Feb. 20, 1945. R. V. OLSON 2,370,066

SECTION WARP BEAM, SPOOL, OR REEL

Filed Oct. 29, 1941 2 Sheets-Sheet 1

Fig. 1.

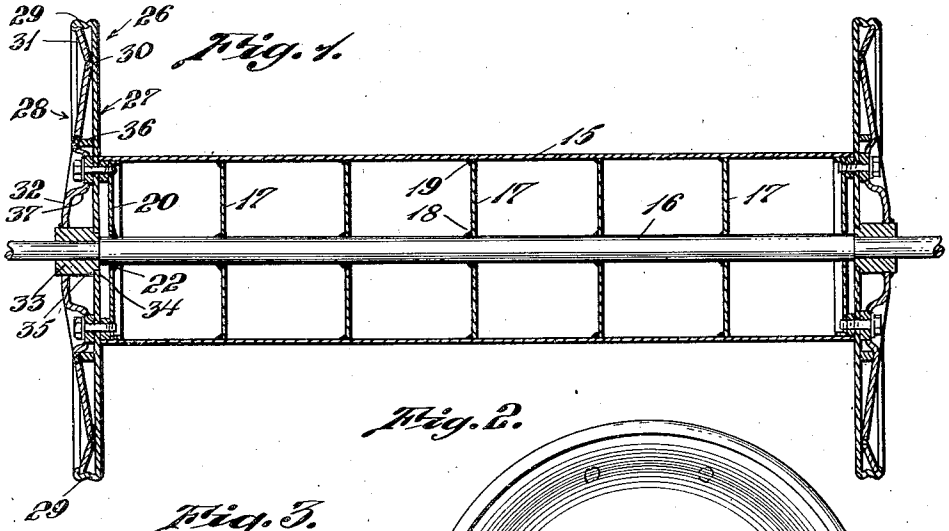


Fig. 2.

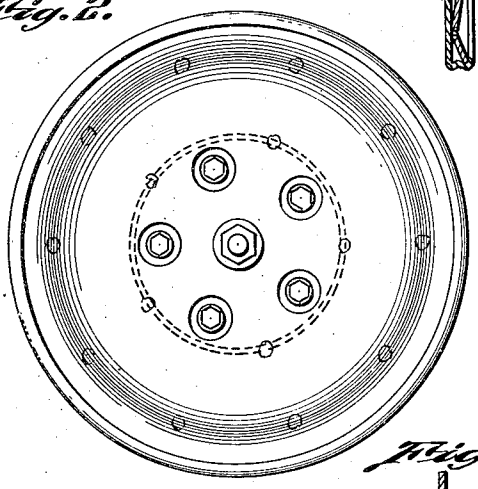


Fig. 3.

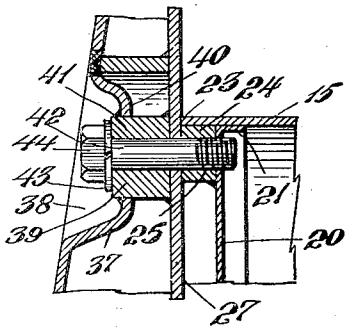


Fig. 5.

Fig. 4.

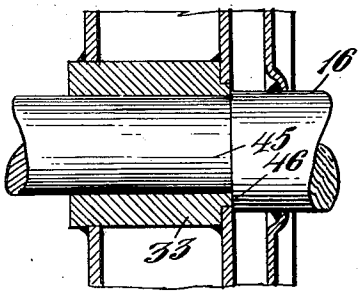


Fig. 6.

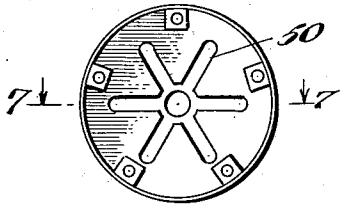
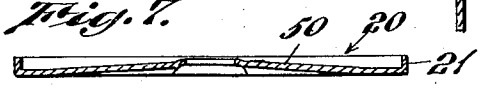


Fig. 7.



INVENTOR
Robert V. Olson
BY Barlow & Barlow
ATTORNEYS

Feb. 20, 1945. R. V. OLSON 2,370,066

SECTION WARP BEAM, SPOOL, OR REEL

Filed Oct. 29, 1941 2 Sheets-Sheet 2

Fig. 8.

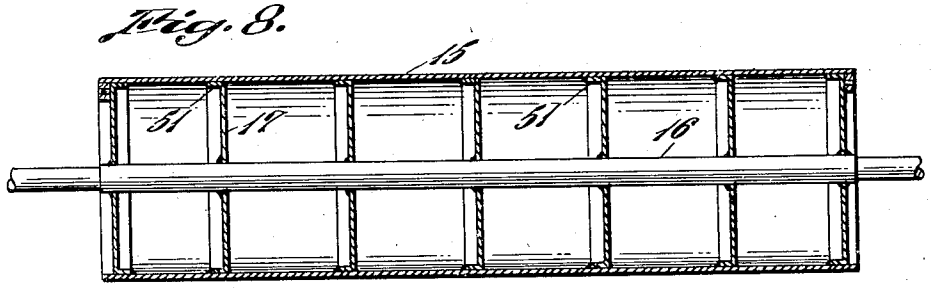


Fig. 9.

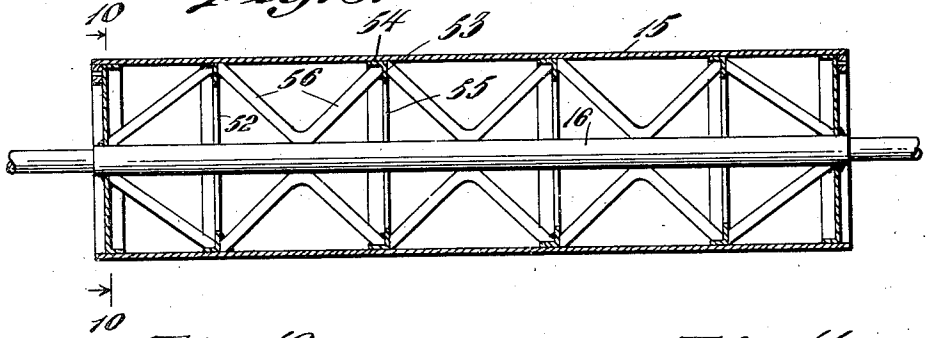


Fig. 10.

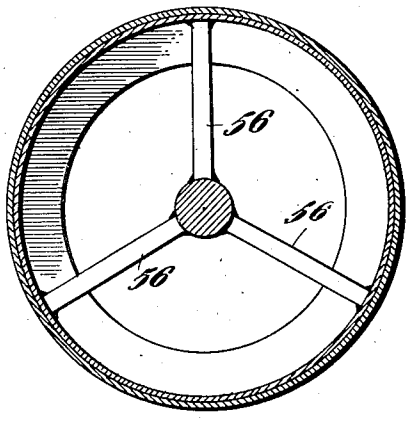
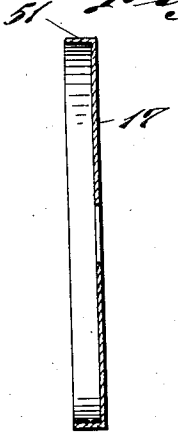


Fig. 11.



INVENTOR
Robert V. Olson
BY Barlow & Barlow
ATTORNEYS

Patented Feb. 20, 1945 2,370,066

UNITED STATES PATENT OFFICE

2,370,066

SECTION WARP BEAM, SPOOL, OR REEL

Robert V. Olson, Attleboro, Mass., assignor to Mossberg Pressed Steel Corporation, a corporation of Massachusetts

Application October 29, 1941, Serial No. 416,958

6 Claims. (Cl. 242—118)

This invention relates to a section warp beam, spool or reel of the type used for winding yarn prior to its winding upon a loom warp beam or for other uses.

In the use of section warp beams, spools or reels of the type to which this invention refers the development of the trade is in the direction of rotation of the section warp beams, spools or reels at a higher rate of speed, and dynamic balance is required in order that they may be rotated at such greater rates of speed. Also there is the growing use in the trade of so-called synthetic yarns such as rayon, celanese, bemberg and the like and it is found that these yarns cause greater strains upon the beams, spools, or reels than do cotton yarns. The strains are both greater compressive strains on the barrel and greater expanding strain on the heads. It is usual to use wood or fiber for the barrel of sections warp beams. The use of these synthetic materials upon such barrels compresses the barrel and in order that the barrel may run true and in dynamic balance a chip must occasionally be taken from the surface of the barrel that the barrel may be maintained concentric and in such balance. Each time the barrel is trued it is weakened and the ultimate life is further diminished. One of the objects of this invention is to provide a metallic barrel so trussed or supported that it may be thin and light in weight and yet will be of such strength as to withstand the compressive strains of the yarn of synthetic nature so that it will not become crushed or distorted but will maintain its dynamic balance for rapid rotation.

Another object of the invention is to so tie together the metallic shell of the barrel and the central shaft through the barrel that the shell, central shaft and supporting means between the two will be substantially one homogeneous material.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described in, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a central sectional view through the section beam, spool, or reel which is the subject of this invention.

Figure 2 is an end view thereof.

Figure 3 is a fragmental sectional view on a larger scale illustrating the head and the means for its attachment to the barrel.

Figure 4 is a fragmental sectional view on a larger scale illustrating the relationship of the central shaft at its connection to the head.

Figure 5 is a sectional view of one of the supporting disks in the barrel.

Figure 6 is an end view of the web or disk at the outer ends of the barrel.

Figure 7 is a section on line 7—7 in Figure 6.

Figure 8 is a sectional view of the barrel showing a slight modification of the supporting disks.

Figure 9 is a sectional view of the barrel showing the modified form of support and tying together between the barrel shell and the center shaft.

Figure 10 is a section on line 10—10 in Figure 9.

Figure 11 is a sectional view of one of the supporting disks illustrated in Figure 8.

Proceeding with this invention I provide a metallic shell of steel, light in weight and of cylindrical shape, and position within it a center shaft which I brace by securing supports between the center shaft and the shell. These braces are welded into place so as to provide a substantially homogeneous structure.

With reference to the drawings in greater detail, I have illustrated in Figure 1 a metallic shell 15 of cylindrical shape and of a desired length for the section warp beam which is provided. A center shaft 16 extends entirely through the shell. Disks 17 having an opening to receive the shaft are of a size to extend between the shaft 16 and the shell 15 and are welded as at 18 and 19 to the shaft and to the shell so as to provide a substantially homogeneous structure of these parts. These disks 17 are positioned at intervals along the barrel sufficiently close so as to obtain the desired supporting relation. The disks as well as the barrel are thin and light in weight and yet by reason of their rigid welding connection provide substantial supports and prevent compression from the forces tending to compress or distort the barrel. The barrel thus formed is trued to dynamic balance.

The disks or webs 20 at the ends of the barrel (see Figure 3) are flanged inwardly as at 21 and secured to the shell 15. These webs 20 are also secured as at 22 to the shaft 16 (see Figure 1) and are located just inwardly from the end 23 of the barrel. Strengthening ribs 50 are provided on the web 20 as illustrated in Figure 6 embossed from the stock of the web for reinforcing the same. Blocks 24 of a thickness equal to the spacing of the web 20 inwardly from the end of the barrel are located at intervals about the web 20 and a threaded opening 25 extending through the block and the web 20 is provided in these two parts.

A head unit designated generally 26 consists of an inner plate 27 and outer plate 28. The inner

plate 27 is located substantially in a single plane with a flanged edge 29 extending outwardly therefrom. The plate 28 serves as a reinforcing plate for the plate 27 and is deflected as best can be seen in Figure 1 so as to contact the plate 27 at the point 30 and extend outwardly at an angle to the plate 27 to engage the flange 29 along a portion 31. While it extends outwardly as it approaches the center as at portion 32 to engage a hub 33 which serves to space the plate 28 from the plate 27 centrally of the head unit. Both plates 27 and 28 are secured to this hub 33, the inner edge of the hub 33 being reduced as at 34 to receive the plate 27 against a shoulder 35 provided by its reduction in diameter. A strengthening reinforcing annular member, 36, such as described in my co-pending application, Ser. No. 253,726, issued as Patent No. 2,263,113 Nov. 11, 1941, in greater detail is provided. To provide for securing the head to the barrel the outer plate 28 is deflected inwardly as at 37 a distance sufficient to form a recess 38 for the reception of the head of the securing means. Spacing element 39 is positioned between the lower portion 40 of this recess and the plate 27 and is welded in position both to the plate 27 and the plate 28 at this deflected portion 40. A bore 41 extends through this spacing element 39 and plate 27 so that a bolt 42 may extend through this hole and engage the threads of the hole 25 in block 24. A lock washer 43 is positioned beneath the head 44 of the bolt while the head 44 is received in the recess 38 so as to be protected both from abrading any surface with which it may come in contact and from any jolt or bump which might serve to dislodge this means of connection from the head to the barrel or cause personal injury to the attendant. As seen in Figure 2 five of such connecting means all similar to the one described are provided.

The center shaft 16 is reduced as at 45 so as to provide a shoulder 46 and the hub 33 of the head will engage this shoulder 46 so as to prevent the plates at this central location from cupping inwardly.

While I have illustrated and described one means for trussing the barrel it might be desirable in some instances to provide the disks 17 with a flange 51 which provides for a greater welding area and also provides an axially extending support inwardly of the shell 15 of the barrel for greater strength and supporting relationship. The welding is performed along flange 51 of the edge of these disks and also is welded to the shaft 16 as heretofore described.

In Figure 9 I have illustrated a still different or modified form of strengthening construction for the barrel and here I provide annular rings 52 having a radially extending lip 53 and an axially extending lip 54, the center 55 being cut away, and these rings are tied to the shaft 16 by struts or braces 56 extending from one ring to the shaft and then returning to the next ring, as shown in Figure 9. A triangular bridge type of zigzag trussed construction is thus provided to securely brace the rings and shell against compression by utilizing a tie so that no axial movement of the shaft and the shell or the rings secured thereto may occur. Thus some of the tensile strength of the shell is utilized for support against compression in this type of structure. These braces 56 are located radially of the barrel at three equally angular positions as shown in Figure 10 for the strengthening and support of the barrel in a relationship where great strength and minimum weight are necessary.

The ends of the barrels as shown in Figures 8 and 9 are the same as those shown in Figures 1–3 heretofore described and the heads may be positioned on these barrels as heretofore described.

I claim:

1. In a section warp beam, spool, reel or the like a barrel comprising a metallic shell, a center shaft extending centrally thereof throughout the length of the barrel, and zigzag truss means between and secured to said shell and shaft in axially spaced relation intermediate of the barrel ends.

2. In a section warp beam, spool, reel or the like a barrel comprising a metallic shell, a center shaft extending centrally thereof throughout the length of the barrel, and truss means between said shell and shaft and comprising a plurality of axially spaced braces each extending at an acute angle to the axis of the shaft and radially outward to the shell and fixed to said shaft and to said shell.

3. In a section warp beam, spool, reel or the like a barrel comprising a metallic shell, a center shaft extending centrally thereof throughout the length of the barrel, and bracing means comprising an angle iron ring extending completely about the inner periphery of the shell and angularly disposed braces secured thereto.

4. In a section warp beam, spool, reel or the like, a barrel comprising a metallic tubular shell, heads secured to its ends, a center shaft extending centrally throughout the length of the barrel, a plurality of bracing means spaced at intervals in the barrel between the heads and each comprising a portion extending completely around the inner periphery of the shell and securely welded thereto and a portion extending radially inwardly to the shaft and securely welded thereto.

5. In a section warp beam, spool, reel or the like, a barrel comprising a metallic tubular shell, heads secured to its ends, a center shaft extending centrally throughout the length of the barrel, a plurality of disks spaced at intervals in the barrel between the heads with the outer peripheral edges of the disks extending completely around the inner periphery of the shell and welded thereto and the peripheral edges about the shaft being welded thereto.

6. In a section warp beam, spool, reel or the like, a barrel comprising a metallic tubular shell, heads secured to its ends, a center shaft extending centrally throughout the length of the barrel, a plurality of disks spaced at intervals in the barrel between the heads with flanges on the outer peripheral edges of the disks extending completely around the inner periphery of the shell and welded thereto and the peripheral edges about the shaft being welded thereto.

ROBERT V. OLSON.