No. 860,326. PATENTED JULY 16, 1907.

F. J. PRUE.

COP AND SPINDLE CONNECTOR.

APPLICATION FILED APR. 5, 1907.

Fig. 1.

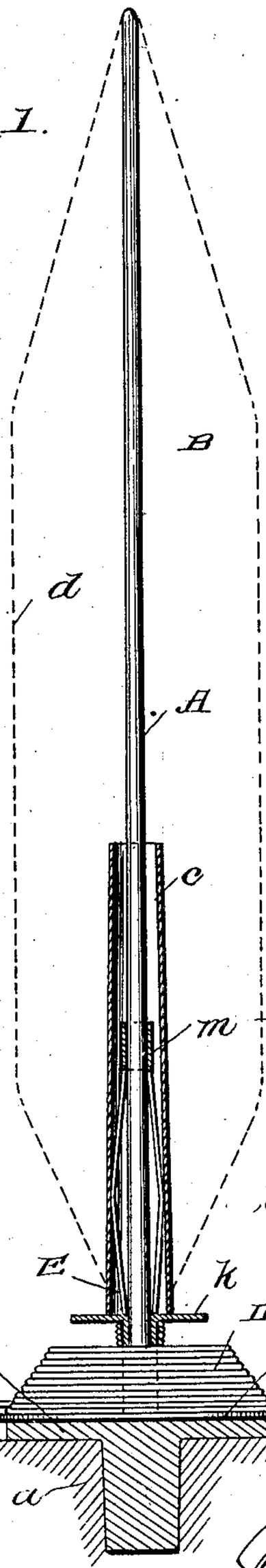


Fig. 2.

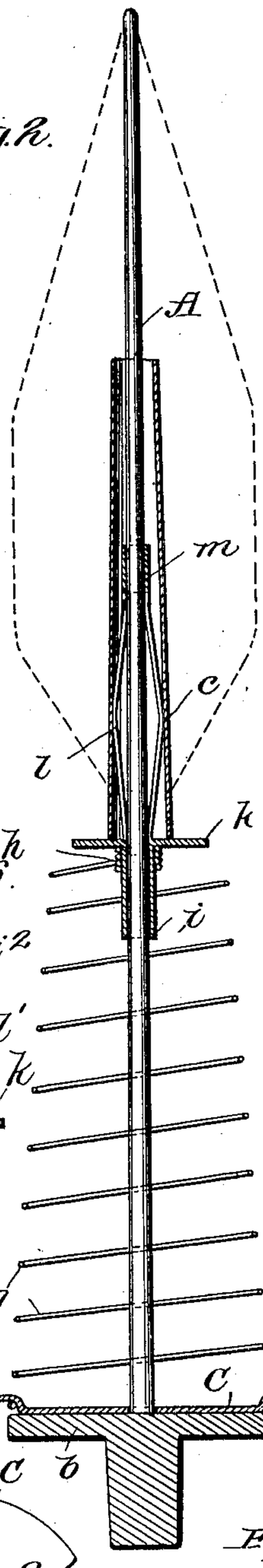


Fig. 3.

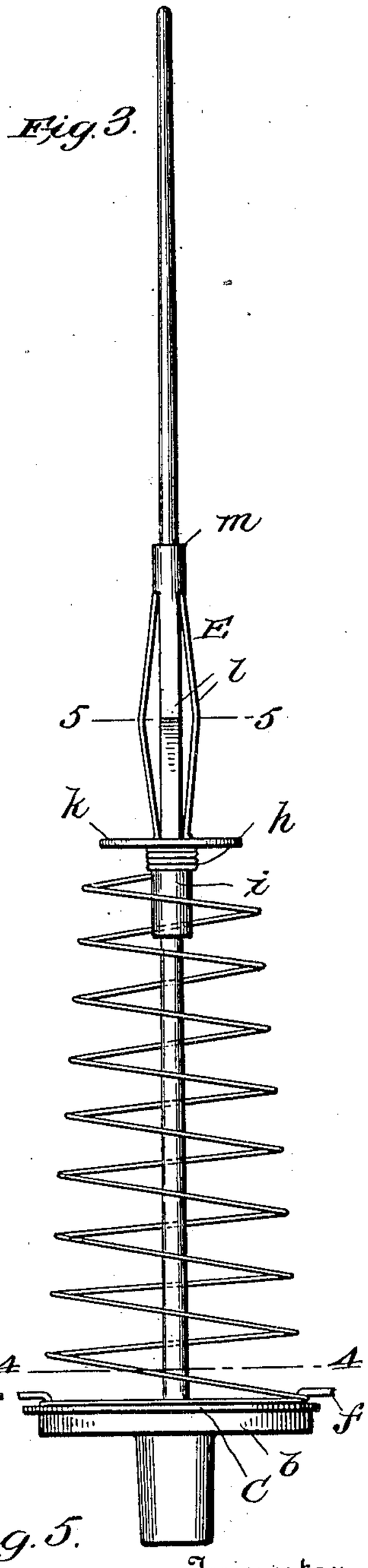


Fig. 6.

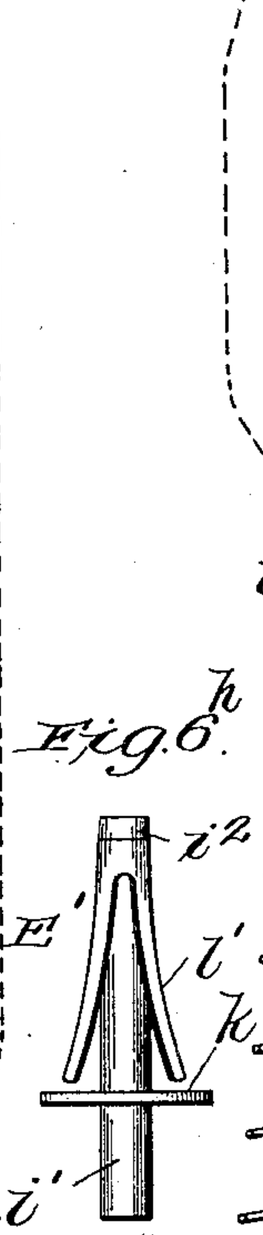
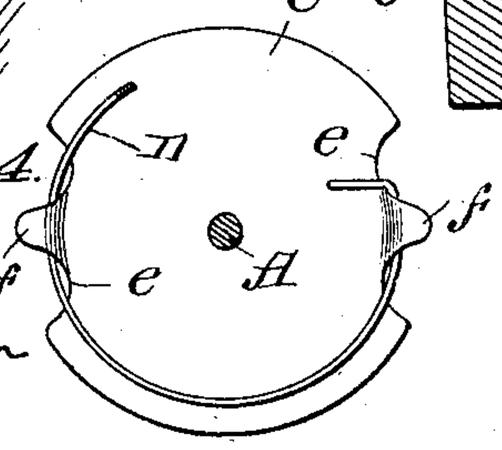
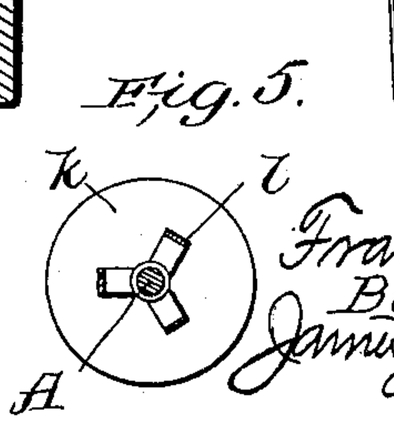


Fig. 5.

Witnesses
Geo. A. Bruce.
Thos. E. Turpin

Fig. 4.





Inventor
Frank J. Prue.
By James L. Shelby
Attorney

UNITED STATES PATENT OFFICE.

FRANK J. PRUE, OF WOONSOCKET, RHODE ISLAND.

COP AND SPINDLE CONNECTOR.

No. 860,326. Specification of Letters Patent. Patented July 16, 1907.

Application filed April 5, 1907. Serial No. 366,611.

To all whom it may concern:

Be it known that I, FRANK J. PRUE, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Cop and Spindle Connectors, of which the following is a specification.

My invention pertains to means for connecting cops, bobbins and the like to spindles; and it contemplates the provision of a connection designed more particularly for use in the art of spooling or winding yarn from a cop tube on a spool or bobbin in knit goods manufacture, and embodying such a construction that initially the cop is held by its weight and the friction between its upper portion and the spindle down on the lower portion of the spindle, and as yarn is taken from the cop and the friction mentioned and the weight of the cop are lessened, the cop will be lifted on the spindle, this being materially advantageous since the raising of the cop removes the liability of the yarn which whirls rapidly around in unwinding, becoming wrapped about the spindle and being subjected to increased tension which makes it uneven in size and frequently results in its being broken.

Other advantageous features peculiar to my invention will be fully understood from the following description and claims when the same are read in connection with the accompanying drawings, forming part of this specification, in which:

Figure 1 is a vertical section illustrating the relative arrangement of a spindle, a cop, and my improvements when a full cop is first placed on the spindle. Fig. 2 is a similar view illustrative of the manner in which the spring operates to raise the cop on the spindle subsequent to the taking of yarn from the upper portion of the cop. Fig. 3 is an elevation showing my improvements properly positioned on a spindle. Fig. 4 is a horizontal section taken in the plane indicated by the line 4—4 of Fig. 3, looking downward, and illustrating the disk to which the base whirl of the spring is clipped. Fig. 5 is a horizontal section taken in the plane indicated by the line 5—5 of Fig. 3 and showing the cop tube holder of my improvements. Fig. 6 is a view of modified cop-tube holder which may when desired be used in lieu of the one shown in Figs. 1–3.

Similar letters of reference designate corresponding parts in all of the views of the drawings.

The spindle A may be and preferably is of the ordinary well known construction, being mounted on a rail *a* and being provided adjacent to the rail with a platform *b*. The cop B is of the original construction shown in Fig. 1—that is to say, it comprises a tube *c*, and yarn *d* which is mounted on the tube and extends about the proportional distance illustrated above the tube, this latter to assure the presence of friction between the cop, when placed initially on the spindle, and the said spindle.

In the present and preferred embodiment of my invention my cop connector or holder comprises an apertured disk C, preferably of sheet-metal, a coiled spring D superposed on the said disk, and a cop tube holder E superposed, in turn, on the coiled spring. The apertured disk C loosely receives the spindle A and rests on the platform *b* thereof, and it is peculiar in that its periphery is recessed as indicated by *e*, and it is provided with upwardly bent, radially disposed clips or tongues *f* which occupy positions between the recesses *e* as best illustrated in Fig. 4. The lowermost whirl of the spring D is arranged on the disk C and under the clips or tongues *f*, and in that manner is connected in a strong and durable manner to the disk. From this it follows that while there is no liability of the spring being casually disconnected from the disk, yet when necessity demands the spring may be expeditiously and easily removed and replaced with a new spring, and this without the employment of skilled labor. The upper end portion of the spring D is formed into a plurality of coils *h* of small diameter, and these coils *h* tightly receive and frictionally hold the lower tubular portion *i* of the cop tube holder E. The said tubular portion *i* of the cop tube holder has raised or otherwise fixed upon it a collar *k* against which the spring D bears at its upper end; and above the said collar *k*, the tubular portion *i* merges into outwardly bent or bowed spring strips *l*, which latter merge in turn at their upper ends into a tubular portion *m* of a diameter to snugly receive the spindle A.

From the construction described it follows that when a cop is placed on the spindle and the cop tube is crowded down on the holder E, the spring strips *l* of said holder will be pressed inward and put under tension, and by tending to spring outward will exert considerable pressure against the inner side of the cop tube and thereby frictionally hold said cop tube on the holder E.

The arrangement of a full cop relative to the spindle A and my novel cop holder or connector is shown in Fig. 1, and by reference to the said figure it will be apparent that the friction between the upper portion of the yarn combined with the weight of the cop will hold the spring D compressed. When, however, yarn is taken from the upper portion of the cop and the friction between the cop and the spindle and the weight of the cop are lessened, the spring D will operate to raise the cop on the spindle after the manner shown in Fig. 2. This raising of the cop is advantageous because it removes the liability of the yarn being wrapped around the spindle and subjected to

increased tension; and it is also advantageous because the cop is held firm and is not permitted to leave the spindle, and because it assures the yarn winding evenly in bobbins, and lessens the liability of the yarn being broken.

It will be readily appreciated from the foregoing that the general construction of my improvements is such that the improvements are susceptible of being used to advantage for holding cop filling in shuttles.

The modified cop tube holder E′, Fig. 6, comprises a tube i', a collar k fixed on the tube at an intermediate point in the length of the latter, and a tubular portion i^2 fixed on the upper portion of tube i' and having spring strips l' extending downward and outward from the tubular portion i^2 and designed to exert outward pressure against and hold a cop tube.

Either of the two types of cop tube holders shown and described or any other type of cop tube holder may be employed in my improvements without involving departure from the scope of my invention as claimed.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a device for the purpose described, the combination of a spindle, a coiled spring mounted on the spindle and bearing at its inner end against an abutment on the spindle, and a cop holder connected to the outer end of the spring so as to be pressed outward by the spring and having outwardly extending strips possessed of resiliency and arranged to frictionally hold the cop tube.

2. In a device for the purpose described, the combination of a spindle, a coiled spring mounted on the spindle and arranged to press a cop outward thereon, and a disk loosely mounted on the spindle and bearing against an abutment thereon and having peripheral recesses and also having radial clips between said recesses engaged with and arranged to hold the innermost whirl of the spring.

3. In a device for the purpose described, the combination of a spindle, a coiled spring mounted on the spindle, a cop holder connected to the outer end of the spring and loosely surrounding the spindle and having outwardly bowed resilient strips, and a disk loosely mounted on the spindle and bearing against an abutment thereon and having peripheral recesses and also having radial clips between said recesses engaged with and arranged to hold the innermost whirl of the spring.

4. In a device for the purpose described, the combination of a spindle having an abutment on its inner portion, a disk loosely mounted on the spindle and against said abutment, a cop tube holder loosely mounted on the spindle, and a coiled spring surrounding the spindle and interposed between and connected to the disk and the cop tube holder.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK J. PRUE.

Witnesses:
EDGAR L. SPAULDING,
ISABELLE SMITH.