

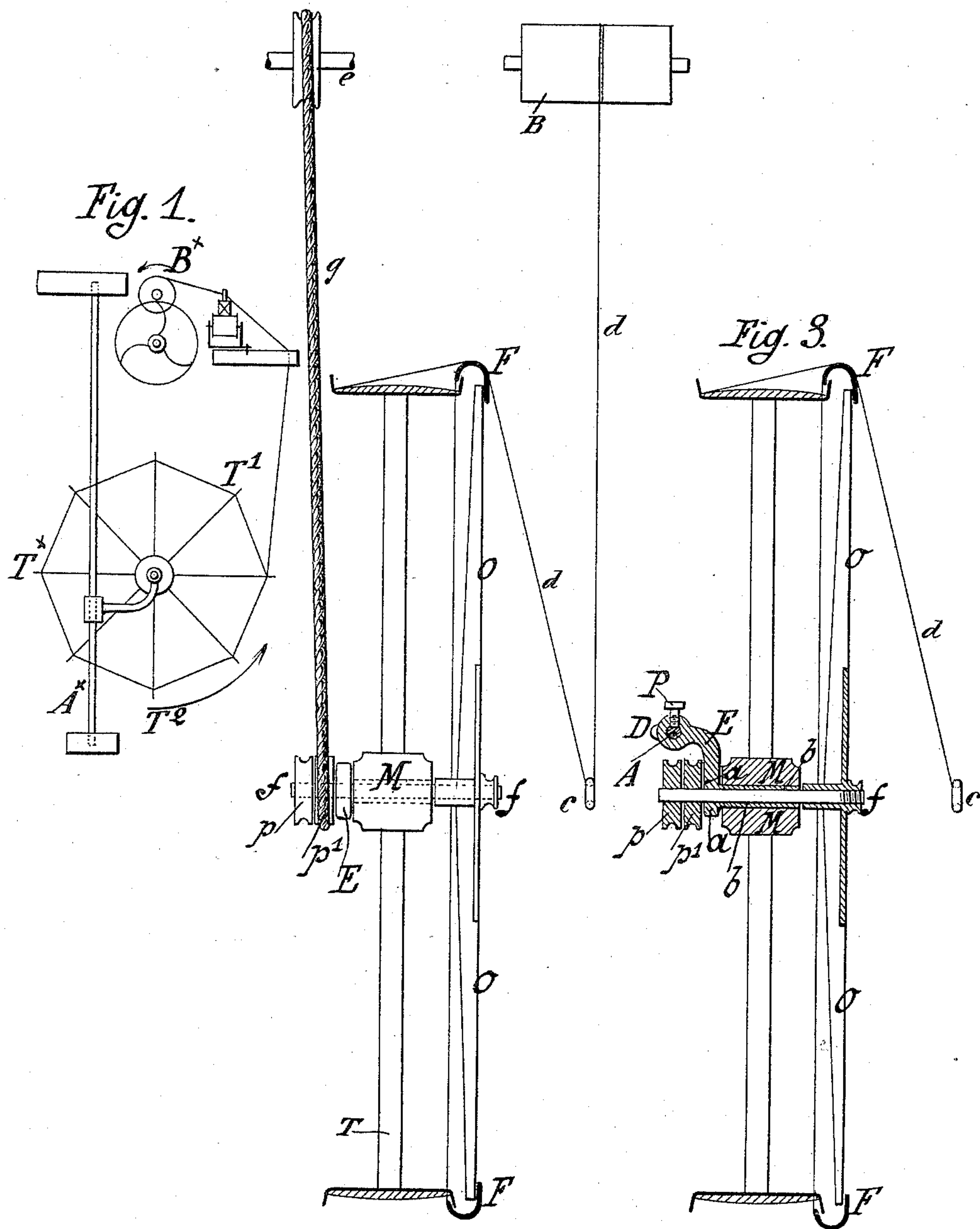
(No Model.)

E. FOUGEIROL.
APPARATUS FOR WINDING SILK, &c.

No. 495,479.

Patented Apr. 18, 1893.

Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDOUARD FOUGEIROL, OF PARIS, FRANCE.

APPARATUS FOR WINDING SILK, &c.

SPECIFICATION forming part of Letters Patent No. 495,479, dated April 18, 1893.

Application filed July 21, 1892. Serial No. 440,831. (No model.) Patented in France April 25, 1891, No. 221,156.

To all whom it may concern:

Be it known that I, EDOUARD FOUGEIROL, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Apparatus for Winding Silk and other Textiles, of which the following is a specification.

This invention is the subject of Letters Patent in France, dated April 25, 1891, No. 221,156.

In the winding of silk from the skein to the bobbins as now practiced, the skein is carried on a very light octagonal frame called a silk reel, which is rotated by the unwinding of the filament from it as it is wound on to the bobbin or spool. However light this silk reel may be, its weight, with that of the skein it carries, is sufficient to impose a considerable strain upon the filament, which is extremely attenuated, so that it is difficult to drive the reel at a speed exceeding forty revolutions per minute. Efforts have been made to increase this speed by transmitting to the reel a differential speed, with means for automatically stopping it in case of breaking the filament, but up to the present these efforts have not been practically successful. I have invented a system by means of which the speed of the winding may be considerably increased without adding appreciably to the tension of the filament. By my system I keep the silk reel and the skein stationary, and draw off the filament by unwinding it rotatively from the skein.

Let us suppose the silk reel mounted horizontally on the ground, with a polished metal ring or cap of semicircular section laid over it so as to overhang or inclose and embrace all the extremities of the eight arms of the reel. Then by drawing the thread from the skein, carrying it over this ring, and passing it through a glass eye in the axis of the reel, the thread may be drawn off without other resistance to overcome than that of its own weight, its adhesion to the other filaments of the skein, and its friction against the polished surface of the metal cap, the radius of which is only two or three centimeters greater than that of the skein. The unwinding thread will describe a cone the apex of which is formed by the glass eye, and the base by the annular cap. By this arrangement the reeling may

be effected at any desired speed, because the friction of the thread over the cap or ring is insignificant. The large amount of room required for the reeling operation would however be a serious objection. This difficulty, however, is overcome by arranging the reel in its usual vertical position and placing the glass eye quite near the reel, only seven or eight centimeters from the plane of the annular cap or ring, whereby the space occupied is scarcely greater than that of a common silk reel. The thread then during the reeling will describe a very flat cone. This arrangement will considerably increase the friction of the thread over the ring, which might cause breakage. To reduce this friction, I provide for rotating the annular cap or ring at the same speed as the rotatory motion of the filament in reeling off.

Figure 1 of the accompanying drawings is an elevation illustrating the ordinary process of reeling off. Fig. 2 is a sectional elevation on a larger scale illustrating the application of my invention. Fig. 3 is a horizontal section through the reel and its accessories.

In the ordinary construction shown in Fig. 1, the skein T' is carried on the reel T^x , and the filament is drawn therefrom over suitable guides and wound on the bobbin B^x , turning in the direction of the arrow, and thereby imparting rotation to the reel in the direction of the arrow T^2 .

Referring to Figs. 2 and 3, let B designate the winding-on bobbin, T the reel, and d the filament or thread being drawn from the reel to the bobbin. The hub M of the reel is placed over a tubular stationary spindle b formed as a projection on a bracket E , which is fastened by a set-screw P on the usual vertical supporting rod A (shown in section in Fig. 3). The reel will remain stationary on this hollow spindle, but may be turned by hand in order to search for the end of the filament. Through the hollow spindle b passes a rotatory spindle f carrying fast and loose pulleys p and p' at one end, and having fastened at the other end the hub-carrying arms O supporting the ring or annular cap F . This ring F is preferably made of sheet metal semi-circular in cross-section so as to be hollow, and of a diameter very slightly larger than that of the reel, in order that it may be

applied close against the side of the reel and in a plane parallel thereto and preferably concentric therewith (although a slight degree of eccentricity might not be injurious).
 5 The filament is drawn from the skein, carried over the ring F, and passed through a glass eye *c* at the center or axis of the reel, from which it is carried up to the winding-on bobbin B. The ring F is revolved at a speed
 10 proportionate to the speed of the bobbin B and from the same source of power through the medium of a spindle *e* carrying a pulley over which passes a cord or belt *g* running over the fast or loose pulleys *p* or *p'*.

15 The purpose of rotating the ring F is to reduce the friction of the filament in passing over it. With a stationary ring the filament moves over the ring obliquely, its motion resolving itself essentially into two movements,
 20 one in a radial direction across the face of the ring, and the other in a rotative direction traversing the ring circumferentially. The former motion is attended by a very insignificant friction, while the friction of the lat-
 25 ter movement is much greater and is accompanied by much greater liability of the filament being torn by contact with minute and imperceptible roughnesses on the ring. This
 30 rotatory movement of the filament relatively to the ring is overcome by movement of the ring at approximately the same speed as that which the filament assumes as it reels off. It
 35 results from this that the filament has little or no movement against the ring otherwise than that of traversing it transversely, by which its contact with the ring is very brief, and is accompanied by the minimum of friction.

40 The advantages resulting from my improved mode of reeling off are very important, because not only may the speed be at least quadrupled, but the silk reel being stationary, the filament, which has only its own mass to carry away, will when broken cease

to move and can be immediately found and 45 tied, while by the old method the torn filament was carried away by the reel, which continued its motion on account of the momentum due to its acquired speed. It will
 50 furthermore be possible to purge or clear the thread by my invention during the reeling, which hitherto has necessitated a second operation.

My invention is not confined in its application to the winding of silk, but may be applied with other textile fibers. 55

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. The improved apparatus for winding silk 60 or other textiles comprising in combination with a reel on which the skein is wound, a rotatively mounted hollow ring of greater diameter arranged in a plane approximately parallel therewith and adjacent thereto, and 65 overhanging the reel, having a smooth rounded outer surface over which the filament is drawn and by which it is carried outward and laterally free from the reel, and a central eye through which the filament passes and from 70 which it goes to the winding-on bobbin.

2. The combination with the reel on which the skein is wound, of a stationary mounting therefor, a ring arranged adjacent thereto over which the filament is drawn, a central 75 eye through which the filament passes to the winding-on bobbin, and means for revolving said ring at a speed approximately equal to the speed of unwinding of the filament, whereby the filament is carried around by the ring, 80 but is not driven positively.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDOUARD FOUGEIROL.

Witnesses:

JULES ARMENGAUD, Jeune,
 R. M. HOOPER.