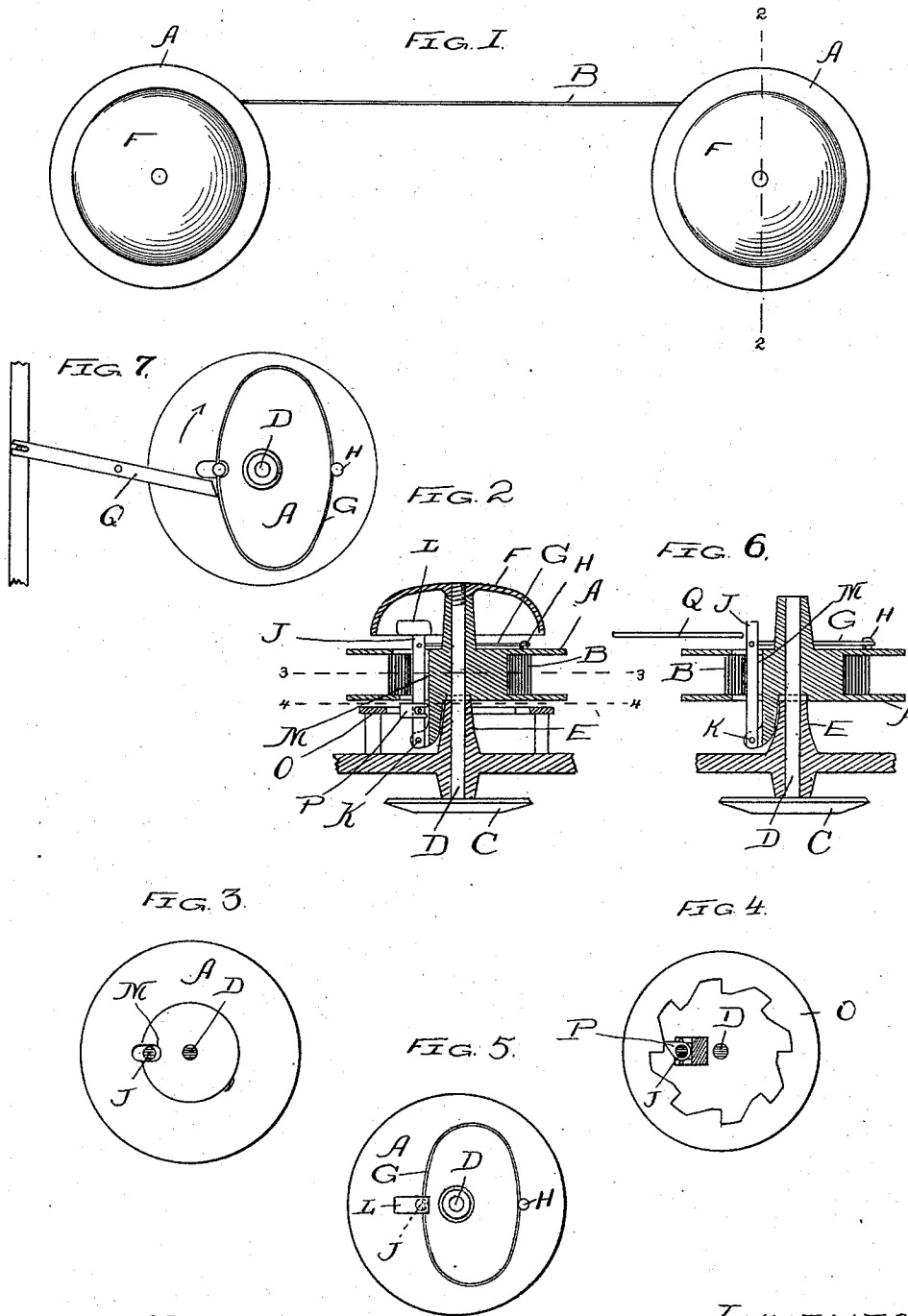


(No Model.)

D. E. FELT.
INK RIBBON MECHANISM.

No. 578,919.

Patented Mar. 16, 1897.



WITNESSES:

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DORR E. FELT, OF CHICAGO, ILLINOIS.

INK-RIBBON MECHANISM.

SPECIFICATION forming part of Letters Patent No. 578,919, dated March 16, 1897.

Application filed April 3, 1896. Serial No. 586,049. (No model.)

To all whom it may concern:

Be it known that I, DORR E. FELT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have
5 invented a new and useful Improvement in Ink-Ribbon Mechanism, of which the following is a specification.

This invention relates to the ink-ribbon mechanism of type-writers and other machines employing ink-carrying ribbons.

My main object in the invention has been to provide the spools with means whereby when the ribbon has been drawn off from either spool either an alarm will be sounded adapted
15 to give notice to the operator that he should reverse the ribbon-feed or the reversing-lever which controls the ribbon-feed will itself be automatically shifted so as to reverse the feed. To this end I provide upon each of the spools
20 a spring device adapted to be compressed by the ribbon when it is wound upon the spool, and also adapted when it is released by the drawing off of the ribbon to sound an alarm or to operate the reversing-lever. Where this
25 spring device is to sound an alarm, I also preferably provide secondary means for sounding the alarm operable after the spring device is released by the ribbon.

In the accompanying drawings, forming a
30 part of this specification, Figure 1 is a plan view of the invention. Fig. 2 is a section of one of the spools on the line 2 2 of Fig. 1. Figs. 3 and 4 are sections on the line 3 3 and 4 4, respectively, of Fig. 2. Fig. 5 is a plan
35 of one of the spools with the alarm-bell omitted. Fig. 6 is a section similar to Fig. 2, showing the invention used to operate the reversing-lever of the spool-controlling mechanism. Fig. 7 is a view similar to Fig. 5, showing the re-
40 versing-lever.

In said drawings, A A represent the companion spools carrying the ribbon B. Except as hereinafter pointed out these spools may be of the ordinary construction, and they may
45 be operated by mechanism in the usual manner. I have shown at C a gear suitable for their actuation, at D a shaft upon which they may be mounted, and at E a bearing for the shaft. F F are alarm-bells mounted one upon
50 each spool.

The mechanism for sounding the alarm consists of a spring G, located, preferably, on the

side face of the spool and secured thereto by a pin H. The spring may be in loop form and exerts pressure outward from the spool-axis
55 upon the end of a lever J, lying parallel with the axis of the spool and along the side of its barrel. The lever is pivoted at K to an arm projecting from the spool and carries upon its swinging end the hammer L, whereby the bell
60 is sounded. Between its ends it is surrounded by and forced toward the axis of the spool by the ribbon wound upon the latter, so that the spring G is compressed by the ribbon and power stored up in it, which will act upon the
65 unwinding of the ribbon to force the hammer outward and against the bell. The lever is preferably long enough so it may project both above and below the spool, as shown, and I
70 prefer to recess the side of the spool-barrel, as at M, in order that the lever may be sunken within its periphery, as shown, and the winding-surface of the spool remain uniform and round.

Inasmuch as the ribbon when nearly un-
75 wound will still encompass the barrel it may sometimes release the lever so gradually as to prevent the hammer from striking the bell with sufficient force to sound the latter. To
80 guard against this result, I also provide secondary means in conjunction with the lever and spring whereby the alarm may be given, and these means consist of one or more stationary cam-surfaces adapted to move the lever
85 in recompressing the spring. These cam-surfaces may be formed upon a stationary ring O, located close to the spool and surrounding its axis, the cams being upon its interior edge and being in effect ratchet-teeth which are abrupt upon one side and sloping
90 upon the other. A pawl P, rigid upon the lever J, engages the teeth of ring O. Through this ratchet and pawl the lever J is forced inward by the contact of the pawl with the sloping side of the ratchet-teeth, thus compressing
95 the spring, and as soon as the pawl has passed the crown of the tooth the lever is free to yield outward to the spring, and an actuation of the bell is sure to result.

The spring device shown, instead of sound-
100 ing an alarm, may be used to operate the reversing lever or device whereby the direction of the ribbon is controlled, as in Figs. 6 and 7. Such a reversing lever or device is shown at

Q in position where the lever J when it is moved outward by the spring will project far enough to engage the lever Q and swing said lever upon its pivot in the direction in which the spool is rotating. This movement of lever Q reverses the spool-actuating mechanism. A similar lever Q being placed in proximity to each of the spools, and each of them being adapted to reverse the actuating mechanism of the spools, it follows that a reversal of the feed will occur in the same manner with the unwinding of either spool.

It will be noticed that when the spring is wound upon the spool it forces the hammer-lever into its recess and holds it there, so that there can be no contact by the lever with the teeth of ring O until the ribbon is unwound, and of course the spring G remains compressed during all the time the ribbon remains closely wound. When, however, the ribbon is nearly unwound, the spring may force the lever outward by overcoming the resistance of the ribbon. Such movement will not usually cause the sounding of the alarm, because it is apt to be a gradual or slow movement instead of the quick one necessary to ring the bell, but it allows the lever J to move into position where the pawl P encounters one of the teeth of ring O, and consequently the spring G is compressed by the tooth, which forces the lever inward and causes a ringing of the bell as soon as the lever falls off the tooth so as to give vent to the spring, and should there be any failure to ring the bell in the case of the first tooth a subsequent one is sure to effect it. When the ribbon is wholly unwound, the bell will be sounded by each of the ring-teeth as the pawl of lever J encounters them

and is forced by them to compress the spring. A sounding of the alarm will also result from the unwinding if the ribbon should yield quickly to the spring instead of gradually.

I claim—

1. The combination with the spool and alarm of a spring-lever J located upon the side of the spool and in which power is stored by the ribbon wound upon the spool, and means essentially as described for causing the lever to sound the alarm in cases where it is released gradually from the ribbon, substantially as specified.

2. The combination with the spool of the lever J lying alongside of the spool so it will be encircled by the ribbon and pivoted to the spool at one end, and a spring G acting to force the other end of the lever outward, and cause it to sound an alarm or actuate a reversing device, substantially as specified.

3. The combination with the spool, the spring and the lever, actuated by the spring of the ratchet-ring and the pawl upon the lever, substantially as specified.

4. The combination with the spool, the alarm, the spring and the lever actuated by the spring, of the ratchet-ring and the pawl upon the lever, substantially as specified.

5. The combination with the rotating spool, of the spring, the lever actuated by the spring, both spring and lever being carried by the spool, and a stationary cam-surface also adapted to act upon the lever and compress the spring, substantially as specified.

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Witnesses:

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