F. B. SHUSTER.

STRIP METAL STRAIGHTENING AND CUTTING OFF MACHINE.

APPLICATION FILED MAY 23, 1910.

973,571.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

Fig 1

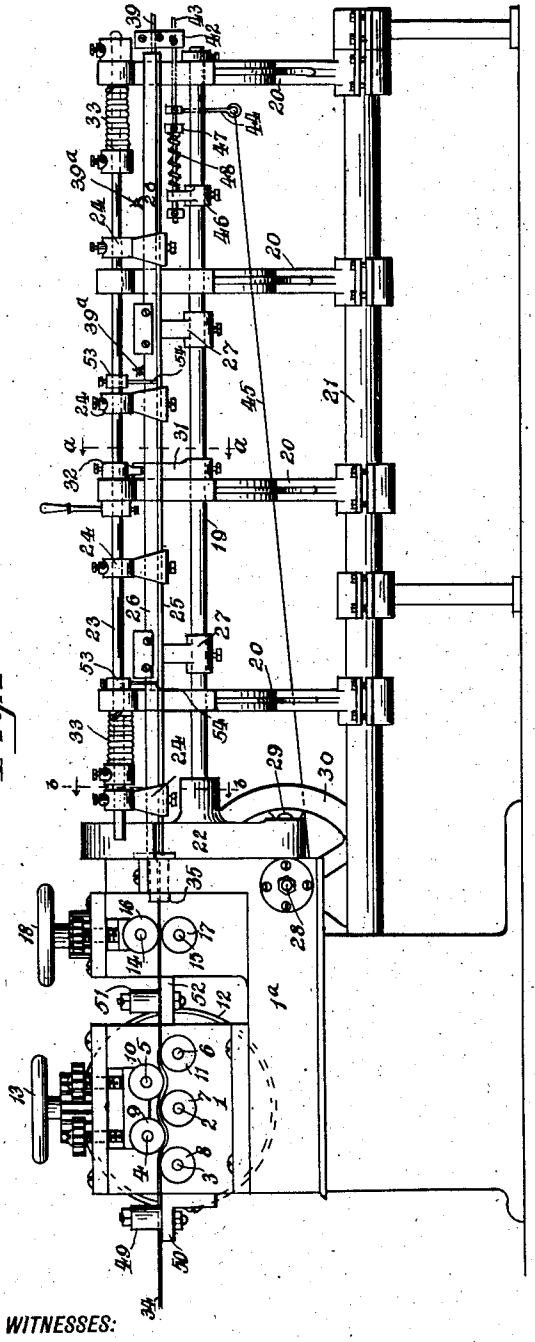

Fig 2

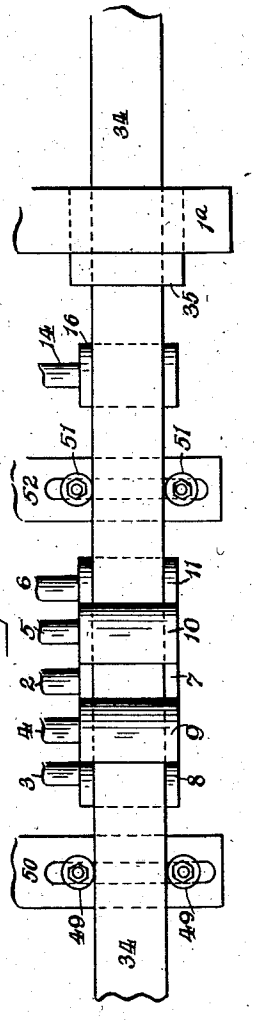

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Fig. 3

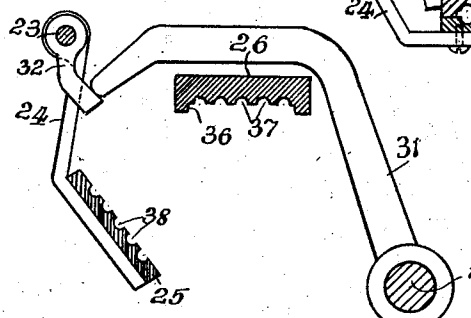


Fig. 4

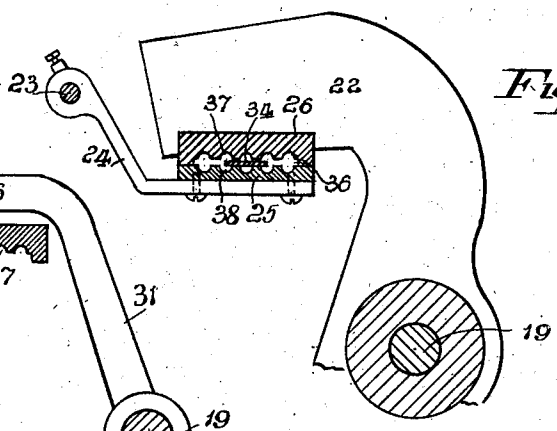


Fig. 5

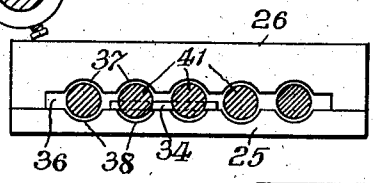


Fig. 6

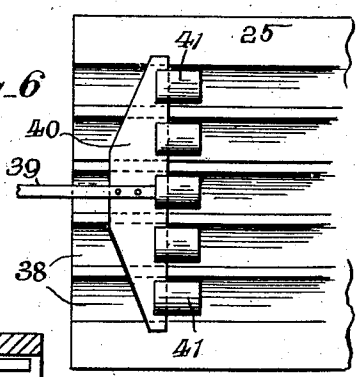


Fig. 7

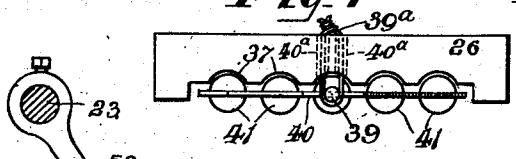


Fig. 8

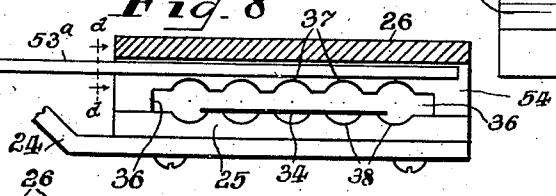
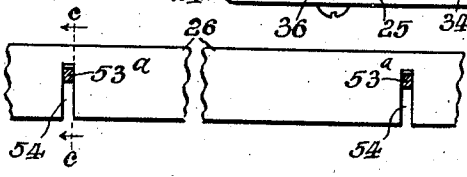


Fig. 9



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UNITED STATES PATENT OFFICE.

FRANKLIN BONAPARTE SHUSTER, OF NEW HAVEN, CONNECTICUT.

STRIP-METAL STRAIGHTENING AND CUTTING-OFF MACHINE.

973,571. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed May 23, 1910. Serial No. 562,848.

To all whom it may concern:

Be it known that I, FRANKLIN B. SHUSTER, a 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 Strip-Metal 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 metal straightening and cutting off machinery, and particularly to machines adapted for straightening and cutting off into predetermined lengths thin sheet metal strips, as will be hereinafter more fully set forth.

Referring to the drawings: Figure 1 represents a reduced side elevation of the machine; Fig. 2 is an enlarged upper plan view of straightening rolls and feed rolls; broken view of their shafts, broken view of the machine frame, and broken view of a strip of metal; Fig. 3 is an enlarged sectional view of the sheet metal guide-bar and its apron; cutting off lever rock shaft and apron supporting rock shaft on line *a* of Fig. 1; Fig. 4 is an enlarged broken view of the cutting off lever and sectional view of its rock shaft, and sectional view of the guide-bar and its apron and apron supporting rock shaft on line *b* of Fig. 1; Fig. 5 is an enlarged end elevation of the guide-bar and its apron, and cross sectional view of the gage rod head; Fig. 6 is an enlarged broken upper plan view of the guide-bar apron showing the gage rod head overlying the same; Fig. 7 is an enlarged rear elevation of the gage rod and its head, guide-bar and means for operatively suspending the rod to the bar; Fig. 8 is an enlarged cross sectional view of the guide-bar on line *c* of Fig. 9, sectional view of the apron supporting rock shaft, broken view of one of the apron arms and side elevation of one of the stock extractors; and Fig. 9 is an enlarged broken side elevation of the guide bar, and cross sectional view of the extractors on line *d* of Fig. 8.

The principal features of the machine shown at Fig. 1 belong to the ordinary wire straightening and cutting off machines, and they consist of the head 1 carrying the straightening roll shafts 2, 3, 4, 5 and 6. These shafts carry the straightening rolls 7, 8, 9, 10 and 11 on one side of the machine, and pinions (not shown) on the opposite side of the machine, which pinions mesh together and are driven by the pulley 12 mounted on shaft 2, and the adjustment of these rolls is effected by means of the hand wheel 13 in the usual manner. 14 and 15 are the feed roll shafts carrying the feed rolls 16 and 17 adjusted by means of the hand wheel 18. 19 is a rock shaft journaled in the standards 20, which standards are supported on the large stationary pipe 21, and 22 is the cutting off lever mounted on the inner end of said rock shaft. 23 is a smaller rock shaft journaled in the upper ends of the standards 20, and 24 are the apron arms secured thereto and to the apron 25. 26 is the guide-bar supported by the brackets 27 from the rock shaft 19, so that when the rock shaft 19 is rotatively actuated the guide-bar will be actuated with it. The cutting off lever 22 is actuated in the usual manner by means of a cam (not shown) on the shaft 28 in frame 1^a, engaging a roll (not shown) on the pin 29 in the lower end of said lever. 30 is the combined balance and driving wheel on said shaft. 31 is an arm—see Figs. 1 and 3—on the shaft 19 adapted to rock with said shaft and engage the toe of the collar 32 and rock the shaft 23 and carry the apron away from the guide-bar to allow a severed strip to drop out. 33 are torsional springs on the shaft 23 adapted to return the apron against the guide-bar.

The above description briefly sets forth the present construction of machines for straightening and cutting of wire.

My present improvement consists in the addition of certain features whereby the machine is adapted to straighten and cut off flat metal strips of any thickness and width within its capacity. Instead of grooved straightening and feeding rolls as in wire straightening, the rolls shown have smooth faces for feeding the flat strip 34. The die 35 through which the strip is fed to the guide-bar is made to conform to flat instead of round stock. In feeding round wire, a semi-circular groove was formed throughout the length of the guide-bar to form a passageway through which the wire from the

feed rolls was carried, and a gage rod was located in the groove of the guide-bar in advance of the incoming wire with which said wire contacted to actuate the cutting off mechanism.

In utilizing the above described features of the machine adapted for round wire, I also employ a guide-bar and apron for strip stock, but add a new feature consisting of the recess 36 formed by a depression in the guide-bar, so that when the apron is closed the recess will form a passageway through which the stock is delivered from the feed rolls through the guide-bar. Longitudinal grooves or depressions 37 are formed at the bottom of the recess 36 in the guide bar, and similar depressions 38 are formed in the apron.

39 is the gage rod carrying the thin sheet metal head 40 to which head is attached the gages 41, and as these gages, by reason of the grooves 37 and 38, extend below the inner surfaces of the guide-bar and its apron, it will be impossible for the end of a thin metal strip to slip by these gages 41. While only one of these gages would be sufficient for narrow metal strips, a plurality are employed to accommodate wider strips.

The gage rod 39 is adjustably clamped in the block 42 at the rear of the machine as shown at Fig. 1, and the position of the gages 41 are thus located in the guide-bar to represent the length of the severed strips. The block 42 is also secured to the lengthwise movable strip rod 43, and on this trip rod is secured the finger 44 to which one end of the trip wire 45 is attached while the other end of said wire is connected with the clutch mechanism (not shown). This manner of tripping the clutch mechanism being old and well known, a detail description here would be unnecessary.

46 is a collar on the rock shaft 19, and 47 is a collar on the trip rod 43, and between these collars, on rod 43, is the balance spring 48. The object of this spring is to reduce the strain or push necessary for tripping the clutch mechanism to actuate the cutting off lever 22. In other words, when very thin metal strips are to be cut into predetermined lengths, it is absolutely necessary that the tripping mechanism be made sufficiently sensitive to be actuated by the slight pressure of which this thin metal strip is only capable without buckling, as any resistance offered that the strip could not overcome without buckling would vary the length of the severed strip. Therefore, the tension on this spring is regulated to suit the thickness of the metal strip by means of the adjustable collar 44 on the trip rod.

The gage rod 39 is suspended in the guide-bar by passing the wire 39^a around said rod, Fig. 7, and up through the holes 40^a of the bar and twisting their free ends together to form a supporting loop for said rod. This arrangement will enable the rod to be freely actuated longitudinally and also maintain it in position when the apron is temporarily swung away from the gage bar. The holes for the rod suspension wire or wires are formed on either side of the rod and at regular distances apart the extreme length of the guide-bar. While the block 42 could be made to hold a plurality of rods extending into the longitudinal grooves of the guide-bar and apron to act as gages, a single rod carrying the gages 41, as shown, will serve the same purpose and thus avoid the necessity of suspending a plurality of rods to the guide-bar. It will, therefore, be understood that where I employ the term "gage" to indicate an element against which the end of a metal strip from the rolls contact to actuate the cutting off mechanism, it applies as well to a plurality of members or contact points connected to a single rod as shown, as to a single rod for each depression in the apron and bar and a single rod therein to form the gage. In each and every instance, however, the recess in the guide bar through which the strip is fed from the rolls is an important feature in connection with the depression or depressions.

49, Figs. 1 and 2, are guide rolls adjustably located on the rear bracket 50, and 51 are similar guide rolls adjustably mounted on the bracket 52, one pair of said guide rolls being located on each side of the set of straightening rolls 6, 7, 8, etc., in order to guide the metal strip into the die 35 and also preserve its true alinement in the recess of the guide-bar. While pins could be used in place of rolls to effect the guiding of the metal strip, the rolls offer less friction and are therefore preferable.

As very thin metal strips are apt to hang between the cutting off die and the gages after being severed, and not having sufficient weight to disengage themselves therefrom when the apron is opened, the extractors or pick outs 53 are mounted on the apron rock shaft 23 with their horizontal fingers 53^a projecting into the transverse slots 54 of the guide-bar 26 as shown at Figs. 1, 8 and 9. As the normal position of these fingers is above the recess 36 and the grooves 37 in the bar, they will not interfere with the feeding of the metal strips. When, therefore, the rock shaft 23 turns to carry the apron away from the guide-bar, the extractors will be carried with it and dislodge any strip disposed to hang in the guide bar. It will be understood that any numbers of these extractors may be employed and distributed along the guide-bar that will give the best results, and, if necessary, be timed to move in unison with the apron or at a later period.

Having thus described my invention, what I claim is:

1. In a strip metal straightening and cutting off machine of the character described, the combination with straightening rolls and cutting off mechanism, of a guide-bar and its movable apron, said bar having a recess in the face to form with the apron a passageway for a metal strip, said guide-bar having one or more longitudinal depressions at the bottom of said recess, the apron having corresponding depressions, and one or more gages adapted to project into said depressions of the guide-bar and apron to prevent the feeding of a metal strip by said gage or gages.

2. In a strip metal straightening and cutting off machine of the character described, the combination with straightening rolls and cutting off mechanism, of a guide-bar and its movable apron, said bar having a recess in its face to form with the apron a passageway for a metal strip, said bar having longitudinal depressions at the bottom of the recess, the apron having corresponding depressions, gages adapted to project into the depressions of the bar and apron for the purpose described, a trip rod, means for connecting the gages thereto, means for connecting the trip rod with the cutting off mechanism, and an adjustable tension spring connected with the tripping mechanism to assist a thin metal strip in actuating said tripping mechanism.

3. In a machine of the character described, the combination with the guide bar, its apron and a gage rod, said guide bar having a series of holes extending therethrough and located on each side of the gage rod, suspension wires for said holes formed into a loop for supporting the gage rod when the guide bar apron is opened.

4. In a sheet metal straightening and cutting off machine of the character described, the combination with the guide-bar and its apron, of strip extractors adapted to contact with a severed strip and throw it out of the guide-bar when the apron has been carried away from said bar.

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

FRANKLIN BONAPARTE SHUSTER.

Witnesses:
WILLIAM SUKLOFF,
E. L. SIMPSON.