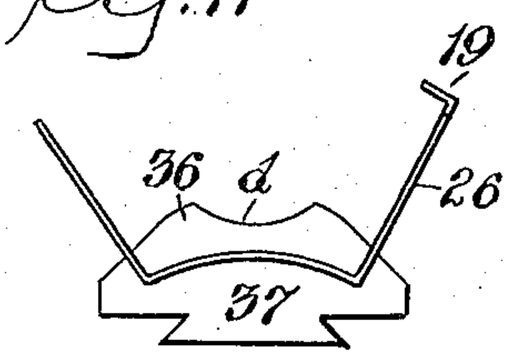


Fig. 12.

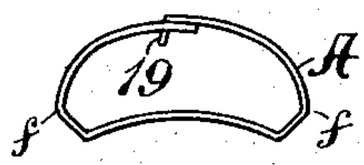


Fig. 13.

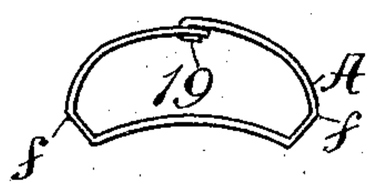
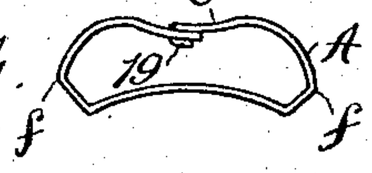


Fig. 14.



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UNITED STATES PATENT OFFICE.

HENRY A. HOUSE, OF BRIDGEPORT, CONNECTICUT.

MECHANISM FOR MAKING SHEET-METAL LINKS.

1,167,073. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed April 8, 1913. Serial No. 759,624.

To all whom it may concern:

Be it known that I, HENRY A. HOUSE, citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Making Sheet-Metal Links; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to mechanism for forming sheet metal links for metal belting of the character shown and described in my application filed Oct. 6, 1911, Serial Number 653,164, and it consists in certain details of construction to be more fully set forth in the following specification.

To enable others to fully understand my invention, reference is had to the accompanying drawings wherein the same figures and letters of reference indicate like parts throughout the several views:

Figure 1 represents an upper plan view of a die block carrying tools employed in the formation of a link, showing the link forming jaws closed; Fig. 2 is a front elevation of the die block and link forming jaws, sectional view of the pin for actuating the jaws on line 2 of Fig. 4, broken view partly in section of the vertically operating gate carrying the punch holder, and broken view of a press on which the die block is supported; Fig. 3 is a broken detail view of the arms of the link forming jaws, and sectional view of the jaw actuating pin; Fig. 4 is a side elevation of the upper and lower tools for forming the link looking in the direction of arrow *x* of Fig. 2, also broken view of the levers for actuating a part of the tools, also broken sectional view of the gate, and broken view of the bed of the press; Fig. 5 is an enlarged broken detail view partly in section of the link forming jaws closed about a link; Fig. 6 is an enlarged detail upper plan view of one of the link forming jaws carrying the clenchers, and broken view of the arm for actuating the clenchers; Fig. 7 is an enlarged broken detail view partly in section of one of the link forming jaws on line 6 of Fig. 6; Fig. 8 represents an enlarged perforated metal strip from which the links are formed; Fig. 9 represents an enlarged detail view of a severed blank ready to be formed into a link; Fig. 10 is an enlarged detail end elevation of the tools employed in forming the link, and broken view of a link blank; Fig. 11 is an enlarged detail end elevation of the tools for giving the initial bend to the link, showing a link partially formed therein; Fig. 12 is a view of a link in readiness for interlocking the ends; Fig. 13 represents an interlocked link; and Fig. 14 represents a completed link.

The tools shown in the several views are adapted for use in any suitable machine where they can be used to the best advantage. An ordinary press having a sliding tool carrying gate is one of the class of machines that can be used for this purpose, and as the machine forms no part of my invention, nor the mechanism which actuates the tools, these parts have been purposely omitted in order that the invention may be more fully illustrated and described.

The die block 1 is attached to the bed 2 of a press by screws 3 in the usual manner. The die 4 has the openings 5, 6 and 7 and is secured to the die block by screws 8. The punches for these die openings are, consecutively, 9, 10 and 11, carried by the punch holder 12 in the vertically operating gate 13 and are secured thereto by screws 14 and 15, Fig. 2. The metal strip 16, Fig. 8, is inserted far enough in the die for the punch 9 to pierce the openings 17, and is then advanced until the end of said strip projects just beyond the opening 7 of the die when the openings 18 will be pierced by the punch 10, while the punch 11 will form the fingers 19 on the end of the strip. The strip is then advanced under the strippers 20, 21 and 22, Fig. 1, with the fingers 19 against the inner end of the block 23 and resting on the narrow ledge 24. The next downward movement of the gate will pierce the openings 17 and 18 on the strip, Fig. 8, and the finger forming punch 11 will cut out the waste piece 25, thus leaving the link blank 26 free. At the same time, the end of the finger bending punch 27, Figs. 2 and 4, will engage the blank 26 just back of the fingers 19 and the downward movement of the gate will cause the fingers to be bent upward at right angles to the body of the blank, as shown at Figs. 8, 9, 11 and 12. The depression 28, Fig. 1, giving a set to the fingers by means of the finger bending punch 27, said punch being secured to the punch holder 12 by the screw 29. When a link blank is thus severed and

its fingers bent as before mentioned, it is advanced to the link forming jaws 30 and 31, which jaws are then in open position, by the slide 32 carrying the upward projections 33 to engage the outer edge of the blank. This slide is actuated forward by means of the lever 34 acting against the upright 61 secured to the slide, which lever is actuated from a source of power not shown, and the spring 35, Fig. 4, will return the slide to its normal outward position. The blank is pushed forward under the forming arbor 36 and on the apex of the angular edges of the stationary arm or seat 37, Figs. 1 and 10. The forming arbor 36 is pivotally supported in the punch holder 12 on two pointed screws, one on each side, one of said screws, 38, being shown at Fig. 4. When the gate descends, it will carry the arbor 36 with it and force the blank into the upper recess *a*, Fig. 10, of the arm 37 and cause the blank to assume the position shown at Fig. 11 and will hold said link in this position while the link forming jaws close and interlock the projecting ends of the blank around the arbor 36 in the following manner: The arms 39 and 40, Figs. 2 and 4, of the jaws 30 and 31 are journaled on the pin 41, which pin may project from the die block 1 or from any convenient and stationary part of the machine. The curved jaws are adjustably secured to the arms by the screws 42. The jaws are actuated to open and close through the medium of the lever 43, which lever may be actuated in any suitable manner to impart thereto a vertical oscillatory movement. The pin 44 in the end of this lever travels in the curved or cam like slots 45 and 46 in the arms of the jaws, so that, when the pin is at the point shown at Fig. 3, the jaws will be fully closed to bend the blank into the link A, shown at Fig. 12, with the fingers projecting through the openings 17 at the opposite end. To clench the fingers, the jaw 30 is provided with the three grooves 47, 48 and 49, Figs. 6 and 7, in which are located the finger clenchers 50, 51 and 52, held in said grooves by the bridges 53 and 54, secured to the jaw 30. These clenchers have a circumferential movement in their grooves through the medium of the thin arm 55 journaled on the pin 41 and independently movable between the jaw arms as shown at Fig. 4.

The arm 55 has the projection 56 which enters the slot 57 in the plate 58, to which plate the clenchers are secured by pins 59, so that, when the arm 55 is actuated, the plate and clenchers will also be actuated. The arm 55 is also provided with the cam groove 60, which also embraces the pin 44, but it does not fully register with the cam grooves of the arms, so that, when the pin 44 is in the position shown at Fig. 3 and the jaws fully closed, as before mentioned, the lower part 55[a] of the arm 55, Fig. 3, will lie in the path of the pin and said arm will be actuated thereby until the pin has reached its lowest position as shown at Fig. 2. This slight movement of the arm 55 will carry the clenchers forward to engage the fingers 19 and fold them under in the form of a clip as shown at Figs. 5, 13 and 14.

As soon as the operation, just described, has been performed, the gate will retreat and its next downward stroke will pierce the metal strip, bend the fingers of another severed link blank and advance the same to the link forming jaws by the movement of the slide 32, before described. This forward movement of the slide will cause the upright 61 to engage the pin 62 to push the link within the jaws forward on the arbor 36 to a position directly under the punch 63 carried by the punch holder 12. This punch, Fig. 10, has the convex end *c*, and the upper surface of the arbor has the concave *d* to form the depression *e*, Fig. 14, in the outer surface of the link, so as to stiffen the same. This finished link will be ejected from the arbor 36 by the next link pushed forward by the pin 62, which pin is retreated by the spring 64, Fig. 4.

The end of the lever 43, Fig. 4, carries the roller 65 adapted to be guided in the vertical groove 66 of the bracket 67 to prevent lateral or side movement of said lever.

The shape of the arbor 36 determines the shape of the link, and while the shape of the arbor may vary to suit any form of sheet metal links having interlocked ends, the arbor shown is designed to form links having the angular ends *f*.

While I show the clenchers for interlocking the ends of the link carried by one of the link forming jaws, I hold myself at liberty to locate said clenchers outside of said jaws.

Having thus described my invention, what I claim is:

1. Mechanism for making sheet metal links, a movable arbor, comprising dies and punches for piercing openings in a metal strip and forming fingers on one end of the strip bending the fingers at an angle and means for severing a link blank preparatory to forming a completed link over the movable arbor.

2. Mechanism for making sheet metal links, comprising a movable arbor shaped to conform to the required form of the link, an opposed chair for supporting a link blank, said blank having openings near its ends and upturned fingers on one end, means for actuating the arbor toward the chair to give an initial bend to an interposed blank, jaws adapted to embrace the arbor to form the link and force the fingers of the blank into the openings at the opposite end of said blank, and clenchers located on one of the jaws to clench said fingers and interlock the ends of the blank.

3. Mechanism for forming sheet metal links, comprising a movable arbor, movable jaws adapted to embrace the arbor, and independently operated clenchers carried by the jaws.

4. Mechanism for forming sheet metal links, comprising a movable arbor about which a link is formed, movable jaws adapted to embrace the arbor, and independently operated clenchers carried by the jaws for interlocking the ends of a link.

5. Mechanism for forming links from a sheet metal blank having fingers on one end and openings in the opposite end, comprising a movable arbor, movable jaws adapted to fold the blank into link form about the arbor, and independently operated clenchers carried by the jaws for interlocking the fingers of the blank within the said blank openings.

6. Mechanism for forming links from a sheet metal blank having ends adapted to be interlocked, comprising a movable arbor about which links are formed, movable jaws adapted to embrace the arbor, and independently operated clenchers on one of the jaws for interlocking the ends of a link while the jaws are closed about the arbor.

7. Mechanism for forming links from sheet metal blanks having ends adapted to be interlocked, comprising a movable arbor about which links are formed, movable jaws adapted to embrace the arbor, means for actuating the jaws, independently operated clenchers carried by the jaws located on one of said jaws and operated by the same means that actuate the jaws and adapted thereby to interlock the formed link while the jaws are closed about the arbor.

8. Mechanism for forming links from sheet metal blanks, comprising an arbor about which links are formed, a chair adapted to support an interposed blank, means for actuating the arbor toward the chair to give an initial bend to the blank, link forming jaws adapted to embrace the arbor, independently operated clenchers for interlocking the link, means for advancing an interlocked link along the arbor and away from the jaws, and means for forming a depression in the link at the interlocked part thereof.

9. Mechanism for forming links from a sheet metal strip comprising dies and punches for piercing openings in the strip and forming fingers on one end thereof, bending said fingers and severing a link blank from the strip, a movable arbor, a chair in close proximity thereto, means for advancing a severed link blank between the arbor and chair into the link forming field, means for closing the arbor to the chair to give the initial bend to the link, link forming jaws adapted to embrace the arbor, and independently operated clenchers adapted to interlock the fingers in the openings at the opposite end of the link.

10. The combination of mechanism for forming sheet metal links comprising punches for perforating a strip of sheet metal in the body thereof and forming fingers on one end of the strip, a punch adapted to bend the fingers at an angle to the strip, means adapted to form the blank into a link, and means for forcing the fingers on one end of the blank through the perforations on the opposite end of said blank and locking them therein.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY A. HOUSE.

Witnesses:
P. S. JOHNSON,
JAMES FEELEY.