Oct. 13, 1936. H. KOPLIN ET AL 2,057,035

CYLINDER FOR WASHING MACHINES

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Fig. 1.

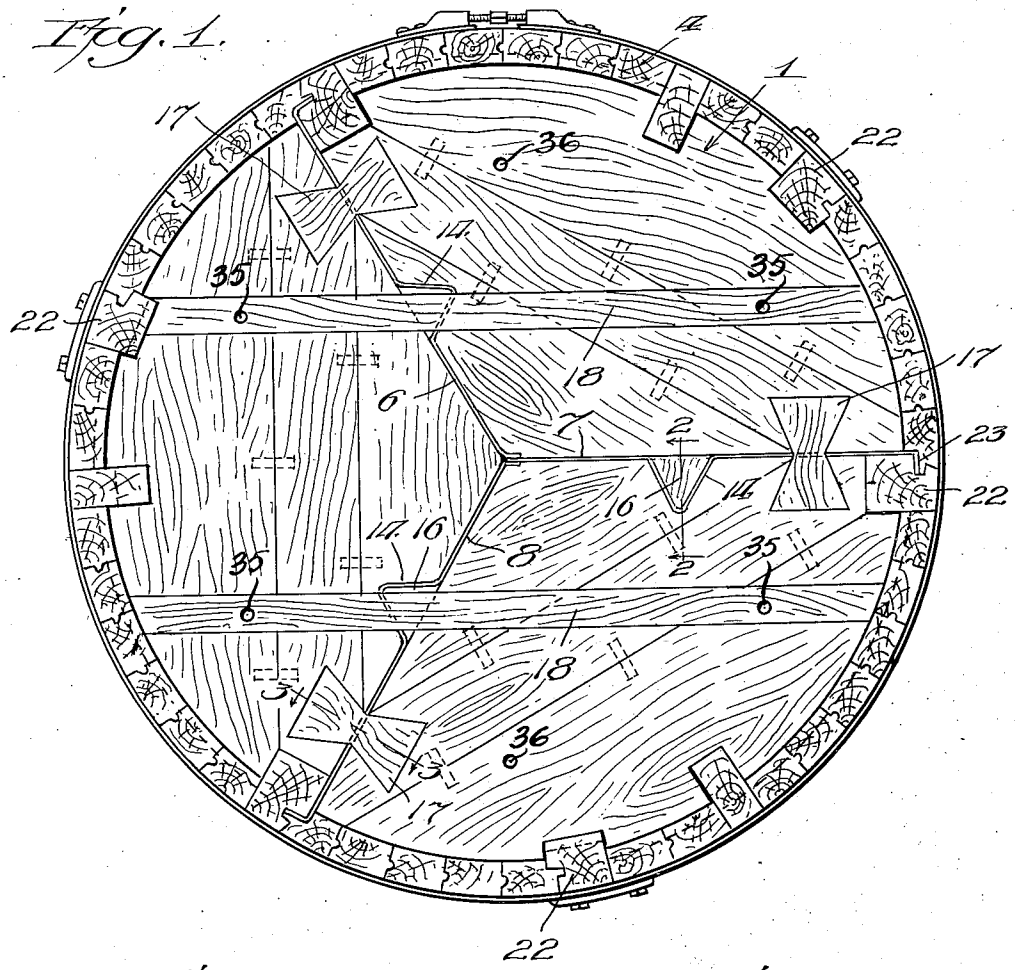


Fig. 2.

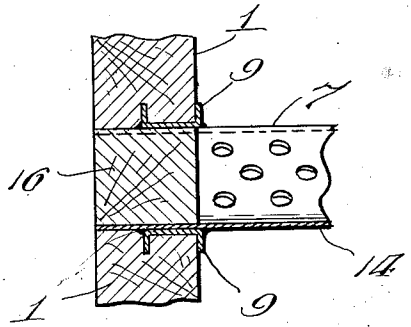
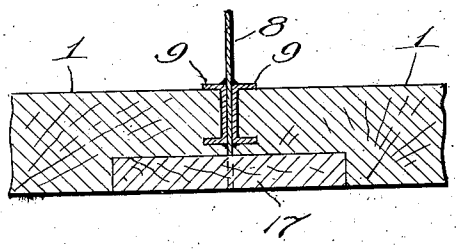


Fig. 3.



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Fig. 4.

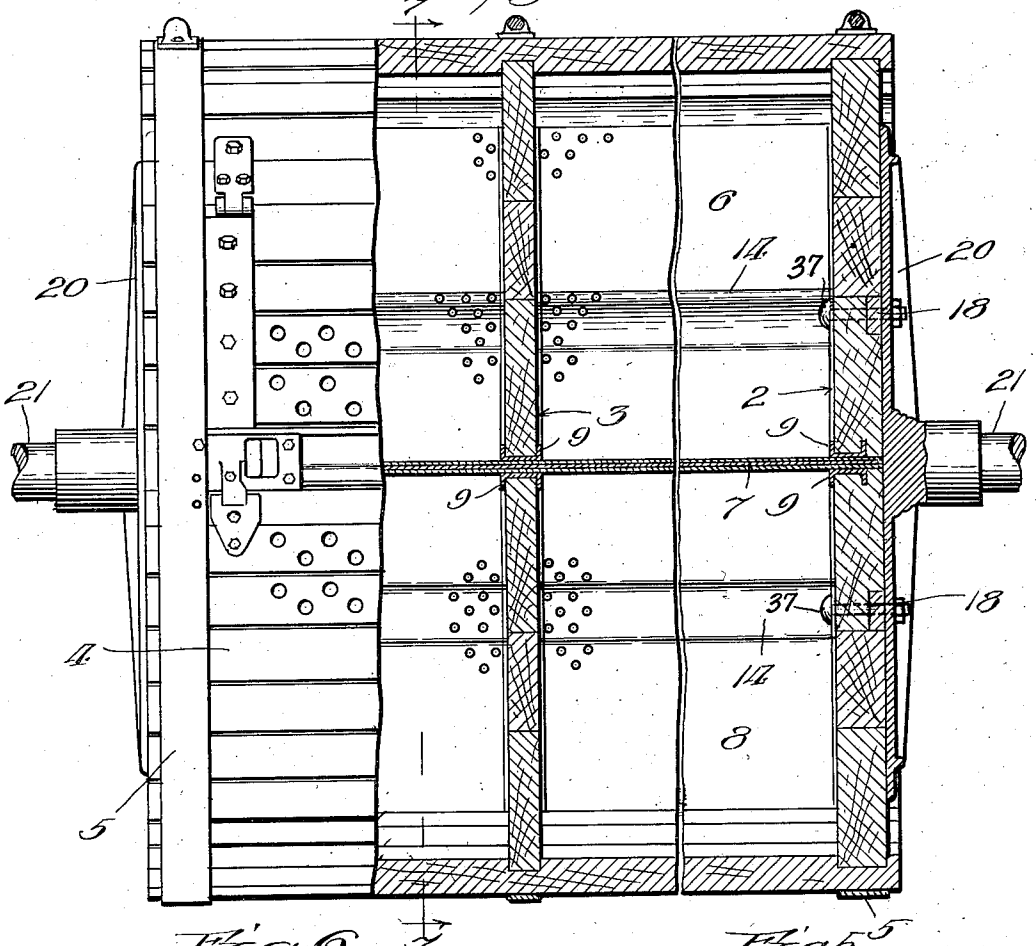


Fig. 6.

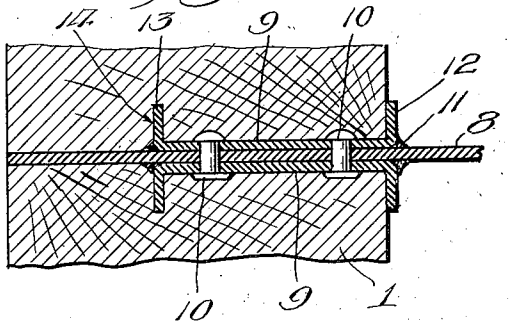
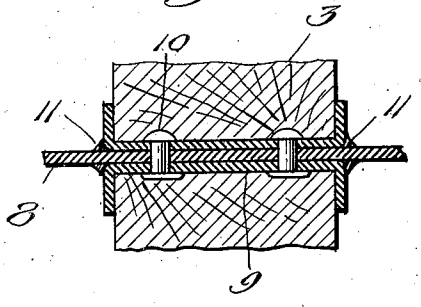


Fig. 5.



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Fig. 7.

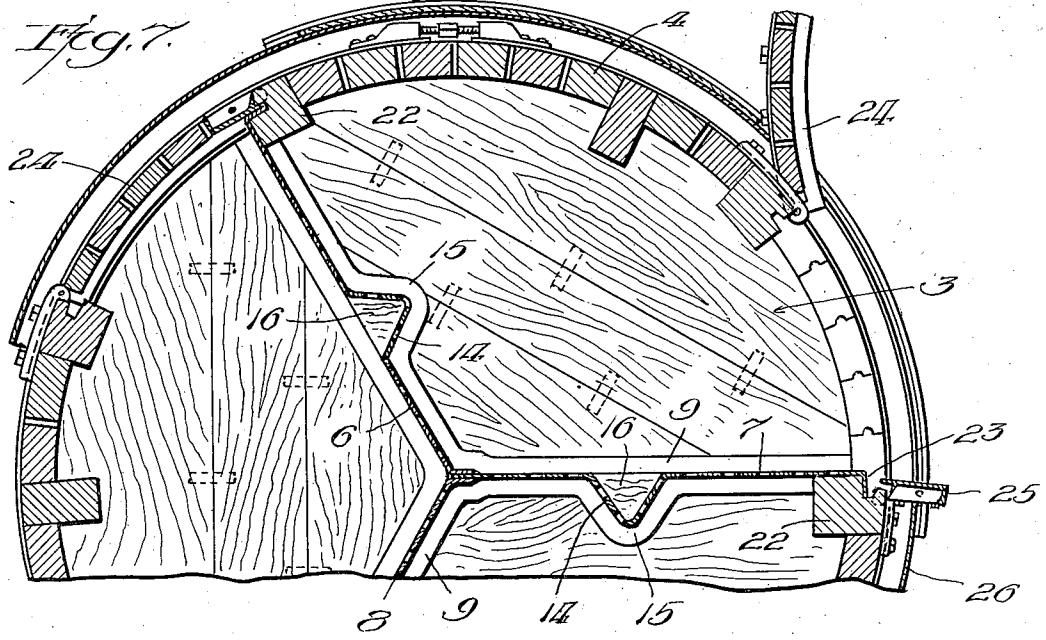
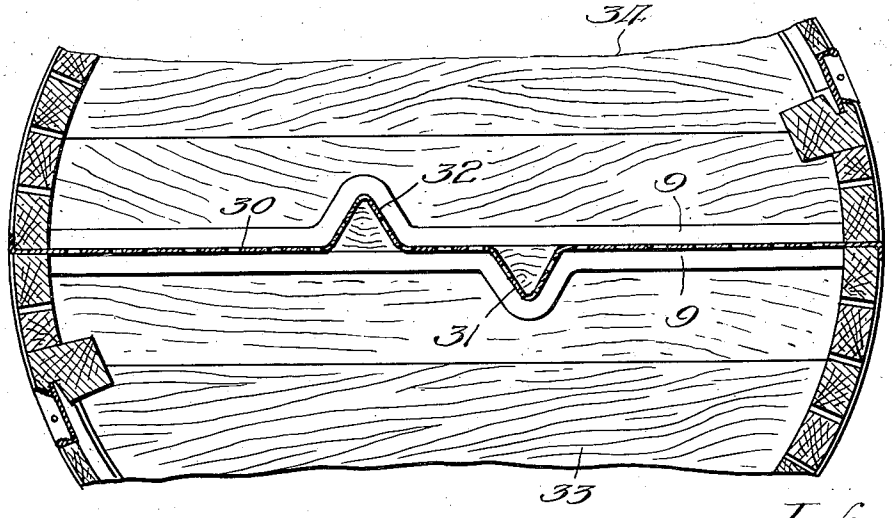


Fig. 8.



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Patented Oct. 13, 1936 2,057,035

UNITED STATES PATENT OFFICE

2,057,035

CYLINDER FOR WASHING MACHINES

Harry Koplin, Chicago, Ill., and Julius Maki, Syracuse, N. Y., assignors, by mesne assignments, to United States Hoffman Machinery Corporation, New York, N. Y., a corporation of Delaware

Application November 25, 1932, Serial No. 644,154
Renewed August 17, 1935

8 Claims. (Cl. 68—18)

The principal object of the present invention is to produce a cylinder for washing machines constructed of wood and metal in such a manner as to secure the advantages of cylinders made of wood and cylinders made of metal without retaining the objectionable features of these two old types of cylinders.

In constructing a cylinder partly of wood and partly of metal, the cylindrical shell and the heads, both at the ends and at intermediate points, are best formed of wood, whereas the longitudinal partitions can most advantageously be formed of metal. Heretofore there has, to our knowledge, been no satisfactory way of constructing the wooden heads and connecting them to the metal longitudinal partitions in such a manner as to secure the necessary structural rigidity and insure against the formation of cracks or crevices in which the laundry may catch and become torn.

Viewed in one of its aspects, the present invention may be said to have for its object to produce a simple and novel means for connecting the cylinder heads, both at the ends and at intermediate points, to the metal longitudinal partitions.

In carrying out our invention, we employ longitudinal partitions extending continuously from one end of the cylinder to the other; the heads, whether they be the ends of the cylinder or constitute transverse partitions, being made in sectors which accurately fit in the angles between adjacent longitudinal partitions. One of the objects of the present invention is so to form the sectors of which the heads are composed that the grain of the wood will be disposed, as nearly as may be, in the same way throughout all of the sectors in any given head; whereby the swelling of the wood will take place in substantially the same way in one sector as in another; and whereby the sectors are interchangeable with each other and only one kind of sector need be made for any given type of head, regardless of the number of such heads that are required.

The various features of novelty whereby our invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is an end view of a cylinder embodying the present invention with the trunnion plate removed; Fig. 2 is a section, on an enlarged scale, taken on line 2—2 of Fig. 1; Fig. 3 is a section, on the same scale as Fig. 2, on line 3—3 of Fig. 1; Fig. 4 is a view of a cylinder, partly in elevation and partly in longitudinal section, only two short sections, forming the ends of the cylinder, being shown; Figs. 5 and 6 are sections on a much larger scale than Fig. 4, showing, respectively, the details of a connection between an intermediate head and a longitudinal partition and of an end head and the longitudinal partition; Fig. 7 is a section on line 7—7 of Fig. 4, showing only a fragment of the cylinder with one of the doors open, as well as a part of the stationary casing within which the cylinder revolves; and Fig. 8 is a transverse section through a modified form of cylinder, the upper and lower portions of which are broken away.

Referring to Figs. 1-6 of the drawings, 1 and 2 represent the end cylinder heads and 3 an intermediate head or cross partition of a washing machine cylinder of any desired diameter and length and containing any desired number of intermediate heads. All of the heads are of wood as are the staves 4. The present invention is not concerned with the means for fastening and holding the staves to the heads which means, including the hoops or bands 5, may be of any usual or suitable character. Within the cylinder are longitudinal partitions of metal. In the arrangement shown, there are three of these partitions, 6, 7, 8, extending throughout the entire length of the cylinder and from the axis of the cylinder to the periphery. The longitudinal partitions are so disposed about the axis of the cylinder that each partition makes an angle of one hundred and twenty degrees with each of the other two partitions. In other words, the longitudinal partitions divide the interior of the cylinder into three equal parts.

Since the longitudinal partitions pass through the heads, the latter must be divided into sections which, in the arrangement just described, are sectors of a disk. Each of these sectors fits into the angle between two longitudinal partitions and must be fastened to these partitions in such a manner that no cracks in which the laundry may catch are present initially or can be created thereafter in the use of the cylinder. We have therefore fastened on the longitudinal partitions channel-shaped metal strips 9, 9 extending along the longitudinal partitions transversely of the axis of the cylinder. In the arrangement shown, the channel strips are riveted to the metal partitions

by means of rivets 10 and fillets of solder 11 are run along both sides of each strip so as to leave no open joints between the strips and the metal partitions. The intermediate heads are shown as being just thick enough to fit into the trough of the channels when the parts are initially assembled, as best shown in Fig. 5; whereas the end heads are considerably thicker than the width of the channels, so that the inner flange 12 of each channel engages with the inner face of the head, while the outer flange 13 enters a groove 14 cut into the corresponding radial edge of the sector with which the channel is engaged. With this arrangement, the channel-shaped strips are not exposed at the outer faces of the end heads of the cylinder.

After the washing machine has been filled with water the wood of the heads swells, producing intimate contact at all points between the flanges of the channels and the faces of the corresponding head sections. The wood may even swell sufficiently so as to bulge out over the edge faces of the flanges on the channel strips. In any event, no cracks or crevices will be left into which pieces of laundry may be washed and held tightly enough to become torn when the laundry is removed from the cylinder. Furthermore, the joints will be so tight that water cannot be forced through the same while the washing machine is in operation, and therefore the wood cannot be worn away by the water so as eventually to produce open joints.

Each of the longitudinal partitions is preferably bent or folded at about the longitudinal center to produce therein a rib 14 extending from end to end. Since these ribs are formed of two long narrow sections of sheet metal lying at an angle to each other, they appear as ribs on one side of their partitions and as depressions or valleys on the opposite side. As best shown in Fig. 7, each channel-shaped strip is long enough, and is bent along a transverse line midway between the ends thereof, to extend across the faces of two adjacent longitudinal partitions, so that only three of these strips are required for each head. One wing or leg of each strip is bent into a V-shape, as indicated at 15, to follow the contour of the rib which it must cross. Since the other wing or leg of the strip does not meet an obstruction in the form of a rib, it is left straight and simply bridges the valley formed by the underlying rib. One of the radial edges of each sector is left straight while the other radial edge is provided with a notch to fit the hump in the channel-shaped strip where the latter passes over the underlying rib. When the parts are assembled, the ends of the valleys in the V-shaped ribs would remain open except for the fact that we drive wooden blocks 16 into each of these valleys at each of the heads. These blocks swell when they become wet and form tight joints which prevent water from surging from one side of a head to the other through the channels in the ribs.

The flanges on the channel-shaped holding strips may be made deep or high enough to compensate for any irregularity in the swelling of the sectors of which the heads are made and to compensate for any variation in size. However, to secure the greatest advantage from our invention it is desirable that the wooden heads be so designed that the expansion or swelling of all of the sectors constituting one of the heads be the same. If all of the sectors constituting a head swell or expand in the same manner and about equally, it becomes a fairly simple matter properly to proportion the channel-shaped strips to insure that the joints will be kept tight. On the other hand, if the sectors are not uniform insofar as the characteristic to expand or swell is concerned, each sector must be fitted differently than are the other sections. Therefore, instead of producing a sectional head by first forming a disk and then cutting it into the desired number of sectors, we manufacture the sectors as individual units, so disposing the wooden planks or heavy boards of which they are formed that the grain runs as nearly as may be in the same direction in all of the sectors. In actual practice we so arrange the pieces of wood in each sector that the grain runs transversely of a line bisecting the angle of the sector; thereby placing end grain in both radial edges of each sector. Consequently, when the sectors are assembled in the cylinder, the bottoms of the troughs in the channels engage only with end grain. Furthermore, all of the sectors for any given head are interchangeable with each other and they are also interchangeable with an indefinite number of similar sectors adapted to produce similar heads. It will thus be seen that, when a cylinder is assembled, it is with the assurance that each wooden sector will swell in the same way as every other sector, so that the effect of swelling will always be directed toward tightening or further tightening the joints instead of toward a loosening or opening of a joint or joints.

We prefer to reenforce the end heads by setting into the outer face of each of the same a plurality of keys, such as indicated at 17. These keys are preferably double-ended dovetail blocks of wood. Ordinarily it will be sufficient to have one of these keys placed across each of the joints between the sectors constituting a head; the keys being placed as far from the axis of the cylinder as is practicable. Further reenforcement may be given by setting into the outer face of each end head two long parallel bars or cleats 18 of wood lying on opposite sides of and paralleling one of the joints in the head The bars 18 are provided with bolt holes 35 which align with certain of the bolt holes 36 provided in the head 1 for passage of bolts 37, see Fig. 4, employed to fasten to the head the plate 20 of the trunnion 21. These bars thus bolted to the head and the trunnion plate being set into the head, prevent slipping of the parts of the head and render same very strong and rugged.

As best shown in Fig. 7, the outermost portion of each longitudinal partition rests upon a longitudinal door sill 22, the extreme outer marginal portion being bent down past the sill, as indicated at 23. The closure at each door opening consists of a large upper door 24 and a small lower door 25 hinged to the sill 22. When the door 25 is swung out, as shown in Fig. 7, it forms an unloading shelf which bridges the gap between the cylinder and the surrounding casing 26. It will be seen that, whenever the cylinder is turned into one of its three loading or unloading positions, the corresponding longitudinal partition will be horizontal so that the laundry may be slid out over the same and across the unloading shelf without requiring to be lifted.

In Fig. 8, we have shown a modified arrangement of cylinder in which there is only a single metal longitudinal partition 30 which extends diametrically across the cylinder and reaches from one end to the other, as before. This longitudinal partition has two parallel longitudinal ribs 31 and 32, produced by deforming the metal of the partition in opposite directions

from the plane of the partition. Each head is made in two sections **33** and **34**, each in the form of a half disk whose straight edge is set into a channel-shaped strip **9**, such as heretofore described.

It will thus be seen that we have produced a simple, strong and rugged cylinder divided into any desired number of compartments by longitudinal partitions, wherein the entire structure, excepting only the longitudinal partitions, is made of wood, while the longitudinal partitions are in the form of thin metal plates that take up very little room; the arrangement of parts being such that the partitions are firmly anchored to the heads without producing a condition which, because of the presence of cracks or projections, will permit laundry to be caught in the joints, or which will permit the water to wear away the wood, in the use of the cylinder, so as to open up cracks or crevices. It will also be seen that we have produced a simple and novel form of wooden head which will afford a more uniform expansion and contraction than is the case with heads of wood as heretofore constructed; bringing about a more balanced condition in the cylinder as a whole, and simplifying the process of manufacture by which joints are secured that are initially tight and afterwards remain so. It will, of course, be understood that, while we have illustrated only two forms of cylinder, in one of which there is a single longitudinal partition and in the other of which the partitions are arranged in so-called Y formation, the invention is not limited to these particular types.

While we have illustrated and described with particularity only a single preferred form of our invention, with a single modification, we do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of the invention constituting the appended claims.

We claim:

1. In a washing machine cylinder, a longitudinally extending metal partition, sheet metal strips fixed to opposite faces of said partition adjacent an end and extending transversely thereof, the marginal portions of each strip standing at an angle to the remainder and forming therewith a wide shallow trough, and head elements of wood standing edgewise in the troughs of said strips.

2. In a washing machine, more than two longitudinal partitions radiating from the longitudinal axis of the cylinder, a plurality of heads each formed of a plurality of sectors fitted at their radial edges into the angles between said partitions and forming a disk-like member, and metal troughs extending transversely across and fixed to opposite faces of each partition in the plane of each disk-like head and embracing the adjacent marginal portions of such sectors, the grain of the wood in each sector extending transversely of the line bisecting the angle thereof whereby the radial edges of all of the sectors have therein end grain.

3. In a washing machine cylinder, in combination, a longitudinally extending partition, a transversely extending wall member composed of wood sections disposed at opposite sides of said partition and metal troughs affixed to opposite sides of said partition in the plane of said wall member to provide seats for the edges of said wood sections, the flanges on said metal troughs holding said wood sections against lateral displacement.

4. In a washing machine cylinder, in combination, a longitudinally extending metal partition, a sheet metal channel member affixed to said partition intermediate the ends thereof, the flanges of said channel member standing outwardly from the plane of said partition, and a transversely extending partition member of wood having an edge seated in and embraced by said channel member.

5. In a washing machine cylinder, in combination, a pair of longitudinally extending partitions radiating from the axis of said cylinder and forming an angle therebetween of less than 180°, a transversely extending sector-shaped head member interposed between opposing sides of said pair of partitions, and a trough member having two angularly related portions secured respectively to the said opposing sides of said pair of partitions in the plane of said head member and providing seats for the angularly related edges of said head member.

6. In a washing machine cylinder, in combination, a cylinder head, a flanged trunnion secured by bolts to said cylinder head, said cylinder head comprising a plurality of sector-shaped members disposed edge to edge in the same plane, a pair of bars arranged in spaced relation to one another upon opposite sides of the cylinder axis, each bar extending across the corresponding faces of a pair of adjacent sectors and inset in aligned mortices formed in the said faces of said sectors, said bars having bolt holes aligned with certain of the bolt holes in said sectors through which the trunnion flange bolts pass, whereby each of said bars is secured to each of the sectors with which it is associated.

7. In a washing machine cylinder, in combination, a longitudinally extending sheet metal partition therein, a transversely extending wood partition, and a separate member independently secured to said metal partition forming a shallow trough in which an edge of said transverse partition is seated.

8. In a washing machine cylinder, in combination, a longitudinally extending metal partition formed to provide on one side thereof a longitudinally extending ridge, and opposite said ridge on the other side a longitudinally extending valley, a transversely extending partition composed of wood sections disposed with adjacent edges in alignment and in engagement with said metal partition upon opposite sides thereof, one of said sections being notched to interlock with the said ridge on the one side of said metal partition, and means for blocking up the valley upon the other side of said metal partition where it is crossed by the edge of the other of said sections.

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