United States Patent

[11] 3,542,308

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[54] **METAL REEL**
3 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **242/118.8**
[51] **Int. Cl.** **B65h 75/14**
[50] **Field of Search** 242/118.8, 77.3, 77.9, 118.7, 118.4, 118.6

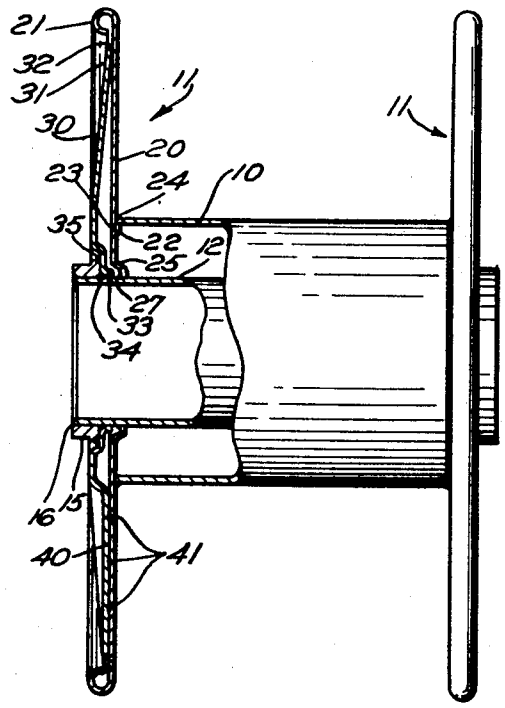
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ABSTRACT: A metal reel for wire having a barrel with heads at its opposite ends, which heads are reinforced to prevent outward deflection by the pressure of wire being wound thereon by a disc having ribs which increase in width radially outward from the center thereof.



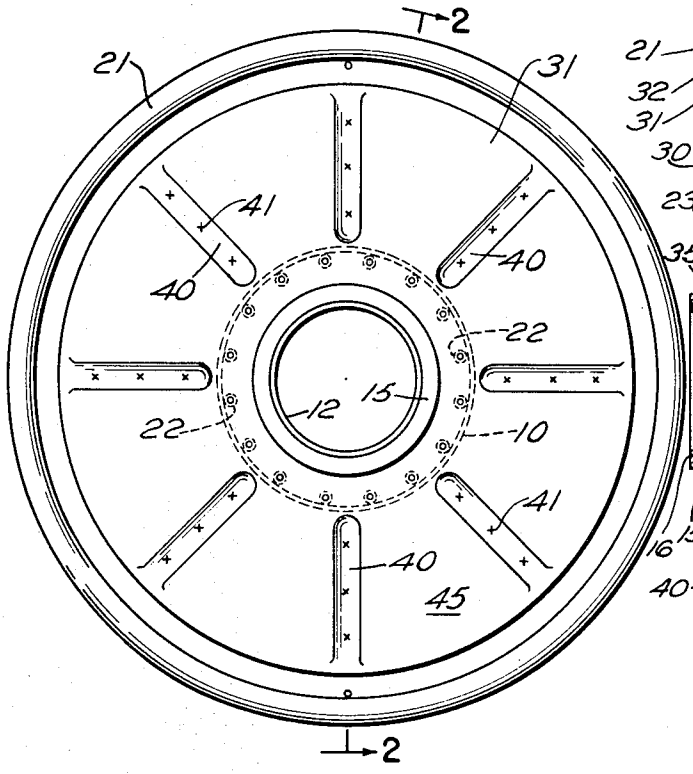


FIG. 1

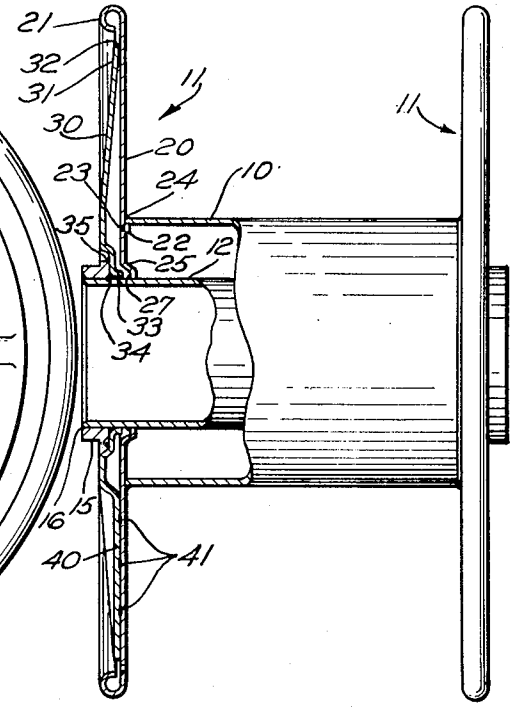


FIG. 2

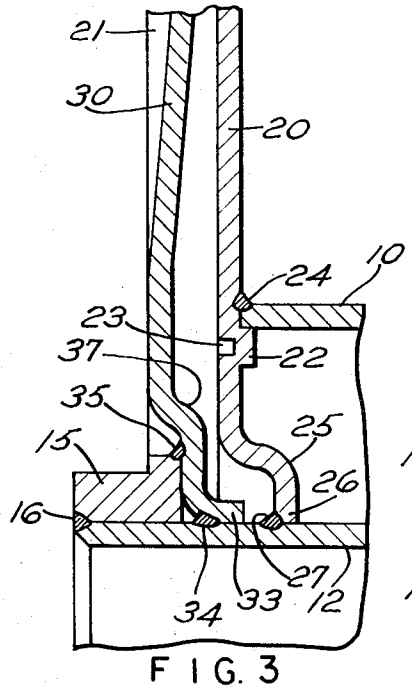


FIG. 3

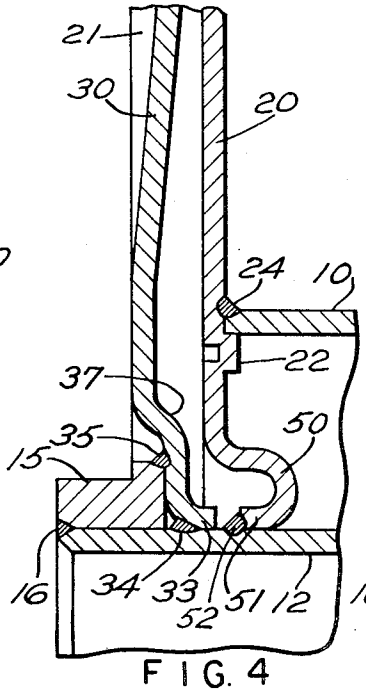


FIG. 4

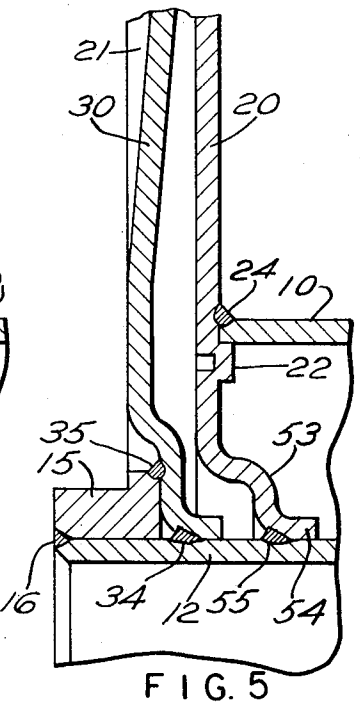


FIG. 5

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METAL REEL

BACKGROUND OF THE INVENTION

In the wire-drawing industry, the wire is packaged upon reels in quantities varying with the size of the reel from 200 pounds for an 18-inch reel to 600 pounds for a 30-inch reel. Since it is desired to operate these reels at high speeds, the strain placed upon the heads tends to and does deflect the heads to a considerable extent due to the lateral forces placed thereon by the buildup of wire as it is reeled upon the reel. The reel is also required to maintain its concentricity, accuracy and balance. More recently the trend is toward higher speed reels driven from a center tube extending through the barrel of the reel and projecting beyond the end thereon.

Reels are usually built to contain a certain number of pounds. For example, a 30-inch reel is intended to carry approximately 600 pounds of wire and in building this reel, the center tube must be a certain length in order to fit into the machine and in order to obtain space for the required amount of weight of wire, the inner surface of the heads must be a certain distance apart. This allows very little room for reinforcing the heads to prevent outward flaring as the pressure of the work or wire engages the inner surface of the heads.

SUMMARY OF THE INVENTION

The reel which is described herein has each of its heads of a composite construction with a main disc at right angles to the axis of the reels welded to the barrel of the reel and also to the center tube, while there is a dish-shaped reinforcing disc having its outer periphery welded to the outer surface of the main disc and its center portion extending axially away from the center disc and also secured to the center tube, thus providing in effect a triangular relationship of support. Offsets are provided adjacent the center tube so that some tendency of axial movement of the center tube relative to the barrel, sometimes referred to as a drumming effect, may be absorbed. The reinforcing disc is also provided with radial deflections contacting the main disc and providing a point of tacking it to the main disc to resist a shearing action between the dished reinforcing disc and the main disc and also providing radially flaring ribs which strengthens the disc.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of one of the heads on the end of a reel;

FIG. 2 is an elevation with one end shown in section taken on substantially line 2–2 of FIG. 1;

FIG. 3 is a fragmental view on a much larger scale showing the connection of the discs of the head to the barrel and center tube;

FIG. 4 is a view similar to FIG. 3 showing a modified arrangement; and

FIG. 5 is a view similar to FIG. 4 showing a different modified arrangement of connection of the head to the center tube.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The reel comprises a cylindrical barrel **10** with heads **11** at either end of this barrel. A center tube **12** concentric with the barrel and within the barrel projects beyond the ends of the heads where it receives a loading ring **15** on the end thereof and through which the reel is driven. This ring is welded to the center tube as at **16** at its end.

Each head **11** comprises a main disc **20** which is circular and in a single plane at right angles to the axis of the reel. The disc is reinforced as at **21** at its outer peripheral edge by rolling the same which provides a stiffening of the disc and may be made as described in U.S. Pat. No. 2,286,640. This disc is also provided with a plurality of locating nibs **22** forced inwardly and leaving a recess **23**. The nibs **22** are generally concentric with the axis in a position so as to locate the barrel **10** as its end abuts the disc **20**. A circular filet weld **24** secures the end of the barrel to this disc at its point of contact

therewith. There is a knuckle **25** at a location adjacent the center tube **12** which offsets the end **26** of the disc from the plane of the disc inwardly of the barrel and this offset portion **26** is secured to the tube by a weld **27** extending circularly about the tube. This offset or knuckle serves to assist in absorbing axial movement, often referred to as a drumming effect, by reason of axial forces in opposite directions which may occur in the operation of the reel.

The main disc **20** is reinforced by a reinforcing disc **30** which is generally dish-shaped and of a diameter less than the diameter of the main disc **20**. Thus, the outer periphery **31** of this reinforcing disc will engage the main disc inwardly from the curved portion **21** and a circular weld **32** serves to secure the reinforcing disc to the main disc at this location. The generally dish-shaped reinforcing disc will extend away from the main disc as it progresses inwardly and at its inner or center portion it is provided with an opening to just fit over the center tube **12**, the edge being turned inwardly as at **33** to have some extended metal to metal contact with the center tube **12** where it is secured by welding **34** and secured to the loading ring by welding **35**, thus providing a secure anchor of the inner edge of the reinforcing disc to the center tube. A knuckle or offset **37** is provided adjacent the center tube in the reinforcing disc which serves also to provide absorption of axial forces, sometimes referred to as the drumming effect, and to cooperate with the offset or knuckle portion **25** above referred to. These offset or knuckle portions actually must be considered cones. Structurally a cone provides rigidity to axial deformation and thus portions **25** and **37** provide rigidity between the reinforcing disc and the main disc and the center tube. Since discs **30** and **20** are spaced at the center tube, the previously mentioned triangulation support of the head is provided. The dish-shaped reinforcing disc is provided with portions **40** deflected into a plane parallel to the main disc **20** and, as seen in the lower portion of the sectional view of FIG. **2**, lie along this main disc and are welded thereto by either plug or spot welding at **41**, three locations being illustrated by way of example. This welding serves to prevent a sliding action or shearing action between the main disc and the reinforcing disc and substantially strengthens the weld connection **32** of the reinforcing disc to the main disc at the periphery thereof. These deflected portions **40** extend radially with parallel sides and provide radially flaring ribs **45** between them increasing in width as they progress from the axial center of the reel which greatly strengthen the reinforcing disc **30** and the head **11**.

In some cases instead of shaping the main disc at its point of contact with the center tube as shown in FIG. **2** and FIG. **3**, the main disc may be offset as at **50** with a portion **51** to extend along the center tube outwardly as in FIG. **4** or it may be provided with an offset **53** with a portion **54** extending inwardly and along the tube as in FIG. **5**. In both cases a weld as at **52** and **55** secures the end or inner portion of the main disc to the center tube. In these forms there is provided extending metal to metal contact of the portions **51** and **54** to the center tube **12** which places less load on the welds **52** and **55** than on weld **27**, for example, of FIG. **3**.

I claim:

1. A metal reel comprising a cylindrical barrel, heads on each end of the barrel, a center tube concentric with the barrel and extending through said heads, each head comprising a main disc at right angles to the axis of the barrel and welded to the end thereof and contacting and welded to the center tube at a location spaced inwardly from the end thereof, each head including a reinforcing disc of a diameter less than the main disc with its peripheral portion circularly contacting said main disc and welded thereto and with its center portion extending outwardly from said main disc and contacting and welded to said center tube at a location spaced outwardly from the weld of the main disc to said tube, said main disc and said reinforcing disc each having inwardly extending annular knuckles in the area adjacent the center tube to form generally conical sections whose inner edges reverse in direction to form annular flanges that lie parallel and adjacent to said center tube to provide increased metal to metal support.

2. A metal reel as recited in claim 1 wherein said inner edges of the annular knuckles of said main disc and said reinforcing disc both reverse in the same direction inwardly toward the middle of the center tube.

3. A metal reel as recited in claim 1 wherein said inner edges of the annular knuckles of said main disc and said reinforcing disc reverse in opposite directions with the inner edge of the main disc reversing toward the outside of the reel and the inner edge of the reinforcing disc reversing toward the middle of the center tube.