Sept. 15, 1959 H. B. SMITH 2,904,157

STENOGRAPHIC MACHINES

Filed March 27, 1957 3 Sheets-Sheet 1

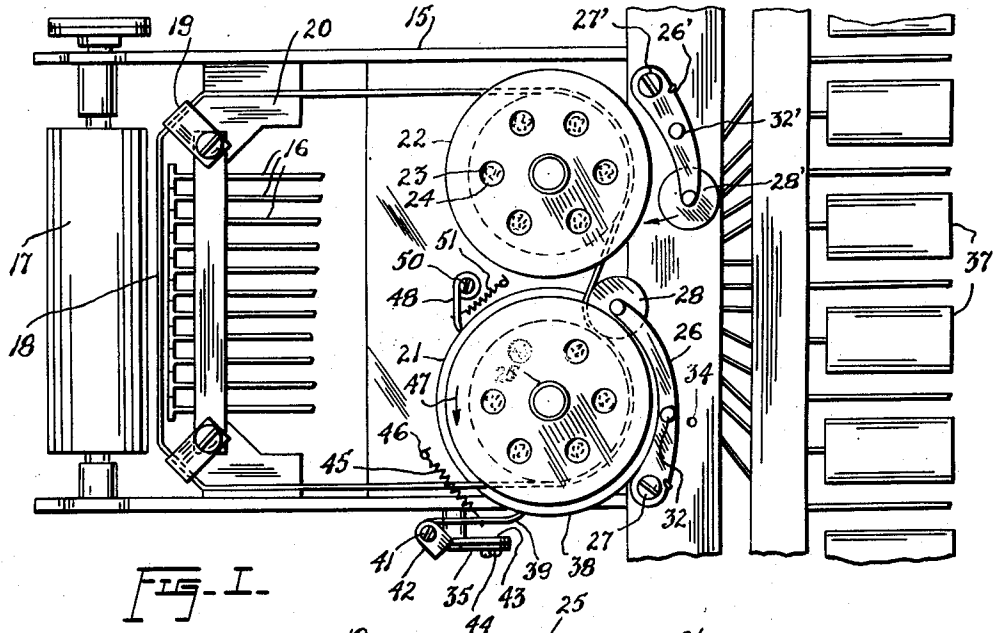


Fig. 1.

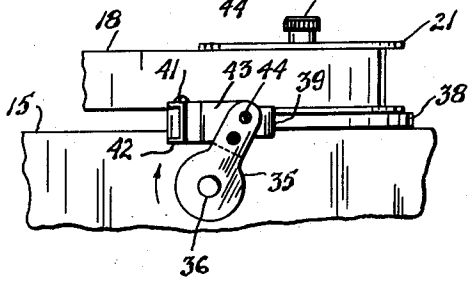


Fig. 2.

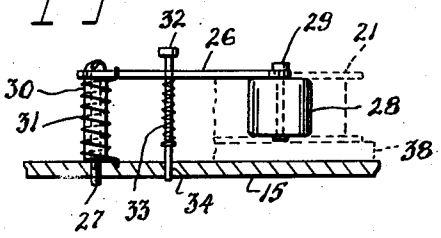


Fig. 3.

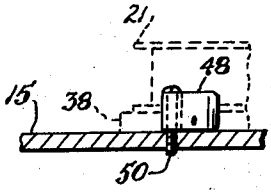


Fig. 5.

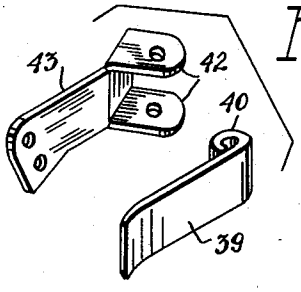


Fig. 4.

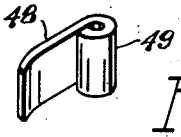


Fig. 6.

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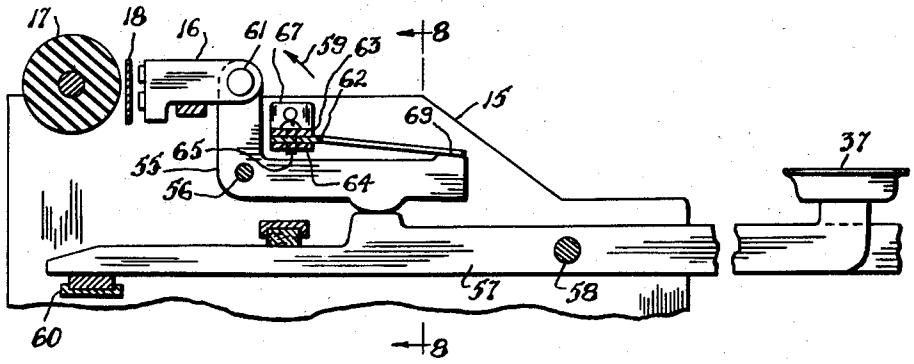


FIG. 7.

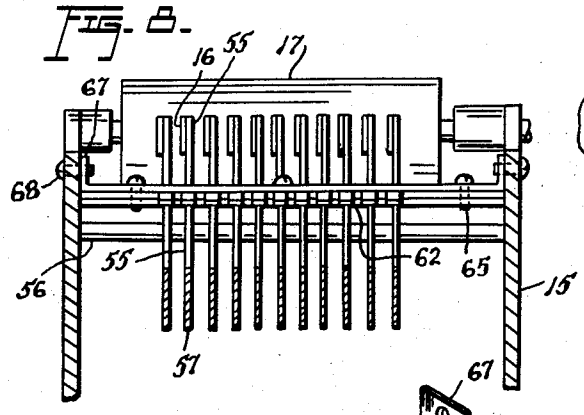


FIG. 8.

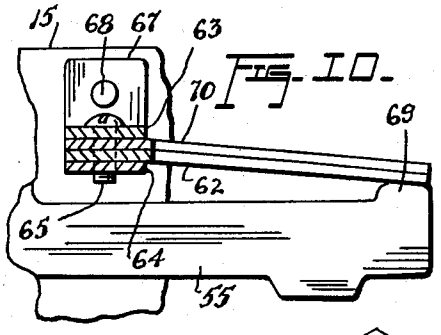


FIG. 10.

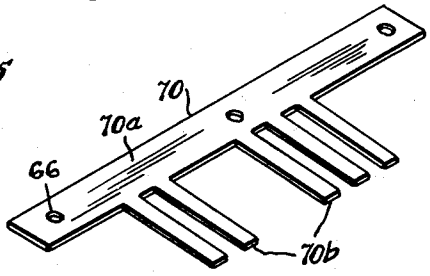


FIG. 11.

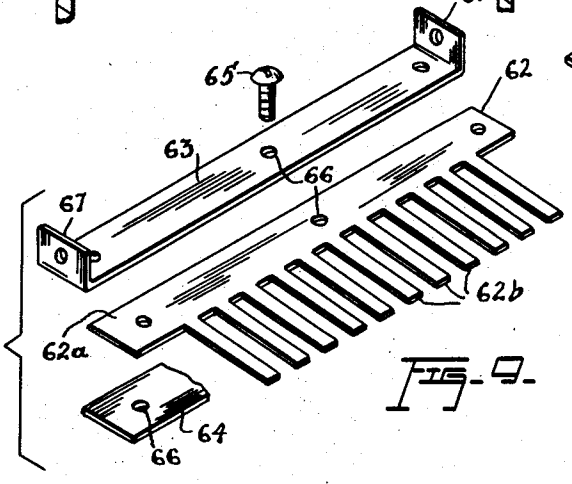


FIG. 9.

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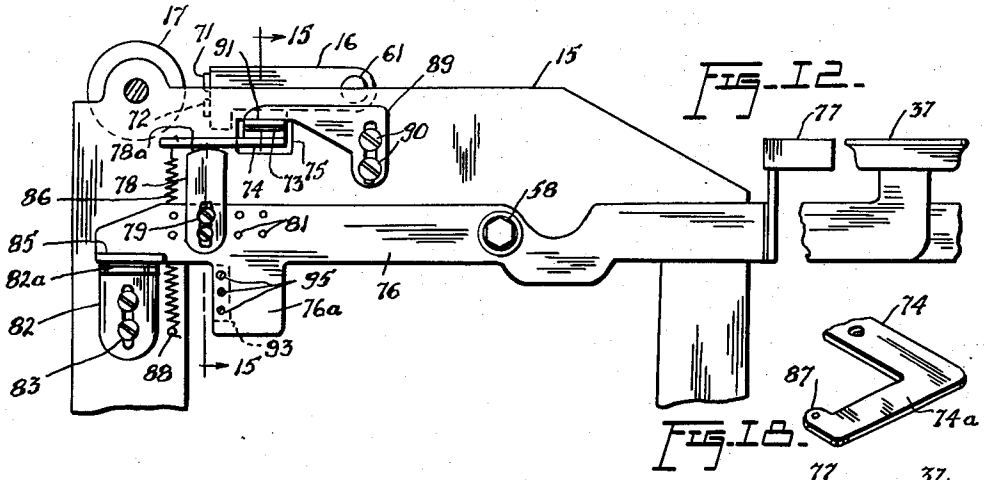


FIG. 12.

FIG. 18.

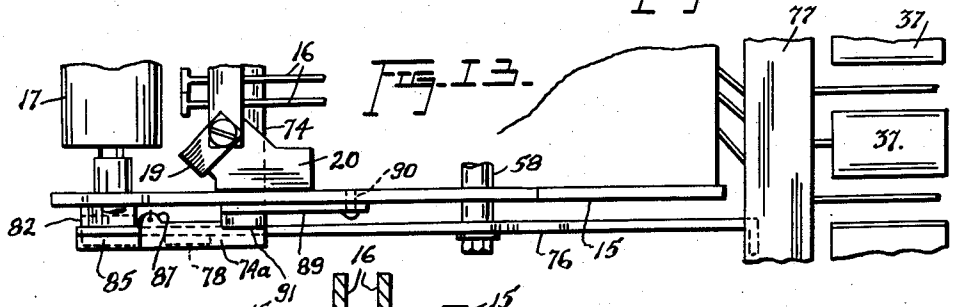


FIG. 13.

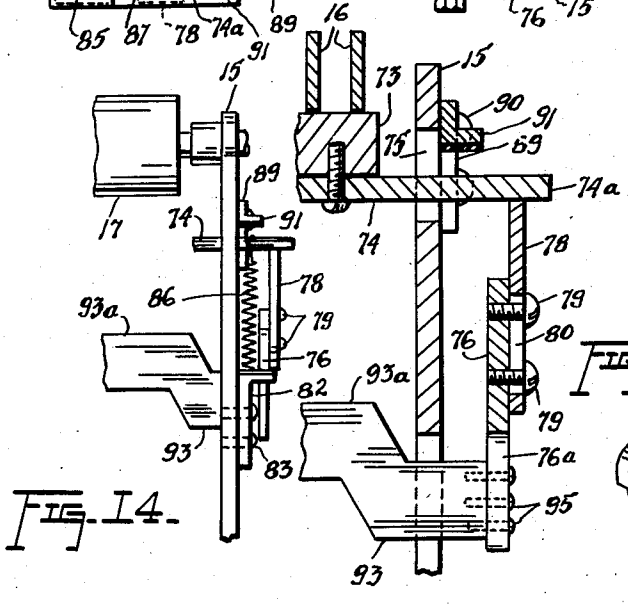


FIG. 14.

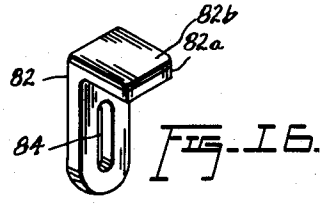


FIG. 16.

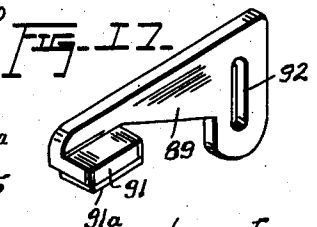
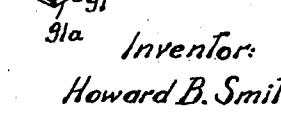


FIG. 17.



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FIG. 15.

United States Patent Office 2,904,157 Patented Sept. 15, 1959

2,904,157

STENOGRAPHIC MACHINES

Howard B. Smith, Washington, D.C.

Application March 27, 1957, Serial No. 648,915

14 Claims. (Cl. 197—9)

This invention relates to new and useful improvements in stenographic machines or so-called stenotype or stenograph machines used for typing shorthand.

Such machines usually employ a set of type bars movable toward and away from a platen, an inking ribbon being interposed between the platen and the type bars so that an impression is made upon paper passing over the platen when the type bars are actuated. The ribbon is in the form of a relatively short, endless band which passes partly around a combined ribbon inking and driving spool, the latter containing an ink supply which is transmitted to the ribbon at the same time as the ribbon is driven by the spool.

The principal object of the present invention is to substantially improve the ribbon mechanism in general, and particularly from the standpoint of increasing the supply of ink, so that the machine may be operated for prolonged periods without the necessity for reinking.

The above object is attained by providing the machine with two ribbon inking spools in place of the one conventionally used, whereby the ink supply in the improved machine is literally doubled.

As a result of utilizing two spools, the length of the ribbon is increased, so that the longer ribbon is subjected to less wear than the conventional shorter ribbon, in the performance of a given amount of work.

Another object of the invention is to provide improved means for urging the ribbon into engagement with the two spools selectively, whereby ink may be transferred to the ribbon from one spool when the supply of ink in the other spool is exhausted, or whereby ink may be transferred to the ribbon simultaneously from both spools, of an extra heavy impression is to be made by the type bars.

Another object of the invention is to provide improved driving means for the ribbon spools, which do not employ expensive gearing conventionally utilized for this purpose.

Another object of the invention is to provide improved spring means for biasing the type bars away from the platen after the type bars are actuated.

Another object of the invention is to provide improved means for actuating the shifter mechanism of the type bars for bringing the upper and lower cases of type thereon selectively in alignment with the platen.

Some of the advantages resulting from the above outlined improvements reside in a greater efficiency and durability of the machine, and in its adaptability to more economical manufacture.

With the above more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention will be understood from the following description taken in conjunction with the accompanying drawings, wherein like characters of reference are used to designate like parts, and wherein:

Figure 1 is a fragmentary top plan view of a stenographic machine embodying the improved ribbon mechanism;

Figure 2 is a fragmentary side elevational view of the spool driving means;

Figure 3 is a fragmentary sectional detail, showing the means for urging the ribbon into engagement with the spools;

Figure 4 is a group perspective view of the bracket and pawl of driving means;

Figure 5 is a fragmentary sectional detail, showing pawl means for preventing reverse rotation of the spools;

Figure 6 is a perspective view of the pawl per se, shown in Fig. 5;

Figure 7 is a fragmentary longitudinal sectional view of the machine showing the improved spring means for biasing the type bars;

Figure 8 is a vertical sectional view, taken substantially in the plane of the line 8—8 in Figure 7;

Figure 9 is a group perspective view of the biasing spring and its support means;

Figure 10 is a fragmentary sectional detail, on a slightly enlarged scale as compared to Figure 7, and illustrating main and auxiliary biasing springs;

Figure 11 is a perspective view of the auxiliary biasing spring;

Figure 12 is a fragmentary side elevational view of the machine showing the improved shifter mechanism;

Figure 13 is a fragmentary top plan view thereof;

Figure 14 is a fragmentary rear end view of the same;

Figure 15 is a vertical sectional detail on an enlarged scale, taken substantially in the plane of the line 15—15 in Fig. 12;

Figure 16 is a perspective view of a bottom stop bracket used in the improved shifter mechanism;

Figure 17 is a perspective view of a top stop bracket used therein, and

Figure 18 is a fragmentary perspective view of the shifter strap.

Referring now to the accompanying drawings in detail, particularly to Figures 1–6 inclusive, it should be understood that the same illustrate only the operating components of the machine with which the invention is concerned, the arrangement of all other components being conventional and well known in the art, so that a detailed explanation and illustration thereof herein is unnecessary.

As such, the frame of the machine is designated by the numeral 15, the same carrying a set of type bars 16 which are slidably movable toward and away from a platen 17. An endless inking ribbon 18 passes between the platen and the type bars, its positon and movement being guided by conventional guides 19, 20, carried by the frame.

In conventional machines the ribbon 18 passes around a single spool located centrally of the frame, but in accordance with the instant invention, two such spools 21 and 22 are provided. These spools, per se, are conventional in structure, each having a core of absorbent material 23 which is impregnated with ink so that the ink is transferred to the ribbon when the latter passes around the spool, it being understood that the absorbent cores of the spools may be re-inked through openings 24 with which the tops of the spools are usually formed.

The two spools 21, 22 are mounted side-by-side at the top of the frame 15 by removable pins 25 and the ribbon 18 passes around the spools as shown. The ribbon is relatively slack, but means are provided for urging the ribbon into engagement selectively with the two spools, as will be presently explained. As is best shown in Figure 3, a curved arm 26 is pivotally mounted at one end thereof on an upstanding stud 27 provided on the frame 15, while the other end of this arm carries a rotatable roller 28 mounted on a suitable pin 29. A tubular spacer 30 is provided on the stud 27 between the frame 15 and the arm 26, and a coil spring 31 is positioned

on this spacer, one end of the spring being suitably anchored to the frame, while its other end engages the arm so as to urge the same toward the spool 21. As this occurs, the roller 28 causes the ribbon 18 to engage the ink impregnated core of the spool so that ink from the core is transferred to the ribbon while at the same time the ribbon is driven by rotation of the spool, as will be hereinfter described.

A locking pin 32, biased by a spring 33, is provided intermediate the ends of the arm 26 and has the lower end portion thereof receivable in a locking aperture 34 formed in the frame 15 at such point that when the locking pin is in the aperture, the arm 26 is held away from the spool 21 to facilitate convenient changing of the spool or the ribbon.

Similar means are provided for urging the ribbon into engagement with the second spool 22, wherein the corresponding parts are designated by the numerals 26', 27', 28' and 32'. The arrangement of these parts is the same as that shown in Figure 3.

The machine may be used with the arm 26' in its inoperative position wherein the roller 28' does not press the ribbon against the spool 22, so that the ribbon receives its ink supply mainly from the spool 21. When the supply of ink in the spool 21 is exhausted, the arm 26' may be released from its inoperative position so that the roller 28' presses the ribbon against the spool 22 to transmit ink from that spool to the ribbon. If desired, both arms 26, 26' may be placed in their operative positions to transfer ink to the ribbon simultaneously from both spools, when an extra heavy impression is to be made by the type bars 16. Moreover, both arms may be locked in their inoperative positions when either the ribbon or the spools are to be changed.

For purposes of driving the ribbon, only one of the two spools needs to be positively driven, such drive means being taken from a crank 35 secured to a rock shaft 36 at one side of the frame 15 in accordance with conventional practice. The crank 35 is subjected to oscillatory movement when any of the keys 37 actuating the type bars 16 is depressed, and in conventional machines drive from the crank 35 to the spool is taken through the medium of a complex ratchet mechanism and gearing.

However, in the instant invention a simple friction drive is provided, the same involving the provision of a friction disc 38 of suitable material such as hard rubber, or the like, which underlies the spool 21 so that when the disc is rotated, the spool rotates therewith. The disc 38 projects beyond the periphery of the spool and the peripheral edge portion of the disc is operatively engaged by the free end of a pawl 39. The other end of this pawl is curved to form a bearing 40 for a pivot pin 41 whereby the pawl is hingedly attached to a yoke 42 formed integrally with a bracket 43 which, in turn, is rigidly secured to the crank 35 by suitable screws 44. A tension spring 45 extends from the pawl 39 to a suitable anchor pin 46 on the frame 15 whereby to urge the pawl into driving engagement with the disc 38, it being apparent from the foregoing that when the crank 35 is oscillated, the pawl will impart an intermittent unidirectional rotation to the disc and to the associated spool 21, as indicated by the arrow 47.

Reverse rotation of the spool is prevented by a second pawl 48 which also engages the periphery of the disc 38 and is provided with a bearing 49 to receive a mounting post or pin 50 on the frame 15. A suitable tension spring 51 urges the pawl 48 into contact with the disc 38, as will be clearly apparent.

It will be noted that by providing two spools in place of the usual one, the inking capacity is literally doubled. Moreover, the provision of the two spools results in the use of a somewhat longer ribbon, whereby the ribbon is subjected to lesser wear in performing a given amount of work.

Referring now to Figures 7–11 of the accompanying drawings which also illustrate only the operating components of the machine with which the invention is concerned, the type bars 16 are operatively connected to the actuating keys 37 by a set of bell cranks 55 which are rockably mounted on a cross shaft 56 in the frame 15 and are in engagement with the inner ends of the key bars 57 supported by a cross shaft 58. When any one of the keys 37 is depressed, the movement of the associated key bar 57 rocks the associated crank 55 in the direction of the arrow 59 and the associated type bar 16 is thereby slid toward the platen 17. In their undepressed position, the key bars 57 abut the topside of a bank bar 60 and resilient means are provided for urging the type bars 16 away from the platen. In conventional machines such means consist of a set of individual tension springs, one for each of the type bars, such springs being attached at one end to the pivotal connections 61 between the respective type bars and the respective bell cranks, and being anchored at their other end to anchoring pins provided on the frame. As such, the conventional construction requires the use of several springs, the assembly of which is a tedious task.

In accordance with the present invention, such individual tension springs are eliminated and a single comb-shaped spring 62 is used. This spring is best shown in Figure 9, wherein it will be noted that the spring includes a transverse back portion 62*a* and a set of transversely spaced, projecting, resilient fingers 62*b*. The back portion 62*a* of the spring is clamped between a pair of holder straps 63, 64 by a plurality of screws 65 disposed in registering apertures 66 with which the parts 62*a*, 63 and 64 are formed.

The ends of the strap 63 are provided with apertured ears 67 which are secured to the frame 15 by screws 68 so that the entire spring assembly is disposed adjacent the bell cranks 55, as shown. The spring fingers 62*b* bear upon lobes 69 formed on the cranks 55 and individually bias the respective cranks so that the type bars 16 are individually urged to their retracted or inoperative positions. This arrangement not only eliminates the use of the conventional set of tension springs, but also produces a lighter and a more efficient touch on the keys 37 when the machine is operated.

The keys 37 of the machine are usually arranged in banks so that the key bars 57 are of different lengths and consequently do not have the same mechanical advantage with respect to their fulcrum 58 in operating the bell cranks and type bars. As a result, the pressure required to depress the keys varies with the different keys and the operating touch in a conventional machine is not uniform. An effort has been made in the past the eliminate this disadvantage by using individual tension springs of different resiliencies, but such a remedy not only still required a set of individual springs, but also made it possible for errors to occur when installing the springs in position so that a spring of the appropriate tension became associated with the ball crank of the particular type bar with which such a spring was intended to be used.

The instant invention avoids all the disadvantages above outlined by the provision of an auxiliary spring 70, best shown in Figure 11. This spring is similar to the aforementioned spring 62 and includes a back portion 70*a* and a plurality of resilient fingers 70*b*. However, the fingers 70*b* are provided only for bell cranks associated with key bars which are relatively light to depress, rather than being provided for each bell crank, as are the fingers 62*b*. The spring 70 is superposed on the spring 62 between the holder straps 63, 64 so that the fingers 70*b*, where provided, are in register with the fingers 62*b*. Consequently, some of the bell cranks are biased by two superposed spring fingers while others are biased by the single finger 62*b* only, and the resulting difference in resiliency effectively compensates for different mechanical advantages of the different key bars, so

that virtually uniform touch is required for depressing all of the keys.

If desired, more than one auxiliary spring **70** may be superposed on the spring **62**, so that some of the bell cranks are biased by three or more spring fingers, thus effecting a fine degree of compensation by resiliency for the different mechanical advantages of the different key bars. It is to be understood that the fingers **70***b* may be provided on the auxiliary spring or springs **70** at whatever points required, so as to affect the bell cranks for any desired key bars in the set.

By omitting the conventional individual tension springs of the type bars **16**, a bar to which such springs are anchored is also omitted. As a result, the lower horizontal arms of the bell cranks **55** may be lengthened as shown in Figure 7 beyond the point where they are contacted by the key bars **57** and the power of the springs **62**, **70** at the contact points **69** is greatly increased.

In accordance with conventional practice, the type bars **16** are provided with upper and lower cases of type **71**, **72**, respectively, and are swingable in vertical planes about their pivots **61** so that the upper and lower type cases may selectively be brought into a alignment with the platen **17**. The type bars rest upon a cross bar **73** which, in turn, is supported by a strap **74**, one end portion of the latter projecting outwardly through an opening **75** in one side of the frame **15**. The cross bar **73** is also supported at the ends thereof by crank means (not shown) pivoted coaxially with the pivots **61** of the type bars, the arrangement being such that when the strap **74** and the crank means are in their initial position, the upper type cases **71** are in alignment with the platen. On the other hand, when upward force is applied to the outwardly projecting end of the strap **74**, the crank means and all the type bars **16** are swung upwardly about the pivots **61**, so that the lower type cases **72** are in alignment with the platen.

The above outlined arrangement is quite conventional in the art, the improvement in accordance with the invention being concerned with the operative connection between the projecting end of the strap **74** and the shifter arms **76** at opposite sides of the frame, by which the shifter mechanism is actuated. These shifter arms are fulcrumed on the aforementioned cross shaft **58** and carry at their keyboard ends a transverse shifter bar **77** which is disposed adjacent the keys **37**.

A substantially upright link **78**, having an arcuate upper end **78***a*, is rigidly fastened to one of the shifter arms **76** adjacent the projecting end portion of the strap **74** and the latter is provided with a forward extension **74***a*, as is best shown in Figure 18. The arcuate upper end **78***a* of the link **78** engages the underside of this extension and the link is secured to the arm **76** by a plurality of screws **79**, so that when the shifter bar **77** is depressed, the link **78** forces the strap **74** upwardly and correspondingly shifts the type bars **16** from the upper to the lower case position. The link **78** is formed with a vertical slot **80** to receive the screws **79** whereby the link may be vertically adjusted with respect to the associated shifter arm **76** in order to give the appropriate amount of movement to the type bars. This adjustment is simple and may be easily effected without the necessity of bending or twisting any of the parts. Moreover, the shifter arm **76** is provided with sets of apertures **81** to receive the screws **79**, whereby the link **78** may be secured to the shifter arm at various distances from the fulcrum **58** in order to adjust the amount of pressure or touch required for depression of the shifter bar **77**. The extension **74***a* of the strap **74** is sufficiently long to permit engagement of the link **78** therewith, regardless of the position of the link on the shifter arm **76**.

Stop means are provided for the arm **76** in the upper case position of the type bars **16**, these stop means comprising an angle bracket **82** which is secured to the frame **15** by a plurality of screws **83** and abuts the underside of the arm **76**. The bracket **82** is formed with a vertical slot **84** to receive the screws **83**, whereby the position of the bracket may be adjusted so that in the initial position of the shifter bar **77**, the upper case **71** of the type bars is aligned with the platen **16**. The lower edge portion of the arm **76** is preferably outturned as indicated at **85** to abut the outturned poriton **82***a* of the stop bracket, as shown. A suitable tension spring **86** extends from an apertured ear **87** on the strap extension **74***a* to an anchor pin **88** on the frame **15**, whereby the entire type bar supporting means **73**, **74** and actuating means **76**, **78** are urged to the initial position wherein the arm **76** contacts the stop **82**.

Stop means are also provided for the arm **76** in the lower case position of the type bars **16**, these stop means comprising a bracket **89** which is secured by a plurality of screws **90** to the frame **15** and is provided with an outturned portion **91** which abuts the upper surface of the strap **74** when the latter is shifted upwardly by the link **78** to the lower case position of the type bars. For purposes of adjustment, the bracket **89** is formed with a vertical slot **92** in which the screws **90** are disposed, as will be clearly apparent. Suitable pads **82***b* and **91***a* are provided on the portions **82***a* and **91** of the respective brackets **82** and **89**, these pads being of suitable resilient material so as to avoid a metal-to-metal contact with the respective arm **76** and the strap **74**.

The two shifter arms **76** at the opposite sides of the machine are rigidly connected together by a transverse bar member **93** which extends under the machine frame and has the ends thereof fixed by a plurality of screws **95** to depending lobes **76***a* which are usually provided on the arms **76**. The bar member **93** is disposed on edge and may be relatively light in weight in view of its rigid connection to the arm lobes **76***a*. The intermediate portion of the bar member is upwardly offset as indicated at **93***a*, so that it does not interfere with other parts under the frame of the machine.

It is necessary to provide the actuating link **78** on the shifter arm **76** only at one side of the machine, but if desired, the same may be duplicated on the opposite side by also extending the strap **74** from the frame of the machine at that side and providing another link **78** on the arm **76** on that side of the machine.

While in the foregoing there has been described and shown the preferred embodiment of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure, and various modifications may be resorted to, such as may lie within the spirit and scope of the appended claims.

What is claimed as new is:

1. In a stenographic machine including a frame, a platen and a set of type bars carried by said frame, the combination of an endless inking ribbon movable between said platen and said type bars, a pair of ribbon inking spools rotatable on said frame, means for urging said ribbon into engagement selectively with said spools, and means for driving one of the spools.

2. In a stenographic machine including a frame, a platen and a set of type bars carried by said frame, the combination of an endless inking ribbon movable between said platen and said type bars, a pair of ribbon inking spools rotatable on said frame, means for driving one of said spools, and means for urging said ribbon into engagement with at least one of the spools, said last mentioned means comprising an arm pivoted to said frame for movement toward and away from the associated spool, a roller carried by said arm, and resilient means for urging said arm toward the associated spool whereby said roller may engage said ribbon.

3. The combination is defined in claim 2 together with means for locking said arm in an inoperative position wherein said roller is out of engagement with said ribbon.

4. The combination as defined in claim 3 wherein said last mentioned means comprise a spring-pressed locking pin carried by said arm and receivable in a locking aperture formed in said frame.

5. In a stenographic machine including a frame, a platen and a set of type bars carried by said frame, and a crank provided at one side of the frame and adapted for oscillatory movement in a vertical plane when said type bars are actuated, the combination of an endless inking ribbon movable between said platen and said type bars, a ribbon inking spool mounted at the top of the frame for rotation in a horizontal plane and having said ribbon in engagement therewith, and means for driving said spool, said last mentioned means comprising a friction drive disc underlying and rotatable with said spool, a bracket secured to said crank, a pawl pivoted to said bracket, and resilient means for urging said pawl into frictional driving engagement with the periphery of said disc.

6. The combination as defined in claim 5 together with means for preventing reverse rotation of said disc.

7. In a stenographic machine, the combination of a frame, a platen mounted thereon, a set of type bars movable toward and away from said platen, a set of individual actuating cranks for the respective type bars in the set, and resilient means for urging the type bars away from the platen, said means comprising at least two superposed unitary comb-shaped springs mounted in said frame, one of said springs including a set of individually movable resilient fingers engaging the respective cranks and the other spring including a plurality of individually movable resilient fingers superposed on and coacting with only certain predetermined fingers of the first spring, whereby certain predetermined cranks are each biased by at least two superposed coacting spring fingers and the remaining cranks are each biased by one spring finger only.

8. In a stenographic machine, the combination of a set of type bars shiftable vertically between upper and lower type case positions, a tranverse strap for supporting and shifting said type bars, said strap having an end portion projecting laterally outwardly through an opening in the frame of the machine, a shifter arm pivotally attached to the machine frame for movement in a vertical plane, and a link rigidly secured to said shifter arm and engaging the underside of the projecting

portion of said strap, whereby to operatively connect said strap to said arm.

9. The combination as defined in claim 8 together with stop means provided on the machine frame and engageable with said arm in the upper case position of said type bars, and means for adjusting said stop means.

10. The combination as defined in claim 8 together with stop means provided on the machine frame and engageable with said arm in the upper case position of said type bars, means for adjusting said stop means, and resilient means for urging said arm against the stop means.

11. The combination as defined in claim 8 together with stop means provided on the machine frame and engageable with said strap in the lower case position of said type bars, and means for adjusting said stop means.

12. The combination as defined in claim 8 together with means for adjusting said link in a vertical direction relative to said arm.

13. The combination as defined in claim 10 together with means for adjusting said link longitudinally of said arm.

14. In a stenographic machine, the combination of a frame, a platen mounted thereon, a set of type bars movable toward and away from said platen, a set of keys, sets of links operatively connecting the respective keys to the respective type bars for moving the latter toward the platen, and resilient means for urging the type bars away from the platen, said resilient means comprising at least two superposed unitary comb-shaped springs mounted in said frame, one of said springs including a set of individually movable resilient fingers engaging the respective sets of links and the other spring including a plurality of individually movable resilient fingers superposed on and coacting with only certain predetermined fingers of the first spring, whereby certain predetermined sets of links are each biased by at least two superposed coacting spring fingers and the remaining sets of links are each biased by one spring finger only.

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