March 7, 1939. H. H. HARLAN 2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 18, 1936 5 Sheets-Sheet 1

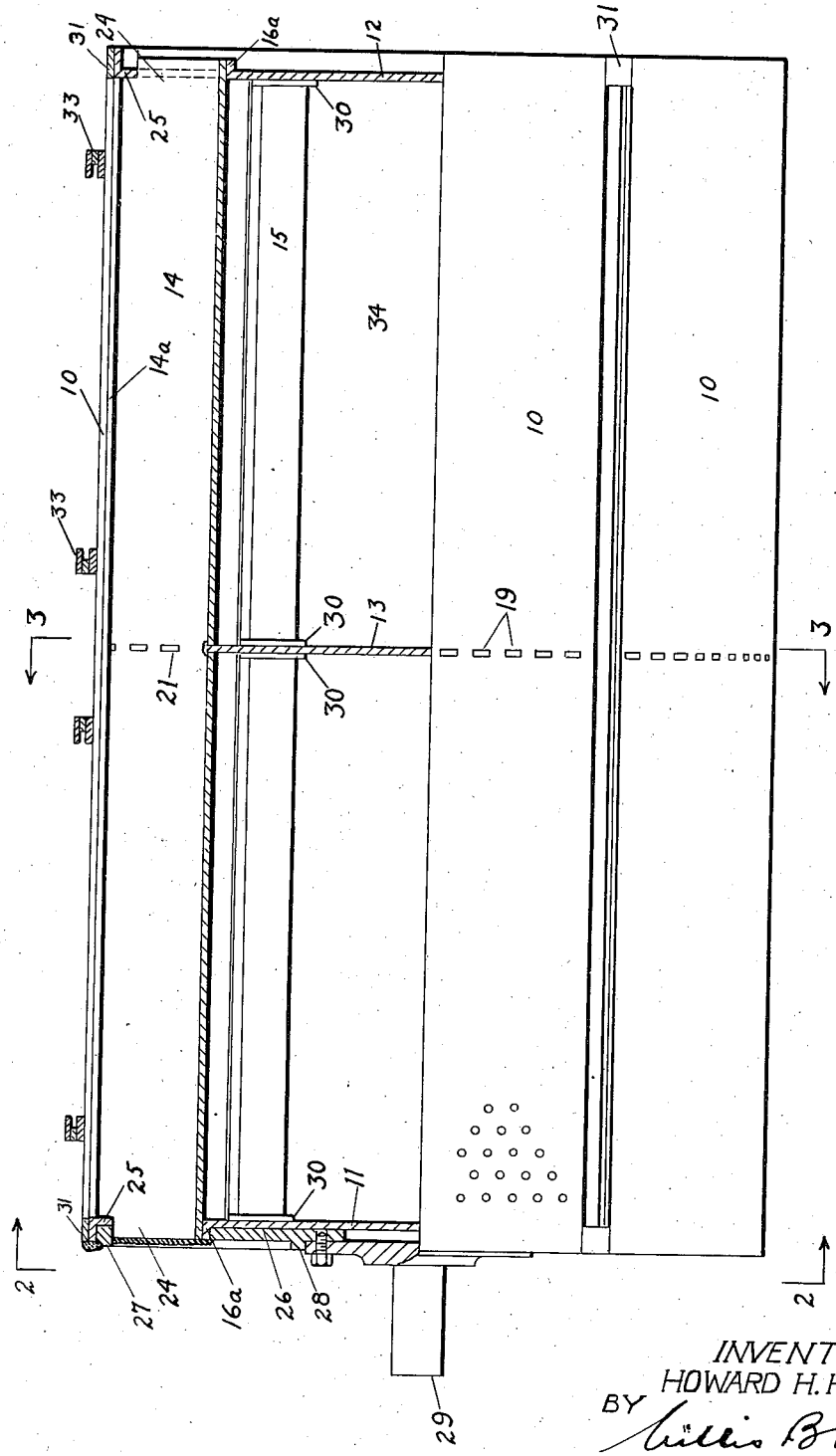


Fig. 1.

INVENTOR
HOWARD H. HARLAN
BY Willis B. Rice
ATTORNEY

March 7, 1939. H. H. HARLAN 2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 18, 1936 5 Sheets-Sheet 2

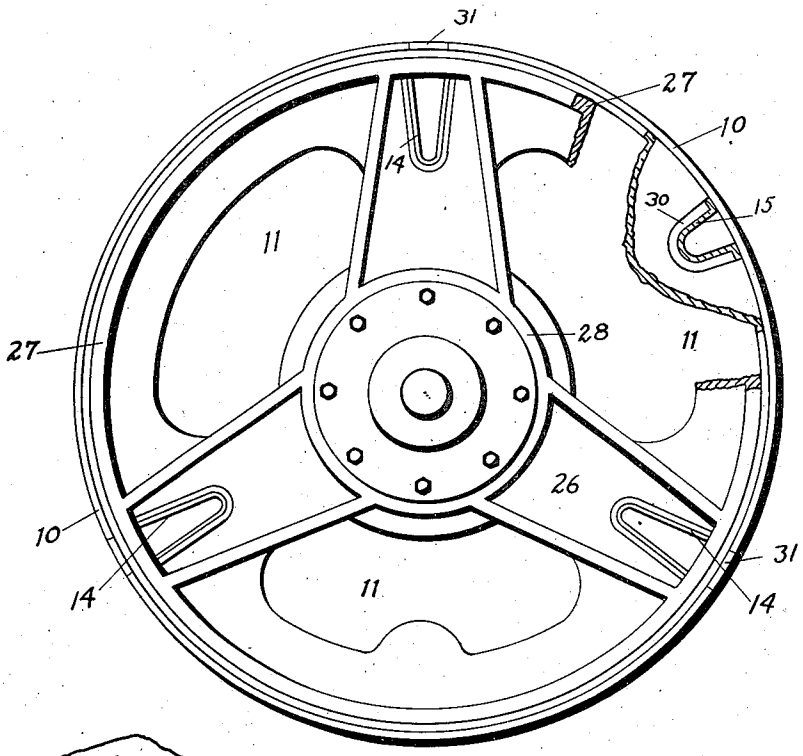


Fig. 2.

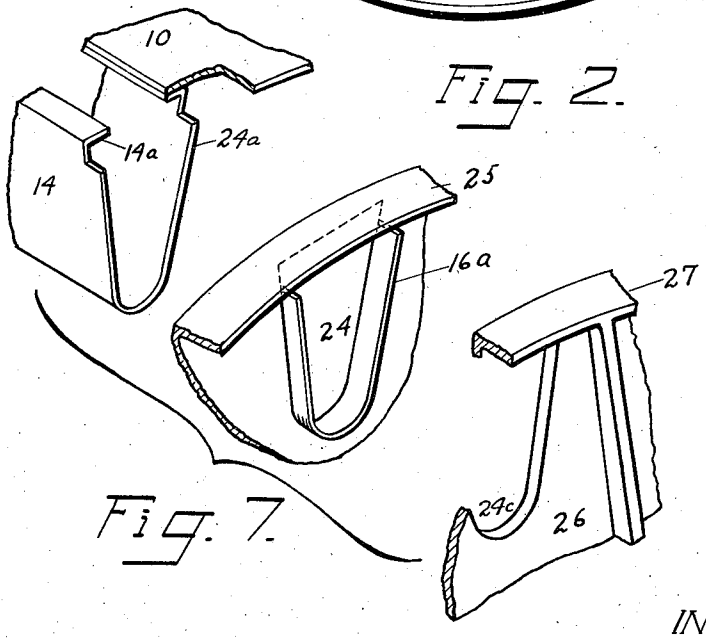


Fig. 7.

INVENTOR
HOWARD H. HARLAN
BY
ATTORNEY

March 7, 1939. H. H. HARLAN 2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 18, 1936 5 Sheets-Sheet 3

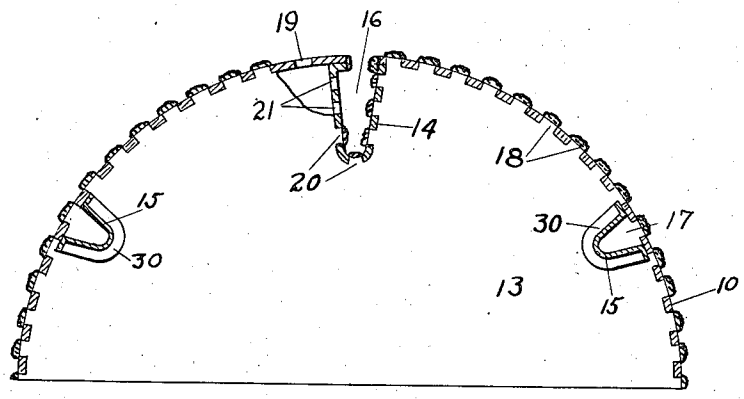


Fig. 3.

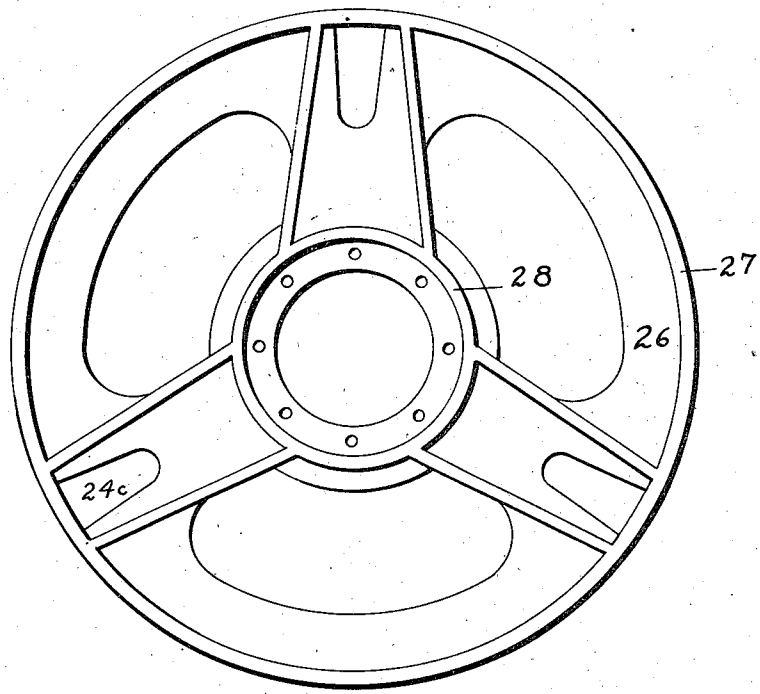


Fig. 4.

INVENTOR
HOWARD H. HARLAN
BY Wilcox & Price
ATTORNEY

March 7, 1939. H. H. HARLAN 2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 18, 1936 5 Sheets-Sheet 4

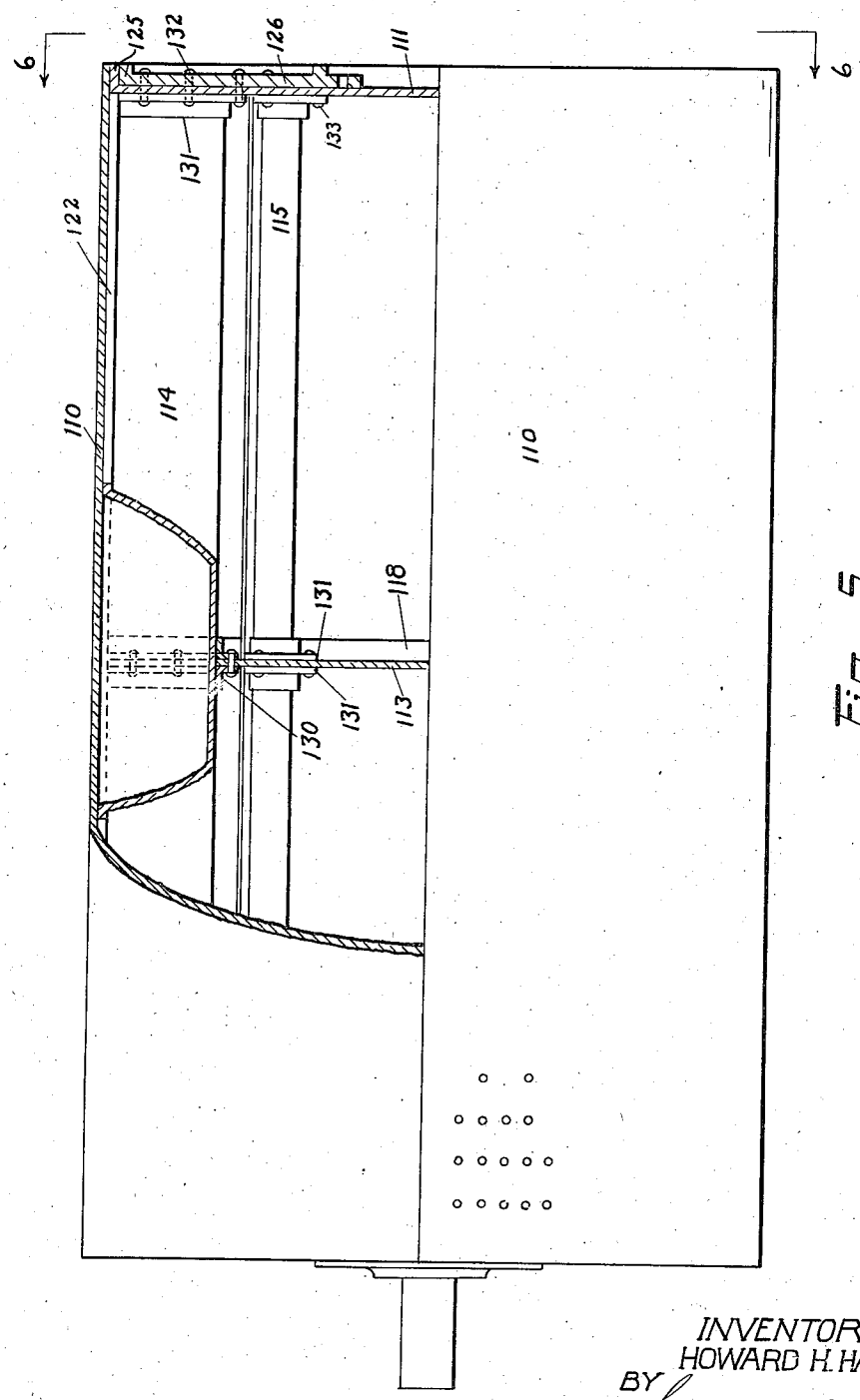


Fig. 5.

INVENTOR
HOWARD H. HARLAN
BY
ATTORNEY

March 7, 1939. H. H. HARLAN 2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 18, 1936 5 Sheets-Sheet 5

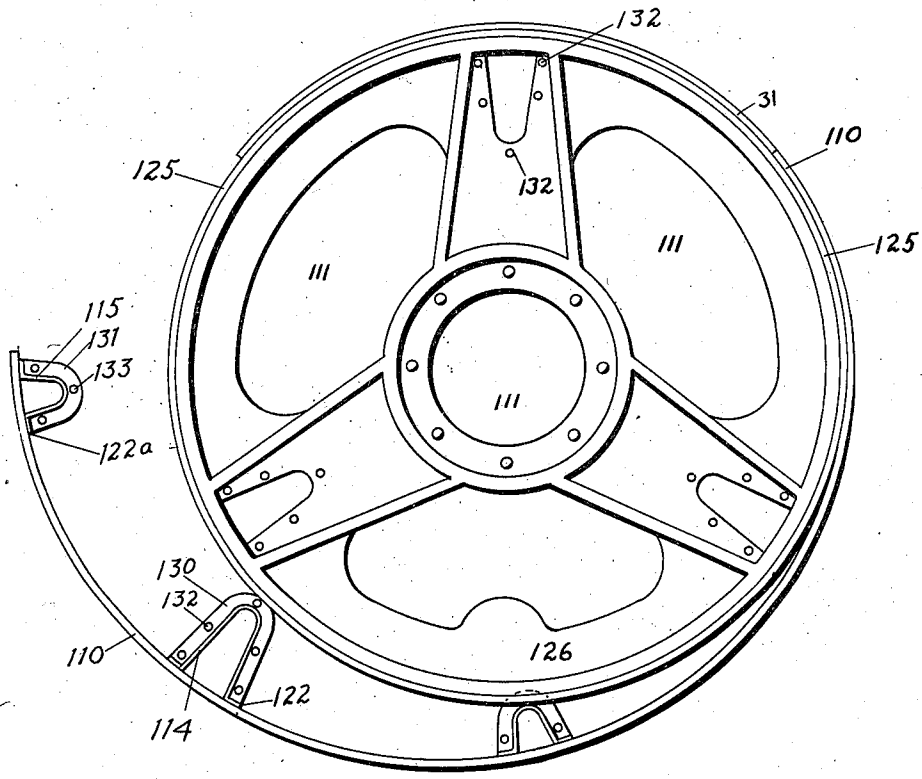


Fig. 6.

INVENTOR
HOWARD H. HARLAN
BY
ATTORNEY

Patented Mar. 7, 1939

2,149,809

UNITED STATES PATENT OFFICE

2,149,809

CYLINDRICAL WASHING MACHINE STRUCTURE AND METHOD OF MAKING SAME

Howard H. Harlan, East Moline, Ill., assignor, by mesne assignments, to American Machine & Metals Inc., New York, N. Y., a corporation of Delaware

Application February 18, 1936, Serial No. 64,423

10 Claims. (Cl. 29—148.2)

This invention relates to a cylindrical washing machine structure. It is an object of this invention to provide a new and improved method of constructing the cylinder of a rotary washing machine in accordance with which such cylinders may be made by welding in a more simple and economical manner and to provide a cylinder which will be inexpensive to construct and which will be rigid and durable.

Cylinders of the character described have presented difficulties in construction by customary welding processes, partly because of their large size and the number of different sizes which are required, and partly because of the presence of ribs or lifts within the cylinder which interfere with the use of the spot-welding apparatus customarily used in the construction of common tanks.

It has heretofore been proposed to construct such a cylinder by extending the walls of the ribs outwardly beyond the periphery of the cylinder walls and to provide an out turned flange all along the edge of the sheet forming the cylinder wall to abut and be riveted to this outwardly extending wall. This construction requires a small filler piece of a width equal to the inside of the rib and also having outwardly extending flanges to be welded to the rib wall extension.

This construction is expensive and difficult and the resulting cylinder has objectionable projections upon its outer face.

It is an object of this invention to devise a method of constructing such a cylinder which will overcome the foregoing difficulties and to devise a cylinder which will be suitable for use in washing machines which is capable of construction by simple welding processes without elaborate mechanics of prohibitive cost.

The invention accordingly comprises the several steps and the relation and order of one or more of such steps with respect to each of the others, and the device embodying features of construction, combinations of elements and arrangements of parts which are adapted to effect such steps, all as exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings, in which:

Figure 1 is a front elevation partly in section of a cylinder embodying my invention.

Figure 2 is an end view taken along the line 2—2 of the finished assembled cylinder, partly in section at small rib.

Figure 3 is a half cross section of the cylinder taken along the line 3—3 in Figure 1, intended to show the method by which the partition is fastened in the cylinder.

Figure 4 is a view of the spider before assembly.

Figure 5 is a front elevation, partly in section of a modified form.

Figure 6 is an end view taken along the line 6—6 of Figure 5 during the process of assembly.

Figure 7 is an exploded fragmentary view showing the manner in which the side wall and ribs are attached to the heads and spider.

In the drawings the numeral 10 designates a plurality, in this instance three, perforated sheets of metal rolled to the arc of a circle and supported at their ends by heads 11 and 12 to form a cylinder. The interior of the cylinder may be divided longitudinally into two or more portions by one or more transverse partitions 13. Extending longitudinally of the cylinder and spaced around the interior of its periphery are a plurality of large ribs 14 and a plurality of small ribs 15, which extend the full length of the cylinder. Each of these ribs may comprise a sheet of metal bent longitudinally into a channel form. Each leg of the ribs 14 is bent inwardly as at 14a to form a longitudinal flange and each of the sheets 10 is designed to extend between and lap upon the nearest flange of each of two adjacent ribs 14 and to be welded thereto.

Each of the partitions 13 is cut out as shown at 16 in Figure 3 to receive the ribs 14 in order that the latter may be continuous from one end of the cylinder to the other.

The heads are flanged laterally as at 16a to provide a surface to which the ribs may be attached, and each partition may also, if desired, be cut out for each of the ribs 15, but I prefer to butt the smaller ribs against the partitions as shown at 17.

When the welding is done by the autogenous process, there is provided a plurality of tabs 18 around the periphery of the partition 13, adapted to fit in a corresponding series of slots 19 upon the metal sheets 10 so that when the sheets are bent around the partition, the tabs will extend through the slots substantially to the outer face of the sheet 10. Similarly along the edges of the opening 16, there is provided a plurality of tabs 20 adapted to fit into slots 21 in the interior of the rib 14.

A triangular opening 24 is located in each end head 11, 12, opposite the ends of each of the ribs 14. The rib 14 has the upper portion cut away to leave a projecting end 24a adapted to extend into this opening. This opening 24 is provided with a projecting flange 16a surrounding the end 24a of the rib. The head also has a circumferential flange 25 which is adapted for welding to the ends of the sheets 10.

A spider 26 is provided at each end of the cylinder fitting up closely within the head 11 or 12 and having a circumferential rim 27 adapted to lie beneath and support the flange 25 of the head to which it may be welded if desired. The spider 26 is also cut out as shown at 24c to permit the flange 16a and the projecting end 24a of the rib to extend through it. Preferably this projecting end 24a and the flange 16a are cut low enough to permit the rim 27 to be continuous around the circumference.

In assembling the cylinder in the form heretofore described, the perforated sheets 10 are rolled approximately to the arc of the finished cylinder and one of the smaller ribs 15 is centrally spaced in proper position and welded to the sheet.

Supporting plates 30 for the small ribs 15 are welded to the partitions 13 and to the inside of the end heads 11 or 12.

A spider 26 is placed in each of the end heads, 11 and 12 so that the projecting flange 16a of the end head extends through opening 24c of the spider and the flange 25 of the end head overlies the flange 27 of the spider.

We now proceed to assemble the skeleton.

The large ribs 14 are laid in place within the recesses 16 of the partitions with the tabs 20 on the partitions extending into the slots 21 in the rib and the end heads 11 and 12 are moved axially inward so that the rib ends 24a extend into the opening 24 in the end heads. The parts may be held in their assembled position by welding the outer ends of the tabs 20.

The cylindrical sheet 10 with the smaller ribs attached as described may now be put in place, extending circumferentially from one large rib 14 to the next. The tabs 18 enter recesses 19 in the sheet and are welded in place. The straight edges of sheet 10 are welded through the flanges 14a of the ribs. The curved edges of the sheet are welded to the edges of flanges 25 and 27. The sheets 10 may, if desired, be joined by filler strips 31 to make the outer wall continuous.

The rib end 24a, and the lateral flange 16a of the head are welded to the spider around the opening 24c.

In the form of the invention shown in Figures 5 and 6, the device may be assembled by spot welding. In this form the cylinder may comprise a single perforate plate 110, although this plate may be formed of a plurality of sections, if desired. This plate is bent to cylindrical form and supported by heads 111 and divided, if desired, into different sections by partition 113. The cylinder is also provided with large ribs 114 and smaller ribs 115 extending longitudinally, each rib comprising a flat plate bent longitudinally into U shape along its longer center line.

In accordance with this embodiment, the sheet metal comprising the rib is bent outwardly at its longitudinal edges to provide outwardly extending flanges 122 and 122a, adapted to bear against the inner face of the plate 110, and angle shaped connecting plates or stirrups 130—131, are welded to the ribs to serve to connect the ribs to the heads and to the partitions. The sheet 110 is first bent into cylindrical form of a diameter a little greater than the finished cylinder and the ribs 114 and 115 are properly spaced upon it and spot welded to it by the flanges 122—122a.

The partition 113 and the heads 111 have circumferential flanges 118 and 125 of an outside diameter equal to the inside diameter of the finished cylinder.

In assembling the device, if no partition is to be used the sheet 110 is wrapped around the heads 111, but if a partition is used the sheet is first assembled around the partition. In such case the plate 110 is wrapped around one of the partitions, if there are several, and the flange 118 is welded to the plate 110 by spot welding. Thereupon, the flange of the stirrup 130 and 131 in contact with the partition may be attached to the partition by rivets 132—133, thus firmly holding the parts together and bracing the cylinder by the ribs. If more than one partition is to be used, it is attached in a similar manner.

Finally the heads 111 are inserted with the flanges extending outwardly and similarly attached. When the heads are in place, spiders 126 are inserted within the flanges 125 and welded in place. It will be understood that in this form some of or all of the rivets 132 which attach the flanges of the stirrups 130 upon the ends of the ribs to the head, will pass through the spider 126, thus transmitting the driving torque direct to the ribs.

In either construction, the plate 10 or 110 will be provided with a filling opening 34, guides for sliding doors may consist of grooved pieces such as 33, which may be plates welded together and welded to the curved sheet adjacent to the opening, either before or after assembling the cylinder.

Since certain changes in carrying out the above process and certain modifications in the article which embody the invention may be made without departing from its scope, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The method of making a washing machine cylinder divided into a plurality of compartments which comprises welding to the interior of a perforate sheet bent to form a cylindrical wall, a plurality of ribs all of a length equal to the interior of each of said compartments, inserting a partition within said sheet between the adjacent ends of said ribs, said partition having a peripheral flange, closing said sheet about said partition and welding the said flange to said sheet and fastening the ends of said ribs to said partition and thereafter inserting heads in the ends of the cylinder so formed and attaching the same to the ribs and welding the periphery of said heads to the said sheet.

2. The method of making a washing machine cylinder divided into a plurality of compartments which comprises forming a sheet into a cylindrical wall, providing a plurality of ribs all of a length equal to the interior of each of said compartments, inserting a partition within said sheet

between the adjacent ends of said ribs, said partition having a peripheral flange, closing said sheet about said partition and welding the said flange to said sheet and fastening the ends of said ribs to said partition and thereafter inserting heads in the ends of the cylinder so formed and welding the periphery of said heads to said sheet, applying a spider to the ends of said heads and attaching the ends of said ribs and said spider to said heads by a common attaching means.

3. A welded cylinder for washers comprising a cylindrical sheet, a plurality of ribs attached longitudinally to said sheet, each of said ribs being cut back at its ends adjacent to said sheet to provide space for the circumferential flange of an end member and having a projecting end within said flange and extending outwardly beyond the cut away portion and an end member having an opening to receive said projecting end of said rib.

4. A welded cylinder for washers comprising a cylindrical sheet, a plurality of ribs attached longitudinally to said sheet, each of said ribs being cut back at its ends adjacent to said sheet to provide space for the circumferential flange of an end member and having a projecting end within said flange and extending outwardly beyond the cut away portion and an end member having an opening to receive said projecting end of said rib, said end member comprising a head having a continuous circumferential flange fitting the interior of said cylindrical sheet, and a spider having a flange fitting within the flange on said member, said flanges being welded together and to said sheet, and said spider being directly connected to said ribs.

5. A welded cylinder for washers comprising a pair of heads, a plurality of ribs attached to said heads to connect them to form a frame, a cylindrical sheet attached to said frame having a set of perforations on a transverse line between its ends and a partition having notches to correspond to the ribs and having tabs on its periphery fitting within said perforations and welded to the edges thereof.

6. A welded cylinder for washers comprising a pair of heads, a plurality of ribs attached to said heads to connect them to form a frame, a cylindrical sheet attached to said frame having a set of perforations on a transverse line between its ends and a partition having notches to correspond to the ribs and having tabs on its periphery fitting within said perforations and welded to the edges thereof, said ribs having a set of perforations on a line corresponding to the position of said partition and said partition having also a series of tabs fitting within said perforations in said rib and welded thereto.

7. A welded cylinder for washers comprising a pair of heads, each having a continuous circumferential flange and a U shaped opening inside of said flange, ribs extending between said heads fitting within said openings and welded thereto and having the longitudinal edges of said ribs extending upwardly and inwardly toward each other in the same cylindrical surface as the circumferential flange on said heads and an outer arcuate sheet overlying the adjacent flanges on adjacent ribs and the circumferential flanges on said heads and welded thereto.

8. A welded cylinder for washers comprising a pair of heads, each having a continuous circumferential flange and a U shaped opening inside of said flange, ribs extending between said heads fitting within said openings and welded thereto and having the longitudinal edges of said ribs bent inwardly toward each other in the same cylindrical surface as the circumferential flange on said heads and an outer arcuate sheet overlying and welded to the adjacent flanges on adjacent ribs and overlying and welded to the flanges on said heads, and a spider adjacent to said head, each spider having an arm extending to each rib and having a U shaped opening, said head having a flange surrounding the opening therein and extending through the opening in said arm and closely embracing the end of said rib and welded to both.

9. A welded cylinder for washers comprising a pair of heads, each having a continuous circumferential flange and a U shaped opening inside of said flange, ribs extending between said heads fitting within said openings and welded thereto and having the longitudinal edges of said ribs bent inwardly toward each other in the same cylindrical surface as a circumferential flange on said heads and an outer arcuate sheet overlying and welded to the adjacent flanges on adjacent ribs and overlying and welded to the flanges on said heads, and a spider adjacent to said head, each spider having an arm extending to each rib and having a U shaped opening, said head having a flange surrounding the opening therein and extending through the opening in said arm and closely embracing the end of said rib and welded thereto, and said spider arm having a circumferential flange closing the opening therein and parallel and adjacent to the flange in said head, said arcuate sheet, said flanges on said head and said flanges on said arm being welded together.

10. A welded cylinder for washers comprising a pair of heads each having a circumferentially continuous flange, a rib extending between said heads and fitting into an opening in each, and welded thereto, said rib having its longitudinal edges bent inwardly to form flanges extending toward each other, said flanges on said rib and on said heads lying in a cylindrical surface, arcuate sheets overlying said flanges and welded along its ends to the flanges on said head and on its longitudinal edges to the flanges on said ribs, said arcuate sheets having a transverse line of perforations intermediate its ends and a partition having notches to receive said ribs and having tabs on its periphery fitting within said perforations and welded to the edges thereof.

HOWARD H. HARLAN.