June 9, 1959 E. J. HUBBARD 2,889,921

CONTAINER FOR WIRE

Filed Nov. 23, 1956 2 Sheets-Sheet 1

Fig. 2

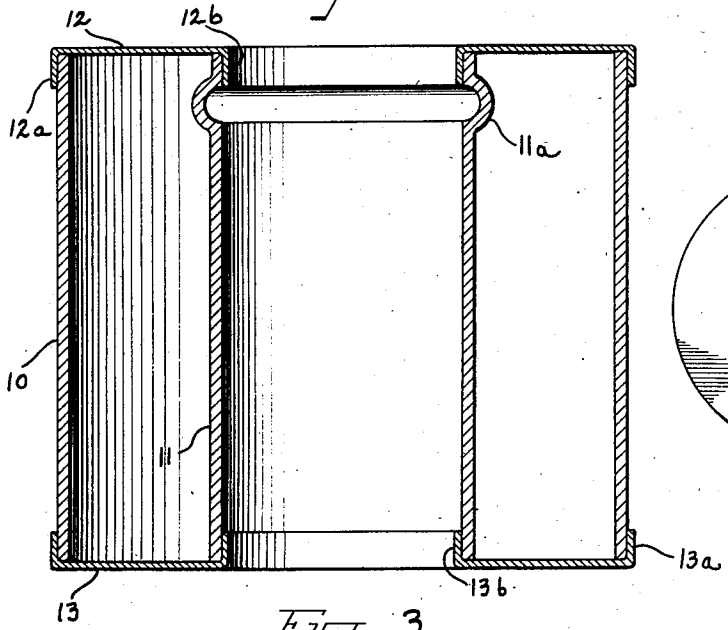


Fig. 1

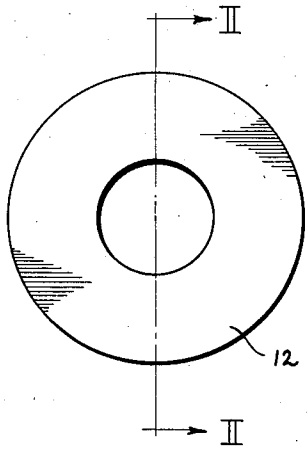


Fig. 3

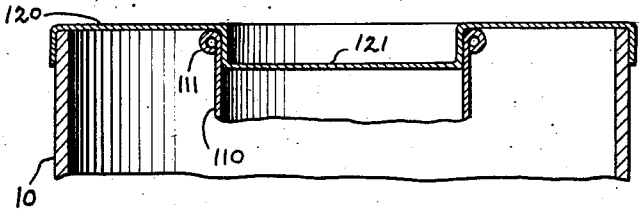


Fig. 4



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Fig. 5

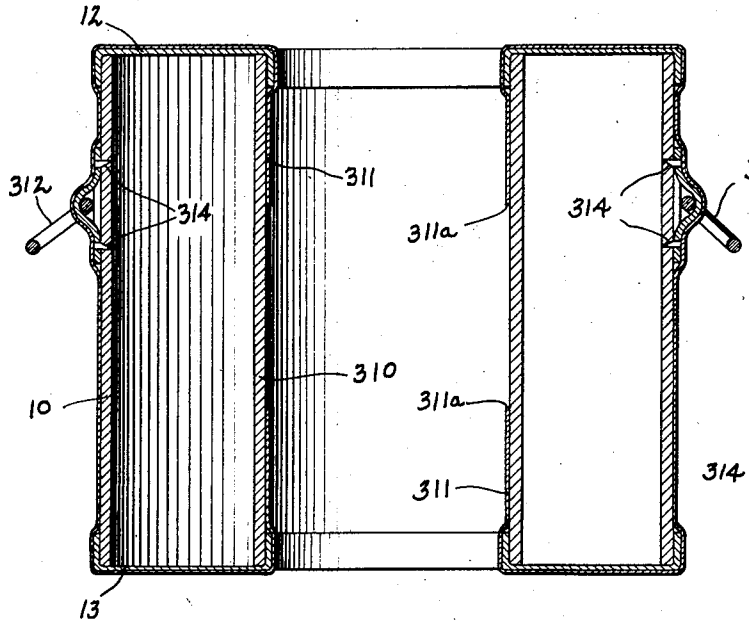


Fig. 6

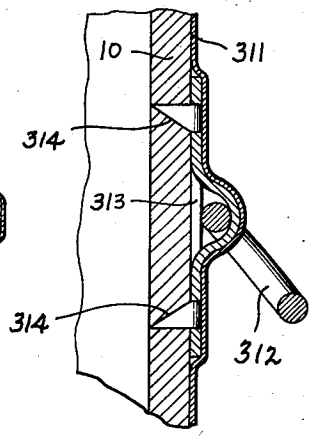
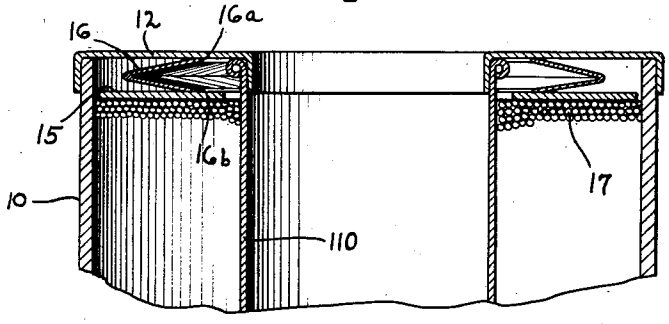


Fig. 7



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CONTAINER FOR WIRE

Eber J. Hubbard, Fort Wayne, Ind., assignor, by mesne assignments, to The American Pulley Company, Philadelphia, Pa., a corporation of Pennsylvania

Application November 23, 1956, Serial No. 624,127

4 Claims. (Cl. 206—52)

The present invention relates to container construction and is, more particularly, concerned with the provision of a substantially simplified and improved container for the shipment and storage of wire or the like.

As those familiar with the field of wire storage and shipping are aware, the practice of the industry has been, until recently, to provide spools for the shipment of wire. The wire, cable, or the like was then tightly wound on the spools at the place of wire manufacture and the wound spools were then shipped in box-like containers or, if the spools were of a large size, separately as individual units.

Very recently, however, it has been considered desirable for various reasons set forth in my earlier filed copending application, Serial No. 529,023, filed Aug. 17, 1955, now Patent No. 2,869,719, to provide a generally cylindrical container in which wire is coiled loosely from an open end thereof. To my knowledge, however, such loose coil containers generally used in the trade have been extremely expensive and have incorporated complex methods of container assembly in order to provide rigidity to the container.

In accordance with the principles of the present invention an approved container is provided in which only four simple parts are provided and in which those parts interlock, upon assembly of the container, to provide an extremely rigid container capable of withstanding the stresses imposed by shipping. In further accordance with the principles of the present invention, the simplified shipping container is constructed of inexpensive materials suitable for mass production techniques whereby minimum expense is incurred in the manufacture of the container.

As will be further explained in detail below, the container constructed in accordance with the principles of the present invention comprises a pair of concentrically positioned cylindrical members forming inner and outer container walls, and a pair of pressed metal end caps or covers which have upstanding circular flanges for frictional cooperation with the inner and outer cylindrical members. In operation, the container is initially assembled with the inner and outer cylindrical tubular members positioned on the bottom or base end cap, leaving the other end of the container open and facing in the vertical direction. Wire or the like is then loosely coiled in the container on the base cap until it approaches the top of the container at which time the top cap is positioned on the container. In view of the cooperating flanges on the end caps and the ends of the cylindrical members, an extremely rigid container structure is provided in which the inner cylindrical member is positively properly aligned relative to the outer member and in which the cylindrical members operate to satisfactorily take loads in a columnar manner when a plurality of the containers are stacked one on the other. In further accordance with the present invention, modified forms of the invention include structures in which handles or other carrying means are provided either as an integral part

of the container components above mentioned or as separate elements. As an additional feature, a spring biasing means is provided in association with the upper end cap of the container to provide a force acting against the coiled wire to prevent its shifting movement during transit.

It is, accordingly, an object of the present invention to provide an easily assembled shipping container for wire or the like comprising a minimum number of simple parts.

Another object of the present invention is to provide a container for wire or the like having a maximum rigidity with a minimum of structural components.

Yet another object of the present invention is to provide a simplified container for wire or the like capable of vertical stacking without collapse, through the incorporation of a center interlocking columnar support.

Still a further object of the present invention is to provide improved construction and methods of assembly for wire shipping containers.

Still a further object of the present invention is to provide a coil type wire shipping container porviding simple means for preventing tangling of the wire during removal from the container subsequent to shipment or storage.

Another object of the invention is the provision of an improved loose coil type of shipping container having spring tensioning means incorporated therein for preventing shifting and tangling of the wire during handling of the container.

A feature of the invention is the provision of carrying handles integrally formed in the end caps of a container or the like.

Still another feature of the invention comprises the provision of a modified form of handle attachment wherein handles are mechanically secured to the exterior of a cylindrical container and maintained in such position by the same means provided for maintaining the entire container in assembled relation.

Still other and further objects and features of the present invention will at once become apparent to those persons skilled in the art from a consideration of the attached drawings wherein several preferred embodiments of the instant invention are shown by way of illustration only, and wherein:

Figure 1 is a plan view of an assembled shipping contianer constructed in accordance with the principles of the present invention;

Figure 2 is a side elevational view of the container shown in Figure 1 taken along the line II—II of that figure;

Figure 3 is a modified form of a shipping container constructed in accordance with the principles of the present invention shown in partial side elevation and in cross section;

Figure 4 is still a further modified form of shipping container constructed in accordance with the principles of the present invention, in side elevation and in cross section;

Figure 5 is yet another modified form of the present invention shown in cross section in side elevation;

Figure 6 is a fragmentary enlarged view of the handle structure illustrated in Figure 5; and

Figure 7 comprises a modified form of the invention shown in partial cross-sectional side elevation and incorporating a novel wire positioning means.

As shown on the drawings:

As may be seen from a consideration of Figures 1 and 2, the container constructed in accordance with the principles of the present invention comprises generally an outer cylindrical tubular wall member **10** and an inner cylindrical, tubular, wall member **11**. The members **10** and

11 are secured at their ends to upper and lower end caps 12 and 13 by means of projecting peripheral flanges 12*a*, 12*b*, 13*a* and 13*b* on the respective end caps 12 and 13. As shown, the end caps 12 and 13 comprise sheet metal and the flanges are drawn therein to form an integral portion of the caps. During this drawing process the internal diameters of the flanges 12*a* and 13*a* are constructed to be the same as or very slightly less than the external diameter of the outer wall member 10 while the external diameters of the flanges 12*b* and 13*b* are constructed to be the same as or very slightly larger than the internal diameter of the inner wall member 11. In this manner, the wall members 10 and 11 cooperate with the respective caps 12 and 13 in a press fit manner. This press fit may be sufficient in some uses to maintain the base cap 13 in assembled relation with the wall members 10 and 11 during the loading or wire coiling operation but it will be understood that wire staples may be driven through the flanges 13*a*, 13*b* into the respective wall members 10 and 11 to secure these components together in a positive manner. Likewise, as an alternative, glue or other similar adhesive may be positioned between flanges and their respective wall members to provide a fixed assembly. Likewise, after the coiling of loose wire into the container, in the loose coiling method generally described in my earlier copending application Serial No. 529,023, mentioned above, the upper end cap 12 may be press fitted into simple cooperation with the wall members 10 and 11 and glued or otherwise fixedly secured thereto. As thus assembled, the cylindrical nature of the wall members 10 and 11, cooperating in an interlocked fashion with the flanges 12*a*, 12*b*, 13*a* and 13*b* provide an extremely rigid container capable of absorbing shocks from substantially any angle and, further, capable of stacking one on top of the other without injury.

In the embodiment shown in Figures 1 and 2 the wall members 10 and 11 comprise inexpensive cardboard, preferably of several thicknesses to provide substantial rigidity. In order to permit smooth coiling and uncoiling of the wire within the container it is preferred that the external surface of the wall member 11 comprise a layer of glazed paper or the like which provides a minimum of resistance to movement of the wire thereover. Likewise, the internal surface of the outer wall member 10 may be provided with such a glazed surface for the same purpose. It will be noted that in the situation in which glue or other similar adhesive is utilized for securing the end caps to the walls, such glazed surfaces ordinarily pose problems of adhesion.

In the form of the invention shown in Figures 1 and 2, novel and simple means are provided for handling the container in the form of the outwardly expanded portion 11*a* of the inner wall member 11. This provides an annular groove in the inner wall of the wall member 11 which permits grasping the container by means of the upper ends thereof, with the fingers of the hand finding purchase in the groove. In addition to the improved handling provided by this construction, the outer surface of the expanded portion 11*a* provides means for preventing tangling of the wire upon its removal from the container subsequent to shipment. It has been found during experiments in the loading and unloading of wire by the loose coil technique that in the removal of the wire there is sometimes a tendency for the wire to slip en masse along the inner wall 11. Thus, while it is desirable that the surface of the wall 11 in contact with the wire be smooth and provide a minimum of friction during the wire coiling, in order to permit the wire to position itself compactly in the container, this smoothness prevents some types of wire from leaving the container properly. By providing the outward projecting annular ring portion 11*a*, the innermost coil of each layer of wire is prevented from upward movement, past the open top of the container, until it is free to expand outwardly slightly. This applies a frictional force tending to maintain the wire in its coiled state and permit even withdrawal of the wire from the container during the unloading operation.

In the embodiment shown in Figure 3, provision for preventing undesired excess of sliding movement between the wire and the internal wall of the container is provided by means of the rolled over lip 111 formed on the inner wall member 110. When such a construction is utilized it is preferred that the wall member 110 comprise sheet metal in order to permit easy rolling of the edge bead 111. Additionally, the modified form shown in Figure 3 provides a top cap 120 having the central disk portion 121 integral therewith rather than pierced out as shown in the embodiment of Figures 1 and 2. Where the provision of handles in the inner portion of the container is not felt to be necessary due to the type of shipping utilized, it has been found that utilization of the disk portion 121 for purposes of identifying indicia is very satisfactory since that portion of the top of the container is recessed away from damage by other containers. Although only the upper cap 120 is shown in Figure 3 it will be understood that this cap may be used at both ends of the container if so desired.

In the embodiment of the invention shown in Figure 4 the upper container cap 220 cooperates with an outer container wall 10 in the manner already discussed relative to the form shown in Figures 1 and 2 and with sheet metal internal wall 110 in the manner discussed relative to the construction shown in Figure 3. However, instead of providing a flat surface disk 121 as in the form of Figure 3, the central portion 221 of the top 220 is pierced to provide a rolled handle 222. By utilizing such a cap at both ends of the container, two very convenient handles are provided for the container and, additionally, the peripheral space 221*a* may be utilized, if desired, for carrying indicia as to the contents of the container, the manufacture thereof, or other advertising matter.

In the embodiment shown in Figures 5 and 6, a container substantially identical to that shown in Figures 1 and 2 is provided except that additional handle means are provided for the container and the container is held in its assembled condition by means of externally applied adhesive. Thus, as there shown, the container comprises outer wall 10, inner wall 310, and upper and lower end caps 12 and 13 having substantially the same fit relationships described relative to the construction shown in Figures 1 and 2. Instead of securing the end caps to the container walls by means of mechanical means, such as staples, or internally applied glue or other adhesive, several strips of pressure sensitive adhesive tape material, shown at 311 are applied. In the illustration of Figure 5, these strips are initially secured on the inside wall of the inner wall member 310 and secure the bottom cap 13 to the walls 10 and 310, and subsequently secure the upper cap 12 to the container walls 10 and 310 in the manner shown. The ends 311 may be overlapped to provide for heavy duty installations but in ordinary practice it has been found that satisfactory securement is provided in the manner shown.

In the form shown in Figures 5 and 6, the pressure sensitive tape material 311 may also be passed through a carrying handle ring 312, securing the plate 313 thereof to the outer container wall 10. As additional aid in maintaining the handle ring 312 on the container, the plate 313 is provided with pierced and deflected prongs 314 having a length substantially equal to the thickness of the material forming the wall 10. While this short length prevents clinching of the prongs 314, the internal surface of the wall 10 is not injured and the coiling operation is accordingly unhampered. The utilization of the short prongs 314 in combination with the pressure sensitive tape 311 provides a very satisfactory means for lifting the container. It is, of course, contemplated that a pair of handles 312 be provided at diametrically opposed sides of the container in order to cause an appli-

cation of the lifting forces on the handles in a substantially vertical direction relative to the side walls of the container, thereby placing most of the lifting force on the prongs **314** rather than the tape **311**. In unloading, the tape may be cut at **311***a*.

It has been found that in shipment of loosely coiled wire in containers of the type herein shown, which may be termed the "pail-type" container, shipment of the container will be accompanied by a jostling movement of the container tending to cause the loosely coiled wire to settle in the container. This settling action causes the individual coils of wire to become very tightly engaged with each other and has caused some difficulty in the removal of the wire from the container at the point of destination. In order to prevent this settling or compacting of the coiled wire in the container it is necessary to control the position of the wire therein to prevent up and down movements thereof. Means have been provided in the form of the invention shown in Figure 7 for accomplishing this function, and comprise a pressure disk or plate **15** in the form of an annulus, and a spring **16** of the bellows type. It will be understood, of course, that the spring **16** may take any one of a number of conventional forms and its exact shape is not considered critical except that its construction must be such as to provide substantially uniform pressure throughout the periphery of the pressure disk **15**, in the manner shown. Preferably, in order to simplify assembly of the component parts, the spring **16** is secured at **16***a* to the upper cap **12** by means of spot welding or like technique, and to the pressure disk **15** as at **16***b* in a similar manner. In operation, after the wire, which may be seen at **17**, is loosely coiled into the container, the upper cap **12** is placed over the walls **10** and **110** and secured thereto by means of pressure sensitive tape or any of the other methods above outlined, compressing the spring **16** and forcibly urging the pressure disk against the top surface of the wire **17**. The constant pressure applied by the pressure disk to the wire **17** prevents upward movement of the mass of wire in the container which would otherwise occur every time the container is jolted. By preventing such upward movement of the wire the downward movement accompanying such upward movement is prevented and accordingly the compacting which accompanies such downward movement of the wire is substantially eliminated. It will be understood that the pressure disk **15** and the spring **16** may be associated with any one of the upper cap members **12**, **120** or **220**, further that the inner container wall **11** may be utilized with any of the end caps shown.

It will thus be seen that I have provided an extremely simple shipping container for wire or the like which comprises only four basic parts two of which are, or may be, identical in construction. As a result of the simple interlocking action between the end caps and the cylindrical container walls, an extremely rigid container is provided in the assembled stage. In view of the inherent rigidity of the over-all container, it has been found practicable to utilize extremely inexpensive materials such as cardboard for the walls **10** and **11**, thereby reducing the cost of the container to a point which permits its disposal after a single use. It will be understood, however, that if desired the walls **10** and **11** may comprise sheet metal, such as steel, brass or aluminum which may be spot welded, brazed or otherwise permanently secured to the lower end cap **13** and releasably secured to the upper cap **12** by means of spring clip fasteners, bolts, or other conventional means. Since it is apparent that further modifications and variations are practicable without departing from the scope of the novel concepts of the present invention it is my intention that the scope of the invention be limited solely by that of the hereinafter appended claims.

I claim as my invention:

1. A container for coiled wire or the like comprising first and second end caps, a first inner cylindrical wall member, a second outer cylindrical wall member, each of said caps comprising a flat sheet having inner and outer projecting circular flanges extending axially toward the other cap and positioned concentrically of each other for snug cooperation with said respective inner and outer cylindrical wall members, and means securing said caps to said wall members, said means comprising pressure sensitive tape extending through said end caps and along and in contact with the inner surface of said inner wall and the outer surface of said outer wall and said end caps.

2. A container for coiled wire or the like comprising first and second end caps, a first inner cylindrical wall member, a second outer cylindrical wall member, each of said caps comprising a flat sheet having inner and outer projecting circular flanges extending axially toward the other cap and positioned concentrically of each other for snug cooperation with said respective inner and outer cylindrical wall members, means securing said caps to said wall members, said means comprising pressure sensitive tape extending through said end caps and along and in contact with the inner surface of said inner wall and the outer surface of said outer wall and said end caps, and externally applied handle means having a securing plate secured to the outer surface of the outer wall by said tape as it passes along said outer wall.

3. A container for coiled wire or the like comprising first and second end caps, a first inner cylindrical wall member, a second outer cylindrical wall member, each of said caps comprising a flat sheet having inner and outer projecting circular flanges extending axially toward the other cap and positioned concentrically of each other for snug cooperation with said respective inner and outer cylindrical wall members, means securing said caps to said wall members, and spring means secured to the surface of the top cap facing the inside of the container and cooperating with an annular pressure plate lying between the first and second wall members to urge said plate to apply a constant force to the top layer of wire coiled in the container to thereby prevent shake-down of the wire during transit.

4. A container for coiled wire or the like comprising first and second end caps, a first inner cylindrical wall member, a second outer cylindrical wall member, each of said caps comprising a flat sheet having inner and outer projecting circular flanges extending axially toward the other cap and positioned concentrically of each other for snug cooperation with said respective inner and outer cylindrical wall members, means securing said caps to said wall members, an annular pressure plate positioned in said container between the first and second wall members and on top of the wire coiled therein, and spring means positioned between said plate and the top end cap for maintaining pressure on said wire.

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