E. W. ROBINSON.

MAKING SHEET METAL HOOPS.

APPLICATION FILED JULY 16, 1914.

1,148,480.

Patented July 27, 1915.

2 SHEETS—SHEET 1.

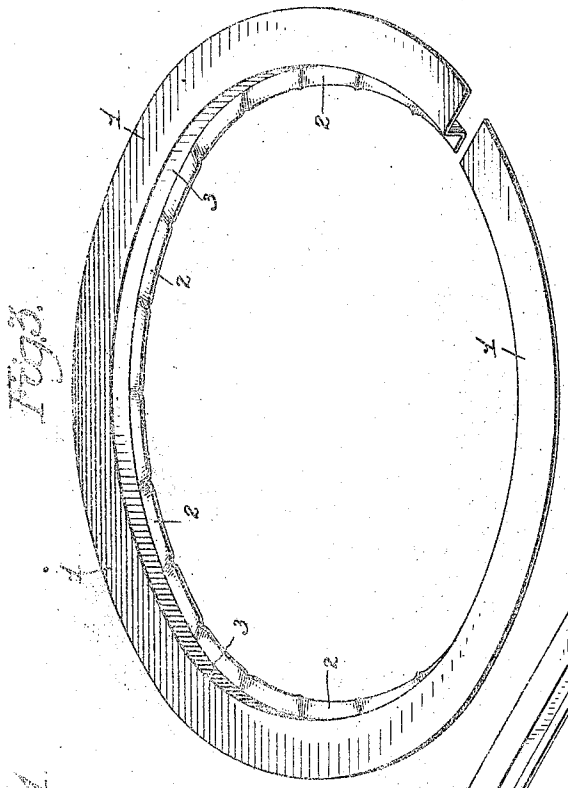


Fig. 3.

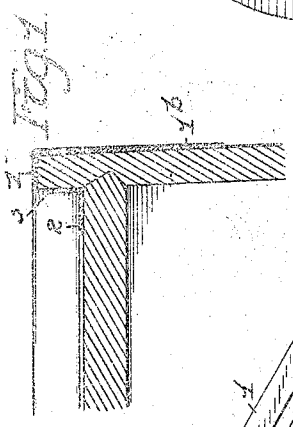


Fig. 1.

Fig. 2.

Fig. 4.

Witnesses
Brandhorst S. Turner
Elsie Fullerton

Inventor
Edward W. Robinson
by his Attorney
Harry Smith

E. W. ROBINSON.

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2 SHEETS—SHEET 2.

Fig. 5.

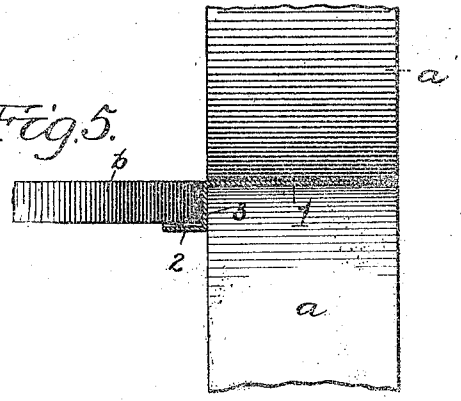


Fig. 6.

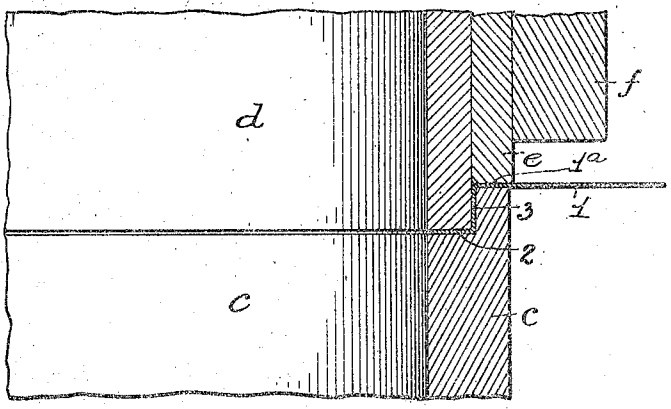


Fig. 7.

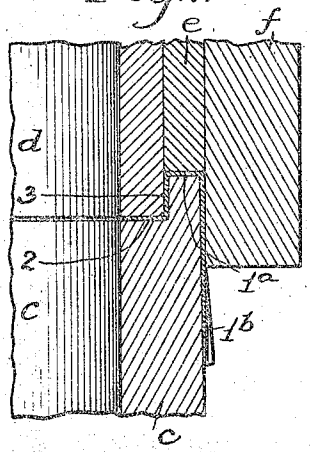
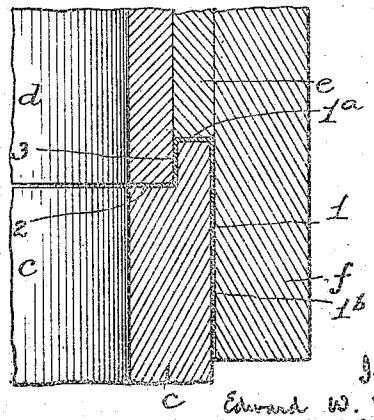


Fig. 8.



Witnesses
Hamilton D. Turner
Elsie Fullerton

Inventor
Edward W. Robinson
by his Attorney
Harry Dwight

UNITED STATES PATENT OFFICE.

EDWARD W. ROBINSON, OF SAVANNAH, GEORGIA.

MAKING SHEET-METAL HOOPS.

1,148,480. Specification of Letters Patent. Patented July 27, 1915.

Application filed July 16, 1914. Serial No. 851,330.

To all whom it may concern:

Be it known that I, EDWARD W. ROBINSON, a citizen of the United States, residing in Savannah, Georgia, have invented certain Improvements in Making Sheet-Metal Hoops, of which the following is a specification.

One object of my invention is to produce from a straight strip of sheet metal of angular cross section a hoop having opposite substantially parallel annular side flanges with a web connecting adjacent edges of the same, a further object being to produce such a hoop having an inwardly projecting web at the opposite edge of the inner flange of the hoop. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which

Figure 1 is a sectional view illustrating one of the purposes for which my improved hoop may be used; Fig. 2 is a view of the preferred form of straight strip from which the hoop is produced; Fig. 3 is a perspective view of the same after being bent into ring form; Fig. 4 is a perspective view of the hoop complete, except as to the joining of the ends of the same; Fig. 5 is a diagram representing the first step in the formation of the hoop from the strip; Fig. 6 is a diagram representing the first step in the completion of the hoop; Fig. 7 is a diagram illustrating a further step, and Fig. 8 is a diagram illustrating the final step.

In carrying out my invention I first prepare a straight sheet metal strip such as shown in Fig. 1, said strip presenting opposite edge portions 1 and 2 in parallel planes, and a connecting portion 3 in a plane at right angles or thereabout thereto, and this strip is then subjected to the action of rollers *a*—*a* and *b*, the rollers *a*—*a*, acting upon opposite sides of the flange 1 and the roller *b* bearing against the inner face of the flange 3 and pressing said flange against the flat faces of the rollers *a*—*a*, as shown in Fig. 5. The rollers *a*—*a* are so formed or set as to impart greater pressure to the outer portion of the flange 1 than to the inner portion of the same, thereby longitudinally spreading or expanding the outer portion of said flange 1. The result of this action is that the flanges 1 and 2 are bent edgewise and the connecting web is bent sidewise, the straight strip fed to the rollers *a*—*a* being delivered thereby in curved form and finally assuming the condition of a split ring, as shown in Fig. 2, the flange 2 being puckered or wrinkled at its inner edge owing to the contraction in the diameter of said inner edge as compared with the diameter of the flange 3, which retains its original condition, not having been subjected either to expansion or contraction, in any of its parts, but having been bent flatwise or transversely to its original plane instead of edgewise or in such original plane, as is the case with the flanges 1 and 3. The ring shown in Fig. 2 is then subjected to the action of circular dies *c*, *d*, *e* and *f*, each of which may be in the form of a continuous ring or may be made in as many different pieces or sections as is found desirable. The die *c* has upper, side and lower faces for contact, respectively, with the flanges 1, 3 and 2 of the ring and the dies *d*, *e* and *f* are movable vertically in respect to the die *c*. The die *d* presses the wrinkled or corrugated flange 3 against the lower face of the die *c* so as to flatten out said wrinkles or corrugations, as shown in Fig. 6.

The die *e* clamps upon the upper face of the die *c* that portion 1^a of the flange 1 which is adjacent to the flange 3, and the die *f* bends down alongside of the die *c* the outer projecting portion of said flange 1 so as to produce the depending outer flange 1^b of the hoop, as shown in Figs. 7 and 8. As the projecting portion of the flange 1 is bent downwardly over the die *c* to form the flange 1^b, the lower portion of said flange is puckered or wrinkled, as shown in Fig. 7, because of the reduction in the diameter of the same as compared with the diameter of the outwardly projecting flange 1, but as the die *f* continues to descend these puckers or wrinkles are flattened out, as shown in Fig. 8. After the split hoop shown in Fig. 3 has been produced, the hoop is completed by uniting the opposite ends 5—5, by welding, brazing, riveting, or equivalent means, or these ends may remain disconnected, and may be retained in proper relation to each other by nailing or other means after the hoop has been applied.

In carrying out my invention the use of the die *d* may be omitted and the head-retaining flange 2 permitted to retain its wrinkled or corrugated outer edge, if desired, or this flange 2 may be omitted altogether in some cases and instead of continuing the movement of the die *f* until it has flattened the wrinkles at and near the

lower edge of the flange 1^b of the hoop, the action of the die f may be arrested before it effects such flattening of said wrinkles.

I claim:

1. The mode herein described of preparing a blank for hoop segment, said mode consisting in first preparing a straight strip of sheet metal with flanges substantially at a right angle to one another, and then subjecting one of these flanges to greater pressure at and near the free edge than at and near its junction with the other flange, and thus causing the first named flange to spread or expand longitudinally at and near said free edge and thereby simultaneously bend said flange edgewise and the other flange flatwise into a ring segment.

2. The mode herein described of preparing a blank for a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having opposite edge flanges in separate planes parallel with each other, and a connecting web in a plane substantially at right angles to said edge flanges, and then subjecting one of said edge flanges to greater pressure at and near its free edge than at and near its junction with the connecting web and thus causing said flange at and near its free edge to spread or expand longitudinally and thereby cause simultaneous bending of both edge flanges edgewise and of the connecting web flatwise into a ring segment.

3. The mode herein described of producing a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having flanges at right angles or thereabout to one another, then bending one of said flanges edgewise and the other flatwise into a ring segment, and then subjecting the latter to the action of a die whereby the edgewise bent flange has its free edge portion bent to form a flange substantially parallel with the flatwise bent flange.

4. The mode herein described of producing a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having flanges at right angles or thereabout to one another, then bending one of said flanges edgewise and the other flatwise into a ring segment, then subjecting the latter to the action of a die whereby the edgewise bent flange has its free edge portion bent to form a flange substantially parallel with the flatwise bent flange, and after the bending operation has been completed, continuing the action of said die so as to flatten any wrinkles or corrugations which may have been formed at and near the free edge of the flange by the preliminary bending action.

5. The mode herein described of producing a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having opposite edge flanges in separate parallel planes, and an intervening connecting web in a plane at right angles or thereabout to said edge flanges, then bending said parallel edge flanges edgewise and said intervening web flatwise into a ring segment, and then subjecting the outer flange of the latter to the action of a die whereby the portion of said flange at and near its free edge is bent to form a flange substantially parallel with the connecting web.

6. The mode herein described of producing a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having opposite edge flanges in separate parallel planes, and an intervening connecting web in a plane at right angles or thereabout to said edge flanges, then bending said parallel edge flanges edgewise and said intervening web flatwise into a ring segment, then subjecting the outer flange of the latter to the action of a die whereby the portion of said flange at and near its free edge is bent to form a flange substantially parallel with the connecting web, and, at the same time, imparting pressure to the opposite edge flange so as to flatten any wrinkles or corrugations which may have been formed therein by the edge bending of the same.

7. The mode herein described of producing a hoop segment, said mode consisting in first preparing a straight strip of sheet metal having opposite edge flanges in separate parallel planes, and an intervening connecting web in a plane at right angles or thereabout to said edge flanges, then bending said parallel edge flanges edgewise and said intervening web flatwise into a ring segment, then subjecting the outer flange of the latter to the action of a die whereby the portion of said flange at and near its free edge is bent to form a flange substantially parallel with the connecting web, and, at the same time, imparting pressure to the opposite edge flange of the ring so as to flatten any wrinkles or corrugations which may have been formed therein by the edge bending of the same, and then continuing the action of the die which bent the outer edge flange so as to flatten any wrinkles or corrugations which may have been formed therein by such bending operation.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

EDWARD W. ROBINSON.

Witnesses:
KATE A. BEADLE,
HAMILTON D. TURNER.