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WIRE STRAIGHTENING AND CUTTING OFF MACHINE.

APPLICATION FILED JUNE 28, 1911.

1,045,098.

Patented Nov. 19, 1912.

3 SHEETS—SHEET 1.

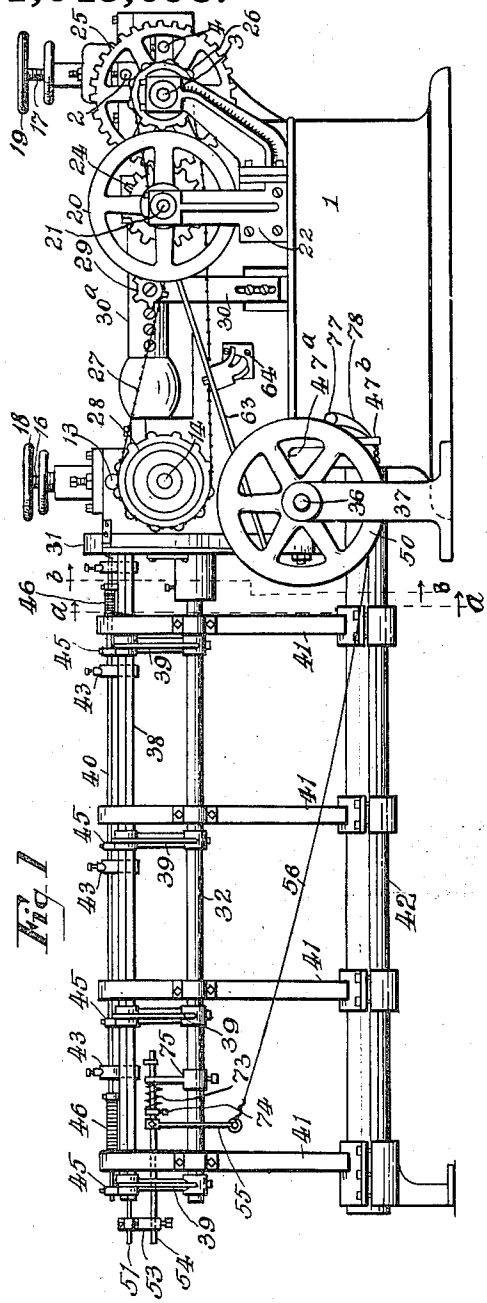

Fig. 1

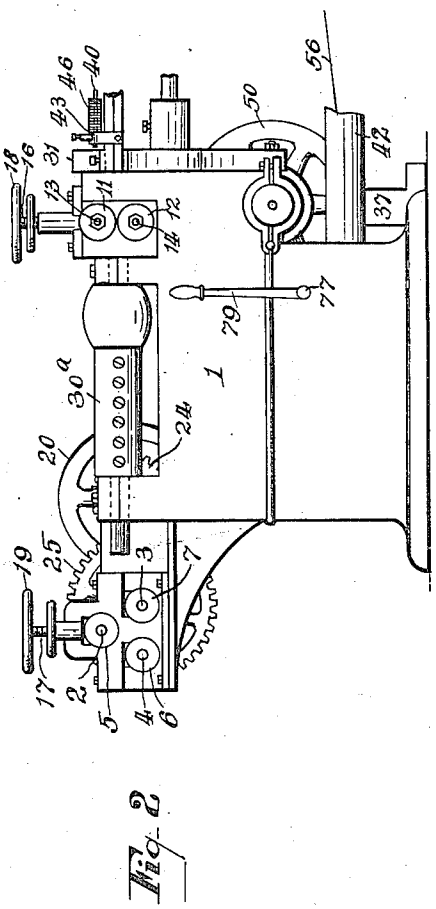

Fig. 2

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Fig. 3

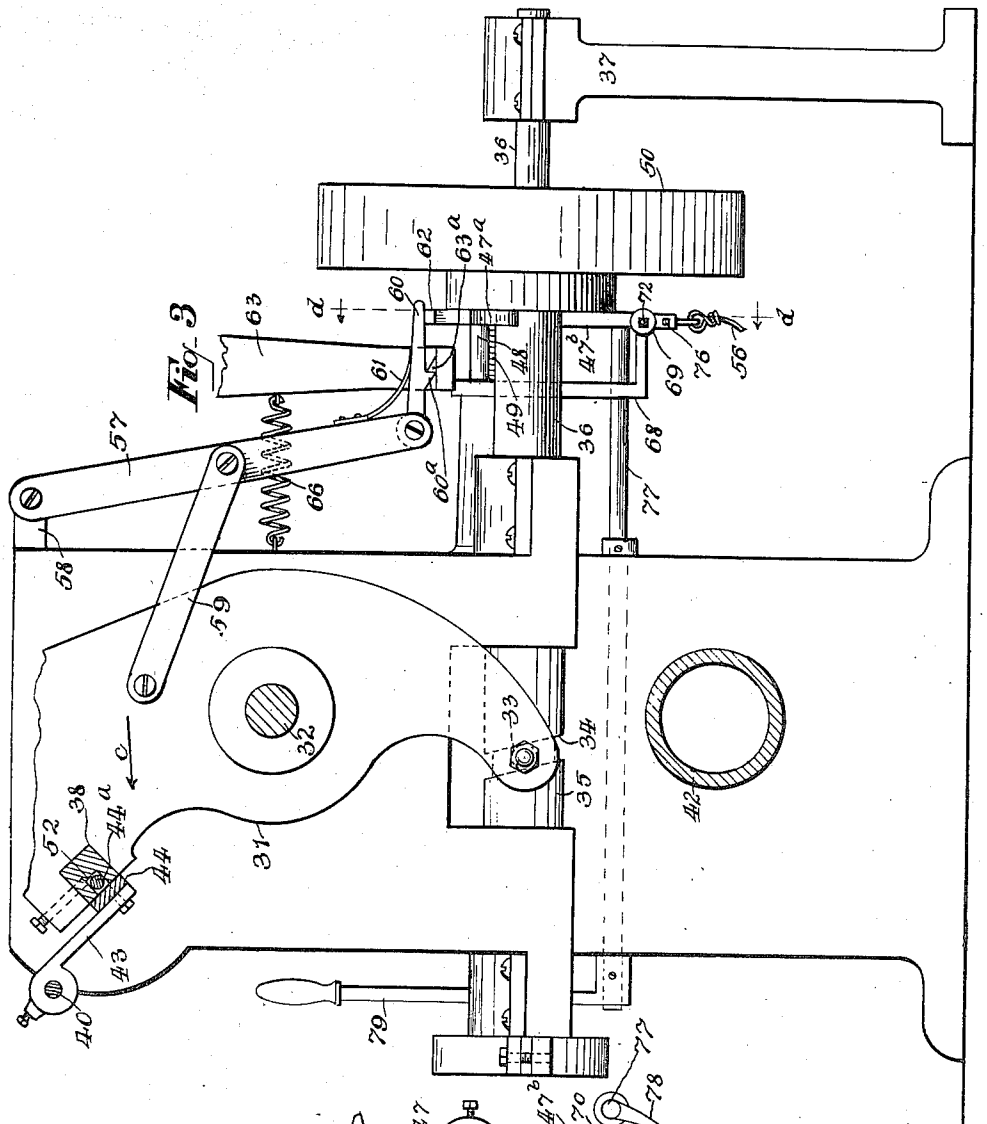
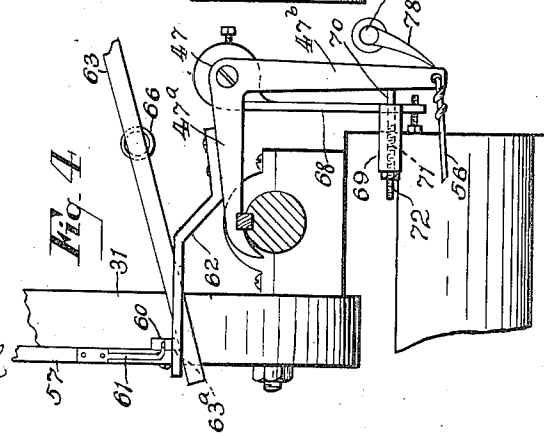


Fig. 4



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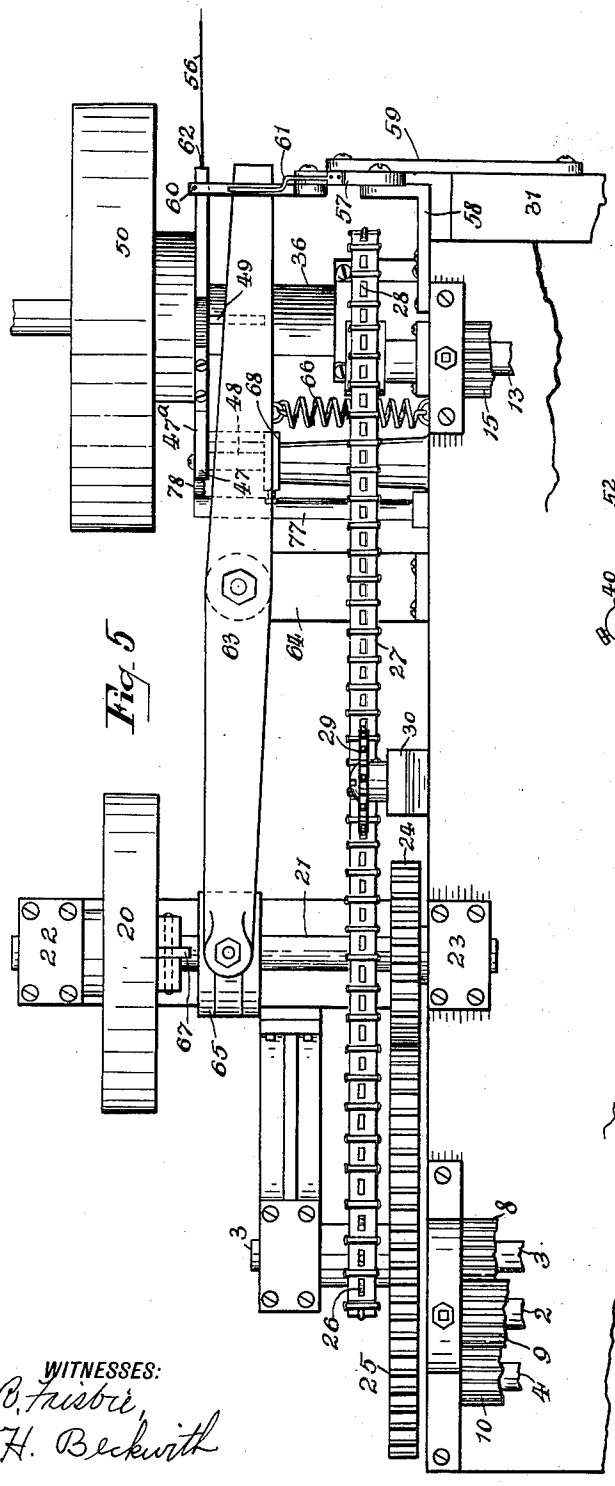

Fig. 5

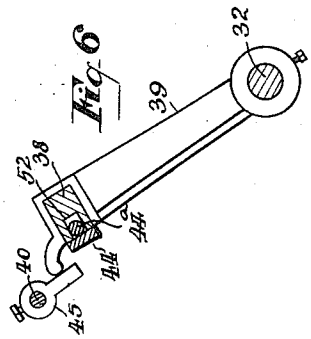

Fig. 6

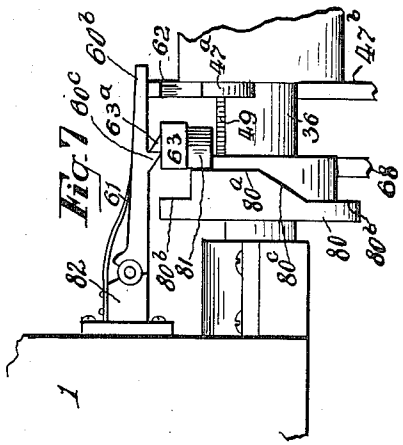

Fig. 7

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UNITED STATES PATENT OFFICE.

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WIRE STRAIGHTENING AND CUTTING-OFF MACHINE.

1,045,098. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed June 28, 1911. Serial No. 635,814.

To all whom it may concern:

Be it known that I, FRANKLIN B. SHUSTER, citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Wire Straightening and Cutting-Off Machines; 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 wire straightening and cutting off machines, it being an improvement on my former application filed August 13, 1910, Serial No. 576,969. In said former application, two trip wires were necessary, one to trip and stop the straightening and feeding rolls, and the other to actuate the cutting off mechanism.

My present application consists in making one wire do double duty, viz., stop the straightening and feeding mechanism and simultaneously set in motion the cutting off mechanism.

Referring to the drawings in which the same figures of reference indicate like parts throughout the several views: Figure 1 represents a side elevation of the machine; Fig. 2 is a reverse side view of the standard supporting the feeding and straightening mechanism, and broken view of the mechanism forward of the cutting off lever on line *a*—*a* of Fig. 1; Fig. 3 is an enlarged front elevation of the machine, sectional view of the guide bar, cutting off lever shaft, and large supporting pipe on line *b*—*b* of Fig. 1; also broken view of the cutting off lever, and broken view of the feed controlling or shift lever, the rest of the feeding mechanism being omitted; Fig. 4 is an enlarged broken view of the machine standard or head, cutting off lever, feed controlling or shift lever, supporting pipe, and sectional view of the cutting off shaft on line *d*—*d* of Fig. 3; Fig. 5 is an enlarged broken upper plan view of the head or standard supporting the feeding and straightening mechanism; Fig. 6 is an enlarged detail side elevation of one of the rock-shaft arms, sectional view of the rock-shaft, apron shaft, guide bar and its apron, and sectional view of a rod in the guide bar; and Fig. 7 is an enlarged partly broken view showing the improved tripping mechanism employed in connection with a cam on the cam shaft.

A description of the well-known features of the machine will be briefly set forth to show the relation of my improvements thereto.

1 is the main standard or head supporting the journaled shafts 2, 3 and 4 carrying the initial straightening rolls 5, 7 and 6. These roll shafts are geared together by the pinions 9, 8 and 10 shown at Fig. 5. The forward feed rolls 11 and 12, Fig. 2, are mounted on the shafts 13 and 14, which shafts are also geared together by pinions, one of said pinions, 15, being shown at Fig. 5. The feed rolls and straightening rolls are adjusted in the usual manner by means of the screws 16 and 17 and the hand wheels 18 and 19.

20 is a balance wheel pulley mounted on the shaft 21 journaled in the standards 22 and 23. This shaft carries the gear 24 meshing with the gear 25 on the roll shaft 3. 26 is a sprocket wheel also mounted on shaft 3 and it carries the chain 27 to drive the sprocket wheel 28 mounted on the forward lower feed roll shaft 14, and 29 is an intermediate sprocket idler supported on the vertically adjustable standard 30.

30ª is the rotary wire straightener.

31 is the cutting off lever mounted on the rock shaft 32, which shaft is actuated by means of the roll 33, Fig. 3, in the lower end of said lever, engaging with the cam groove 34 of the cam 35 mounted on the cam shaft 36 journaled in the machine head and the standard 37.

38 is the guide bar whose inner end is secured to the cutting off lever, and also to the free ends of the rock shaft arms 39, which arms are secured to the rock shaft 32, as shown.

40 is a smaller rock shaft journaled in the upper ends of the standards 41, which standards are supported and secured on the large pipe 42. This shaft carries the arms 43 whose lower ends are secured to the guide bar apron 44 as seen at Fig. 3. When, therefore, the rock shaft 32 is actuated to swing the cutting off lever to sever the section of wire 44ª in the guide bar, it will also actuate the arms 39, which arms, contacting with the tail piece of the collars 45, Fig. 6, mounted on the rod 40, will turn said rod to

open the apron and let the severed wire section drop from the guide bar. The coiled springs 46 on rod 40 will actuate said rod in the opposite direction to return the apron to its normal closed position against the guide bar as soon as the cutting off lever retreats.

47 is a double arm clutch lever, Figs. 3, 4 and 5, journaled on the outer end of the stationary rod 48 projecting from the machine head. The horizontal arm 47^a of this lever engages with the usual groove (not shown) in the spring actuated key 49 to hold such key back from engagement with the balance wheel pulley 50 when the cutting off lever 31 is stationary.

51, Fig. 1, is an adjustable gage rod located in the groove 52, Figs. 3 and 6, to determine the length of the wire sections to be severed. 53 is an adjustable block secured to the outer end of this gage rod and to the trip rod 54, and 55 is a finger connected to said trip rod, to which finger is attached one end of the trip wire 56, while the other end of said wire is attached to the lower end of the vertical arm 47^b of the clutch lever.

57, Fig. 3, is a lever pivotally supported on the bracket 58 and is pivotally connected to the cutting off lever 31 through the medium of the link 59.

60 is a trip lever pivoted to the free end of lever 57 and it is normally held against the upper surface of the overhanging extension 62 of the clutch lever by the spring 61, as seen more clearly at Figs. 3 and 4.

63 is a shift lever (see also Fig. 5) pivotally supported on the bracket 64 and it carries the catch 63^a at its lower end adapted to be engaged by the catch 60^a of the trip lever 60. The opposite end of the shift lever 63 is pivoted to the sleeve 65 adapted to have a longitudinal movement on the shaft 21.

As represented in the several views, all of the movable elements are in position for feeding the wire through the machine. When, therefore, the end of the wire that is being fed contacts with the end of the gage rod 51 in the guide bar 38 and actuates the trip rod 54, the wire 56 will exert a pull on the arm 47^b of the clutch lever and raise the arm 47^a of said lever and release the engagement of the trip lever 60 with the shift lever 63 and bring said shift lever under the control of the retractile spring 66. This will cause the opposite end of the shift lever to move its sleeve 65 toward the continuously running balance wheel pulley 20 and engage the finger 67, which finger is connected with well known clutch mechanism (not shown), and instantly stop the feed rolls. The instant the clutch lever 47 is raised, the key 49 will be released to engage with the continuously running balance wheel pulley 50 and start the rotation of the cam shaft to actuate the cutting off lever 31 in the direction of arrow *c*, Fig. 3, to cut off a section of wire. This forward cutting off movement of lever 31 will, through the medium of the lever 57 and link 59 reëngage the trip lever 60 with the shift lever 63 so that, when the cutting off lever is returned, the shift lever will be carried back to the position shown at Fig. 3 to restart the feed roll mechanism simultaneously with the stoppage of the cutting off mechanism. It will thus be observed that by means of a single trip wire actuating the clutch lever the feed rolls are instantly stopped and the cutting off mechanism is brought into operation, and, by means of the simple mechanism connecting the clutch lever with the cutting off lever, the feed rolls are restarted simultaneously with the stoppage of the cutting off mechanism. This arrangement not only does away with an expensive cam on the cutting off shaft to actuate the shift lever, and also the use of an extra trip wire as in my former application, but the action is much quicker and with correspondingly better results.

As in my former application, the arm 68, secured to the rod 48, carries at its lower end the housing 69 and its spring pin 70 contacting with the arm 47^b of the clutch lever under the tension of the spring 71, which spring is adjusted by the screw 72. The spring 73, Fig. 1, adjustably located between the collars 74 and 75 on the trip rod 54, serves to reduce the push or strain for tripping the clutch mechanism to actuate the cutting off lever, and thus assist the wire when contacting with the end of the gage rod to force the weight of all the constituent parts out with but little resistance. The spring 71 will force the arm 47^a of the clutch lever into engagement with the key 49 after the cutting off operation has been completed. The adjusting screw 76 in the lower end of the arm 68 forms a stop to limit the movement of the clutch lever when actuated by the trip wire 56.

In starting the machine, the operator is on the side opposite the tripping mechanism and as there is always a bad end on every fresh reel of wire which must first be cut off before regular lengths are fed and cut, the operator at present must pass around and manually actuate the tripping mechanism to sever such end. To obviate this, the rod 77 extends through the machine head carrying the finger 78 adapted to engage with and actuate the clutch lever through the medium of the handle lever 79 located on the same side of the machine as the operator.

In Fig. 7 is shown how the single wire trip mechanism could be used in connection with the cam 80 mounted on the cutting off shaft 36. In this construction the shift lever 63 carries the roll 81 on its under side to contact with the cam. Also in this construction the lever 57 and link 59, Fig. 3,

are dispensed with and the trip lever 60^b is jointed to the bracket 82 of the machine head. When the feed rolls are in operation, the parts will be in the position shown at Fig. 7, viz., with the shift lever roll 81 against the straight face 80^a of the cam, and the catch 63^a of the shift lever engaged by the catch 60^c of the trip lever. When the clutch lever is actuated to release the key 49 it will also lift the trip lever 60^b and release the shift lever as previously described, and when released the roll will rest against the straight portion 80^b of the cam, and when the cutting off operation is completed, the inclined face 80^c of the cam will carry the shift lever back and interlock the same with the trip lever as shown.

Having thus described my invention, what I claim as new is:—

1. In a machine of the character described, the combination with wire feeding and wire straightening mechanism, cutting off mechanism, guide bar and gage-rod mechanism, a clutch lever for controlling the cutting off mechanism, and a shift lever for controlling the feeding mechanism, of a trip lever adapted to engage with the shift lever while wire is being fed, a trip wire connecting the gage-rod mechanism with the clutch lever, so that, when said trip wire is actuated by the incoming wire in the guide bar, the clutch lever will be actuated to simultaneously release the shift lever to stop the feeding mechanism and start the cutting off lever.

2. A machine of the character described, comprising wire feeding and wire straightening mechanism, guide bar and gage-rod mechanism, a cutting off lever, a clutch lever controlling the cutting off lever, a shift lever controlling the wire straightening and feeding mechanism, a trip lever controlled by the cutting off lever and adapted to engage with the shift lever and hold the same in working relation with the straightening and feeding mechanism, and a trip wire connecting the gage-rod mechanism with the clutch lever, so that, when the clutch lever is actuated by the trip wire, the trip lever is actuated by the clutch lever to release the shift lever and bring the wire straightening and feeding mechanism to a standstill and simultaneously release the cutting off lever, and on the return of said cutting off lever the trip lever is reëngaged with the shift lever to actuate the feeding and straightening mechanism.

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

FRANKLIN B. SHUSTER.

Witnesses:
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ELMORE F. SHUSTER.