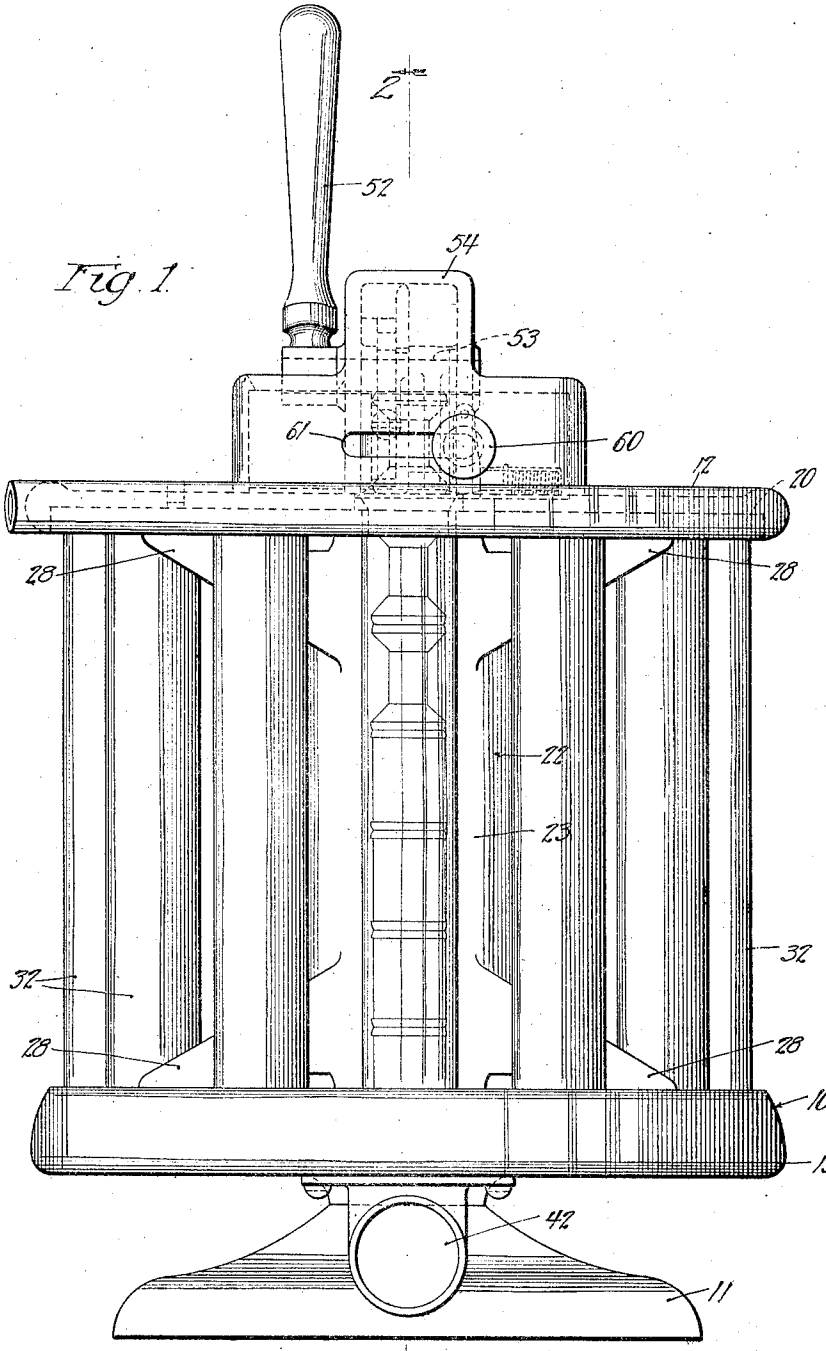
March 8, 1927. 1,620,178

E. O'B. WARWICK ET AL

DISPENSING DEVICE

Filed July 14, 1921 3 Sheets-Sheet 1

Fig. 1.



Inventors
F. O'B. and R. M. Warwick
By Williams, Bradbury, Sue, & McCabe Attys

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DISPENSING DEVICE

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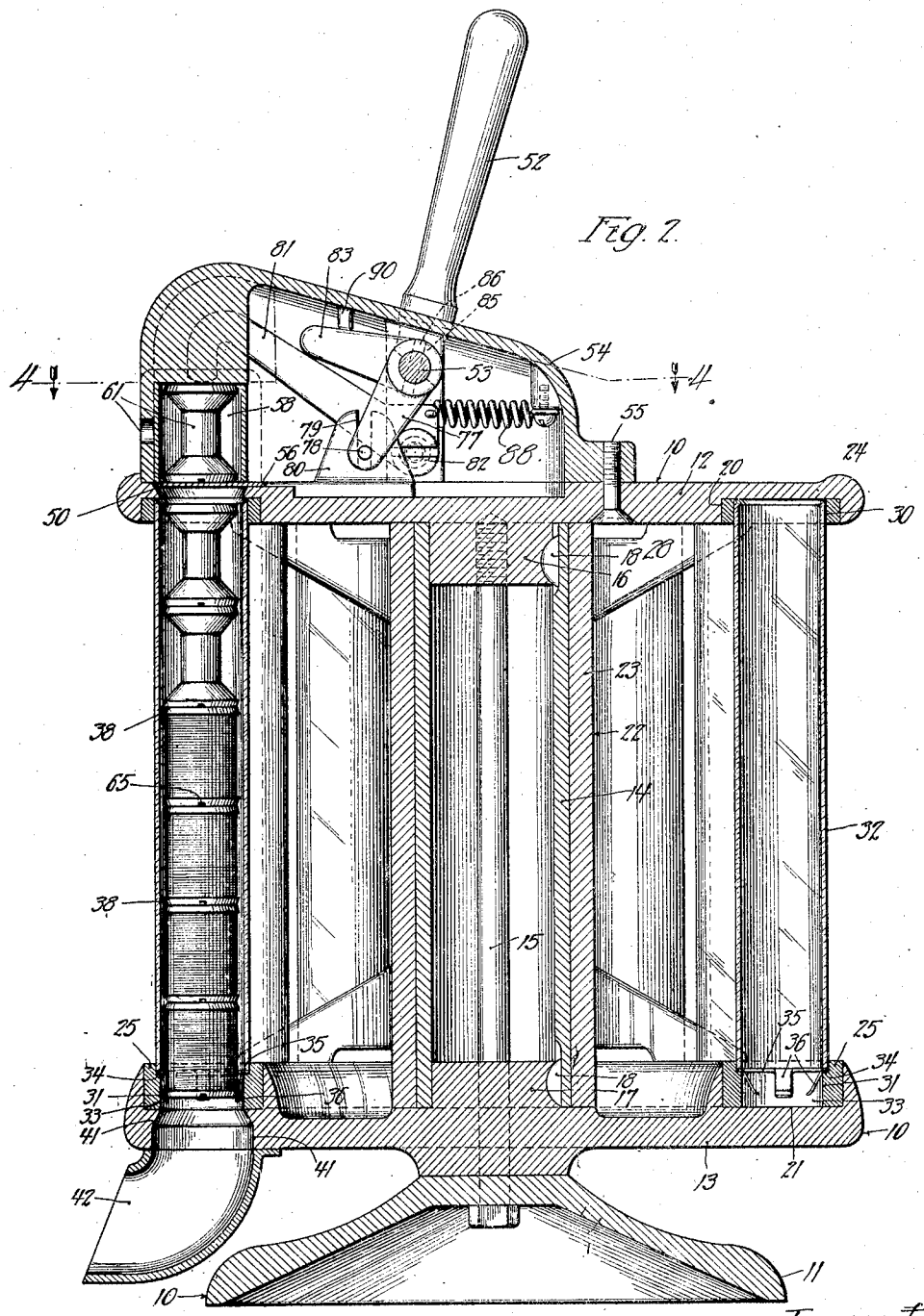
Fig. 1.



Inventors
E. O'B and R. M. Warwick
By: Williams, Bradbury, Sec. & McCabe Attys.

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DISPENSING DEVICE

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Fig. 3.

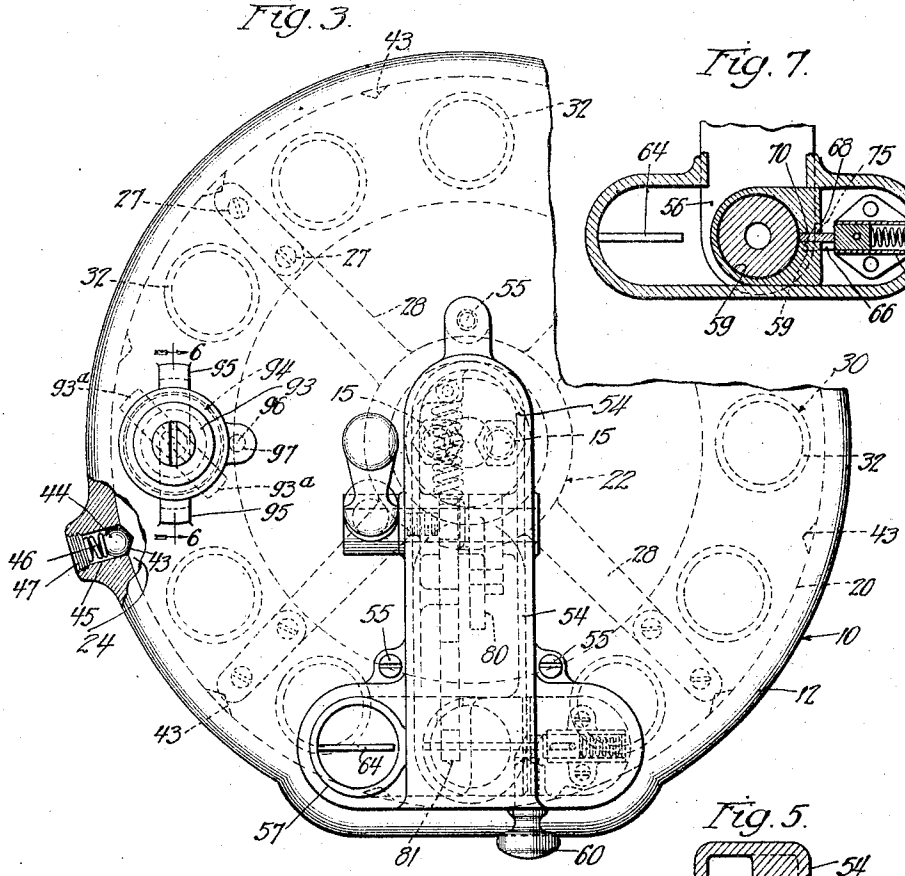


Fig. 7.

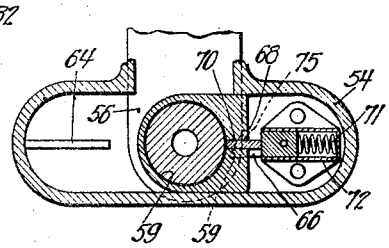


Fig. 5.

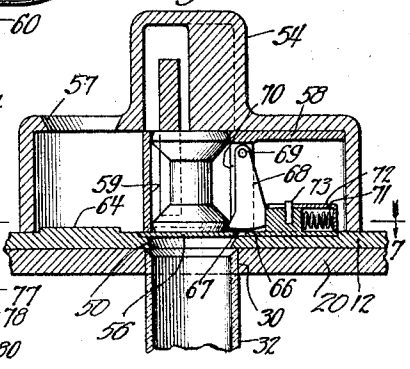


Fig. 6.

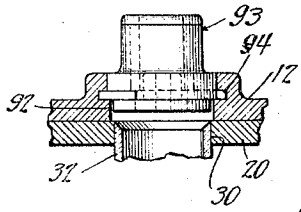
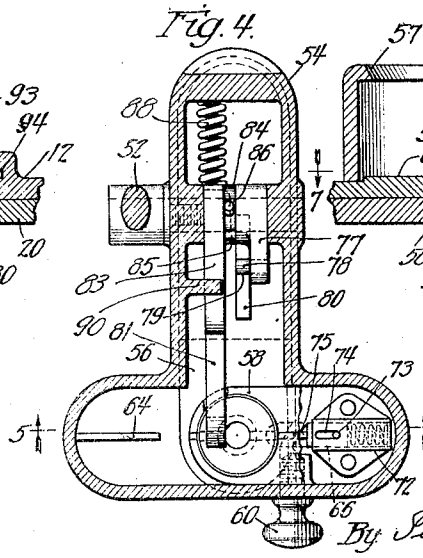


Fig. 4.



Inventors
E. O'B. and R. M. Warwick
Williams, Bradbury,
By Lee & McCabe Attys.

Patented Mar. 8, 1927. 1,620,178

UNITED STATES PATENT OFFICE.

ELEANOR O'B. WARWICK AND ROGERS M. WARWICK, OF EASTLAKE, FLORIDA.

DISPENSING DEVICE.

Application filed July 14, 1921. Serial No. 484,602.

Our invention relates to dispensing devices, and more particularly to devices for dispensing predetermined amounts or units of some substance or material, the predetermined amounts or units of the substance or material being contained in or carried by cartons, spools, and the like.

One of the objects of the invention is to provide a dispensing device in which the articles to be dispensed will be arranged in columns and will be visible so that an article from any of the series of columns can be selected and ejected from the device.

A further object of the invention is to provide a dispensing device in which these columns of articles to be dispensed are supported in a drum cooperating with an ejecting device, the drum and ejecting device having relative rotative movements whereby the ejecting device and any desired column of articles may be brought into operative association by relative rotation between the drum and the ejecting device.

It is a further object of the invention to provide a dispensing device in which the articles to be dispensed will be disposed end to end in their columns, and in which it is necessary to insert a substantially similar article in one end of the column for ejecting the articles from the other end of the column.

These and other features of our invention will be more clearly set forth as the following description progresses, reference being had to the accompanying drawings, wherein

Figure 1 is a front elevation of a device for dispensing spools of thread, the device embodying the novel features of our invention;

Figure 2 is a section taken on line 2—2 of Figure 1, looking in the direction of the arrows;

Figure 3 is a top plan view of the device;

Figure 4 is a section taken on line 4—4 of Figure 2;

Figure 5 is a section taken on line 5—5 of Figure 4;

Figure 6 is a section taken on line 6—6 of Figure 3; and

Figure 7 is a section taken on line 7—7 of Figure 5.

Similar characters of reference indicate similar parts throughout the several views.

In the drawings, we have illustrated a dispensing device embodying the novel features of our invention. The device is adapted to successively discharge spools of thread from suitable containers.

Referring to Figures 1 and 2, the reference character 10 designates the frame of our improved dispensing device. The frame 10 comprises a base 11, and top and bottom disks 12 and 13, respectively. The disks 12 and 13 are held in spaced relation by a cylindrical spacing tube 14, and bolts 15—15, the tube and disks being co-axially disposed. The tube 14 is interposed between the disks 12 and 13, a boss 16 formed integrally with the disk 12 and a boss 17 formed integrally with the disk 13 being adapted to fit snugly into the ends of the tube. Keys 18—18 and the bolts 15—15 serve to prevent displacement of the several enumerated parts of the frame relative to one another. The under and upper surfaces respectively of the disks 12 and 13 are provided with annular grooves 20 and 21 respectively, having their axes co-incident with the axes of the disks 12 and 13 and the tube 14. The purpose of this construction will presently appear.

Rotatably journaled upon the tube 14 is a drum 22 comprising a central hub 23 and annuli 24 and 25, which are arranged to ride in the grooves 20 and 21 respectively. The annuli 24 and 25 are rigidly secured by machine screws 27—27 to a plurality of arms 28—28 formed integrally with the hub 23. The annulus 24 is provided with a plurality of circular apertures 30 and the annulus 25 is provided with a like number of circular apertures 31—31, each aperture 30 being paired off and in alignment with an aperture 31. Each pair of apertures 30—31 is arranged to receive the ends of a cylindrical tube 32, which is made preferably of glass so that its contents may be noted at any time. Each aperture 31 has a reduced portion 33 thus providing a seat 34. Interposed between the seat 34 and the lower end of the associated tube 32 is a ring 35, having a plurality of depending spring fingers 36—36. The function of the spring fingers 36—36 will presently appear.

As shown most clearly in Figure 2, each tube 32 is adapted to hold in co-axial alignment a plurality of spools 38—38, the spools being of that type usually employed to hold certain lengths of thread. The lowermost spool 38 in each tube 32 is yieldingly held against downward displacement by the

spring fingers 36, the free ends of which are bent inwardly to support the spool. We have illustrated and preferably employ spools having frustro-conical surfaces at each end, the smaller diameter of the frustro-conical surface being, in each case, the diameter of the end face of the spool. We find this construction advantageous in that the spring fingers need not project below the lower end of the spool yieldingly held by them, so that when the lowermost spool is forced downwardly, as will presently appear, the spring fingers are free to engage the succeeding or following spool.

As hereinbefore set forth, means are provided for successively discharging the spools from any one of the containers. The device illustrated is designed to discharge the spools from the lower ends of the tubes 32. To permit the spools to be so discharged, the bottom disk 13 of the frame 10 is apertured as at 41, and has secured to it a discharge chute 42. It is apparent that any one of the tubes 32—32 may be registered with the aperture 41, thus permitting the operator to select the tube having spools wound with the desired thread, or to replace a container that has been emptied of full spools of thread.

To secure any one of the tubes in a position in which it registers with the discharge chute 42, a plurality of depressions 43—43 are formed in the outer cylindrical surface of the annulus 24 (Fig. 3). A ball 44 is arranged to move freely in a bore 45 provided in the top disk 12. The ball 44 is urged inwardly by a helical compression spring 46 interposed between the ball and a plug 47 threaded into the outer end of the bore 45. The ball is adapted to enter any one of the depressions 43—43, and thereby yieldingly holds the drum 22 in a plurality of angularly adjusted positions relative to its rotary axis, the depressions 43—43 being arranged to register any one of the several tubes 32—32 with the discharge chute.

From the foregoing description, it is readily understood that the spools in the tube which has been registered with the discharge chute may be displaced to cause the lowermost spool to drop out of the tube. To accomplish this displacement, the top disk 12 is provided with a circular aperture 50 co-axially arranged with the aperture 41 in the bottom disk 13. The aperture 50 is adapted to permit an empty spool of thread to be forced into the tube registered with the discharge chute 42, thereby forcing a full spool of thread out through the lower end of the tube.

Manually operable means are provided for forcing the empty spool into the upper end of any one of the several tubes 32, but the means are normally controlled or locked against operation by co-acting means which will permit operation of the manually operable means only when the empty spool has been placed therein. And the empty spool must have the same proportions and conformation as the spools in the several tubes. This is to prevent unauthorized operation of the device.

The aforesaid manually operable means and co-acting means comprise a handle 52 rigidly secured to a shaft 53. The shaft 53 is rotatably journaled in a housing 54 rigidly secured to the disk 12 by screws 55—55. The housing 54 extends over the aperture 50 which is normally closed by a plate 56 slidably mounted in a depression formed in the upper surface of the disk 12. An empty spool may be passed into the chamber of the housing 54 through an opening 57 in the upper wall of the housing. The opening 57 is offset relatively to the aperture 50. A slide 58, disposed in the housing 54, is adapted to receive the empty spool and to bring it into alignment with the aperture 50. For this purpose, the slide is provided with a bore 59 in which the spool is placed, and which may be registered with the opening 57 by means of a handle 60 projecting from the slide through a slot 61 formed in the front wall of the housing 54. The slot 61 is of sufficient length to permit the slide to be displaced from the position wherein the bore 59 registers with the opening 57 to a position wherein the axis of the bore is coincident with the axis of the aperture 50. An empty spool inserted into the bore 59 will rest at first against the upper surface of the disk 12, but will rest upon the plate 56 when the bore 59 registers with the aperture 50.

In the preferred form of our construction, the bore 59 is of a diameter sufficient to receive empty spools similar to those in the tubes 32, but will reject a spool of larger diameter. Likewise, the length of the bore is just sufficient to accommodate a spool similar to those in the tube, a spool of greater length serving to prevent operation of the slide as shown in Figure 5. As an additional safeguard against unauthorized operation of the device, each spool is provided preferably with a groove 65 in one of its ends which must be registered with a tongue 64 projecting upwardly from the disk 12. Thus, an empty spool larger than the spools in the tubes 32, or one that lacks a groove 65 will not be received in the slide 58.

It is apparent that the plate 56 must be withdrawn from its position closing the aperture 50 before an empty spool properly disposed in the bore 59 can be forced into a tube 32. However, means are provided for locking the plate in this position to insure that the empty spool is not smaller than the spools in the several tubes. The means comprise a latch 66, adapted to enter a notch

67 cut into one edge of the plate 56. As shown in Figure 7, the latch unless withdrawn from the notch will resist any force tending to move the plate 56 in a direction toward the central axis of the device so as to uncover the aperture 50. To withdraw the latch from the notch, an arm 68 is pivotally journaled upon a pin 69 rigidly secured in the slide 58, the arm 68 being disposed in a slot 70 formed in the slide. The slot 70 communicates with the bore 59. When an empty spool of a diameter equal to the diameters of the spools contained in the tubes 32—32 is placed in the bore 59, the arm will be displaced. This displacement is sufficient to cause the arm 68 to engage and withdraw the latch 66 from the notch 67, when the empty spool is aligned with the aperture 50. The latch 66 is yieldingly urged toward the plate 56 by a helical compression spring 71 interposed between the latch and a latch casing 72, which is rigidly secured to the disk 12. A pin 73 projecting from the latch and a slot 74 formed in the latch casing 72 limit the travel of the latch. The latch 66 will re-enter the notch 67 when released, and is provided with a cam surface 75, which will permit the latch to be longitudinally displaced by the edge of the plate 56 when the plate is moved forwardly, as will presently appear. Such displacement is necessary to permit the latch 66 to register with the notch 67.

The plate 56 is withdrawn from its closing position by means of the handle 52. As aforesaid, the handle 52 is rigidly secured to the shaft 53. A lever 77 also rigidly secured to the shaft 53 carries at its free end a pin 78 which rides in a slot 79 formed in a lug 80 projecting upwardly from the plate 56. If the handle 52 be rotated in a counterclockwise direction (Fig. 2) the plate 56 will be moved inwardly toward the central axis of the device thus uncovering the aperture 50. An empty spool disposed in the bore 59 will drop through the aperture 50 and rest upon the uppermost spool contained in the particular tube 32 disposed beneath the aperture 50. To force the empty spool downwardly, we provide a hammer 81, pivotally journaled upon a pin 82 threaded into a side wall of the housing 54. An arm 83 one end of which is connected to the shaft 53 in a manner presently to be described has its free end resting upon the hammer 81. The arm 83 has a hub 84 through which the shaft 53 freely passes. The hub 84 is slotted as at 85 to receive a pin 86 projecting from the shaft 83. This slot is adapted to allow the handle 52 to be rotated in a counter-clockwise direction a sufficient distance to withdraw the plate 56 from its position over the aperture 50, before the pin 86 will reach one end of the slot 85 and cause the arm 83 to be rotated in a like direction. The reason for this is apparent. However, continued rotation of the handle will cause the arm to move the free end of the hammer 81 downwardly, thus forcing the empty spool into the tube registering with the aperture 50. The spools in that tube will all be forced downwardly, the lowermost spool passing out of the tube against the action of the spring fingers 36—36.

When the handle 52 is returned to its initial position, the hammer 81 will also be restored to the position in which it rests against the arm 83 by a helical spring 88. One end of the spring 88 is secured to the hammer 81, and the other end is secured to the housing 54 by means of a machine screw 89 threaded into the housing. While we have contemplated a structure in which the operator will return the handle 52 to its initial position, it is, of course, understood that the spring 88 may be designed to restore the handle and the several movable parts controlled by the handle to a position wherein the plate 56 again closes the aperture 50. The movement of the handle 52 in a clockwise direction (Fig. 2) is limited by a stop 90 which is adapted to be engaged by the arm 83.

We will now describe the means whereby the several tubes may be refilled.

As shown in Figs. 3 and 6, the disk 12 is provided with an aperture 92 with which any one of the tubes 32—32 may be registered, the aperture 92 being large enough to permit withdrawal of the tubes 32—32 through it. A closure is provided for the aperture 92 comprising a lock 93 having latching members 93^a—93^a, which may be inserted into an annular groove 94 formed in the wall surrounding the aperture 92, the groove 94 communicating with the top surface of the disk 12 by means of slots 95—95. A pin 96 projecting from the lock 93 is adapted to enter a hole 97 drilled into the disk 12. This structure prevents angular displacement of the lock proper about its axis. The latching fingers 93^a—93^a, when placed in the groove 94 by way of the slots 95—95, may be displaced by means of the key to prevent withdrawal of the lock from its position closing the aperture 92. The lock will thus prevent unauthorized removal of the tubes from the device, but will permit authorized refilling of the tubes.

In the operation of the device, the operator places a properly proportioned empty spool in the slide 58 and then aligns the spool with the aperture 50 by means of the handle 60. The handle 52 is then rotated in a counterclockwise direction to withdraw the plate 56, and to force the empty spool into any desired tube 32. A full spool of thread will then be discharged from the discharge chute 42.

While we have described the details of our

invention, it is to be understood that our invention is not limited to these details except by the scope of the appended claims.

Having thus described our invention, what we claim is new and desire to secure by Letters Patent of the United States is:

1. A dispensing device comprising a frame, a drum rotatably journaled in the frame, a plurality of containers for spools wound with thread carried by the drum, the containers being disposed parallel with and equidistant from the rotary axis of the drum, each container having discharge and refilling openings, means adjacent each discharge opening for yieldingly preventing the spools from passing out through the discharge opening, the frame having an aperture with which any of the refilling openings may be registered, and means for successively discharging the spools of any one of the containers comprising a housing secured to the frame having an opening through which an empty spool of substantially the same size as those in the container may be passed into the housing, but which will reject a larger spool, a slide mounted in the housing for aligning the spool with the aperture in the frame, a plate slidably mounted in the frame for closing the aperture in the frame, the plate supporting the empty spool when the spool is aligned with that aperture, a latch member for locking the plate against displacement, an arm pivotally journaled in the slide, the arm co-operating with an empty spool positioned by the slide, if the spool is of substantially the same size as the spool in the container, to unlock the latch member from the plate, means for withdrawing the plate from beneath the empty spool, and means for forcing the spool into the container positioned below the aperture in the frame.

2. A dispensing device comprising a support, a drum rotatably journaled on said support, a plurality of vertically extending containers carried by the drum, said containers being disposed circumferentially around said drum, each container having discharge and refilling openings and comprising a transparent face whereby the articles in said container may be viewed, means adjacent each discharge opening for yieldingly preventing the articles from passing out through the discharge opening, said support having an aperture with which any of the refilling openings may be registered, a slide co-operating with said aperture, said slide being adapted to receive an article and carry the same to said aperture, means for actuating said slide, and article ejecting means adapted to apply pressure to the article conducted to said aperture by said slide for exerting endwise pressure on the series of articles in the container then associated with said aperture.

3. A dispensing device comprising a frame, a drum rotatably journaled in the frame, a plurality of containers carried by the drum, each container having discharge and refilling openings, means adjacent each discharge opening for yieldingly preventing the articles from passing out through the discharge opening, said frame having an aperture therein with which any of the refilling openings may be registered, a blocking member for preventing the insertion of one of the articles through said aperture, means for withdrawing said blocking member, a latch for holding said blocking member against movement, and a measuring member adapted to engage the article to be inserted in the container, said measuring member measuring the size of the article and releasing said latching member if said article is of proper size, and means for ejecting the articles from said containers.

4. A dispensing device comprising a frame, a drum rotatably journaled on said frame, a plurality of containers carried at circumferential points on said frame, each container having discharge and refilling openings, said frame having an aperture with which any of the refilling openings may be registered, a blocking member normally closing said aperture, a latch for holding said blocking member against releasing movement, a slide adapted to receive the article to be inserted in said containers, means for actuating said slide to bring said article in alignment with said aperture, a measuring member adapted to contact with the article and releasing said latch if the article is of predetermined size, and means for forcing said article into the container then aligned with said aperture.

In witness whereof, we hereunto subscribe our names this 6th day of July, 1921.

ELEANOR O'B. WARWICK.
ROGERS M. WARWICK.