No. 711,631. Patented Oct. 21, 1902.

H. B. IRVIN.

METAL CRIMPING MACHINE.

(Application filed July 16, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

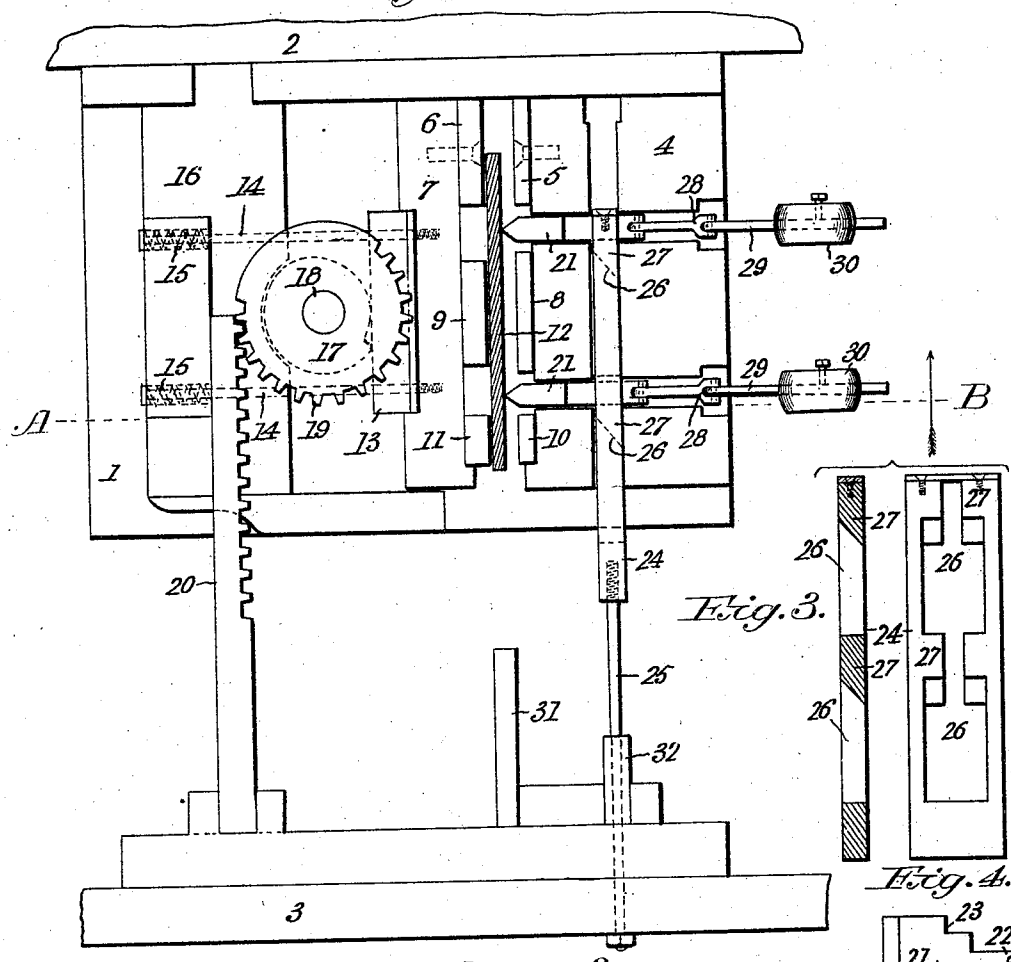


Fig. 3.

Fig. 4.

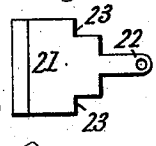
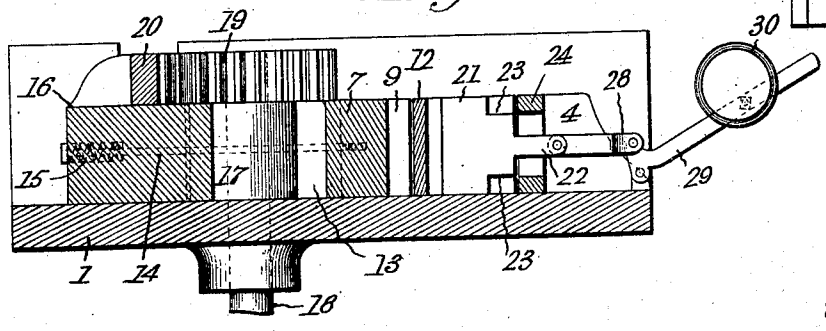


Fig. 2.



Witnesses

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Fig. 5.

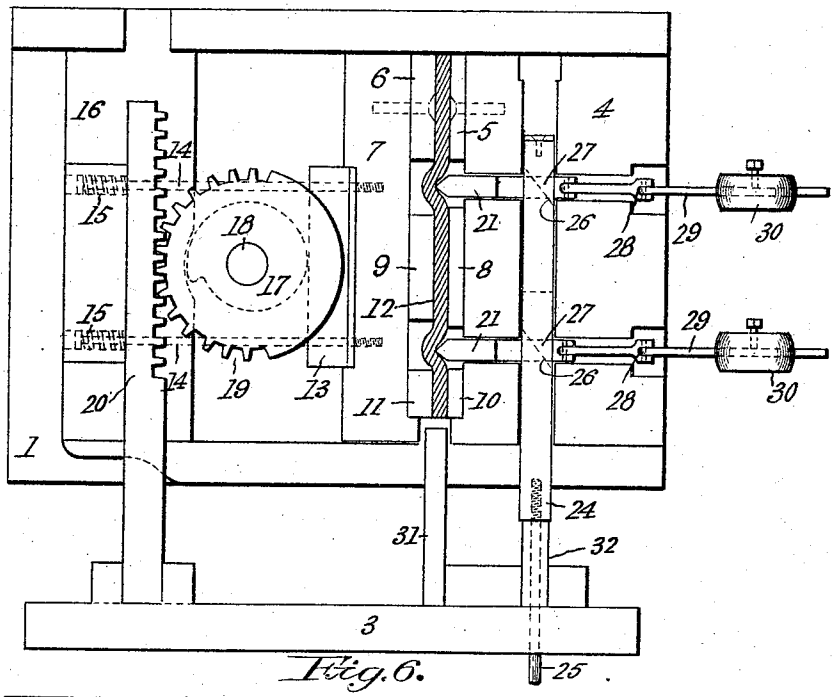
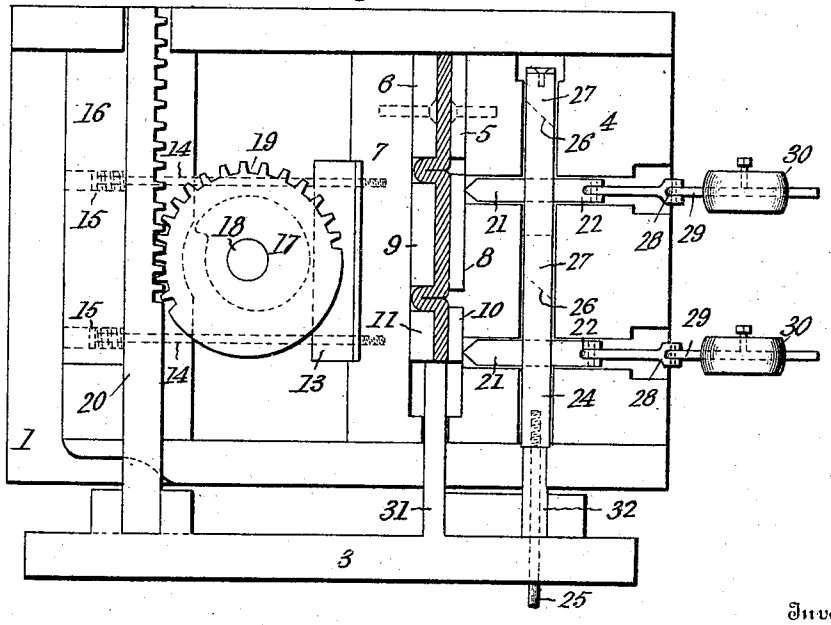


Fig. 6.



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UNITED STATES PATENT OFFICE.

HARRY BENJAMIN IRVIN, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO PRESSED STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

METAL-CRIMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,631, dated October 21, 1902.

Application filed July 16, 1902. Serial No. 115,824. (No model.)

To all whom it may concern:

Be it known that I, HARRY BENJAMIN IRVIN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Metal-Crimping Machines, of which the following is a full, clear, and exact description.

The object of this invention is to provide a machine for crimping metal plates to thereby form commercial articles.

In present car construction, especially so-called "steel-car" construction, the truck-bolsters are provided with chafing-plates on their sides, which form guides coöperating with the column-posts of the truck-frames in order to control the movements of the bolsters between such column-posts. Heretofore such plates have been made, among other ways, by die-pressing a blank to shape; but it is believed that an equally good, if not superior, product may be obtained by crimping the plates in a single continuous operation, and the invention herein is a machine for so making such plates.

The invention comprises a blank-holder or clamp, rams equal in number to the crimps to be made for bending the blank while in the clamp and which are withdrawn when such bending is effected, and means for contracting the clamp at right angles to the bends made by the rams to complete the crimping, and so finish the article, all as will now be more particularly set forth and claimed.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a top plan view of sufficient of the machine to illustrate its essential features and showing the parts arranged for beginning the operation of crimping. Fig. 2 is a vertical cross-section taken substantially in the plane of line A B, Fig. 1. Fig. 3 shows in elevation and longitudinal section the ram abutment-block. Fig. 4 is a side elevation of one of the rams, all of the rams being alike. Fig. 5 is a top plan view showing the blank bent and the abutment-block receding. Fig. 6 is a view similar to Fig. 5, showing the machine in the position of final crimping operation.

The table 1 has a stationary head 2 and a movable head 3.

4 is a base-piece supported upon the table and having attached to it the member 5 of a blank-holder or clamp, the opposite member 6 of which is secured to a block 7, which is mounted upon the frame parallel with the base-piece. The portions 5 and 6 of the holder or clamp are fixed, while there are other portions 8 and 9 and 10 and 11 which are arranged loosely in ways between the base-piece 4 and block 7. The blank 12 is inserted edgewise between these portions 5, 8, and 10 on the one side and 6, 9, and 11 on the other side.

The block 7 is provided with a cam-plate 13, and the said block and its cam-plate are connected by rods 14 with springs 15, arranged in sockets in a stationary block 16 on the table. Adjacent to the cam-plate 13 is a cam 17, mounted upon a vertical shaft 18, and this same shaft is provided with a segmental gear-wheel 19, which is actuated by a horizontally-reciprocating toothed rack-bar 20, carried by the movable head 3, so that by movement of the rack-bar the shaft 18 is rotated, and the cam acting upon the cam-plate 13 moves the block 7, with its adjacent clamp members, toward the clamp members 5, 8, and 10, and thereby moves the blank 12 and holds it in position while being acted upon.

The clamp members 5 and 6 are spaced apart from the clamp members 8 and 9, and the latter are spaced apart from the clamp members 10 and 11 a distance sufficient to permit an initial bending of the blank and the subsequent crimping of the blank at these bent lines. The bending is effected by rams 21, mounted in the base-piece 4 and capable of longitudinal movement therein. The contour of these rams is sufficiently shown in the various views of the drawings and needs no further description, excepting to say that they are provided with tongues 22 and shoulders 23. An abutment-block 24 is mounted in a guideway in the base-piece 4 at right angles to the rams 21 and is loosely connected by a rod 25 with the movable head 3. This

abutment-block 24 is made with openings 26 26, equal in number to the number of rams, and between these openings are solid portions 27 27, having one edge beveled, and these solid portions are slotted longitudinally to coöperate with the stems 22 of the rams, while the adjacent portions thereof coöperate with the edge portions of the rams adjacent to the tongues 22. The rams are connected by links 28 with the levers 29, having counterweights 30 of sufficient weight to automatically withdraw the rams when released by the movement of the abutment-block 24. The movable head has a plunger 31 arranged in alinement with the clamp and adapted to coöperate with said clamp to move its movable members 10 and 11 and then 8 and 9, with the blank, toward the stationary members 5 and 6 and against the resistance of the stationary head, so as to upset or crimp the blank, and said movable head is likewise supplied with another plunger 32, which at a predetermined time comes into contact with the abutment-block 24 to move it and release the rams 21 and permit their counterweights to act to withdraw them, and in the operation of the machine the plunger 32 comes into contact with the abutment-block 24 sufficiently prior to the time when the plunger 31 comes into contact with the blank and clamp members to effect the movement of the abutment-block, and thereby permit the withdrawal of the rams before or just at the time when the plunger 31 begins to move the clamp members.

The operation has already been sufficiently indicated; but, referring now to Fig. 1, it will be seen that the members are all in position to begin the operation of bending, the blank is in position, and the rams 21 are set forward in the openings between the clamp members 5 and 8 and 8 and 10 and held there by their ends next their tongues coming into contact with the solid portions of the abutment-block 24, and then upon the action of the cam 17 the block 7 and its adjacent clamp members are moved toward the rams 21, and the blank being forced against the edges of the said rams is bent as indicated in Fig. 5, the bent portion of the metal going in between the blocks 6 and 9 and 9 and 10, and the blank is then firmly clamped between the members of the clamp. During this operation the movable head has carried its plunger 32 into contact with the abutment-block 24, and upon a continuation of the same forward movement the abutment-block is moved lengthwise and its solid portions freed from contact with the rams and its openings 26 brought opposite the rams, thereby allowing the counterweights to act upon the rams and withdraw them into the base-piece 4, and then the plunger 31, continuing to move, attacks the blocks 10 and 11 and the blank and moves all of them lengthwise and effects the crimping of the blank, as indicated in Fig. 6, and thereafter the movable head reversing its movement the plungers are withdrawn, the cam reversely rotated, and its greater radius moved out of contact with the cam-plate, so as to permit the springs 15 to act upon the rods 14 and then upon the block 7 and withdraw said block and its clamp members from the blank and permit the blank to be discharged in the finished condition. In order then to set the machine ready to receive a fresh blank for repetition of the operations just previously described, the outward movement of the movable head is continued until the said head draws upon the rod 25, and thereby pulls upon the abutment-block, and the beveled edges of the solid portions 27 contacting with the rams moves said rams forward against the resistance of their counterweights and restores the parts to the position shown in Fig. 1. The forward movement of the rams will restore the movable blank-seizing members of the clamp to their normal position, Fig. 1.

It is within my invention to modify the structural details of the machine and to adapt it for the crimping of blanks of other forms than the one herein described and for the manufacture of other shapes than chafing-plates for truck-bolsters.

The invention is not limited to the particular cam mechanism for actuating the block 7, and so, also, other features of the machine may be modified within the principle of the invention.

What I claim is—

1. A metal-crimping machine, comprising essentially a clamp for receiving and moving the blank, any desired number of rams and means to hold them in position, means to move the blank against the rams to initially bend said blank, and means to move the blank while seized by the clamp and effect the crimping along the lines of the initial bends.

2. A metal-crimping machine, comprising essentially a clamp for receiving the blank, means to move the clamp transversely, rams against which the blank is moved and by which it is bent, means to hold the rams in position while bending the blank and to release them after the blank is bent, and other means to move the clamp lengthwise of the blank and while seizing the blank, to crimp the said blank on the lines of its bends previously effected.

3. In a metal-bending machine, a clamp for holding the blank, rams projecting transversely into the clamp to engage the blank and bend it initially, an abutment-block for holding the rams in position for bending and to release them after bending, a cam for moving the clamp for the bending operation, and a plunger for moving the clamp and the blank held by said clamp lengthwise of the blank to effect the crimping along the lines of the bends previously made therein.

4. In a metal-crimping machine, the combination of a base-piece, bending-rams movable longitudinally therein, means to hold the

rams in bending position and to release them, a stationary clamp member and movable clamp members applied to said base-piece and on opposite sides of the rams, a block provided with complemental clamp members, a cam coöperating with said block to move it and its clamp members toward the base-piece, and means to actuate said cam.

5. In a metal-crimping machine, the combination of a table, rams mounted thereon, an abutment-block connected with said rams to hold them in any given position and to release them, means to withdraw the said rams when so released, a clamp for holding the blank in position to be acted upon, a cam for moving the clamp in one direction, and a movable head connected with said block and carrying a plunger for actuating said block in one direction, a plunger for moving the clamp lengthwise, and means for actuating the cam.

6. In a metal-crimping machine, the combination of a table having a fixed head, a base-piece, rams mounted in said base-piece and movable longitudinally therein, a counter-weight applied to each of said rams, an abutment-block arranged in said base-piece and movable lengthwise therein and engaging said rams to force them into operative position and hold them thus, a blank-holder and means to actuate it, and a movable head coacting with the abutment-block to move it relatively to the rams.

7. In a metal-crimping machine, the combination of a table having a fixed head, a base-piece, rams mounted in said base-piece and movable longitudinally therein, a counter-weight applied to each of said rams, an abutment-block arranged in said base-piece and movable lengthwise therein and provided with beveled-edge openings coöperating with the rams, a blank-holder having independently-movable blank-seizing members, and a movable head connected with and moving the abutment-block, and having a plunger for moving the independently-movable blank-seizing members.

8. In a metal-crimping machine, the combination of a table having a fixed head, a base-piece, rams mounted in said base-piece and movable longitudinally therein, a counter-weight applied to each of said rams, an abutment-block arranged in said base-piece and movable lengthwise therein and provided with beveled-edge openings coöperating with the rams, a blank-holder having independently-movable blank-seizing members, and a movable head having a plunger to force the abutment-block out of engagement with the rams and permit their counterweights to withdraw them, and also having a loose connection with said abutment-block to move it to force the rams into operative position, and a plunger for moving the independently-movable blank-seizing members.

9. In a metal-crimping machine, the combination of a table having a fixed head, a base-piece, rams mounted in said base-piece and movable longitudinally therein, a counter-weight applied to each of said rams, an abutment-block arranged in said base-piece and movable lengthwise therein and engaging said rams to force them into operative position and hold them thus, a blank-holder having independently-movable blank-seizing members, a cam for bodily moving said holder toward the rams, and a movable head having means for actuating the abutment-block positively to set and release the rams, a plunger for actuating the independently-movable blank-seizing members, and means to actuate the cam.

10. In a metal-crimping machine, the combination of a table having a fixed head, a base-piece, rams mounted in said base-piece and movable longitudinally therein, a counter-weight applied to each of said rams, an abutment-block arranged in said base-piece and movable lengthwise therein and engaging said rams to force them into operative position and hold them thus, a blank-holder having independently-movable blank-seizing members, a cam for bodily moving said holder toward the rams, spring-pressed rods for moving the holder away from the rams, and a movable head having means for actuating the abutment-block positively to set and release the rams, a plunger for actuating the independently-movable blank-seizing members, and means to actuate the cam.

In testimony whereof I have hereunto set my hand this 12th day of July, A. D. 1902.

HARRY BENJAMIN IRVIN.

Witnesses:
J. J. RONEY,
J. P. MURRAY.