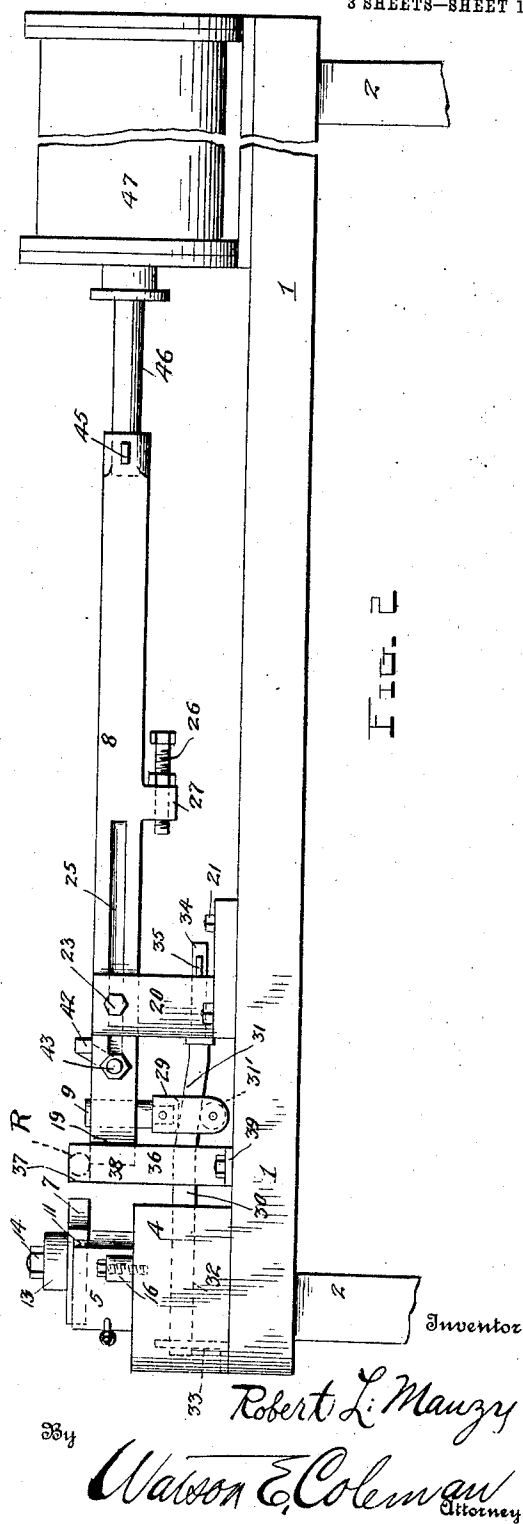
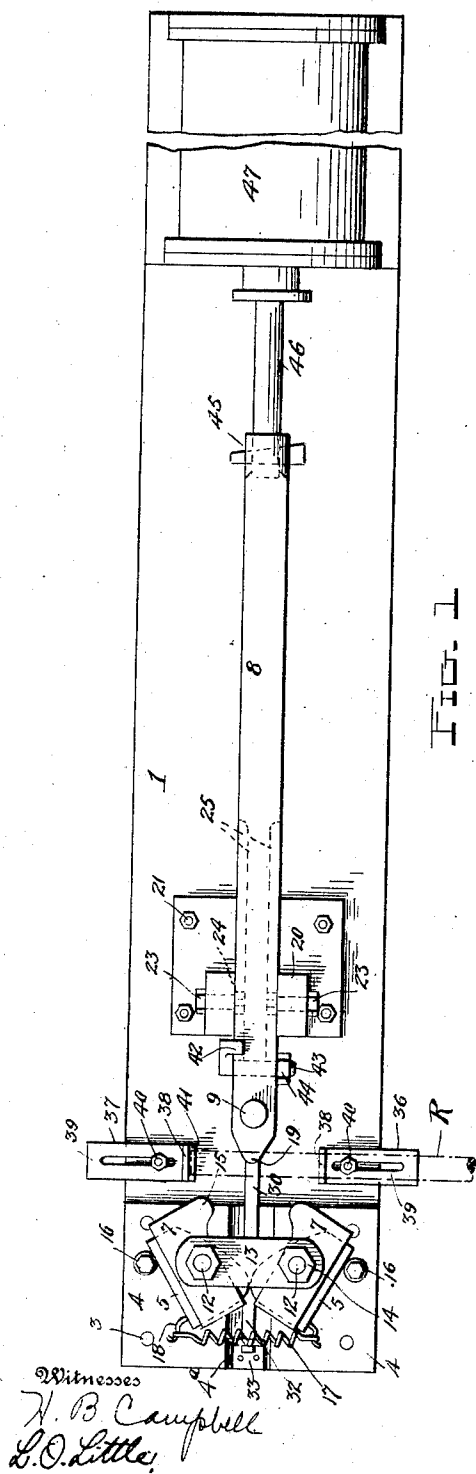


No. 868,792.

PATENTED OCT. 22, 1907.

R. L. MAUZY.
ROD BENDING MACHINE.
APPLICATION FILED JAN. 26, 1907.

3 SHEETS—SHEET 1.

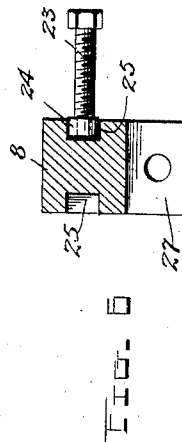
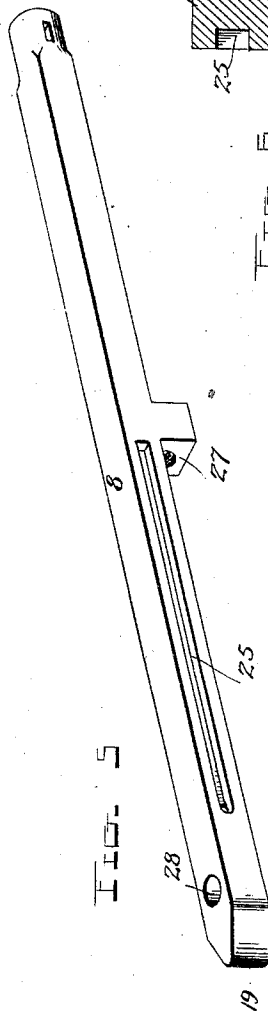
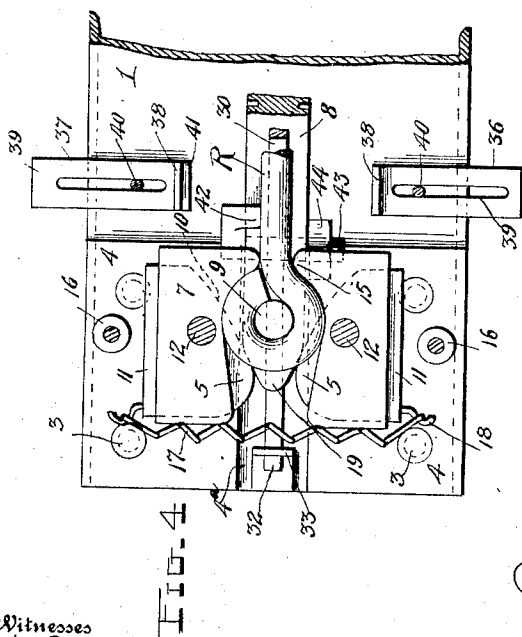
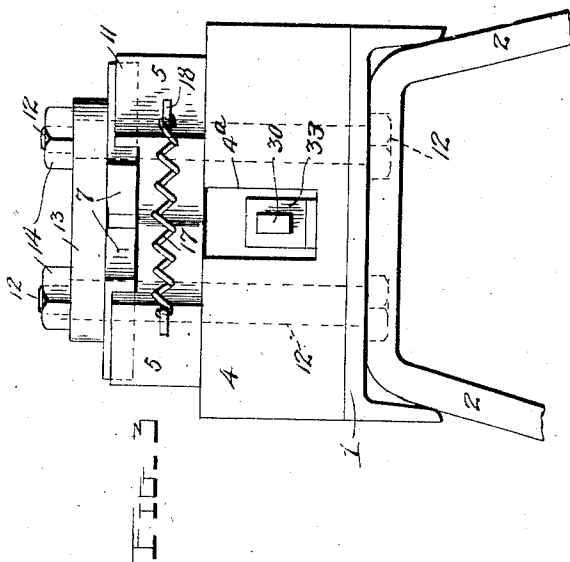


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3 SHEETS—SHEET 2.



Witnesses
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3 SHEETS—SHEET 3.

FIG. 2

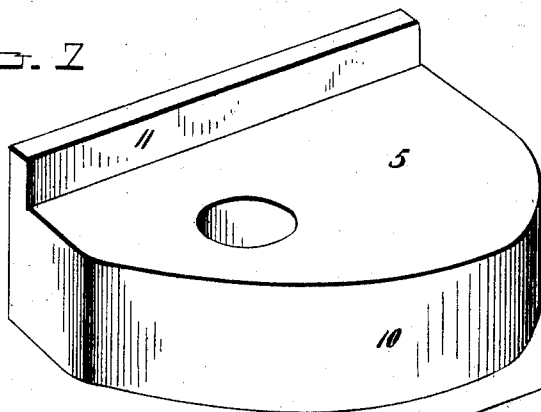


FIG. 8

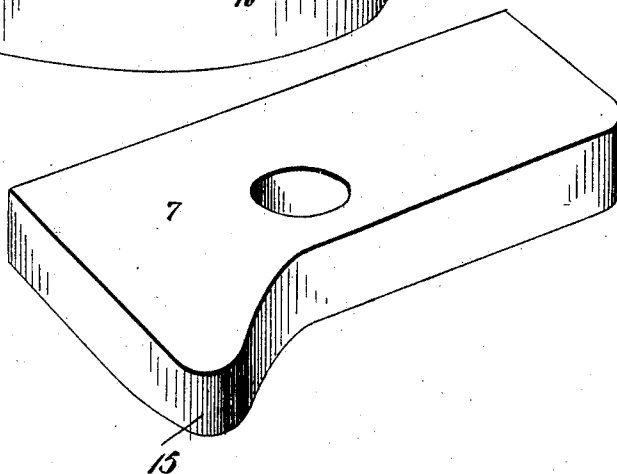


FIG. 9

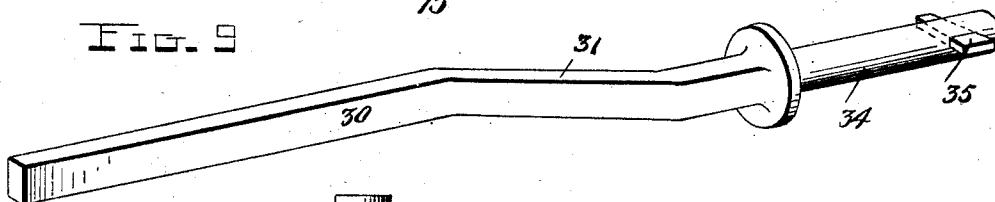
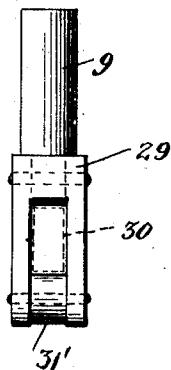


FIG. 10



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UNITED STATES PATENT OFFICE.

ROBERT L. MAUZY, OF PLATTSMOUTH, NEBRASKA.

ROD-BENDING MACHINE.

No. 868,792.

Specification of Letters Patent.

Patented Oct. 22, 1907.

Application filed January 26, 1907. Serial No. 354,251.

To all whom it may concern:

Be it known that I, ROBERT L. MAUZY, a citizen of the United States, residing at Plattsmouth, in the county of Cass and State of Nebraska, have invented certain new and useful Improvements in Rod-Bending Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in machines for bending metal rods to form eye bolts, hooks and the like; and its object is to provide a machine of this character which will be simple and practical in construction and effective in operation.

Further objects and advantages of the invention, as well as the structural features by means of which these objects are attained, will be made clear by an examination of the following specification taken in connection with the accompanying drawings, in which

Figure 1 is a plan view of my improved rod bending machine showing the dies in their open position. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation on an enlarged scale. Fig. 4 is a detail plan view, on an enlarged scale, of one end of the machine showing the dies in their closed position and also showing a finished eye bolt between them. Fig. 5 is a perspective view of the plunger. Fig. 6 is a cross section through the plunger, one of the guides for the latter being also shown. Fig. 7 is a perspective view of one of the cam blocks which carries one of the dies. Fig. 8 is a perspective view of one of the dies. Fig. 9 is a perspective view of the inclined track for the fork or carriage of the eye pin, and Fig. 10 is a detail view of the eye pin or die and its fork or carriage which travels on said inclined track.

The operative parts of my improved rod bending machine may be mounted upon a support of any description, but I preferably employ the one shown which consists of a channel beam 1 supported horizontally by metal straps 2 which are bent to form diverging supporting legs and which are secured to the bottom of the beam or bed plate 1 between its depending flanges, as clearly shown in Fig. 3.

Secured upon the top of one end of the bed plate 1 by bolts or the like 3 is a supporting block 4 formed with a centrally arranged longitudinally extending channel or groove 4^a. Upon the top of the block or support 4, on opposite sides of its channel, are pivotally mounted cam blocks 5 which carry opposing dies 7 and which are actuated by a plunger 8 also carrying a die 9 which latter co-acts with the dies 7. The opposing cam blocks 5, as clearly shown in Fig. 7, are of substantially rectangular form and have curved or cam faces 10 upon one of their sides. Upon their opposite sides, at their tops, are upwardly projecting flanges 11 which are engaged by the straight edges of the dies 7, which lat-

ter are in the form of flat plates arranged upon the tops of the cam blocks. The cams 5 and dies 7 are formed with alining pivot openings to receive pivot bolts 12 upon which they turn and which secure them together and upon the support 4. As shown, the bolts 12 extend vertically through the bed plate, the support 4, the cams, the dies and also through a cross piece or tie plate 13 arranged upon the tops of the dies 7 and secured upon the upper ends of the bolts 12 by nuts 14 screwed upon the reduced upper ends of said bolts. The dies 7 will vary in shape according to the shape of the eye bolt, hook or other article to be made by the machine, but in the form of the invention illustrated, which is adapted for making eye bolts, said dies 7 are of rectangular form and have at one of their inner corners curved projections 15 the purpose of which will hereinafter be explained. The opening movement of each of the dies 7 is limited by a stop 16 arranged upon the top of the block or support 4 adjacent to its outer edge and here shown in the form of a cylindrical sleeve held in place by a screw or bolt. The dies 7 are swung to their open position and held normally in that position which is shown in Fig. 1, by means of a coil spring 17 which has its opposite ends engaged with hooks 18 carried by the cam blocks 5.

The closing movement of the dies 7 is effected by the forward movement of the plunger 8 which latter has at its front end a wedge shaped point 19 adapted to engage the cam faces 10 of the blocks 5 and enter between them to cause them to swing apart and hence move the dies 7 toward each other.

The plunger 8, as clearly shown in Fig. 5, is in the form of a bar arranged centrally and longitudinally above the bed plate and suitably mounted for sliding movement thereon in the horizontal plane of the cam blocks. The forward end of the plunger 8 is supported and guided in a bracket 20 bolted or otherwise secured, as at 21 upon the bed plate and has a centrally arranged opening in its upwardly projecting portion for the reception of the plunger. In this upwardly projecting portion of the support or bracket 20 are provided transversely extending screws 23 having upon their projecting inner ends anti-friction rollers 24 disposed in longitudinally extending grooves 25 formed in the opposite sides of the plunger. It will be seen that the latter travels upon the rollers 25 in a reciprocating movement. An adjustable stop 26 is preferably provided for limiting the forward movement of the plunger. This stop is in the form of a screw extending longitudinally and mounted in a lug 27 depending from the bottom of the plunger 8. The forward end of the screw 26 is adapted to engage the support or bracket 20 when the plunger has moved forward to the desired extent. The die 9 carried by the plunger is in the form of a vertically extending

pin or stud about which the metal rod is bent in forming the eye bolt, hook or other article produced by the machine. As shown, the pin is cylindrical in form because the machine is adapted for making eye bolts having circular eyes, but it will be understood that said pin may be of any other shape according to the contour of the inner face of the article to be formed by the machine. The pin or die 9 is mounted for vertical sliding movement in a vertically arranged opening 28 formed in the plunger and it is carried by a carriage 29 mounted to travel upon a track 30 arranged centrally and longitudinally of the bed plate and beneath the plunger.

As shown, the carriage 29 is in the form of a forked or bifurcated block in the upper end of which the pin 9 is suitably secured and through the opened lower portion of which extends the track 30. An anti-friction roller 31' is journaled in the lower open end of the fork 29 and adapted to engage the bottom of the track 30 which latter is in the form of a bar of rectangular form in cross section. The track 30 has a downwardly and inwardly inclined portion 31 and a horizontally arranged outer portion 32 which latter extends through the channel 4^a in the block 4 and has its extreme end supported by an angle bracket 33, secured in said channel. The opposite or inner end of the track 30 is formed with a reduced cylindrical portion 34 which passes through an opening in the bracket or support 20 and in which it is secured by a wedge or key 35 as will be readily understood upon reference to Figs. 2 and 9 in the drawings. The rod or work R which is to be bent by the machine is supported in a horizontal position transversely of the bed plate upon two supporting brackets 36, 37. The latter are oppositely disposed and adjustably mounted to support a work blank of any description. As shown, they are in the form of right angle brackets having upright portions 38 and horizontal slotted portions 39 which latter are rigidly secured by bolts 40 upon the top of the bed plate, the clamping bolts 40 passing through the slots in said horizontal portions and thus permitting the brackets to be adjusted transversely or toward and from each other, and also angularly in a horizontal plane. The work blank R is supported upon one side upon the upper end of the upright portion 38 of the bracket 36 and upon the other side by a ledge or projection 41 formed upon the inner face of the upright portion 38 of the bracket 37, said portion 38 of this bracket being of greater height than the corresponding portion of the bracket 36 to serve as a stop for engagement by one end of the blank R.

When eye bolts of the form shown in Fig. 4 are to be formed by the machine I provide upon the plunger 8 a stop or gage 42 which is adapted to limit the movement of the long end of the blank R and thus prevent it from passing the longitudinal axis of the plunger. This stop or gage 42 is in the form of a bolt 43 extending transversely through the plunger and held therein by a nut 44, one end of the bolt 43 is bent upon itself to provide the stop block 42 which projects above the top of the plunger, as clearly shown in the drawings.

While the plunger 8 may be reciprocated in any suitable manner I preferably detachably connect it as at 45 to the rod 46 of a piston mounted in a cylinder 47 and actuated by compressed air or steam. The

cylinder 47 is mounted upon the top of one end of the bed plate and the motive fluid may be admitted to it and exhausted from it in any suitable manner.

The operation of the machine is as follows: When it is desired to form an eye bolt, the blank R, shown in dotted lines on Fig. 1 is placed transversely as indicated upon the work supports 36, 37 when the dies are in their positions, shown in said figure. The plunger then travels forwardly or outwardly so that its wedge shaped end 19 passes beneath the blank R and between the cams 5. This forward movement of the plunger carries the pin or die 9 with it and as said pin moves forwardly its carriage 29 travels up the incline 31 of the track 30 causing said pin to be elevated. The continued forward movement of the plunger brings the pin 9 into contact with the blank R and said pin as it moves between the curved projections 15 of the dies 7 carries the blank with it and bends the blank into substantially U-shape, owing to the engagement of the blank with said ends 15 of the dies 7. As the wedge 19 forces the cam blocks 5 apart the ends 15 of the dies 7 are swung inwardly to cause the ends of the blank to be bent around the die or pin 9 and into the form shown in Fig. 4, the gage 42 limiting the swinging movement of the long end of the blank so that the eye of the bolt will be in proper alinement with its longitudinal axis. When the stop screw 26 engages the support or bracket 20 the dies will be in their closed position, shown in Fig. 4. To remove the finished eye bolt from the machine, the plunger 8 is moved rearwardly or in the opposite direction so that the pin 9 will be carried rearwardly by the plunger and will carry the eye bolt with it. As the pin 9 moves rearwardly its carriage 29 travels downwardly upon the inclined portion of the track 30 and thereby lowers the pin in the plunger so that the finished eye bolt will drop off of the plunger and into a suitable chute or receptacle provided for its reception. By changing the shape of the dies, eye bolts, hooks and similar articles of various shapes may be formed by the machine.

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

1. In a machine of the character described, a plunger having one of its ends beveled to provide a V-shaped wedge, having one of its ends beveled to provide a V-shaped wedge, a die projecting from one face of said plunger in rear of said wedge shaped end, a pair of pivoted blocks having cam portions adapted to be engaged by the wedge shaped end of the plunger, means for actuating said blocks to swing their cam portions normally into the path of the plunger and dies arranged upon said cam blocks and adapted to bend a blank around the die upon said plunger.

2. In a machine of the character described, a plunger having one of its ends beveled to provide a V-shaped wedge, a die projecting from one face of said plunger in rear of said wedge shaped end, a support, pivots projecting therefrom, cam blocks arranged upon said pivots and adapted to be engaged and actuated by the wedge end of the plunger, means for swinging said blocks normally into the path of said plunger, means for limiting the swinging movement of said blocks, dies carried by said blocks and adapted to bend a blank around the die upon said plunger and a cross bar connecting the projecting portions of said pivots.

3. In a machine of the character described, a plunger having one of its ends beveled to provide a V-shaped wedge, a die projecting from one face of said plunger in rear of said wedge shaped end, a support, pivot studs projecting therefrom, blocks arranged upon said pivot studs and having cam portions and shoulders, means for actuating said

blocks in one direction to cause their cam portions to swing into the path of the wedge shaped end of the plunger, dies apertured to receive said pivot studs and adapted to engage the shoulders upon said cam blocks, said dies being adapted to co-act with the one upon the plunger and a cross bar or brace connecting the projecting ends of the pivot studs, and adapted to retain said dies upon the cam block, substantially as described.

4. In a machine of the character described, a plunger, a movable die carried thereby, cams actuated by the plunger when moved in one direction, dies carried by said cams and adapted to co-act with the movable die upon said plunger, an inclined track and a carriage mounted upon said track and connected to said movable die in the plunger whereby said movable die is retracted from the article when the plunger is moved in the opposite direction.

5. In a machine of the character described, a plunger, a movable die carried thereby, self opening dies actuated to their closed position by the movement of the plunger in one direction and adapted to co-act with the movable die upon said plunger, an inclined track and a carriage to travel on said track and connected to said movable die in the plunger for the purpose set forth.

6. In a machine of the character described, a plunger, a movable die carried thereby, cams, dies carried by said cams, a spring for actuating said cams in one direction, a wedge carried by the plunger to actuate said cams in the opposite direction, stops to limit the swinging movement of said cams, and means for retracting said movable die in the plunger when the latter is moved in one direction.

7. In a machine of the character described, a plunger, a movable die carried thereby, cams, dies carried by said cams, a spring for actuating said cams in one direction, a wedge carried by the plunger to actuate said cams in the opposite direction, stops to limit the swinging movement of said cams, an inclined track, a carriage to travel upon the latter and connected to said movable die in the plunger, means for supporting a work blank and a gage to limit the bending of the work blank.

8. In a machine of the character described, a plunger having one of its ends beveled to provide a V-shaped wedge, a die projecting from one face of said plunger in rear of said wedge shaped end, a support, pivot studs projecting therefrom, blocks arranged upon said pivot studs and having cam portions and shoulders, a coil spring connecting said cam blocks for actuating them in one direction, stops for limiting the swinging movement of said blocks, dies apertured to receive said pivot studs and adapted to engage the shoulders upon said blocks, said dies being adapted to co-act with the one upon the plunger and a cross bar or brace connecting said pivot studs and adapted to retain said dies upon said blocks, substantially as described.

9. In a machine of the character described, a plunger, a movable die carried thereby, a movable die carrying element arranged in the path of the plunger and adapted to be engaged and actuated by it when the plunger is moved in one direction to cause the die upon said element to co-act with the one upon said plunger, a guide, and means connected to said movable die on the plunger and engaged with said guide for retracting said movable die when the plunger is moved in the opposite direction.

10. In a machine of the character described, a plunger, a movable die carried thereby, a movable die carrying ele-

ment arranged in the path of the plunger and adapted to be engaged and actuated by it when the plunger is moved in one direction to cause the die upon said element to co-act with the one upon said plunger, an inclined track and means connected to said movable die in the plunger and adapted to travel upon said track whereby the movable die in the plunger will be retracted when the latter is moved in the opposite direction.

11. In a machine of the character described, a plunger, a pin transversely slidable therein, opposing pivoted elements, a wedge upon said plunger to enter between and actuate said elements, dies carried by said elements for bending a blank around said pin, means for actuating said elements to retract their dies, a stop carried by the plunger to limit the bending of the work blank and means for retracting said pin when the plunger is retracted.

12. In a machine of the character described, a plunger, a pin transversely slidable therein, opposing pivoted elements, a wedge upon said plunger to enter between and actuate said elements, means for actuating said elements to retract their dies, means for supporting a work blank between said pin and said die, an inclined guide and means to travel on said guide and connected to said pin for retracting the same.

13. In a machine of the character described, a plunger carrying a die, a movable die to co-act with the one upon the plunger, and the gage bolt 43 passed through the plunger and having its end 42 forming a stop to limit the bending of the work blank, substantially as set forth.

14. In a machine of the character described, a support, a plunger carrying a die, a movable die to co-act with the one upon the plunger and a stop screw carried by the plunger and adapted to engage said support and limit the movement of the plunger in one direction.

15. In a machine of the character described, a plunger carrying a die and having recesses in its opposite faces, a movable die to co-act with the one on the plunger, a guide support for the plunger and anti-friction rollers carried by said guide support and adapted to enter the grooves in the plunger.

16. In a machine of the character described, a bed plate, a guide thereon, a plunger slidable in said guide and carrying a die, said plunger being formed with a projection having a threaded aperture, a stop screw arranged in said threaded aperture and adapted to engage said guide to limit the movement of the plunger in one direction, and means mounted upon said bed plate and connected to one end of said plunger for actuating the same.

17. In a machine of the character described, a plunger carrying a die, a support, parallel pivots projecting therefrom, opposing cam blocks arranged upon said pivots and adapted to be engaged and actuated by the plunger, said blocks having ledges upon their upper surfaces, dies arranged upon the upper surfaces of said blocks and engaged with said ledges, said dies being apertured to receive said pivots, and means upon said pivots for retaining the dies upon said cam blocks.

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

ROBERT L. MAUZY.

Witnesses:

GEORGE TARTSCH,
ABRAHAM L. TIDD.