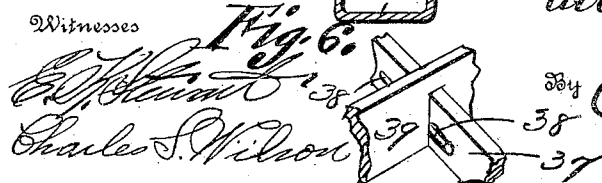
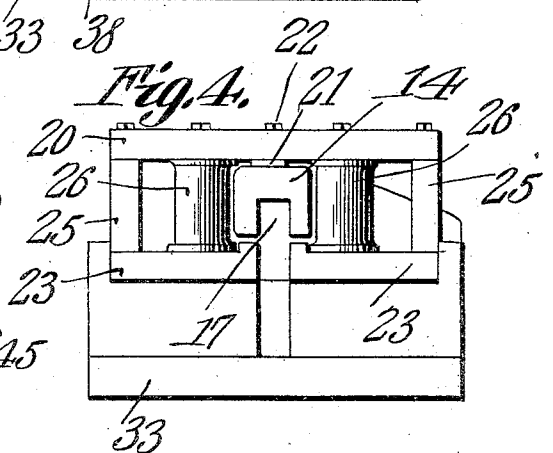
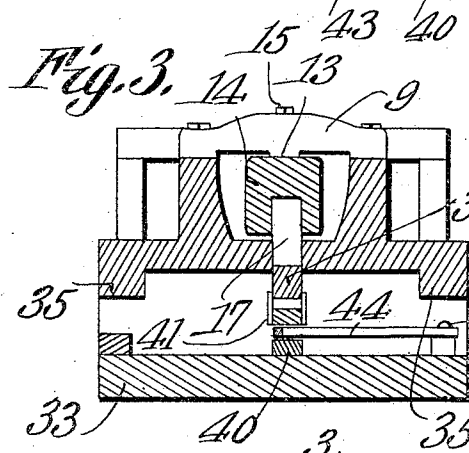
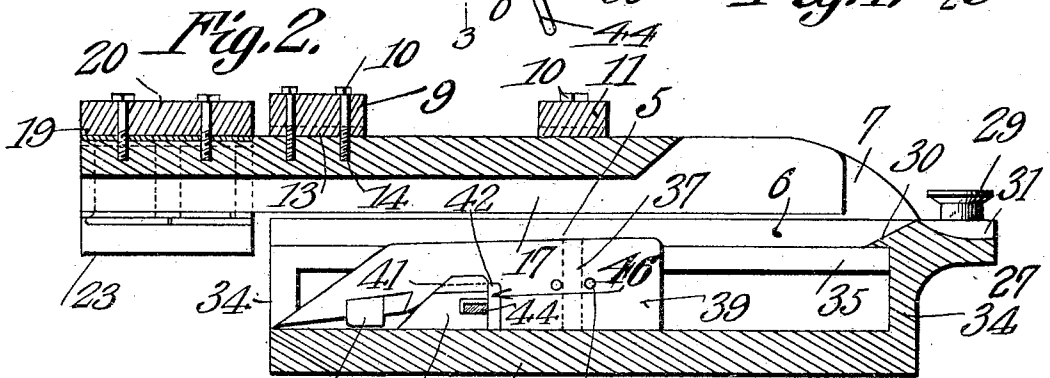
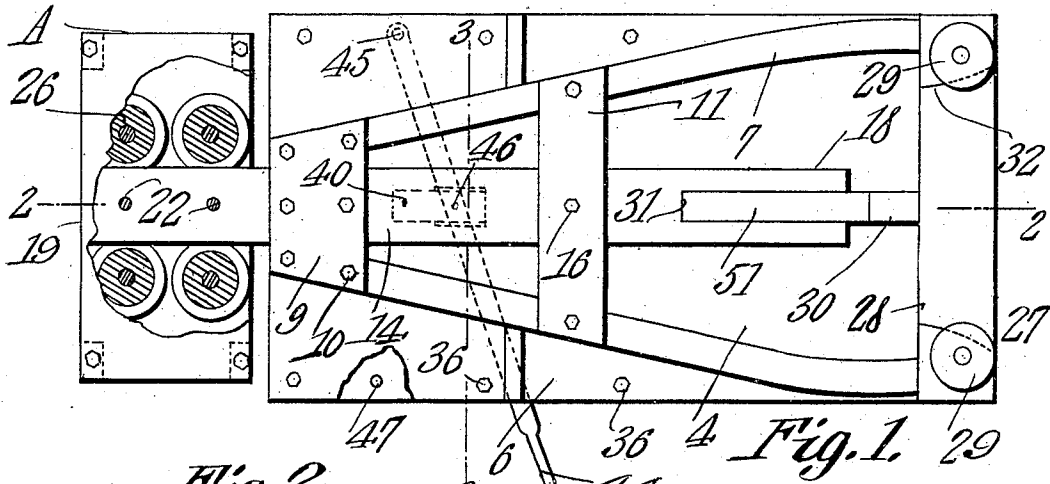


G. R. BENTLEY.
STEEL TIE FORM.
APPLICATION FILED JULY 8, 1909.

953,892.

Patented Apr. 5, 1910.



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STEEL-TIE FORM.

953,892.

Specification of Letters Patent.

Patented Apr. 5, 1910.

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To all whom it may concern:

Be it known that I, GEORGE ROLLAND BENTLEY, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented a new and useful Steel-Tie Form, of which the following is a specification.

My invention has reference to improvements in pressed steel tie form machines and is designed to increase the durability, strength and satisfaction of mechanism of this type and character.

It contemplates the forming of a steel plate tie in a manner that will eliminate all further work thereon.

It still further contemplates a machine of this class which may be secured to the furnace in such a way that by one movement of the plates contained therein, the same may be drawn through the machine and formed in any desired shape.

With the above and other ends in view the invention consists in the construction, combination and arrangement of parts all as hereinafter more fully described, specifically claimed and illustrated in the accompanying drawings, wherein,

Figure 1 is a top plan view of my improved tie former. Fig. 2 is a longitudinal section taken along line 2—2 Fig. 1. Fig. 3 is a transverse cross section taken along line 3—3 Fig. 1. Fig. 4 is an elevation of the machine showing the delivery end thereof. Fig. 5 is a transverse cross section of a product of the machine. Fig. 6 is a detail perspective view of the means for preventing scoring of the metal plate as it is drawn through the apparatus.

The product wrought by this machine as shown in Fig. 5, comprises an angularly formed U shaped steel plate 1, having the extremities of its arms 2 slightly curved inwardly to form a means 3, whereby the filler may be retained therein. The flat stock is placed in the furnace heated, drawn through the machine and is delivered in the form shown, the bolt holes and like orifices being driven or punched into the blank after the latter is formed.

A hollow casting 4, forms the main body of my machine and is so molded that it has extending, longitudinally the entire length of its upper plate, the slot 5 which, at one extremity, abuts on the delivery mechanism and at the other on the furnace. Disposed on each side of said slot 5 and centrally

located on, and made integrally with, the upper plate 6, are the plate forming guides 7, the transverse contour of which is similar to that of a half bell, the flared end thereof being adjacent the furnace and the opposite end having its sides practically perpendicular and situated adjoining the delivery mechanism, indicated in general as A. In order that these guides 7 may be so constructed and a means furnished whereby the mandrel may be carried on the machine, there is provided the cross plate 9 at the extremity of the guides and an intermediate plate 11, secured to the guides by the bolts 10. The forward plate 9, is formed with a downwardly projecting intermediate stud 13, against which the mandrel 14 bears and is secured thereto by means of the bolts 15, interposed between the similar bolts 10. This stud 13 permits the metal, when it is drawn through the machine, to have the curved parts 3 formed at each extremity of the arm 2 thereof. The rear plate 11 is devoid of such a stud, resting flush with the mandrel 14 and secured thereto by the intermediate bolts 16.

The mandrel extends practically the entire length of the machine and has a projection 19 which carries the delivery mechanism A. In the form shown in the drawings, the mandrel comprises a rectangularly formed, longitudinally extending bar, having on its lower face the passage 17 reaching throughout its entire length and at the extremity thereof adjacent the furnace is cut entirely through forming a pair of arms 18.

The product delivery mechanism carried on the projection 19, comprises the rectangularly formed upper plate 20, having a centrally disposed stud 21 on its lower surface through which extends the bolts 22 securing the mandrel thereto. The lower plates 23 having the passage 17 therebetween, are secured to the upper plates 20 by the spacing members 25 and the shafts of the rollers 26. These rollers are journaled between the plates 23 and 20 and are adapted to facilitate the passage of the tie plate therethrough and to provide a means whereby the desired shape and finish are supplied to the same.

To promote the operation of carrying the plate from the furnace to the guide, there is provided adjoining the furnace, a feeding mechanism 27 which comprises a transverse bar 28 cast integrally with main body portion carrying at each longitudinal extrem-

ity a vertical stub roll 29 and having a sloping guide 30 for the operating tongs disposed in the passage 5. Interposed between the said rolls 29 is a channel 31, the sides 32 of which are tapering toward the guide 7 and constructed in such a manner that the bends or creases formed therein are parallel and located in exactly the desired position.

A bed plate 33 is held in spaced parallel relation from the upper plate 6 of the body portion of the form by the transverse, upwardly extending plates 34, each of which is pierced by a centrally vertical passage. To provide further means whereby the plate 6 may be stiffened and reinforced, the bars 35 are secured under the upper longitudinal edges thereof by the bolts 36. Passing through an intermediate bar 37 and held thereto by the pins 38 on each side thereof, is the wedge 39 the portion at the rear extremity thereof forming the weight, while the forward end is designed to be carried and brought into engagement with the plate passing through the machine preventing the lower surface thereof from becoming warped or injured by the passage 5. This is done by the reciprocation of the secondary wedge 40 in the recess 42 located in the lower face of the forward portion of the wedge 39, which is provided with a bumper or pad 43 which prevents injury to the bed plate 32 or the wedge 39. In order to retain the wedge 40 in the recess 42, it has the retaining and guide plates 41 along its upper edge, which engage each side of the base of the recess 42. A lever 44 operates the secondary wedge 40 and being fulcrumed at (45) on one side of the bed plate 13 and secured to the wedge 40 by means of a pin passing through the slot 46 formed therein, the handle of the same extends on the opposite side of the base and is limited in its motion by a lug 47 and the intermediate plate 37 in such a manner that the forward portion of the member 39 is never raised above the level of the plate 6.

In the operation the heated plate is drawn through the machine by means of the tongs entering the slot 17 from the delivery end A, the wedge 39 being in its lower position, and the tongs being opened between the arms 18, the slope 30 forming a guide. The tongs are then inserted between the door of the furnace and caused to grip the plate whereupon a pull on the tongs will draw the plate between the rolls 29 and under the mandrel 14, the bell formed guide 7 bending the edges thereof upwardly into the design and semblance of the desired shape and before the same is brought into exact engagement with the forming members. When the tongs are past the wedge 39 the same is raised completely filling the passage, and thus preventing any of the heated iron from being scored or injured by the edges of the passage. After having completed this operation

the guides 7 are in such close relation to the mandrel that the plate takes the desired rectangular form and is passed from the main body of the machine to the delivery mechanism, the rolls 26 facilitating the passage thereof through the same and adding the finishing touches thereto. The mandrel 14 having its face partially curved or provided with rounded edges in that portion thereof extending into the delivery mechanism consequently binds the plate and by the close engagement with the rolls 26, forms the retaining members 3 thereon. The passage 51 between the arms 18 permits the tongs to be opened to their fullest extent and placed in the furnace through the slot or guide 30, the latter also guiding the tongs into the passage 5 when it has engaged the plate between its jaws.

Having thus fully described my invention what I claim as new and desire to secure by U. S. Letters Patent is:

1. In a metal bending device of the class described, the combination with a bed plate, of a slotted supporting plate, a centrally disposed bell formed metal guide, and a metal bending mandrel disposed in said guide having a channel in its lower side registering with the slot in the supporting plate whereby to accommodate a metal withdrawing tool.

2. In a metal bending machine of the class described, the combination with a bed plate, of a supporting plate held in spaced parallel relation thereto, a centrally disposed metal guide made integrally with the supporting plate, and a longitudinally extending metal bending mandrel having a channel in the lower face to permit the passage of a metal-holding tool.

3. In a metal bending machine of the class described, the combination with a bed plate, of a supporting plate held in spaced parallel relation thereto, a bell formed metal guide made integrally therewith, and a metal bending mandrel having its lower face channeled and its rearward end bifurcated.

4. In a metal bending machine of the class described, the combination with a bed plate, of a supporting plate held in spaced parallel relation thereto, a metal guide disposed on the upper face of the supporting plate, a mandrel carried in said guide, and having a channel in its lower face, and guides on the upper side of the supporting plate at the rear end thereof leading into said channel.

5. In a metal bending machine of the class described, the combination with a bed plate, of a longitudinally slotted supporting plate held in spaced parallel relation thereto, a bell formed metal guide disposed on each side of said slot, a mandrel arranged within and supported on the upper edge of said bell formed guide and having a chan-

nel in its lower face and bifurcated at its rear end, a feeding mechanism adjacent said bifurcated end of the mandrel and a delivering and finishing mechanism carried by the opposite end thereof.

6. In a metal bending machine of the class described, the combination with a bed plate, of a longitudinally slotted supporting plate held in spaced parallel relation thereto, a metal guide on said plate on each side of the slot therein, a mandrel interposed between said guides, having a channel in its lower face and having its rear end bifurcated to permit the engagement of the mandrel by the metal operating means carried in said channel, a feeding facilitating means located adjacent the said bifurcated end and a delivering and finishing mechanism supported by the opposite end thereof.

7. In a metal bending machine of the class described, the combination with a bed plate, of a slotted supporting plate, a bell formed guide disposed on each side of said slot, a mandrel supported by said guide having a channel in its lower face and its rear extremity bifurcated to permit the opening of the tongs adapted to reciprocate in said channel, means for facilitating the movement of the sheet metal plate into the guide and into operative engagement with the mandrel, and means carried at the opposite extremity thereof for delivering and finishing the bent metal plate.

8. In a metal bending machine of the class described, the combination with a bed plate, of a slotted supporting plate, guides disposed on each side of said slot, a mandrel interposed between and supported by said guides having a channel in its lower face registering with the said slot, and its rearward extremity bifurcated, means carried by the forward extremity of the mandrel comprising a pair of substantially rectangular plates having journaled therebetween a series of rollers said rollers adapted to bear against the metal plate drawn through said machine, and means pivoted under said supporting plate for preventing the edges of said slot from scoring or corrugating the metal passing through the machine.

9. In a metal bending machine of the class described, the combination with a bed plate, of a slotted supporting plate held in spaced parallel relation thereto, guides disposed on each side of said slot, a mandrel interposed between the guides and having a channel in its lower face adapted to register with said slot, and means adjacent the

extremity of said slot under said supporting plate for preventing the scoring or injuring of the metal passing through the machine.

10. In a metal bending machine of the class described the combination with a bed plate, of a slotted supporting plate held in spaced parallel relation thereto, guides disposed on each side of the slot in said plate and a delivering and finishing mechanism adjacent the smaller end of said guides, and a mandrel disposed between said guides comprising a longitudinally disposed bar having a channel in its lower surface, and bifurcated at its rearward extremity, and having its upper edges rounded at its forward end.

11. In a metal bending machine of the class described the combination with a bed plate, of a supporting plate held in spaced parallel relation thereto and provided with a central longitudinal slot, semibell formed guides disposed on each side of said slot a mandrel disposed between and supported by said guides and carrying at its forward extremity a delivering and finishing mechanism, comprising a pair of transverse plates, and metal rollers journaled between said plates.

12. In a metal bending machine of the class described, the combination with a bed plate, of a slotted supporting plate held in spaced parallel relation thereto, a mandrel having a channel in its lower extremity, registering with said slot, means carried at the forward extremity of the mandrel for delivering and finishing the metal, and means mounted on said supporting plate for filling said slot and presenting a smooth surface to the metal.

13. In a metal bending machine of the class described, the combination of a bed plate, a slotted supporting plate held in spaced parallel relation thereto, a mandrel carried by said supporting plate having a channel in its lower face registering with the slot therein and means for presenting a smooth surface under said supporting plate consisting of a pivoted wedge having a weight attached to its rearward extremity, and a slide under the forward portion of the wedge to raise and lower the same.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE ROLLAND BENTLEY.

Witnesses:

DAVID H. MARTIN,
F. B. MICKEY.