Dec. 20, 1932. B. J. DOWD 1,891,590

TYPEWRITING MACHINE

Filed Sept. 14, 1931 4 Sheets-Sheet 1

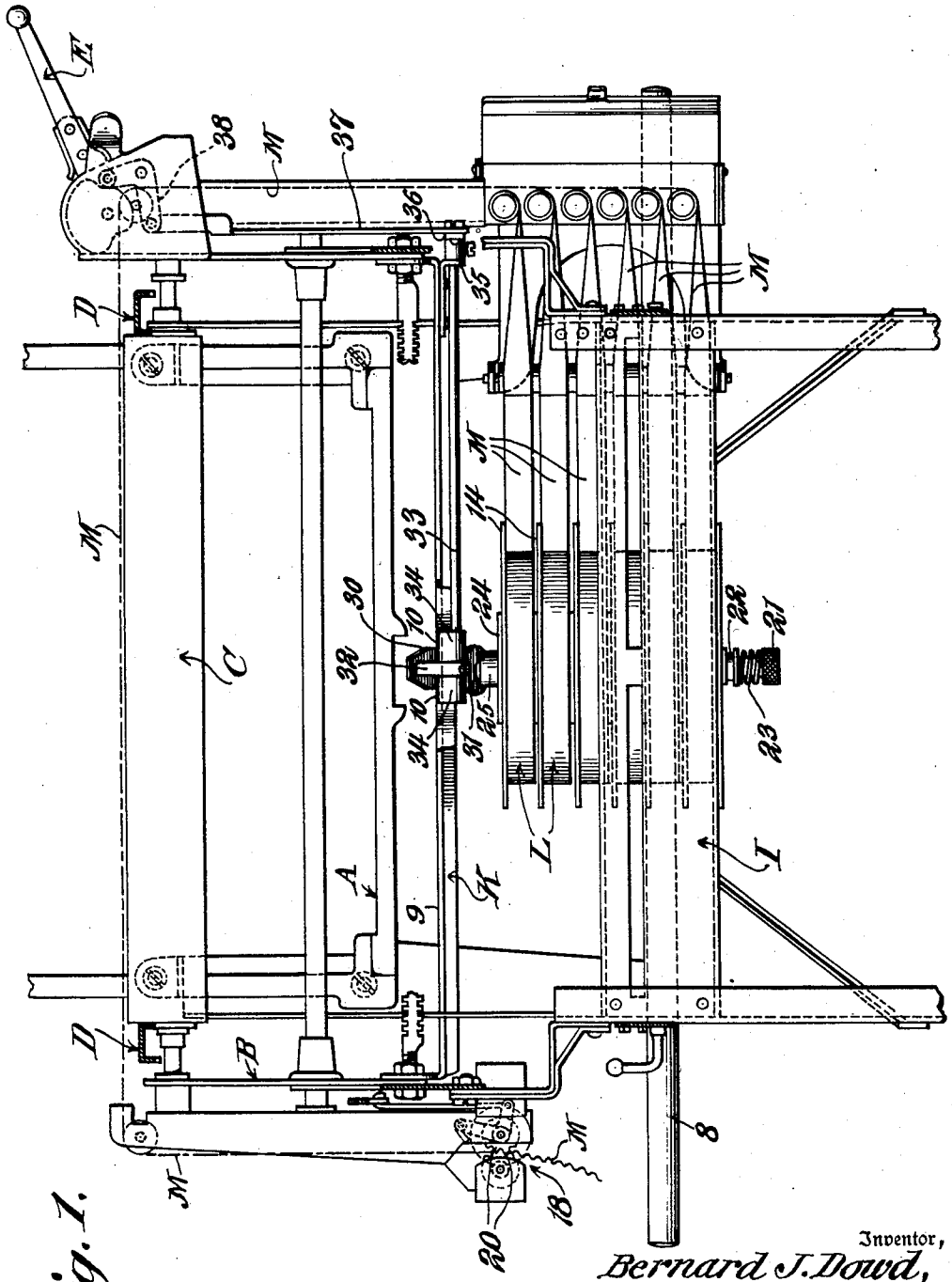

Fig. 1.

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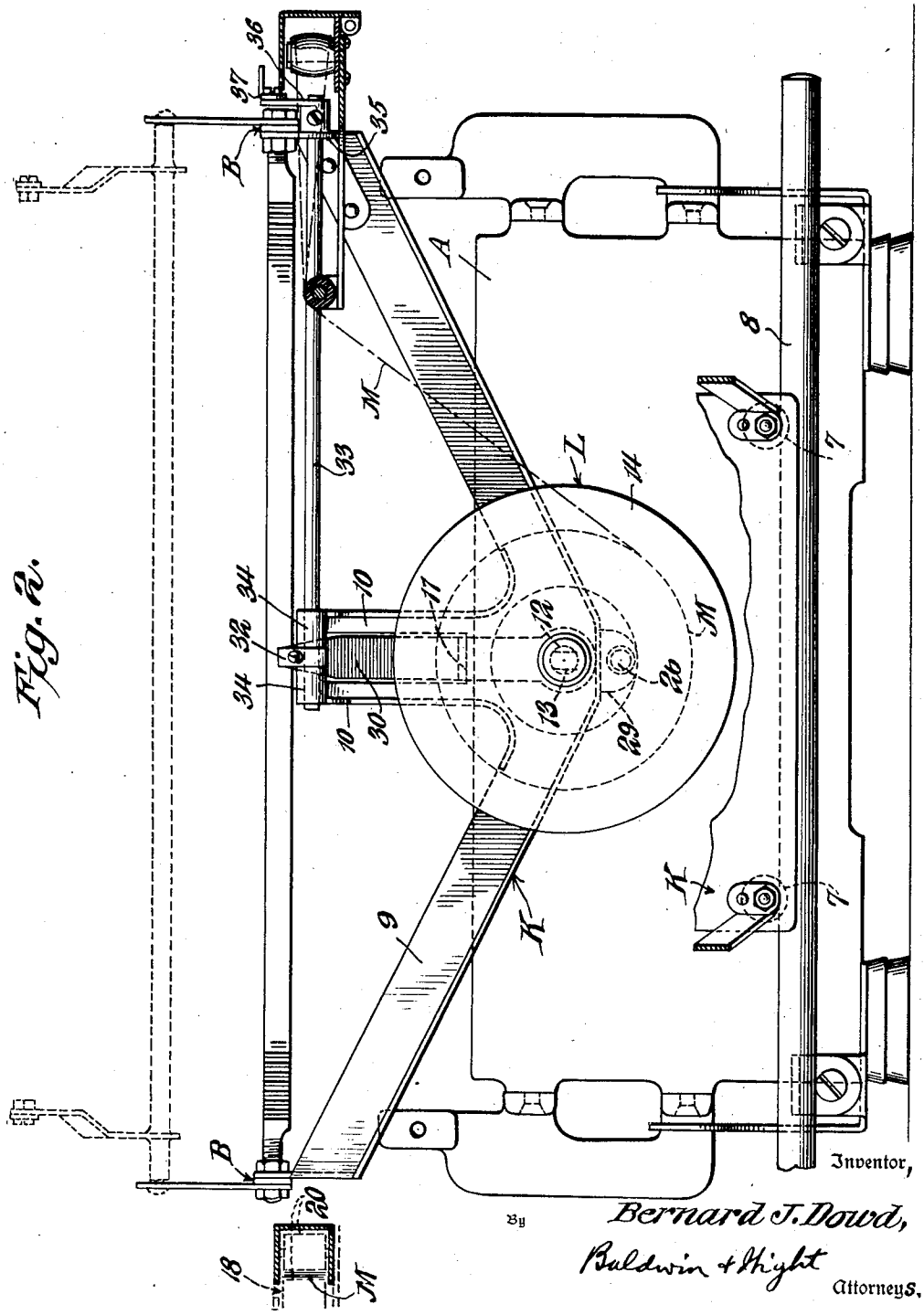
Fig. 2.



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TYPEWRITING MACHINE

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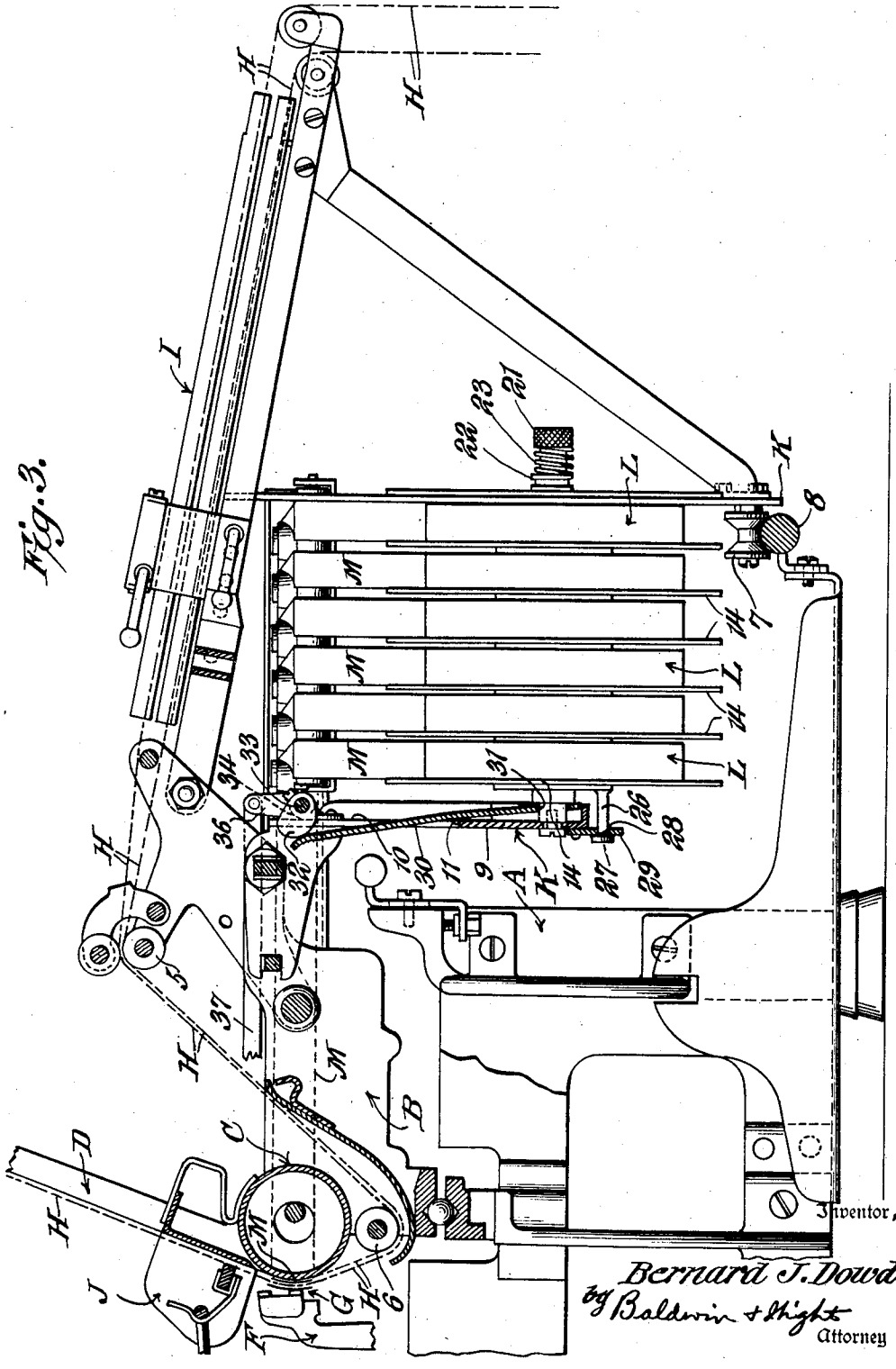
Fig. 3.



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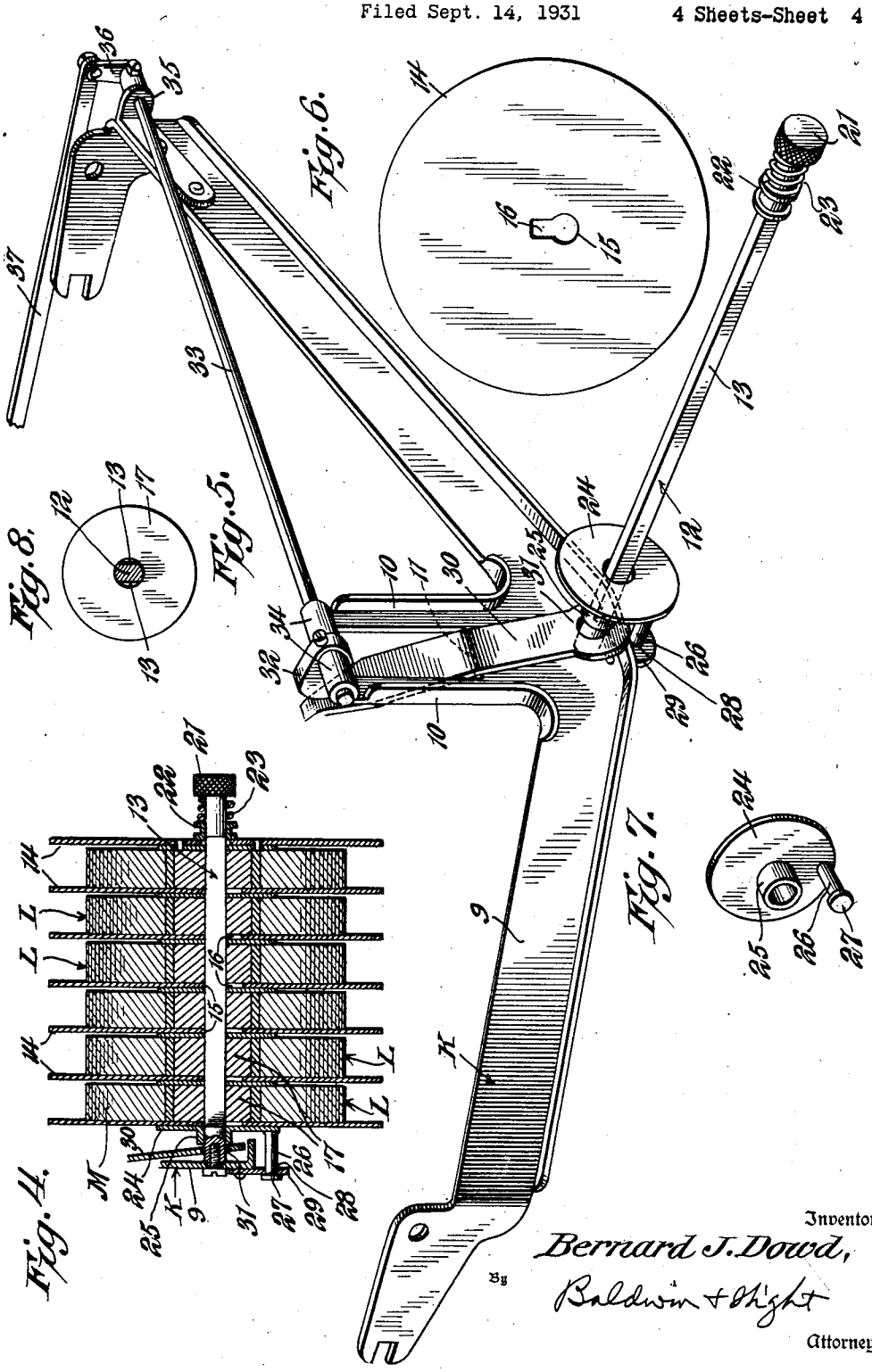
TYPEWRITING MACHINE

Filed Sept. 14, 1931 4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Application filed September 14, 1931. Serial No. 562,788.

This invention relates to new and useful improvements in manifolding attachments for typewriting machines or the like and embodies certain improvements over the co-pending application Serial No. 546,858, filed June 25, 1931, by Myers and Handley relative to the tensioning means for the ribbon spools.

Among the several objects of my invention are to provide novel means for supporting the ribbon spools on the machine, cooperating means located beyond the outer spools and engaging the same for applying a normal light tension on the spools for permitting the type to freely engage the platen, and operable means for effecting the feeding of the ribbons and concomitantly actuating the tension applying means to further increase the tension whereby the spools will be sufficiently tensioned during their feeding rotation.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:—

Figure 1 is a top plan view of a typewriting machine constructed in accordance with my invention,

Figure 2 is a rear elevation thereof,

Figure 3 is a view in elevation of the right hand side of the machine, parts thereof being shown in section,

Figure 4 is a cross sectional view taken through the ribbon spools and showing the mounting of said spools,

Figure 5 is a perspective view of the spool frame,

Figure 6 is a view in elevation of one of the spacer discs for the spools,

Figure 7 is a perspective view of the tension disc, and

Figure 8 is a view showing the relation between a spool hub and the spool supporting shaft.

As previously stated, this invention relates to improvements in the ribbon spool tensioning and locking means shown in the Myers and Handley application filed June 25, 1931, and therefore only that much of the typewriting machine is illustrated in the drawings as will be necessary to an understanding of the present invention.

The typewriting machine includes a main frame A on which a carriage B is supported for letter space movements. A platen C is fixed to the lower end of a collating frame D pivoted on the carriage to swing forwardly and rearwardly to effect a rearward and forward movement of the platen upon swinging movement of the carriage return lever E through suitable connections shown in said co-pending application. Type bars F co-operate with the platen, and a main ribbon G is disposed in front of the platen. Work sheets H are led forwardly to the platen over a work guide I attached to the carriage, thence over a roller 5 journaled on the carriage, thence downwardly under a guide roller 6 journaled on the carriage below the platen, and thence upwardly past the platen and have their upper edge portions clamped to a truck J which is mounted on the collating frame D for line spacing movements, the truck being line spaced by the lever E by a mechanism shown in said co-pending application. A spool supporting frame K is disposed in rear of the main frame A and is attached to the carriage to move therewith, the frame K carrying rollers 7, 7 which ride along a rail 8 attached to the main frame A.

The spool frame K comprises a substantially V-shaped bar 9 having its end portions attached to the end plates of the carriage. Extending upwardly from the central portion or apex of the bar 9, are integral arms 10, 10 having a fulcrum bearing 11 formed therebetween.

Fixed to the bar 9 below the bearing 11 is the inner or front end of a rearwardly extending spool supporting shaft 12 having flat sides 13, 13. Slidably mounted on the shaft 12 is a plurality of spacing discs 14, each disc being provided with an eccentric circular opening 15 for receiving the shaft and with an angular opening 16 which merges with the opening 15 and interlocks with the flat sides 13 of the shaft to retain the disc against rotation. Rotatably mount-

ed on the shaft 12 and located between adjacent spacing discs are ribbon spools L, each comprising a hub 17 and carbon strips or ribbons M. The carbon strips or ribbons M are led from the spools forwardly along the left side of the carriage, thence along and in front of the platen and in rear of the main ribbon G and in interleaved relation with the work sheets, and thence rearwardly along the right hand side of the carriage to a ribbon feeding means 18 which includes co-operating feed rolls 20, 20. The ribbon feeding means 18 is actuated from the collating frame D by connections shown in said co-pending application. Means are provided for normally and collectively tensioning the spools against feeding rotation, and operative means are provided for actuating the ribbon feeding means and increasing the action of the tensioning means to effect the locking of the spools against feeding rotation prior to the completion of the operation of the ribbon feeding means, whereby the last part of movement of the ribbon feeding means will render the ribbons taut and thereby prevent the work sheets from dragging the ribbons upwardly therewith during line spacing movements of said work sheets.

Threadably mounted on the outer end of the shaft 12 beyond the outermost spacing disc 14 is a stop 21, and slidable on the shaft between said disc and stop is a tension collar 22. A coil spring 23 is disposed around the shaft between the stop 21 and collar 22. Slidable on the inner end of the shaft 12 between the bar 9 of the spool frame K and the innermost spacing disc 14 is a tension disc 24 provided with a forwardly extending hub 25 and a forwardly extending guide pin 26 having a head 27 on its inner end, the pin having sliding engagement in a guide opening 28 formed in a bracket 29 fixed to and depending from the bar 9. A vertical lever 30 is fulcrumed intermediate its ends on the fulcrum seat 11 of the bar 9 and the lower end of this lever is disposed between the bar 9 and the tension disc 24, said lower end of the lever being formed with an opening 31 for receiving the inner end of the shaft 12. The upper end of the lever 30 extends between the arms 10, 10 of the bar 9 and is engaged by a cam 32 fixed on a horizontal rock shaft 33 which is journaled in bearings 34, 34 located on the upper ends of the arms 10, 10 and in a bearing 35 formed on one end of the spool frame K. In order to rock the shaft 33 and thereby increase the tension on the spools so as to lock the latter against feeding rotation immediately prior to the completion of the ribbon feeding operation, I have provided said shaft 33 with a rock arm 36 to which I have pivotally connected one end of a link 37, the forward end of said link being pivotally connected to one arm of a bell crank lever 38 which is fulcrumed on the carriage and is operable upon swinging the carriage return lever E.

From the foregoing, it will be apparent that normally a slight tension is applied to the several ribbon spools and consequently during the printing operation the type bar will not be resisted by the ribbons during its movement of impact against the platen. After a line has been written on the work sheets the operator swings the carriage return lever E and as a result the collating frame G is swung forwardly and the platen rearwardly to relieve the normal tight engagement between the work sheets and the platen; the ribbon feeding means 18 is then actuated by further movement of the carriage return lever E in the same direction, and immediately prior to the last part of the feeding movement of the ribbons the tension lever 30 will be actuated to further increase the tension on the ribbon spools; and during the last part of the movement of the carriage return lever E in the same direction the truck J will be moved upwardly along the collating frame G to effect a line spacing movement to the work sheets H. During this line spacing movement of the work sheets, the ribbons will be held taut owing to the fact that the tension on the spools which had been increased remains in the same condition. The amount of this increased tension applied to the spools may be varied by adjusting the stop 21 and thereby vary the tension of the spring 23. Thus a maximum tension may be applied to the several spools to such an extent to lock all of the spools against feeding rotations. Upon return movement of the carriage return lever, the parts which had been operated thereby will return to their normal positions.

I claim:—

1. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a ribbon spool including a hub rotatably mounted on said shaft, means located on opposite sides of the hub for normally and directly applying a slight tension thereto, and operable means for actuating the ribbon feeding means and concomitantly actuating said tension applying means to further tension the spool against feeding rotation.

2. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a ribbon spool

including a hub rotatably mounted on said shaft, means located on opposite sides of the hub for normally and directly applying a slight tension thereto and including means for varying said tension, and operable means for actuating the ribbon feeding means and concomitantly actuating said tension applying means to further tension the spool against feeding rotation.

3. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a ribbon spool rotatably mounted on said shaft, means located on opposite sides of the spool for normally applying a slight tension thereto and including means for varying said tension, said tension varying means including a stop having threaded connection with the shaft and a coil spring disposed around the shaft between the spool and the stop, and operable means for actuating the ribbon feeding means and concomitantly actuating said tension applying means to further tension the spool against feeding rotation.

4. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a ribbon spool rotatably mounted on said shaft, means including a normally inactive lever and a spring respectively located on opposite sides of the spool for normally applying a light tension to said spool, and operable means for actuating the ribbon feeding means and concomitantly actuating the lever to increase said tension.

5. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a pair of spaced brake discs slidably mounted on said shaft, a ribbon spool rotatably mounted on said shaft between the discs, means including a normally inactive lever and a spring respectively located on the shaft beyond the discs for normally applying a light tension to said spool, and operable means for actuating the ribbon feeding means and concomitantly actuating the lever to further increase said tension.

6. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame, a ribbon spool rotatably mounted on said shaft, means located on opposite sides of the spool for normally applying a slight tension thereto comprising a stop secured to the outer end of the shaft, a coil spring disposed around the shaft between the spool and the stop, a tension disc slidable on the inner end of the shaft, and a vertical lever fulcrumed on the spool frame and having its lower end disposed between said frame and tension disc, and operable means for actuating the ribbon feeding means and concomitantly actuating the lever to further increase said tension.

7. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith and provided with a guide opening, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame and provided with flat sides, a plurality of spaced brake discs slidably mounted on the shaft and respectively provided with axially located key hole slots having interlocking engagement with the flat sides of the shaft, a ribbon spool located between said brake discs and rotatably mounted on the shaft, means including a normally inactive lever and a spring respectively located on the shaft beyond the discs for normally applying a light tension to said spool, and operable means for actuating the ribbon feeding means and concomitantly actuating the lever to further increase said tension.

8. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith and provided with a guide opening, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame and provided with flat sides, a plurality of spaced brake discs slidably mounted on the shaft and respectively provided with axially located key hole slots having interlocking engagement with the flat sides of the shaft, a ribbon spool located between said brake discs and rotatably mounted on the shaft, and means for normally applying a slight tension to the spool comprising an adjustable stop removably secured to the free end of the shaft beyond the outermost disc, a collar slidably mounted on the shaft between the stop and the outermost disc, a coil tension spring disposed around the shaft between the stop and the collar, and a tension disc slidably mounted on the shaft between the spool frame and the innermost brake disc, a vertical lever fulcrumed on the spool frame and having its lower end disposed between said frame and tension disc, and operable means for actuating the ribbon feeding means and con-

comitantly actuating the lever to further increase the tension.

9. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith and provided with a guide opening, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame and provided with flat sides, a plurality of spaced brake discs slidably mounted on the shaft and respectively provided with axially located key hole slots having interlocking engagement with the flat sides of the shaft, a plurality of ribbon spools respectively located between adjacent discs and rotatably mounted on the shaft, and means for normally applying a slight tension to the spools comprising an adjustable stop removably secured to the free end of the shaft beyond the outermost disc, a collar slidably mounted on the shaft between the stop and the outermost disc, a coil tension spring disposed around the shaft between the stop and the collar, a tension disc slidably mounted on the shaft between the spool frame and the innermost brake disc, and a guide pin fixed to the disc below the shaft and extending longitudinally of the shaft and having sliding engagement with the guide opening in the spool frame, a vertical tension lever fulcrumed on the frame above the shaft and having its lower end disposed above the guide pin and between the frame and the tension disc and provided with an opening for receiving the shaft, and operable means for actuating the ribbon feeding means and concomitantly actuating the lever to further increase said tension.

10. In a typewriting machine, the combination with a main frame, of a carriage mounted thereon for letter space movements, a ribbon spool frame fixed to the carriage to move therewith and provided with a guide opening, ribbon feeding means mounted on the carriage, a horizontal spool shaft secured at one end to the spool frame and provided with flat sides, a plurality of spaced brake discs slidably mounted on the shaft and respectively provided with axially located key hole slots having interlocking engagement with the flat sides of the shaft, a plurality of ribbon spools respectively located between adjacent discs and rotatably mounted on the shaft, and means for normally applying a slight tension to the spools comprising an adjustable stop removably secured to the free end of the shaft beyond the outermost disc, a collar slidably mounted on the shaft between the stop and the outermost disc, a coil tension spring disposed around the shaft between the stop and the collar, a tension disc slidably mounted on the shaft between the spool frame and the innermost brake disc, and a guide pin fixed to the disc below the shaft and extending longitudinally of the shaft and having sliding engagement with the guide opening in the spool frame, a vertical tension lever fulcrumed on the frame above the shaft and having its lower end disposed above the guide pin and between the frame and the tension disc and provided with an opening for receiving the shaft, a horizontal rock shaft journaled on the spool frame above the spool shaft and arranged in a plane at right angles to the latter, a cam fixed to the rock shaft and engageable with the upper end of the tension lever, and operable means mounted on the carriage for actuating the ribbon feeding means and for concomitantly actuating the rock shaft to further tension the spools against feeding rotation.

11. In a typewriting machine, the combination with a rotatable ribbon spool including a hub, of ribbon feeding means, means located on opposite sides of the hub and directly engaging the same for normally applying a slight tension to the spool against the action of the ribbon feeding means, and means for concomitantly actuating the ribbon feeding means and the tensioning means for increasing the tension against said spool.

12. In a typewriting machine, the combination with a stationary shaft, of a plurality of ribbon spools freely journaled on said shaft and respectively provided with hubs for frictional contact with one another, ribbon feeding means, means located on opposite sides of said spools and directly engaging the outer faces of the hubs of the outer spools for normally applying a slight tension to said spools against the action of the ribbon feeding means, and means for concomitantly actuating the ribbon feeding means and the tensioning means and increasing the tension against all of the spools.

In testimony whereof, I have hereunto subscribed my name.

BERNARD JOSEPH DOWD.