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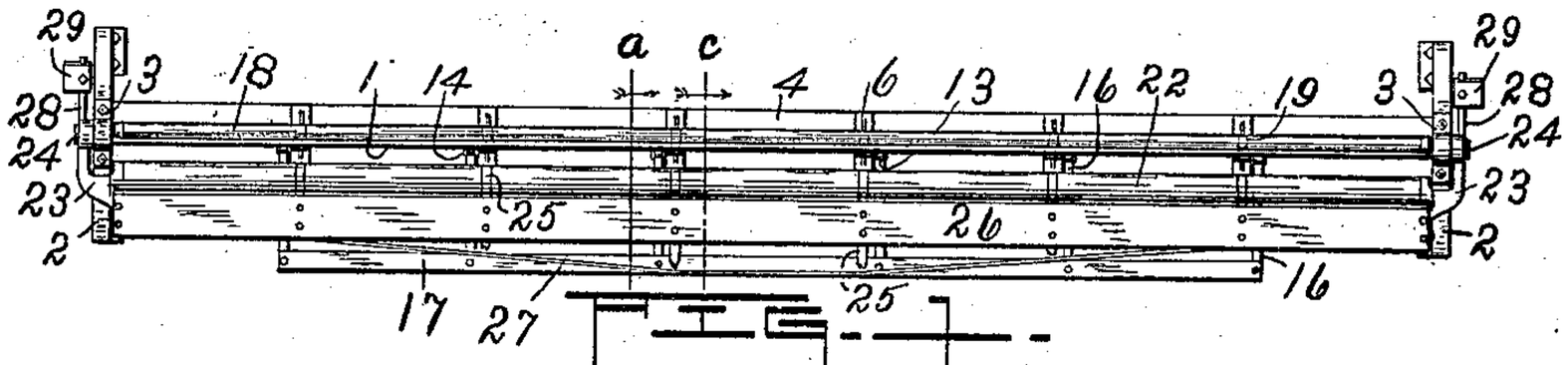
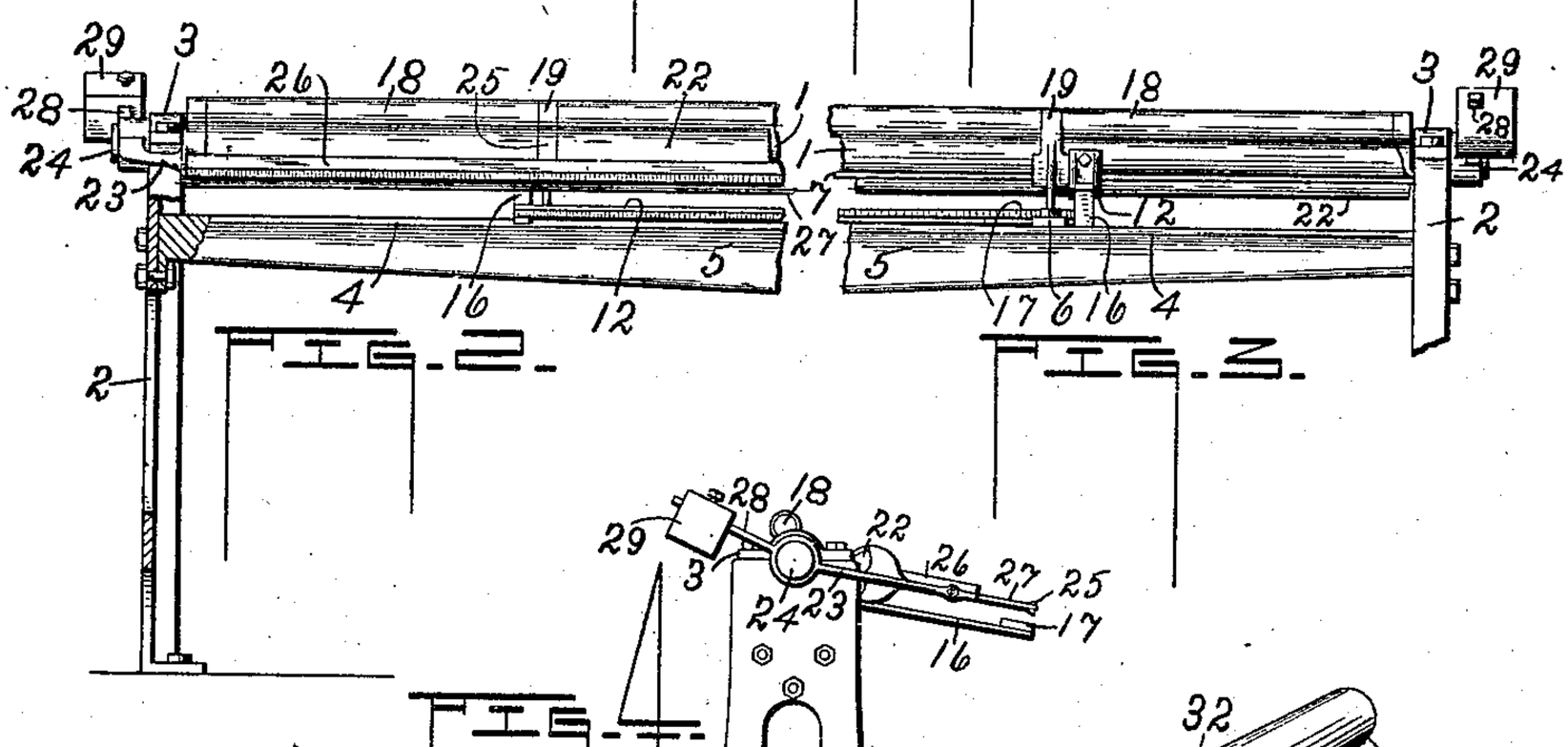
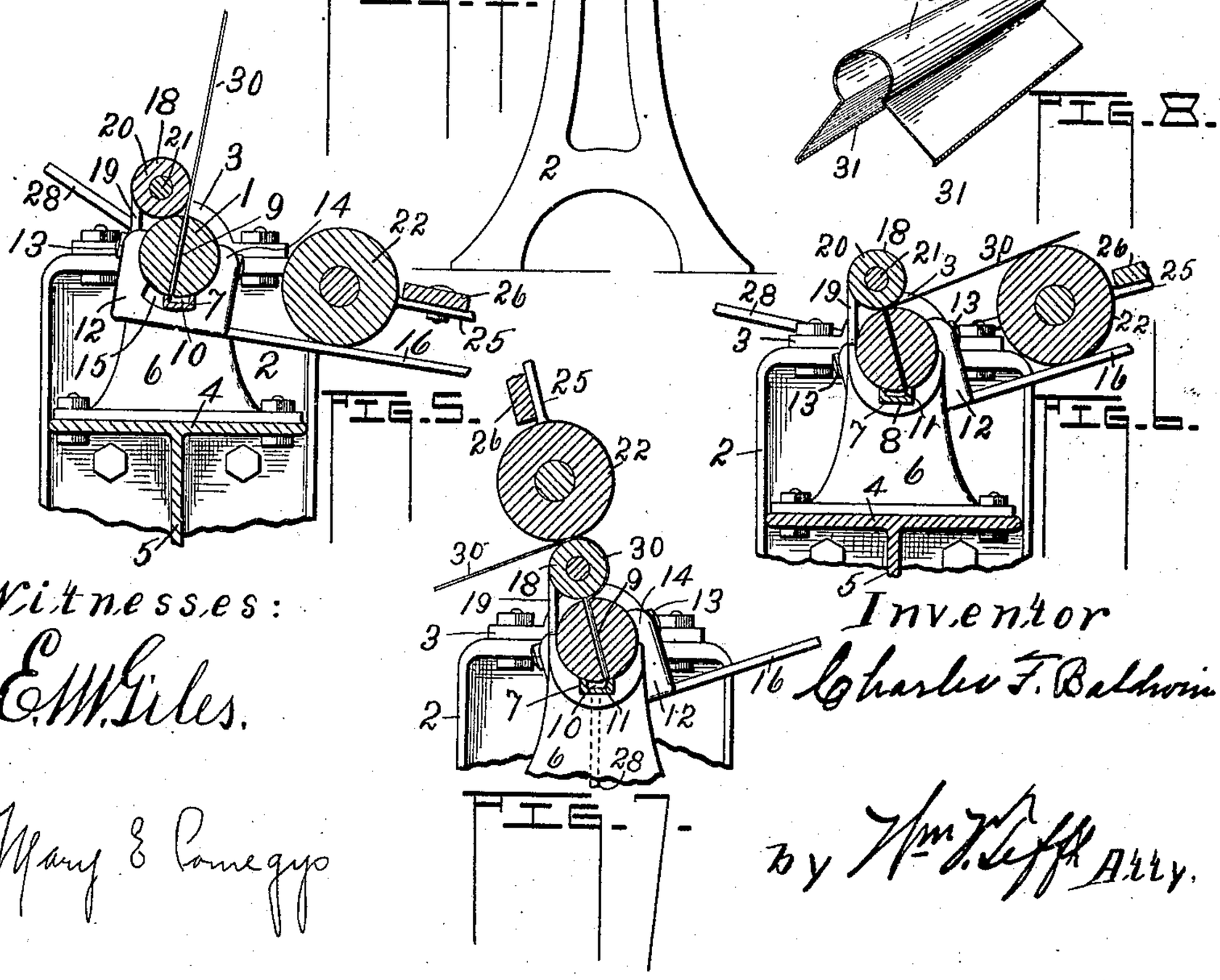
C. F. BALDWIN.

RIDGE ROLL MACHINE.

APPLICATION FILED FEB. 3, 1906.







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RIDGE-ROLL MACHINE.

No. 842,994. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed February 3, 1906. Serial No. 299,319.

To all whom it may concern:

Be it known that I, CHARLES F. BALDWIN, a citizen of the United States, and a resident of Fond du Lac township, in the county of Tazewell and State of Illinois, have invented certain new and useful Improvements in Ridge-Roll Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference more particularly to sheet-metal-bending machines for making what is commonly known as "ridge-rolls," and the nature and character of said improvements will more fully appear hereinafter.

Referring to the accompanying drawings, which are made a part hereof, and in which similar reference characters indicate similar parts in the several views, Figure 1 is a top or plan view of the complete machine; Fig. 2, a front view of a portion of one end of the machine, a part of the standard being broken away to show the connection of the bed-plate to the standard; Fig. 3, a rear view of the end portion of the machine shown in Fig. 2; Fig. 4, an end view of the machine; Fig. 5, an enlarged view on the line *a* of Fig. 1 looking in the direction indicated by the arrow, showing the parts of the machine in their inoperative positions; Fig. 6, an enlarged view on the line *c* of Fig. 1 looking in the direction indicated by the arrow, showing the position of the parts at the end of the first operation; Fig. 7, a view similar to Fig. 6, showing the parts in the positions at the end of the second operation, and Fig. 8 shows in perspective a ridge-roll such as is formed by my machine.

The split shaft or mandrel 1, which is of suitable length to form ridge-rolls of the desired length, is supported at its ends by the standards 2 and held thereon by means of the standard-caps 3. Extending from standard to standard and located below the split shaft or mandrel 1 is the base or bed plate 4, which is securely bolted to the end standards, as shown, and is provided with a downwardly-depending web or flanged portion 5 to stiffen the same. The split shaft 1 is supported from sagging intermediate of its ends by means of the cradle-bearings 6 at intervals throughout its length, which are secured to the upper face of the bed-plate 4 and are provided with semicircular bearing-faces adapted to receive and contain the said shaft.

Directly beneath the split shaft 1 and parallel therewith is the channel-plate 7, which has its ends fixed in notches in the end standards 2 and extends through similar notches 8 in the cradle-bearings 6 and is supported thereby directly in contact with the split shaft and with the channel thereof facing the split shaft. The slot 9 of the split shaft 1 extends diametrically through the shaft from points just inside the end standards 2 of the machine, and the said slot in the normal inoperative position of the shaft 1 leans or is inclined toward the front of the machine, as is shown in Fig. 5, and the shaft 1 is adapted in the operation of the machine to be capable of a limited rotary movement to such a position that the slot leans or inclines correspondingly toward the rear of the machine, as is shown in Figs. 6 and 7, and the channel 10 of the channel-plate 7 is of such width that the slot 9 communicates therewith in every position of the rotation of the shaft 1 and is provided on the side next the front of the machine with an inclined or beveled inner wall, as shown at 11, for purposes hereinafter specified.

For holding the two half-sections of the split shaft 1 suitably distant there are provided yokes 12 at intervals throughout the length of said shaft, which partially encircle the shaft and are provided with set-screws 13, which pass through the jaws 14 of said yokes and have a threaded connection with the half-sections of the shaft for securing the same to the jaws 14 of the yokes 12. The said yokes 12 are provided with an arcuate recess or slot 15, adapted to contain the channel-plate 7, and are of sufficient length to enable the shaft 1 to be rotated a limited distance and to limit the movement of the same by contact of the ends of the slot with the said channel-plate. For the purpose of rotating the shaft 1, as hereinbefore specified, there are provided rods 16, which are secured to the yokes 12, the said rods being connected at their outer ends to the strip 17, which extends parallel to the shaft 1. Secured above and slightly toward one side of the split shaft 1 is a shaft or roller 18, which extends parallel with the shaft 1 and terminates

at points directly within the standards 2 of the machine. This shaft is suitably mounted upon brackets 19, which may be integral with the cradle-bearings 6, if desired, or is otherwise suitably supported so as to lie almost in contact with the split shaft 1 and is preferably mounted so as to be capable of rotation. This may be effected in the manner herein shown by stringing tubular rollers 20 upon the shaft 21 intermediate of the brackets 19, whereby said shaft is supported.

There is a roller 22, which is mounted, by means of bracket-arms 23, to swing about the projecting ends 24 of the split shaft 1, the said roller being supported in its normal inoperative position by resting upon the rods 16, as is shown in Fig. 5. This roller is parallel with the split shaft 1 and is positioned a suitable distance therefrom, so that in its revolution about the split shaft 1 it will barely pass the roller 18, which is located above the split shaft 1, and the said roller is preferably made, as is the roller 18, by stringing short rollers upon a shaft and is braced by strap-bearings 25, which are secured to the said shaft and to the frame 26, which lies adjacent the roller and extends throughout the length of the same. The roller 22 and frame 26 are further braced by the truss-rod 27, which is engaged by the notched ends of the strap-bearings 25 and bolted at each end to the brackets 23. The brackets 23 are further provided with an extension 28 beyond the connection with the protruding ends of the split shaft 1, upon which is provided an adjustable balance-weight 29 to counterbalance the weight of the roller and frame and facilitate in the operation of the machine.

In the operation of forming ridge-rolls by means of the machine hereinbefore described the operator or operators stand at what has been hereinbefore termed the "front" of the machine, and the parts being in the normal inoperative positions (shown in Fig. 5) insert the longitudinal edge of the sheet-metal blank 30 in the slot 9 of the split shaft until the edge thereof protrudes through the said shaft and comes to rest in the bed of the channel 10 of the channel-plate 7, as is indicated in Fig. 5. The split shaft is then rotated in a counterclockwise direction by raising the strip 17 until further movement is resisted by the end of the slot 15 coming in contact with the channel-plate 7, in which position the slot 9 will have been moved with the upper edge thereof directly beneath the roller 18, and the sheet-metal blank 30 is accordingly bent along the edge of said slot, as shown in Fig. 6. This movement of the split shaft 1 likewise moves the lower edge of the sheet-metal blank 30 across the bed of the channel in the channel-plate 7 against the inclined wall 11 thereof and bends or crimps the edge 31 thereof, as is shown in Figs. 6, 7, and 8. This operation also raises the roller 22 slightly above its normal position, and at the end of the foregoing operation the said roller is rotated about its pivotal connection with the split shaft 1 approximately to the position shown in Fig. 7, thereby wrapping or folding the sheet metal around the shaft or roller 22, partially forming the roll 32 of the ridge-roll, in which position of the said roller the weight arms or extensions 28 depend vertically downward, as is shown by the dotted lines in Fig. 7. This operation having been performed upon the sheet-metal blank 30, the parts of the machine are returned to their normal positions (shown in Fig. 5) and the sheet-metal blank removed from the slotted shaft 1, the slot 9 of which is of sufficient width to allow the crimped edge 31 to pass therethrough. The sheet-metal blank 30 is then turned and the other edge inserted in the slot 9 of the split shaft and operated upon in a similar manner, thus completing the ridge-roll shown in Fig. 8.

What I claim is—

1. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with a narrow opening throughout its length extending transversely therethrough for holding the sheet metal, bending means adjacent the holder extending lengthwise thereof for bending portions of the sheet metal protruding from the holder and means connected with said holder intermediate of the ends of the said bending means for rotating the holder.

2. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with a narrow opening throughout its length extending transversely therethrough for holding the sheet metal, bending means adjacent the holder extending lengthwise thereof for bending portions of the sheet metal protruding from the holder, and means connected with said holder, at a plurality of places intermediate of the ends of the said bending means for rotating the holder.

3. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder comprising two longitudinal parts adapted to hold the sheet metal therebetween, bending means adjacent the holder extending lengthwise thereof for bending portions of the sheet metal protruding from the holder, means for rotating the holder and means intermediate of the ends of the said bending means embracing and connecting both parts of the holder.

4. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder comprising two longitudinal parts, adapted to hold the sheet metal therebetween, bending means adjacent the holder extending lengthwise thereof for bending portions of the sheet metal protruding from the holder, a plurality of yokes intermediate the ends of said bending means embracing and connect-

ing both parts of the holder, and means connected to said yokes for rotating the holder.

5. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with a narrow opening throughout its length extending transversely therethrough for holding the sheet metal, a member extending lengthwise of the holder adjacent the edge of the opening therethrough for bending the sheet metal protruding from the holder, and a plurality of bearings intermediate the ends of said bending member bearing against the said holder on the opposite side thereof from the said bending means.

6. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with a narrow opening throughout its length extending transversely therethrough for holding the sheet metal, bending means extending lengthwise of the holder adjacent the edge of the opening therethrough, and a plurality of bearings throughout the length of the holder, said bearings being cut away at each side of the holder adjacent the opening therethrough to permit insertion of the sheet-metal blank therethrough.

7. In a sheet-metal-bending machine, the combination with a rotary longitudinally-divided holder suitably journaled at each end, of a plurality of bearings therefor intermediate of its end supports, said bearings being open at one side of the holder adjacent the juncture of the two parts thereof and having cut-out places therein at the other side of the holder adjacent the juncture of the two parts.

8. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder comprising two relatively immovable longitudinal parts adapted to hold a portion of the sheet-metal blank therebetween, bending means adjacent the holder extending lengthwise thereof and a plurality of yokes intermediate the ends of the bending means embracing and connecting both parts of the holder.

9. In a sheet-metal-bending machine, the combination with a rotary longitudinal holder comprising two parts adapted to hold a portion of the sheet-metal blank therebetween, of a plurality of yokes intermediate of the ends and revoluble with the holder embracing and connecting both parts thereof, the said yokes being cut away to allow insertion of the sheet-metal blank through the holder.

10. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with a narrow opening throughout its length extending transversely therethrough, bending means adjacent and extending lengthwise of said holder for bending portions of the sheet metal protruding from the holder, a plurality of bearings for said holder intermediate the ends of the bending means, and a stop on said bearings for limiting the insertion of the sheet metal through the holder.

11. In a sheet-metal-bending machine, the combination of a rotary longitudinally-divided holder journaled at each end and stationary means on each side of and adjacent the holder for bending the portions of the sheet metal protruding from the holder.

12. In a sheet-metal-bending machine, the combination of a rotary longitudinally-divided sheet-metal holder, a form adjacent said holder, and means revoluble around said form for shaping a portion of the sheet metal protruding from said holder about said form.

13. In a sheet-metal-bending machine, the combination of a rotary sheet-metal holder provided with means for rotating the same, a stationary form adjacent the holder and means for shaping an unheld portion of the sheet-metal blank about said form.

14. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with an opening throughout the length thereof extending transversely therethrough for holding a portion of the sheet metal, means for rotating said holder, means adjacent the holder at one side thereof for bending the sheet metal in the rotation of the holder, a form adjacent the other side of the holder and means revoluble around said form for shaping the sheet metal protruding from the holder about said form.

15. In a sheet-metal-bending machine, the combination with a sheet-metal holder consisting of two relatively immovable parts adapted to hold an intermediate portion of the sheet-metal blank, of means adjacent and operative in connection with the holder adapted to simultaneously bend portions of the sheet-metal blank protruding from each side of the holder.

16. In a ridge-roll machine, the combination of a split member for holding a portion of the sheet-metal blank, a channel-plate adjacent the said split member adapted to limit the insertion of the sheet-metal blank through the slot of the split member and to receive the protruding portion of said blank, means for rotating the said split shaft and mechanism for bending the portions of the sheet-metal blank protruding from the slot of the split shaft during the rotation thereof.

17. In a sheet-metal-bending machine, the combination with a rotary longitudinally-divided sheet-metal holder adapted to hold an intermediate portion of the sheet-metal blank, of a stop adjacent one edge and a form adjacent the other edge of the opening through the holder adapted to simultaneously bend the portions of the sheet-metal blank protruding from the holder in the rotation thereof and a member revoluble about

the holder and said form for shaping an unheld portion of the blank about said form, substantially as described.

18. In a ridge-roll machine, the combination with a split shaft suitably arranged to be capable of limited rotary movement, a channel-plate adjacent the said split shaft having the channel thereof adapted to communicate with the slot of the split shaft in every position of the rotation of the split shaft, a cylindrical form adjacent the opposite end of the slot in the split shaft, substantially as and for the purposes specified.

19. In a ridge-roll machine, the combination of a split shaft for holding a portion of the sheet-metal blank, a channel-plate for limiting the insertion of the sheet-metal blank through the slot of the split shaft and for receiving the protruding portion of said blank, means for rotating the said split shaft so that the protruding edge of the sheet-metal blank is bent against the wall of the channel-plate, a cylindrical form adjacent the split shaft adapted to bend the sheet-metal blank during the rotation of the split shaft and means for wrapping a portion of the sheet-metal blank about said cylindrical form, substantially as specified.

20. In a sheet-metal-bending machine, the combination of a rotary longitudinal holder provided with an opening throughout the length thereof extending transversely therethrough for holding the sheet metal, means for rotating said holder, and a member revoluble around said form for bending portions of the sheet metal protruding from said holder.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHAS. F. BALDWIN.

Witnesses:
MARY E. COMEGYS,
E. M. GILES.