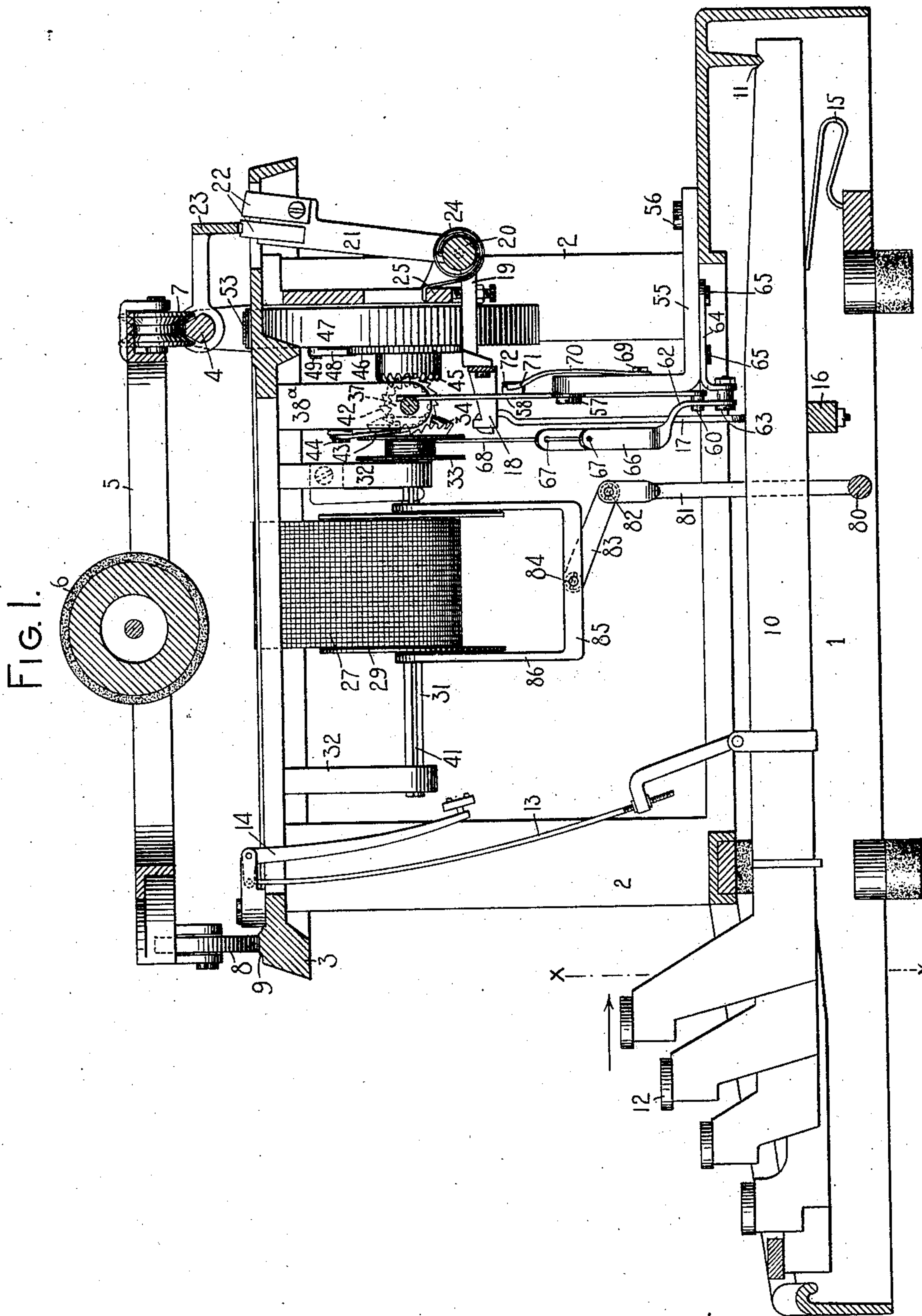


No. 848,402.

PATENTED MAR. 26, 1907.

R. SEIDELINGER.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 22, 1902.

3 SHEETS—SHEET 1.



WITNESSES=

K. V. Monrovan
Charles Smith

INVENTOR=

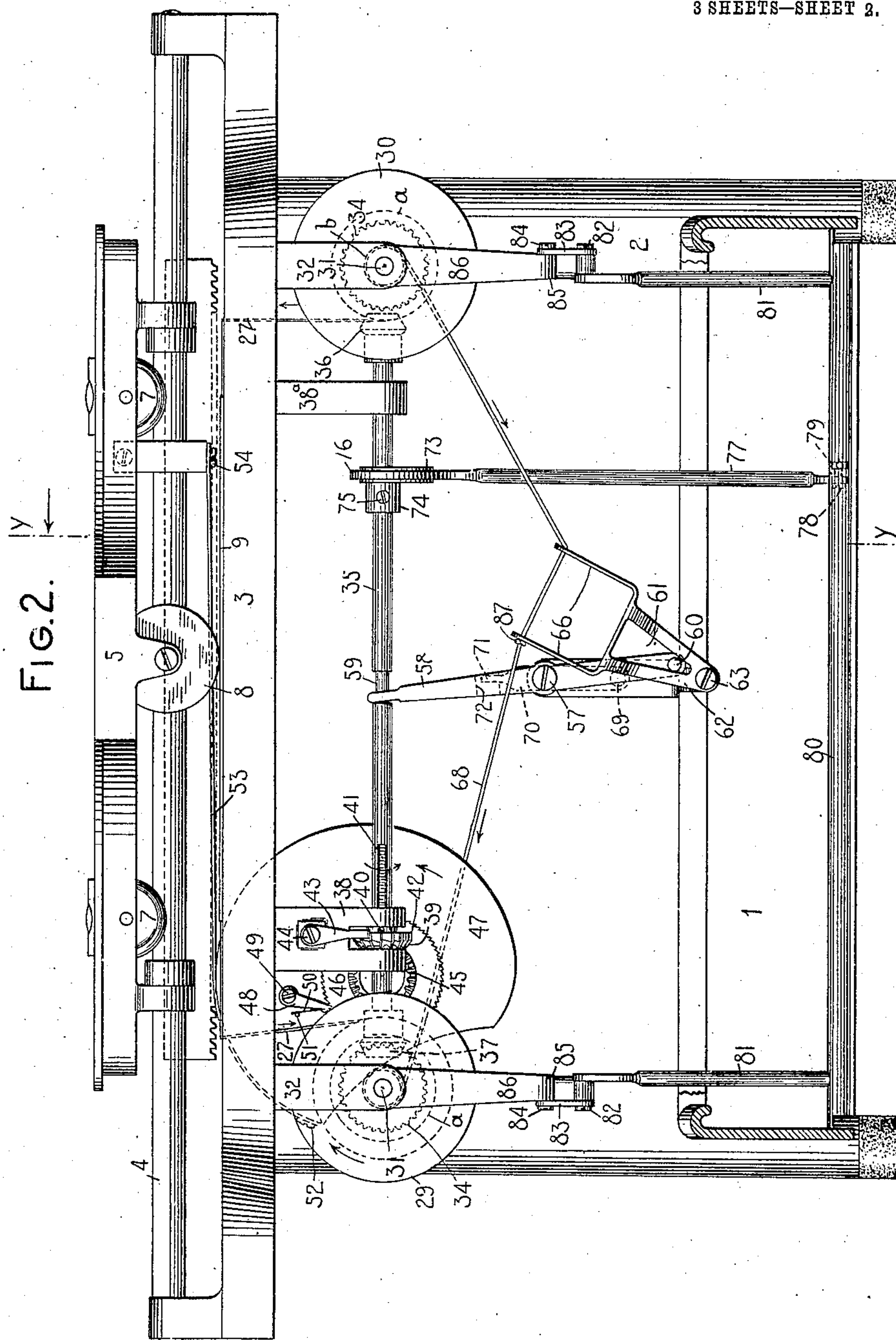
Robie Seidelinger
by Jacob Felber
HIS ATTORNEY

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3 SHEETS—SHEET 2.



WITNESSES.

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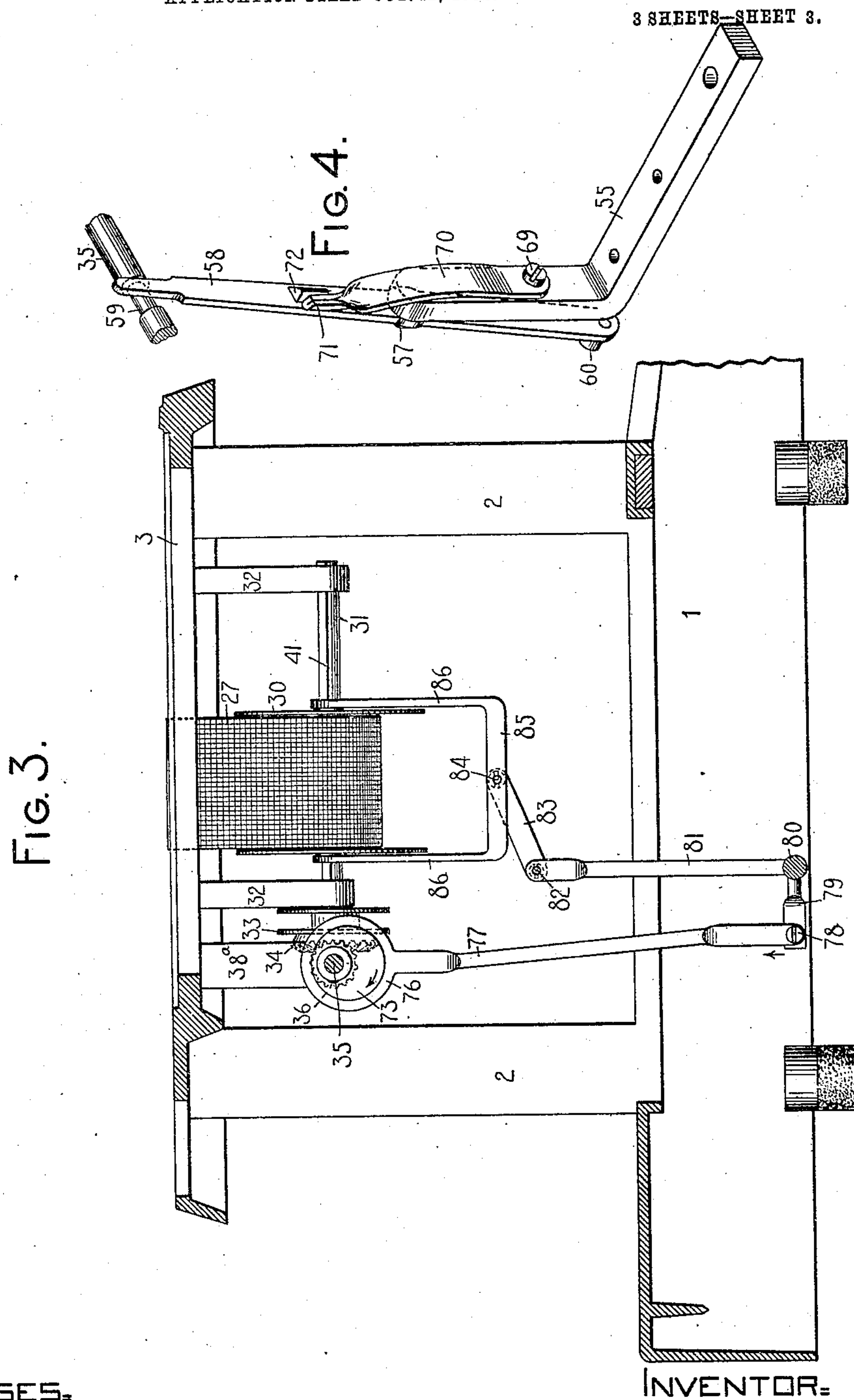
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ROBIE SEIDELINGER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A COR-
PORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 848,402.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed October 22, 1902. Serial No. 128,287.

To all whom it may concern:

Be it known that I, ROBIE SEIDELINGER, a citizen of the United States, and resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to ribbon-feed mechanism for type-writing machines; and one of the main objects of the invention is to provide simple and efficient mechanism of the character described for automatically reversing the direction of the feed of the ribbon when a given amount thereof is fed from one spool to another.

A further object of the invention is to provide simple and efficient mechanism for automatically effecting a transverse as well as a longitudinal feed of the ribbon, so that every portion thereof may be used.

To the above and other ends, which will hereinafter appear, my invention consists in the novel features of construction, arrangements of parts, and combinations of devices to be hereinafter described and claimed.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical central front-to-rear sectional view of one form of type-writing machine embodying my invention. Fig. 2 is a transverse sectional view of the same, the section being taken on the line *xx* of Fig. 1 and looking in the direction of the arrow at said line. Fig. 3 is a fragmentary vertical front-to-rear sectional view of the machine, the section being taken on the line *yy* of Fig. 2 and looking in the direction of the arrow at said line. Fig. 4 is an enlarged detail fragmentary perspective view of a portion of the reversing mechanism to be hereinafter described.

I have illustrated my invention applied to an under-strike type-writing machine, though it should be understood that for the purpose of my invention it is immaterial what character of writing-machine my invention is applied to.

The frame of the machine comprises a base 1, corner-posts 2, and a top plate 3, which latter supports a traverse-rod 4, that guides the carriage 5, in which a platen 6 is mounted to revolve.

The rear of the carriage is provided with rollers 7, that coöperate with the traverse-rod, whereas the front of the carriage carries a roller 8, that bears upon a track 9 of the top plate.

Key-levers 10 are fulcrumed on a bar 11, projecting from the base 1, the forward end of each lever being provided with the usual finger-key 12, and a connecting rod or link 13 is interposed between each key-lever and its associated type-bar 14, whereas a restoring-spring 15 is associated with each lever to assist in restoring it and the connected parts to their normal positions.

A universal bar 16 extends transversely beneath the various key-levers and is connected at its ends to upright links or rods 17, that are supported by their hooked ends on a transverse bar 18, connected to the rocker-arm 19, secured to a rock-shaft 20, that carries an upright rocker-arm 21, provided with feed-dogs 22, which coöperate with the feed-rack 23, connected to the carriage. A spring 24 is connected at one end to the rock-shaft 20, and at its other end bears upon a fixed bracket-plate 25, so that the tension of the spring is exerted to restore the rock-shaft and the parts connected thereto to the position shown in Fig. 1. The carriage is connected by a band to a spring-drum, so as to move the carriage a letter-space distance in the direction of its feed at each actuation of a finger-key.

So much of the mechanism as has thus far been described constitutes portions of a well-known type-writing machine, and further detail description thereof is considered unnecessary.

The ribbon 27 passes from a ribbon-spool 29 at one side of the machine to a ribbon-spool 30 at the other side thereof, whereas the intermediate length of ribbon between the spools passes through slots in the top plate, over the top plate and type-well of the machine, and between the types and the platen in the usual manner.

Each of the ribbon-spools 29 and 30 is splined upon an associated ribbon-spool shaft 31, which extends fore and aft of the machine and is supported in bearings 32, depending from the top plate of the machine, so that each spool is free to move longitudinally on its shaft, but by reason of the

splined connection therewith is caused to rotate with its shaft. Each shaft 31 extends rearwardly of the rear bearing 32 therefor and is provided with a pulley 33 and a bevel-gear 34, both of which are fixed to the shaft.

A driving-shaft 35 extends transversely of the machine and carries bevel-pinions 36 and 37 at the ends thereof, and the length of this shaft is such that when one of the pinions thereon is in mesh with its associated bevel-gear 34 the opposite pinion on the shaft will be out of mesh with its associated bevel-gear, as represented in Fig. 2. The shaft 35 is supported in bearings 38 and 38^a, that depend from the top plate of the machine and in which the shaft is adapted to slide longitudinally. The bearing 38 is bifurcated for the reception of a bevel-gear 39, which is mounted on the shaft and has a pin 40 that extends through a collar on the gear and into a splined groove 41 in the shaft, so that this gear is adapted to remain fixed with relation to the longitudinal movement of the shaft 35, but is connected to rotate therewith. The bevel-gear 39 has peripheral ratchet-teeth 42, with which a spring-detent 43 co-operates, the detent being secured by a screw 44 to the bearing 38, thus preventing a backward rotation of the driving-shaft. The bevel-gear 39 meshes with a companion bevel driving-gear 45, which is secured to or forms part of a ratchet-wheel 46, that is mounted on the same center as the spring-drum 47. The spring-drum has a pawl 48 pivoted thereto at 49, and the nose of the pawl is maintained in engagement with the teeth of the ratchet-wheel 46 by a spring 50, that is secured to the pawl and bears at its free end against a pin 51, carried by the drum. The drum 47 has secured thereto at 52 one end of a band 53, the other end of said band being secured to the carriage at 54, so that the tension of the spring is exerted to effect a step-by-step feed movement of the carriage during the actuation of the key-levers.

An angular bracket 55 is secured by a screw 56 to the base 1 of the machine, and the upright arm of the bracket receives a headed screw-pivot 57 of an upright lever 58, the upper end of said lever being received within a peripheral groove or depression 59 in the driving-shaft 35, whereas the lower end of said lever carries a laterally-projecting pin 60, that is received within an apertured portion 61 of a frame or lever 62, the latter being pivoted at 63 to an auxiliary bracket 64, that is secured by screws 65 to the angular bracket 55. The upper portion of the frame 62 is in the form of a yoke, the two arms 66 of which are apertured at diametrically opposite points, as indicated at 67, (see Fig. 1,) and these apertures receive a band, cord, chain, or ligament 68, which extends freely therethrough and each end of which is secured to one of the pulleys 33. I prefer to

make the part 68 in the form of a fine chain or other flexible ligament in which there is little give or stretch, though it should be understood that any suitable flexible connection may be used, and the term "band" employed in the claims is intended to designate generically any suitable ligament, whether it be a chain, cord, or other line connection.

Secured by a screw 69 to the rear side of the upright arm of the bracket 55 is a spring 70, which is bent at its free end 71 for coöperation with a cam 72 on the rear face of the lever 58. The purpose of this spring and its coöperating cam is to insure a complete movement of the lever 58 and the parts controlled thereby when the cam is moved to either side of the terminal 71 of the spring 70. The spring will when the highest portion of the cam passes its end 71 bear upon a side of the cam and assist or insure a complete movement of the lever and will likewise quicken the action of the parts, as will hereinafter more clearly appear.

The groove 59 in the shaft 35 is wider than the end of the lever 58. When the abutment 87 first engages an arm 66, the lever 58 is moved a certain distance without moving the shaft 35 at all while the end 71 of the spring 70 is riding upward on one of the faces of the cam 72. When said end 71 of the spring 70 passes over the top of the cam 72, said spring completes the motion of the lever 58 quickly, thus instantaneously throwing one of the pinions 36 or 37 out of engagement with its gear 34 and the other of said pinions into engagement with its gear 34.

The driving-shaft 35 carries an eccentric 73, which is provided with a collar 74, through which a set-screw 75 projects, the end of said set-screw bearing against the driving-shaft to rigidly connect the eccentric thereto. A strap 76 surrounds the eccentric and has a depending link 77, the lower end of which is pivoted at 78 to a crank-arm 79, that projects rearwardly from a rock-shaft 80, that extends transversely of the machine and is seated in suitable bearings in the sides of the base.

Projecting upwardly from the rock-shaft 80, near each end thereof, is a crank-arm 81, pivoted at its upper end 82 to a link 83, that in turn is pivoted at 84 to a yoke 85, the side arms 86 of said yoke passing on the outer sides of the flanges of the associated ribbon-spools and being perforated at the upper ends, where they are received on the associated ribbon-spools. It will be understood that the connection on both sides of the machine between the ribbon-spools and the rock-shaft 80 are the same, so that a rocking of the shaft 80 will cause both spools to be moved axially or along their shafts 31 to a corresponding extent to effect a widthwise or transverse feed of the ribbon.

From the foregoing description it will be

seen, especially by reference to Fig. 2, that a movement of the carriage 5 from left to right will merely result in turning the spring-drum 47 without transmitting motion to the ratchet-wheel 46, and every portion of the ribbon mechanism will at this time remain in a state of rest. When, however, the carriage is fed in the usual manner from right to left, motion will be transmitted by the spring-drum through the pawl 48 to the ratchet-wheel 46. The effect of this movement is to turn the bevel or driving gear 45, thus rotating its associated pinion 39 and transmitting a rotary motion to the driving-shaft 35. This rotation of the driving-shaft will turn the bevel-gear 34, with which the pinion 36 or 37 is in mesh, the pinion in mesh depending on the longitudinal position of the driving-shaft. If, for instance, the pinion 37 is in mesh with its companion bevel-gear 34, then the left-hand ribbon-spool will be positively driven by the rock-shaft, and the ribbon 27 will be moved in the direction of the arrows adjacent to the ribbon in Fig. 2, and the various parts will be disposed as shown in said figure. The continued rotation of the left-hand ribbon-spool shaft 31 will continue until an abutment 87 to the right of the frame 62 is brought to bear against the right-hand arm 66 of said frame, when the frame will be shifted around its pivot 63 toward the left. This movement is transmitted through the pin-and-slot connection 60 61 to the lever 58, the upper end of which is vibrated toward the right, thereby moving the driving-shaft 35 longitudinally toward the right until the pinion 36 thereon is thrown into mesh with the companion bevel-gear 34 of the right-hand ribbon-spool. This movement of the shaft 35 effects a disengagement of the pinion 37 from the gear of the left-hand ribbon-spool, and it becomes disconnected from the driving-shaft, and the reversal in the longitudinal direction of the feed of the ribbon is thus brought about. The ribbon continues to wind on the right-hand ribbon-spool until the knot or abutment 87 on the band 68 is brought into contact with the left-hand arm or frame 62, and a continued movement of the band results in the frame being shifted toward the right around its pivot 63 to the position indicated in Fig. 2, which shows the positions of the parts just after the driving-shaft has been moved to the left. This movement is transmitted to the lever 58 to effect a longitudinal movement of the driving-shaft 35, so as to disengage the pinion 36 from the gear of the right-hand spool and to throw the pinion 37 on said shaft into mesh with the gear of the left-hand ribbon-spool, and so on, this action is repeated to automatically reverse the direction of longitudinal feed of the ribbon when a given extent

of the band 68 passes from one pulley to the other.

Upon reference to Fig. 2 it will be seen that the core *a* of each ribbon-spool, which is shown in dotted lines, is much larger than the core *b* of the pulley, which is likewise shown in dotted lines in this figure. It follows, therefore, that the surface speed of the core of the ribbon-spool is much greater than that of the pulley, though each associated pulley and ribbon-spool are mounted on the same shaft and rotate together. This construction permits a ribbon of any desired length to be employed and at the same time enables a comparatively short extent of band 68 to be used. Thus, for instance, a ribbon of, say, five yards or more in length may be employed, whereas the band may be less than a yard in length, and by making the abutments 87 adjustable on the band an automatic reversal in the longitudinal feed of the ribbon can be effected at any desired point in the movement thereof or at any predetermined point from the end of the ribbon. These abutments 87 may be of any desired construction—such, for instance, as a mere split ring which is clamped in place upon the band. It will be understood, therefore, that the machine may accommodate any desired length of ribbon, and by properly setting the stops or abutments 87 the direction of feed of the ribbon may be changed automatically as an end thereof is approached. It will likewise be seen that by this construction there is no strain whatever exerted upon the ribbon itself to effect a reversal in the direction of its feed, that the mechanism for automatically effecting a change in the feed is brought about by mechanism which is entirely independent of the ribbon and which is actuated by the power employed to propel the carriage. Thus, for instance, the spring-drum transmits motion to the pulleys, and the band as it is taken up by one pulley will eventually cause the abutment on the band to be brought into contact with the shifting device 62, thereby changing the longitudinal position of the driving-shaft 35 and throwing it out of operative connection with one ribbon-spool and into operative connection with the other.

Upon reference to Fig. 2 it will be seen that the pivotal connection 78 between the crank-arm 79 and the link 77 is such that the eccentric 73, strap 76, and link 77 may be moved with the shaft during the longitudinal movement thereof without in any way affecting the operation of the connections between the driving-shaft 35 and the rock-shaft 80. The intermittent rotation transmitted to the driving-shaft 35 during the feed movement of the carriage causes the eccentrics 73 to effect an intermittent vibration of the rock-shaft 80 in opposite directions, so that the crank-

arms 81 are moved step by step first toward the front and then toward the rear of the machine, and these movements of the crank-arms are transmitted to the yokes 85 to
 5 cause the ribbon-spools to be moved longitudinally on their shafts 31, so that during an actuation of the machine the ribbon will be automatically fed widthwise, as well as longitudinally, and automatically reversed
 10 in both directions to use the entire surface of the ribbon.

Various changes may be made without departing from the spirit of my invention, and certain features may be employed without
 15 the others.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with a platen and a series of types, of
 20 ribbon-spools, an ink-ribbon that passes from one ribbon-spool to the other, a band which is operatively connected to said ribbon-spools, and mechanism controlled by said band for automatically reversing the direction of the feed of the ribbon, said reversing
 25 mechanism being situated at one side of said series of types.

2. In a type-writing machine, the combination with a platen and a series of types, of
 30 ribbon-spools, an ink-ribbon that passes from one spool to the other, means for intermittently rotating said ribbon-spools, a band operatively connected to move as the ribbon-spools are rotated, and means controlled
 35 by said band for automatically reversing the direction of the feed of the ribbon, said reversing mechanism being situated at one side of said series of types.

3. In a type-writing machine, the combination with a platen and a series of types, of
 40 ribbon-spools, an ink-ribbon that passes from one spool to the other, means for feeding said ribbon, a band that travels with and in the same direction as the ribbon, and
 45 means controlled by said band for automatically reversing the direction of longitudinal feed of the ribbon, said reversing mechanism being situated at one side of said series of types.

4. In a type-writing machine, the combination with a platen and a series of types, of
 50 spools for an ink-ribbon, pulleys operatively connected to rotate with said spools, a band connected to and extending from one of said pulleys to the other, and means controlled
 55 by said band for automatically changing the direction of rotation of said spools, said reversing mechanism being situated at one side of said series of types.

5. In a type-writing machine, the combination with a platen and a series of types, of
 60 spools for an ink-ribbon, gearing adapted to rotate said ribbon-spools, means for shifting said gearing to throw it into coöperative engagement with one ribbon-spool and out of

coöperative engagement with the other of said ribbon-spools, and a band which travels when the ribbon is fed and which controls said shifting means to automatically reverse the direction of the feed of the ribbon, said
 70 reversing mechanism being situated at one side of said series of types.

6. In a type-writing machine, the combination with a platen, a series of types, an ink-ribbon, and feed mechanism therefor, of
 75 a reversing device, and a movable band which passes through said reversing device and is adapted to actuate it to automatically change the direction of the feed of the ribbon, said reversing mechanism being situated
 80 at one side of said series of types.

7. In a type-writing machine, the combination of a power-driven carriage, a platen mounted on said carriage, a series of type-bars, a ribbon interposed between said platen
 85 and said series of type-bars, feed mechanism therefor, a reversing device situated on one side of said series of type-bars, and a movable band which passes through said reversing device and is adapted to be moved by the
 90 power applied to the carriage to actuate the reversing device and thereby automatically change the direction of the feed of the ribbon.

8. In a type-writing machine, the combination of a power-driven carriage, a platen
 95 mounted on said carriage, a series of type-bars, a ribbon interposed between said platen and said series of type-bars, feed mechanism therefor, a reversing device situated on one side of said series of type-bars, a band which
 100 is moved by the carriage, and abutments on the band which coöperate with the reversing device to move it in either of two directions depending upon the direction in which the band is moving, to alternately and automati-
 105 cally shift the reversing device first in one direction and then in the opposite direction to effect a reversal in the direction of the feed of the ribbon.

9. In a type-writing machine, the combination with a platen and a series of types, of
 110 spools for an ink-ribbon, a shaft for each ribbon-spool and with which an associated ribbon-spool rotates, a pulley on each shaft, a band that extends from one of said pulleys to
 115 the other, gearing that is adapted to drive either of said shafts, and a reversing device that coöperates with said gearing and with said band to automatically shift the gearing to effect a reversal in the direction of the
 120 feed of the ribbon, said reversing device being situated at one side of said series of types.

10. In a type-writing machine, the combination with a platen and a series of types, of
 125 ribbon-spools, a shaft for each ribbon-spool and with which an associated ribbon-spool rotates, a gear on each spool-shaft, a rotatable and longitudinally-movable driving-shaft, gears thereon which are adapted to mesh with the gears on the spool-shafts, a
 130

pulley on each spool-shaft, a band that extends from one of said pulleys to the other, and a reversing device that coöperates with said driving-shaft and with said band to automatically shift the driving-shaft longitudinally to effect a reversal in the direction of the feed of the ribbon, said reversing device being situated at one side of said series of types.

11. In a type-writing machine, the combination of a carriage, a spring-drum therefor, a platen mounted on said carriage, a series of type-bars, a gear that is turned by said spring-drum, ribbon-spools, pulleys that rotate with said ribbon-spools, a band that extends from one pulley to the other, gearing that is actuated by the gear of the spring-drum, and a reversing device with which the band coöperates and which coöperates with the gearing to shift it and thereby automatically reverse the direction of the feed of the ribbon, said reversing device being situated at one side of said series of type-bars.

12. In a type-writing machine, the combination of a carriage, a spring-drum therefor, ribbon-spool shafts with which the ribbon-spools rotate, a gear on each of said shafts, a rotatable and longitudinally-movable driving-shaft having gears thereon that are adapted to mesh with the gears on the spool-shafts, pulleys that rotate with said ribbon-spool shafts, said pulleys being mounted on the same ends of said shafts as said gears, a band that extends from one pulley to the other, gearing interposed between the driving-shaft and the spring-drum, and a reversing device with which the band coöperates and which coöperates with the driving-shaft to shift it longitudinally, and thereby automatically reverse the direction of the feed of the ribbon.

13. In a type-writing machine, the combination of a carriage, a spring-drum for said carriage, a ratchet-wheel that is adapted to be turned in one direction by said drum, ribbon-spools, a ribbon that passes from one ribbon-spool to the other, means controlled by said ratchet-wheel for rotating either of said ribbon-spools, a reversing device, and a band that travels as the ribbon is fed from one spool to the other and which coöperates with the reversing device to automatically effect a reversal in the direction of the feed of the ribbon, said band and reversing device being situated at one side of said ribbon.

14. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes from one spool to the other, ribbon-feed mechanism, a band that travels with the ribbon, and a reversing device that coöperates with said band and is actuated thereby, said reversing device comprising a pivoted lever which is moved on its pivot by said band, and a secondary lever controlled by the first-mentioned lever and coöperating with the

ribbon-feed mechanism to effect a reversal in the direction of the feed of the ribbon.

15. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes from one spool to the other, ribbon-feed mechanism, a band that travels with the ribbon, abutments on said band, and a reversing device that coöperates with said band and is actuated thereby, said reversing device comprising a lever pivoted to a fixed portion of the machine and which is moved on its pivot by said abutments, and a secondary lever pivoted to a fixed portion of the machine and controlled by the first-mentioned lever and coöperating with the ribbon-feed mechanism to effect an automatic reversal in the direction of the feed of the ribbon.

16. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes back and forth from one spool to the other, ribbon-feed mechanism, a band that travels with the ribbon, a reversing device that coöperates with said band and is actuated thereby, said reversing device comprising a lever which is moved on its pivot by said band and a secondary lever controlled by the first-mentioned lever and coöperating with the ribbon-feed mechanism to effect a reversal in the direction of the feed of the ribbon, and spring-pressed means coöperating with said device and adapted to assist in completing the throw of the parts when they are shifted by the band and for maintaining them against accidental displacement in the shifted position.

17. In a type-writing machine, the combination of a power-driven carriage, ribbon-spools, a ribbon that passes from one spool to the other, ribbon-feed mechanism that is actuated by the power applied to move the carriage, a band that travels with the ribbon and is moved by the power applied to the carriage, abutments on said band, and a reversing device that coöperates with said band and is actuated thereby, said reversing device comprising a lever pivoted to a fixed portion of the machine and which is moved on its pivot by said abutments and a secondary lever pivoted to a fixed portion of the machine and controlled by the first-mentioned lever and coöperating with the ribbon-feed mechanism to effect an automatic reversal in the direction of the feed of the ribbon.

18. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes from one ribbon-spool to the other, ribbon-spool shafts with which said spools turn, pulleys fixed to said spool-shafts, a band connected to and extending from one pulley to the other, means for rotating said spool-shafts, and a reversing device coöperating with said band to afford a shifting of the rotating means and thus effect an automatic reversal in the direction of the feed of the

ribbon, said reversing device comprising a frame that is moved by said band and a pivoted lever that is controlled by the movable frame and connected to the ribbon-spool-rotating means.

19. In a type-writing machine, the combination of a carriage, a spring-drum therefor, ribbon-spools, a ribbon that extends from one spool to the other, intermediate gear connections between said ribbon-spools and the spring-drum and which are effective to cooperate with either ribbon-spool, pulleys that are turned with the ribbon-spools, a band that extends from one pulley to the other, abutments on said band, a movable frame that is actuated by said abutments, and a lever that is moved by said frame and is effective to shift the gear connections so as to connect them with one spool and disconnect them from the other.

20. In a type-writing machine, the combination of a carriage, a spring-drum therefor, ribbon-spools, ribbon-spool shafts, a ribbon that extends from one spool to the other, intermediate gear connections between said ribbon-spools and the spring-drum and which are effective to cooperate with either ribbon-spool to intermittently rotate it during the travel of the carriage from right to left and to permit the spools to remain at rest during the travel of the carriage from left to right, pulleys that are fixed to the ribbon-spool shafts, a band that extends from one pulley to the other, abutments on said band, a movable frame that is actuated by said abutments, and a lever that is moved by said frame and is effective to shift the gear connections so as to connect them with one spool-shaft and disconnect them from the other spool-shaft.

21. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, an ink-ribbon that extends from one spool to the other, a rotatable and longitudinally-movable shaft that transmits movement to said ribbon-spools, means for rotating said shaft, a traveling band that moves as the ribbon is fed from one spool to the other, and intermediate connections between said band and shaft to automatically effect a longitudinal movement of the latter, said band and intermediate connections being situated on the same side of said ribbon as said shaft.

22. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, an ink-ribbon that extends from one spool to the other, a rotatable and longitudinally-movable shaft that transmits movement to either of said ribbon-spools depending on the longitudinal position of the shaft, means for rotating said shaft, a traveling band that moves as the ribbon is fed from one spool to the other and in the direction of the feed of the ribbon, and intermediate connections between said band and shaft to au-

tomatically effect a longitudinal movement of the latter, in order to automatically reverse the direction of the feed of the ribbon, said band and intermediate connections being situated on the same side of said ribbon as said shaft.

23. In a type-writing machine, the combination with a platen and a series of types of ribbon-spools, means for turning said ribbon-spools, an ink-ribbon that extends from one spool to the other, a band that travels as the ribbon is being fed, abutments adjustably connected to said band, and means cooperating with said adjustable abutments to effect a reversal in the direction of the feed of the ribbon, said band and reversing means being situated at one side of the series of types.

24. In a type-writing machine, the combination of a carriage, a spring-drum therefor, a driving-gear that is adapted to be turned in but one direction by said drum, a rotatable and longitudinally-movable driving-shaft, intermediate gear connections between said driving gear and shaft, ribbon-spools, a ribbon that extends from one spool to the other, gear connections between said shaft and said ribbon-spools, pulleys that are connected to rotate with said ribbon-spools, a band that is connected to said pulleys, abutments on said band, a movable frame having apertures therein for the passage of said band and which is adapted to be automatically actuated by said abutments, and a lever controlled by said frame and connected to the said driving-shaft to effect a longitudinal movement thereof.

25. In a type-writing machine, the combination of a carriage, a spring-drum therefor, a ratchet-wheel, a pawl on the drum for turning the ratchet-wheel in one direction, a driving-gear that is connected to said ratchet-wheel, a rotatable and longitudinally-movable driving-shaft, intermediate gear connections between said driving gear and shaft, ribbon-spools, ribbon-spool shafts, a ribbon that extends from one spool to the other, gear connections between said driving-shaft and said ribbon-spool shafts, pulleys that are carried by and rotate with said ribbon-spool shafts, a band that is connected to said pulleys, abutments on said band, a movable frame having apertures therein for the passage of said band and which is adapted to be automatically actuated by said abutments, and a lever controlled by said frame and connected to the said driving-shaft to effect a longitudinal movement thereof.

26. In a type-writing machine, the combination of a carriage, a spring-drum therefor, a ratchet-wheel, a pawl on the drum for turning the ratchet-wheel in one direction, a driving-gear that is connected to said ratchet-wheel, a rotatable and longitudinally-movable driving-shaft, intermediate gear connections between said driving gear and shaft,

ribbon-spools, ribbon-spool shafts, a ribbon that extends from one spool to the other, gear connections between said driving-shaft and said ribbon-spool shafts, pulleys that are carried by and rotate with said ribbon-spool shafts, a band that is connected to said pulley and travels in the same direction as the ribbon, abutments on said band, a pivoted frame having apertures therein for the passage of said band and which is adapted to be automatically turned on its pivot by said abutments, a lever pivoted to a fixed portion of the machine and controlled by said frame, the lever being connected to the said driving-shaft to effect a longitudinal movement thereof and thereby automatically effect a reversal in the direction of the feed of the ribbon.

27. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, a ribbon that passes from one ribbon-spool to the other, a band which is operatively connected to said ribbon-spools, mechanism controlled by said band for automatically reversing the direction of the longitudinal feed of the ribbon, and means for automatically feeding the ribbon in a direction transverse to the length thereof, said band and reversing mechanism being situated at one side of said series of types.

28. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, pulleys operatively connected to rotate with said spools, a band connected to and extending from one of said pulleys to the other, means controlled by said band for automatically changing the direction of rotation of said spools, and means for automatically feeding said ribbon in a direction transverse of its length, said band and reversing means being situated on one side of said series of types.

29. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, gearing adapted to rotate said ribbon-spools, means for shifting said gearing to throw it into coöperative engagement with one ribbon-spool and out of coöperative engagement with the other of said ribbon-spools, a band which travels when the ribbon is fed and controls said shifting means to automatically reverse the direction of longitudinal feed of the ribbon, and means for automatically moving the ribbon widthwise first in one direction and then in the other, said band and shifting means being situated at one side of said series of types.

30. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, a ribbon that extends from one spool to the other, a driving-shaft that is adapted to be connected to turn either spool, means controlled by said shaft for moving the ribbon widthwise, a band that moves as the ribbon-spools are turned, and means con-

trolled by said band for connecting the driving-shaft with one ribbon-spool and disconnecting it from the other, said band and said connecting and disconnecting means being situated at one side of said series of types.

31. In a type-writing machine, the combination with a platen and a series of types, of ribbon-spools, shafts to which the ribbon-spools are fixed, a ribbon that extends from one spool to the other, a driving-shaft that is adapted to be geared to turn either spool-shaft, means controlled by said driving-shaft for moving the ribbon widthwise, a band, the movement of which is controlled by said ribbon-spool shafts, and means controlled by said band for connecting the driving-shaft with one ribbon-spool shaft and disconnecting it from the other, said band and said connecting and disconnecting means being situated at one side of said series of types.

32. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes from one spool to the other, means for rotating said ribbon-spools, a traveling band, means controlled by said band for reversing the longitudinal feed of the ribbon and means for moving said ribbon widthwise and which comprises a rock-shaft, means for rocking said rock-shaft, which rocking means are connected to the spool-rotating means, and connections between the rock-shaft and the ribbon-spools.

33. In a type-writing machine, the combination of ribbon-spools, a ribbon which passes from spool to spool, a longitudinally-movable rotatable driving-shaft for rotating either of said spools, the spool rotated depending on the longitudinal position of the driving-shaft, an eccentric on said driving-shaft, means controlled by said eccentric for moving said ribbon-spools back and forth on their axial centers, a traveling band, and means controlled by said band for automatically shifting said driving-shaft longitudinally to effect an automatic reversal in the direction of the longitudinal feed of the ribbon.

34. In a type-writing machine, the combination of a power-driven carriage, ribbon-spools, a ribbon which passes from spool to spool, a longitudinally-movable rotatable driving-shaft for rotating either of said spools through the power applied to drive the carriage, the spool rotated depending on the longitudinal position of the driving-shaft, an eccentric secured to said driving-shaft, means controlled by said eccentric for moving said ribbon-spools back and forth on their axial centers, a traveling band which is moved by the power applied to drive the carriage, and means controlled by said band for automatically shifting said driving-shaft longitudinally to effect an automatic reversal in the direction of the longitudinal feed of the ribbon.

35. In a type-writing machine, the combination of a power-driven carriage, ribbon-spools, a shaft for each ribbon-spool, a pulley on each spool-shaft, a ribbon which passes
 5 from spool to spool, a longitudinally-movable rotatable driving-shaft for rotating either of said spool-shafts through the power applied to drive the carriage, the spool-shaft rotated depending on the longitudinal position
 10 of the driving-shaft, an eccentric secured to said driving-shaft, a strap for said eccentric, a link connected to said strap, a rock-shaft connected to and rocked by said link, a yoke for each ribbon-spool, connections
 15 from said yokes to the rock-shaft, whereby said ribbon-spools may be moved back and forth on their shafts, a traveling band which is connected to said pulleys and is moved by the power applied to drive the
 20 carriage, and means controlled by said band for automatically shifting said driving-shaft longitudinally to effect an automatic reversal in the direction of the longitudinal feed of the ribbon.

25 36. In a type-writing machine, the combination of ribbon-spools, a ribbon that passes from one spool to the other, ribbon-feed mechanism, a band that travels with the ribbon, and a reversing device that coöperates
 30 with said band and is actuated thereby, said reversing device comprising a spring which is put under tension by said band and which coöperates with the ribbon-feed mechanism to effect a quick reversal of the direction of
 35 the feed of the ribbon.

37. In a type-writing machine, the combi-

nation of ribbon-spools, a ribbon that passes from one spool to the other, ribbon-feed mechanism, a band that travels with the ribbon, and a reversing device that coöperates
 40 with said band and is actuated thereby, said reversing device comprising a member which is actuated by said band and which has a lost-motion connection with said ribbon-feed mechanism, and a spring which is
 45 put under tension by said member during a portion of the motion thereof and which completes the motion of said member to effect a quick reversal of the direction of the feed of the ribbon.
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38. In a type-writing machine, the combination with a platen, a series of types, two ribbon-spools, an ink-ribbon which passes from one spool to the other, a gear connected to each of said ribbon-spools, and pinions for
 55 engaging said gears, of automatic feed-reversing means comprising a member having lost-motion connection with said pinions, a spring that is put under tension by said member during a portion of the movement of the
 60 latter and that completes said movement, thus quickly effecting the reverse in the direction of the feed; and means for actuating said member.

Signed at Philadelphia, in the county of Philadelphia and State of Pennsylvania, this
 65 18th day of October, A. D. 1902.

ROBIE SEIDELINGER.

Witnesses:

DAVID E. SIMON,
 EMILY M. BOSSERT.