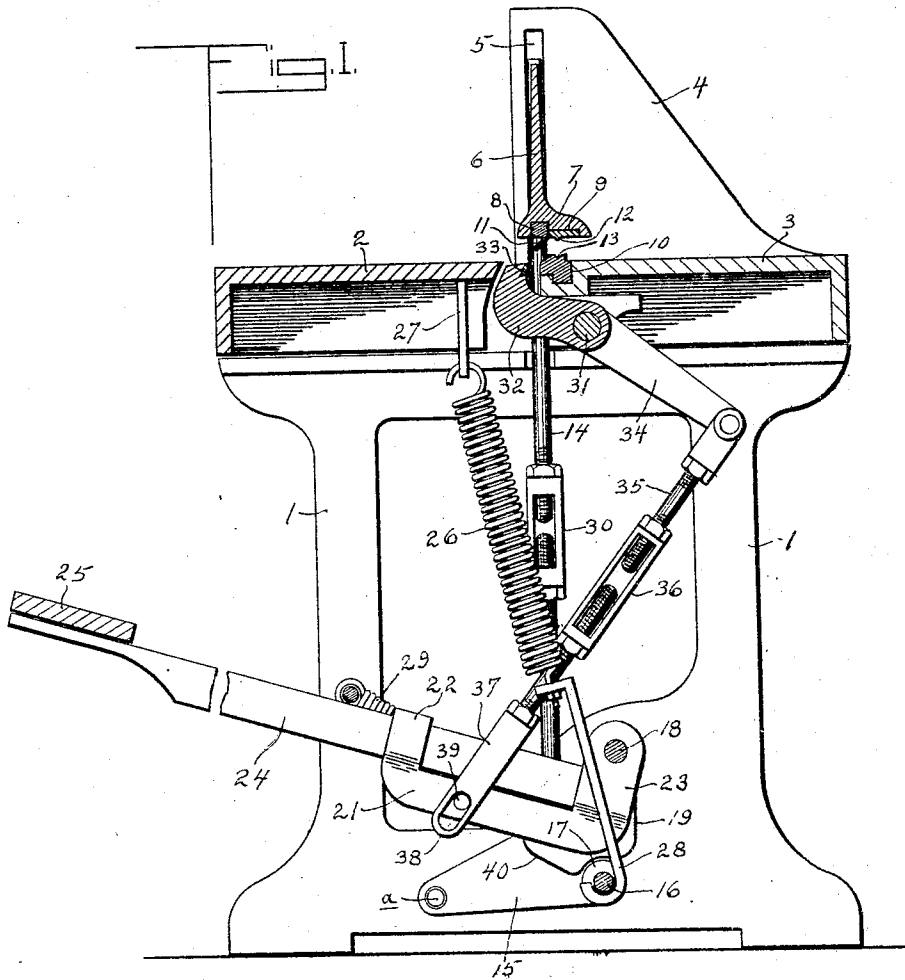


T. BRIEGEL.  
 METAL BENDING MACHINE.  
 APPLICATION FILED MAY 11, 1917.

1,304,152.

Patented May 20, 1919.  
 4 SHEETS—SHEET 1.



Witness

Frank W. Haskell  
 Errol E. Williams.

Inventor

Theodore Briegel,

By

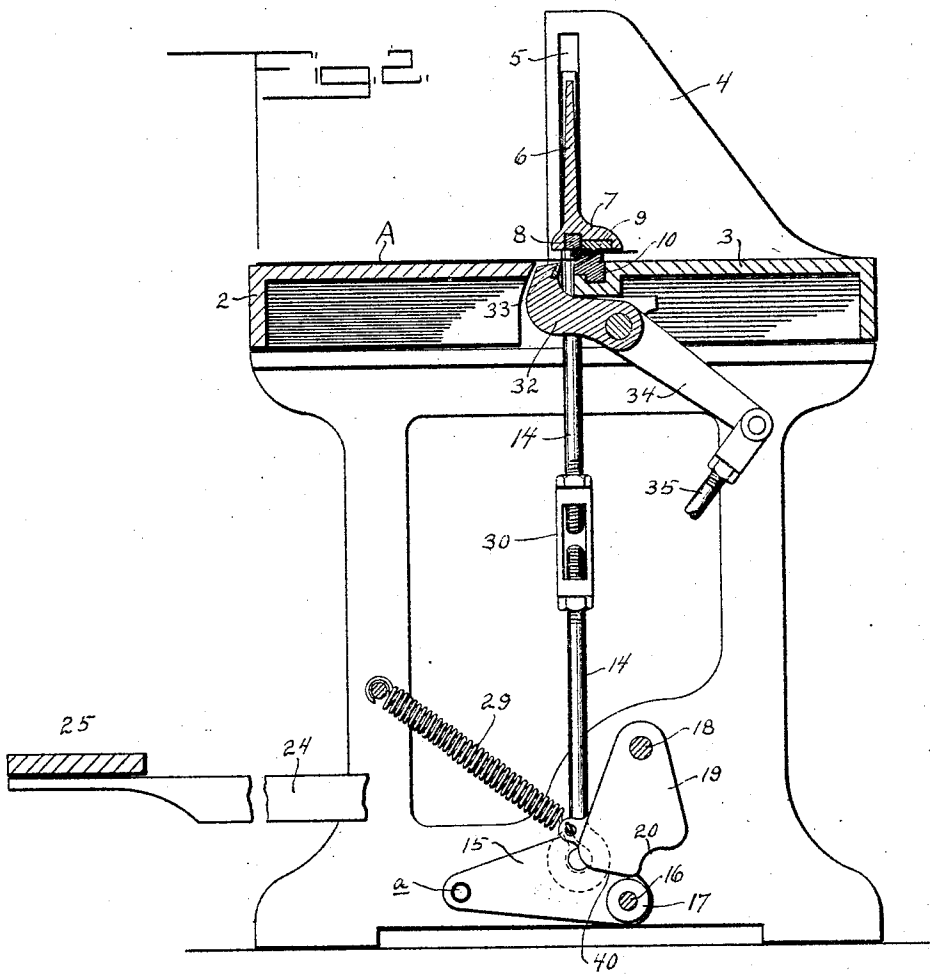
Walter N. Haskell,

his Attorney

T. BRIEGEL.  
 METAL BENDING MACHINE.  
 APPLICATION FILED MAY 11, 1917.

1,304,152.

Patented May 20, 1919.  
 4 SHEETS—SHEET 2.



Inventor

Theodore Briegel,

Witness

Frank W. Haskell  
 Eva E. Williams

By

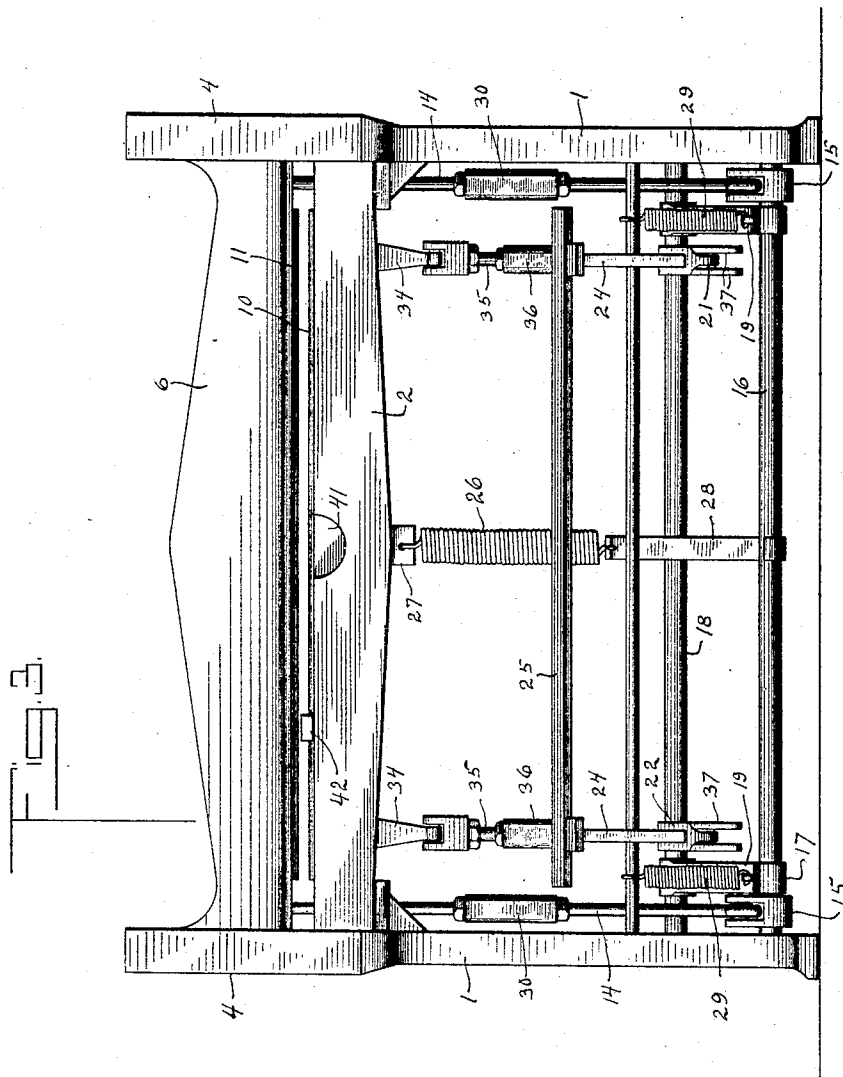
Walter N. Haskell,

his Attorney

T. BRIEGEL.  
 METAL BENDING MACHINE.  
 APPLICATION FILED MAY 11, 1917.

1,304,152.

Patented May 20, 1919.  
 4 SHEETS—SHEET 3.



Witness

Frank W. Haskell  
 Eric E. Williams

Inventor

Theodore Briegel,

By Walter N. Haskell,

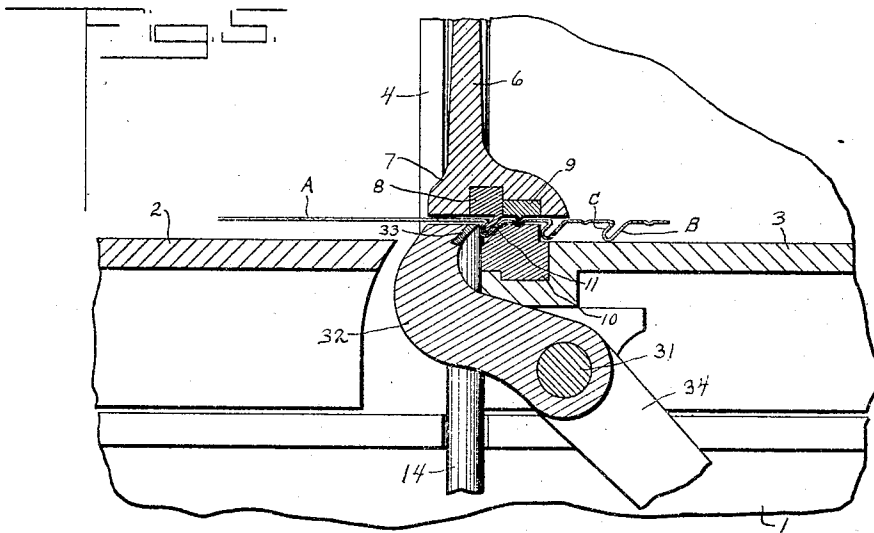
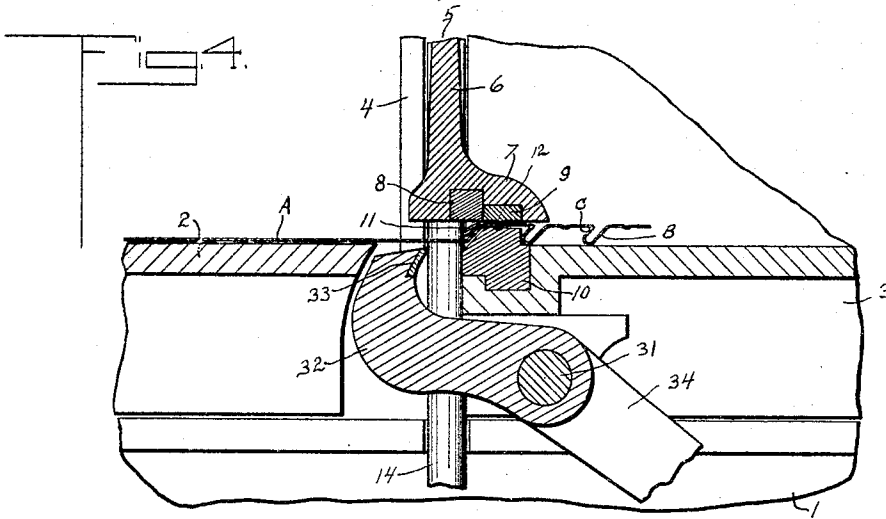
his Attorney

T. BRIEGEL.  
METAL BENDING MACHINE.  
APPLICATION FILED MAY 11, 1917.

1,304,152.

Patented May 20, 1919.

4 SHEETS—SHEET 4.



Inventor

Theodore Briegel,

Walter N. Haskell,

his Attorney

Witness

Frank W. Haskell

Ernest E. Williams

By

# UNITED STATES PATENT OFFICE.

THEODORE BRIEGEL, OF ROCK ISLAND, ILLINOIS.

## METAL-BENDING MACHINE.

1,304,152.

Specification of Letters Patent.

Patented May 20, 1919.

Application filed May 11, 1917. Serial No. 167,912.

*To all whom it may concern:*

Be it known that I, THEODORE BRIEGEL, a citizen of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Metal-Bending Machines, of which the following is a specification.

My invention has reference to metal bending machines, of the kind shown and described in Letters Patent of the United States numbered 1,193,759, issued to myself August 8th, 1916, the present device being similarly intended for the production of metal display sign-boards such as are commonly used by merchants and others for the support of metal letters in the formation of words for advertising their goods. A well-known construction of such sign-boards consists in forming a sheet of metal at regular intervals with transverse loops or pockets at such an angle to the body of the sign-board that when the same is in a vertical or substantially vertical position, as when in use, such pockets will project downwardly therefrom, in position to receive and retain the supporting tongues of the letters carried on the face of the sign-board.

It has been found to be a difficult matter to form a loop or reflex bend in a sheet of metal in one operation, on account of the liability of stretching the metal, and injuring it so that it is not suitable for the purpose for which it is intended. The chief purpose of my invention is to provide a means for forming the loop in the metal by two distinct mechanisms, acting in sequence, and yet by one simple operation of the machine. By this means I secure a simple, double bend of the metal without affecting its tenacity or consistency in any way.

Other purposes and advantages of my invention will more fully appear in the following specification, reference being had to the drawings accompanying the same, in which:

Figure 1 is a transverse vertical section of a machine embodying my invention, in position ready for use. Fig. 2 is a similar view thereof, with the parts in position when the bending operation is partly performed. Fig. 3 is a front elevation of my machine, in an idle position. Fig. 4 is an enlarged detail of

the bending devices, in partial operation. Fig. 5 is a similar view, with the operation completed.

Similar parts are indicated by corresponding reference characters throughout the several figures.

The main operating parts, by means of which the bending devices are actuated, are duplicated at the opposite ends of the machine, and when one of such parts is referred to herein, it will be understood that both of such parts are intended to be referred to.

The machine is provided with a pair of end frames 1, united by a front bed-plate 2 and rear bed-plate 3, the upper surfaces of which are on the same horizontal plane, and said bed-plates being spaced apart for the arrangement and operation of parts hereinafter referred to. Projecting upwardly from the rear part of the frames 1 are standards 4, provided with vertical slots 5 in which are movable the ends of a cross-beam 6, having at its lower edge an enlargement 7, the lower face of which is parallel with the bed-plates 2 and 3. The member 7 is provided with recesses in which are secured dies 8 and 9, extending lengthwise of the machine for nearly the full length thereof. At the forward edge of the bed-plate 3 is fixed a die 10, the forward edge of which is beveled to correspond with the line of direction of a rib 11 projecting downwardly and forwardly from the die 8 at an angle of approximately forty-five degrees. The die 9 is provided with a rib 12 corresponding with a groove 13 in the upper face of the die 10.

The cross-beam 6 is normally held in an elevated position by means of rods 14 attached to said beam at their upper ends and supported at their lower ends by plates 15 pivotally attached to the frames 1, as at *a*. The free ends of the plates 15 are united by a rod 16, on the ends of which, adjacent to the plates 15, are rollers 17. Above the rod 16 a shaft 18 is rockingly mounted in the end pieces 1, and secured to said shaft near each end thereof, and in line with the rollers 16 are cams 19, having recesses 20 which are normally in engagement with such rollers, as shown in Fig. 1. Secured to the shaft 18 is a frame 21 having bifurcated ends 22 and 23 in which are secured bars 24 of a foot-lever

25. The downward movement of the foot-lever operates to rock the shaft 18, causing the cam 19 to force the roller 17 and shaft 16 downwardly, also lowering the plates 15  
5 and rods 14, and moving the cross-beam 6 downwardly into the position shown in Figs. 2 and 4. With a sheet of metal in position on the bed-plates, as indicated at A, the downward movement of the die 8 and rib  
10 11 operates to form in the plate A an angular bend B. At the same time a slight crimp is formed in the metal by means of the rib 12 and recess 13.

The rod 16 is normally held in elevated  
15 position, and is returned thereto after being depressed, by means of a contractile coiled spring 26 attached at its upper end to a plate 27 on the lower face of the bed-plate 2 and connected with said rod at its lower  
20 end by a hook member 28. The cam 19 is returned to its former position by means of a coiled spring 29 attached to said cam at one of its ends and at its opposite end to a pin in the frame 1. The rod 14 is preferably  
25 formed in two sections, united by a turn-buckle 30, by means of which the length of said rod can be varied, and the movement of the beam 6 with relation to the die 10  
adjusted.

30 While the sheet of metal A is securely held between the head 7 and die 10 as above described, a reflex bend is formed therein by the following means: Supported at its ends on the frames 1 is a shaft 31, on which is  
35 rockingly mounted a curved plate 32, in the upper edge of which is fixed a die 33. Projecting from the plate 32 are arms 34, pivotally connected with which are rods 35, preferably formed in two sections united  
40 by a turn-buckle 36, and having bifurcated lower ends 37, passing on opposite sides of the frames 21. The ends 37 are provided with slots 38 engaging pins 39 in the frames 21. By this means a partial downward  
45 movement of the bars 24 and frames 21 is permitted without disturbing the rods 35.

The slots 38 are of such predetermined length as to permit the downward movement  
50 of the cross-beam 6, into the position shown in Fig. 2, without causing a movement of the rods 35. As the movement of the foot-lever continues, however, the pins 39 engage the lower ends of the slots 38, drawing the  
55 rods 35 downwardly, and moving the plate 32 and die 33 upwardly, forcing the plate A into the angle between the die 8 and rib 11, forming a second bend C in the plate, the bends B and C being spaced apart the thickness of the rib 11. There is thus formed in  
60 the metal plate a loop or pocket adapted to receive the tongue of a metal letter, or piece of metal containing a letter or other character, such loop being at such an angle to the body of the plate as to depend therefrom  
65 when the plate is in a proper position, at

such an angle as to hold the tongue of the metal letter without danger of its being accidentally released therefrom.

The upper edge of the plate 32 is of such  
70 formation that when such plate is at the end of its upward movement such edge will be parallel with the lower face of the head 7, as shown in Fig. 5. During the movement of the rods 35 the shaft 18 and cams 19  
75 continue their rocking movement, but without further action upon the rods 14, as during this part of the movement the face 40 of the cam is passing over the roller 17 without affecting the position thereof. As soon as the pressure is relieved from the  
80 foot-lever, the springs 29 return the cams 19 and foot-lever to their former positions, permitting the spring 26 to raise the plates 15 and cross-beam 6, in position for the operation to be continued. On account of  
85 the loop in the metal closely engaging the rib 11, the plate A is carried upwardly thereby in the upward movement of the cross-beam, but the plate being drawn forwardly by the operator quickly releases the  
90 same. The plate A is then moved rearwardly along the bed-plates until the loop just formed therein drops in rear of the die 10, whereupon such loop is drawn tightly against the rear face of the die, as  
95 shown in Fig. 5. The thickness of the die thus furnishes a gage to determine the amount of space between the successive loops in the metal. If desired, the amount of space can be increased by placing in rear of  
100 the die a strip of metal of similar height therewith, and of any desired thickness.

The crimping of the plate A intermediate  
105 the loops by means of the rib 12 and groove 13 is chiefly for the purpose of ornamentation, and is not essential to the construction or later use of the plate.

By reason of the loop in the plate A being  
110 formed by two distinct bends or folds of the metal, the blank portion of the plate is drawn into the machine a little distance at each operation, and there is no strain or tension on the metal.

It is sometimes desired to have the sign-  
115 board provided with alternate series of loops and blank spaces, and this can be accomplished by forming the desired number of loops and then moving the plate A rearwardly until the desired blank space is secured. More loops are then formed in the  
120 plate, and so on.

The bed-plate 2 may be provided with an  
125 opening 41 (Fig. 3) for the hand of the operator, and a metal strip 42 may be used as a guide for the edge of the plate A, especially when signs of narrower widths are being formed. Such strip also assists in keeping the plate straight in its passage through the machine. The machine is formed of sufficient length to receive a  
130

sheet of metal of the greatest width which is desired to be employed in the manufacture of sign-boards of the kind mentioned.

The preferred embodiment of my machine has been shown and described herein, but the same is capable of numerous adaptations without departing from the spirit of the invention, and other classes of products could be formed thereby than the one mentioned herein.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is:

1. In a metal-bending machine, a frame, a bed-plate mounted therein and provided with a central opening; a die fixed in said bedplate at one edge of said opening and having a metal-bending face at an angle with said bed-plate; a die member vertically movable above said opening and carrying a metal-bending rib at an angle corresponding with the angle of the face of said first-named die, and adapted to be brought into proximity therewith to form a bend in a sheet of metal; a die member pivotally mounted in said frame and capable of forming a reflex bend in said sheet of metal; mechanism for operating said vertically movable die member; mechanism for operating said pivoted die member; and actuating devices for causing the operation of both of said last-named mechanisms, in succession, in the order mentioned.

2. In a metal-bending machine, a frame; a bed-plate supported therein and provided with a central opening; a die member vertically movable in said frame, and provided with a metal-bending rib projected at an angle therewith; a die fixed in said bed-plate adjacent to said opening, and provided with a beveled face corresponding with the angle of said rib; a pivoted die member capable of a swinging movement in said opening, and provided with operating arms; a rock-shaft journaled in said frame; plates rockingly mounted and operatively connected with said rock-shaft; means of connection between said rock-plates and vertically movable die member; actuating devices attached to said rock-shaft; and means of connection between said actuating devices and the arms of said pivoted die member, adapted to operate said die member following the operation of said first-named die member.

3. In a metal-bending machine, a frame; a bed-plate supported therein and provided with a central opening; a die fixed in said bed-plate adjacent said opening and provided with a face at an angle to said bed-plate; a die member movable at an angle with said bed-plate and provided with a metal-bending rib at an angle corresponding with the angle of said face, and adapted to be brought into proximity thereto, to form

a bend in a sheet of metal, a die member pivotally mounted and adapted to be brought into proximity with said rib to form a re-flex bend in such sheet of metal; operating members connected with said pivoted die member; a shaft rockingly mounted in said frame; a pair of plates operatively connected with said first-named die member so as to move the same toward said bed-plate or away therefrom, as desired; means for imparting the movement of said rock-shaft to said rock-plates, to suitably actuate the same; frames attached to said rock-shaft and provided with actuating means; and connecting members between said last-named frames and the operating members of said pivoted die member, said connecting members having a link and pin connection with said frames permitting a movement of said vertically movable die member preceding the operation of said pivoted die member.

4. In a metal-bending machine, a frame; a bed-plate supported therein and provided with a central opening; a movable die member provided with a metal-bending rib at an angle therewith; a die fixed in said bed-plate adjacent the edge of said opening and having a face corresponding with said rib in angular disposition, and adapted to cooperate therewith in forming a bend in a sheet of metal, a die-member pivotally mounted in said frame, provided with operating arms, and adapted to cooperate with said rib to form a reflex bend in such sheet of metal; a shaft rockingly mounted in said frame; a pair of rock-plates pivoted in said frame and operatively connected with said first-named die member; means for imparting the movement of said rock-shaft to said rock-plates, to operate the same; frames fixed to said rock-shaft and provided with outwardly projecting pins; rods pivotally connected with the operating arms of said pivoted die member and provided at their other ends with slots engaging said pins; and power applying means connected with said frames.

5. In a metal-bending machine, a frame; a bed-plate supported therein and provided with a central opening; a movable die member provided with a metal-bending rib at an angle therewith; a die fixed in said bed-plate adjacent to said opening and having a face corresponding with said rib in angular disposition, and adapted to cooperate therewith in forming a bend in a sheet of metal; a die-member pivotally mounted in said frame, provided with operating arms, and adapted to cooperate with said rib to form a reflex bend in such sheet of metal; a shaft rockingly mounted in said frame; a pair of rock-plates pivoted in said frame and operatively connected with said first-named die member; means for imparting the movement of said rock-shaft to said rock-plates,

to operate the same; frames fixed to said  
 rock-shaft and provided with power apply-  
 ing means; rods pivotally connected with  
 the operating arms of said pivoted die mem-  
 5 ber and having a link connection with said  
 frames, so as to be motionless during the  
 first part of the movement of said frames;  
 means for returning said rock-shaft to a nor-

mal position; and means for returning said  
 rock-plates to a normal position.

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

THEODORE BRIEGEL.

Witnesses:

W. N. HASKELL,  
 HARRY WEINGART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
 Washington, D. C."