This invention relates to improvements in spools and more especially in spools of a type employed in the textile industry for use on up-twisters, spinning frames, twisters, and the like and for use as a warping spool.

It is well known to those familiar with the art that in many instances yarn is withdrawn from a spool to a point disposed in substantial axial alignment with the spool and this requires that the yarn be withdrawn past a flange or head having a rounded peripheral edge and, upon this edge becoming scarred or damaged in any way, such as by handling the spool, the yarn, upon being withdrawn therefrom, will usually be severed or broken from engaging the rough or scarred places on the periphery of the head of the spool. Herefore, this has required that the spools be discarded or that a new head be provided for the spools.

It is, therefore, an object of this invention to provide an improved spool structure having a tubular portion and removable head portions and being provided with means for easily securing the head portions to the tubular portion.

It is another object of this invention to provide an improved spool structure comprising a tubular body member having a plurality of longitudinally extending projections on the inner surface thereof and to further provide a disk adapted to fit in the tubular member and having notches therein to coincide with the projection on the tubular member and the projections on the tubular member being notched or cut away intermediate the ends thereof and at points adjacent one another so that, upon the disk being inserted in the tubular member, the disk may be partially rotated in the notches in the longitudinally extending projections and whereupon a removable flange may be fastened, as by screws, to the disk to thus lock the flange in place against the end of the tubular member. Thus, by loosening the screws slightly, the flange with the disk may be rotated to align the notches in the disk with the projections on the inner surface of the tubular member for withdrawing the disk from the flange from the tubular member when it is desired to replace the same.

It is another object of this invention to provide a bobbin or warping a tubular body having a plurality of spaced longitudinally extending ribs or projections on the inner surface thereof which are provided with coinciding notches to form a circular groove on the inner surface of the tubular body adjacent each end thereof and to, further, provide a disk having notches therein adapted to coincide with the ribs in the tubular body and to fit within the tubular member whereby the disk may be inserted in the tubular member and partially rotated in the circular groove to where its notches will not coincide with the ribs to prevent the disk from being removed from the tubular member. A flange may then be secured to the disk and held in place at the end of the tubular body.

In one form of the invention there is provided in a structure of the type described, a substantially circular head block having a plurality of longitudinally extending grooves on the outer surface thereof which is inserted in the end of the tubular member, this block having longitudinally extending grooves therein which coincide with the ribs in the tubular member and also having longitudinally extending grooves therein through which screws may be inserted, the disk being provided with threaded bores for the inner ends of the screws. A head member or flange of substantially greater diameter than the diameter of the tubular body is then fitted against the outer end of the tubular body and the head block and this disk is provided with a plurality of bores through which the screws may extend for securing the disk against the tubular body, these screws extending through the grooves provided therefor in the head block and being threadably embedded in the disk at the inner end of the head block.

It is another object of this invention to provide a spool or bobbin of the type described in which the head block extends through a suitable opening in the flange and is provided with a handle or knob for carrying the spool.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which—

Figure 1 is an elevation showing one form of a bobbin or spool embodying the features of the present invention;

Figure 2 is an enlarged vertical sectional view, with the medial portion broken away, and is taken substantially along the line 2—2 in Figure 1;

Figure 3 is an enlarged sectional plan view, with parts broken away and with other parts in elevation, taken substantially along the line 3—3 in Figure 2, and showing the manner in which the head member is secured to the tubular body of the spool;

Figure 4 is an enlarged sectional plan view taken substantially along the line 4—4 in Figure...
ure 2 and showing the manner in which the lower base member of the spool is secured to the tubular body portion thereof;

Figure 5 is an enlarged exploded isometric view of the upper portion of the spool or bobbin shown in Figure 1;

Figure 6 is an elevation, with parts broken away, showing a modified form of spool embodying features of the present invention;

Figure 7 is an inverted plan view looking at the bottom of the spool shown in Figure 6;

Figure 8 is a vertical sectional view taken substantially along the line 8—8 in Figure 6.

Figure 9 is a top plan view of the spool shown in Figure 6 with part of the head member or flange thereof broken away.

Figure 10 is a sectional plan view taken substantially along the line 10—10 in Figure 6.

Figure 11 is a partially exploded isometric view of the spool shown in Figures 6 to 10, inclusive, with parts broken away and other parts in section and showing the spool tilted for purposes of clarity.

Referring more specifically to the drawings, the numeral 10 broadly designates the tubular member or body of the improved bobbin or spool. The tubular body 10 includes an outer or first tube 11, preferably of a plastic or a pressed fiber or other close-grained material, which fits snugly over a second or inner tube 12, this second tube preferably being of metal such as aluminum to afford additional strength to the bobbin or spool and so as to be as light in weight as possible. The outer tube 11 may be adhesively secured to the outer surface of the second tube 12 or it may be moulded integral therewith as desired.

The second tube 12 is provided with a plurality of circularly spaced longitudinally extending reinforcing ribs or projections 13 which are preferably cast integral with the second tube 12. The second tube 12, being of metal and being reinforced by the ribs 13, serves as a strengthening member for the tubular body 10, and the outer tube 11, being made of a plastic material, may be provided with a smoother outer surface than would be possible with a metal such as aluminum and, also, upon the exterior surface of the outer tubular member 11 the tube 12 or otherwise damaged, the outer tubular member 11 may be removed from the second tubular member 12 and replaced with a similar tubular member having a smooth outer surface thus considerably lengthening the life of the bobbin or spool.

The outer tube 11 also serves as an electrical insulator against static electricity and inasmuch as the yarns wound onto many types of bobbins or spools substantially of the type shown in the drawings, are usually synthetic and are subjected to relatively extensive variations in temperature causing them to expand and contract, the outer tube 11 will assist in minimizing the variations in diameter and length of the tubular body 10 of the spool due to these variations in operating temperatures, and the inner tube 12 will prevent collapse of the tubular body 10 under contraction of the yarns wound thereon.

Adapted to be secured against opposed ends of the tubular body 10, in a manner to be presently described, are a first and a second outer upper and a lower head member broadly designated at 20 and 21, respectively. In many instances these head members 20 and 21 may be identical and are shown in Figures 1, 2, 3, and 4 as being substantially identical. A detailed description of the first head member 20 will now be given.

The first head member 20 comprises a first head block 23 which is substantially circular in cross-section and is provided with a plurality of circularly spaced, longitudinally extending grooves 24 cut in its periphery, each of the grooves 24 being adapted to coincide with and to slidably fit in engagement with the respective projections 13 in the interior of the tubular body 10, and the first head block 23 being adapted to slidably or loosely fit within the upper portion of the second tube 12 as shown in Figure 2.

The first head block 23 is also provided with a plurality of spaced grooves 25, there being one of these grooves 25 disposed between each of the grooves 24. The grooves 25 are preferably of greater depth than the grooves 24 and are provided for accommodation of screws 26 for securing a head flange or disk 27 to the upper or outer surface of the first head block 23 as well as to the adjacent outer edge of the tubular body 10.

In order to assist in sealing the upper end of the tubular body 10 as shown in Figure 2, the lower or inner surface of the disk 27 is provided with an annular groove 30 for reception of the upper head block 23, the second tube 12 and it will be noted that the upper surface of the first head block 23 is spaced below the upper edges of the tubular members 11 and 12 so the medial portion of the disk 27 may be inserted into the second tube 12. The first head block 23 has an upwardly projecting restricted or pilot portion 32 integral therewith which is preferably tapered slightly and the disk or flange 27 is provided with bore 33 which is adapted to fit snugly over the upwardly projecting restricted portion 32 of the head block 23.

The head block 23 also has a restricted outer portion 34 integral therewith which is of substantially less diameter than the restricted portion 32 thus forming a shoulder 35 which is adapted to be engaged by a handle or knob 36 secured on the restricted portion 34 of the head block 23 as by an adhesive or by the use of a synthetic resin which, upon being subjected to relatively high temperatures, will become pliable and will permit removal of the knob 36. The restricted portion 34 of the head block 23 so the disk 27 may be removed from the restricted portion 32 for replacement purposes. The knob 36 is provided to be grasped by an operator for carrying the bobbin or in a dollying operation as on a spinning frame or twister.

In order to secure the first head block 23 and the flange or disk 27 in position at the upper end of the tubular body 10, the inner surface of the second tubular member 12 has an annular groove therein spaced from the upper surface thereof and which is of the same depth as the ribs 13 or, in other words, each of the ribs 13 is provided with a notch or groove 40 (Figure 5) which is of sufficient width to permit a locking member or disk 41 to be slidably rotated therein. This locking disk 41 has a plurality of circularly spaced notches or slots 42 in the periphery thereof which are spaced so as to coincide with the ribs 13 of the second tube 12. The locking disk 41 also has a plurality of circularly spaced bores 43 therein, these bores 43 being spaced according to the spacing of the longitudinally extending grooves 25 in the first head block 23 and being provided for the reception of the screws 26. The locking disk 41 also has a centrally disposed opening 44 therein for purposes to be presently described.
It is thus seen that the disk 41, which is of slightly less diameter than the interior diameter of the second tube 12, may be inserted in the tube 12 with the notches in the peripheral thereof straddling the longitudinally extending ribs 13. When the locking disk 41 has been inserted so as to engage the alignment with the grooves 40 in the ribs 13, the locking disk 41 may then be partially rotated to where the threaded bores 43 will be in alignment with the longitudinally extending grooves 25 of the head block 23 when the head block 23 is placed with the tube 12 with the longitudinally extending grooves 24 of the head block disposed in alignment with the ribs 13.

Assuming the flange or disk 27 to have been positioned on the pilot or restricted portion 32 of the head block 23 and also assuming that the knob had been positioned on the restricted portion 34 of the pilot 32, the screws 26, which slideably penetrate the flange 27, then extend through the grooves 25 of the head block 23 and are threadably embedded in threaded bores 43 and, by tightening the screws 26 in the threaded bores 43, the locking disk 41 is pulled tightly against the upper walls of the notches 40 in the ribs 13 thus forcing the flange 27 tightly against the outer edges of the outer tube 11 and the second tube 12, it being evident that the tubular body 16 engages the bottom of the annular groove 30 in the flange 27.

It will be noted that the outer peripheral edge of the flange 27 is rounded, as at 45 and that this flange 27 is of a substantially larger diameter than the external diameter of the outer tube 11 of the tubular body 10 and, thus, yarn passing between a point substantially in axial alignment with and in spaced relation to the upper end of the spool or bobbin in Figure 2 and the outer surface of the tubular body 10 may pass in engagement with the peripheral edge of the flange 27.

The head block 23 has a longitudinally extending bore 47 therethrough which is provided for the reception of a suitable spindle or the like on which the spool may be mounted and this longitudinally extending bore 47 may be enlarged, as at 50, if so desired, to serve in directing the spool onto the said spindle or the bore 41 may be tapered depending on the type of spindle on which the spool is to be mounted.

Referring to Figure 5, it will be observed that the head block 23 has a restricted portion 51 extending downwardly therefrom, this restricted portion 51 being disposed remotely from the restricted portion 32 relative to the head block 23, and also being penetrated by the bore 45.

A third inner tube or tubular member 55 of substantially less diameter than the inner diameter of the second tube 12 is adapted to fit snugly around the projection 51 of the head block 23.

Now, the second head member 21 is substantially identical to the head member 20, and the head member 41 may be exactly identical to the head member 21, if desired, and, therefore, the parts associated with the head member 21 shall bear the same reference characters as like parts associated with the head member 20 with the prime notation added. However, since the second head member 21 is shown in Figures 1, 2 and 4 as serving in the capacity of a base member, the second head member 21 does not have a projection such as the projection 32 of the first head member but instead, a bore 32" is merely provided for reception of a suitable spindle or the like.

The second head member 21 also is provided with a bore 50' of substantially greater diameter than the bore 50 of the first head member 20 and the bore 50' of the second head member 21 is slightly larger in diameter than the external diameter of the downwardly projecting portion 51 of the head block 23, the projection 51 being omitted from the head block 23 since the lower end of the tube 50 in Figure 2 fits snugly into the bore 50' and rests on the shoulder formed at the juncture of the bores 50" and 47'.

The flange or disk 27 at the lower end of the bobbin or spool in Figure 10 is shown as being substantially larger than the flange 27 of the first head member 20 and does not, necessarily, have a smoothly rounded peripheral edge such as the edge 46 of the flange 27 since the yarn does not ordinarily move past the lower flange 27.

Since the remaining structure of the lower or second head member 21 is identical to that of the upper or first head member 20, a further description thereof is deemed unnecessary since those parts associated with the second head member are identical to the parts associated with the first head member and bear the same reference character with the prime notation added.

It should be noted that the inner tubular member 55 is provided to provide an air space between the same and the tube 12 to insulate the bobbin as much as possible and to also "lead" a spindle or the like as the spool is placed therein.

Modified form of invention:

Referring to Figures 6 to 11, inclusive, there will be observed a modified form of spool or bobbin structure which is similar to the structure shown in Figures 1 to 5 inclusive.

The modified form of the invention comprises a tubular body broadly designated at 70 and, like the bobbin or spool shown in Figure 2, the tubular body 70 comprises a first or outer tube or tubular member 71 which is mounted on an inner or second tube 72, this second tube 72 preferably being metallic and the outer tube 71 preferably being of a plastic or pressed fiber material. The inner or second tube 72 also has a plurality of circularly spaced ribs or longitudinally extending projections 73 on the inner surface thereof opposed ends of which terminate short of the opposed ends of the second tube 72. The ribs 73 are also provided with coinciding notches or grooves 74 which, in combination, form an annular groove in the inner wall of the second tube 72. These notches 74 each define a relatively short projection 75, the function of which will be later described.

Opposed ends of the second tube 72 are adapted to slidably or loosely receive locking members on head block members 80 and 80', these head block members 80 and 80' being substantially the same and being a part of first and second, respective head members broadly designated at 81 and 82.

Since the parts associated with the head members 81 and 82 are substantially the same, only the head member 81 will be described and parts associated with the head member 82 will bear the same reference characters with the prime notation added and any differences between the head members 81 and 82 will be clearly pointed out and described.

The head block 80 has an annular groove 84 therein, which defines outer and inner circular
or disk-like portions 85 and 86, respectively. The outer and inner circular portions 85 and 86 of the head block 80 are adapted to be embedded in a plurality or circularly spaced coinclined grooves or notches 87, the notches 87 being so spaced as to coincide with the ribs 73 and the projections 78, which are formed as a part of the ribs 73 when the head block 80 is positioned within the tubular body 70.

The outer circular portion 85 is provided with a plurality of circularly spaced bores 80 and the inner circular portion 86 is provided with a plurality of circularly spaced threaded bores 81, which coincide with the notches 87. The bores 80 and 86 are adapted to slidably receive screws 92 which are threadably embedded in the threaded bores 91. The screws 92, like the screws 98 in the original form of the invention (Figure 3), are preferably of a type which are flush with the outer surface of a flange 93 of the head members 81 and 82 for securing the flange to the outer surface of the head block 80.

The head block 80 is provided with a longitudinally extending and diametrically opposed bore 95 into which the upper end of a relatively thin walled tube 96 is adapted to snugly fit. This third or inner tube 96 is of a substantially less diameter than the inner diameter of the second tube 72 as to provide a dead air space between the second and third tubes 72 and 96 for insulating purposes.

The third tube 96 has a pair of bushings 100 and 101 inserted in opposed ends thereof and secured thereto, as by a pressed fit. The bushings 100 and 101 are spaced slightly from the outer ends of the tube 96 and are provided with coinclined tapered bores 102 and 103, respectively. These bores 102 and 103 may be straight or tapered and may be of the same size or of different sizes according to the particular spindle onto which the screw or bobbin is adapted to be placed.

It will be observed in Figure 8, that the medial portion of the flange 93 is provided with a circular recess 105 which is adapted to slidably receive the upper end of the tubular body 70 and against the bottom of which the tubular body 70 and the upper surface of the circular portion 85 of the head block 80 are adapted to be secured by any suitable means such as the screws 92.

In mounting the flange 93 on the upper end of the tubular body 70 as shown in Figure 8, the head block 80 may either be loosely secured against the bottom of the recess 105 in the flange 93 or the head block 81 may be inserted in the upper end of the tubular member with the notches 87 in alinement with the ribs 73 on the second tube 72. It will be noted that the projections 75 (Figure 11) are spaced slightly apart from the outer end of the second tube 72, this spacing being substantially the same as the thickness of the circular portion 85 of the head block 80. Thus, the head block 80 may be moved into the tube 72 until the circular portion 86 registers with the notches 74 and the grooves 84 in the head block 80 register with the projections 75. The head block 80 may then be partially rotated so that the notches 87 and the ribs 74 and 78 are not in alinement after which the flange 93 may be secured against the head block 80 as well as against the upper end of the tubular body 70 by tightening the screws 92, since the upper surface of the circular portion 86 will bear against the lower or left-hand edges of the projections 75 in Figure 11.

The flange 93 is also provided with a bore 106 in which an inverted cup-shaped cap member 107 is secured, as by a pressed fit. This inverted cup-shaped member 107 is of greater height than the wideness of the flange 93 and projects into the upper end of the tube 96, the bushing 101 being spaced from the upper end of the tube 96 for this purpose. The inverted cup-shaped member 107 has an opening 110 there-through which the upper end of a spindle or the like, not shown, may extend.

The lower head member 82 differs from the upper head member 81 in that the flange 93 is provided with slot 111 in addition to the opening 106. This slot 111 being provided in part of the inverted cup-shaped member 107 in Figure 8. The slot 111 is for the well-known purpose of mounting the bobbin or spool on a spindle having a suitable key for engagement with the slot 111 to thus cause the bobbin to rotate with the spindle.

The bottom or second head member 82 also has a circular recess in the flange 93 of such diameter as to receive the lower end of the tubular body 70, the lower end of the second head block 80, and the lower end of the third tube 96 in Figure 8. The bushing 101 is preferably spaced from the lower end of the tube 96 if it is desired to have a projection from the medial portion of the air space between the second and third tubes 72 and 96 for insulating purposes.

If so desired, one end of the other of the tube 96 may be threadably embedded in the corresponding head block 80 or 85 and may be then secured prior to the head block and the third tube being mounted in the tubular body 70 as shown in Figure 8.

When it is desired to remove the flange 93, the screws 92 may be loosened and the head 81 and head block 80 may be partially rotated to where the notches 84 coincide with the ribs 73 and 78 and the head assembly may be removed from the tubular member 70 with the screws 92 still partially embedded in the threaded bores 91.

The purpose of the innermost tubular members or tubes 55 and 56 of the respective forms of the invention being spaced apart from the tubular bodies 10 and 70, respectively, is to provide a dead air space between the innermost tubes 55 and 56 and the respective tubular bodies 10 and 70 to thus serve as an insulator since most bobbins are subjected to excessive variations in temperature and humidity and this dead air space will serve in minimizing the amount of variation in length and diameter of the tubular bodies 10 and 70 which are usually caused as a result of these variations in temperature and humidity.

It is thus seen that I have provided an improved bobbin which is relatively light in structure and having head members thereon which may be quickly removed and easily repaired or replaced. Also, I have provided a tubular member having internal ribs therein and I have further provided a disk adapted to operate in slots or grooves in said ribs for holding the disk in place whereby a head block may be placed against the disk and a flange may, in turn, be placed against the outer surface of the head block and the tubular member and secured by screws to the disk, there being suitable bores or grooves provided for the passage of the screws through the head block, to thus cause the flange against the outer surface of either end of the tubular portion.

It is evident that the reinforcing or second tubes 12 and 72 of the respective tubular bodies 10 and 70 may be of a plastic material if so desired, however, it is preferable that this tube be made of a magnesium or aluminum alloy. Also, the longitudinally extending ribs 12 and 73 in the
respective tubular bodies 10 and 70 serve to reinforce the respective tubular bodies 10 and 70 to such an extent that they will withstand a substantially greater amount of pressure and strain resulting from the many types of synthetic yarns now in use than ordinary tubes which have not been provided with the reinforcing ribs and which have heretofore been in use in the manufacture of textile spools. The ribs and the relatively light weight of the material used in forming the second tubes associated with each of the tubular bodies 10 and 70 do not add substantially to the weight of the spool.

Since the head blocks and flange disks of the two forms of spools shown in the drawings may be of relatively light plastic material, this will also minimize the weight of the spool assemblies and this unique structure will permit easy replacement of any of the parts of the spools.

The centermost or third tube in each of the spools shown in the original and modified forms of the invention may be made of either a plastic or light metallic material and this third tube provides means to assist in placing the spool on the spindle rapidly and easily.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense, not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A spool having a removable head member at least one-end thereof, said removable head member comprising a flange, a head block removably mounted in said spool, a locking disk removably mounted in said spool, said spool having a plurality of circumferentially spaced ribs on the inner surface thereof, said ribs having notches therein adapted to receive said locking disk, said locking disk having spaced notches therein coinciding with said ribs, said locking disk being rotatable in said tube to position the notches therein out of alignment with said ribs, said head block having a plurality of notches corresponding to said ribs whereby said locking member may be inserted in said spool with the notches therein in alignment with said ribs and then be partially rotated in the notches in said ribs to move the notches in the locking member out of alignment with said ribs and screw means connecting said flange and said locking member.

2. A spool provided with a removable head member at least one-end thereof, said spool comprising a first tubular member, a second tubular member adjacent the inner surface of said first tubular member, a third tubular member of lesser diameter than said first and second tubular members and spaced within said tubular members to form a dead air space within the same for insulation purposes, said head member including a flange and means for removably locking said flange on the end of said tubular members comprising said second tubular member having a plurality of spaced longitudinally extending ribs, said ribs having notches therein, said locking member adapted to fit in said notches, said locking member having a plurality of notches corresponding to said ribs whereby said locking member may be inserted in said spool with the notches therein in alignment with said ribs and then be partially rotated in the notches in said ribs to move the notches in the locking member out of alignment with said ribs and screw means connecting said flange and said locking member.

3. A spool comprising a tubular body having a plurality of longitudinally extending ribs on the inner surface thereof, said ribs having a plurality of notches therein, a head member for each end of said tubular body and means securing said head members to said head members to hold the head members on the tubular body when the notches in said locking members are out of register with said ribs.

4. A spool comprising a tubular body having a plurality of spaced longitudinally extending ribs on the inner surface thereof, said ribs being notched intermediate their ends and adjacent opposed ends of the tubular body, said notches being circularly arranged, a head member for each end of said spool comprising a locking disk provided with a plurality of circularly spaced notches in its periphery, a flange member, the notches in the periphery of the locking disk coinciding with the ribs in said tubular body, said locking disk being removably mounted in said tubular body, and partially rotatable to out-of-register position with respect to said ribs, screw means connecting said flange and said locking disk for securing the same in position at one-end of the tubular body.

5. A spool comprising a tubular body having a plurality of spaced longitudinally extending ribs on the inner surface thereof, said ribs being notched intermediate their ends and adjacent opposed ends of the tubular body, said notches being circularly arranged, a head member for each end of said spool comprising a locking disk adapted to be removably mounted in said tubular body and provided with a plurality of circularly spaced notches in its periphery, said notches in the periphery of the locking disk coinciding with the ribs in said tubular body, a flange, said locking disk having a plurality of circularly spaced threaded bores therein, a plurality of screws Gladly penetrating said flange and said head members to secure the locking disk to the tubular body.

6. A spool comprising a tubular body having a plurality of spaced longitudinally extending ribs on the inner surface thereof, said ribs being notched intermediate their ends and adjacent opposed ends of the tubular body, said notches being circularly arranged, a head member for each end of said spool comprising a locking disk adapted to be removably mounted in said tubular body and provided with a plurality of circularly spaced notches in its periphery, said notches in the periphery of the locking disk having a plurality of circularly spaced threaded bores therein, a plurality of screws Gladly penetrating said flange and said head members to secure the locking disk to the tubular body.
7. A spool structure comprising a tubular body having a plurality of spaced longitudinally extending ribs on the interior thereof, a head member for at least one end of the tubular body comprising a head block adapted to be removably mounted in the end of the tubular body, a circular member having their ends within which the circular member may have sliding rotational movement, a flange, screws securing the flange against the outer surface of the head block and the tubular body, said screws slidable penetrating the head block and being threadedly embedded in the threaded bores of said circular member, whereby the circular member may be partially rotated to where its notches do not coincide with the longitudinally extending ribs and the screws may be tightened to secure the flange against the outer edge of the tubular body.

8. A spool or bobbin comprising a tubular body, a flange adapted to be secured to each end of the tubular body, said tubular body having a plurality of circularly spaced longitudinally extending ribs on the interior surface thereof, a head block slidably mounted in each end of the tubular body and having notches therein coinciding with the ribs in the tubular body, said ribs having coinciding circularly arranged notches therein, said notches in the ribs being disposed inwardly relative to the corresponding head blocks, a disk adapted to fit in said notches in said ribs, said disk having a plurality of notches therein adapted to coincide with the ribs on said tubular body to permit ingress of the disk in the tubular body as it is moved into position to coincide with said notches in the ribs, said disk having a plurality of threaded bores therein, a plurality of screws slidably penetrating the flange at each end of the spool and being adapted to coincide with the threaded bores in the disk when said disk is partially rotated so that the notches therein do not coincide with notches in said ribs, and said screws also slidably penetrating the head block to thus secure the head block and the flange in position at each end of the tubular body.

9. A spool comprising a tubular body, a flange adapted to be secured to each end of the tubular body, said tubular body having a plurality of circular spaced ribs on the inner surface thereof, a head block slidably mounted in each end of the tubular body and having notches therein coinciding with the ribs in the tubular body, said ribs having coinciding circularly arranged notches therein, said notches in the ribs being disposed inwardly relative to the corresponding head blocks, a disk adapted to fit in said notches, said disk having a plurality of notches therein adapted to coincide with the ribs on said tubular body to permit ingress of the disk in the tubular body as it is moved into position to coincide with said notches in the ribs, said disk having a plurality of threaded bores therein, a plurality of screws slidably penetrating the flange at each end of the spool and being adapted to coincide with the threaded bores in the disk when said disk is partially rotated so that the notches therein do not coincide with the notches in said ribs, said screws also slidably penetrating the head block to thus secure the head block and the flange in position at each end of the tubular body.

10. A spool structure comprising a tubular body member including an outer tube of a smooth relatively close-grained material, a second tube on which the outer tube is fixedly mounted, said second tube serving as a reinforcing tube and having a plurality of longitudinally extending ribs therein provided with notches adjacent opposed ends thereof, the remote ends of the ribs being spaced substantially from the outer end of the tubular body member, a head member for each end of the tubular body comprising a head block having an annular groove therein, said annular groove defining an outer and an inner circular portion, said circular portions having coinciding circularly spaced longitudinally extending notches in their peripheries thereof, said notches being spaced so as to be in line with the ribs on the interior of the tubular body, a flange, means for securing the flange against the outer surface of the outer circular portion of the head block and the outer end of the tubular body including a plurality of screws slidably penetrating the flange and being threadedly embedded at their free ends in at least one of the circular portions of the head block, said head block being adapted to be removably mounted in the second tubular member and partially rotated so that the notches therein are out-of-register with the ribs and the outer circular portion being adapted to fit against the outer ends of said ribs so as to permit the head member to be partially rotated and, upon tightening said screws, the head member will lock the flange against the outer edge of the tubular body member.

11. A bobbin, spool and the like, comprising a tubular body having a plurality of longitudinally extending ribs on the inner surface thereof, said ribs being notched intermediate their ends adjacent at least one end of the tubular body, said notches being circularly arranged, a head member for at least one end of said spool comprising a locking disk provided with a plurality of circularly spaced notches in its periphery, said notches in the periphery of the locking disk being adapted to coincide with the ribs on said tubular body, said disk being adapted to be removably mounted in said tubular body, a flange, a plurality of screws slidably penetrating said flange and threadedly embedded in said disk, said locking disk having a plurality of circularly spaced threaded bores therein, so arranged that said disk may be partially rotated to where the notches therein are out-of-register with the ribs in said tubular member and said screws may be tightened to secure the flange onto said tubular member.

12. A spool structure comprising a tubular body member including an outer tube of a smooth relatively close-grained material, a second tube on which the outer tube is fixedly mounted, said second tube serving as a reinforcing tube and having a plurality of longitudinally extending ribs therein provided with notches adjacent opposed ends thereof, the remote ends of the ribs being spaced substantially from the outer end of the tubular body member, a head member for each end of the tubular body comprising a lock-
ing member having an annular groove therein, said annular groove defining an outer and an inner circular portion, said circular portions having coinciding notches in said circular portions therein, said annular groove being spaced so as to align the ribs on the interior of the tubular body, a flange, means for securing the flange against the outer surface of the outer circular portion and the third end of the tubular body including a plurality of screws threadedly penetrating the flange and being threadedly embedded at their free ends in at least one of the circular portions of the head block, said head block being adapted to be removably mounted in the second tubular member and partially rotated so that the notches therein are out-of-register with the ribs and the outer circular portion being adapted to fit against the outer ends of said ribs so as to permit the head member to be partially rotated and, upon tightening said screws, the head member will lock the flange against the outer edge of the tubular body member, a third tube of substantially less outside diameter than the inside diameter of the second tube and extending substantially from one end to the other of the tubular body, at least one of the head blocks having a bore therein for slidably receiving the one end of the third tubular member, the other of the head blocks having an inwardly projecting portion therewith snugly embedded in the other end of the third tubular member and said spacing between the second and third tubular members serving as a dead air space for thermal insulation purposes.

13. A spool comprising a tubular body having a plurality of longitudinally extending ribs on the inner surface thereof, said spools having a plurality of notches therein, a locking member rotatable in said notches at each end of said tubular body, said locking members having notches therein spaced in coincidence with said ribs to permit the locking member to be removed from said tubular body, a head member for each end of said tubular body and screw means penetrating said head members and threadedly embedded in said locking members for securing said head members to said locking members to hold the head member on the tubular body when the notches in said locking members are out of register with said ribs.

14. A spool comprising an outer tubular body, an inner tubular body concentric with the outer tubular body and secured thereto and having a plurality of longitudinally extending ribs on the inner surface thereof, said ribs having a plurality of notches therein, said notches being circularly arranged adjacent each end of the spool, a locking member rotatable in said notches at each end of said tubular body, said locking member having notches therein spaced in coincidence with said ribs to permit the locking member to be removed from said tubular body, a head member for each end of said tubular body and screw means securing said head members to said locking members to hold the head members on the spool when the notches in said locking members are out of register with said ribs.

15. A spool having a tubular body and being provided with removable heads at each end of said tubular body, said tubular body having a plurality of circumferentially spaced ribs on the inner surface thereof, a locking disk positioned in each end of said tubular body, said circumferentially spaced ribs each having notches therein so positioned as to coincide with said ribs whereby the locking members may be removably mounted in said tubular body and partially rotated in the notches in said ribs to move the notches in said locking members out of alignment with said ribs and screw means connecting said removable heads to said locking members.

16. A spool having a tubular body and being provided with removable heads at each end of said tubular body, said tubular body having a plurality of circumferentially spaced ribs on the inner surface thereof, a locking disk positioned in each end of said tubular body, said circumferentially spaced ribs each having notches therein, said notches in said ribs being circumferentially spaced around the inner periphery of said tubular body and spaced from each end of said tubular body and adapted to receive said locking disks and said locking disks having notches therein so positioned as to coincide with said ribs whereby the locking disks may be inserted in said tubular body and partially rotated in the notches in said ribs to move the notches in said locking members out of alignment with said ribs, a head block positioned in each end of said tubular body between said locking disks and said removable heads and screw means penetrating said head blocks and connecting said heads to said locking disks.

17. A spool having a tubular body and being provided with removable heads at each end of said tubular body, said tubular body having a plurality of circumferentially spaced ribs on the inner surface thereof, a locking member positioned in each end of said tubular body, said circumferentially spaced ribs each having notches therein circumferentially spaced about the inner periphery of the tubular body spaced from each end thereof, said ribs stopping short of the ends of said tubular body, said locking members each having an annular groove therein defining inner and outer circular portions adapted respectively to fit into the notches in said ribs and the space defined by the ends of said ribs, and said inner circular portion having notches therein so positioned as to coincide with said ribs whereby the locking members may be removably mounted in said tubular body and partially rotated in the notches in said ribs to move the notches in said circular portions of the locking members out of alignment with said ribs and screw means connecting said heads to said locking members.

JESSE R. MOSS.

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