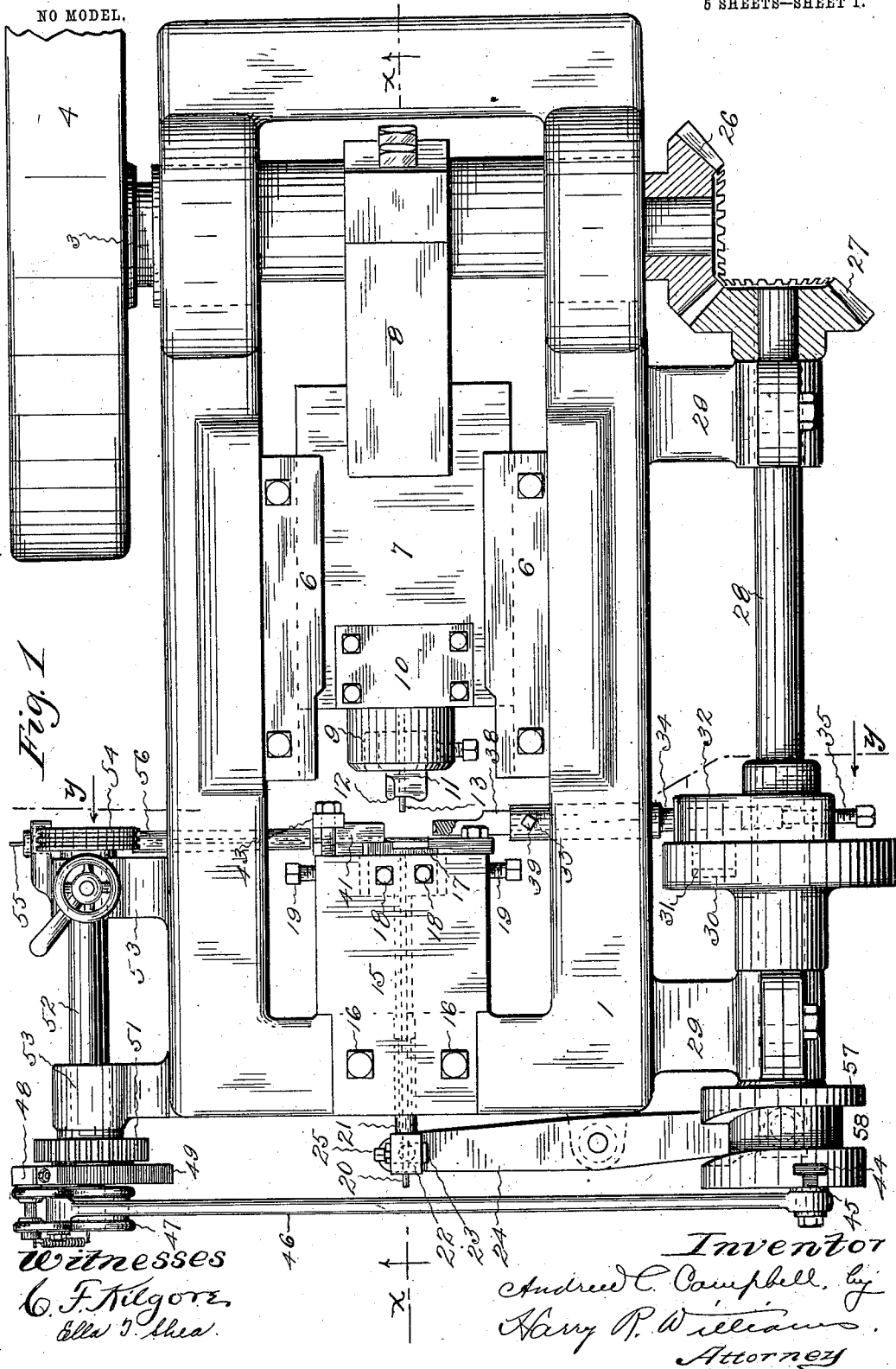


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WIRE FORMING MACHINE.
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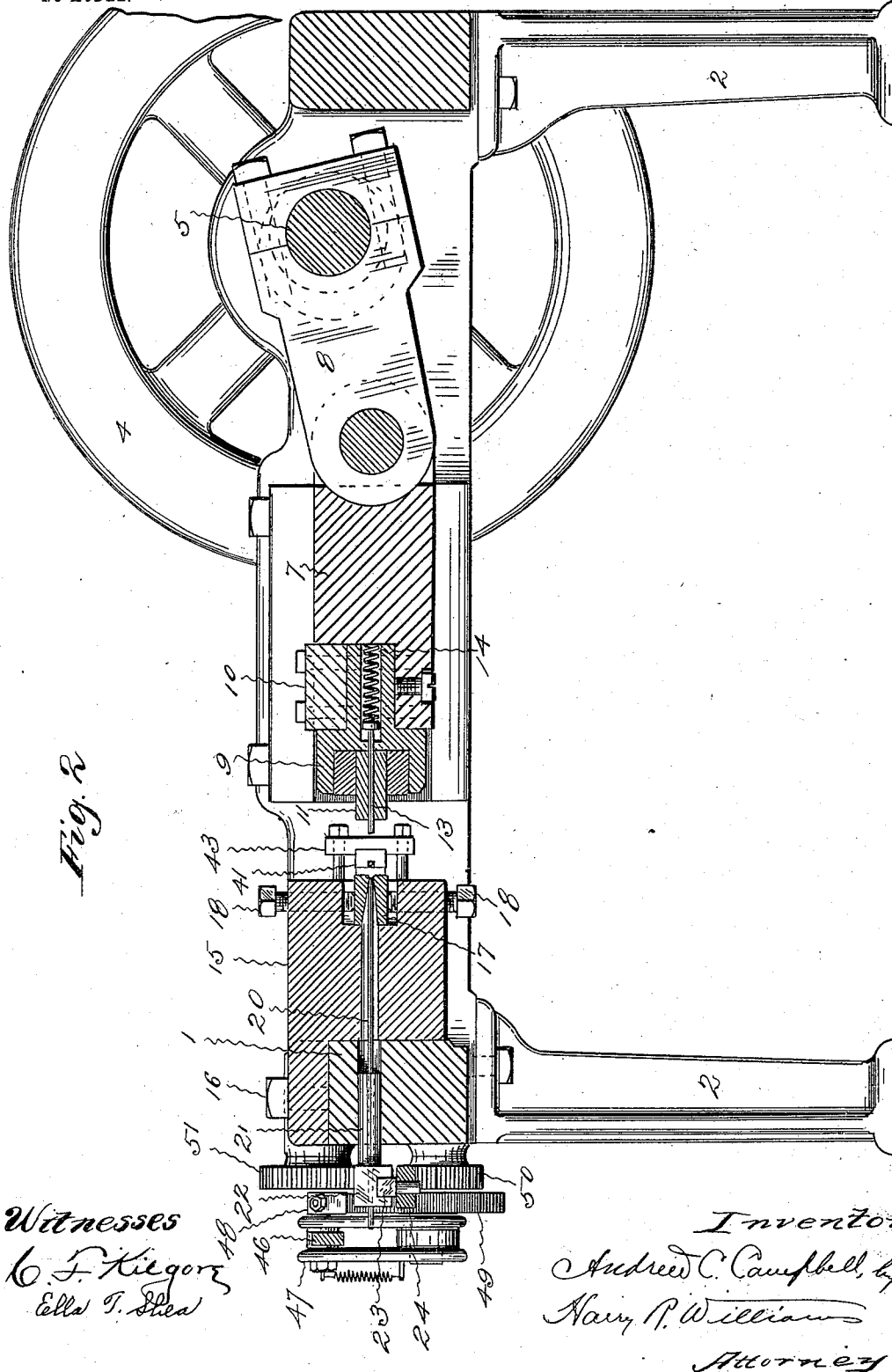
5 SHEETS—SHEET 1.



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NO MODEL.

5 SHEETS—SHEET 2.



Witnesses

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No. 728,201.

PATENTED MAY 19, 1903.

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5 SHEETS—SHEET 3.

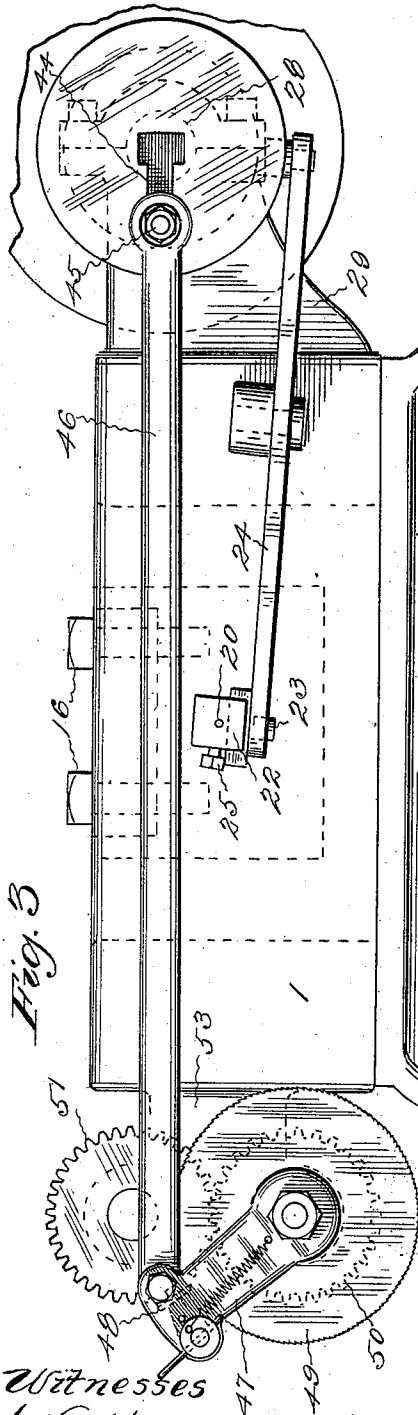


Fig. 3

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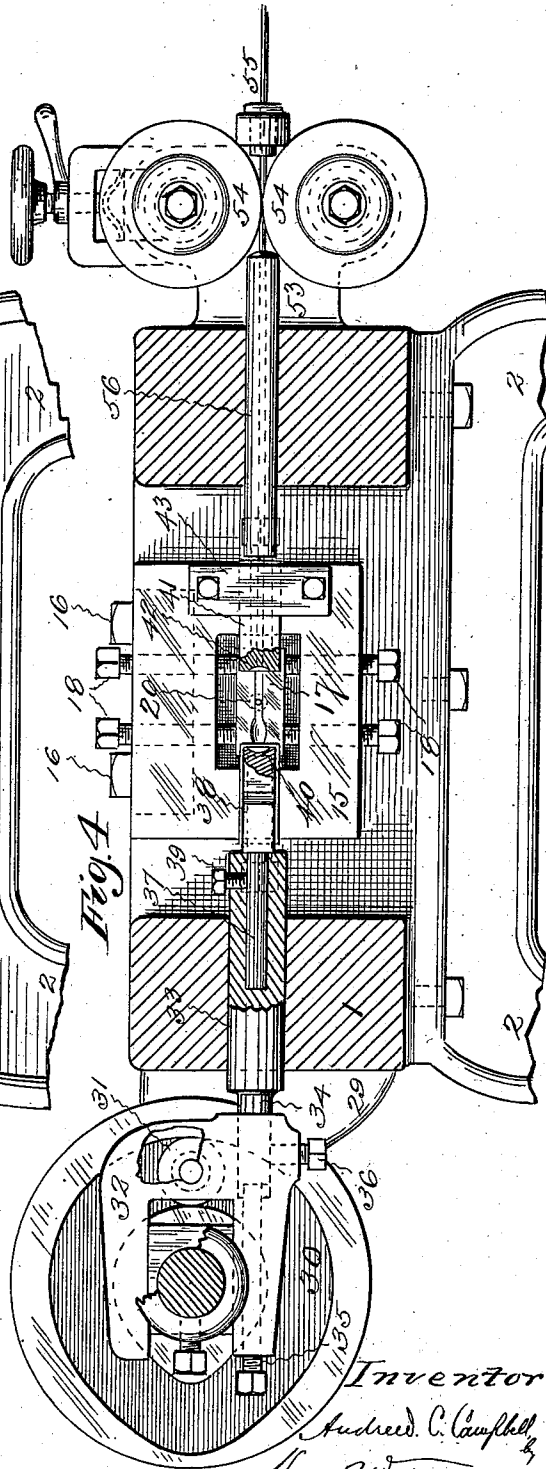


Fig. 4

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5 SHEETS—SHEET 4.

Fig. 6.

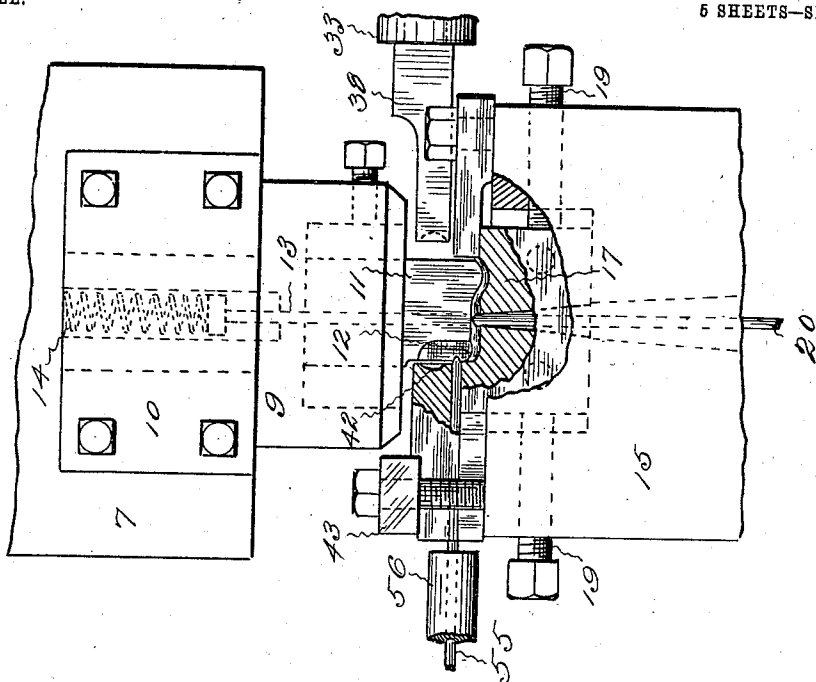
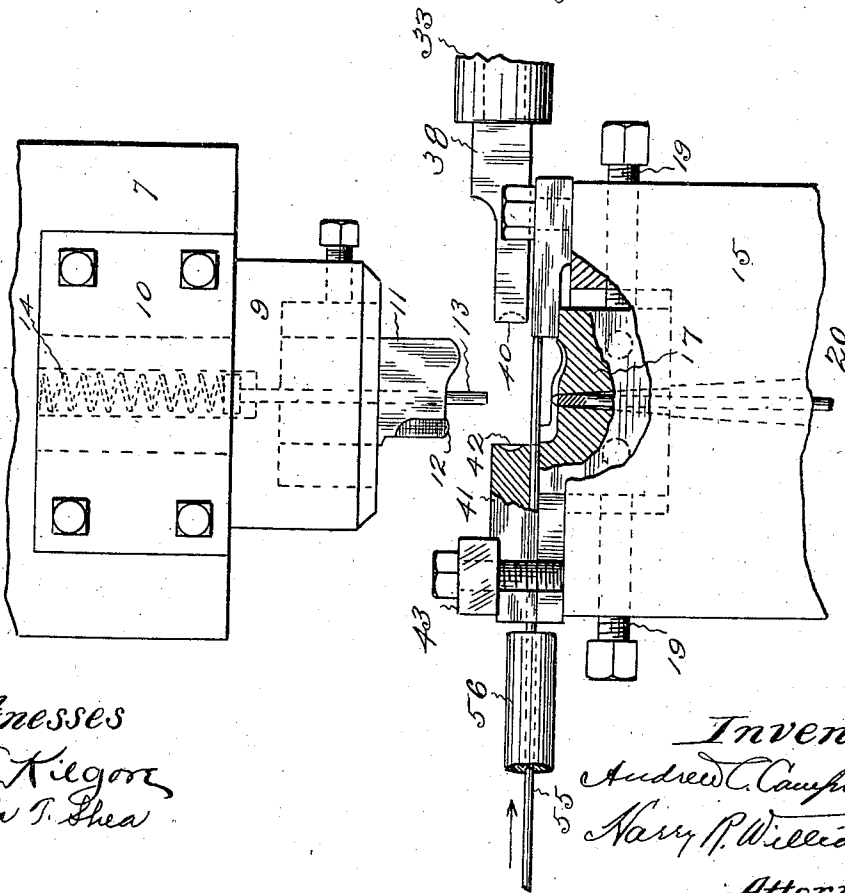


Fig. 5.



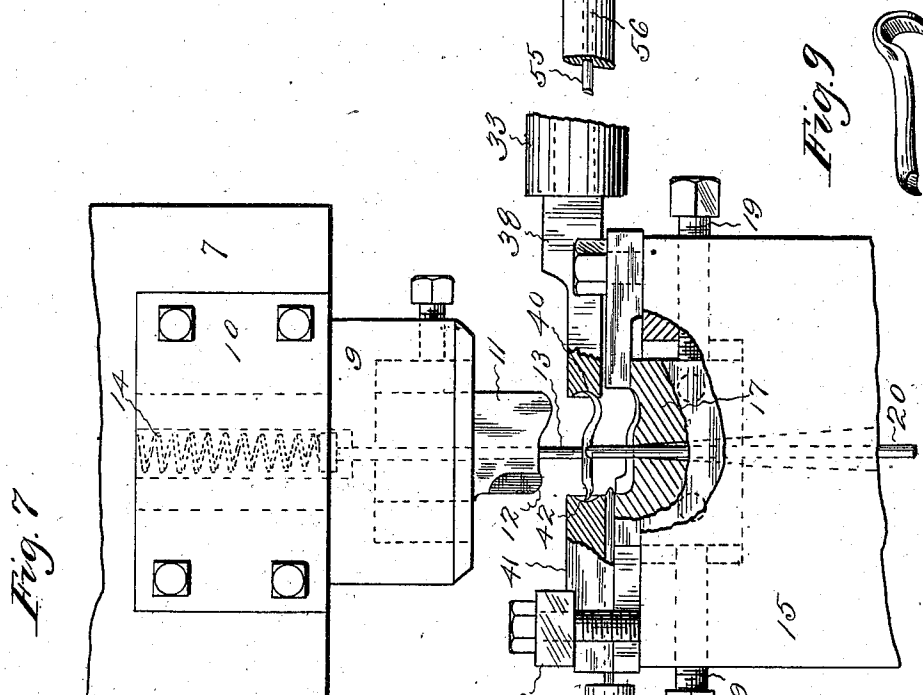
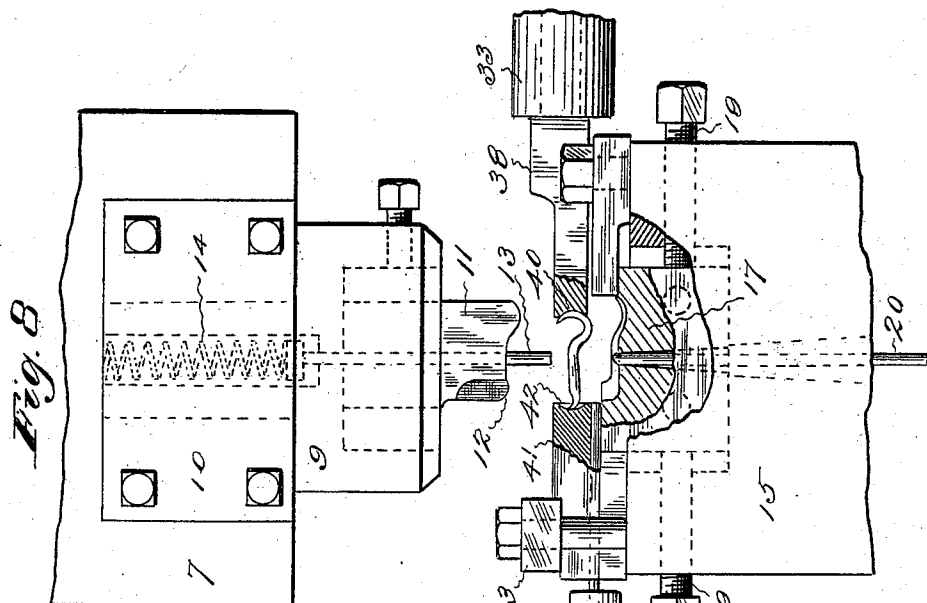
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

ANDREW C. CAMPBELL, OF WATERBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF TO CHARLES W. WARNER, OF MIDDLETOWN, CONNECTICUT.

WIRE-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 728,201, dated May 19, 1903.

Application filed August 28, 1902. Serial No. 121,329. (No model.)

To all whom it may concern:

Be it known that I, ANDREW C. CAMPBELL, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Wire-Forming Machines, of which the following is a specification.

The invention relates to a wire-forming machine which is particularly designed for forming tongues for wire buckles.

The object is to provide a compact, powerful, and rapid machine which cuts a length of wire from a coil or rod and forms a curved point at one end and a partially-rounded loop that is flattened on the inside at the other end.

The machine that is shown in the accompanying drawings as embodying the invention feeds a length of wire longitudinally into position to be cut and partly shaped by a pair of blanking-dies that act transversely of the wire and then moves the wire sidewise into the position in which the loop end is curved by a die that reciprocates longitudinally of the wire.

Figure 1 shows a plan of this machine with the wire fed into position to be acted upon by the blanking-dies. Fig. 2 shows a longitudinal vertical section of the machine on the plane indicated by the dotted line *xx* on Fig. 1. Fig. 3 shows an elevation of the front end of the machine. Fig. 4 shows a transverse vertical section taken on the plane indicated by the dotted line *yy* on Fig. 1. Fig. 5 shows a plan, on a larger scale, of the blanking and bending dies with the wire fed into position to be acted upon by the blanking-dies. Fig. 6 shows the blanking-dies closed upon a piece of wire which they have severed from the stock. Fig. 7 shows the same parts with the blanked piece carried out into position to be acted upon by the bending-dies. Fig. 8 shows the bending-dies acting upon the blank, and Fig. 9 is a perspective view of a completed buckle-tongue formed on this machine.

The rectangular frame 1 of the machine is supported by any common form of legs 2. In suitable bearings near the back of the frame is the shaft 3, that is provided with a driving-pulley 4 and a crank 5. Supported by guides

6, attached to the sides of the frame, is a slide 7. A link 8 connects this slide with the crank on the driving-shaft. A die-holder 9 is fastened to the front of the slide by a block 10, that is bolted to the slide. Secured in a socket in the front end of the die-holder is a blanking-die 11, that has a shearing edge 12 on one side and a face that is adapted to flatten and slightly curve each end of the sheared blank. This die is perforated, and a pin 13 extends through the perforation from a socket in the shank of the die-holder. A spring 14 is placed in this socket, so as to normally thrust the pin forward out of the front end of the die. A die-bed 15 is secured to the front end of the frame by bolts 16. In a socket in the back face of this die-bed is a female die 17, with a face that complements the face of the male die. This female die is located directly opposite the movable male die, and it is adjusted vertically by set-screws 18 and horizontally by set-screws 19, that pass through the die-bed and butt against the sides of the die. The female die and the die-bed are perforated for a rod 20. This rod is adjustably fastened by a screw 25 to a sleeve 21, that is movable in an opening in the front of the frame and is attached to a block 22, that is connected by a stud 23 with a lever 24, pivoted to the front of the frame. On the end of the driving-shaft opposite the pulley is a bevel-gear 26, that meshes with a bevel-gear 27 on the end of a shaft 28, that is supported by brackets 29, which project from the side of the frame of the machine. The end of this shaft opposite the bevel-gear bears a cam-block 57, having a cam-groove 58 in its periphery. A roller on the end of the lever 24 lies in this cam-groove, so that the rotation of the shaft oscillates the lever and reciprocates the rod in and out of the female die. On the shaft 28 is a cam-block with a cam-groove 30 in its face. A roller 31 on yoke 32 lies in this cam-groove. Extending through an opening in the side of the frame is a punch-carrier 33, the shank 34 of which is inserted into a recess in the lower part of the yoke 32 and after being adjusted longitudinally by the screw 35 is clamped by the screw 36. The shank 37 of the punch 38 is clamped by a set-screw 39 in a socket in

the punch-holder. The punch has a concave end 40. The rotation of the cam reciprocates this punch. Opposite the punch is a punch-bed 41, which has a concave recess 42. This punch-bed is held in position by a plate 43, that is bolted to the face of the female-die bed.

In the front face of the cam-block 57 is a groove 44, projecting into which is a crank-pin 45. A rod 46 connects this crank-pin 10 with a rocker-arm 47, that bears a pawl 48, which engages the teeth of the ratchet-wheel 49. The rotation of the crank gives the ratchet-wheel an intermittent movement. Fastened to the ratchet-wheel is a gear 50, in mesh with which is a gear 51. The shafts of these gears are supported by brackets 53, that project from the side of the frame. These shafts bear grooved feed-rolls 54.

When the machine is set in operation, the 20 wire 55 is advanced intermittently by the feed-rolls through the guide-tube 56, that is held by the side of the frame of the machine. Each intermittent movement of the rolls feeds a sufficient length of wire for forming a tongue in front of the female blanking-die, as shown in Fig. 5. After the wire has been fed the male die moves forward and shears off a piece of wire and then forces it into the female die, as illustrated in Fig. 6. This 30 action of the blanking-die sharpens, flattens, and curves the end which is to form the point of the tongue and flattens out and partially curves the end which is to form the eye of the tongue. After this operation as the male die 35 is moved backward the rod that passes through the female die is moved backward, so that the partially-formed tongue-blank is gripped at the center between the rod and the spring-pin that projects from the male die. These 40 move backwardly together and carry the blank into line with the bending-dies, as shown in Fig. 7. After the bending-dies have grasped the blank the rod is withdrawn and the spring-pin moved back with the male die. 45 The punch is then moved so that the blank is compressed longitudinally between it and the punch-bed and the pointed end bent a little more than the eye and curved considerably more, as illustrated in Fig. 8. When 50 the blank has been acted upon by the bending-dies and formed to final shape, as illustrated in Fig. 9, the punch is withdrawn and the tongue allowed to drop from the machine. These operations are carried on very rapidly, 55 each revolution of the main shaft feeding a

section of wire, cutting off and bending the fed section by the transversely-acting male and female blanking-dies, bending to final form, and allowing it to drop from the machine.

I claim as my invention—

1. A machine for forming wire having a shearing and blanking die movable transversely of the wire, carrying mechanism for transferring the partially-formed blank from 65 the blanking-dies into line with bending-dies, and a bending-die movable longitudinally of the wire, substantially as specified.

2. A machine for forming wire having feeding mechanism for intermittently advancing 70 the wire, shearing and blanking dies adapted to act transversely of the wire, mechanism for separating the blanking-dies and the blanked wire, and bending-dies adapted to act longitudinally of the wire, substantially 75 as specified.

3. A machine for forming wire having feeding mechanism for intermittently advancing the wire, a shearing and blanking die movable transversely of the wire, carrying mechanism for transferring the partially-formed 80 blank from the blanking-dies into line with bending-dies and a bending-die movable longitudinally of the wire, substantially as specified. 85

4. A machine for forming wire, having a feed for intermittently advancing the wire, a fixed female die and a movable male die for operating transversely upon the wire, a rod 90 extending through the female die and a pin extending through the male die, mechanism for causing the rod and pin to grasp the blank after the action of the blanking-dies and transfer it into line with bending-dies, and a movable bending-die for acting lon- 95 gitudinally upon the wire, substantially as specified.

5. A machine for forming wire having a feed for intermittently advancing the wire, male and female blanking-dies adapted to 100 operate transversely upon the wire, bending-dies adapted to operate longitudinally upon the wire, and mechanism for transferring the blanked wire transversely from the blanking-dies into line with the bending-dies, substan- 105 tially as specified.

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Witnesses:

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N. W. CUMMINS.