J. F. DOOLEY & W. W. HOWARD.

EXPANDING SHAFT.

APPLICATION FILED FEB. 25, 1914.

1,128,955.

Patented Feb. 16, 1915.

2 SHEETS—SHEET 1.

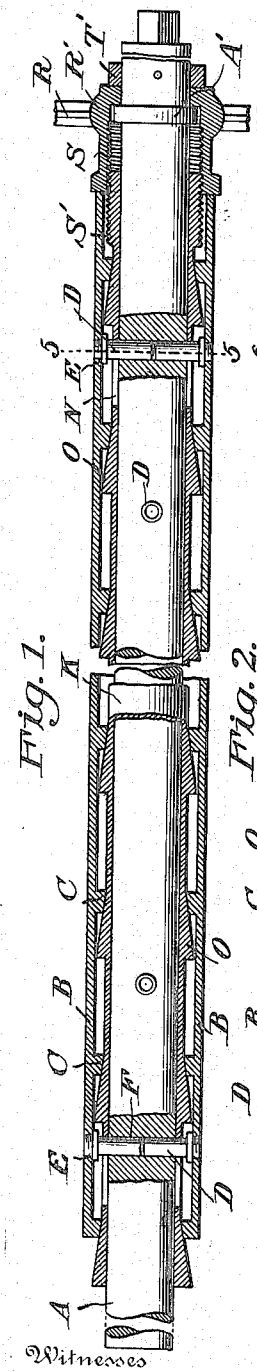


Fig. 1.

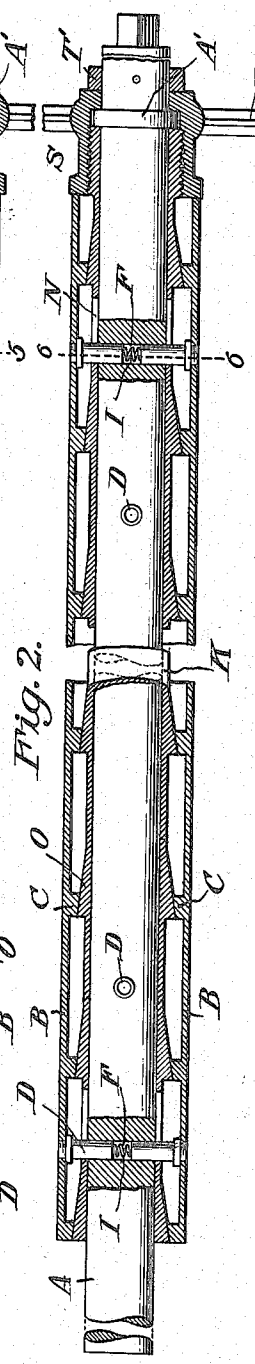


Fig. 2.

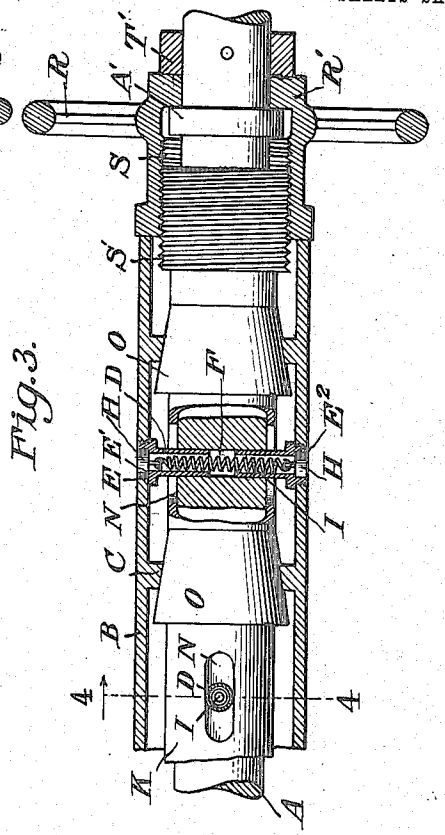


Fig. 3.

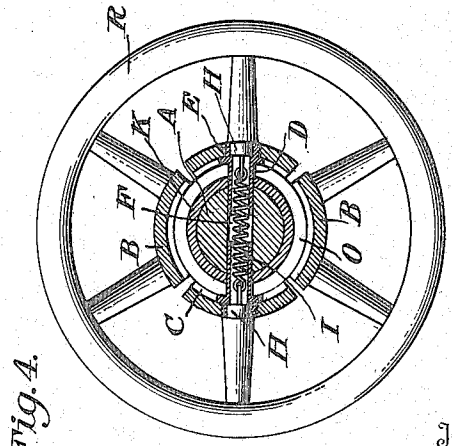


Fig. 4.

Witnesses

Fenton S. Belt

J. W. Sherwood

Inventors

James F. Dooley

William W. Howard

By Franklin D. Young

Attorney

J. F. DOOLEY & W. W. HOWARD.

EXPANDING SHAFT.

APPLICATION FILED FEB. 25, 1914.

1,128,955.

Patented Feb. 16, 1915.

2 SHEETS—SHEET 2.

Fig. 5.

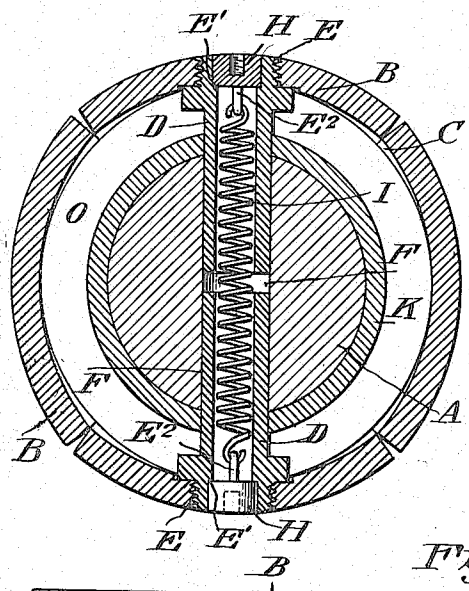


Fig. 6.

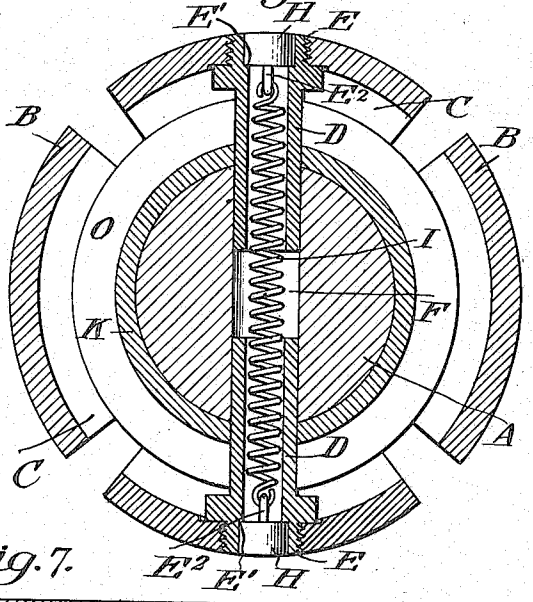
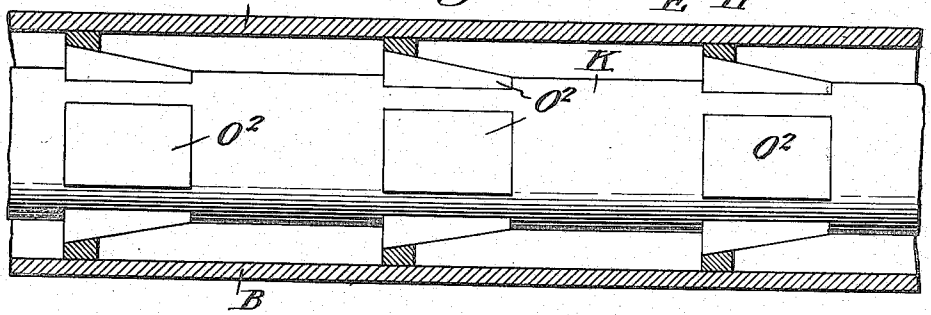


Fig. 7.



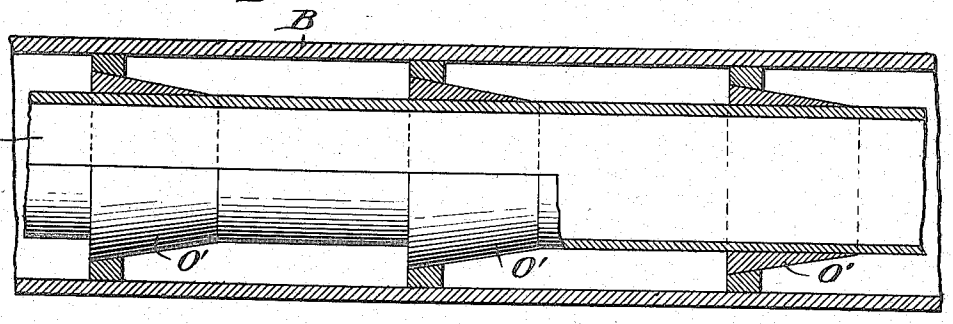


Fig. 8.

Witnesses

Fenton W. Belt

J. N. Sherwood

Inventors

James F. Dooley and

William W. Howard

By Frankel & Howard

Attorney

UNITED STATES PATENT OFFICE.

JAMES FRANCIS DOOLEY AND WILLIAM W. HOWARD, OF CARTHAGE, NEW YORK.

EXPANDING SHAFT.

1,128,955. Specification of Letters Patent. Patented Feb. 16, 1915.

Application filed February 25, 1914. Serial No. 820,981.

To all whom it may concern:

Be it known that we, JAMES F. DOOLEY and WILLIAM W. HOWARD, citizens of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Expanding Shafts; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in expanding shafts or mandrels designed for use especially for rewinding rolls of paper, etc.

The present invention comprises various details of construction, combinations and arrangements of parts which will be hereinafter fully described, shown in the accompanying drawings and then specifically defined in the appended claims.

We illustrate our invention in the accompanying drawings, in which:

Figure 1 is a sectional view longitudinally through a shaft before being expanded. Fig. 2 is a similar view showing the segments expanded. Fig. 3 is an enlarged sectional view through one end of the expanding apparatus. Fig. 4 is a cross sectional view on line 4—4 of Fig. 3. Fig. 5 is a sectional view on line 5—5 of Fig. 1. Fig. 6 is a sectional view on line 6—6 of Fig. 2. Fig. 7 is a detail view showing a slightly modified form of the shape of the expanding member, and Fig. 8 is a detail view of expanding cones made independent of and shrunken upon a sleeve.

Reference now being had to the details of the drawings by letter, A designates a core, consisting of a solid cylindrical shaft having a collar A′ either fixed or integral therewith, and B, B designate expansible segments each made on the arc of a circle and provided with a series of ribs C integral therewith upon the inner concaved faces of each segment and each rib has a beveled edge, said segments being arranged opposite each other in pairs. Open-ended shells, designated by letter D, have corresponding ends fitted in any suitable manner in holes E in the segments. Each of said shells has an annular shoulder E′ formed in the inner wall thereof near one end and each end of the shell is flush with the outer convexed surface of the segment in which it is mounted. Said core is provided at intervals with transverse holes F for the reception of said guide shells D and buttons H are seated in the outer end of each shell and resting upon the shoulders. Said button is provided with an eye E^2 to which one end of a spring I is connected, the other end being connected to a similar button in the other of the shells, as shown clearly in Fig. 3 of the drawings.

A sleeve, designated by letter K, telescopes over the core, having a sliding longitudinal movement thereon, and is provided at intervals with elongated slots N through which said shells D pass. The sleeve is provided either with integral conical-shaped projections O, as shown in Fig. 3, or with similar shaped sleeves, designated by letter O′ and as shown in Fig. 8 and which are made separate from the sleeve and shrunken thereon or otherwise fastened thereto, or, if preferred, wedge-shaped members O^2, shown in Fig. 7, may be utilized in place of the forms shown in Figs. 3 and 8, it being immaterial as to the particular form of expanding projections upon the sleeve as they all tend to produce the same results. Said conical-shaped expanding members upon the sleeve are adapted to contact with the concaved beveled ribs C upon the inner surfaces of the segments B, as shown in the drawings.

A shell R′ has interior threads S which engage threads S′ formed upon the circumference of the sleeve and the inner end of the shell R′ is adapted to contact with the ends of the adjacent expanding segments B, as shown clearly in Fig. 3 of the drawings. A handle R is integral with the shell R′ and forms a convenient means for rotating the same. A coller T′ is fastened to the core in any suitable manner and between which and the collar T the said shell R′ is swiveled, as shown in Fig. 3 of the drawings.

The operation of our apparatus will be readily understood and is as follows: The segments with the core forming the expansible shaft are inserted in the roll and, by turning the hand wheel R, the shell integral therewith will bear against the ends of the adjacent segments and, as the interior threads of the shell engage the threads S′, the sleeve will be drawn toward the hand wheel while the expanding members upon

the sleeve bearing against the bevels upon the lugs on the inner faces of the segment will be thrown out into expanded positions. The springs which connect the buttons which are carried by the segments will be guided by the shells through which they pass and, when the hand wheel is turned in the opposite direction, the sleeve will be moved in the opposite direction and the springs will draw the expanding segments back toward the center of the core, thus returning the parts to their normal positions. Said shells through which the springs pass, it will be noted, pass through the slots in the sleeve and also through a hole in the core and thus guide the segments as they move away from or toward the center of the core.

What we claim to be new is:—

1. An expansible shaft for rewinding rolls of paper, etc., comprising a core with transverse holes therein and having a collar about its circumference, a series of curved expanding segments, open-ended guide shells fitted in holes in the expanding segments, springs passing through said shells and means at the outer ends of the latter to which the ends of the springs are anchored, said shells being guided in their longitudinal movements by the holes through the core, a longitudinally movable sleeve mounted upon said core and having a portion of its circumference threaded, a threaded shell swiveled to the core and engaging threads upon the sleeve and adapted to bear against the adjacent ends of said segments, the inner circumference of the latter having projections engaged by the expanding means upon the sleeve, as set forth.

2. An expansible shaft for rewinding rolls of paper, etc., comprising a core with transverse holes therein and having a collar about its circumference, a series of curved expanding segments, open-ended guide shells fitted in holes in the expanding segments, springs passing through said shells and means at the outer ends of the latter to which the ends of the springs are anchored, said shells being guided in their longitudinal movements by the holes through the core, a longitudinally movable sleeve mounted upon said core and having a portion of its circumference threaded and having inclined expanding projections thereon, said core having a collar thereon, a shell, interiorly threaded and swiveled against said collar and having interior threads engaging threads upon the sleeve, the ends of said interiorly threaded shell bearing against the adjacent ends of said segments, the inner surface of the segments being provided with projections against which said inclined projections are adapted to bear as the shell is moved, as set forth.

3. An expansible shaft for rewinding rolls of paper, etc., comprising a core with transverse holes therein and having a collar about its circumference, a sleeve mounted to move longitudinally upon said core and having slots therein, conical-shaped expanding projections upon the sleeve, curved expanding segments provided with holes and lugs upon their inner surfaces and which lugs are beveled and adapted to engage said conical-shaped projections, open-ended shells engaging the holes in the core and slots of the shell and their outer ends engaging the holes in said segments, buttons fastened in the outer ends of said shells, springs fastened at their ends to said buttons, a threaded shell swiveled to the core and engaging threads upon the sleeve and adapted to bear against the adjacent ends of said segments, as set forth.

4. An expansible shaft for rewinding rolls of paper, etc., comprising a core with transverse holes therein and having a collar about its circumference, a sleeve mounted to move longitudinally upon said core and having slots therein, conical-shaped expanding projections upon the sleeve, curved expanding segments provided with holes and lugs upon their inner surfaces and which lugs are beveled and adapted to engage said conical-shaped projections, open-ended shells engaging the holes in the core and slots of the shell, their outer ends having threaded connection with holes in the segments, the outer end of each of said shells having a shoulder upon the inner surface thereof, buttons seated on said shoulders, eyes projecting from the buttons, springs fastened at their ends to said eyes, an interiorly threaded shell swiveled to the core and having a hand wheel thereon, the threads of the core engaging the threads on the sleeve, and the inner end of the core engaging the adjacent ends of the segments, as set forth.

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

JAMES FRANCIS DOOLEY.
WM. W. HOWARD.

Witnesses:
CHARLIE I. JENKS,
H. K. GREENE.