

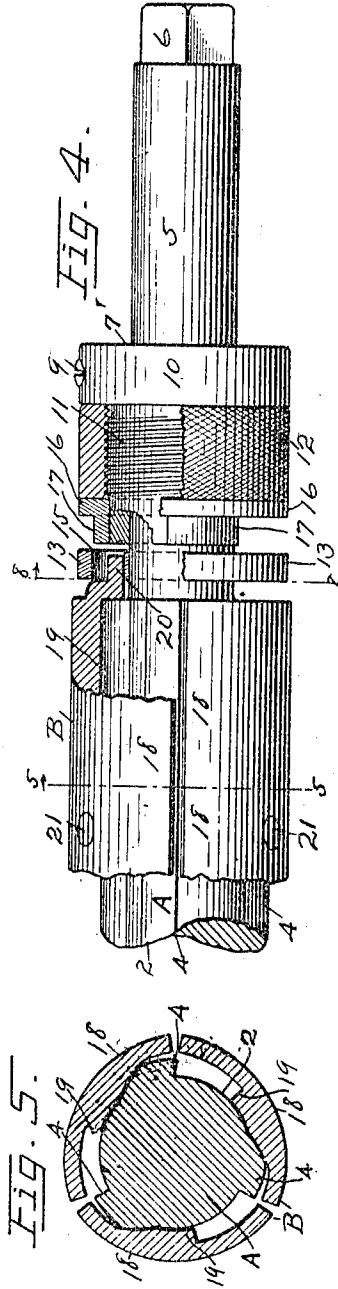
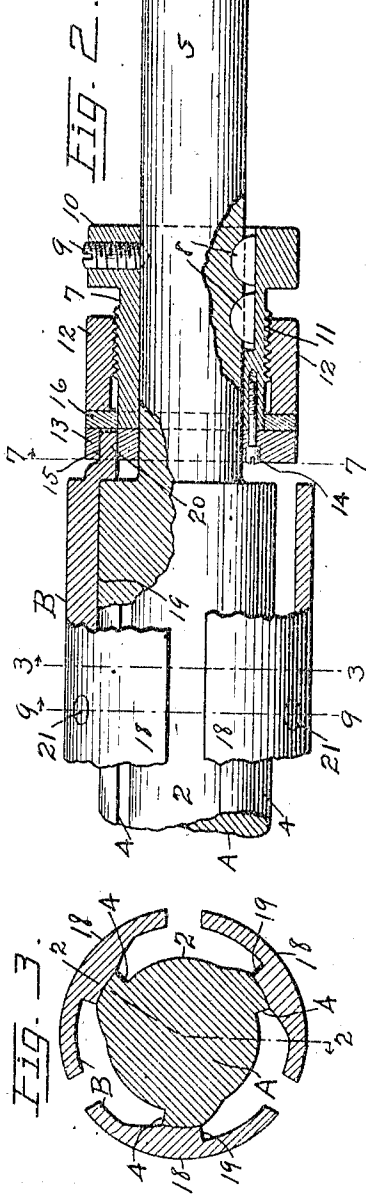
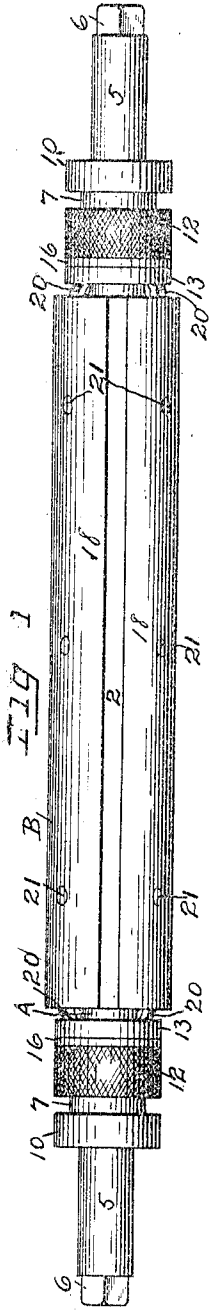
EXPANSIBLE CORE.

APPLICATION FILED DEC. 5, 1913.

1,115,057.

Patented Oct. 27, 1914.

2 SHEETS—SHEET 1.



*WITNESSES:*

A. C. Thomas  
Geo. de Wallace.

INVENTOR.

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Lawrence J. Delaney  
BY Harry DeWitt  
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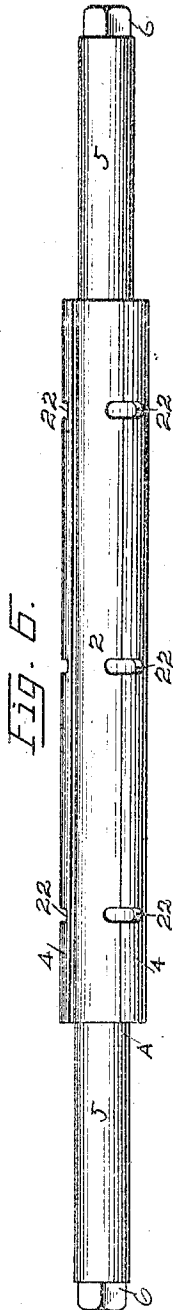
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L. F. DELANEY.  
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WITNESSES:  
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*Geo. De Wallace*

Fig. 11.

Fig. 10.

Fig. 9.

Fig. 7.

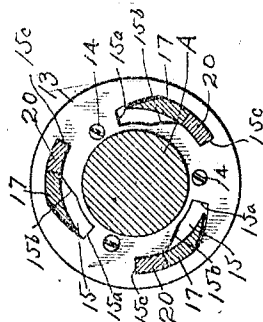
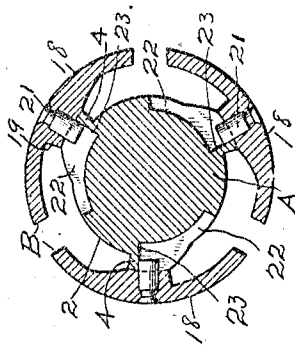
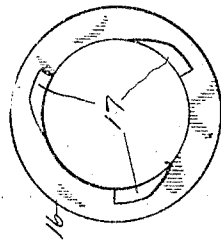
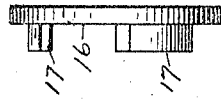
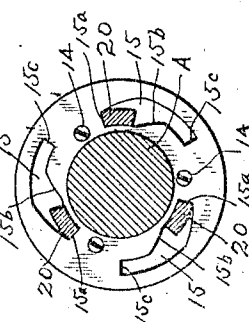
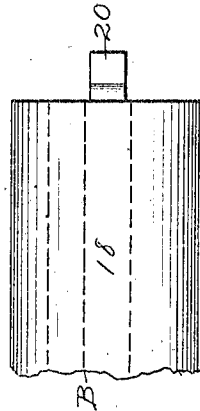
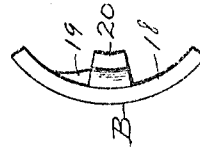


Fig. 13.

Fig. 12.

Fig. 8.



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# UNITED STATES PATENT OFFICE.

LAWRENCE F. DELANEY, OF WATERTOWN, NEW YORK.

EXPANSIBLE CORE.

1,115,057.

Specification of Letters Patent.

Patented Oct. 27, 1914.

Application filed December 5, 1913. Serial No. 804,945.

*To all whom it may concern:*

Be it known that I, LAWRENCE F. DELANEY, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Expansible Cores, of which the following is a specification.

This invention relates to improvements in 10 expansible cores, and the invention relates particularly to cores of the class for use in winding paper, cloth and the like.

The object of the invention is to provide a solid shaft which is disposed within a 15 segmental drum or cylinder, each of said parts having a plurality of cam surfaces by means of which the expansion and contraction of the core are effected.

A further object is to provide novel and 20 simple means carried by the shaft located at the opposite ends of the segmental drum, which cooperate with parts carried by the drum for effecting the collapsing of the core. And a further object is to provide simple 25 and effective means for locking and holding the device expanded.

The various features and parts of the invention will be understood from the detailed description which follows, and by reference 30 to the accompanying drawings, in which—

Figure 1 is an elevational view of the complete device; showing the same expanded. Fig. 2 is a broken longitudinal section, substantially on line 2—2 of Fig. 3; showing 35 the segments of the drum expanded and the means for holding the parts in said position. Fig. 3 is a cross-section of the same taken on line 3—3 of Fig. 2. Fig. 4 is a part elevational and part longitudinal section; showing the drum collapsed. Fig. 5 40 is a cross-section taken on line 5—5 of Fig. 4. Fig. 6 is an elevational view of the main shaft. Fig. 7 is a view of the collar member of the clutch, taken on line 7—7 of Fig. 2. 45 Fig. 8 is a similar view of the collar, taken on line 8—8 of Fig. 4. Fig. 9 is a cross-section taken on line 9—9 of Fig. 2; showing one series of the stops. Figs. 10 and 11 are respectively a face and an edge view 50 of the clutch-ring. Fig. 12 is a partial plan view of one of the segments. Fig. 13 is an end view of the same.

In the drawings, the main shaft A comprises an enlarged central portion 2, of irregular shape in cross-section (see Figs. 3

and 5), having a plurality of equally spaced longitudinal cam-ribs 4, which are preferably integral with the shaft, but which may be detachable and consist of any suitable material if desired. The shaft A, adjacent 60 the opposite ends of the part 2, is reduced and cylindrical, as at 5, for providing journals the extreme ends 6, of which are squared to receive a key or wrench for rotating the shaft by hand. Near each end the shaft A 65 is fitted with a sleeve 7, which is driven with the shaft by means of keys 8, which are applied in the usual way, and the sleeve is held from longitudinal movement by a set screw 9, which pierces a flange 10 diametrically opposite the keys 8. Adjacent the 70 flange 10 the sleeve is externally threaded, as at 11, to receive a gland-nut 12, employed for holding certain of the locking parts in place. On the inner end of each sleeve 7 is 75 mounted a collar-like clutch member 13, which is rigidly attached to the sleeve by screws or bolts 14, which pass through the collar and are threaded into the end of the sleeve. The members 13 are provided with 80 three equally spaced irregular openings 15.

16 represents a clutch-ring, which is journaled on the sleeve 7, between the nut 12 and the collar 13, and which is provided with three teeth or lugs 17, which face the said 85 collar, and these are inserted in and partially fill the openings 15 of the collar when the core is expanded (see Fig. 7). The rings or members 16 are held in engaged position, as shown in Fig. 2, by the nut 12. B represents a split drum or cylinder which surrounds the shaft A, and upon which paper or cloth may be wound. The drum consists of three similar segments, as 18, which are substantially the same length as the enlarged portion 2 of shaft A. The segments 18 are provided with internal longitudinal cam-ribs or ledges 19, having substantially the same shape in cross-section as the ribs 4, with which they engage during the expanding and contracting operations. The ribs 19 project beyond each end of the segments 18, and have reduced ends 20, which are disposed and play in the transverse openings 15 in the collars 13 alongside of the clutch-teeth 17 of the ring 16, which serve to hold the segments from rotation in one direction independent of the shaft A, while the latter is being driven, during the winding operations. The drum 130

B is held from rotation in the opposite direction by a series of stops 21, the outer ends of which are rigidly set into holes in the segments 18, while their inner ends project into circumferential slots 22 formed in shaft A facing the drum B, as shown in Figs. 6 and 9. During the expanding and contracting movements of the drum B the stops 21 move back and forth in the slots 22, and when the drum is expanded to the full extent, as shown in Figs. 1, 2 and 3, the stops bear against the shoulders 23, which limit the expanding movements. In practice there are three or four of the stops 21 provided for each of the segments 18.

When the drum B is collapsed as shown in Figs. 4 and 5, which is the normal condition when at rest or idle, the points 20 of the segments 18 are disposed in the ends 15<sup>a</sup> of the openings 15 of members 13. (See Fig. 8). To expand the drum B one operator applies a wrench or key (not shown) to one of the square ends 6 of shaft A, and rotates the said shaft toward the left, while another operator holds drum segments stationary. The partial rotation of shaft A, owing to the incline surfaces 15<sup>b</sup>, spreads the points 20 and the segments 18 apart, and when the drum is fully expanded, the said points are disposed in the farther ends 15<sup>c</sup> of the openings 15 of the collar 13, as shown in Fig. 7. At the same time, the cam-ribs 4 and 19 will be shifted from the position shown in Fig. 5 to that shown in Figs. 3 and 9, and the stops 21 will be engaging the shoulders 23 of the slots 22. To hold the segments 18 of the drum B in the expanded position, the clutch-rings 16 are moved up against the members 13 and the teeth 17 enter the openings 15 and lie alongside of the points 20 of the segments. The nuts 12 are then screwed up tightly against the rings 16, and hold all of the parts locked in the condition shown in Figs. 2, 3, 7 and 9, ready for the winding operation. After a roll of paper or cloth has been wound on the drum B, the shaft and drum may be readily and quickly removed from the roll, by unscrewing the nuts 12, withdrawing the rings 16 from the collars 13 (see Fig. 4), and then by rotating the shaft A in the opposite direction or to the right, for forcing the tongues 20 of the segments from ends 15<sup>c</sup> to ends 15<sup>a</sup> of the slots 15 of the collars, which effects the collapsing of the drum, as shown in Figs. 4, 5 and 8.

The provision of the oppositely facing cam-ribs 4 and 19, which extend the full length of the drum B, affords unyielding supports for the segments 18, and prevents any springing or variation in the diameter of the core, due to the increasing weight of the roll of material during the winding operations. The novel, simple, quick acting and positive adjusting and locking means,

comprising the sleeves 7, the nuts 12, the collars 13, and the clutch-rings 16, all of which are disposed beyond and clear of the winding surface or portion of the core, enable the users or operators to apply, use and remove the cores with facility and ease, because the working parts are always in view and readily accessible, before, during and after the winding operations.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. A collapsible core, comprising a main shaft provided intermediate its ends with radial cam-ribs, a segmental drum surrounding said cam-ribs, having corresponding cam-surfaces engaging said cam-ribs, sleeves mounted on said shaft near the opposite ends of said drum, a clutch carried by each sleeve, comprising a collar having openings to receive projecting ends of the segments of said drum and a ring having teeth capable of entering said openings for preventing the collapsing of said drum, and nuts carried by said sleeves for holding the said collars and said rings interlocked.

2. A collapsible core, comprising a main shaft provided intermediate its ends with radial cam-ribs, a segmental drum surrounding said cam-ribs, having corresponding cam-surfaces engaging said cam-ribs, stops carried by said segments for limiting the expansion of said drum, sleeves mounted on said shaft near the opposite ends of said drum, a clutch carried by each sleeve, comprising a collar having openings to receive projecting ends of the segments of said drum and a ring having teeth capable of entering said openings for preventing the collapsing of said drum, and nuts carried by said sleeves for holding the said collars and said rings interlocked.

3. The combination with a central shaft provided with a plurality of cam-ribs disposed intermediate its ends, of a split drum surrounding the intermediate portion of said shaft, each segment of said drum having cam-surfaces engaging said cam-ribs and having tongues projecting beyond their opposite ends, sleeves mounted on the said shaft adjacent the ends of said cam-ribs, clutch collars secured to said sleeves having openings to receive said tongues, gland-nuts carried by said sleeves, and clutch rings journaled on said sleeves between said nuts and said clutch collars, said clutch-rings having a plurality of teeth adapted to enter the openings in said clutch alongside of said tongues for holding said segments expanded.

4. In a collapsible core, a central shaft having longitudinal cam-ribs disposed equidistantly around its body intermediate its ends, sleeves mounted on the opposite ends of said shaft adjacent the ends of said cam-

5 ribs and provided with external threads, collar-like clutch members secured to the sleeves and facing said cam-ribs, said members having transverse openings coinciding  
 10 with said cam-ribs, a split drum comprising a plurality of segments surrounding said shaft, each of said segments having internal longitudinal cam-ledges engaged by said cam-ribs, and each cam-ledge projecting be-  
 15 yond said segments and having reduced ends which are disposed in the openings of said clutch members, and clutch-rings journaled on said sleeves having teeth adapted to enter the openings in said members.  
 20 5. In a collapsible core, a central shaft having longitudinal ribs disposed equidistantly around its body intermediate its ends, sleeves rigidly mounted on the opposite ends of said shaft and provided with external  
 25 threads, collar-like clutch members secured to the sleeves and facing the ends of said cam-ribs, said members having openings coinciding with said cam-ribs, a split drum comprising a plurality of segments sur-  
 30 rounding said shaft, each of said segments having internal longitudinal cam-ledges engaged by said ribs, and each cam-ledge projecting beyond said ribs and having reduced ends which are disposed in the openings of  
 said clutch members, clutch-rings mounted on said sleeves having teeth adapted to enter the openings in said members, and gland-

nuts carried by said sleeves adapted to hold said clutch-rings in the engaged position.

6. An expansible core, comprising a shaft, 35 sleeves rigid on said shaft near the opposite ends thereof, a clutch carried by each sleeve, a segmental drum surrounding said shaft between said clutches, each segment of the drum having tongues inserted in the corre- 40 sponding members of said clutches, and means carried by said sleeves for locking said tongues in the expanded position.

7. In an expansible core, a central shaft, a drum comprising a number of similar seg- 45 ments surrounding a portion of said shaft and provided with longitudinally projecting tongues, collars rigidly mounted on said shaft at the opposite ends of said drum and provided with cam-slots to receive said 50 tongues, adapted when rotated with said shaft to expand and contract said drum, means carried by said segments for limiting the expanding and contracting move- 55 ments of said segments, and means carried by said shaft for preventing the accidental collapsing of said drum.

In testimony whereof I affix my signature in presence of two witnesses.

LAWRENCE F. DELANEY.

Witnesses:

H. C. TEEPEL,  
 FANNIE A. McNEIL.