

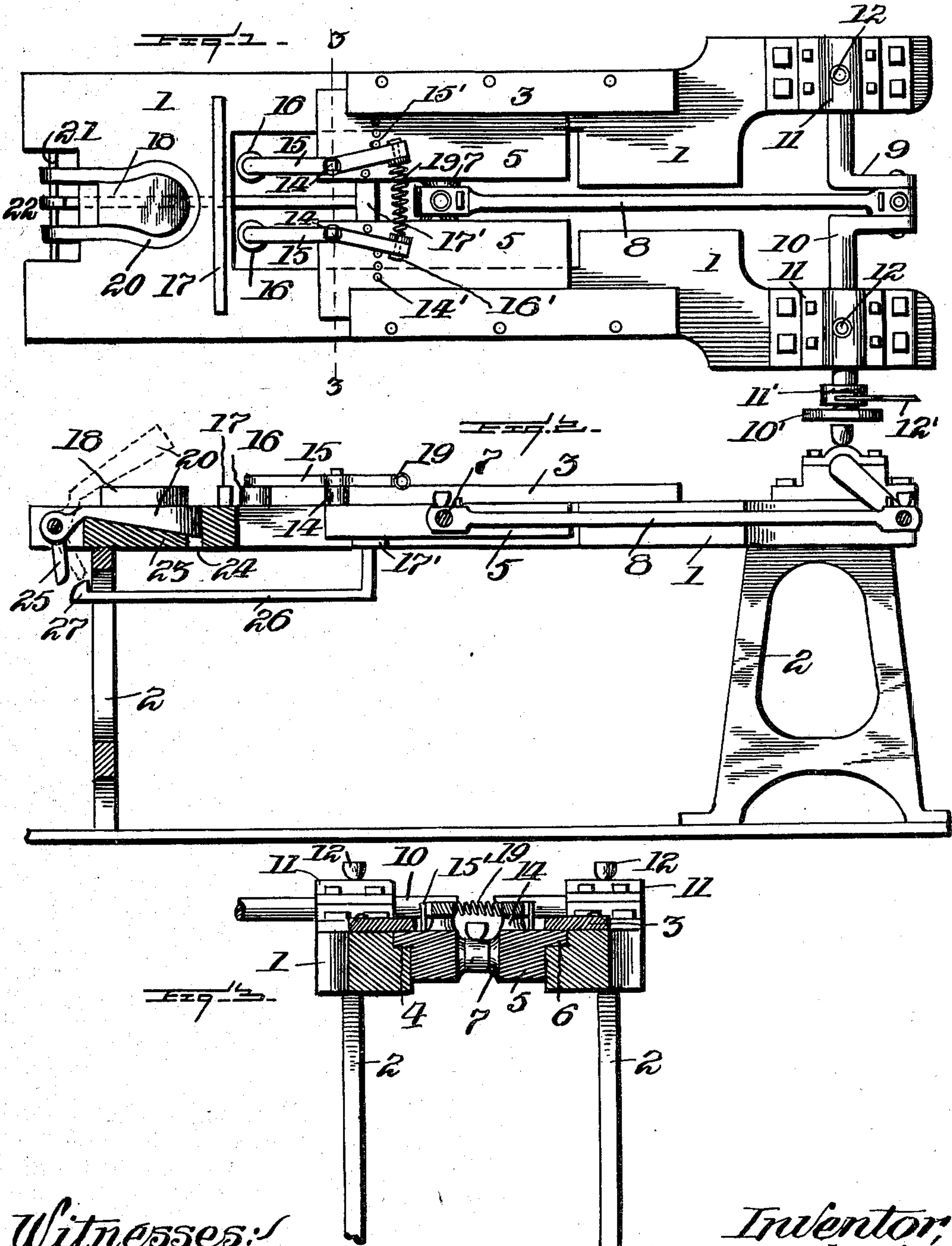
No. 733,117.

PATENTED JULY 7, 1903.

C. ARBUTHNOT.
MACHINE FOR BENDING HORSESHOE BLANKS.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.



Witnesses:
J. H. Butler
E. E. Potter

Inventor,
Chas. Arbuthnot,
By *J. H. Butler*
E. E. Potter
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES ARBUTHNOT, OF MCKEES ROCKS, PENNSYLVANIA.

MACHINE FOR BENDING HORSESHOE-BLANKS.

SPECIFICATION forming part of Letters Patent No. 733,117, dated July 7, 1903.

Application filed September 15, 1902. Serial No. 123,427. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ARBUTHNOT, a citizen of the United States of America, residing at McKees Rocks, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Bending Horseshoe-Blanks, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in machines for bending blanks, such as horseshoe-blanks and other shapes, the particular objects of my invention being to provide a simple, durable, comparatively inexpensive, and effective machine for bending metal bar or blanks into horse or mule shoe shapes and to provide means for automatically removing the shoe after it has been shaped from the former or shaper.

Briefly described, my invention comprises a suitable frame having a bed or table provided with guides, and in these guides is arranged a cross-head adapted to reciprocate therein and connected to a drive-shaft journaled in the frame. Pivottally mounted on the cross-head, so as to move therewith, is a pair of former-arms, which are provided with rollers at their forward end and at their rear ends are normally pressed outward by means of a spring arranged between the ends. A shaper or former is mounted on the bed in front of the reciprocating cross-head, and the blank from which the shape is formed is placed on the table or bed between the rollers carried by the former-arms and the shaper or former, whereby it is bent around the shaper or former by the rollers on the former-arms engaging the same, these arms being forced away from each other at their rear ends, so as to cause the rollers carried by the arms to remain in engagement with the bar and cause the blank to assume the shape of the former or shaper. A trip or removing mechanism is provided and a practical construction of the same comprises, in part, a loop which lies around the shaper or former and has a dog or pawl depending below the bed or table to be engaged by an arm carried by the reciprocating cross-head, whereby when the latter

moves backward the trip is elevated and the shoe discharged from the former or shaper.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a top plan view of the machine, illustrating my invention. Fig. 2 is a central longitudinal sectional view of the same. Fig. 3 is a cross-sectional view taken on the line 3 3 of Fig. 1, the supporting-legs being partly broken away.

In carrying out my invention after the metal bar or blank is received from the rolls and while warm or hot is passed through a cutter, whereby it is cut into the proper lengths for the shape, the blank is presented to mechanism for forming the shape, as will now be described. This mechanism embodies a suitable bed or table 1, preferably supported upon three legs 2, two of the same being at the rear end of the machine and one at the front end thereof, as shown. The bed or table is provided at its upper face at opposite sides with suitable guides 3, and in these guides and on ledges 4 of the bed or table is arranged a reciprocating cross-head 5, the latter being provided with slides 6 to operate on the ledges or shoulders 4. This reciprocating cross-head is, though made of a single piece of material, slotted from each end to a point near the center, and the remaining portion, which connects the two side pieces thus formed together, is turned to form a wrist-pin 7, to which the one end of the connecting-rod 8 is attached. This connecting-rod at its other end is attached to a bell-crank 9 and a drive-shaft 10, the latter being journaled in suitable bearings 11, mounted on the bed or table, and which may be of the ordinary pillow-block form, provided with oil-caps 12 for feeding lubricant to the drive-shaft. The connection of the connecting-rod 8 with the bell-crank and with the wrist-pin is of the ordinary gib-and-key form, and I preferably provide this connection with oil-caps, so that the bearing parts may be kept perfectly lubricated. The cross-head 5 is provided adjacent its forward end with a pair of bosses

14, and on these bosses is pivotally mounted a pair of former-arms 15. These arms may be conveniently mounted on the bolt or tap which engages in the bosses 14, and at their forward ends the former-arms carry rollers 16, which are adapted to engage the blank 17 and bend the same around the shaper or former 18, which is located near the forward end of the bed or table. At their rear ends the former-arms have a spring 19 arranged between the same, this spring tending to normally force the rear ends of the former-arms away from each other, and thus cause the rollers 16 during the bending of the blank to engage the same at all times during the process of bending. In order to automatically remove the formed shoe or other shape from the former or shaper after it has been completed, I provide a trip mechanism, of which I have shown a practical form of construction in this illustration. The construction herein shown embodies a loop 20, which is mounted on a shaft 21, journaled in the cut-away portion 22 at the forward end of the bed or table. The upper face of the loop 20 when the latter is in its normal position is flush with the upper face of the bed or table; but the lower face of this loop is made at an incline and rests on the inclined seat 23, provided therefor in the bed or table around the shaper or former 18. A discharge-port 24 is made at the rear end of this inclined seat. When the loop is elevated, any scale or other substance which may drop into the recess normally occupied by the loop will slide down the inclined walls of the seat and be discharged through the opening 24. The loop is operated through the medium of the depending pawl or dog 25, carried by the shaft 21 and by the L-shaped arm 26, connected to the cross-head 5. This L-shaped arm is provided at its free end with a hook 27, the outer end of which is beveled, and during the forward movement of the arm this beveled forward end engages the beveled lower end of the pawl or dog 25 and rides past the same, while on the rearward movement of the cross-head, together with the arm 26, the hook 27 engages the pawl or dog and actuates the same to operate the loop, as shown in dotted lines in Fig. 2, so as to cause the same to remove the shape from the shaper or former and discharge the same at the end of the machine.

The rollers 16, which are carried by the former-arms, are preferably made of a thickness equal to the thickness of the bar or blank which is to be bent into shape, and consequently these rollers are bearing firmly against the outer face of said bar over the entire width of said face during the time of the bending operation. As the cross-head is moved forward the rollers carried by the former-arms engage the bar or blank 17, forcing the same against the shaper or former, and during the continued forward movement of the cross-head the former-arms bend the blank or bar

around said shaper or former, the spring 19 serving at all times to keep the rollers in firm contact with said bar or blank in order that the same may be effectually shaped to the contour of the shaper or former. As the cross-head completes its forward stroke and begins its return movement the catch 27 engages the dog or pawl and elevates the loop, so as to discharge the shape from the shaper or former, and as the catch 27 passes out of engagement with the dog or pawl 25 the loop falls to its normal position before the cross-head again begins its forward movement. The bed or table is suitably cut away, so as to permit the operation of the cross-head and also the reciprocating of the upwardly-extending portion of the arm 26, which connects with said cross-head. By bending the blank or bar around the shaper or former and firmly engaging said blank or bar at the point of bending during the process I am enabled to effectually bend the same without in any way distorting the metal, which has been a serious objection to devices for this purpose as heretofore operated where the bar or blank to be bent was forced within the shaper or former and bent into shape.

In practice it is desirable to temporarily retain the cross-head at the limit of its rear stroke, which is the position shown for same in Fig. 1. This is to permit the placing of another blank in position before the cross-head again moves forward. To this end I provide the drive-shaft 10 adjacent the drive-pulley 10' with a clutch 11', which may be of any desired or approved form and operated by hand-lever 12', by a treadle, or in other convenient manner.

As the tension of the spring 19 normally tends to force the forward ends of the former-arms 15 toward each other, it is desirable to hold these arms in the proper position for engaging the blank. To this end I provide the cross-head with a series of apertures 14', placed in a line outside each former-arm. In one aperture in each row is placed a pin 15', against which pins the former-arms rest and their outward movement under the tension of the springs limited. The pins are changed to different holes, according to the size of the shape being formed. As the spring 19 may lose its tension under continued use, I mount set-screws 16' in the former-arms and connect the ends of the spring 18 thereto. As these set-screws are unscrewed the tension of the springs is increased. The arm 26 may be conveniently connected to the cross-head by a bar or cross-piece 17' or the end of arm 26 may be forked and connected one arm to each side member of the cross-head.

In the practice of the invention it will be noted that various changes may be made in the details of construction without departing from the general spirit of my invention. Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for bending metal shapes, the combination with the bed or table, a cross-head reciprocating therein, a pair of former-arms pivotally mounted between their ends on the cross-head, rollers carried by the forward end of said arms, and springs arranged between the rear end of said arms for normally separating the rear end of the same, means for limiting the movement of said arms, and a former mounted on the said table, substantially as described.

2. A machine for bending metal shapes, the combination with the table, of a reciprocating cross-head, operating means for said cross-head, former-arms pivoted between their ends on said cross-head, means for normally forcing apart the rear ends of said arms, and a stationary former mounted on said table, substantially as described.

3. A machine for bending metal shapes comprising a table, a reciprocating cross-head mounted thereon, means for reciprocating the same therein, a shaping means

mounted on the table, means pivotally mounted on the table for removing a blank, said means surrounding the shaping means and comprising a pivoted loop, said table having a seat therein to receive said loop, and means mounted on the cross-head adapted to engage said loop whereby the same may be raised from its seat to eject the blank, substantially as described.

4. A machine for forming metal shapes comprising in combination with a bed or table a shaper mounted thereon, a cross-head slidably mounted on the table, and arms carried by said cross-head for engagement with a blank, means for normally forcing together the forward end of said arm, and means for limiting the separating movement of said arms.

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

CHARLES ARBUTHNOT.

Witnesses:

JOHN GROETZINGER,
A. M. WILSON.