Sept. 9, 1952

J. W. LENDVED ET AL

2,610,043

ROLLER-TRACK MOUNTING FOR CONCRETE MIXER DRUMS AND THE LIKE

Filed April 27, 1950

2 SHEETS—SHEET 1

Fig. 1.

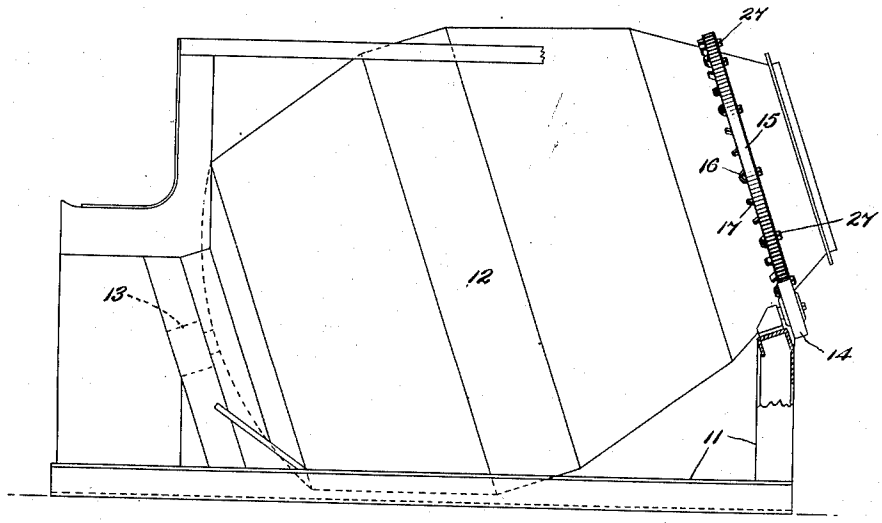


Fig. 5.

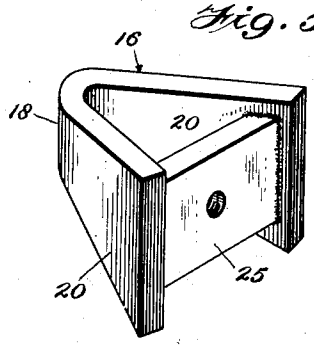
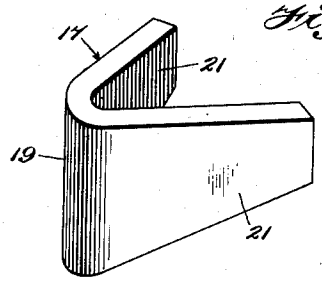


Fig. 6.



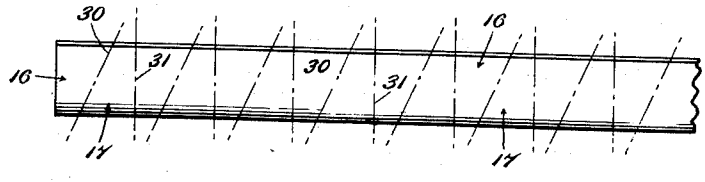


Fig. 7.

INVENTORS
John W. Lendved and
BY Chas. I. Longenecker,

B. B. Collings
ATTORNEY

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2 SHEETS—SHEET 2

Fig. 2.

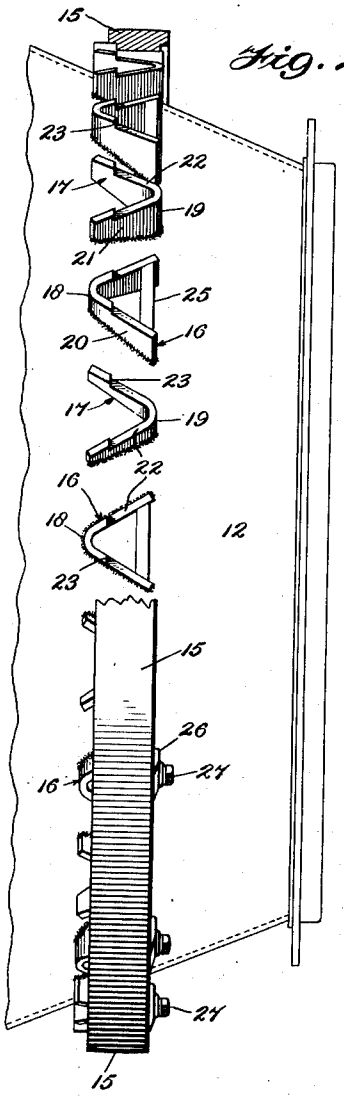


Fig. 3.

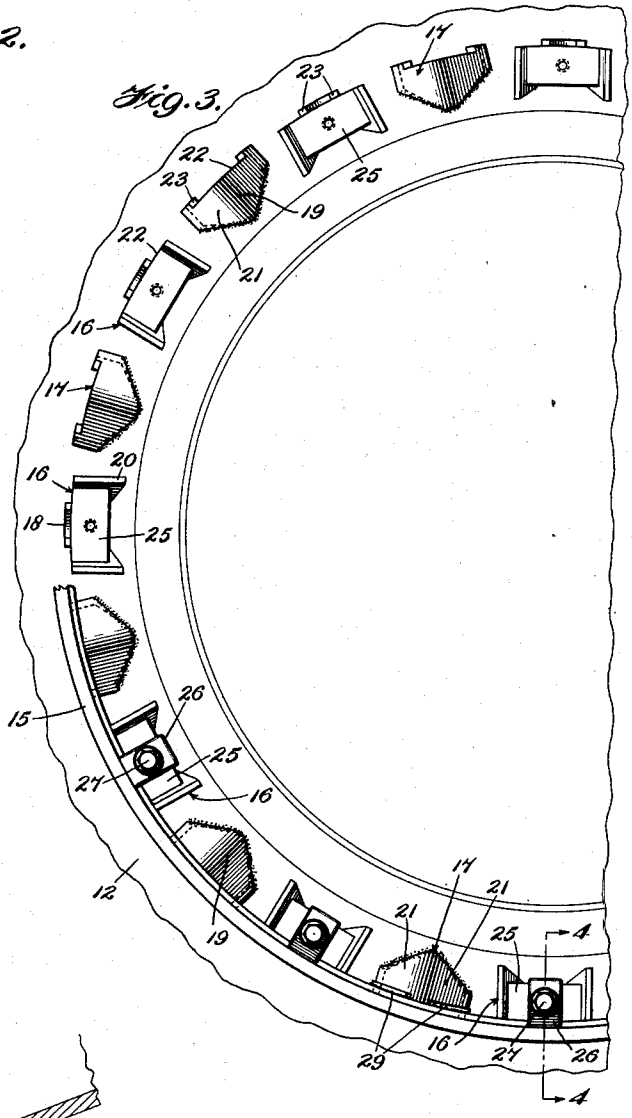
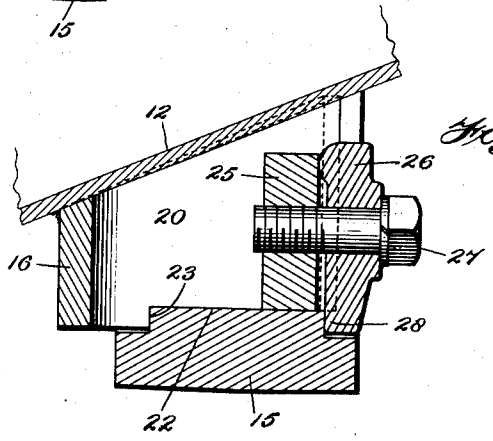


Fig. 4.



INVENTORS
John W. Lendved and
BY Chas. I. Longenecker;

ATTORNEY

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ROLLER-TRACK MOUNTING FOR CONCRETE MIXER DRUMS AND THE LIKE

John W. Lendved, Milwaukee, and Charles I. Longenecker, Wauwatosa, Wis., assignors to Chain Belt Company, Milwaukee, Wis., a corporation of Wisconsin

Application April 27, 1950, Serial No. 158,406

9 Claims. (Cl. 259—175)

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The invention relates to rotatable drums, and more especially to drums formed of sheet metal and having one or more annular members surrounding and secured to their peripheries to constitute tracks engageable with rolls which rotatably support the drum. A typical example of the drums in question may be found in the mixing or agitating receptacles widely used in truck-mounted concrete mixers, and while not strictly limited thereto, for purposes of the present disclosure the invention has been illustrated and will be described in connection with such a drum.

In the past much trouble has been experienced with the roller tracks of such concrete mixing drums, due at least in part to the strains imposed upon the drum and track by twisting of the truck chassis and the mixer frame carried thereby (which frame carries the drum supporting rollers) as the truck passes over or rests upon uneven ground. Additionally, the weight of the concrete within the drums (as much as five tons or more in the larger sizes) has a tendency to distort the drum from a circular to an oval cross-section, and as the drum walls are not sufficiently rigid to fully overcome such tendency, the distortion is constantly shifting as the drum rotates.

To overcome the difficulty it has been proposed to weld the roller tracks to the drum periphery, but since in the ordinary commercial mode of constructing the drums from metal sheets or plates the peripheral surfaces are seldom truly circular, i. e., they have high and low spots, the welds have not been uniform all around the drum. As a result, the strains imposed upon the drums and tracks in use have frequently ruptured the welds and loosened the tracks.

It is the principal object of the present invention to provide a roller track construction and mounting for rotatable drums which substantially overcomes the aforesaid difficulties and provides an arrangement better adapted to withstand the usage to which it is subjected.

In the accompanying drawings forming a part of this specification, in which like reference characters designate like parts in all views:

Figure 1 is a side elevational view of the essential elements of a well known commercial form of concrete mixer unit adapted for mounting upon the chassis of a motor truck, and the drum of which unit is provided with one form of roller track mounting constructed in accordance with the invention;

Fig. 2 is an enlarged elevational view, partly

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broken away and in section, of that portion of the drum which is equipped with the roller track;

Fig. 3 is an end elevational view of the parts shown in Fig. 2, as seen from the right thereof;

Fig. 4 is an enlarged sectional view on the plane indicated by the line 4—4 of Fig. 3, looking in the direction of the arrows;

Figs. 5 and 6 are perspective views of the elements which are secured to the drum periphery, in circumferentially spaced relation thereabout, and serve as seats for the roller track; and

Fig. 7 is a plan view illustrating a convenient mode of initially forming the seating elements shown in Figs. 5 and 6.

Referring to the said drawings in greater detail, the concrete mixer unit shown in Fig. 1 is of the inclined axis type employing a coniform drum, and comprises a frame 11 adapted to be mounted upon the chassis of a motor truck (not shown), in which frame the mixing drum 12 is rotatably mounted by an axial forward self-alining bearing 13 and a rearward pair of transversely spaced supporting rolls 14, upon which rests and travels the roller track 15 surrounding and secured to the rearward end portion of the drum 12. The said roller track is an endless ring of hardened steel having a cross-section substantially as shown in Figs. 2 and 4, and its inner circumference is seated upon and supported by a plurality of seating members 16 and 17 which are disposed in edgewise position upon the drum wall in arcuately spaced relation and welded to said wall.

As clearly shown in Figs. 2, 5 and 6, these seating members are V-shaped in plan and they are positioned alternately about the drum with the apexes 18 of the members 16 facing forwardly while the apexes 19 of the members 17 face rearwardly. Since the drum surface on which they are mounted is coniform rather than cylindrical, the seating members are formed to taper longitudinally complementarily to the conicity of the drum, the members 16 being of less depth at their apexes than at the divergent ends of their legs 20, while the apex portions of the members 17 are deeper than the forward ends of their legs 21. Thus, when the seating members are disposed about and secured to the coniform surface of the drum the outer edge faces of the legs are substantially parallel to the drum axis and in effect provide a substantially cylindrical support for the inner circumference of the track ring 15.

After the members 16 and 17 have been secured to the drum the rearward portions of their

outer faces are turned or ground down to provide seats 22 which are parts of a true circle concentric with the drum axis. This leaves shoulders 23 at the forward ends of the members against which the track ring 15 may abut, and this ring is shrunk onto the seats 22 by being heated, positioned upon the seats, and then cooled. Such shrink fit ordinarily is effective to retain the track in place indefinitely, but to guard against the contingency of its ultimate failure which would permit the ring to be displaced, the members 16 are provided with struts 25 welded to their legs 20, and clamping members 26 are secured thereto by bolts 27, said members having portions 28 engaging the rearward face of the track ring and tending to maintain said ring firmly against the shoulders 23.

At one point on its inner circumference the track annulus 15 has welded to it a pair of angularly disposed bars or lugs 29 (Fig. 3) adapted to be engaged by the divergent legs 21 of one of the seating members 17 when the track is in position on the drum, which lugs resist any circumferential creeping of the track upon the seating members which would tend to destroy the shrink fit between them.

The shape and positioning of the seating members 16 and 17 about the drum in effect provides a substantially serpentine reinforcing band or rib encircling the drum which strengthens it both longitudinally and circumferentially and enables it to better withstand the distorting stresses and strains to which it is subjected in normal use. This, coupled with the shrink fit of the roller track upon the seating members, produces a construction which in actual practice has been found superior to previous ones in which the track was welded directly to the drum wall.

Since the seating members 16 and 17 are welded to the drum before the seating surfaces 22 are formed, the said members may accommodate any slight inequalities in the drum surface (i. e., high and low spots) and the welds by which they are attached my be substantially uniform, thus eliminating one source of trouble with tracks welded directly to the drum as heretofore. Furthermore, the elimination of all welding of the track itself after it has been hardened eliminates any distortion thereof and any unusual inequalities in its hardness. If the track becomes worn to the point where replacement is necessary, it need be cut through at only one point to permit its removal, whereas with the prior welded tracks a cutting torch had to be employed around the entire circumference.

The seating members 16 and 17 may be formed in any appropriate manner, but a convenient and relatively inexpensive mode of manufacture is indicated in Fig. 7. That is to say, an elongated sheet or plate is bent along its longitudinal axis to a V-shaped cross-section, and this is then severed transversely along alternate inclined planes 30 and perpendicular planes 31 to result in the tapering V-shaped members 16 and 17 shown in Figs. 5 and 6.

While the invention has been illustrated and above described in connection with a coniform drum, it is not necessarily limited thereto, and those skilled in the art will readily appreciate that its principles may be easily applied to cylindrical drums, in which case fore-and-aft tapering of the legs of the seating members of course will not be essential.

What is claimed is:

1. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of seating members disposed in circumferentially spaced relation about said wall and projecting outwardly therefrom, each of said members being rigidly attached to said wall and provided with seating surfaces constituting portions of a true circle concentric with said axis; and a contractile annulus surrounding said series of members and frictionally engaging their respective seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

2. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of seating members having elements extending generally longitudinally of the receptacle and disposed in circumferentially spaced relation about and in engagement with said peripheral wall and projecting outwardly therefrom, the portions of said members in contact with said wall being rigidly secured thereto while their outward portions are provided with seating surfaces constituting portions of a true circle concentric with said axis; and an annulus surrounding said series of members and contractively engaging their respective seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

3. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of seating members disposed in circumferentially spaced relation about said wall, each of said members comprising divergent elements extending fore-and-aft of the receptacle in engagement with said wall and projecting outwardly therefrom, the portions of said elements in contact with the wall being rigidly secured thereto while parts of their outward portions are cut away to provide seating surfaces constituting portions of a true circle of reduced diameter concentric with said axis; and a contractile annulus surrounding said series of members and tightly engaging their respective seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

4. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of V-shaped seating members disposed in circumferentially spaced relation about said wall with their legs extending fore-and-aft of the receptacle and projecting outwardly from the wall, the portions of said members in contact with the wall being rigidly secured thereto while parts of their outward portions are cut away to provide shoulders and adjoining seating surfaces constituting portions of a true circle of reduced diameter concentric with said axis; and an annulus surrounding said series of members, abutting their said shoulders and contractively engaging their respective seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

5. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of V-shaped seating members disposed in cir-

cumferentially spaced relation about said wall with their legs extending fore-and-aft of the receptacle and projecting outwardly from the wall, and with the apexes of adjacent members facing in opposite directions, the portions of said members in contact with the wall being rigidly secured thereto while parts of their outward portions are cut away to provide seating surfaces adjoined by raised shoulders, said surfaces constituting portions of a true circle concentric with said axis; and a contractile annulus surrounding said series of members, having an end face abutting said shoulders and an inner circumferential face tightly engaging said seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

6. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of series of V-shaped seating members disposed in circumferentially spaced relation about and rigidly secured to said wall with their legs extending fore-and-aft of the receptacle and projecting outwardly from the wall, the outward portions of said members being cut away to provide seating surfaces adjoined by raised shoulders, said surfaces constituting portions of a true circle concentric with said axis; an annulus surrounding said series of members, having an end face abutting said shoulders and an inner circumferential face contractively engaging said seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis; and clamping members detachably secured to certain of said seating members and engageable with said annulus to prevent movement of the latter away from said shoulders.

7. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of V-shaped seating members disposed in circumferentially spaced relation around and rigidly secured to said wall with their legs extending fore-and-aft of the receptacle and projecting outwardly from the wall, certain of said members being provided with struts extending between and rigidly secured to their divergent legs, and the outward portions of all of said members being cut away to provide seating surfaces adjoined by raised shoulders, said surfaces constituting portions of a true circle concentric with said axis; a contractile annulus surrounding said series of members, having an end face abutting said shoulders and an inner circumferential face tightly engaging said seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle

for rotation about said axis; and clamping members detachably secured to said struts and engaging the other end of said annulus to prevent movement of the latter away from said shoulders.

8. The combination with a receptacle having a peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of seating members disposed in circumferentially spaced relation around and rigidly secured to said wall, said members having elements extending fore-and-aft of the receptacle and projecting outwardly from the wall, the outward portions of said elements being cut away to provide seating surfaces adjoined by raised shoulders, said surfaces constituting portions of a true circle concentric with said axis; an annulus surrounding said series of seating members, having an end face abutting said shoulders and an inner circumferential face contractively engaging said seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis; and means carried by said annulus positively engaging one of said seating members to prevent circumferential creep of the annulus relative to the members.

9. The combination with a receptacle having a coniform peripheral wall surrounding an axis about which the receptacle is to be rotated, of a series of seating members disposed in circumferentially spaced relation about and rigidly secured to said wall, said members having tapering elements extending fore-and-aft of the receptacle and projecting outwardly from the wall, the outward portions of said members being formed to provide seating surfaces constituting portions of a true cylinder concentric with said axis; and a contractile annulus surrounding said series of members and tightly engaging their respective seating surfaces, whereby to provide a track engageable with a supporting roller to mount the receptacle for rotation about said axis.

JOHN W. LENDVED.
CHARLES I. LONGENECKER.

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