J. SCHWEITER.

CROSS WINDING MACHINE.

APPLICATION FILED FEB. 1, 1910.

1,003,301.

Patented Sept. 12, 1911.

4 SHEETS—SHEET 1.

Fig. 1.

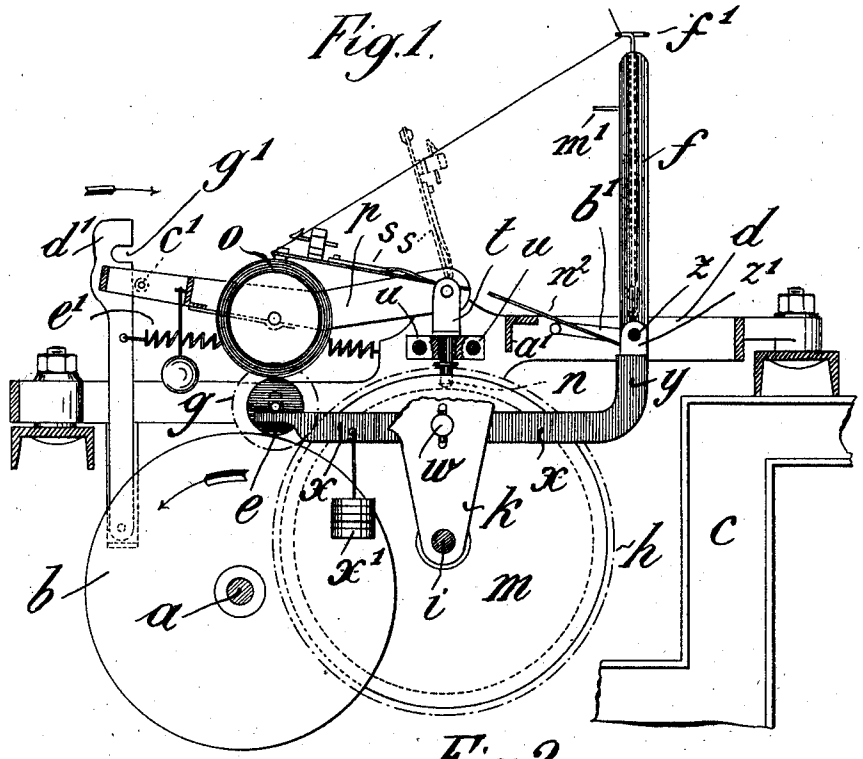
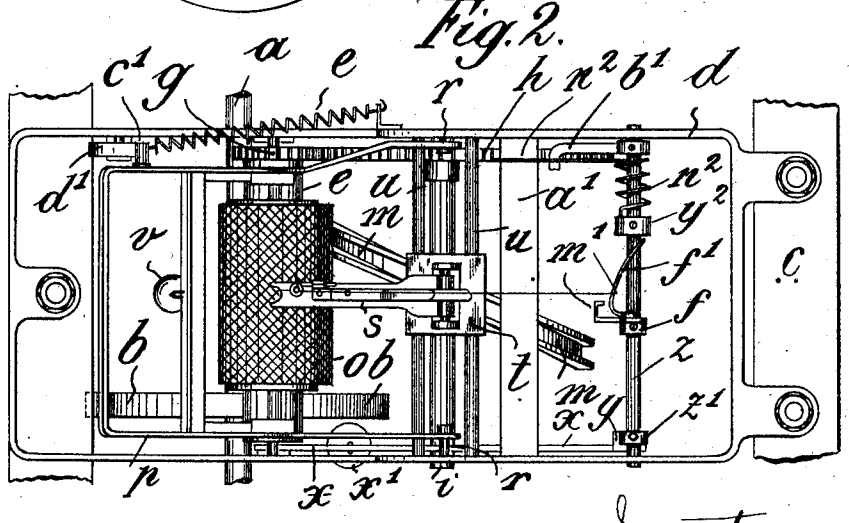


Fig. 2.



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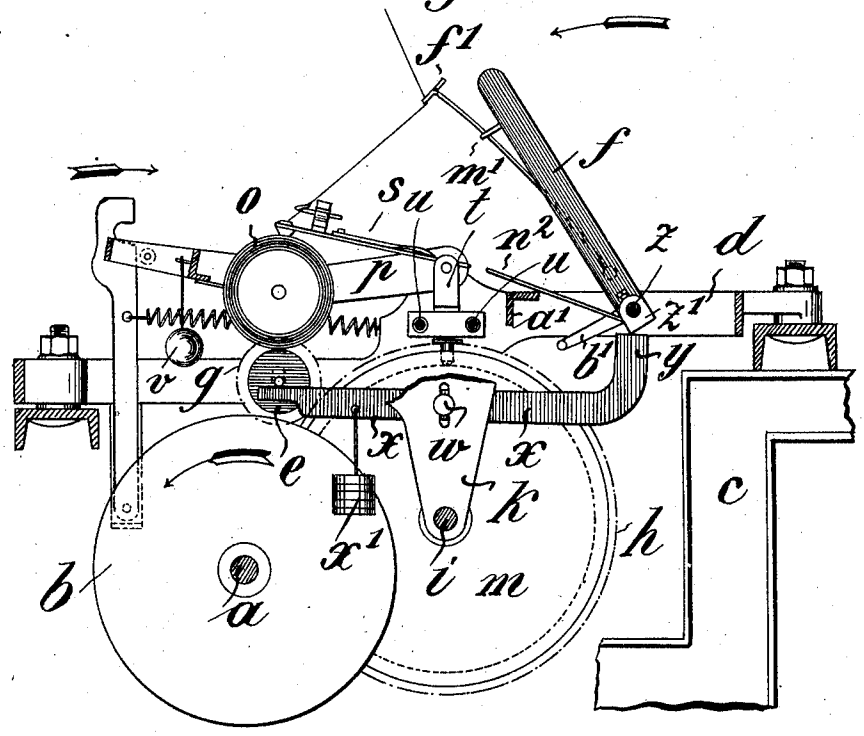
4 SHEETS—SHEET 2.

Fig. 3



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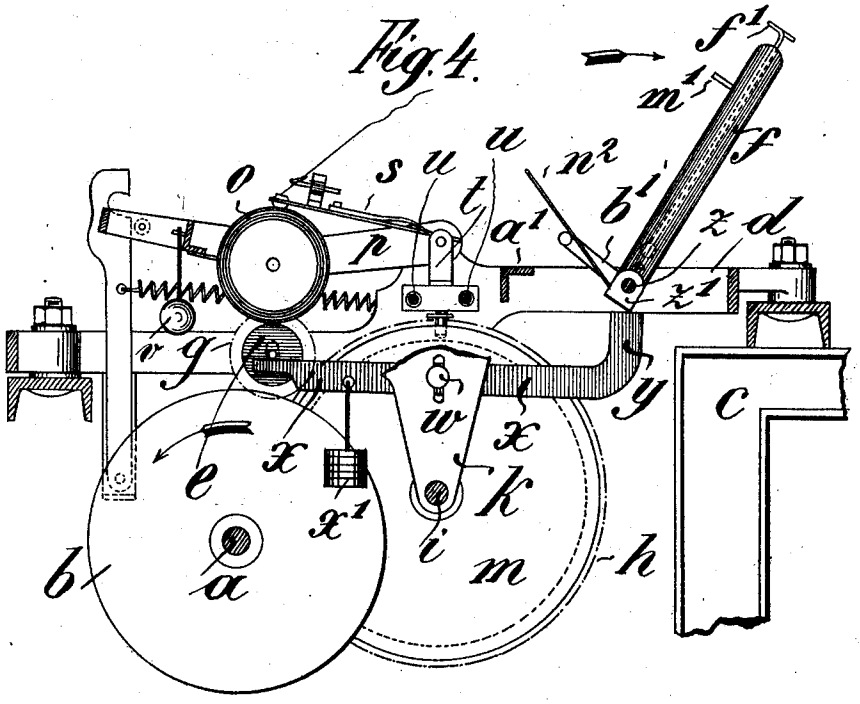
4 SHEETS—SHEET 3.

Fig. 4.



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4 SHEETS—SHEET 4.

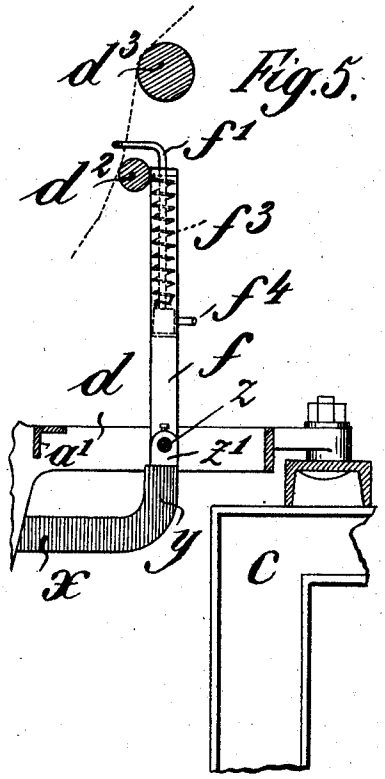

Fig. 5.

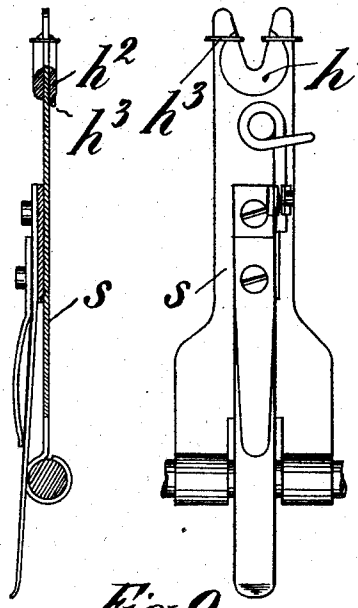

Fig. 7.

Fig. 8.

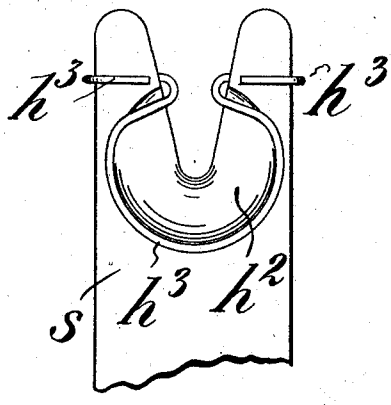

Fig. 9.

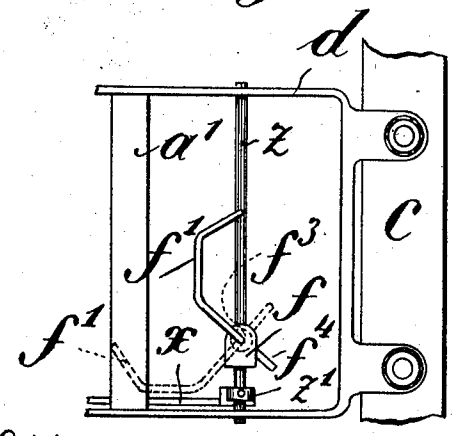

Fig. 6.

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UNITED STATES PATENT OFFICE.

JEAN SCHWEITER, OF HORGEN, NEAR ZURICH, SWITZERLAND.

CROSS-WINDING MACHINE.

1,003,301. Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed February 1, 1910. Serial No. 541,281.

To all whom it may concern:

Be it known that I, JEAN SCHWEITER, of Horgen, near Zurich, Switzerland, a citizen of the Swiss Confederation, and resident of Horgen, near Zurich, Switzerland, have invented certain new and useful Improvements in Cross-Winding Machines, of which the following is a specification.

The present invention relates to improvements in cross-winding machines and consists principally in the employment of an intermediate roller actuated by a driver which also effects the rotation of the winding spool and the reciprocation of the thread carrier as well as the automatic throwing out of the winding spool follows either after tearing or breaking of the thread.

The drawing illustrates one way of constructing such a cross winding machine, and in the views shown: Figure 1 is a side view partly in section; Fig. 2 is a top plan view; Figs. 3 and 4 show two different operating positions; Figs. 5 and 6 represent two views of a modified construction of the feeder arms; and Figs. 7, 8 and 9 show three views of the thread carrier on an enlarged scale.

Referring to the drawings in further detail, *a* is the driving shaft on which the driving disk *b* is mounted. On the stand *c* there is mounted a frame *d* on which the intermediate roller *e* is journaled in bearings adapted to have slight vertical movement. This intermediate roller lies normally with one end on the driver *b*. The opposite end of the intermediate roller carries a toothed wheel *g* which meshes with a second toothed wheel *h* carried on a shaft *i*. This shaft *i* is journaled in hangers *k* in the frame work *d*. The winding spool *o* rests in a swinging frame *p*, mounted on bolts *r* in the frame work *d*.

s is the thread carrier composed of spring plates, one end of which always lies against the spool. It is placed on a carrier *t* which has underneath, a pin *n* that engages within a groove in the grooved disk *m* on the shaft *i*. The carrier *t* can slide on the guide rails *u*. In order to facilitate the replacing of the spool in the machine, the thread carrier may be set in the position indicated by dotted lines in Fig. 1. The spool *o* can in the usual manner run loose in the frame *p* and is, from the pressure of a weight *v*, on said frame given a constant pressure on the intermediate roller *e*. The journal of the roller *e*, mounted in the frame *d* is touched underneath by a double-armed lever *x* swinging on a bearing *w*. One end of this lever is loaded by a weight *x'*, whereas the other end of the lever-arm has a stop *y* and is bent over at the top. Against the stop lies a projecting piece *z'* affixed to the shaft *z*. The shaft *z* turns in the frame *d* and carries an arm *f* which is provided with a resilient thread-guide *f'*, and *m'* is a stop for the thread-guide.

At normal tension on the thread, the arm *f* takes the position indicated in Fig. 1, *i. e.* it stands vertical. The projecting piece *z'* rests on the bent part *y* of the lever *x*. The shaft *z* carries further, an adjusting ring y^2, in which one end of a spring n^2 is fastened; the free end of which spring rests on a bar *a'*. A finger *b'*, which grips below the spring, is also attached to the shaft *z*.

On one side of the frame *p* is journaled a roller *c'*, which engages within an upwardly inclined notch *g'* of a lever *d'*, said lever oscillating in the frame *d*. A spring *e'* constantly tensions the lever against the roller *c'*. This arrangement has for its function to automatically disengage the winding spool as will be presently explained.

The machine operates as follows. As already remarked, the intermediate roller *e* is driven by the rotation of the driver *b* which also, by means of the gears *g*, *h*, rotates the grooved disk *m*. Through this, the carrier *t* and with it the thread guiding arm are also set in motion, back and forth.

With the increase of the diameter of the winding-on-spool, the frame *p* raises itself up or describes an arc around the bolts *r*. In the same way the thread-carrier is also lifted and describes an arc around its axis and since these two axes coincide, it follows that as the thread spool increases (within the possible limits of the diameter of the latter) the point where the thread leaves the carrier always lies upon the spool so that notwithstanding the increasing diameter of the spool, sharp spool edges will be assured. When the spool has reached the regulation size so, in the meantime, has the roller *c'* arrived adjacent the inclined recess *g'*. There, the spring *e'* draws the lever *d'* in the direction of the arrow, causing the roller *c'* to rise slightly and carry with it the frame *p* and consequently the spool is held in suspended position and cannot any longer be driven by the intermediate roller.

As is usual, the arm *f* will, at normal

thread tension, take the upright position shown in Fig. 1. Should the tension of the thread, running on to the spool o, increase for any reason, then the thread-guide f' will give to a certain extent. At still more increased tension, *i. e.* when the member f' comes in contact with the stop m', then will the strength of the spring n^2 be overcome and the arm f will be brought into the position shown in Fig. 3, whereby the lower left-hand edge of the projecting piece z' will depress the right end of the lever x and raise the left end thereof. This will cause the intermediate roller e to be lifted from the driver b. This position is shown in Fig. 3. Through this means the connection between driver and intermediate roller is broken.

Should the thread-tension now cease altogether, then will the spring n^2 expand and gradually erect the arm. When the latter has regained its upright position, the arm b' meets with the free end of the spring n^2; whereby the further influence of the spring on the arm f is stopped. The latter has by now regained its working position and the wound-up thread will balance it during the operation. Should, however, breaking of the thread occur when the arm is in the position shown in Fig. 3, the arm f will be swung to the right by the spring n^2. In so doing the square set edge of the projecting piece z' acts on the lever x and produces the same effect as in the tearing of the thread. The position of the separate parts when the thread breaks is indicated in Fig. 4.

Another way of arranging the arm is represented in Figs. 5 and 6, where the thread-guide can be thrown out to the side. As will be seen in Fig. 6, the thread guide f' is made U-shaped and is swivelly mounted on the arm f. A spring f^3 fixed to the guide f' and the arm f has the function always to retain the thread-guide in the position shown in Fig. 6. When it is desired to take hold of the thread, it will be necessary only to bring the thread-guide into the dotted position of Fig. 6 by means of the handle f^4, and it will snap back into its working position as soon as released.

In the described arrangement, the arm f is suitably placed so that it can by its own weight hold the thread in tension, that is it tends to draw out the thread between the rods d^2 and d^3. In thread breaking, the operation is the same as in the already described instance in Fig. 1.

As regards the thread-carrier, it should be stated, that the eye h^2 (Figs. 7 to 9) at the working point is inclosed by a wire h^3 in order to prevent any jumping off or out of the thread during the winding. This wire may suitably be of brass.

I claim:—

1. A thread-winding machine comprising a frame, a rotary driving disk, a roller driven thereby, said roller mounted in bearings adapted to have vertical movement in the frame, a reel supported on and driven by the roller, a carriage mounted to reciprocate in the frame, a thread guiding arm carried by the carriage, a grooved cam disk mounted beneath and adapted to impart reciprocating movement to the carriage, gearing connection between the roller and the grooved cam disk whereby to actuate the latter, a second and spring tensioned thread guiding arm mounted on a shaft, a lever pivoted between its ends, one end being in lifting relation to the roller to raise the latter and its supported reel from operative position, said shaft having means whereby when it is rocked by the oscillation of the second arm the engaged end of the lever is depressed and an automatically actuated lock adapted to hold the reel in elevated position.

2. A thread winding machine comprising a frame, a rotary driving disk, a roller driven thereby, said roller mounted in bearings adapted to have vertical movement in the frame, a frame swingingly mounted in said first named frame, a reel journaled in said swinging frame and supported upon and driven by said roller, a carriage mounted to reciprocate in the first named frame and having a thread guiding arm, a grooved cam disk mounted beneath and adapted to impart reciprocating movement to the carriage, gearing connection between the roller and the cam disk whereby to actuate the latter, a second and spring tensioned thread guiding arm actuating a shaft, a horizontally disposed lever pivotally mounted on the first named frame having its opposite ends in engagement with the roller and the spring tensioned arm respectively, means borne on said shaft for rocking said pivoted lever to lift the roller and its supported reel frame from operative position and an automatically actuated lever adapted to engage with and hold the reel frame in elevated position.

3. A thread winding machine comprising a frame, a rotary driving disk, a roller driven thereby, said roller mounted in bearings having vertical movement in the frame, a second frame swingingly mounted in the first named frame, a reel journaled in the second frame and supported upon and driven through the medium of the roller, a carriage mounted to reciprocate in the first named frame and having a thread guiding arm, a wabbling disk mounted beneath and adapted to impart movement to the carriage, gearing connection between the roller and the wabbling disk adapted to impart movement to the latter from the former, a vertically disposed spring tensioned thread guiding arm mounted on a shaft in the first named frame, and a rocking lever having its opposite ends engaging with the roller and the spring ten-

sioned arm respectively, said shaft having means to depress the engaging end of the rocking lever on any position of said spring tensioned arm out of the vertical whereby to raise the roller and reel from operative position and stop the rotation of the wabbling disk.

The foregoing specification signed at Zurich, Switzerland, this 14th day of January, 1910.

JEAN SCHWEITER.

In presence of—
JAC SURLEER,
HEINR. BAUMGARTNER.