Nov. 25, 1941. R. V. OLSON 2,264,029

SPOOL OR REEL

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Fig. 1.

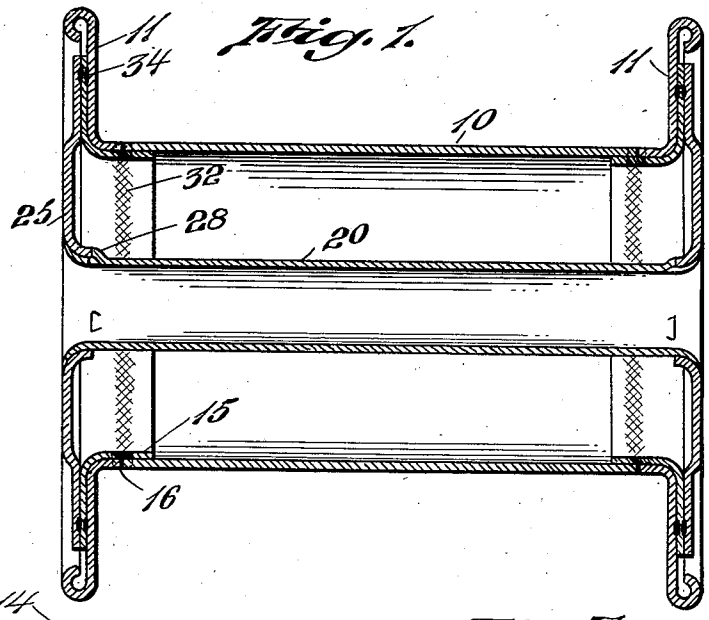


Fig. 2.

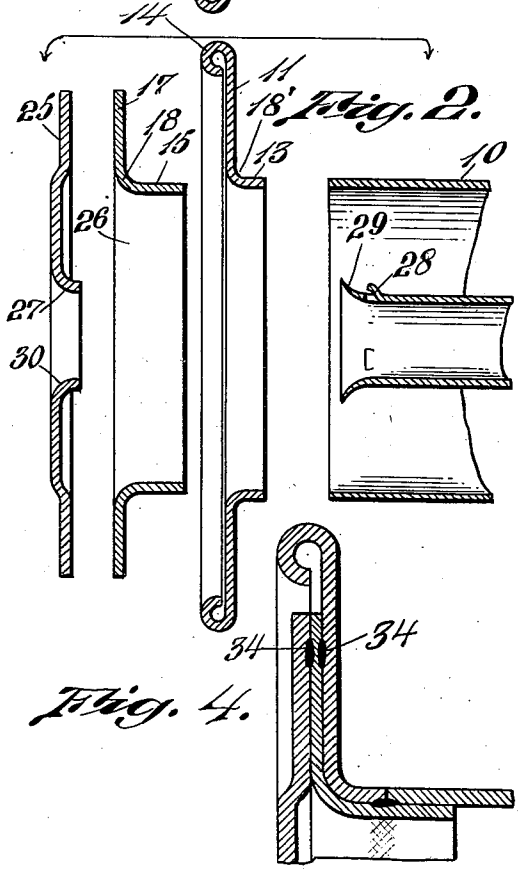


Fig. 3.

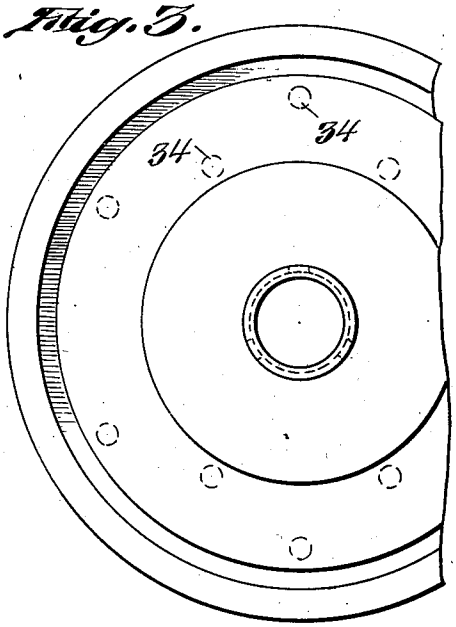


Fig. 4.

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Fig. 7.

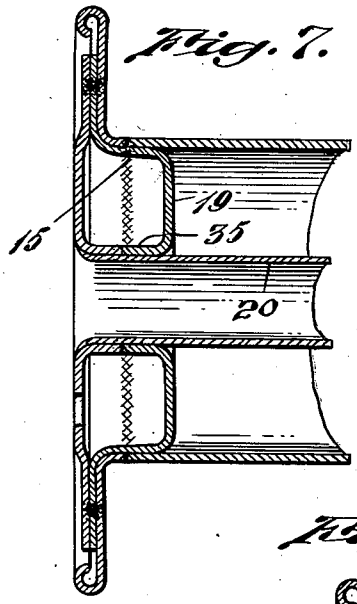


Fig. 5.

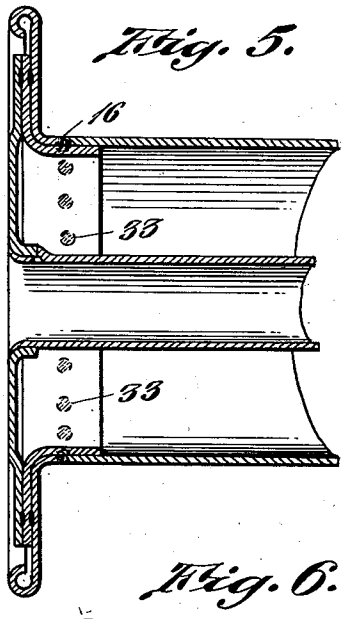


Fig. 11.

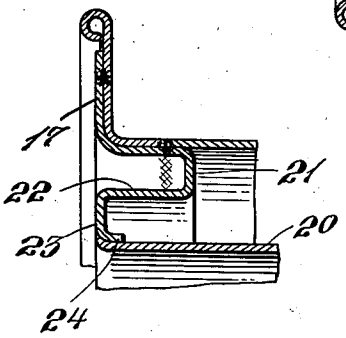


Fig. 6.

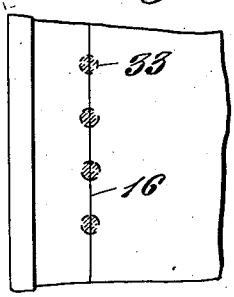


Fig. 8.

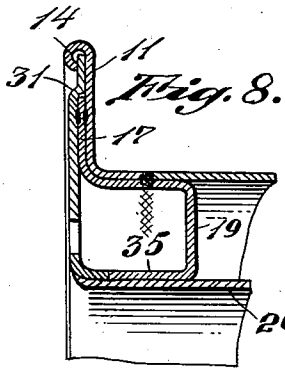


Fig. 10.

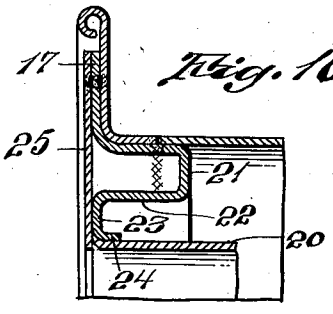


Fig. 12.

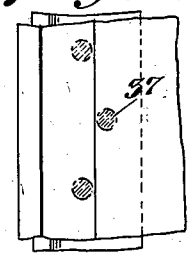
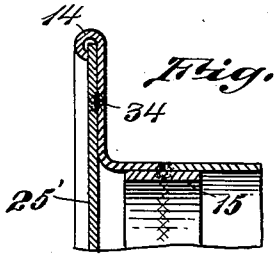


Fig. 9.



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2,264,029

SPOOL OR REEL

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

Application June 1, 1940, Serial No. 338,308

9 Claims. (Cl. 242—123)

This invention relates to a spool or reel of the type formed of sheet stock and is a continuation in part of my copending application, Serial No. 190,894, filed February 17, 1938, now Patent Number 2,258,580.

The invention has for one of its objects to provide a spool or reel which will have unusually strong heads so that when copper wire is reeled upon the spool and heated for annealing, which provides considerable expansion because of its greater co-efficient of expansion than the steel of the spool, the strains exerted will be resisted and the heads will maintain their shape in planes at right angles to the axis of the barrel.

Another object of the invention is the provision of a structure which will so support the stresses as to remain concentric whereby to permit of high speed drawing without wobbling or chattering of the spool on its supports.

Another object of the invention is the provision of a spool having the desired strength in the head and yet one which will have a seamless joint at the corner where there usually exists a seam between the inner surface of the head and the outer surface of the barrel.

Another object of the invention is to prevent the entry of wire into the seam between the barrel and the flange of the head which contacts the end of the barrel.

Another object of the invention is to seal the steam between the end of the barrel and the flange of the head which engages the same at spaced locations sufficiently close to prevent the entry of wire into the same.

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

In the accompanying drawings:

Fig. 1 is a sectional view through the spool embodying this invention;

Fig. 2 is an exploded view of the several parts which go to make up one of the heads of the spool;

Fig. 3 is a fragmental end view of the head of the spool;

Fig. 4 is a sectional view of the parts shown in Fig. 2 in assembled relation and on a much larger scale than shown in Fig. 1;

Fig. 5 is a view similar to Fig. 1 but illustrating a spot weld instead of a continuous weld at the seam between the barrel and the flange of the head;

Fig. 6 is a fragmental view of the joint looking at the outer surface thereof with a spot weld formation in the modification of Fig. 5;

Fig. 7 is a sectional view of a modification of a spool embodying a further development of this invention;

Fig. 8 is a fragmental view showing a different modification of the invention;

Fig. 9 is a fragmental sectional view illustrating a still different modification of the invention;

Fig. 10 is a fragmental sectional view illustrating a still different modification of the invention;

Fig. 11 is a fragmental sectional view illustrating a still different modification of the invention;

Fig. 12 is a view similar to Fig. 6 of a modified spot welding arrangement.

It is found in the use of spools, such as are used for annealing copper wire, that when the loaded spool is heated that the expansion of the copper wire being greater than the expansion of the steel of the spool causes tremendous stresses to be exerted on the head of the spool and often a warping of the head of the spool and an opening at its joint with the barrel which allows entrance of the wire; and in order that a wire may be drawn at high speeds it is essential that the spool be accurate and concentric with the center hole, and accordingly I have so constructed a spool that the strains may be resisted sufficiently to prevent the spool from becoming eccentric or any part moving beyond the tolerance allowed for high speed production; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawings, 10 designates the barrel of the spool and 11 the heads of the spool which are formed from a piece of sheet stock, as shown more fully in Fig. 2, having a central hole, the flange 13 extending inwardly about the hole and of a size to abut the end of the barrel 10. The outer portion of the sheet stock head is rolled as at 14 to strengthen the edge thereof. A sleeve 15 snugly engages the inner surface of the flange 13 and the end portion of the barrel so as to extend on either side of the joint 16 formed by the abutting of the flange and the end of the barrel. For strengthening of the head this sleeve may extend axially and radially outwardly to provide the plate 17 as shown in Figs. 1 to 8, 10 and 11 by reason of the

curved portion 18 closely following the arcuate portion 18' between the flange 13 and head 11.

In some cases the sleeve 15 may extend from its other end radially inwardly as at 19 into engagement with a center tube 20 as shown in Figs. 7 and 8, while in other instances, the stock may extend radially inwardly as at 21 for a short distance then axially outwardly as at 22 parallel to the barrel and tube 20 and then radially inwardly again as at 23 and turn back upon itself as at 24 to engage the tube 20 as in Figs. 10 and 11.

A further reinforcement consisting of a plate 25 will engage the plate portion 17, span the opening of the head and opening 26 of the reinforcement 17 and engage the center tube 20 by being turned inwardly as at 27 to extend into engagement with raised abutments 28 spaced about the tube and sheared from the stock thereof as shown in Fig. 2, while the outer end portion 29 of the center tube is rolled outwardly over the curvature 30 of this reinforcing plate to assist in binding the plate in position. In Figs. 7 and 8 the portion 27 engages the outwardly extending flange 35 from the portion 19.

In Figs. 1 to 7 the diameter of this reinforcing plate 25 is substantially the same as the diameter of the reinforcement 17, while in Figs. 8 and 9 this reinforcement plate 25 is of a greater diameter than the reinforcement plate 17 and is offset inwardly as at 31 (see Fig. 8) over the plate 17 so as to contact the head 11 and extend beneath the rolled edge 14 thereof. In Fig. 9 in which there is no plate 17, the plate 25' is substantially in a single plane without this offset and likewise extends beneath the rolled edge 14, while in Fig. 11 the outer plate is omitted.

Two particular types of welding are illustrated for securing the parts in assembled relation above referred to. In one instance a continuous resistance seam weld, designated 32, may be provided as illustrated in Figs. 1 to 4 to secure the parts at the joints 16 together. In Figs. 5 and 6 a spot weld is utilized for this purpose, each of the spots of which is designated 33 and is spaced at various locations along the seam 16 for securing the parts together. Both of these types of welds, or either one, may occur in the various modifications which I have shown in which the flange 13 of the head 11 is secured to the end of the barrel in abutting relation, while the sleeve 15 is secured to the flange 13 and also to the end portion of the barrel 10. Thus, this weld in this location secures three parts in the fixed relation which they assume. The weld while being at the seam and bridging the same also is by reason of its width located on either side of the seam and in some cases, as in Fig. 12, the spots 37 are even spaced from the seam 16 on either side thereof in staggered relation or these welds on either side of the seam might be continuous.

In the situations where the plate 17 abuts the outer surface of the head 11, a spot weld 34, or in some instances a continuous seam weld, is provided to secure these two parts in assembled relation at various locations about the head while a similar spot or continuous seam weld which may be provided at the same time where the reinforcement 25 also occurs, serves to secure this reinforcement to the reinforcement 17 as appears in Figs. 1, 4, 5, 7, and 10 and directly to the head as shown in Figs. 9 and 11.

By reason of the arrangement which I have provided the bridging of the seam 16 either by the continuous weld 32 or by spot weld 33 prevents fine wire which may be wound on the spool from entering this seam, while at the same time the weld secures the three parts in assembled relation and while a curved portion of the head at the arc 18' provides no location at which the wire may enter, even though stresses may occur in the head; in Fig. 12 the abutting of the ends will be held sufficiently tight by the welds on either side to prevent entrance of the wire into the seam. The welding of the reinforcements 17 and 25 to the outer surface of the head strengthens the head and by preventing any possibility of sliding one part on the other provides a head which is substantially as strong as though the head were all of one piece of the three thicknesses of the metal.

I claim:

1. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a cylindrical sleeve in said barrel extending on either side of the junction of said flange and tubular member, and a continuous weld at said junction to secure said flange and tubular member together and said sleeve to said flange and tubular member.

2. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, an end plate abutting the outer surface of said head and having a sleeve extending into the opening of said head and barrel to extend across the joint between said head and barrel and then extending radially inwardly to engage said tube, and a continuous weld at said joint to secure said flange and tubular member together and said sleeve to said flange and tubular member.

3. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, an end plate abutting the outer surface of said head and having a sleeve extending into the opening of said head and barrel to extend across the joint between said head and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and a weld at said joint to secure said parts together.

4. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, an end plate abutting and reinforcing the outer surface of said head and having a sleeve extending into the opening of said head and barrel to extend across the joint between said head and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and welding means adjacent the juncture of said flange and tubular member to secure said sleeve to said tubular member.

5. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, a sleeve extending into the opening of said head and barrel to extend across the joint between said head and

barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and welding means adjacent the juncture of said flange and tubular member to secure said sleeve to said tubular member and to secure said sleeve to said flange.

6. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, a sleeve extending into the opening of said head and barrel to extend across the joint between said head and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and welding means adjacent the juncture of said flange and tubular member to secure said tubular member to the flange and the sleeve to both of them.

7. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, a sleeve extending into the opening of said head and barrel to extend across the joint between said head flange and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and spot welds on either side of said joint and adjacent thereto to secure said sleeve to the flange and to said tubular member.

8. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, a sleeve extending into the opening of said head and barrel to extend across the joint between said head flange and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and spot welds in staggered relation on either side of said junction and adjacent thereto to secure said sleeve to the flange and to said tubular member.

9. In a reel or spool of sheet metal, a head having its stock deflected to provide an inwardly extending flange forming a part of the barrel, a tubular member abutting said flange and continuing said barrel, a central tube, an end plate abutting the outer surface of said head and having a sleeve extending into the opening of said head and barrel to extend across the joint between said head and barrel and then extending radially inwardly toward said tube, then axially parallel to said tube and then radially inwardly to engage said tube, and a second reinforcing plate abutting the outer surface of said first plate and extending inwardly to the radius of said center tube and welding means adjacent said joint to secure said parts together and to secure said second plate in position.

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