(No Model.) 4 Sheets—Sheet 1.

J. SCHWEITER.

WEFT THREAD SPOOLING MACHINE.

No. 596,794. Patented Jan. 4, 1898.

Fig. 1.

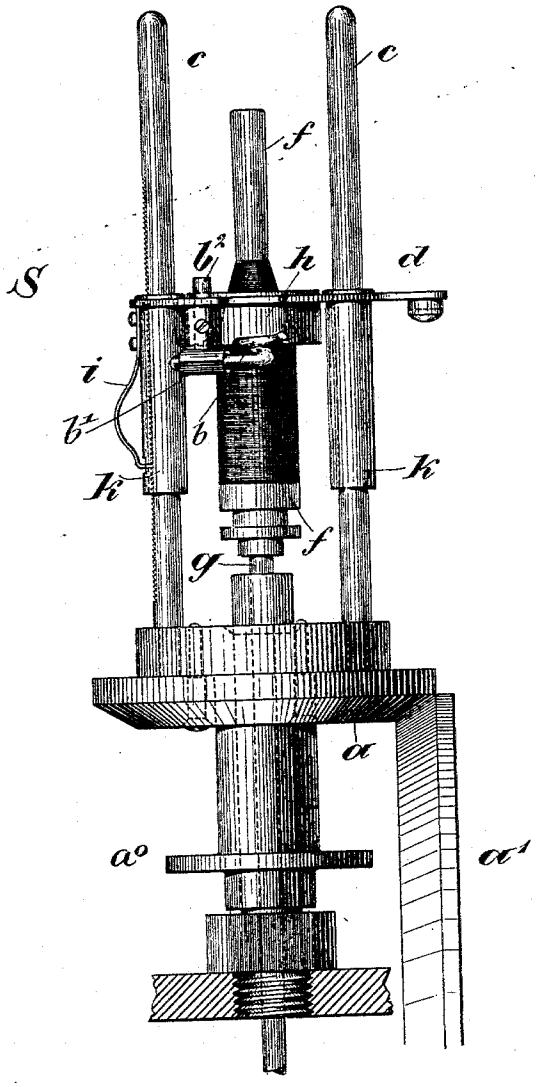

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Fig. 2.

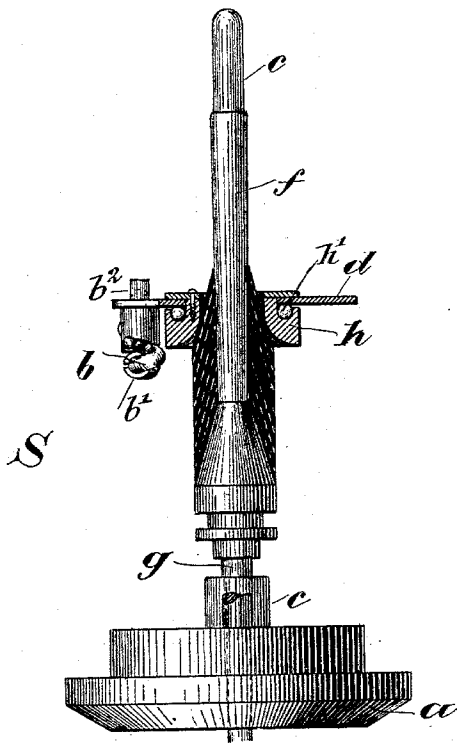
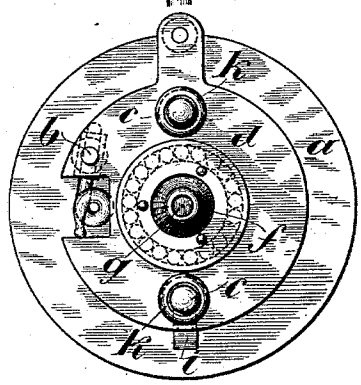


Fig. 3.



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J. SCHWEITER.

WEFT THREAD SPOOLING MACHINE.

No. 596,794. Patented Jan. 4, 1898.

Fig. 4.

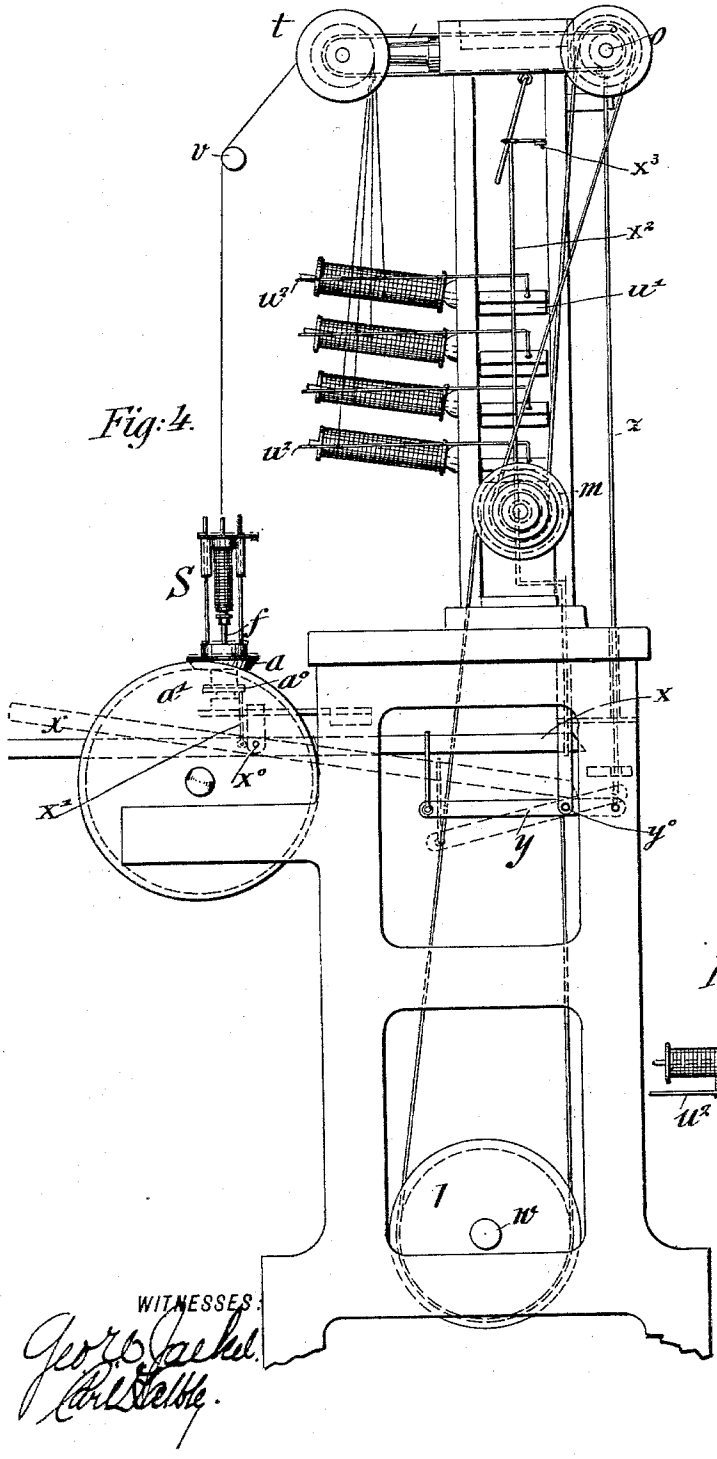


Fig. 4ª.

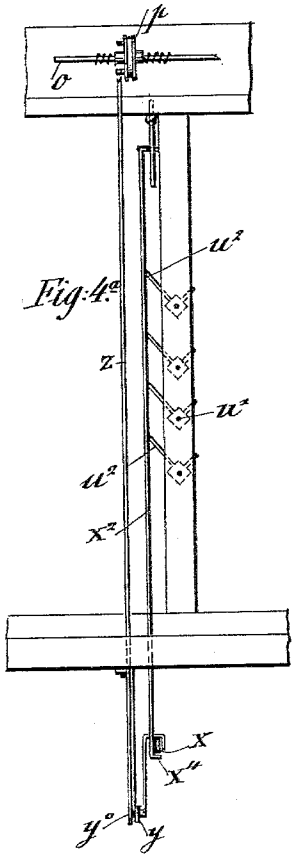
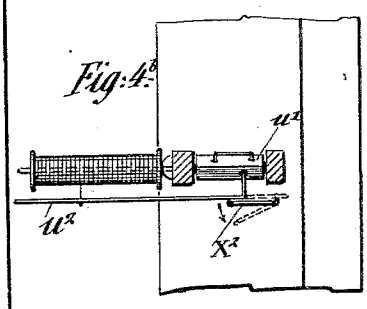


Fig. 4ᵇ.



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(No Model.) 4 Sheets—Sheet 4.

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WEFT THREAD SPOOLING MACHINE.

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Fig. 5.

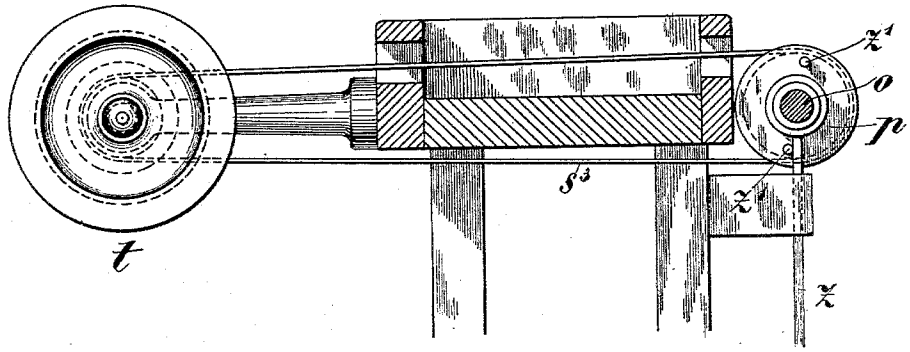
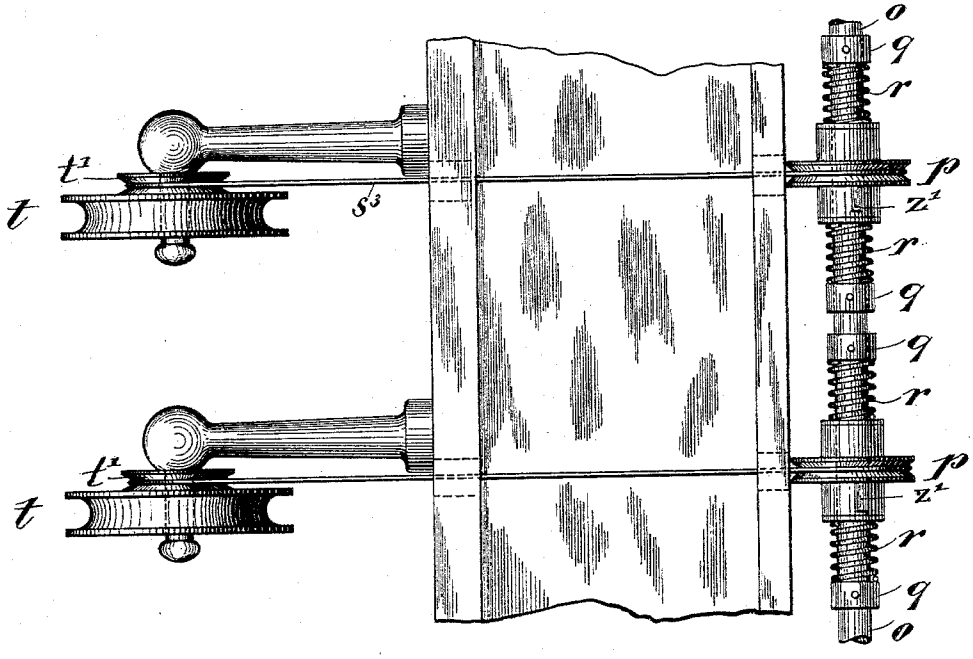


Fig. 6.



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UNITED STATES PATENT OFFICE.

JEAN SCHWEITER, OF HORGEN, SWITZERLAND.

WEFT-THREAD-SPOOLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 596,794, dated January 4, 1898.

Application filed July 17, 1896. Serial No. 599,484. (No model.) Patented in Germany July 17, 1894, No. 86,906; in Switzerland September 22, 1894, No. 8,974, and in France October 31, 1894, No. 242,546.

To all whom it may concern:

Be it known that I, JEAN SCHWEITER, a citizen of the Republic of Switzerland, and a resident of Horgen, Switzerland, have invented certain new and useful Improvements in Weft-Spooling Machines, (for which I have obtained patents in Germany, No. 86,906, dated July 17, 1894; in Switzerland, No. 8,974, dated September 22, 1894, and in France, No. 242,546, dated October 31, 1894,) of which the following is a specification.

In weft-thread-spooling machines the spindle on which the thread is wound in so-called "conical" layers moves relatively to the thread-guide, the thread-guide or the spindle being moved up and down in the direction of the axis of the latter, or both are simultaneously moved in opposite directions. Each conical layer which is formed during the up-and-down motion either by the rotation of the spindle on its own axis or by the rotation of the thread-guide around the spindle, abuts at the end of the down winding of the thread against the carrier of the thread-guide and imparts thereby a shifting motion to the thread-carrier in the direction of the upward motion of the spindle, so that each new conical layer appears to be set off for a corresponding length toward the preceding layer and that the spindle is thus gradually covered by these conical layers of thread.

In the present invention the shifting motion, which is produced by the action of the conical layers on the carrier or support of the thread-guide, is accomplished through the medium of a rotary ring with the least possible resistance, which ring becomes, at the moment of the shifting action, by the "friction," so to say, part of the spindle itself, so that the friction which takes place between the shifting part and the part that is shifted, due to the fact that one of these parts turns on its axis, is thereby removed from the conical layers of thread and taken up by the rotary ring referred to. Hitherto such means were lacking, and in consequence thereof the spooled thread suffered the friction exerted thereon, while, on the other hand, the layers of thread were wound irregularly toward each other on the spindle.

The invention relates, further, to certain improvements in the means for guiding the thread, which consist in the arrangement of of a frictional mechanism for the thread-guiding pulleys, by which the transmission of various speeds to the same may be produced, and, furthermore, in a speed device for this frictional mechanism which is placed in connection with a stop-motion for the spindle of each spool.

In the accompanying drawings, which fully illustrate my improved thread-spooling machine, Figure 1 represents a side elevation of my improved spooling device. Fig. 2 is a vertical central section of the same, in which the motion-transmitting mechanism and the guides for the spindles are broken away. Fig. 3 is a plan view of Fig. 1. Fig. 4 shows a side elevation of the entire machine with the thread-guiding pulleys, the motion-transmitting mechanism for the latter, and the stop-motions for the same. Fig. 4^a is a detail view of the stop-motion, looking from the rear. Fig. 4^b is a detail transverse section of the stop-motion. Fig. 5 is a detail vertical longitudinal section of the upper part of the thread-spooling machine with the thread-guide rolls and the motion-transmitting rolls drawn on a larger scale. Fig. 6 is a plan view of Fig. 5.

Similar letters of reference indicate corresponding parts.

In regard to the construction of the spooling device it is assumed that a spindle f has a regular up-and-down longitudinal or axial motion, while the thread-guide b and its carrier d turn around the spindle and produce thereby the winding up or spooling of the thread. The carrier d is arranged shiftably on two vertical guide-pins c, which are screwed into the friction-disk a, so as to be firmly connected with the same. For the transmission of the shifting action from the conical layers of thread that are formed around the spindle on the carrier d (which shifting action corresponds to each upward motion of the spindle and the thickness of the conical layers made during the up-and-down motion) is arranged a rotatable ring h, which surrounds the spindle and which in the moment of the thrust produced by the layers is retained on the spool by losing the rotary motion imparted by the

carrier d and so that thereby the spool itself is protected against the friction of the continuously-rotating carrier.

For the purpose of increasing the freedom of rotation of the ring h in the carrier d it is best to introduce between the parts, as shown in Figs. 2 and 3, antifriction-balls h', so that only a rolling friction takes place between the parts. This results in the thorough protection of the silk threads and in an easy and effective spooling of the same. The carrier d receives an intermittent or step-by-step shifting motion, so as to gradually assume different heights, which is assisted by means of sliding sleeves k, through which the guide-pins c are passed, and which sleeves are attached to the carrier d and, together with the carrier, retained after each shift by means of a steel spring or catch i, attached to one of the sleeves k and engaging minute teeth or serrations on one of the guide-pins c, so that the carrier is thereby retained in its relative position.

The thread-guide b is formed of an open twisted snail-like body of glass and is supported in a horizontal sleeve b', the shank b^2 of which is capable of axial adjustment in a socket of the carrier d, as shown in Fig. 1.

For the purpose of enabling the supplying of very thin and slender threads the thread-guiding roll t, by which the thread is guided from the original spool u to the glass rod v and to the thread-guide b of the spooling device, is operated from the driving-shaft of the machine, as shown in Figs. 4 to 6, in the following manner: On the driving-shaft is located a pulley l, by which the rotary motion of the driving-shaft is transmitted through a belt or cord s' to a cone-pulley m and from the same, by means of a cross-belt s^2, to a cone-pulley n at the upper part of the machine. The latter is fast on the shaft o, while the pulleys p (shown in Figs. 5 and 6) are placed loosely on the shaft and carried around by the friction which is exerted on the same by the lateral pressure of the helical springs r, which are interposed between fixed collars q and the hubs of the pulleys p. From each of the pulleys p rotary motion is transmitted, by means of a belt s^3, to the grooved hub of the thread-guiding pulley t. The latter receives thereby a motion which is independent of the rotary motion of its spool device and which produces the unwinding of the thread from the main spools u, so as to conduct the thread over the glass rod v to the thread-guide of the corresponding spooling device at various degrees of speed according as the cross belt or cord is placed on one or the other steps of the two cone-pulleys m.

Machines of this class are usually provided with ways and means for suitably changing the speed in accordance with the ascending and descending motion of the spool-carriers g—that is to say, as all of the spool-carriers g receive a simultaneous up-and-down motion it is only necessary to take care that when the same are in a position corresponding to the uppermost point of the cop the speed of rotation is somewhat greater, while in the opposite position of the cop the speed of rotation is less. The mechanism for accomplishing this movement has no foundation in the present invention, as it is well known.

Should one of the threads from the main spool u be broken, the rotation of the thread-guiding pulley t is to be instantly interrupted. For this purpose a stop-lever x, which is pivoted at x^0, is arranged, said lever being connected with each spool device, Fig. 4, in a suitable manner, and also being connected with a second lever y, which is pivoted at y^0. The lever x carries the rod x', which engages with the disk a^0 on the hub of the friction-cone a, and when the lever x is moved in upward direction the cone-pulley a is raised and its rotation discontinued. This operation can take place at any time according to the desire of the attendant by simply lifting said stop-lever x; but it also takes place automatically in case when the thread breaks. For this latter purpose the rear end of the lever x is supported normally in raised position by means of a hook x^4 on the lower end of a break-wire x^2, which is hinged at x^3 to the frame so as to swing sidewise. There are also arranged L-shaped supporting-arms u^2, which extend parallel with the spool-spindles u and which are mounted to oscillate in the frame through the medium of short shafts or pivots u', journaled in the frame. The oscillating arms u^2 are arranged to extend transversely across and in juxtaposition to the break-wire x^2, which latter, when the oscillating arms are in raised position, as shown in Figs. 4 and 4^a, is held in the outwardly-swung position there shown by reason of the engagement of the hook x^4 with the lever x. The oscillating arms u^2 are held in their upward position by the upward passage of the threads which run from the bobbins. Whenever a thread breaks, the corresponding oscillating arm u^2 drops, thus swinging the break-wire x^2 into the position shown in dotted lines in Fig. 4^b, and thus disengaging its hook x^4 from the lever x, permitting the rear end of the said lever to drop, so that the friction-cone is automatically raised, whereby the motion of the cone-pulley is arrested. Simultaneously the stopping of the corresponding motion-transmitting mechansm takes place. For this purpose the lever y is connected at its opposite end with a push-rod z, which, during the motion of the machine, is located below the pulley p, but which is shifted in an upward direction in case of the breaking of a thread, so that its upper end is placed in the path of one or the other of two pins z' on the pulley p, as shown in Figs. 5 and 6, so that the further turning of the pulley p is prevented by the contact of the uppermost end of the stop-rod z with one of the pins z' on the pulley p, as shown in Fig. 5.

As soon as the stop-lever x is lowered and its rear end correspondingly raised the stop-rod z is lowered to a corresponding extent out of the path of the pin z' and offers no resistance, so that pulley p is taken along with the shaft o by the frictional action of the spring r, whereby the normal transmission of the motion from the driving-shaft to the thread-guiding pulley is restored.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a thread-spooling machine, the combination of a thread-guide carrier d, with a loose ring h adapted to turn freely in the same and engage the yarn on the bobbin being wound, substantially as set forth.

2. In a thread-spooling machine, a thread-guide carrier d provided with a ring h adapted to turn freely in the said carrier, and engage the yarn on the bobbin being wound, in combination with antifriction-balls arranged between the guide-carrier and ring, substantially as set forth.

3. In thread-spooling machines, the combination with the thread-guiding pulleys provided with grooved hubs, of means by which different speeds can be imparted to said pulleys, said means consisting in a set of cone-pulleys mounted on suitable shafts, a transmitting cord or belt running on the cone-pulleys, loose friction-pulleys on the shaft of the upper cone-pulleys, stationary collars on the latter shaft, springs interposed between the said stationary collars and the said friction-pulleys, and transmitting belts or cords between said loose friction-pulleys and grooved hubs of the thread-guiding pulleys, substantially as set forth.

4. In a thread-spooling machine, the combination with the thread-guiding pulley, loosely-mounted friction-pulley provided with laterally-projecting pins, shafts for both of said pulleys, means for rotating the friction-pulley, and means for rotating the thread-guiding pulley from the friction-pulley, of a stop-motion consisting of the stop-lever x, an intermediate lever y connected with the stop-lever, a stop-rod z connected with the intermediate lever y and adapted to engage with the pins of the friction-pulley, the plate or disk a^0 of the spooling device, a contact-rod x' carried by the stop-lever x and adapted to contact with said disk a^0 and the break wire or rod x^2 adapted to act automatically when a thread breaks, substantially as set forth.

In testimony whereof I hereunto sign my name, in the presence of two subscribing witnesses, this 12th day of June, 1896.

JEAN SCHWEITER.

Witnesses:
I. BLUM,
H. CABHART.