Aug. 9, 1932. J. C. CROMWELL 1,870,836

BATHTUB

Filed March 18, 1927 4 Sheets-Sheet 1

Fig. 1.

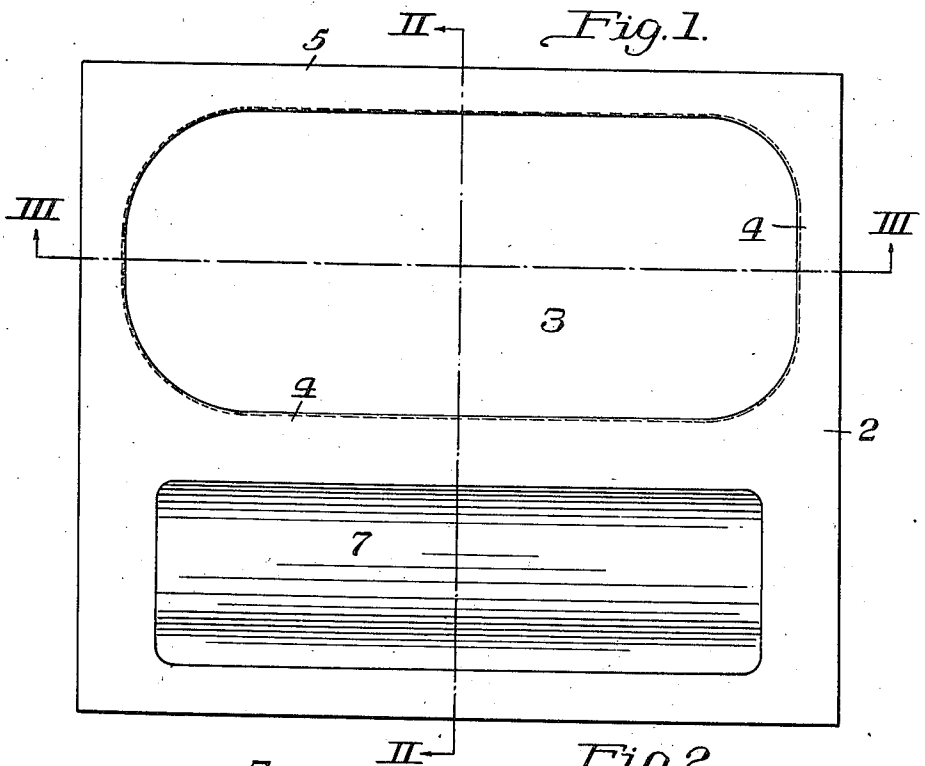


Fig. 2.

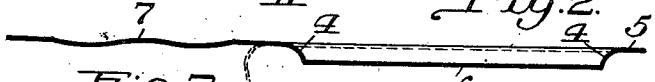


Fig. 3.

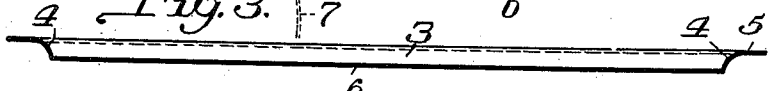


Fig. 4.

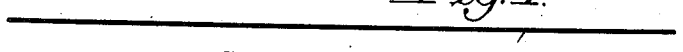


Fig. 5.

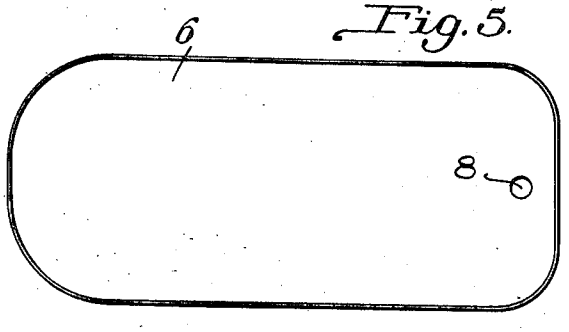


Fig. 6.

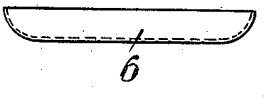
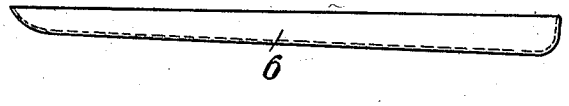


Fig. 7.



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Fig. 8.

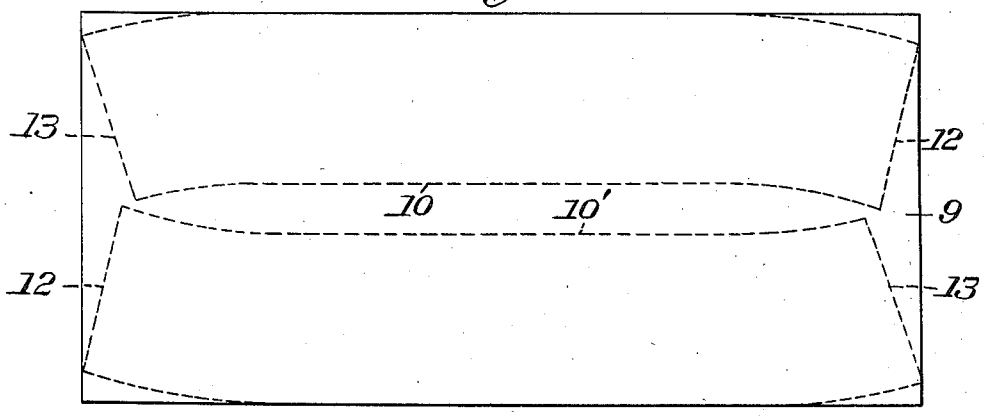


Fig. 9.

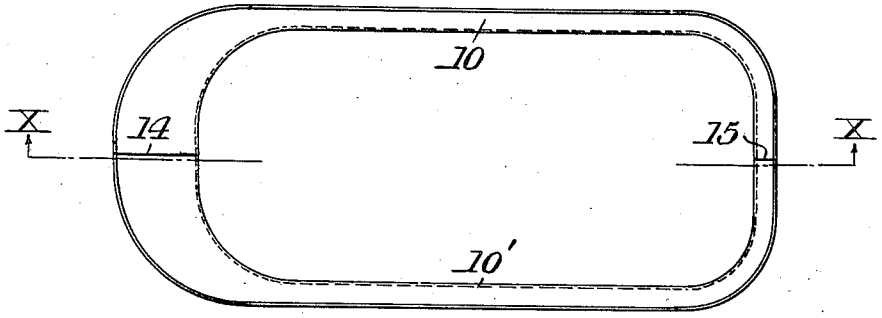


Fig. 10.

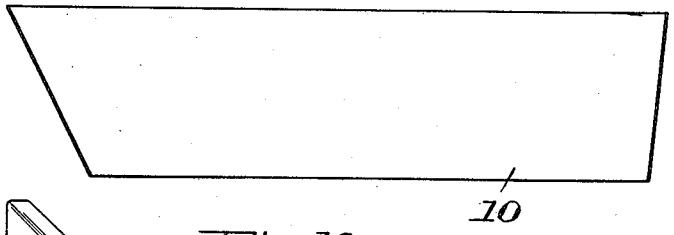


Fig. 19.

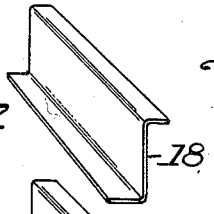
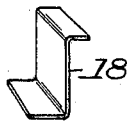


Fig. 17.



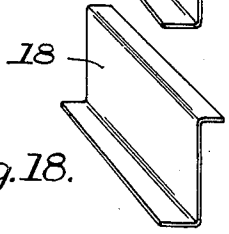


Fig. 20.

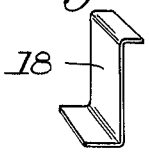


Fig. 18.

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Fig. 11.

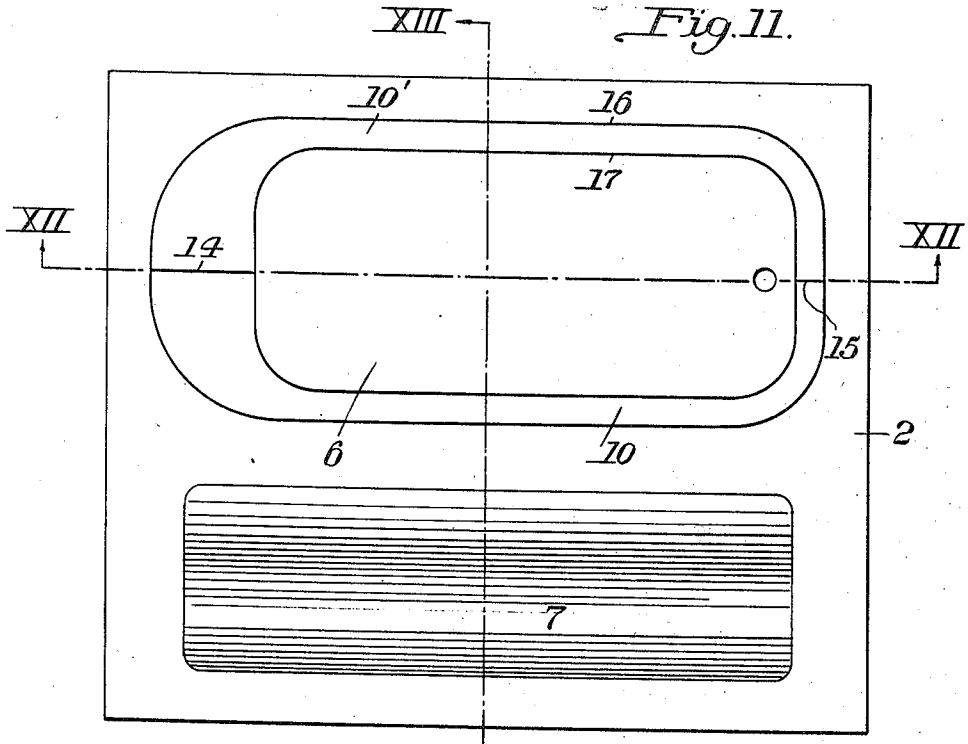


Fig. 12.

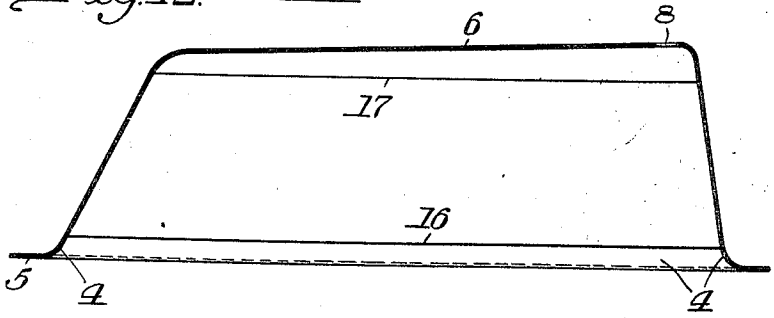
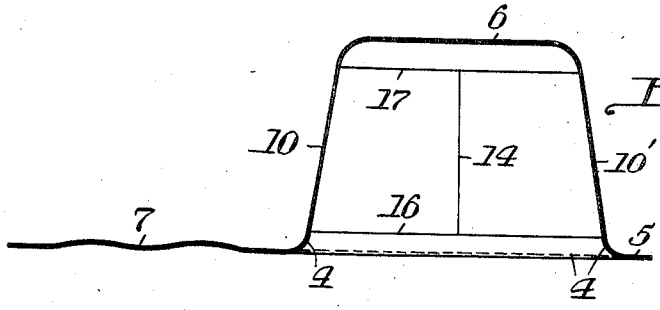


Fig. 13



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Fig. 14.

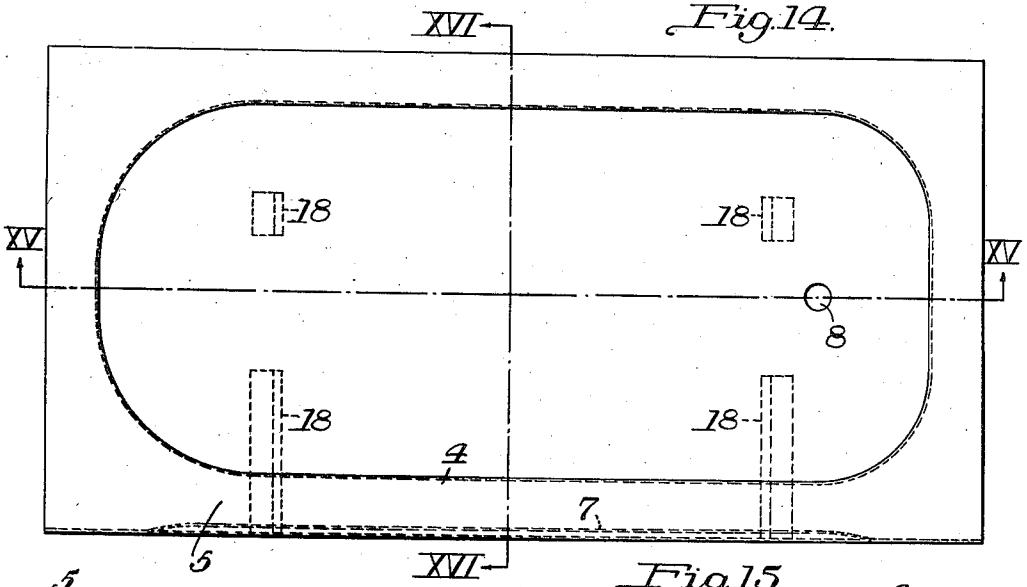
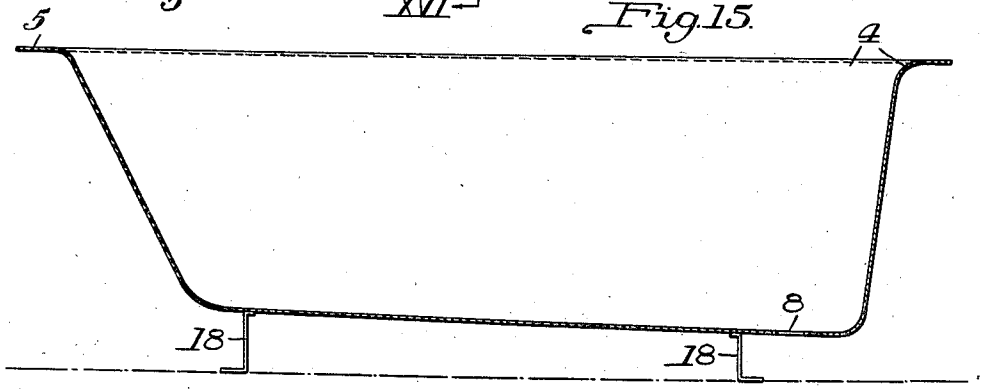


Fig. 15.



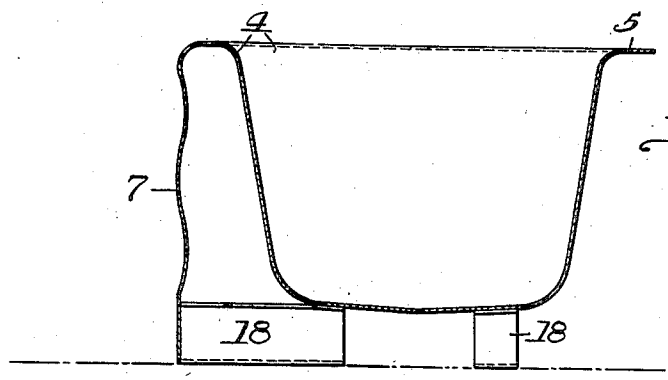


Fig. 16.

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Patented Aug. 9, 1932 1,870,836

UNITED STATES PATENT OFFICE

JOHN C. CROMWELL, OF COLUMBUS, OHIO, ASSIGNOR TO THE STEEL SANITARY COMPANY, OF ALLIANCE, OHIO, A CORPORATION OF OHIO

BATHTUB

Application filed March 18, 1927. Serial No. 176,567.

The present invention relates broadly to the art of metal working and articles formed therefrom and more particularly to sheet metal ware working and making and to improved receptacles produced therefrom such, for example, as bath tubs, so called stationary tubs, sinks, and the like.

At the present time the standard practice in the United States in the production of articles of this general nature from metal is to make use entirely of a casting process. In order to provide the necessary strength, a cast metal article of the general nature herein contemplated is necessarily considerably heavier than would be the case with a corresponding article manufactured from sheet metal.

In an effort to overcome this objectionable feature with respect to weight, efforts have been heretofore made to produce tubs from sheet steel. In this country, recourse has been had to a deep drawing operation in an effort to form tubs from a single piece of material. Experience demonstrated, however, that such a drawing operation was not feasible from an economic standpoint. This was due not only to the fact that the operation represented in excess of 40% waste of the original sheet, but also from the fact that the drawing resulted in such a thinning of the metal as to require the use initially of stock having a substantially greater thickness than would ordinarily be used. It was found that a five-foot tub having supporting legs, for example, produced in accordance with the drawing method referred to, would have a net weight of about 170 pounds as compared to a net weight of the same tub in cast iron of about 240 pounds. This would result in a tub representing a much greater production cost than the standard cast iron tub.

In Germany the problem is being attacked from the standpoint both of making a thinner casting, and from the standpoint of producing a sectionalized sheet metal tub, the parts of which are hand shaped and welded. Cast iron tubs as thin as 1/8 of an inch in some parts are being produced at the present time with this object in view, but obviously possessing disadvantages incident to thin castings of large size. The sectional steel structures, depending upon the process of manufacture utilized, comprise from five to seven separate sections which must be hand-shaped, hand-assembled, and hand-welded, in addition to the usual finishing operations incident to such a process.

The large number of sections and the expensive shaping and assembling operations represented by the present German practice in connection with sheet steel tubs requires such a large amount of labor that it is impossible to commercially manufacture tubs in this country in accordance with such practices.

A sheet steel tub possesses many advantages, among which may be pointed out the smoothness of the surface, thereby insuring a better finish and appearance, and the relatively smaller mass of metal present whereby the entire body of the tub is more quickly brought up to water temperature and the fuel cost for heating the water correspondingly reduced.

In addition to the above, the tub possesses greater strength; may be more easily handled and installed, and due to its lighter weight enables a relatively lighter construction of building floors.

The present invention has for one of its objects the production of a receptacle having the general characteristics referred to from sheet metal in such manner that it is adaptable to quantity production.

Still another object of the present invention is to provide a sheet metal receptacle from a minimum of pieces, each capable of being easily formed, the parts being formed in

such manner that the amount of scrap is almost negligible.

In accordance with the present invention, a five-foot tub of the general characteristics previously referred to may be produced of such material that the net weight of the finished tub will be approximately eighty-five pounds.

In the accompanying drawings, there is shown for purposes of illustration only, and more or less diagrammatically, a series of operations and sections adapted to be respectively carried out and produced in accordance with the present invention for the production of a sheet metal tub of any desired style, it being understood that the drawings do not define the limits of my invention as changes in the steps and manner of carrying out the same as well as in the contour and arrangement of the parts may be made without departing either from the spirit of the invention or the scope of my broader claims.

In the drawings,

Fig. 1 is a top plan view of a blank which has been subjected to an initial shaping operation;

Fig. 2 is a transverse sectional view on the line II—II of Fig. 1;

Fig. 3 is a longitudinal sectional view on the line III—III of Fig. 1;

Fig. 4 is a top plan view of the punching produced in accordance with the operation illustrated in Figs. 1, 2 and 3;

Fig. 5 illustrates, in top plan view, the formation of a bottom from the punching of Fig. 4;

Fig. 6 is an end elevation of the construction of Fig. 5; and,

Fig. 7 is a side elevation of the construction of Fig. 5;

Fig. 8 is a top plan view of a sheet adapted for the formation of side pieces, the figure illustrating such pieces in dotted lines;

Fig. 9 is a top plan view illustrating the side sections after they have been shaped and assembled;

Fig. 10 is a longitudinal sectional view on the line X—X of Fig. 9;

Fig. 11 is an inverted plan view showing the various parts in shaped and assembled position;

Fig. 12 is a vertical longitudinal sectional view on the line XII—XII of Fig. 11;

Fig. 13 is a vertical transverse sectional view on the line XIII—XIII of Fig. 11;

Fig. 14 is a top plan view of a completed tub;

Fig. 15 is a longitudinal sectional view on the line XV—XV of Fig. 14;

Fig. 16 is a transverse sectional view of a line XVI—XVI of Fig. 14; and,

Figs. 17, 18, 19, and 20, respectively, are perspective views illustrating different feet for use on the tub of Figs. 14 to 16.

In accordance with the present invention, a piece of metal stock 2 in sheet form and of the exact over-all dimensions required for a completed tub with respect to width including the width of the apron, and length, is subjected to a suitable pressing and punching operation. This operation is effective for forming a depression 3 having curved sides and ends 4 of a curvature suitable for forming the connecting portion between the sides of a finished tub and the rim 5. At this same operation the bottom 6 of the depression 3 illustrated in Fig. 4, is punched from the sheet 2. The shaping operation is also such that the apron portion 7 of the tub may be given any shaping action that may be desired, one contour being illustrated in Fig. 2.

The bottom 6 punched from the blank 2 is of such dimensions that it may be effectively utilized by means of an inexpensive shallow drawing operation to form the bottom of the finished tub. This shallow drawing operation is such as to give the contour illustrated in Figs. 5, 6, and 7 in which corners of the desired radius and side portions of proper curvature to join with the main sides of the tub are produced. The blank 6 may be simultaneously punched to form a drain opening 8 therein.

In Fig. 8 there is illustrated a sheet of material 9 adapted for the formation of sides 10 and 10′, these two sides preferably being exactly alike. In order to effect a saving of metal in the formation of the sides, they are preferably produced from the sheet in reversed end to end arrangement as indicated in dotted lines in Fig. 8. In this manner the high points on the respective blanks may occupy staggered or overlapping relationship with respect to each other as laid out on the sheet 9. Each of the blanks has one end portion 12 of relatively slight taper adapted to produce the desired contour when assembled for the front of a tub, and an opposite end portion 13 of relatively greater taper adapted when assembled to form the relatively greater inclination for the back end of the tub.

After the sides have been punched from a sheet by any desired punching operation, they may be subjected to a shaping operation effective for bringing each side into the general shape illustrated in Fig. 9 with the ends 13 abutting along the line 14 and the ends 12 abutting along the line 15.

The blank illustrated in Figs. 1 to 3 may then be inverted into the position illustrated in Figs. 11, 12, and 13, and the assembled sides as shown in Figs, 9 and 10 placed thereon, the taper of the side and end portions of the sides being such as to constitute the desired continuation of the curved edge walls forming the depression 3. The bottom 6 may then be placed in position on the sides, and thus provide an assembly including but four sections adapted to be secured together by a

simple welding operation along the lines 14 and 15 referred to and along the lines 16 and 17 which represent respectively the junction between the sides and the top and the junction between the bottom and the sides.

After the main receptacle sections have been welded in position, the entire blank 2 may be subjected to a trimming operation if desired, and the apron portion 7 then bent downwardly into the position illustrated in full lines in Fig. 15. After these operations, suitable feet 18 illustrated in perspective in Figs. 17 to 20 both inclusive, may be welded into position to support the finished tub in the manner desired. It will be obvious from Figs. 14 and 15 that certain of these feet are preferably of greater length than the others whereby they extend continuously from the bottom of the tub to the bottom of the apron and constitute bracing means therefor. These feet are also effective for raising the entire tub from the floor a sufficient amount to permit the desired installation of piping below the same without the necessity of cutting through or otherwise mutilating the joists or floor of the building.

While the invention has herein been illustrated in connection with the formation of a bath tub of a particular style, it will be understood that it is adaptable to bath tubs of any desired shape or style as well as to a large number of other receptacles such as sinks, stationary laundry tubs, kettles, and the like. This is particularly true where such articles have downwardly and inwardly tapering side walls whereby the punching produced by the initial shaping operation may be utilized for the formation of the bottom of the finished article.

After the desired article has been produced in accordance with the present invention it may be finished, if produced from ordinary steel, by the usual annealing and enameling operations. If produced from so-called stainless steel, it may be finished by a suitable polishing operation.

In accordance with the present invention, it is possible to form a completed article from four main sections punched from two sheets. By utilizing the portion removed from one of these sheets forming the top for the production of the bottom of the finished article, there is practically no waste in such sheet. With respect to the other sheet, the sections produced therefrom are either duplicates or substantial duplicates depending upon the characteristics of the article to be made therefrom, and are of such shape that there is a minimum of waste material resulting from their production.

It will be apparent from the foregoing that the entire article in accordance with the present invention, may be produced ready for welding by seven or eight strokes, depending upon the number of trimming operations on a standard press which is capable of a normal operating speed of approximately this number of strokes per minute. In other words, a tub ready for assembly can be produced on a series of presses corresponding in number to the number of operations, at the rate of from seven to eight per minute depending upon the actual number of operations. Thereafter, it is only necessary to weld and finish the tubs, which operations can obviously be accomplished with extreme rapidity.

The invention is particularly adaptable to the production of bath tubs for the reason that in accordance with the present practice the body portions of all of such tubs are of the same general contour. It is therefore only necessary to change the character of the shaping operation for the top sheet in order to produce tubs of different styles. This enables the different styles of tubs of a given length to be produced from a standard set of dies only the top forming die of which need be changed to produce the style desired.

One of the advantages of the present invention arises from a method by means of which sheet metal ware articles may be produced in quantity with extreme rapidity and with a minimum waste of material.

Another advantage of the present invention arises from the provision of a method of forming completed articles from sheet metal by the use of two main blanks subjected only to shallow drawing and punching operations. This enables the use of steel of any desired thickness and characteristics and obviates the use of special drawing steel such as required for deep drawing operations.

A further advantage of the present invention arises from the provision of a method by means of which the metal displaced from the blank forming the top of the receptacle may be utilized for forming the bottom thereof.

A still further advantage of the present invention arises from the provision of an article comprising a shallow bottom section, a shallow top section, and a main body portion formed entirely from flat sheets subjected to a simple shaping operation.

I claim:

1. A sheet metal bath tub comprising a curved rim section having a downwardly projecting edge, a smooth bottom section having an upwardly projecting edge, and a body portion comprising exclusively two sections having butt welded connecting joints, said body-forming portion having upper and lower edges butt welded respectively to the downwardly and upwardly projecting edges of the top and bottom section respectively, said sections being formed of freely sheared and separate plates bent to shape.

2. A sheet metal bath tub comprising a curved rim section having a downwardly pro-

jecting edge, a smooth bottom section having an upwardly projecting edge, and a body portion comprising two side sections welded end to end and having upper and lower edges butt welded respectively to the downwardly and upwardly projecting edges of the top and bottom section respectively, said sections being formed of freely sheared and separate plates bent to shape, said rim section having a down-turned apron integral therewith.

In testimony whereof I have hereunto set my hand.

JOHN C. CROMWELL.