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W. H. MILLSPAUGH

1,609,377

ROLL CONSTRUCTION

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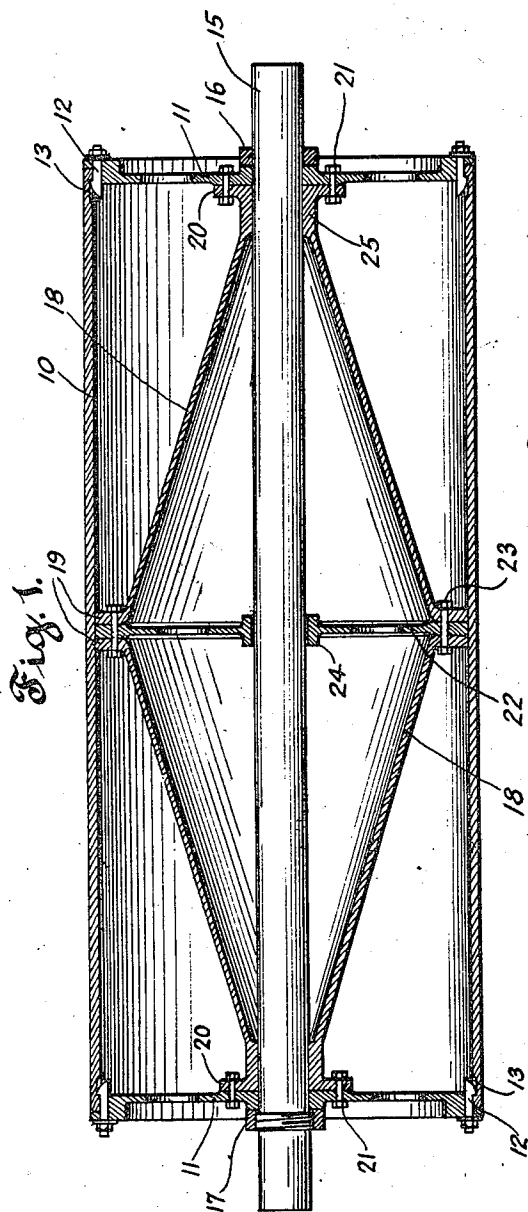


*Fig. 3.*

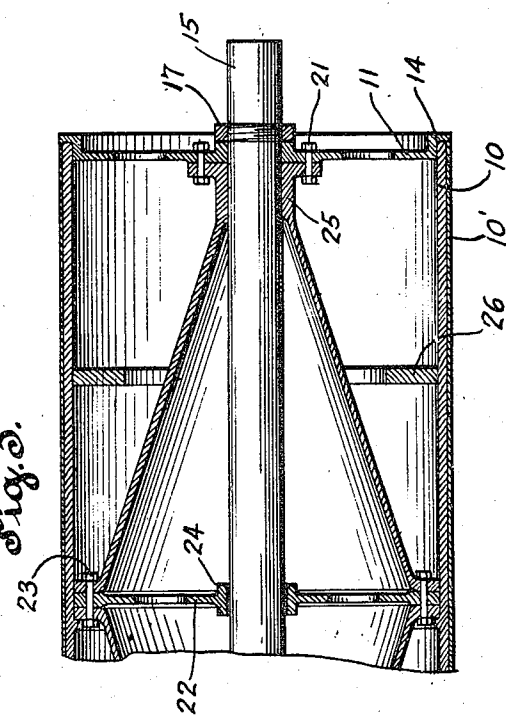
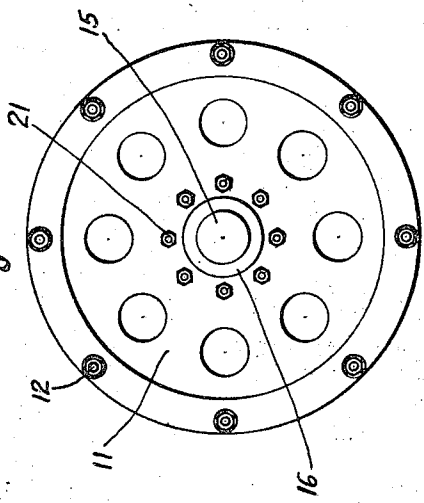


*Fig. 2.*



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## UNITED STATES PATENT OFFICE.

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## ROLL CONSTRUCTION.

Application filed January 19, 1922. Serial No. 530,483.

This invention relates to rolls or drums and particularly to rolls such as are used in textile, printing and paper manufacturing for marking rolls or drier rolls.

5 One of the objects of the invention is to provide a roll or drum that will be light in weight for its size but will be rigid and firm in construction.

Another object of the invention is to provide a roll of the type described constructed to withstand strains and stresses to which the roll is subjected and furthermore to provide a roll that will preserve true alinement and will not be warped out of shape.

15 Another object of the invention is to provide a drum of the type described having truss means adapted to withstand the deflecting and deforming stresses on the drum where the strain is greatest and to distribute the strain throughout the length of the roll.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application and in which—

25 Fig. 1 is a longitudinal sectional view illustrating a drum constructed in accordance with my invention.

Fig. 2 is an end elevation of the drum shown in Fig. 1, and

30 Fig. 3 is a sectional view similar to Fig. 1 but partly broken away and showing a modification of construction.

The invention may be briefly described as comprising a drum having internal truss structure or means adapted to receive, withstand and prevent deflection and deformation or distortion of the drum.

In the particular embodiment of the invention shown this truss structure comprises 40 a pair of conical members having their bases flanged and abutting and engaging the inner bore of the drum and having their apexes engaging the drum heads. A spider may also be provided for further bracing the drum, this spider being mounted on the shaft between the flanges on the bases of the truss members and fitting the inner periphery of the drum. If desired the apexes 50 of the conical members may be secured to the shaft in which the drum is mounted instead of to the drum heads as shown.

Referring to the drawings, the shell 10 of the drum is preferably a plain, hollow cylinder with no internal projections, such as 55 may be conveniently cast in a centrifugal

casting machine, although, of course, any other form of cylinder may be used if desired.

In the particular embodiment of the invention illustrated in Figs. 1 and 2, the cylinder 10 has a pair of heads 11 secured there- 60 to by means of a plurality of hook bolts 12 supported by lugs carried by the heads adjacent their peripheries, the bolts engaging notches or recesses 13 formed in the inner 65 wall of the shell 10 adjacent the ends thereof. The particular manner of securing the heads to the shell just described is clearly shown in my Patent No. 1,092,847 and need not be described in further detail in this 70 application.

In Fig. 3, the heads 11 at their peripheries are offset and flanged at 14 to provide seats for the ends of the shell 10. The shell is also shown with an outer jacket 10' of cop- 75 per, brass or other suitable material that may be required for engraving or to resist acid or rust. It will, of course, be understood that any other method of securing the heads to the shell may be employed if de- 80 sired and that the methods shown were selected merely to illustrate practical embodiments of the invention. For instance, it is obvious that if a very light roll is required, the shaft need not extend through 85 the roll but may have a forced fit in the conical members 18. Also, the bolting of the heads 11 to the conical members may be omitted.

In the construction shown the shell 10 and 90 heads 11 are mounted on a shaft 15 between a collar 16 secured to or formed on the shaft adjacent one end thereof and a nut 17 carried by the shaft at the other end thereof.

The truss means for taking up or with- 95 standing the strain and for preventing deflection on the shell comprises a pair of conical truss members 18 having laterally extending flanges 20 at their apexes.

The flanges 19 may engage the bore of the 100 shell 10 at substantially the longitudinal center thereof and the flanges 20 engage the inner surfaces of the heads 11 at the portions of these heads adjacent the shaft 15. The flanges may be secured to the heads in any 105 suitable manner as by bolts 21. As shown in Fig. 1 the central portion of the shell 10 is further braced by means of a spider 22 mounted on shaft 15 and positioned be- 110 tween the flanges 19 of the conical truss

members and the flanges and spider are secured together by means of bolts 23. If desired, the flanges 19 on members 18 may be secured to spider 22 without directly engaging the shell. The spider 22 has a hub 24 on the shaft 15 and the truss members 18 have sleeve portions 25 at their apexes, these sleeve portions being also mounted on the shaft 15. Additional reinforcing means such as rings 26 in Fig. 3, may be mounted in the shell 10 if desired.

The truss structure of the drum or roll above described may be used for a marking roll or for a drier roll or for any other suitable purpose.

From the above description, it will be seen that simple and practical means have been provided for trussing a drum or roll and that the truss means will effectively compensate for the strains on the drum and will tend to distribute the strains along the drum surface and to withstand the tendency of the drum to deflect or warp out of shape.

Although one specific embodiment of the invention has been illustrated and described it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention as expressed in the following claims.

What I claim is:

1. A drum comprising a hollow, continuous, cylindrical shell, a pair of circular heads respectively affixed to the ends of the shell, and cone-like truss members engaging the inner wall of the shell at its middle portion, extending therefrom to the heads, and affixed to said heads near their axis.

2. The combination of a central circular supporting member and a pair of circular heads of substantially the same diameter as that of the central member, equally spaced therefrom and in axial alinement therewith, a pair of elongated conical truss members, each having its base affixed to said central member near the periphery thereof, and each being affixed near its apex to one of said heads near its axis, and a hollow, continuous,

cylindrical shell fitted over and in engagement with the central member and the heads and secured to the heads.

3. The combination of a central circular supporting member and a pair of circular heads of substantially the same diameter as that of the central member, equally spaced therefrom and in axial alinement therewith, a pair of elongated conical truss members, each having outwardly extending annular flanges at its ends, with the flange at its base affixed to said central member near the periphery thereof, and with the flange at its apex affixed to one of said heads near its axis, and a hollow, continuous, cylindrical shell fitted over and in engagement with the central member and with the base flanges of the truss members and with the heads and secured to the heads.

4. A drum comprising a hollow, continuous, cylindrical shell, a pair of circular heads respectively affixed to the ends of the shell, a shaft on which said heads are mounted, and cone-like truss members, bearing on the shaft near the heads, engaging the inner wall of the shell at its middle portion, extending therefrom to the heads, and affixed to said heads near the shaft.

5. The combination of a central circular supporting member and a pair of circular heads of substantially the same diameter as that of the central member, equally spaced therefrom, a shaft on which the central member and the heads are mounted, a pair of elongated conical truss members each having outwardly extending annular flanges at its ends, with the flange at its base affixed to said central member near the periphery thereof, and with the flange at its apex affixed to one of said heads near its axis, the ends of the truss members at the heads bearing on the shaft, and a hollow, continuous, cylindrical shell fitted over and in engagement with the central member and with the base flanges of the truss members and with the heads and secured to the heads.

In witness whereof, I have hereunto set my hand this 16th day of January, 1922.

WILLIAM H. MILLSPAUGH.