(No Model.)

I. E. PALMER.

APPARATUS FOR WINDING THREAD ON SPOOLS.

No. 562,651. Patented June 23, 1896.

Fig. 1.

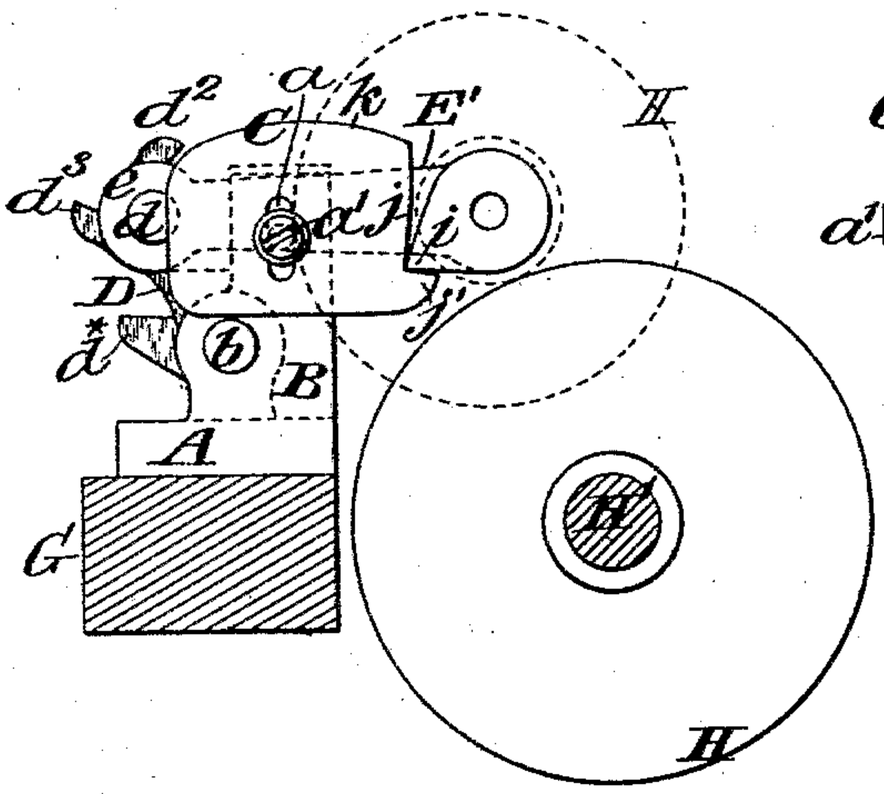


Fig. 4.

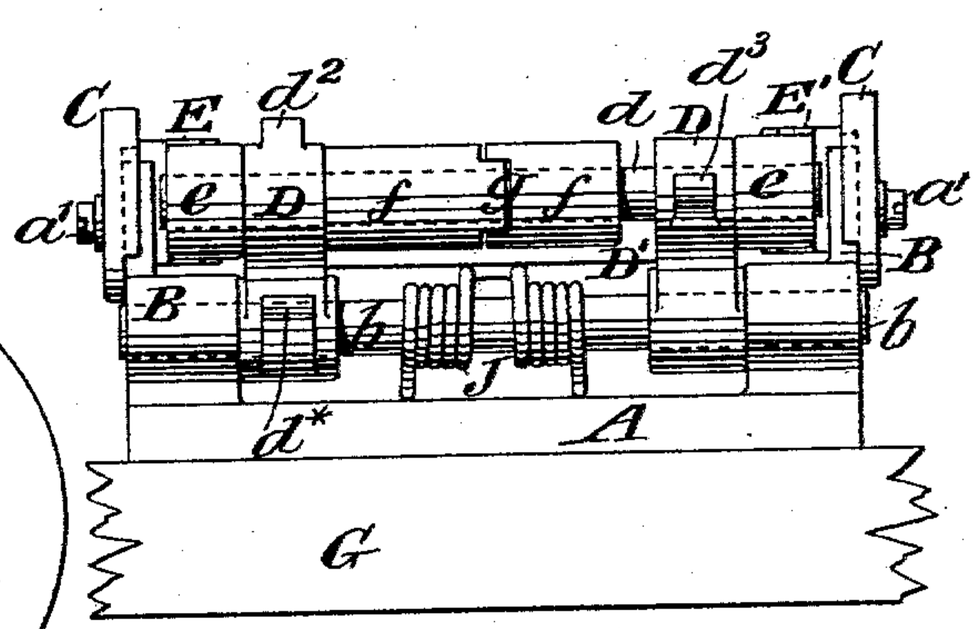


Fig. 2.

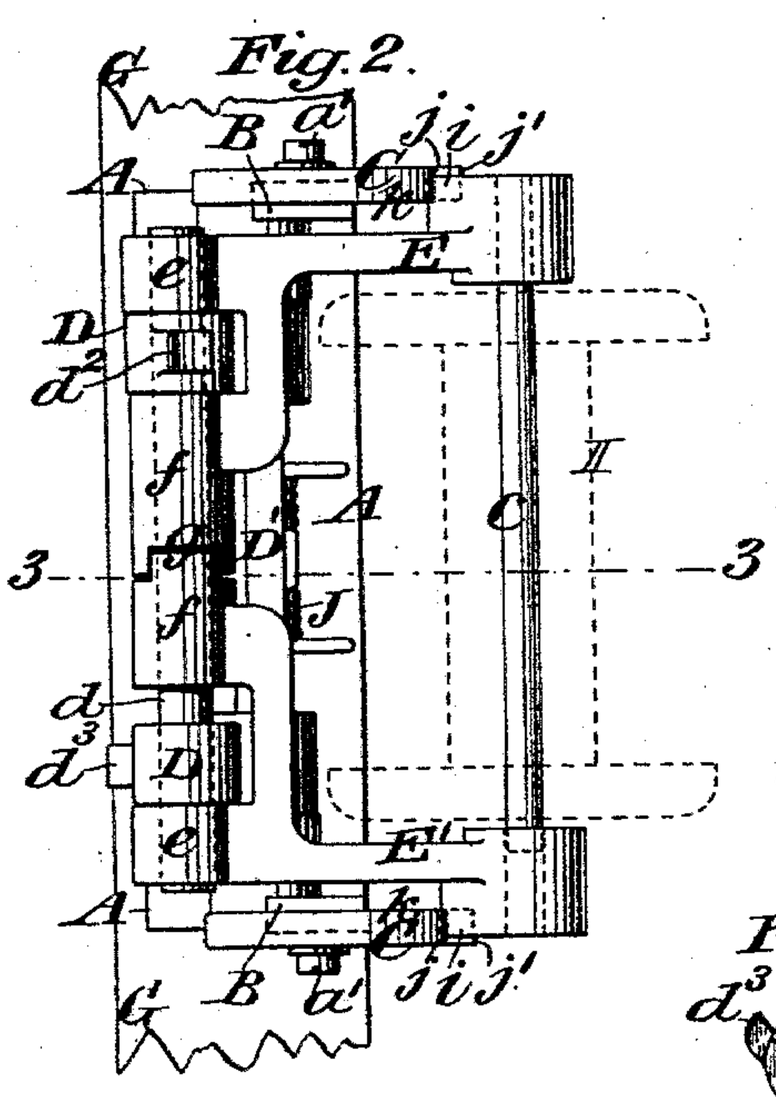


Fig. 3.

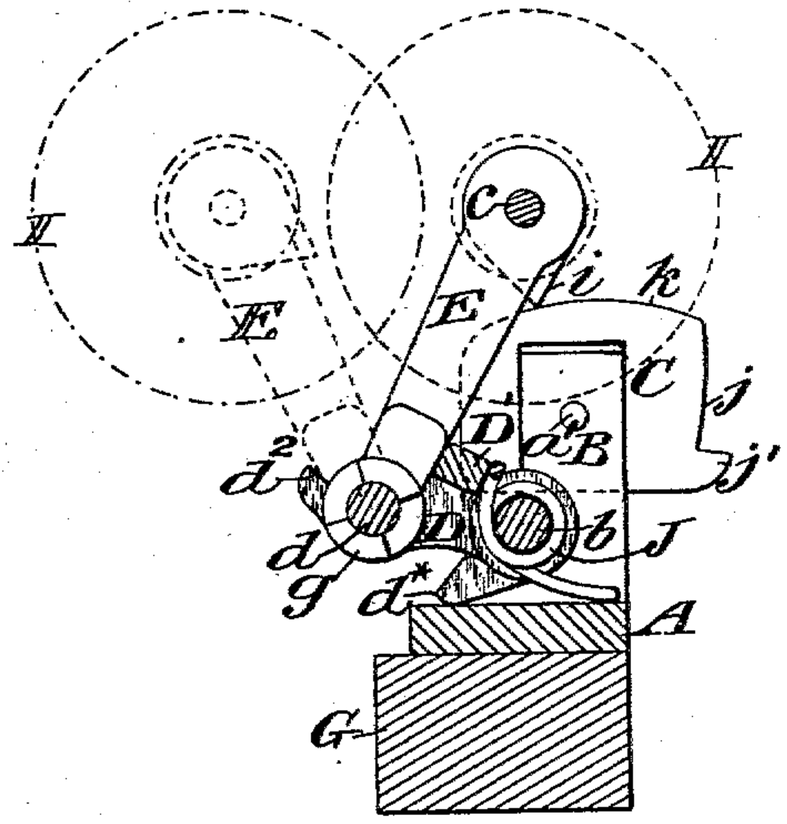
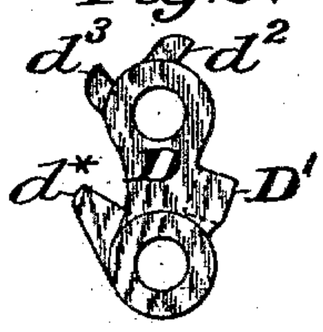


Fig. 5.



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UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

APPARATUS FOR WINDING THREAD ON SPOOLS.

SPECIFICATION forming part of Letters Patent No. 562,651, dated June 23, 1896.

Application filed February 15, 1895. Serial No. 538,497. (No model.)

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Apparatus for Winding Thread on Spools, of which the following is a specification.

The object of this invention is to provide for the automatic stopping of the spool when it becomes full, and to afford facility for the removal of the full spool from the winder-head, and, generally speaking, to enable the change of full spools for empty ones to be performed with as little handling as possible.

I will proceed to describe my invention with reference to the accompanying drawings, and afterward point out its novelty in claims.

Figure 1 represents a side view of a winder-head embodying my invention. Fig. 2 represents a plan of the same; Fig. 3, a transverse section in the line 3 3 of Fig. 2; Fig. 4, a back view corresponding with Fig. 1. Fig. 5 is a detail which will be hereinafter explained.

Similar letters of reference designate corresponding parts in all the figures.

All the movable parts of the winder-head herein represented are supported by a stand A B C, consisting of a base A, on the ends of which are two standards B B and two side plates C C. The side plates C C, which constitute a gage, as will be hereinafter explained, project forward beyond the standards B B. The said plates C C are so fitted to the standards B B as to be adjustable vertically thereon, and are slotted, as shown at *a* in Fig. 1, to receive screws *a'*, which screw into the standards to secure the adjustment. The stand is supported on one of the girths G of the framing of the winder at a suitable distance from the drum or pulley by which the spool is driven. The said drum or pulley H and its shaft H' are represented in Fig. 1, and a spool I is shown in dotted outline in Figs. 1, 2, and 3.

In the standards B there is pivoted, by a pivot *b*, a swinging spool-carrier. This spool-carrier is represented as consisting of a swinging frame D D' and two independently-swinging arms E E', pivoted to the said swinging frame D D' by a pivot *d* and carrying the spool-spindle *c*.

The swinging frame D D' consists of two arms D and a connecting-bar D'. A side view of this frame detached is given in Fig. 5. The pivot *b* passes through the two arms D of said frame, and the said frame is confined lengthwise between the standards B, as may be understood by reference to Fig. 4.

The spindle-carrying arms E E' are capable of swinging on their pivot *d* between a position in which both are supported on the bar D' of the frame D D' and positions in which they are separately supported by stops d^2 d^3 on the arms D of said frame. The spindle-carrying arms E E' are represented as each made with two hubs *e* and *f*, which embrace the arms D between them, and the inner ends of the hubs *f* are constructed to form a clutch *g*, as shown in Figs. 2 and 4. The hubs *e f* of the arm E are so spaced apart that the said arm is confined in place lengthwise of the pivot *d* by its respective arm D of the frame D D'. The hubs *e f* of the arm E' are so spaced apart, as shown in Figs. 2 and 4, as to leave room between them and their respective arm D of the frame D D' for a sufficient longitudinal movement of the said arm E' on the said pivot *d* to clutch it with and unclutch it from the arm E. The spool-spindle *c* has one end fast in the arm E and its other end merely enters loosely into a bearing in the arm E'. When the two arms E E' are clutched together, the arm E' receives its respective end of the spindle and a spool on the spindle is confined lengthwise thereon between the said arms, and when the arms are unclutched the arm E' is withdrawn from the spindle. The arms E E' when clutched are capable of being brought forward and dropping down between the said plates C and standards B, as shown in Figs. 1 and 2, and when in that position the arm E' is so confined laterally by the adjacent standard or plate as to be kept clutched with the arm E, so that both move together about the pivots *b* and *d*, but when said arms are both raised up and thrown back to a position to clear the standards, as shown in dotted outline in Fig. 3, the arm E' may move aside far enough to disengage it from the end of the spindle *c*, and when so disengaged it may drop back far enough to clear it from the end of a spool on the spindle and so permit the spool to be drawn off said spindle.

The pivots *b* and *d* and the gage-plates C are so arranged and the weight of the several

parts of the spool-carrier is so disposed that the spool-carrier has a tendency to swing backward automatically, as indicated in Fig. 3, when not restrained, as shown in Fig. 1, by the projections *i* on the spool-carrying arms E E′ being in front of the gage-plates C. This tendency of the weight of the spool-carrier may be sufficient for the successful operation of the apparatus, but in order to assist in throwing it back I have represented (see Figs. 3 and 4) a spring J coiled around the pivot *b* and having one end bearing on the base A and the other end against the bar D′ of the swinging frame D D′. The backward-swinging movement is limited, as will be hereinafter more fully explained, by a stop *d**, consisting of a projection on one of the arms D, coming in contact with the base A, as shown in Fig. 3. The front edges *j* of the gage-plates C are approximately vertical, being only slightly inclined forward, as shown in Figs. 1 and 3, that the weight of the spool-carrier and the throwing-back action of the spring upon it pulling the said arms against the said edges will exert a certain degree of downward pressure on the arms E E′ and thereby tend to press the spool into contact with the driving drum or pulley H. Stops *j′* for the arms E E′ are provided on the gage-plates C below the curved front edges *j*. The upper edges of the said plates C are approximately horizontal and are represented as having an upward inclination for some distance back from the front edges *j*, as indicated at *k* in Figs. 1 and 4.

The operation of the device is as follows: When a spool is to be placed on the spindle *c*, the spool-carrier is swung back to a position in which the spindle-carrying arms E E′ are clear of the gage-plates C and the arm E′ is free to be moved aside on the pivot *d* to unclutch it from the arm E. This position is indicated in Fig. 3 by the representation of the frame D D′ in full outline with its projection *d** stopped against the base A, and the representation of the arm E in dotted outline stopped against the stop d^2 on said frame. The arm E′ is then moved aside and unclutched, and is then permitted to drop further backward and downward until it is arrested by the stop d^3 on the said frame, leaving room around the free end of the spindle *c* for the placing of the spool upon the latter. After the spool has been placed on the spindle, the arm E′ is returned to the position opposite the arm E and moved along the pivot *d* until it engages with the end of the spindle and is again clutched with the latter arm. The whole of the carrying-frame is then swung forward on the pivots *b* and *d* until the projections *i* on the arms E E′ pass over the front edges *j* of the gage-plates and allow the spindle to drop down into contact with the driving pulley or drum H, as shown in Figs. 1 and 2. The end of the thread to be wound being then attached to the spool, the winding proceeds, and as the quantity of thread on the body of the spool increases the spool rises, the arms E E′ rising with it, until when the spool becomes full or has a desired quantity wound upon it the projections *i* of the arms E E′ rise clear above the abruptly-terminating front edges *j* of the gage-plates and leave the whole spool-carrier with the spool in it free to swing back by its weight aided by the action of the spring J, if the latter be used, until the stop *d** is arrested on the base A. When this arrest takes place, the arms E E′ have passed the highest points on the top of the gage-plates C, as shown in full outline in Fig. 3. From this position they may be moved back by hand to the position shown in dotted outline in Fig. 3, where they are arrested by the stop d^2 on the frame D D′, but if the spring J be used the momentum acquired by the spool and its carrying-arms will be sufficient to swing them back to the position in which the arms are shown in dotted outline in Fig. 3. The arm E′ being now clear of its adjacent gage-plate C is free to be unclutched and dropped farther backward until arrested by the stop d^3 on the frame D D′, in which position it is clear of the spool and permits the spool to be drawn off the spindle. An empty spool is then placed on the spindle, as hereinbefore described, and the arm E′ is again raised and moved into engagement with the spindle and clutched with the arm E, and the spool-carrier and spool are then moved forward to allow the spool to drop into its operative position over the pulley or drum, as shown in Fig. 1.

It will be understood that the quantity of thread wound upon the spool is regulated by the height of the front edges *j* of the gage-plates C, which, consequently, constitute a gage to regulate the quantity of thread to be wound on the spool and to produce the automatic stoppage of the winding when such quantity has been wound. It is with a view to provide for a variation of the quantity to be wound that these gage-plates or gage are made separate from the standards B, and secured adjustably thereto to be capable of being raised or lowered.

It may be here stated that the only object of the arm E′ is to steady the end of the spindle *c*. This arm E′ may in some cases be dispensed with and in such case there will be a gage C on one side of the machine only.

What I claim as my invention is—

1. In a spool-winding apparatus, the combination of a stand, a gage affixed to said stand, a spool-carrier consisting of a frame pivoted to said stand to swing backward and forward thereon and a spindle-carrying arm pivoted to said frame to swing upward and downward thereon under the control of said gage, and means substantially as herein described for actuating said carrier to hold the spindle-carrying arm against and throwing it over the operating edge of said gage, substantially as herein set forth.

2. In an apparatus for winding spools, the

combination of a stand, a spool-carrier consisting of a frame pivoted to said stand and spindle-carrying arms pivoted separately to said frame but provided with a clutch by which they are capable of being connected to swing together, a spool-spindle the ends of which are fitted respectively to said arms, and side plates affixed to said stand and between which said arms are movable while so confined laterally as to keep them clutched together and both in engagement with the spindle, substantially as herein set forth.

3. The combination with a stand, of the swinging frame D D′ pivoted to the said stand, the spindle-carrying arms E E′ pivoted separately to said swinging frame and movable the one toward and from the other and provided with a clutch *g*, the spool-spindle *c* fitted to said arms, and the spring J applied to said frame D D′ for throwing back the said frame and arms, the said stand being furnished with side plates between which the said arms are confined laterally, and the said frame being furnished with stops d^* d^2 d^3 for arresting its own pivotal movement and the pivotal movement of said arms, all substantially as and for the purpose herein set forth.

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