No. 819,340. PATENTED MAY 1, 1906.

J. R. COE.

METHOD OF MAKING SPINNING RINGS.

APPLICATION FILED JULY 16, 1904.

2 SHEETS—SHEET 1.

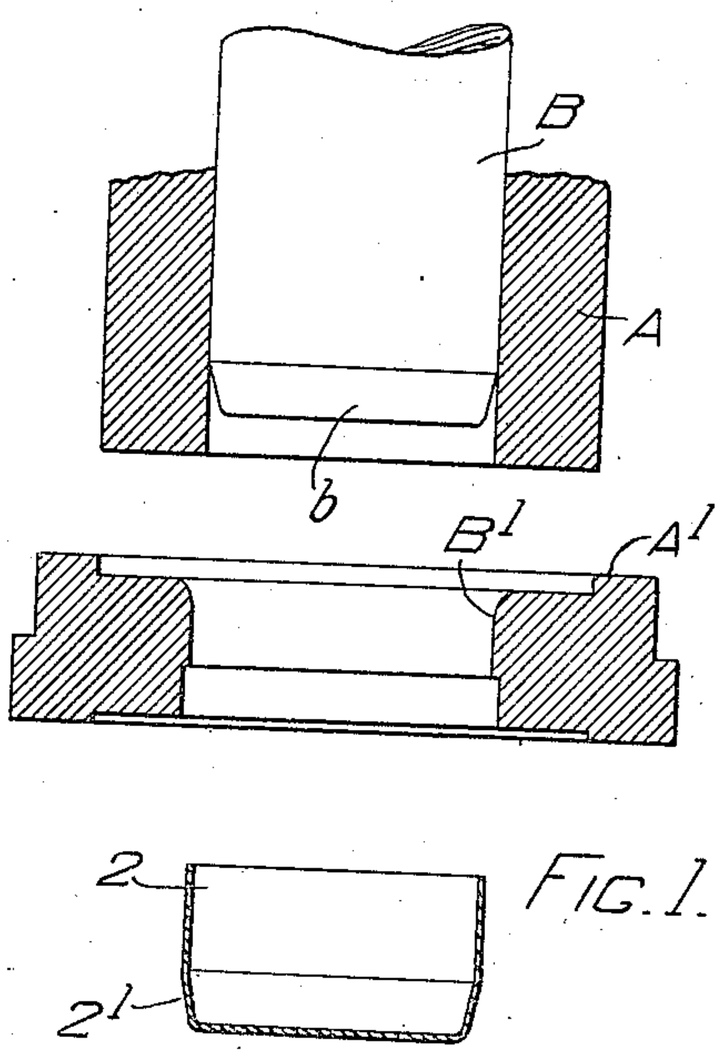


FIG. 1.

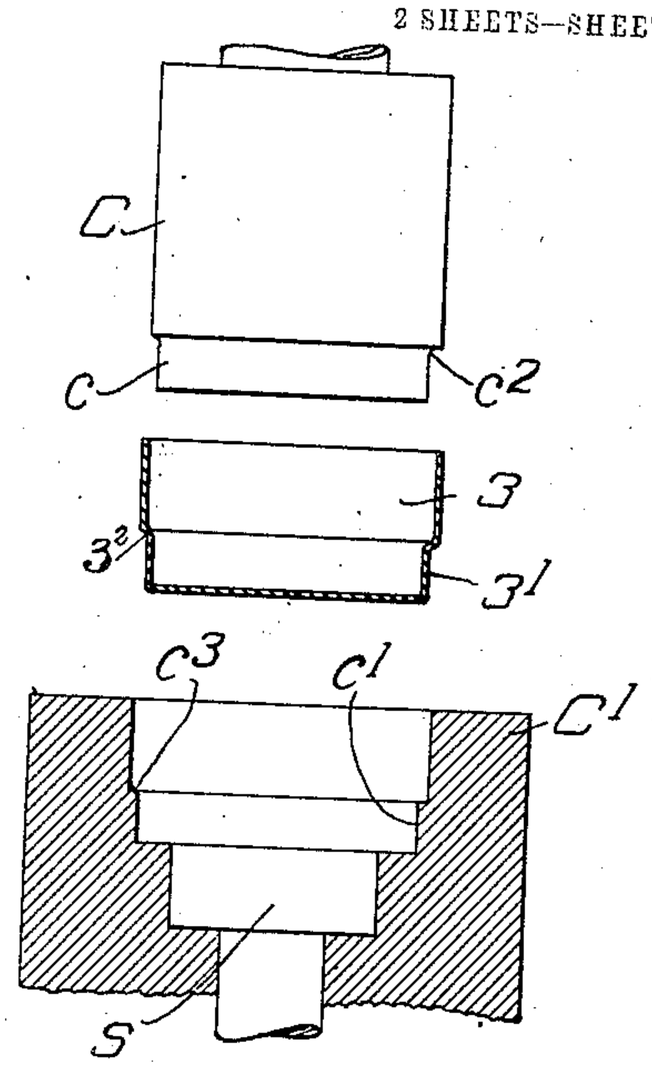
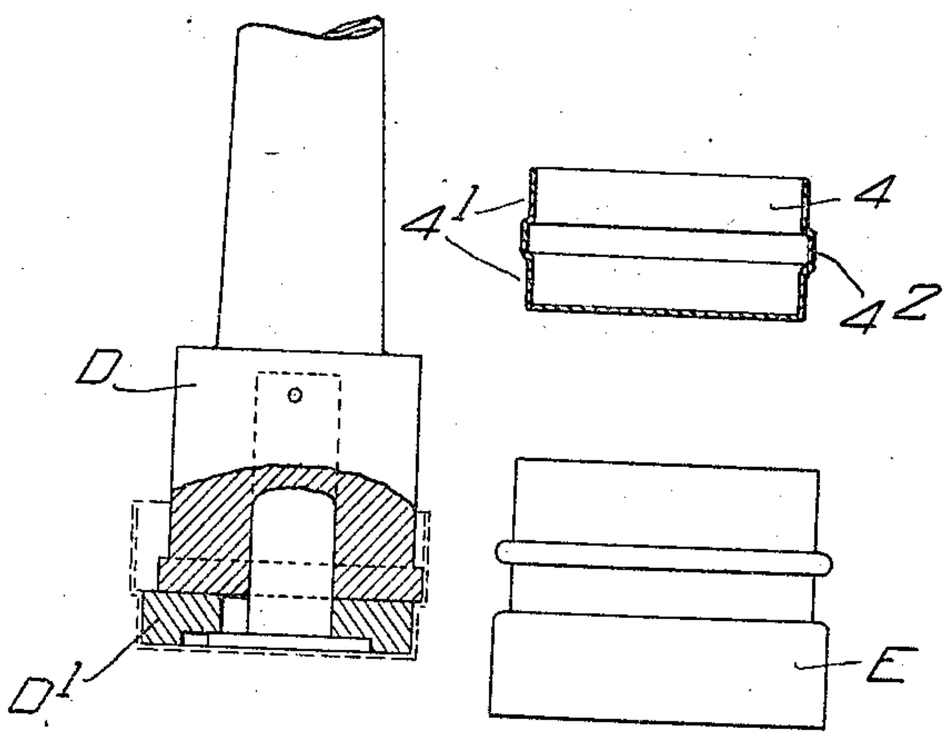


FIG. 2.



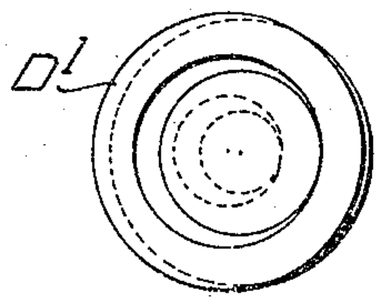


FIG. 3.

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2 SHEETS—SHEET 2.

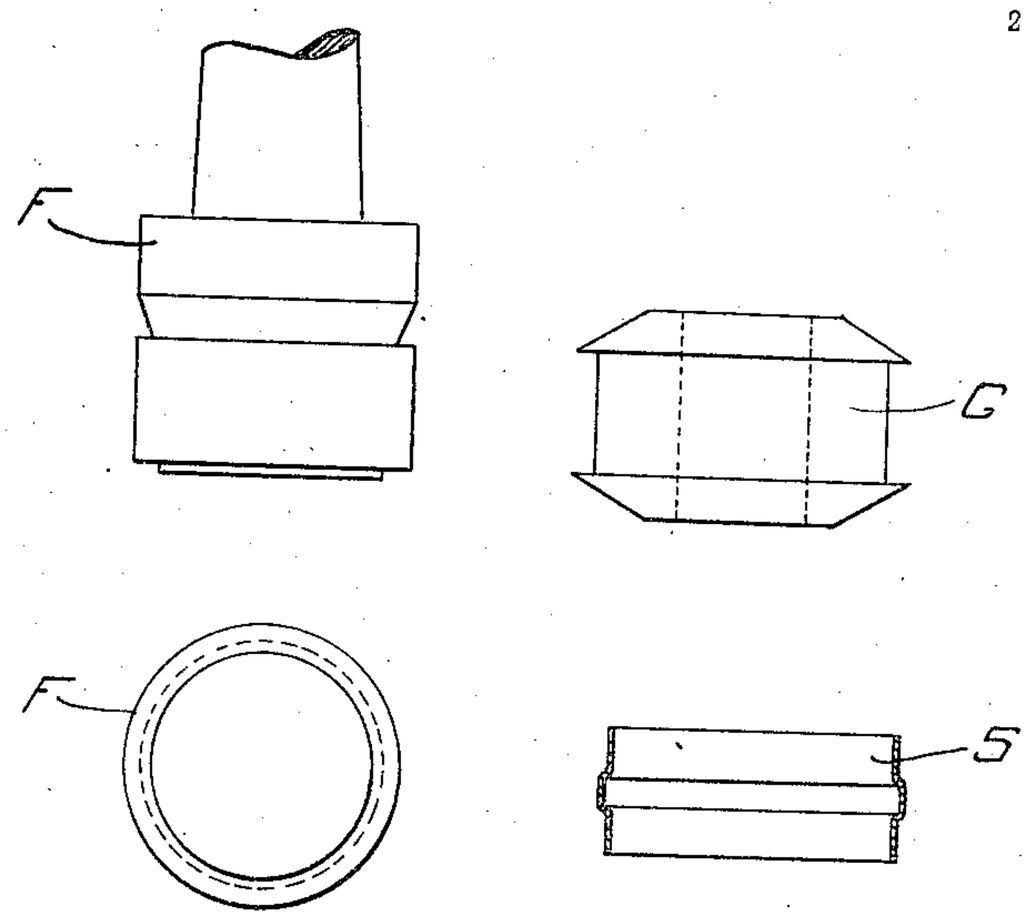

FIG. 4.

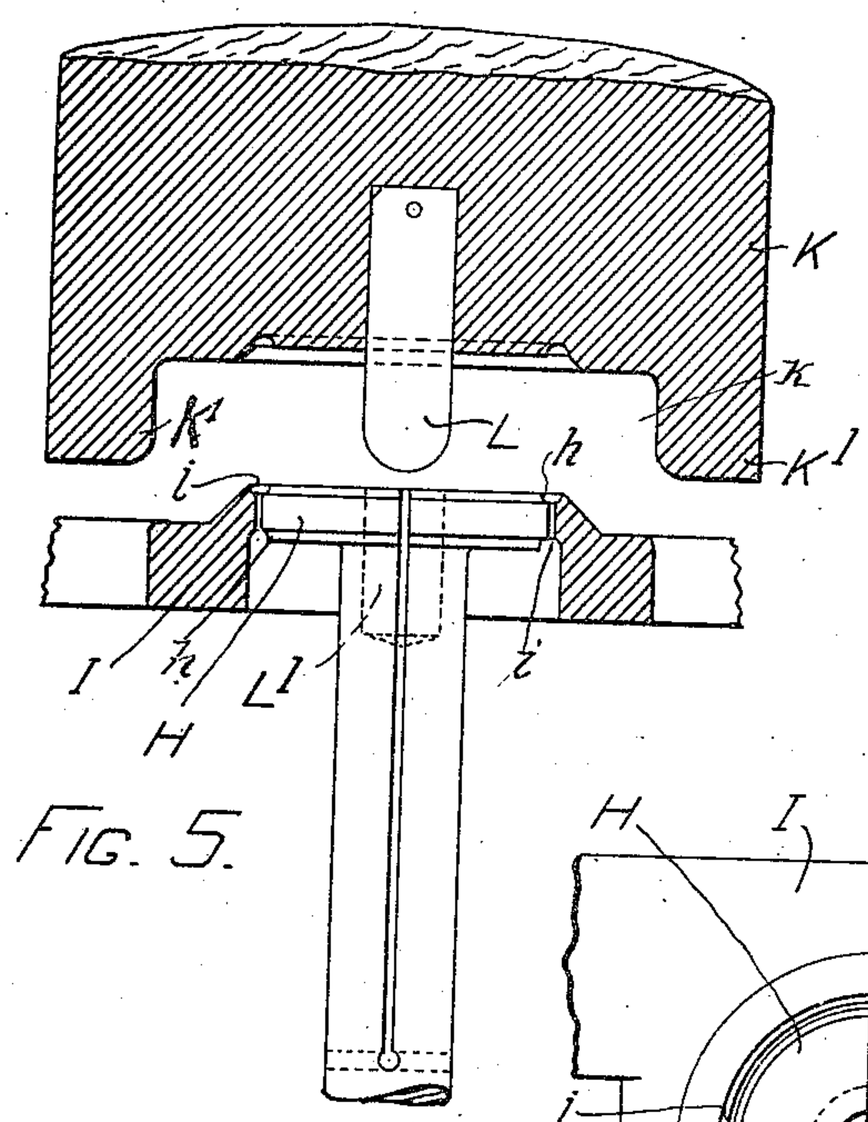

FIG. 5.

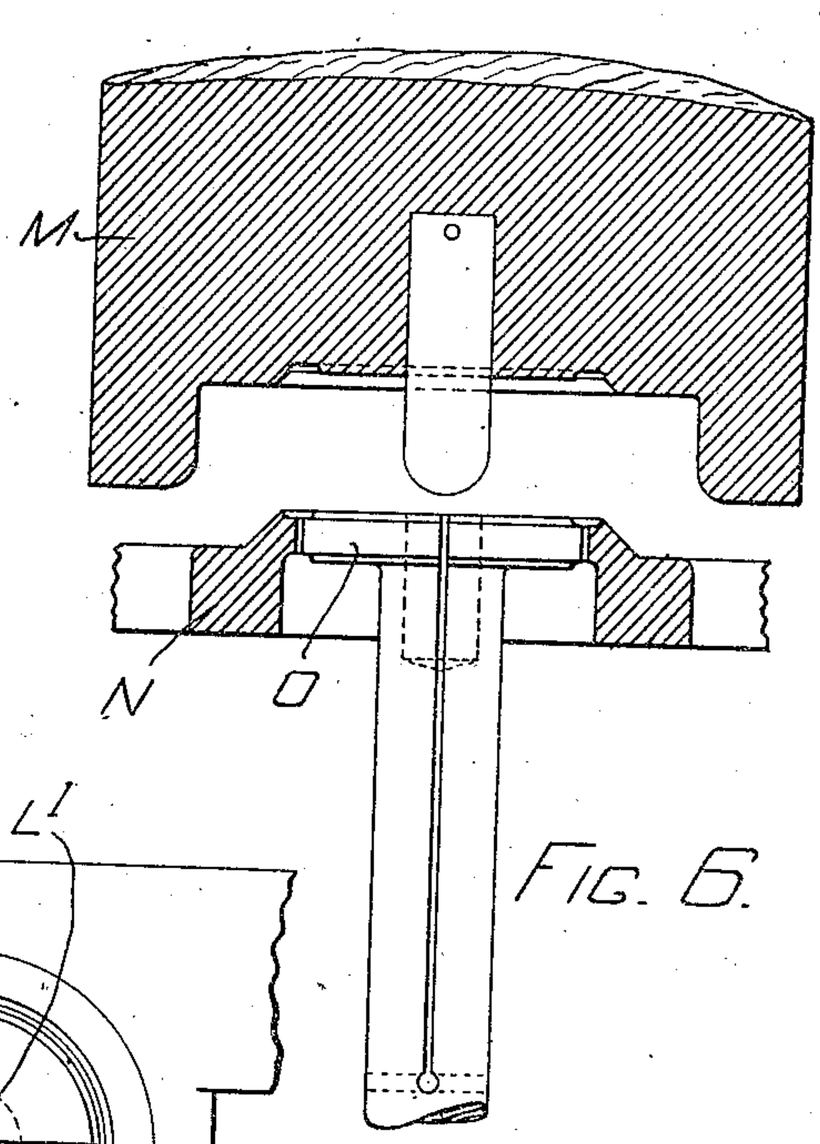

FIG. 6.

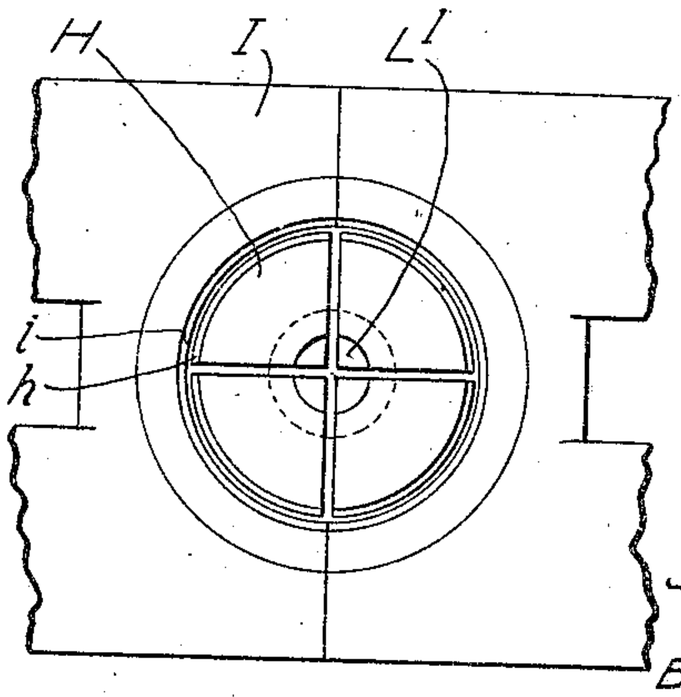

FIG. 7

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UNITED STATES PATENT OFFICE.

JAMES ROBERT COE, OF ANSONIA, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CONNECTICUT MILL SUPPLY COMPANY, A CORPORATION OF NEW JERSEY.

METHOD OF MAKING SPINNING-RINGS.

No. 819,340. Specification of Letters Patent. Patented May 1, 1906.

Application filed July 16, 1904. Serial No. 216,905.

To all whom it may concern:

Be it known that I, JAMES ROBERT COE, a citizen of the United States, residing at Ansonia, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Methods of Making Spinning-Rings, of which the following is a specification.

This invention relates to the manufacture of spinning-rings, and particularly to the forming of double-flanged spinning-rings from sheet metal.

Single-flanged spinning-rings have heretofore been made in various ways from sheet metal; but double-flanged rings have only been successfully made by turning from a blank.

It is the object of the present invention to produce a double-flanged ring from sheet metal by a certain method of bending and pressing which will give it strength and durability of structure and at the same time make possible its manufacture at a cost comparing favorably with the single-flanged ring.

In the drawings, in which like characters of reference indicate corresponding parts throughout, Figure 1 indicates the first die and its product; Fig. 2, the second die and product; Fig. 3, the roller and product of the third step; Fig. 4, the trimmer and the trimmed blank; Fig. 5, the closing-down die and closed blank; Fig. 6, the forming-die and formed blank; Fig. 7, a plan view of the inclosing die in Fig. 5.

Taken in their order the steps of the operation are as follows, a brief description of the dies and rolls by which they are performed being included therewith for the sake of clearness.

2 is a cup of metal formed from a flat disk, which is cut from a sheet of stock by the cutting-dies A A′, Fig. 1, and drawn by the reducing-dies B B′, of which B is an inner plunger carried by the punch A. The plunger B has a tapered end portion *b*, which gives to the cup 2 a tapered portion 2′ adjacent to its bottom.

C C′ represent a die which forms from the cup 2 the cup 3, Fig. 2, in which the tapered portion 2′ is reduced to a tubular section of smaller diameter 3′ by the portion *c*′ of the die C′. The shoulder between C and *c* is formed with a concave c^2, and between the parts C′ and *c*′ is an oppositely-rounded shoulder c^3. These shoulders form the shoulder 3^2 of the cup with a curve which assists in the forming of the flange, as will appear later. S is a knock-out pin in the bottom of the die C′. The opposite end of the cup 3 is then reduced to produce the cup 4, which operation is performed by rolling on the arbor D, Fig. 3, with the roll E, which has corresponding flanges to form the new shoulder with a similar curve and maintain the form of the shoulder first formed. The arbor D has a loose ring D′, which is just the size of the bottom of the cup 3′, Fig, 2, and which is mounted to yield sufficiently to form the central rib 4^2 while the arbor is coacting with the roll E. The cup 4, it will be noted, now has reduced portions 4′ at each end and a central rib or groove 4^2 substantially rectangular in cross-section, but joining the said reduced portions by the curved shoulders. The cup 4 is then trimmed on the arbor F, Fig. 4, by the trimmer G to remove the bottom of the blank 4, trim the edges, and produce the blank 5. The blank is now internally supported on a collapsible mandrel H, Fig. 5, which is substantially the shape of the central portion of the blank 5 and externally supported by the die I, a plan of which is shown in Fig. 7, and which corresponds to the exterior of said central portion of the blank, except that its upper and lower edges *i* are oppositely recessed to form with the curved shoulder *h* of the mandrel a semicircular cavity for the formation of the rim from which the flange is to be shaped. K is a second die member having a similar annular cavity *k* and carrying a pin L, which engages and enters the mandrel at L′ to center the die and to maintain the mandrel expanded during the closing of the flanges of the blank 5 to form the blan k6. K′ represents cam-faced ears for holding the die I closed. After one end of the ring has been closed down, it is turned over and the other end similarly treated. In this die I the ends of the blank are closed down by bending over upon the central portion, following the curve between the shoulders before described, so as to form a substantially round rim. The blank 6 then has its rims flattened in the die M N, while said blank is supported on a similar collapsible mandrel O to produce the ring 7

in a similar manner to the formation of the ring 6. The rings thus formed are then buffed or burnished to produce the finished marketable article.

The blank 5 may obviously be produced in a variety of ways by drawing or rolling from thin stock or by forming from thicker metal. The essential point of the invention is the internal supporting of the blank in the collapsible die and mandrel, which allows the production of a double-flanged ring from sheet metal by bending. The article thus produced is cheap, strong, and satisfactory and has the obvious and admitted advantages of the double-flanged ring.

In forming these rings it is usually desirable to have the flange folded outward, so that the seam will come on the outside of the ring; but obviously the flanges might be turned in and the seam internally located. As above stated, the exact features of the first four steps, as above described, may be variously modified, although those outlined are satisfactory from the standpoint of quality of product and economy of production. Various modifications may therefore be made in the forms of the blanks in the manipulation thereof without departing from the spirit of my invention.

What I therefore claim, and desire to secure by Letters Patent, is—

1. The method of forming a double-flanged spinning-ring from sheet metal, consisting in forming a cup having the lower portion of the sides tapered, in reducing said tapered portion to form an annular shoulder, in forming a similar annular shoulder on the opposite end of the cup thus formed, in removing the bottom of the cup, in closing the ends of the tube over, and against said shoulder, and flattening said closed portions to form flanges.

2. The method of forming a double-flanged spinning-ring, consisting in forming a blank having a central tubular portion and end tubular portions of slightly-different diameter, in supporting said central portion internally, and in bending said end portions, while the central portion is thus supported, and compressing and flattening the bent end portions to form flanges, substantially as shown and described.

3. The method of forming a double-flanged spinning-ring, consisting in forming a blank having a central tubular portion, and end tubular portions of slightly-different diameter, in supporting said central tubular portion, and in bending said end portions while the central portion is thus supported, and compressing and flattening the bent end portions to form flanges.

4. The method of forming a double-flanged spinning-ring, consisting in forming a blank having a central tubular portion and end tubular portions of slightly-different diameter, in supporting said central portion externally and internally, and in bending said end portions while the central portion is thus supported, and compressing and flattening the bent end portions to form flanges, substantially as shown and described.

5. The method of forming a double-flanged spinning-ring from sheet metal, consisting in forming a tubular blank having a central portion of one diameter, and end portions of a different diameter, in supporting said central portion, and in bending, compressing and flattening the end portions to form flanges, while the central portion is thus supported.

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

JAMES ROBERT COE.

Witnesses:

DAVID COE,

DAVID H. COE.