May 2, 1950 J. R. MOORE 2,506,516

LAUNDRY DRIER

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Fig. 1.

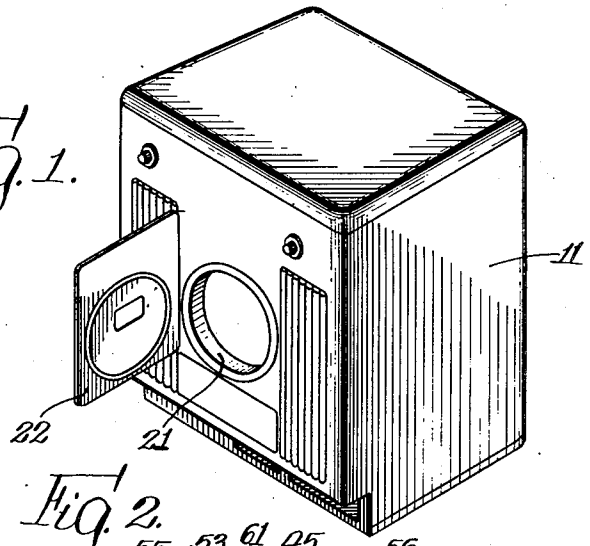
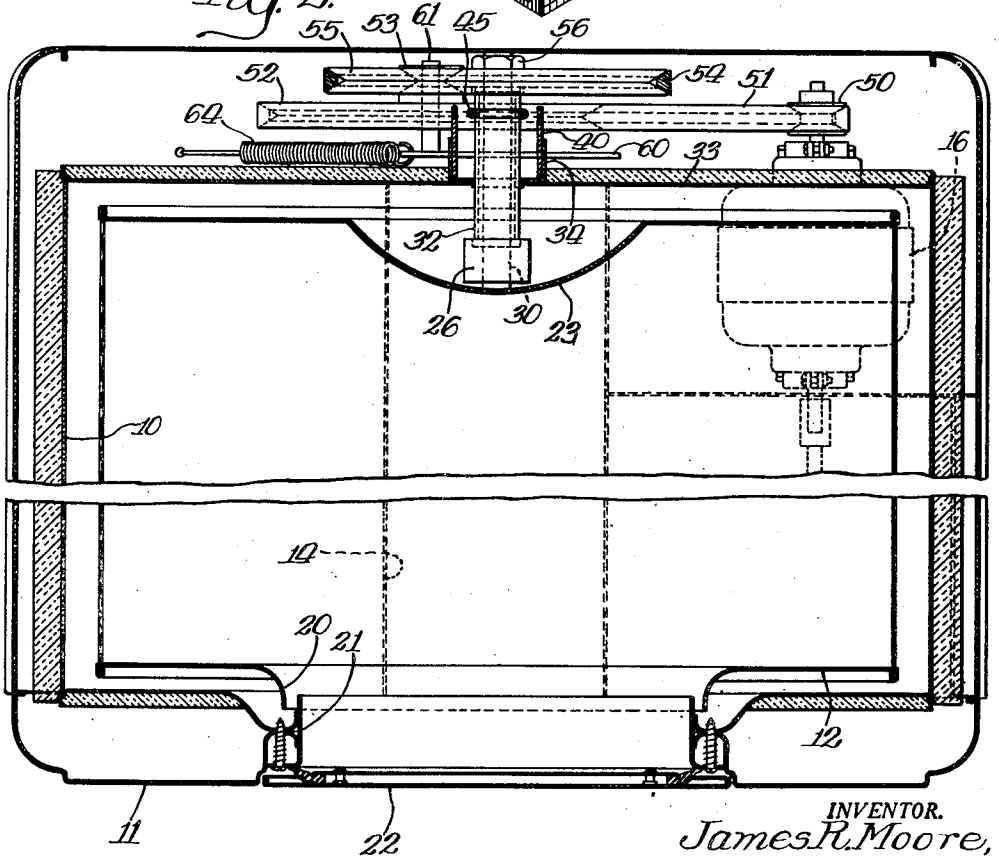


Fig. 2.



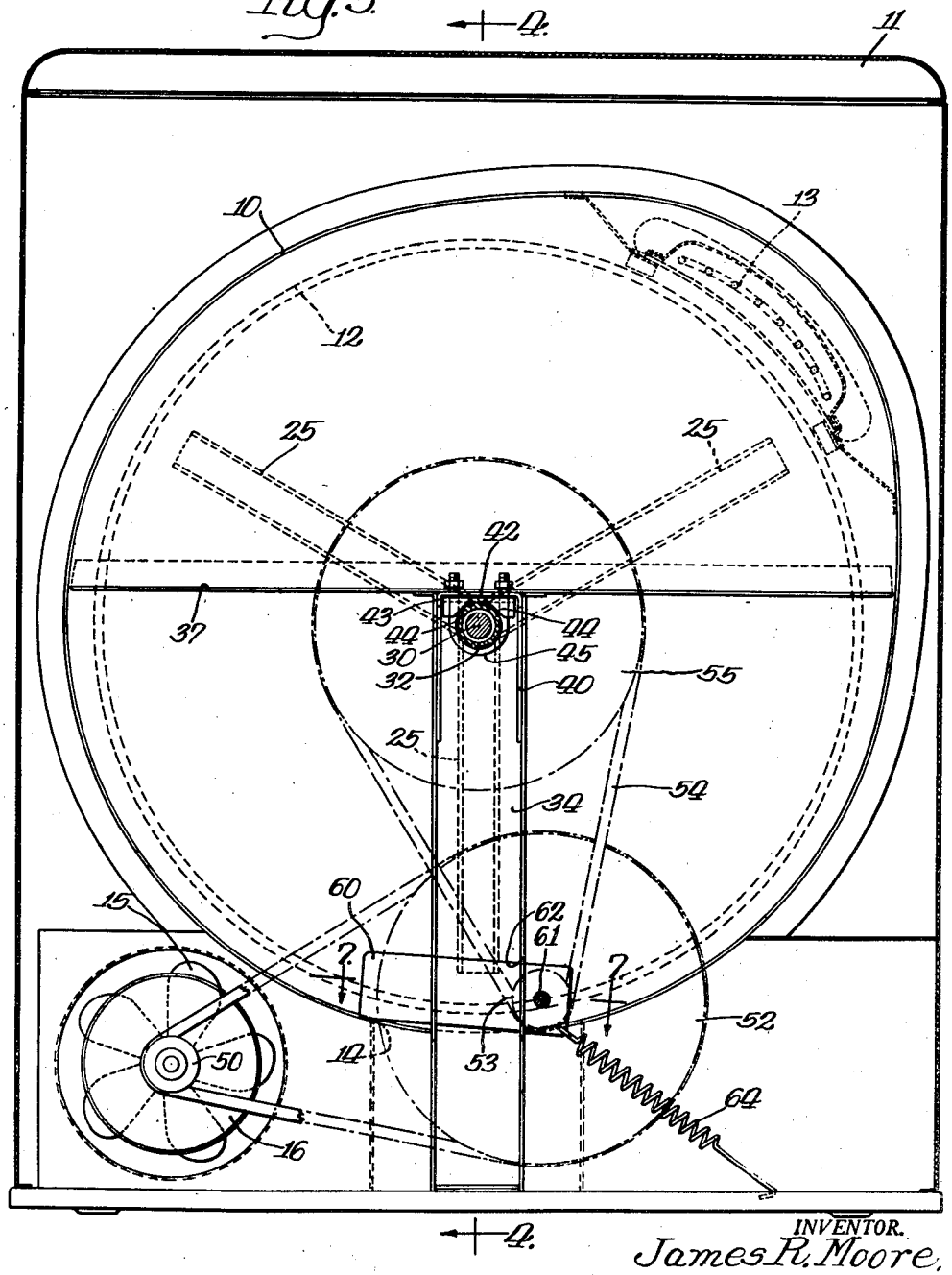
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Fig. 3.



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Fig. 4.

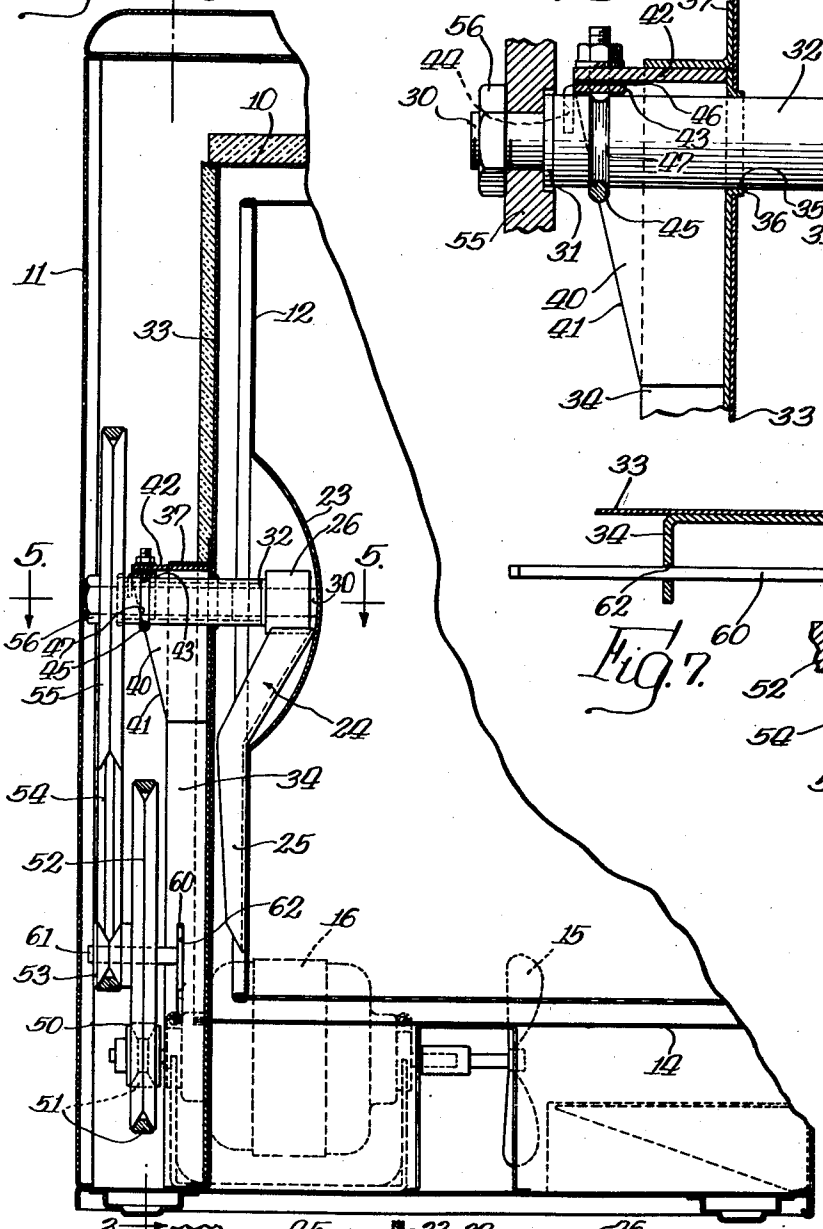
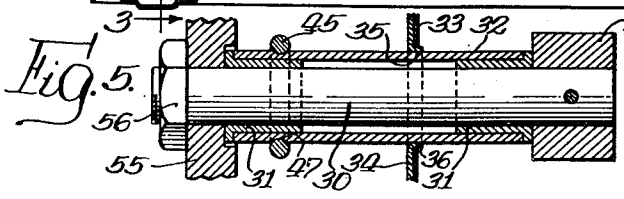


Fig. 6.

Fig. 7.

Fig. 5.



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UNITED STATES PATENT OFFICE

2,506,516

LAUNDRY DRIER

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Application September 19, 1945, Serial No. 617,312

10 Claims. (Cl. 308—22)

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The invention relates generally to a laundry drier of the type comprising a rotatably driven drum for tumbling the laundry during the course of drying, and a casing providing a chamber in which the drum is mounted. More particularly, the invention relates to structure for supporting the drum within the casing and for driving the drum.

The general object of the invention is to provide, in a drier of the foregoing type, novel structure for supporting and driving the drum, which is simple in character, inexpensive and easy to manufacture, and provides for all necessary adjustments.

Another object to provide a drier of the foregoing type having a novel drum supporting means which permits adjustment, during assembly of the drier, of the position of the drum in the surrounding casing so that the drum may be accurately centered with the casing and be firmly held in such centered relation, the adjustment thus compensating for any tendency of the drum to sag.

It is also an object to provide a laundry drier of the foregoing type, having novel drive mechanism for the drum of the belt and pulley type and having means for taking up slack in the belts, which is of simplified construction and is carried by part of the drum supporting structure.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a drier embodying the features of the invention.

Fig. 2 is a horizontal sectional view of the drier.

Fig. 3 is a vertical sectional view taken substantially on the line 3—3 of Fig. 4, with portions of the drive structure shown in dotted lines.

Fig. 4 is a fragmentary vertical sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged fragmentary sectional view of a portion of Fig. 4.

Fig. 7 is a fragmentary horizontal sectional view taken on the line 7—7 of Fig. 3.

A laundry drier of the type herein disclosed is adapted to receive laundry after a portion of the washing or rinsing water has been removed therefrom as by wringing, and to dry such laundry to a substantially bone-dry condition or to a condition where the moisture content is suitable for ironing. To this end, the drier comprises generally an inner casing 10, which in the present instance is generally cylindrical with its axis horizontal, and an outer casing 11, which is shown as being generally rectangular. Within the inner casing 10 is a cylindrical drum 12 mounted on a horizontal axis and adapted to be rotatably driven to agitate the laundry during the drying operation as by tumbling it, so that all parts of the laundry will be uniformally dried. Heat is adapted to be supplied to the contents of the inner casing 10, and in the present instance an electrical heating element 13 is provided for this purpose.

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To carry away the moisture evaporated from the laundry during the drying operation, an air current is produced which flows through the inner casing 10, with the air when in a substantially saturated condition being withdrawn through an opening in the inner casing, which opening is here shown at the bottom of the casing 10 and is indicated at 14. To provide for the necessary flow of air through the drying chamber or inner casing, the preferred form utilizes an air current produced in the structure supporting the inner casing 10, and an electric fan 15 is provided for this purpose, the fan being driven by a motor 16 mounted in the base of the machine outside of the inner casing 10 but within the outer casing 11.

The laundry is adapted to be inserted and withdrawn from the drum 12 through a central opening 20 provided in its front face, the casing structure also being provided with a similar opening 21 adapted to be closed by a door 22. To permit free access to the interior of the drum 12 through the openings 20 and 21, the drum is supported and driven solely at its rear.

As mentioned above, the present invention relates to the structure for supporting and driving the drum 12. In its preferred form, the rear wall of the drum is provided with a centrally located inward bulge 23 and is rigidly secured to a spider, indicated generally at 24, which in the present instance comprises three radial arms 25 and a central hub portion 26. Rigidly secured to the hub portion 26 is a shaft 30 axially aligned with the drum 12 and extending rearwardly therefrom. The shaft 30 is mounted in bushings 31 positioned in opposite ends of a tubular bearing 32. The tubular bearing 32 extends rearwardly through the rear wall (indicated at 33) of the inner casing 10 with the shaft 30 extending rearwardly beyond the rear end of the tubular bearing 32.

To support the tubular bearing 32, the rear wall 33 of the inner casing is stiffened and reinforced by a vertically extending supporting member 34 comprising, in the present instance, a channel having its web portion abutting the rear face of

the rear wall 33 with the flanges of the channel extending rearwardly therefrom. The channel 34 extends upwardly to a level above the axis of the drum 12, and the web portion thereof is provided with an aperture 35 (see Fig. 6) with the metal belled inwardly as at 36 to extend through an aperture in the rear wall 33. The aperture 35 is dimensioned to fit snugly about the bearing 32 and to support it intermediate its ends, the bearing 32 thus resting on the lower margin of the aperture 35. The rear wall 33 is also transversely reinforced by an angle 37 extending across the back of the rear wall 33 at the top of the channel 34. The weight of the drum 12 with its shaft 30 is thus carried by the belled portion 36 of the channel 34.

In order to properly position the drum 12 within the inner casing and to hold it in centered relation thereto against any tendency to sag, the rear end of the bearing 32 is adjustable vertically so that it may pivot about the belled portion 36 of the channel 34 to raise or lower the drum within the casing. To this end, a U-shaped member 40 is mounted within the channel 34 with its arms extending parallel to the flanges of the channel and its intermediate portion bridging the top of the channel and extending rearwardly from the rear wall 33. The rear edges of the arms of the U-shaped member 40 slant rearwardly as at 41 so that the central portion, indicated at 42, extends rearwardly beyond the channel 34 and adjacent the rear end of the bearing 32. The member 40 may be rigidly secured to the channel by welding the arms thereof to the flanges of the channel.

The central portion 42 of the U-shaped member constitutes a horizontal plate overlying the bearing 32 to which the rear end of the bearing may be adjustably clamped to raise or lower the drum by a pivotal movement into centered relation with the inner casing. To this end, the central portion 42 is provided with a seating member 43 in the form of an angle plate having one flange underlying the central portion 42 and the other flange extending downwardly at the rear end of the bearing. The downwardly extending flange of the angle 43 is notched as at 44 to bear against and form a seat for the tubular bearing 32. Holding the bearing 32 within the notch 44 is a means which, in the present instance, comprises a U-bolt 45 embracing the bearing 32 and having its arms extending upwardly and secured to the central portion 42 of the U-member 40. By adjusting the ends on the U-bolt 45, the rear end of the bearing 32 may be raised or lowered, and when in the desired adjusted position, a shim 46 inserted between the angle member 43 and the central portion 42 of the U-member holds the parts in tightly clamped relation. Thus, by such vertical adjustment of the rear end of the bearing 32 and clamping thereof against the angular seat provided by the notch 44, the drum 12 may be adjusted to and held in proper centered relation with the inner casing 10, the adjustment being by a pivotal action of the bearing 32 about the belled portion 36 of the channel 34. To hold the bearing 32 against any longitudinal shifting relative to the wall 33, the U-bolt 45 fits into an annular groove 47 in the bearing 32.

Another feature of the invention lies in the drive mechanism connecting the motor 16 with the drum shaft 30. In the present instance, the motor 16 is positioned with its axis parallel to the drum axis and below the latter but to one side thereof, as is clearly illustrated in Fig. 3. The drive mechanism in this instance is of the belt type and is such as to provide a reduction in speed. To this end, the motor shaft carries a small pulley 50 connected by a belt 51 to a large pulley 52. The large pulley 52 has an integral hub portion 53 providing a small pulley connected by a second belt 54 to a large pulley 55 rigidly secured to the rear end of the drum shaft 30 as by a nut 56. The pulleys 52 and 53 thus constitute idler pulleys.

It will be noted from an inspection of Fig. 3 that the center lines from the idler pulleys 52 and 53 to the motor pulley 50 and the drum pulley 55 extend generally at right angles to each other. In the present instance, a single means of a simplified character readily manufactured and assembled is provided to maintain both of the belts 51 and 54 under driving tension. In its preferred form, said means comprises a substantially rectangular plate 60 carrying at one end a stub shaft 61 on which the idler pulleys 52 and 53 are mounted. The plate 60 is positioned with its plane vertical and is loosely held for shifting movement in both horizontal and vertical directions, but is prevented from tilting out of its vertical plane under the forces exerted on the stub shaft 61. To this end, the plate 60 extends generally horizontally through slots 62 provided in the flanges of the channel 34 at a point below the drum shaft 30. The slots 62 are of greater height than the plate 60, so that the latter is free to shift both vertically and horizontally in its plane. Thus, the plate 60 provides a simple means for supporting the idler pulleys 52 and 53. To hold the belts 51 and 54 under tension, a tension spring 64 is connected to the lower right-hand corner of the plate 60, as viewed in Fig. 3, and extends downwardly and to the right thereof to be engaged with the base structure of the machine. Thus, the spring 64 tends to pull the plate 60 to the right and downwardly, which movement tensions both the belts 51 and 54.

The channel 34 thus supports the drum at its upper end and the major portion of the drive mechanism, particularly the idler pulleys which form a portion of the connection between the motor and the drum shaft 30. Thus, all stresses resulting from the rotation and weight of the drum are carried by the channel member 34, and the rigidity thereof provides the necessary support.

I claim:

1. In a laundry drier, the combination of a stationary casing having a wall provided with an aperture, a cylindrical drum mounted within said casing and having an axially extending shaft at one end, a bearing extending through said aperture and rotatably supporting said shaft, and means spaced axially from said wall for pivotally adjusting said bearing about the margin of said aperture to center the drum within said casing.

2. In a laundry drier, the combination of a stationary casing having a wall provided with an aperture, a cylindrical drum mounted within said casing and having an axially extending shaft at one end, a bearing extending through said aperture and rotatably supporting said shaft, a rigid member mounted at the outer face of said wall, and adjustable clamping means carried by said member and spaced from said wall for adjusting the outer end of said bearing transversely to its axis and thereby causing it to pivot about the

margin of said aperture to center the drum within the casing.

3. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a cylindrical drum mounted within said casing with its axis horizontal and having an axial shaft extending rearwardly through said aperture, a tubular bearing for said shaft extending through said aperture and pivotally supported intermediate its ends by the lower margin of said aperture, and means engaging the rear outer end of said bearing for adjusting it vertically to center the drum within the casing.

4. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a cylindrical drum mounted within said casing with its axis horizontal and having an axial shaft extending rearwardly through said aperture, a tubular bearing for said shaft extending through said aperture and pivotally supported intermediate its ends by the lower margin of said aperture, a horizontal plate extending rearwardly from said wall, and means for clamping the rear end of said bearing to said plate in vertically adjusted relation thereto to center the drum within the casing.

5. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a cylindrical drum mounted within said casing with its axis horizontal and having an axial shaft extending rearwardly through said aperture, a tubular bearing for said shaft extending through said aperture and pivotally supported intermediate its ends by the lower margin of said aperture, a horizontal plate extending rearwardly from said wall, a seat engaging the upper side of said bearing at its rear end and in adjusted relation to said plate, and a U-bolt embracing said bearing for clamping the bearing against said seat.

6. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a cylindrical drum mounted within said casing with its axis horizontal and having an axial shaft extending rearwardly through said aperture, a tubular bearing for said shaft extending through said aperture and pivotally supported intermediate its ends by the lower margin of said aperture, a horizontal plate extending rearwardly from said wall, an angle member having one leg positioned parallel and below said plate and its other leg provided with a notch fitting over said bearing at its rear end, spacing means between said angle member and said plate, and a U-bolt embracing said bearing and extending through said single member, spacing means and plate for clamping them together.

7. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a cylindrical drum mounted within said casing with its axis horizontal and having an axial shaft extending rearwardly through said aperture, a vertically extending channel secured to the rear face of said wall and having an aperture provided with a flange projecting through the aperture in said wall, a tubular bearing for said shaft extending through said apertures and pivotally supported intermediate its ends by said flange, a U-shaped bracket secured in said channel at the upper end thereof and having a horizontal plate portion extending rearwardly above said bearing, seating means mounted within said bracket under said plate portion and engaging the rear end of said bearing, and a U-bolt embracing said bearing for clamping the bearing against said seating means.

8. A laundry drier comprising a casing having a vertical wall provided with an aperture, a drum rotatably mounted in said casing on a horizontal axis and having a shaft extending through said aperture, a tubular bearing supporting said shaft and pivotally supported intermediate its ends on the lower margin of said aperture, a rigid support extending rearwardly from said wall over said tubular bearing, and means for clamping the rear end of said bearing to said rigid support in vertically adjusted position to center the drum within the casing, said means and said bearing cooperating to hold said bearing against endwise movement.

9. A laundry drier comprising a casing having a vertical wall provided with an aperture, a drum rotatably mounted in said casing on a horizontal axis and having a shaft extending through said aperture, a tubular bearing supporting said shaft and pivotally supported intermediate its ends on the lower margin of said aperture, a rigid support extending rearwardly from said wall over said tubular bearing, and a U-bolt embracing the rear end of said bearing and secured to said rigid support for holding said rear end in vertically adjusted position to center the drum in said casing, said bearing having an annular groove to receive said U-bolt whereby said bearing is held against endwise movement.

10. In a laundry drier, the combination of a stationary casing having a vertical rear wall provided with an aperture, a vertically extending channel secured to the rear face of said wall and having an aperture aligned with the aperture in said wall, a tubular bearing supported intermediate its ends in said apertures, means secured to said channel for supporting said bearing at its rear end in axially spaced relation to the support of the bearing in said apertures, a drum mounted in said casing and having a drive shaft supported by and extending rearwardly through said bearing, a driven pulley mounted on the rear end of said shaft, a pulley support adjustably carried by said channel below said driven pulley, a drive pulley mounted on said pulley support, a belt connecting said pulleys and a spring engaging said support for tensioning said belt and exerting a downward pull thereon, said means holding said bearing horizontal against the weight of the drum on the front end of said shaft and the downward pull of said spring and the driving force on the belt on the rear end of said shaft.

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