No. 641,732. Patented Jan. 23, 1900.

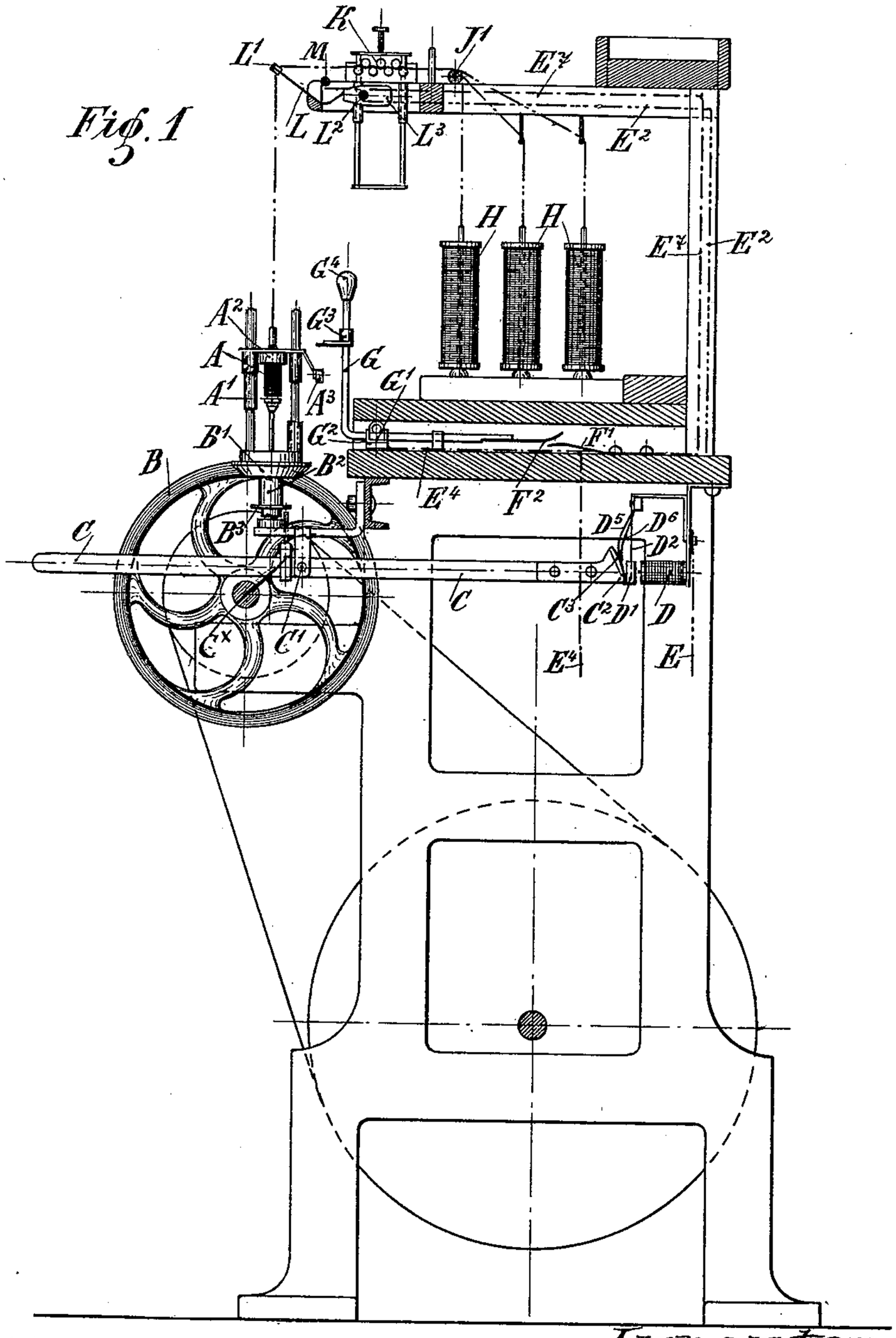
J. SCHWEITER.

SPOOLING MACHINE.

(Application filed Aug. 15, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1



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(No Model.) 3 Sheets—Sheet 2.

Fig. 2

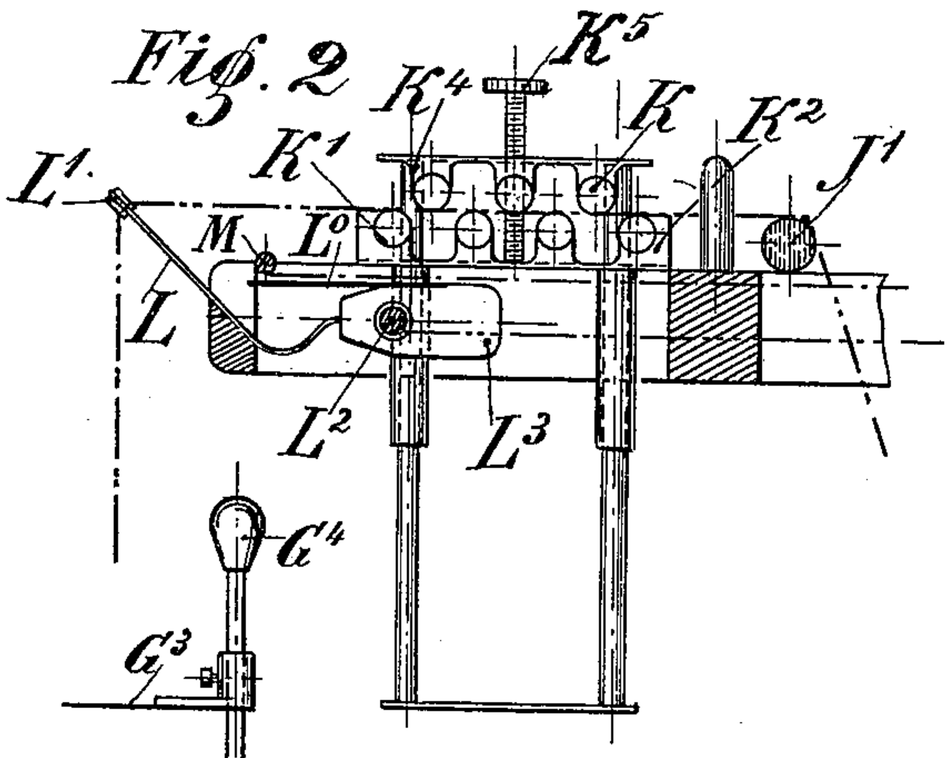


Fig. 3

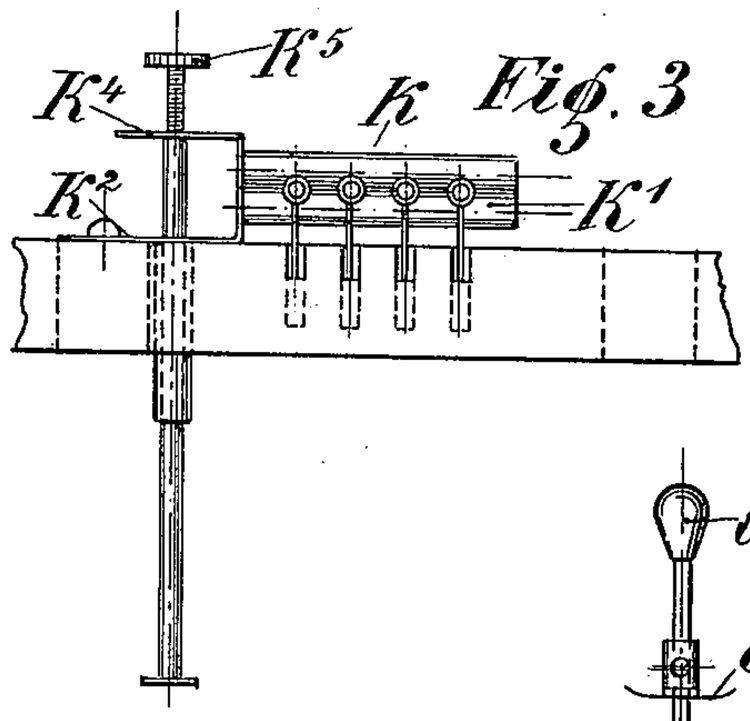


Fig. 4

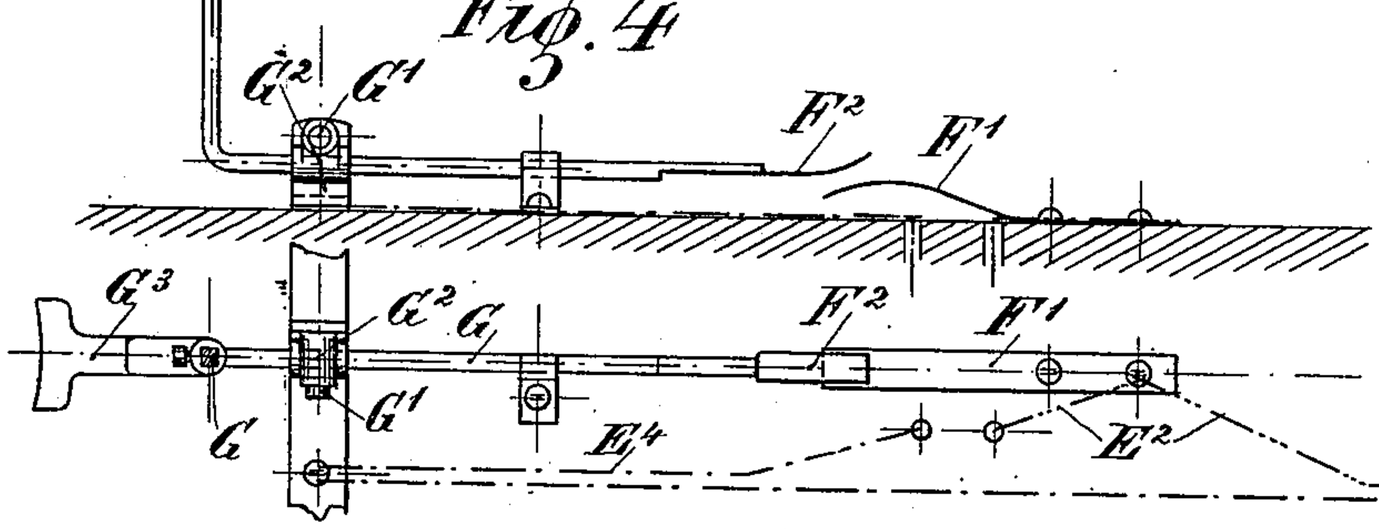


Fig. 5

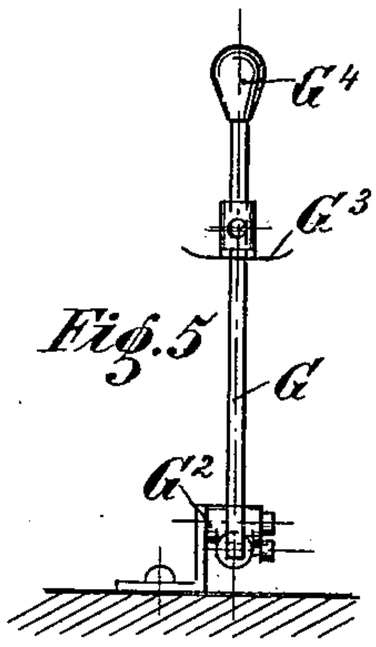


Fig. 6

Fig. 7

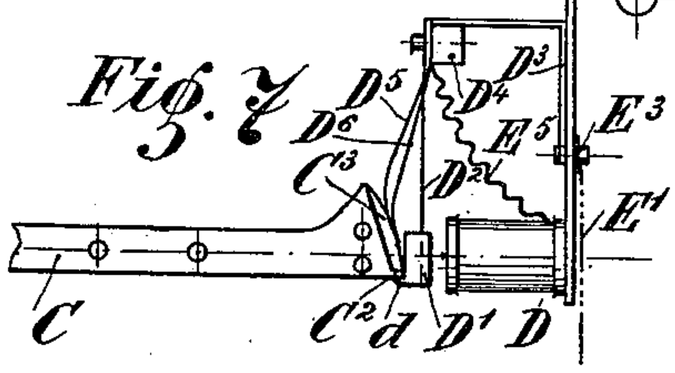


Fig. 8

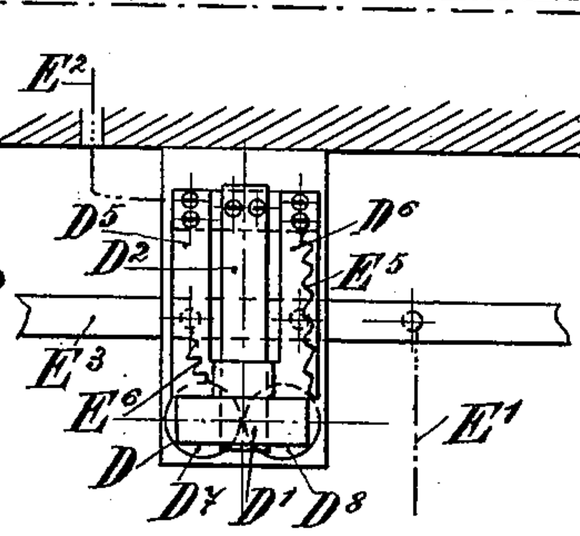


Fig. 9

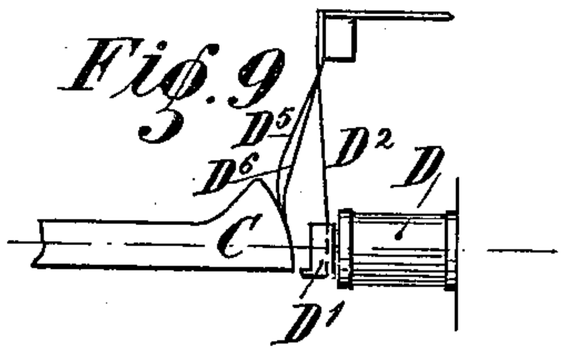
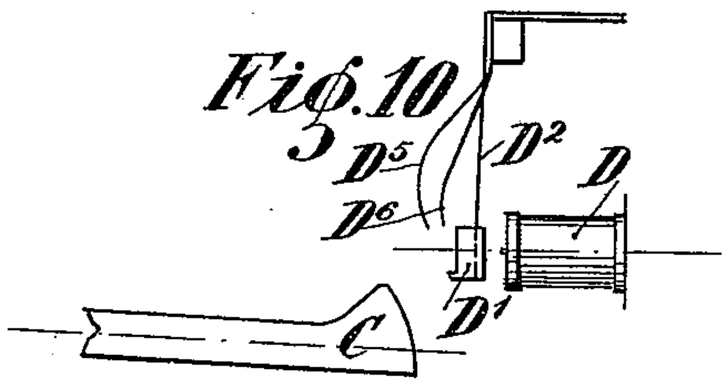


Fig. 10



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J. SCHWEITER.

SPOOLING MACHINE.

(Application filed Aug. 15, 1898.)

(No Model.) 3 Sheets—Sheet 3.

Fig 9ª

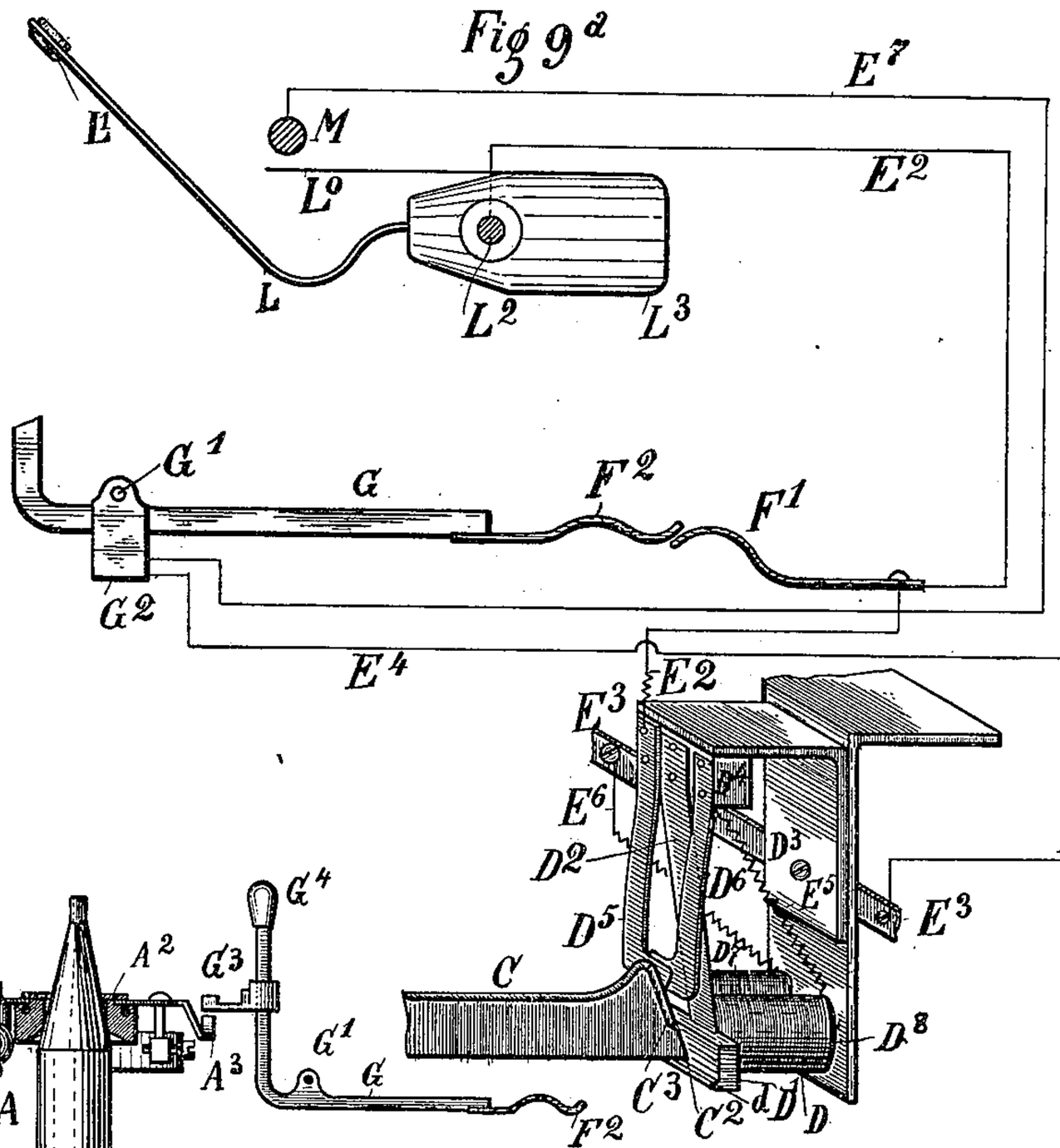
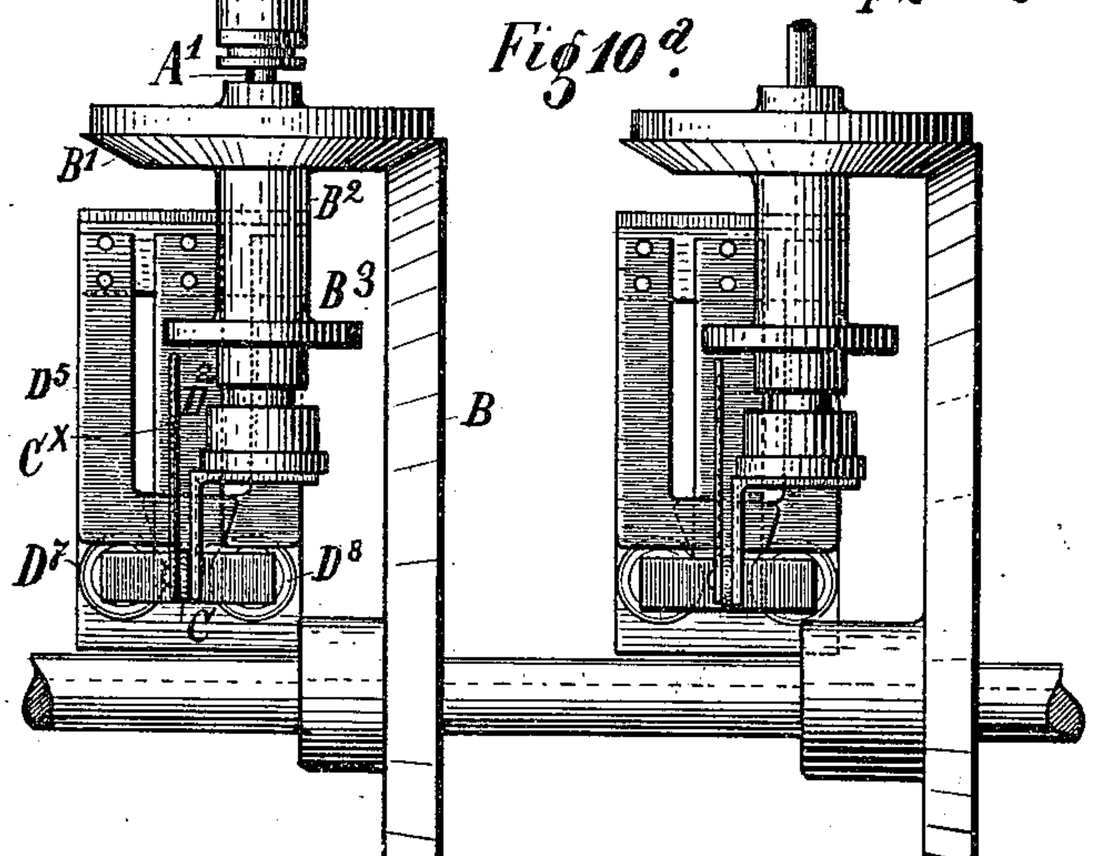


Fig 10ª



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UNITED STATES PATENT OFFICE.

JEAN SCHWEITER, OF HORGEN, SWITZERLAND.

SPOOLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 641,732, dated January 23, 1900.

Application filed August 15, 1898. Serial No. 688,601. (No model.)

To all whom it may concern:

Be it known that I, JEAN SCHWEITER, a citizen of the Swiss Republic, residing at Horgen, in the canton of Zurich and Republic of Switzerland, have invented a new and useful Spooling-Machine, (for which I have applied for Letters Patent in Switzerland January 18, 1898; in Austria February 3, 1898; in France June 9, 1898, and in Italy June 9, 1898,) of which the following is a specification.

The invention consists in a spooling-machine with automatic disconnection of the spools, by means of which an instantaneous separation of the thread-guide from its actuating mechanisms is effected. In this separating device the putting out of action of the thread-guide when the thread breaks or the spool is filled is effected by the closing of an electric-current circuit. In order to obtain these results, each contact-lever operated by a thread is connected to a particular electric-current circuit, to which also an electromagnet is connected, the armature of which being capable of temporarily supporting a throw-out lever. If a thread breaks, the respective contact-lever will be released from the strain of the thread and left to the action of a weight, whereby the respective current-circuit will be closed, the respective electromagnet excited, and the respective throw-out lever released to drop down, whereby the connection between the respective spindle and its actuating device will be suspended. Furthermore, if a spool is filled the respective thread-guide abuts upon a contact-lever and closes the respective current-circuit by means of contact-springs. The electromagnet connected to this circuit thus will be excited, the respective throw-out lever released, and the respective spindle disconnected from its actuating device, as aforesaid. Each of these latter contact-levers has a handle by means of which each spindle may be stopped by hand, if desired.

The accompanying drawings illustrate by way of example a constructional form of the invention, in which—

Figure 1 shows an elevation. Figs. 2 and 3 show the contact-levers with their mechanisms and the checking device. Fig. 4 shows a plan of the contact device capable of being regulated by hand and by the thread-guide. Figs. 5 and 6 are respectively a detail elevation and plan view of parts shown in Fig. 4. Fig. 7 is a side view of the magnet, with the attached parts and the lever controlled by the magnet-armature. Fig. 8 is a front view of the parts in Fig. 7, the lever being omitted. Figs. 9 and 10 are detail side views similar to Fig. 7, with the parts in different positions. Fig. 9^a shows a diagram of the electrical connections, the devices in circuit being shown some in elevation and others in perspective. Fig. 10^a is a detail front view of the spindle-bobbin, friction-disks, and adjacent parts.

The spindle A′, Fig. 1, which receives its motion from two conical friction-disks B B′, bears the bobbin A, which is formed in conical layers by the turning of the thread-guide A^2. This guide is slightly pushed upward at each raising of the alternating spindle, so that it rises successively. Such a spooling device has been described and illustrated in the copy of the United States Patent No. 596,794, granted to me on January 4, 1898.

The thread-guide A^2 has a projection A^3, which shares its motion. The thread passes from the spools H over the glass J′ to the checking mechanisms K and then through the glass loops L′ of the lever L to the bobbins. Each lever L is capable of rotation around the axis L^2 and keeps its thread in tension by means of the weight L^3, Figs. 1 and 2. The smaller friction-disk B′ has attached to its hub B^2 a disk B^3, the object whereof is explained hereinafter. Close to the wheel B there is placed, revoluble upon the pin C′, a shifting or throw-out lever C. This lever has at its longest end an inclined face C^2, the upper part of which is covered with an insulating material C^3, such as fiber, Figs. 1 and 9^a. This lever C is retained in the position shown in the drawings by means of the armature D′, Figs. 1, 7, and 9^a, which in this position is not influenced by the electromagnet D and which has a projection *d* for the reception of the lever C. The armature D is supported by a spring D^2, which is itself screwed upon a plate D^4, of non-conducting material, attached to the support D^3 of the electromagnet. Upon this plate, at both sides of the spring D^2, are also arranged two flat contact-springs D^5 and

D^6, the lower ends of which are superposed and are held by means of the lever C in contact with one another, Figs. 7, 9, and 9^a. The spring D^6 is connected, by means of a conductor E^5, with the coils of the pole-piece D^8 of the electromagnet D, and the coils of the pole-piece D^7 receive current through the connection E', the metal strip E^3, and the conductor E^6. The other spring D^5 is in connection with the spring F', Figs. 1 and 9^a, by means of the conductor E^2. The said spring F' stands opposite the spring F^2, which is itself fixed to a lever G, revoluble about the axle G'. The support G^2 of this axle is in direct connection on the one hand, by means of the conductor E^4, with one pole of a source of electricity, and on the other hand with a contact-piece M, fixed over the lever L, Figs. 1, 2, and 9^a. The said lever G has on its vertical limb the adjustable piece G^3, against which, when the bobbin A is sufficiently filled, the projection A^3 strikes from below. The conductor E^2 proceeds from the spring D^5 to the spring F', Figs. 1 and 9^a, and then to the metallic axle L^2 of the conducting-lever L, Figs. 1, 2, and 9^a. In consequence of the above-described arrangement springs F' and F^2 and M and L^0 are out of contact, spaces being left between the springs F' and F^2 and between the strip L^0 of the lever L and the bar M. When in operation, the thread draws down the front part of the lever L and the glass eyelet L'. If the thread breaks, the said part immediately flies upward in consequence of the weight L^3. The piece L^0 then comes in contact with M, and the circuit is closed. The current consequently passes from one pole of the source of electricity, through the conductor E', the metal strip E^3, and the conductor E^6, to the windings of both coils of the poles D^7 and D^8 and to the spring D^6. From this it passes to the spring D^5, then through the conductor E^2 to the spring F', and then along E^2 to the axle L^2, through the piece L^0, bar M, conductor E^7, to the support G^2, and finally along the conductor E^4 back to the source of current. When the current passes through the electromagnet, this latter is excited and attracts the armature D', which releases the lever C, so that it falls down, Fig. 10. By this motion the front part thereof rises and a pin $C^\times$ thereon strikes the disk B^3 and raises the friction-disk B', placing it out of contact with the driving-disk B, so that B', and consequently the spindle and the bobbin corresponding to the broken thread, comes to rest. For this purpose the forward end of lever C has an arm $C^\times$ extending up, which strikes the disk B^3.

By the falling down of the lever C the spring D^5 loses its support, Fig. 10, so that it can move away from D^6. Consequently the current-circuit is interrupted, the attractive influence of the pole has ceased, and the armature D' returns to its original position. By these latter movements two objects are attained, namely: First, the current consumption is reduced to the minimum, and, secondly, the lever C can be immediately again secured against the projection *d* of the armature D by depressing its front end. As soon as the bobbin A has been filled the projection A^3 strikes from beneath against the piece G^3, and thereby revolves the lever G upon the pin G', so that the spring F^2 comes in contact with F'. The current then flows from its source again on through E' E^3 E^6 D^7 D^8 E^5 D^6 D^5 E^2 to the springs F' and F^2, Figs. 4 and 9^a, to the lever G, the axle G', the support G^2, and back to the conductor E^4, causing actions like those caused by the first operation.

If it be desired to remove a bobbin by hand, it is only necessary to press the lever G by means of the handle G^4 a little backward, which has the same effect as if the projection A^3 had raised the piece G^3.

There are as many electromagnets D, shifting-levers C, contact-levers G, springs F' F^2, and levers L as the spooling-machine has spindles. However, several levers L may be placed on a common axle L^2 and this axle connected to the spring F'. In the same manner the strip E^3 acts as a distributer for the different electromagnets D and the support G^2 as a distributer for the different levers G.

It is evident that by means of the described stopping mechanisms only that spindle will be stopped of which the thread is broken or the bobbin is filled, while all the other spindles continue the turning.

In order to produce well-wound bobbins, it is necessary that if several threads are taken together all these threads should possess the same tension. For this purpose the thread before its passage through the loop L' of the lever L passes through the checking device K, consisting, essentially, of two rows of glass rods, of which the lower one, K', is secured by a support K^2, firmly attached to the frame, while the upper one, K^3, is secured upon an adjustable carrier K^4, which latter can be adjusted exactly at the required height by means of the regulating-screw K^5. According as these two rows of glass rods engage more or less in one another the tension of the thread to be wound becomes greater or smaller, and this tension can be exactly regulated to the material to be worked on. If a thread has to be inserted in the checking device, the adjustable carrier K^4 can be raised without difficulty, and thus the operation is facilitated as much as possible.

What I claim is—

In combination with a spooling-machine comprising a plurality of spindles and their operating means, means for stopping the operation of spooling of that spindle of which the thread is broken or the bobbin filled comprising a thread-guide lever for each thread, electrical contacts controlled thereby, circuit-wires, a magnet and armature for each spindle, a lever supported by each armature and

arranged to throw out of operation the spooling device of the respective spindle when it is released, a lever G and contacts $F^2 F'$ in the circuit, for each spindle, said lever having a part to be operated when the spool is full whereby upon the movement of either the thread-guide lever or the lever G the armature will be attracted to allow the operation of the throw-out lever, substantially as described.

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

JEAN SCHWEITER.

Witnesses:

HERMANN HUBER,

A. M. LIEBERKNECHT.