

M. OLSON.
WIRE FORMING MACHINE.
APPLICATION FILED JUNE 17, 1920.

1,382,379.

Patented June 21, 1921.

4 SHEETS—SHEET 1.

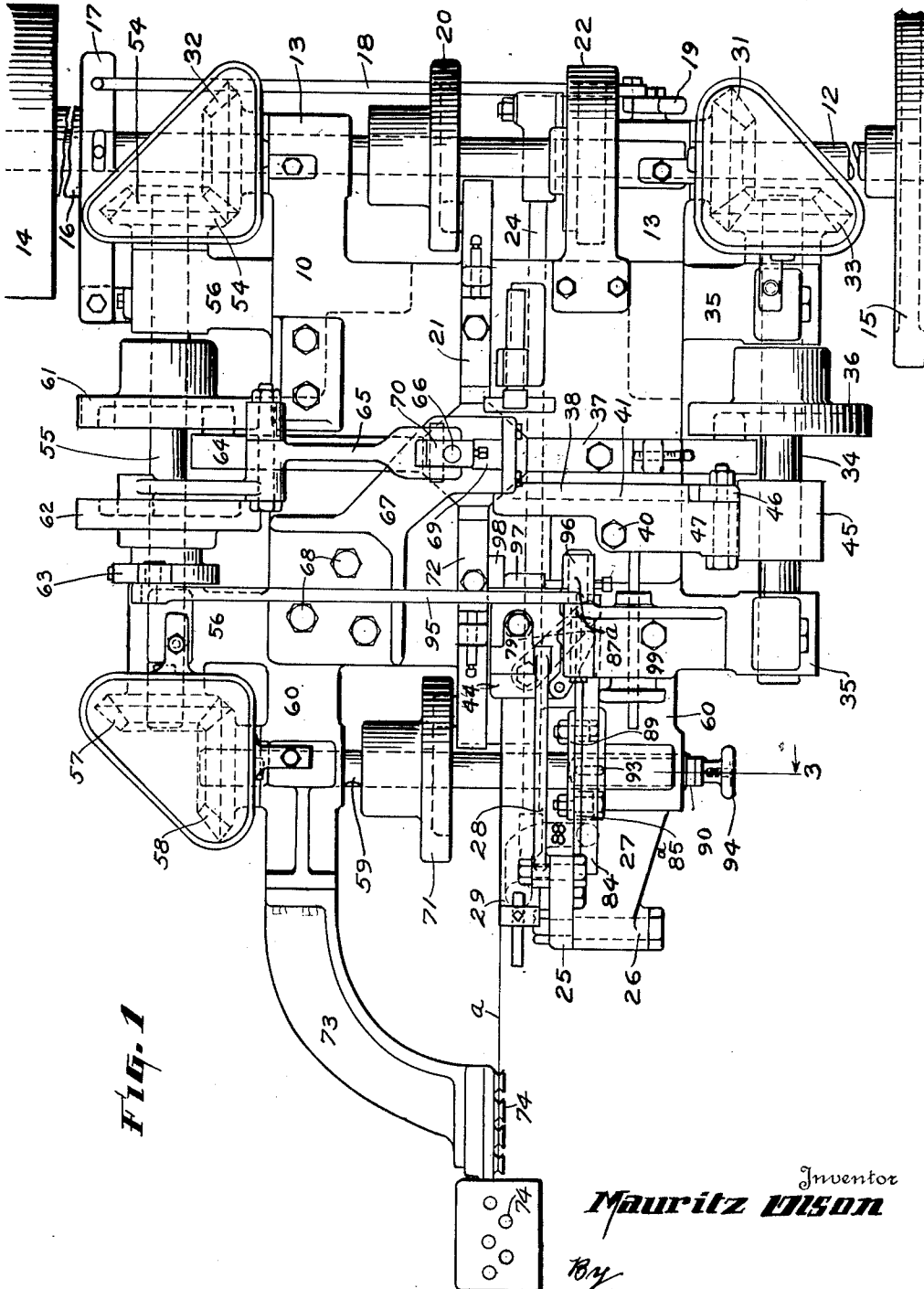


Fig. 1

Inventor
Mauritz Olson

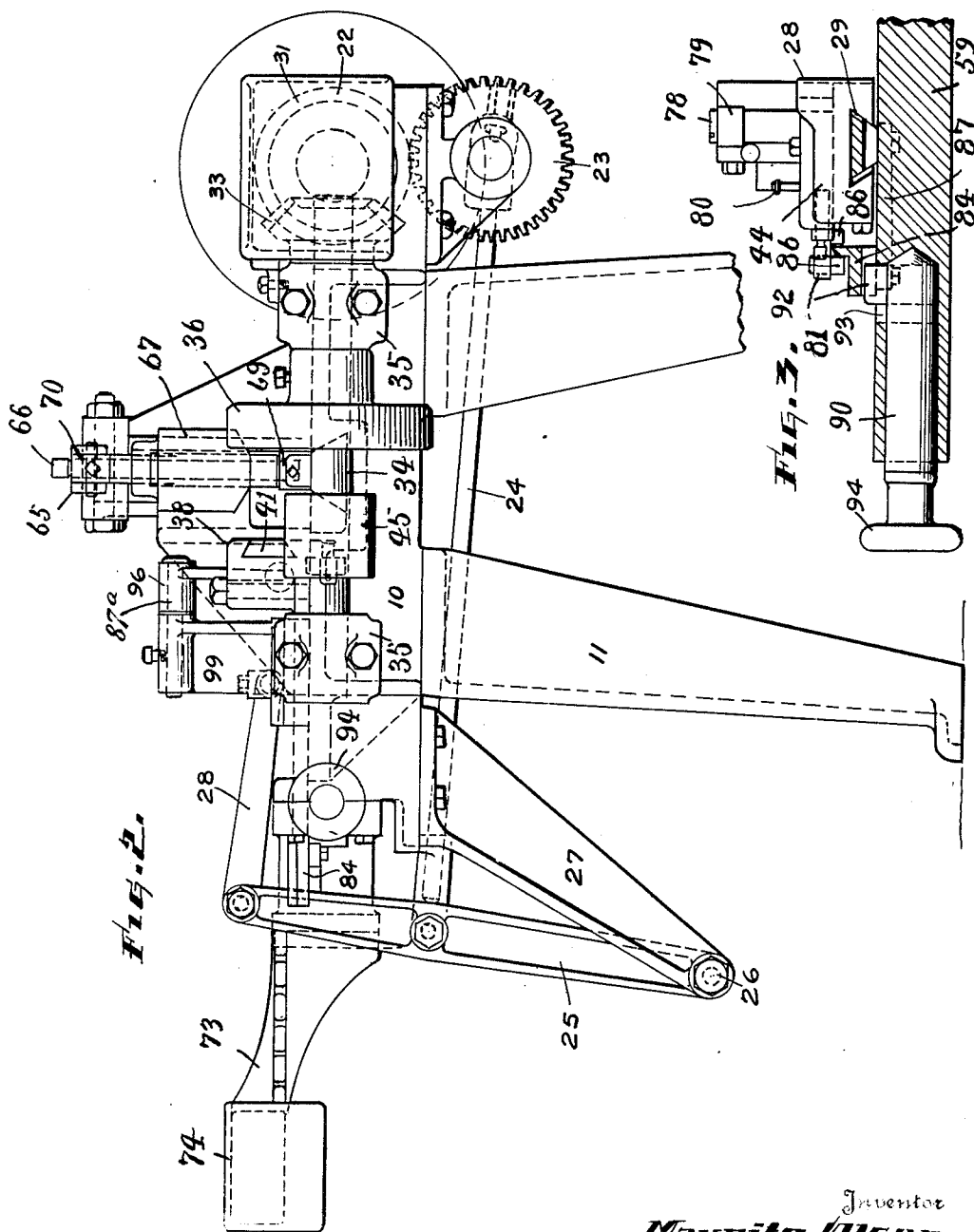
By
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4 SHEETS—SHEET 3.

Fig. 4.

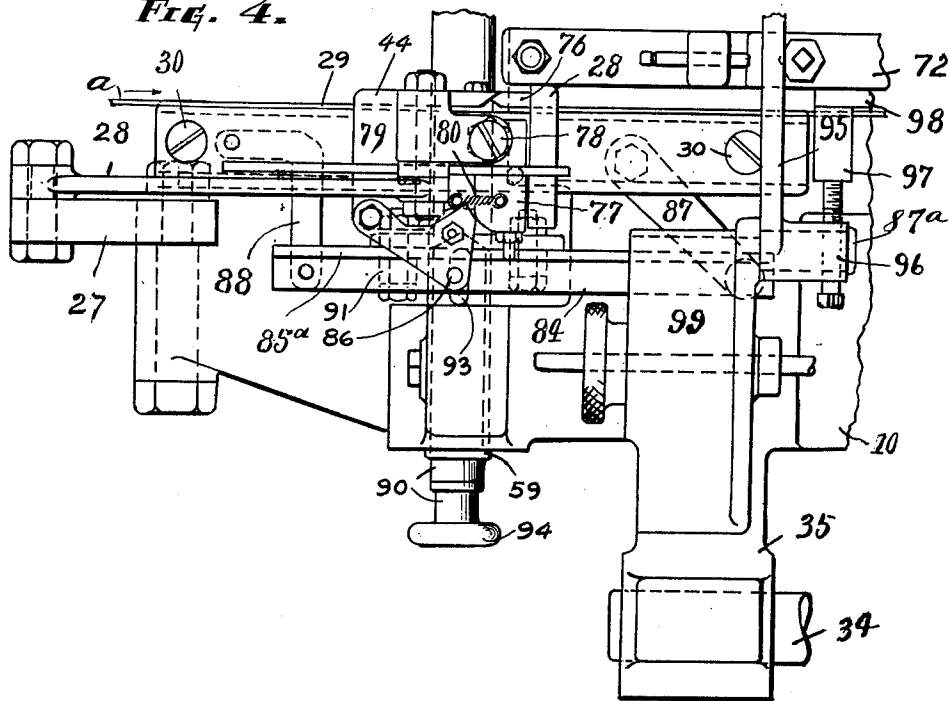


Fig. 5.

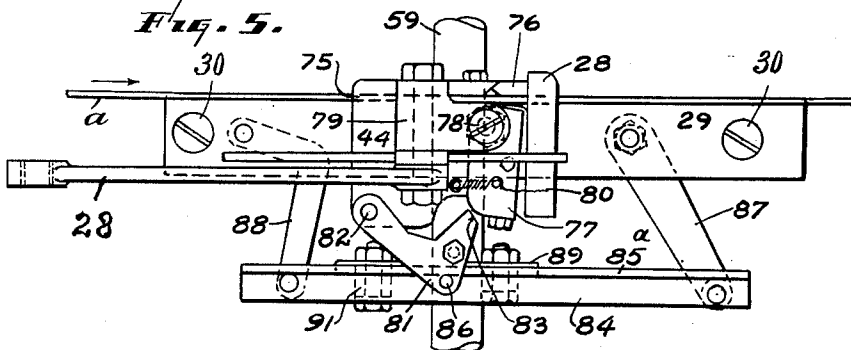
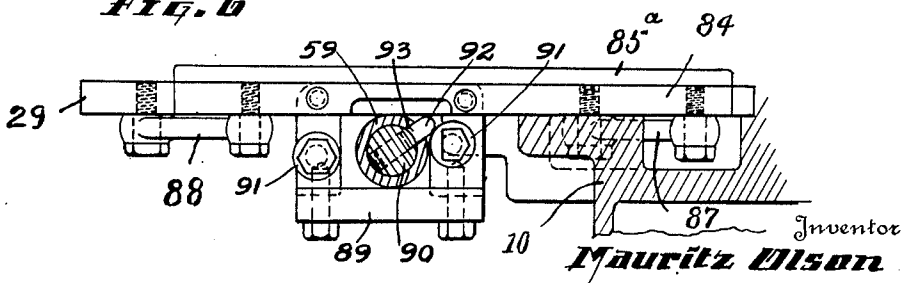
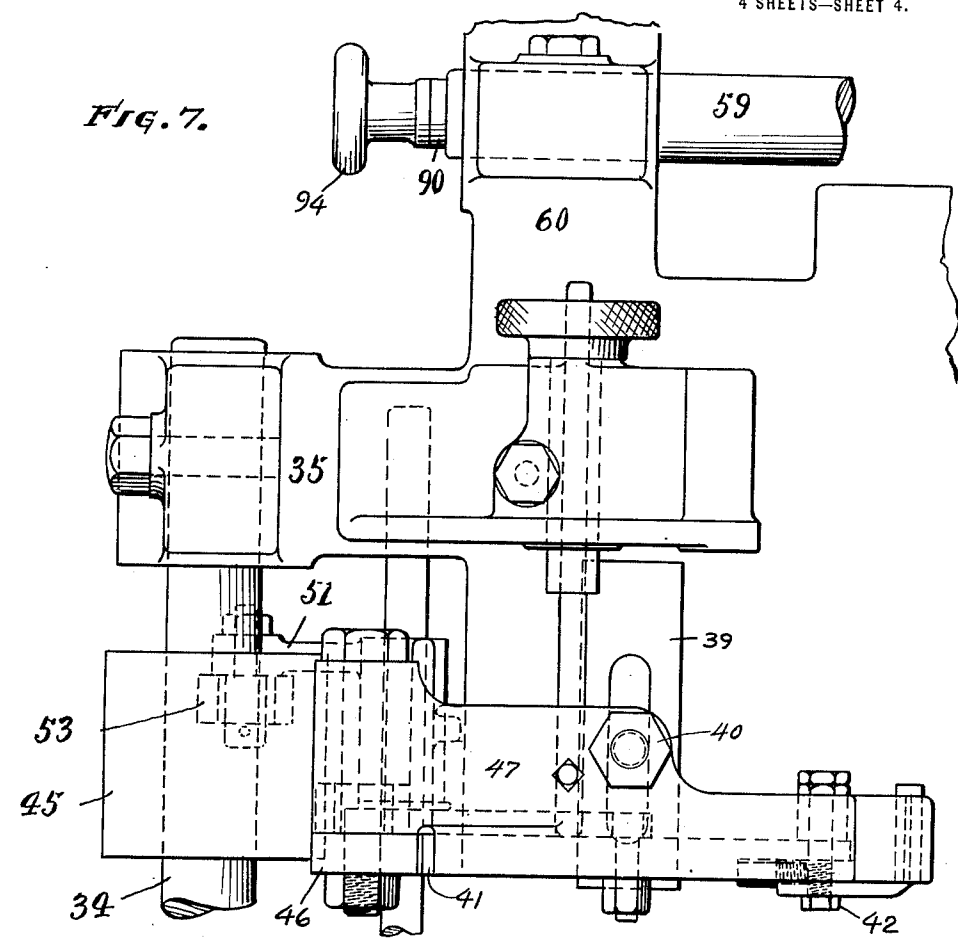
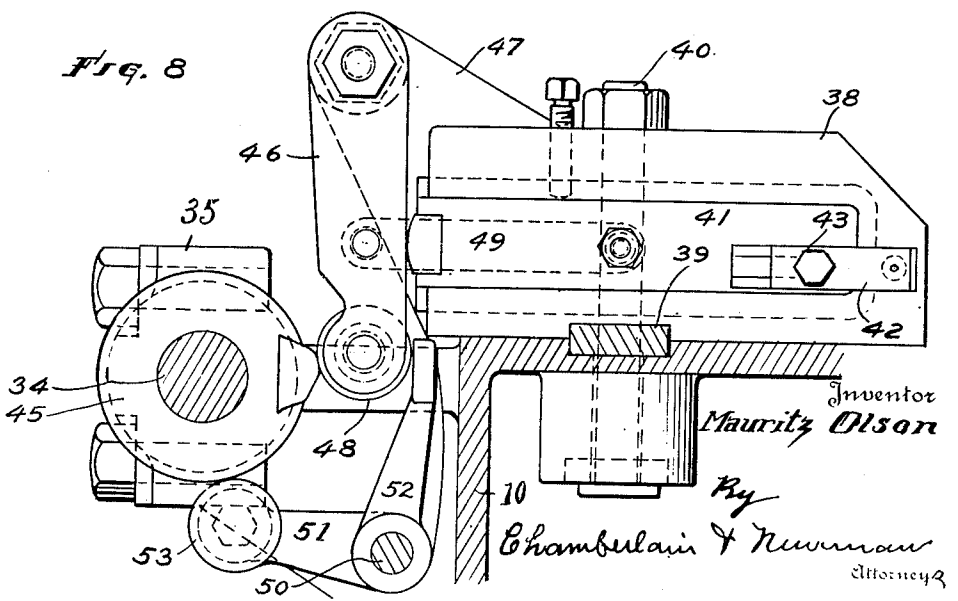


Fig. 6



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UNITED STATES PATENT OFFICE.

MAURITZ OLSON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE A. H. NILSON MACHINE CO., OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

WIRE-FORMING MACHINE.

1,382,379.

Specification of Letters Patent. Patented June 21, 1921.

Application filed June 17, 1920. Serial No. 389,604.

To all whom it may concern:

Be it known that I, MAURITZ OLSON, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Wire-Forming Machines, of which the following is a specification.

This invention refers to automatic wire working machines and has more particular reference to what is commercially known as a four-slide machine wherein the wire is automatically fed forward a predetermined distance, then cut off and bent into the desired form by a series of forming tools.

The object of the invention is to provide a simple reliable and durable form of wire gripping, feeding and releasing mechanism for machines of this class, and wherein the gripping and releasing means is operated by separate means from that which actuates the feed slide; further to provide in connection with such a wire feeding mechanism separate hand operating device whereby the gripping and releasing means may be thrown in and out of operation independent of the slide operating mechanism.

The means for opening and closing the gripping jaws is supported entirely independent of the slide, and is provided with separately operating mechanism whereby it is slid up in parallel alinement with the ways for the slide, for closing the jaw in on and for holding the wire during the feeding movement and for similarly releasing the gripping jaws during the return movement of the slide.

This class of machine is commonly employed for making various forms of articles from round wire, such for instance as the wire parts for beer bottles, fruit jars, bucket-bails, draw-handles and like parts, that are required to be made exactly alike and in quantities.

With these and other objects in view the invention resides and consists in the construction and novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims here-to appended, it being understood that various changes in the form, proportion, size and minor details of construction within the

scope of the claims may be resorted to without departure from the spirit or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawings forming a part of this specification, and upon which,

Figure 1 shows a plan view of a four-slide wire forming machine including my improved wire feeding device.

Fig. 2 is a side view of the same.

Fig. 3 is an enlarged vertical cross section taken on line 3 of Fig. 1.

Fig. 4 shows an enlarged plan view of a part of the bed, the feed slide and wire gripping mechanism shown in Fig. 1.

Fig. 5 is a detached plan view of the feed slide and wire gripping mechanism, in a released position.

Fig. 6 shows a sectional elevation of a part of the wire gripping mechanism shown in Figs. 4 and 5.

Fig. 7 shows an enlarged plan view of the cam and lever connections for operating the wire cutting mechanism, and

Fig. 8 is a sectional elevation of the same as seen from the lower end of Fig. 7.

Referring in detail to the characters of reference marked upon the drawings, 10 represents the bed of a four-slide wire forming machine and 11 legs supporting the same. 12 indicates the main driving shaft journaled in bearings 13—13 upon which is mounted the belt pulley 14 and fly wheel 15. A clutch 16 which is operated through a lever 17, a link 18 and handle 19 serve to engage and disengage the driving pulley 14 for the purpose of controlling the operation of the machine. A cam 20 carried upon the shaft serves to operate the forming slide 21 carrying one of the several forming tools. 22 represents a gear that is also mounted upon the main shaft, and meshes with a gear 23 to which one end of a connecting rod 34 is adjustably connected for the purpose of imparting to the same a reciprocatory movement, the other end of said rod being pivotally connected to an arm 25, the lower end of which is hinged at 26 to the bracket 27 hung from the bed of the machine. One end of a link 28 is connected to the upper end of the arm 25 while the other end is pivot-

edly connected to the feed slide 44 for the purpose of sliding the same backward and forward on the ways 29 secured to the bed by means of screws 30.

- 5 Beveled gears 31 and 32 are also mounted upon the driving shaft 12, gear 31 meshing with a similar beveled gear 33 on a second cam shaft 34 journaled in bearings 35 of the bed. Upon this shaft 34 is mounted a cam
10 36 which actuates the slide 37 mounted in the bed and carrying a forming tool upon its forward end.

- The wire cutting means is also operated from this shaft 34 and as will be seen includes a guide block 38 which is secured to the bed through the medium of a key 39 and bolt 40. A slide 41 is mounted to reciprocate in ways of the block and is provided with a hardened steel cutter 42 which is secured to the slide by the screw bolt 43 in a way to shear off the lengths of wire as between the cutting edge of the fixed block 38 and the movable part 42. Both the block and slide are provided with a hole which
25 normally registers one with the other to permit feeding when the slide is properly positioned. Upon the shaft 34 is mounted a cam 45 which serves to operate the arm 46 hung from the bracket 47 secured to the bed of the machine and bearing a roll 48 for engaging the periphery of the cam. A link 49, one end of which is connected to the arm 46 and the other to the slide 41, serves to form an operative connection between the
35 said arm and the cutting slide whereby the same is shoved forward in its cutting movement. I provide a cam actuated bell crank lever for the return of the cutting slide. This lever is pivoted to the shaft 50 hung from the bed of the machine and includes two arms 51 and 52, the latter serving to engage the roll 48 of the arm 46 to hold it against the cam while the roll 53 on the other arm 51 rides upon the periphery of the
45 cam and imparts a rocker movement to the bell crank lever which in effect forces the roll 48 and its arm together with the cutting slide out when the high point in the cam passes under the roll.

- 50 The bevel gear 32 upon the main driving shaft meshes with and drives a similar bevel gear 54 upon the third cam shaft 55 journaled in bearings 56 of the bed. Upon the other end of this cam shaft is also mounted a second bevel gear 57 that meshes with and operates a similar bevel gear 58 upon a fourth cam shaft 59 journaled in the bearings 60 secured to the bed. Upon this cam shaft 55 is mounted three cams, 61, 62
60 and 63, the first mentioned serving to operate the third forming slide 64 while the second cam 62 operates the bell crank lever 65 pivoted to a bracket in a manner to impart a vertical movement to the stripper 66, which is supported and guided in the bracket

67 secured to the top of the bed by the screws 68. A former 69 is secured in the bracket 67 and projects down in line with the intersection of the ends of the tool slides 21, 37, 64 and 72. The stripper is supported 70 in a block 70 pivotally mounted in the forked end of the bell crank lever 66 and is slidably mounted in the bracket which operates in conjunction with the forming tools of the several slides to strip the completed wire 75 articles from the former.

A further cam 71 is mounted on the cam shaft 59 and serves to operate the slide 72 which is mounted in the bed in alinement with the before mentioned slide 21. The arm 73 secured to one of the bearings 60 carries the usual series of guide rolls 74 between which the wire *a* is drawn and straightened during the feeding operations.

The slide 44 which is operatively mounted upon the ways 29 attached to the bed, includes hole 75 that form guide passages for the wire, and is provided with a fixed jaw 76 against which the wire is gripped during the feeding operations. The gripping jaw 77 carried by the slide is pivoted at 78 to the bracket 79, and is normally held in the released position shown in Fig. 5 by the spring 80. An operating arm 81 for the gripping member is pivotally connected 95 to the slide at 82 and is provided with a bevel end 83 which operatively engages the rounded corner of the gripping member in a way to swing the same upon its pivotal point for the purpose of gripping and releasing 100 the wire against the fixed jaw 76. This arm is carried by the feed slide for the purpose of operating the gripping member of the slide, and is slidably connected with an operating plate 84. The operating plate 105 is of substantially an L-shape in cross section having an upwardly disposed flange 85 against the opposite sides of which the rolls 86 secured to the arm 81 operate, and by means of which the arm is guided and swung upon its pivot. The opposite end 110 portions of this operating plate are linked to the fixed guideway 29 by the links 87 and 88 so that any longitudinal movement imparted to the operating plate will cause 115 the same to also move sidewise and parallel with the guideway for the purpose of holding the parts of the slide for a given length of time, in either an open or closed position. A yoke 89 is attached to the operating plate in a way to surround the shaft 120 59 and in which the plug 90 is slidably mounted. Rolls 91 are mounted on the two legs of the yoke to be engaged by the projection 92 through the slot 93 of the shaft 125 so as to engage the rolls and throw the operating plate backward and forward with the rotation of the shaft 59. Thus it will be seen that the gripping mechanism may be engaged or disengaged for operating the 130

feed-slide by simply pushing in or pulling out the plug. A bell crank lever is pivoted at 87* to a bracket 99 and has its long end 95 operatively connected to the cam 63 which operates the lever. The other end 96 of the lever carries an adjusting screw that engages and operates the holding jaw 97 which serves to engage and hold the wire against the fixed jaw 98 during the return movement of the slide.

From the foregoing it will be seen that owing to the link connection of the operating plate 84 with the fixed part, the said plate will be moved parallel with and toward and from the guideway as the operating plate is thrown forward and backward by the projection 92 on the cam shaft. By nature of the work to be performed it will be seen that the gripping jaw of the feed slide is opened at the completion of each feeding operation by reason of the operating plate 84 being thrown back, as seen in Fig. 6, and thus moved away from the guide-way 29, upon which the feed-slide operates, and in spaced parallel relation thereto, so as to release the arm 81 and the gripping jaw. The operating plate remains in this position during the return open movement of the slide, whereupon it is again thrown forward by the projection 92, to grip the wire preparatory to the next forward feeding movement of the slide, and is held in this forward closed position throughout the entire forward stroke. The operating plate is moved twice with each rotation of the cam shaft and with each complete feeding movement of the feed-slide, being moved out at the forward end of the stroke of the slide and in at the end of the return stroke.

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

1. The combination with wire cutting and forming mechanism, of a wire feeding device including a reciprocatory slide, a wire gripping jaw pivoted thereon, a swinging arm also carried by the slide for operating the gripping jaw, an operating member supported independent of the slide and connected with the arm for operating the same, and means for moving the operating member bodily to and from the slide and in parallel alinement with the movement thereof.

2. The combination with wire cutting and forming mechanism, of a wire feeding device including a reciprocatory slide, a wire gripping jaw pivoted thereon, a swinging arm also carried by the slide for operating the gripping jaw, an operating member hingedly supported upon the bed and slidably connected with the arm on the slide, and means for connecting and disconnecting the operating member to operate or release the swinging arm of the slide to control the wire feeding.

3. The combination with wire cutting and forming mechanisms, of a wire feeding device including a reciprocatory slide, a wire gripping jaw and operating arm carried by the slide, an operating plate for actuating the arm, means for setting the plate in a relative far and near position to the slide with each reciprocation of the same, and separate means for moving the plate to operate the arm.

4. The combination with wire cutting and forming machines, of a wire feeding slide, a wire gripping means thereon, an operating plate slidably mounted on the bed of the machine for actuating the gripping means, a shaft for reciprocating the operating plate, and means for operatively connecting and disconnecting the shaft and plate.

5. The combination with wire cutting and forming mechanisms, of a wire feeding slide, a wire gripping means thereon, a swinging operating plate supported upon the bed and slidably connected with the gripping means for opening and closing the same, and a shaft connection for reciprocating the operating plate.

6. The combination with wire cutting and forming mechanism, of a wire feeding slide, an operating plate having a longitudinal guideway thereon, means for moving the operating plate toward and from the slide and longitudinally thereof, a wire gripping means carried by the slide and having an operating arm in slidable engagement with the guideway of the operating plate.

7. The combination with wire cutting and forming mechanism, of a wire feeding slide, an operating shaft bearing a projection, a slidably mounted operating plate connected to be reciprocated by the projection on the shaft, said operating plate including a longitudinal guiding portion, means for imparting both a longitudinal and sidewise movement to the operating plate, a gripping device including an operating arm carried by the slide, and slidably engaging the operating plate.

8. In a wire feeding device, the combination with a feed-slide and means for reciprocating the same, of an operating plate having engaging rolls, an operating arm carried by the slide, and in slidable engagement with the operating plate, means for operating the plate and gripping means while the slide is at either end of its stroke including a cam shaft, a movable plug in the cam shaft having an operating projection to engage or disengage the rolls of the operating plate to make the operation of the slide effective or not as desired.

9. In a wire feeding device, the combination with a feed-slide and means for reciprocating the same, of an operating plate slidably connected to a fixed part, an operating arm carried by the slide and engaged

by the operating plate, a cam shaft for operating the plate, a movable plug in the cam shaft carrying an operating means to engage or disengage the operating plate to
5 make the operation of the slide effective or not as desired.

Signed at Bridgeport, in the county of

Fairfield and State of Connecticut, this 15th day of June, A. D., 1920.

MAURITZ OLSON.

Witnesses:

C. M. NEWMAN,
LILLIAN M. ALLING.