

Feb. 22, 1955

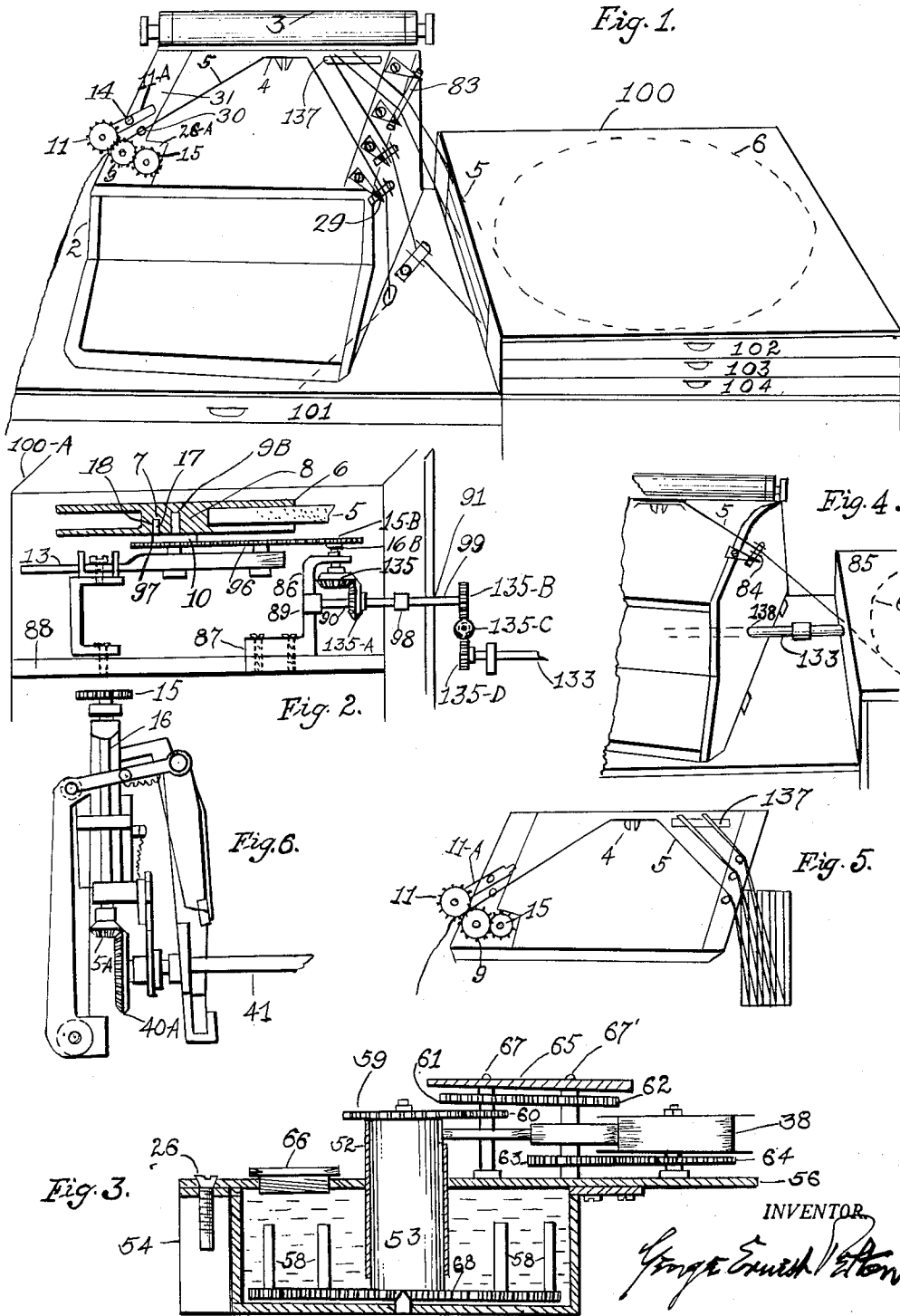
G. E. PELTON

2,702,623

TYPISTS' APPARATUS AND WRITING RIBBONS ENABLING  
TYPISTS TO HAVE WRITING THAT MATCHES FOR MONTHS

Filed April 25, 1952

4 Sheets-Sheet 1



Feb. 22, 1955

G. E. PELTON

2,702,623

TYPISTS' APPARATUS AND WRITING RIBBONS ENABLING  
TYPISTS TO HAVE WRITING THAT MATCHES FOR MONTHS

Filed April 25, 1952

4 Sheets-Sheet 2

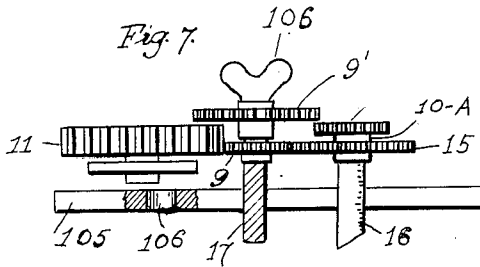


Fig. 8.

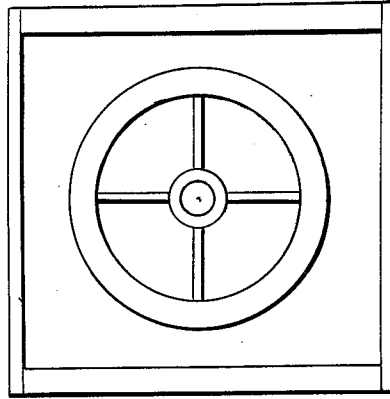


Fig. 9.

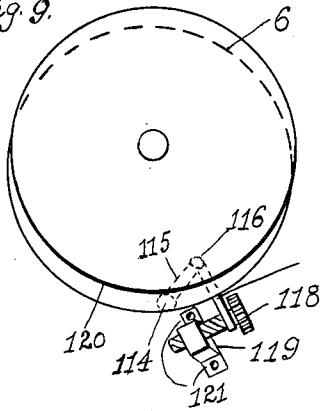
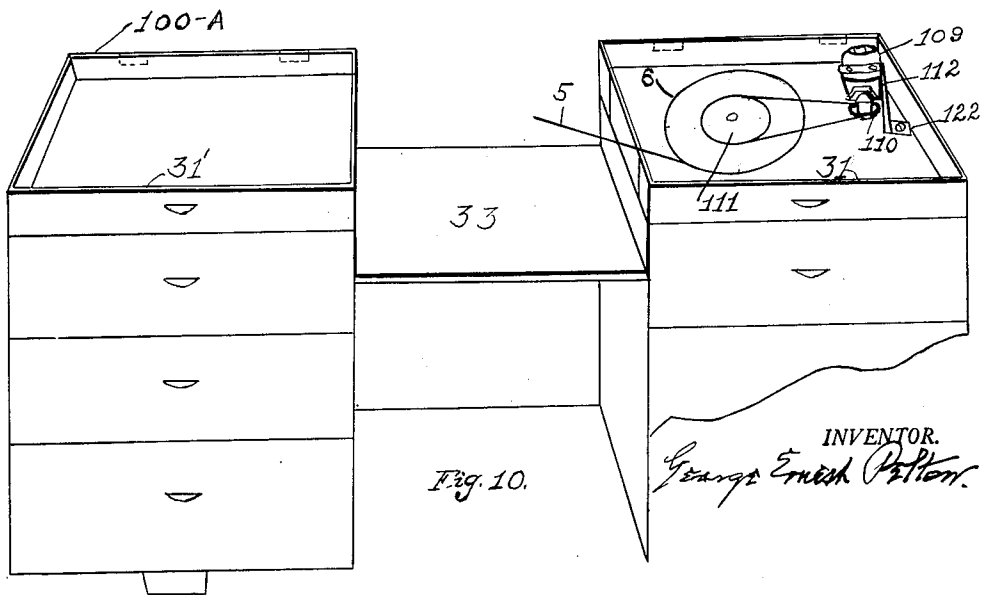
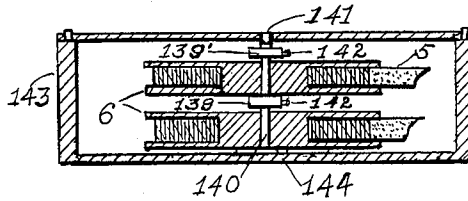


Fig. 18.



Feb. 22, 1955

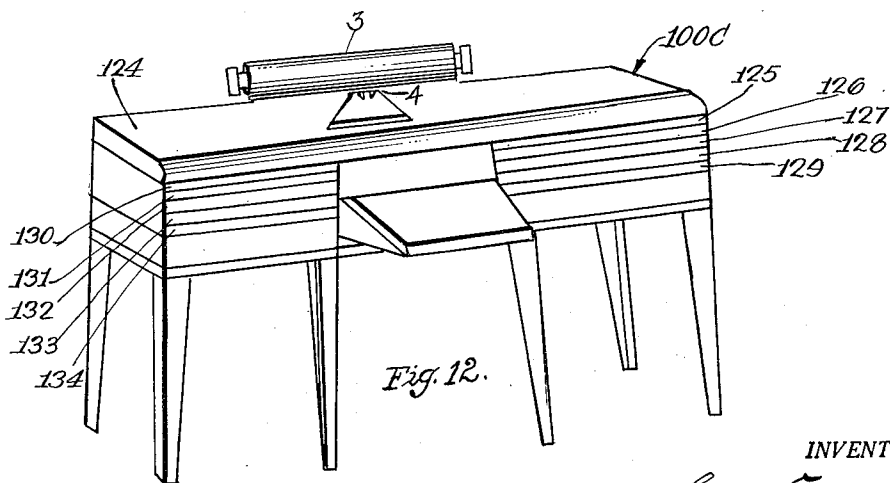
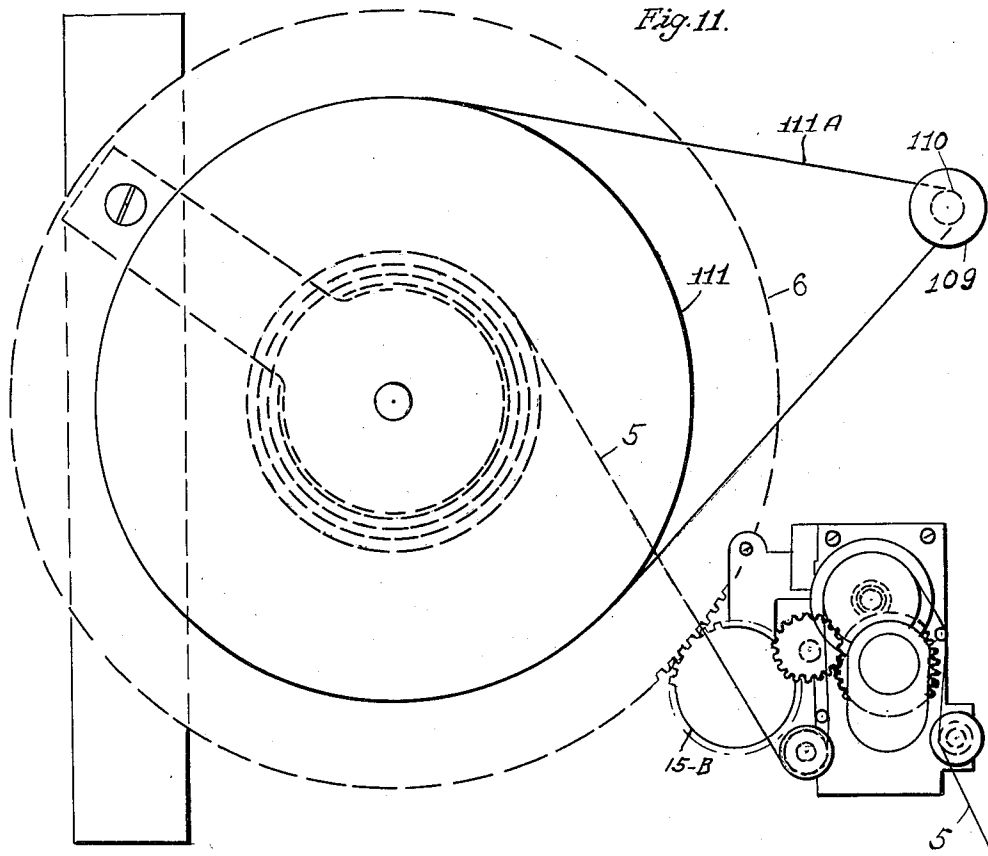
G. E. PELTON

2,702,623

TYPISTS' APPARATUS AND WRITING RIBBONS ENABLING  
TYPISTS TO HAVE WRITING THAT MATCHES FOR MONTHS

Filed April 25, 1952

4 Sheets-Sheet 3



INVENTOR.

*George E. Pelton*

Feb. 22, 1955

G. E. FELTON

2,702,623

TYPISTS' APPARATUS AND WRITING RIBBONS ENABLING  
TYPISTS TO HAVE WRITING THAT MATCHES FOR MONTHS

Filed April 25, 1952

4 Sheets-Sheet 4

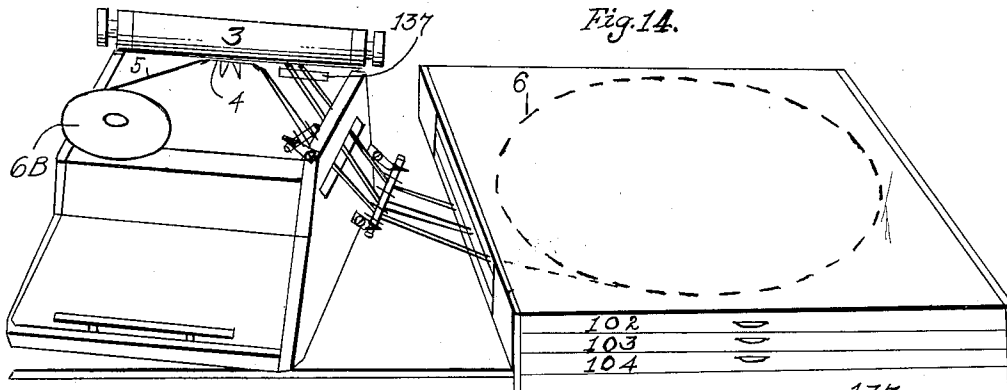


Fig. 14.

Fig. 13.

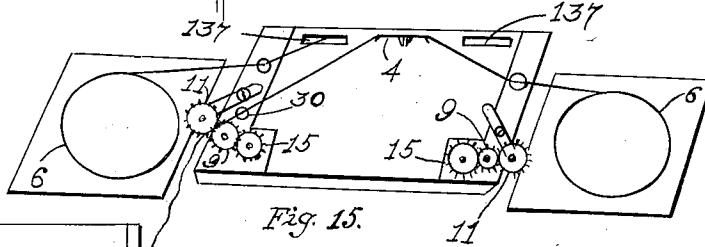
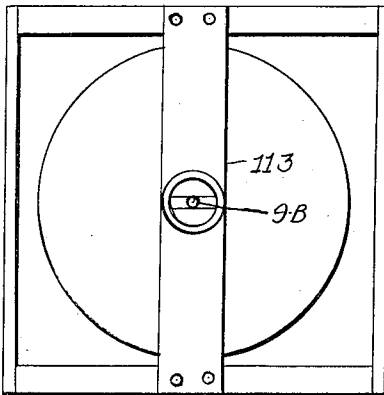


Fig. 15.

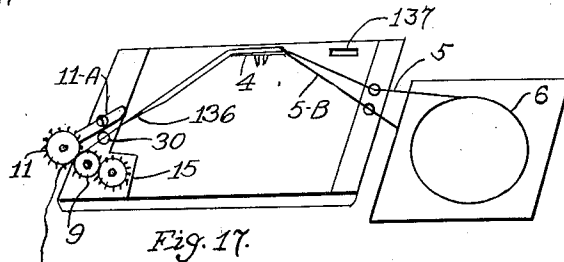


Fig. 17.

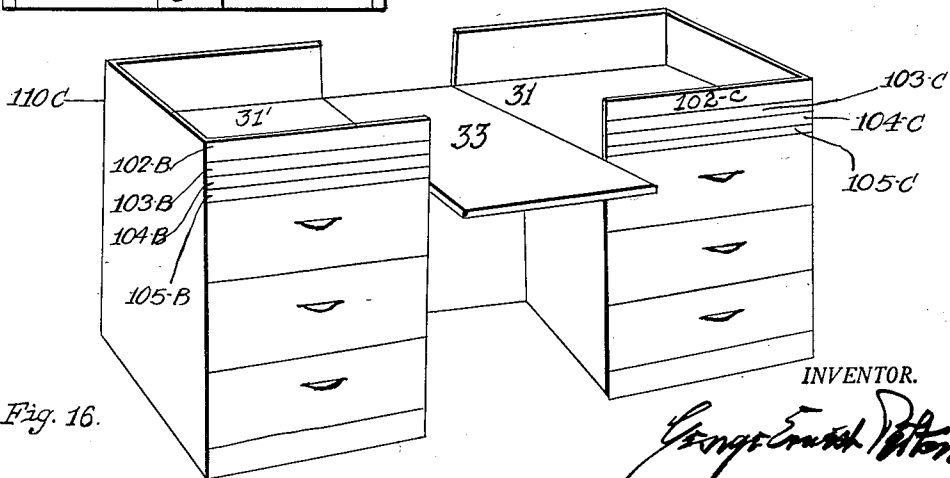


Fig. 16.

INVENTOR.

*George Ernest Felton*

1

2,702,623

**TYPIST'S APPARATUS AND WRITING RIBBON  
ENABLING TYPISTS TO HAVE WRITING THAT  
MATCHES FOR MONTHS**

George Ernest Pelton, Round Hill, Va., assignor to  
Ida S. Pelton, Round Hill, Va.

Application April 25, 1952, Serial No. 284,251

17 Claims. (Cl. 197—151)

This invention relates to improvements in typing machines and to greatly improved writing results from such machines, improved quality of writing and a much greater quantity of writing before a new ribbon is required. It relates to the use of carbon paper ribbons in one form of the invention and to the use of double ribbons, one ribbon being inked and the other uninked, with the uninked ribbon next to the type and the inked ribbon next to the writing paper; and the typist may secure heavier, darker writing from a lightly inked ribbon by using two ribbons together this way.

An object of one form of my invention is to provide a typing machine which requires no universal joint connection at the rear end of the drive shaft, no transverse shaft, no vertical shaft on the right side of the machine, no ribbon reverse mechanism connected with either the left vertical shaft or the right vertical shaft, no ribbon spools on the said vertical shafts, and much of the supporting metal work is eliminated such as supports for the transverse shaft and the right vertical spool shaft and for the ribbon reverse mechanism; and the mechanism for shifting a half inch ribbon so the typist may write along the lower half, or the red half, is eliminated entirely and I provide a new and better and less expensive means for writing with red ink and a means that permits the typist to write along the upper edge of a ribbon at all times, this being much easier and more efficient since the ribbon vibrator does not have to be lifted high at each stroke. The elimination of all of the foregoing members means a tremendous saving in the cost of building a typing machine and the important thing is that the writing results from the said machine are very, very greatly improved over the results from the usual machines.

It is an object of the invention to eliminate the need for a typist to remove a used ribbon from the machine or insert a new ribbon in the machine, if she uses one form of my invention. I provide the typist with a new type of desk with good connections with the typing machine itself, or the typist may have special metal compartments, of any desired size, attached to each side of the typing machine for the inking mechanisms and ribbon spools; and said compartments may be fastened also to a table or desk.

It is also an object of the invention to provide a larger and stronger carriage driving spring drum for drawing the carriage of the typing machine to the left through the medium of the usual draw band attached to the drum and carriage; and it is a further object to locate this driving spring drum in a new position where it can more efficiently rotate the shafts which rotate the ribbon spools of the typing machine in their new locations in the desk or in the metal compartments attached to each side of said machine.

It is also an object of the present invention to provide new connecting shafts for use with present typing machines, by which ribbon spools, of larger size than standard Underwood or Royal typewriter spools, can be rotated by the power of present carriage driving spring drums and gears and connecting members; said connecting shafts of new design being suitable for connecting suitable mechanisms in special compartments of said improved typist's desk with the typing machine, and also suitable for connecting new mechanisms located in metal compartments, as above mentioned, with certain standard shafts and other members of the typing machine.

Another object is to provide improved inking mechanisms and ribbon spools in new compartments of cabinets

2

or desks for use with Teletype machines, bookkeeping and accounting typing machines, electrical invoicing machines, electrical typewriters of various types, portable typewriters and with standard office typewriters and to provide ribbons that give better writing and writing that always has good color and neat, attractive appearance, and a vast quantity of such writing before the typist wears out the ribbon; and said improved inking mechanisms may use wax ink that is first heated and mixed thoroughly before it is fed to the ribbon's face.

Another object is to provide a new mechanism which may be adjusted by the typist to give the rates of travel of the inked ribbon which best fill the need of the particular type of work she is doing; and once she sets the speed of travel of the ribbon, it will maintain that rate of travel through the ribbon vibrator at all times no matter how long or short the ribbon may be; and if the typist desires to secure a fewer number of impressions per inch of travel of the ribbon, in order to have darker writing from a carbon paper ribbon, or other type of ribbon, she may quickly change the speed of travel of the ribbon to secure the new result in her writing; and she may also quickly return to the original speed which gave more impressions from each inch of the said ribbon as it travelled through the ribbon vibrator; and for unimportant work where the writing from a carbon paper ribbon, or other ribbon, may reasonably be lighter and use less ink in the impressions, the typist may quickly adjust the rate of travel to an extremely slow rate which uses much less ink in each impression.

It is also an object of the invention to provide the typist with a black record ribbon which has wax ink on one face for her main ribbon for the vast amount of typing she regularly does, and also provide the typist with additional ribbons in the compartments mentioned above, which may be black ribbons of the same inking as the ribbon she regularly uses, or they may be of other black record inkings for special uses and for special work, or to provide said typist with some additional ribbons which may be of different colors of wax ink, such as blue, purple, green, brown; and it is an object of said invention to make at least four or five additional ribbons readily available for use almost instantly if she has work to do which causes her to desire to stop the use of regular black ribbon and use a blue ribbon or a ribbon of another color of wax ink to meet the needs of special work; and the typist may change to a new type of ribbon without having to remove a spool of ribbon from the typing machine and without being compelled to remove a ribbon from the ribbon vibrator and without having to install a new spool of ribbon in the machine; and it is also an object of said invention to provide means by which said typist never has to remove a spool of used wax ink ribbon from one form of the new typing machine of my invention which uses wax ink ribbons and which also uses a plain paper ribbon, which may be entirely free of ink, or it may have ink on the face opposite the face which the type contacts; and said plain, paper ribbon is of high value to the typist who is using a lightly inked ribbon such as the wax ink ribbon which is being used to write these sheets because the plain, paper ribbon may be almost instantly attached to the uninked face of the inked ribbon in use and then the two ribbons will feed through the ribbon vibrator and the writing becomes darker and the impressions are stronger and suitable for work other than letter-writing, where it is desirable to have very bold writing such as for deeds and other legal papers. Applicant made the discovery that the use of the thin, plain, paper ribbon back of the thin, lightly inked, wax-ink ribbon, with said wax-ink ribbon having its inked face toward the writing paper and with the type striking against the uninked face of the thin, plain paper ribbon, which may be uninked, on both faces, caused the wax-ink ribbon to give impressions on the writing paper that are darker and more suitable for other work than letter-writing, and it is an object of this invention to give the typist the full benefit of this discovery by providing her with any desired length of such plain, paper ribbon for use next to the type and with any desired length of the wax-ink, lightly inked ribbon for letter writing, when used alone.

3

It is also an object of the present invention to provide the private secretary, who uses very expensive letter paper and other fine quality paper, with a typing machine and accessories and with the new typist's desk of my invention, which will at all times for months, give her just the quality of writing and color of writing that she requires for the most beautiful appearance for all her work, without the necessity on her part of having to put up with ribbon work that is too heavy or too dim in color, or too smeary and ugly, or ribbon work that is unsuitable for correspondence, or for other classes of work; and it is also an object of my invention to entirely free her from the necessity of removing used ribbon from the typing machine. In fact, I have provided one form of typing machine which never winds the used ribbon into a ribbon spool but instead the ribbon passes directly from the typing machine into a waste basket or other suitable receptacle. It is an extremely narrow, carbon paper ribbon for one-time use and in writing this present application, applicant states that such a typing machine is being used and there is no spool in the machine and the lightly inked ribbon is situated in a compartment near the machine and it passes from a very large roll, without tension, over certain guide members and through the ribbon vibrator and between certain gears and down into a waste basket.

It is an object of the invention to provide typists with such large rolls of ribbons located in compartments of desks, as above mentioned, or in other suitable compartments connected with the typing machine, that the typists will always have writing that exactly matches for months from any particular ribbon used; and if the typist desires that all of the ribbons in such compartment or compartments be of the same color and same grade of inking exactly then the typist may have exactly the same color of writing and the same weight of ink in the impressions as will give the most beautiful appearance at all times, with the sheets of writing always matching and always giving the employer the amount of ink in the impressions and the particular color of ink which he prefers; and the typist will never have to clean the type because they never contact any ink of any kind.

It is also an object of the invention to provide type that will use the ink most efficiently, that will not cut the carbon paper ribbon unduly and will not cut into the writing paper.

It is an object of the invention is provide such a typing machine and such a desk and accessories that the typist who has to work at her profession for long years may take a deep satisfaction in the beautiful, clean-cut, neat impressions of rich color, all just as they should be, through all the years of her service to her employer, and to free her from the present obstacles and hindrances with which she must put up, such as using a 12 yd. or 18 yd. ribbon which writes too heavily at the start and soon writes too gray and dim. This is the common thing all over the world. It is most unsatisfactory to people who care for quality work.

It is an object of the invention to provide heavier writing by simply using the inked ribbon next to the writing paper and using a plain, paper ribbon next to it but on the side the type contacts.

Applicant states it is also an object of this invention to provide electrical power in the compartments mentioned above for rotating the inking mechanisms and one or more other members in said compartments and also to provide electrical heating units or other electrical means for heating the ink, of any kind, used in the ink reservoirs and the inking mechanisms, whether they be in desks or in cabinets or compartments associated with typing machines or are actually within the frames of said machines.

It is an object of this invention to provide the typist with a typing machine which may have within its outside boundaries, or in her desk, or in cabinets or compartments, ribbons of such different types and colors and of such widths and lengths, as best meet her requirements and also to give her the full use of her typist's desk, otherwise, with ample space for her supply of letter paper and envelopes, legal or other paper, and all other items she requires in doing her work and for her comfort, and also to provide her with a typing machine of extremely light type-bar action, with extremely easy, quick movement of the carriage, and with inking mechanisms (if

4

she prefers that form of machine) that are rotated separately and apart from any tension on the ribbon.

It is also an object of the invention to provide a typing machine having rolls of ribbon, which may be within the frame of said machine, or partly within the frame of said machine, or entirely outside the frame of said machine, which may be of desired length, up to thousands of yards in length per roll, as may be desirable for the particular machine; and said rolls of ribbon may be in a vertical position or in a horizontal position.

It is also an object of the invention to provide a noiseless or silent typing machine having rolls of ribbon, one or more of which may be of carbon paper of any desired width, and at least one roll of ribbon being of coated fabric ribbon and having the coating on the face of the ribbon towards the writing paper, and said coating acting as a screen or filter to feed the ink to the writing paper under control.

It is also an object of the invention to provide a typing machine having at least one roll of coated ribbon and at least one inking mechanism for feeding mixed, heated ink to said ribbon.

It is also an object of the invention to provide spools of carbon paper ribbon or other ribbon which may be some feet in diameter and which may be purchased at much lower cost and may be used so as to save much of the typist's time which she would ordinarily have to expend in frequently replacing small spools of typewriter ribbon which quickly wear down from heavy writing to dim writing, and to give said typist writing from cotton or silk or other fabric ribbons which has good color at all times for some months of use in the hands of a typist who does much typing daily; and it is a fact that a fabric ribbon that is 288 yds. long, or longer (which may be cotton or silk or other fabric) will have much more time for the oily, pigment ink to feed to the used portion of the ribbon during operation of the typing machine since there will be so much time for any particular portion of such long ribbon to rest and allow capillary action to act to renew the ink supply in the said ribbon.

Other objects of the invention will be apparent from the following description and claims.

In the drawings:

Fig. 1 is a fragmentary view of a typing device.

Fig. 2 is a view of a compartment containing apparatus used in connection with the typing machine and the rolls of inked ribbon.

Fig. 3 is a side elevation of an inking mechanism.

Fig. 4 is a fragmentary view of a transverse shaft.

Fig. 5 is a fragmentary view of a typing machine.

Fig. 6 is a fragmentary view of a horizontal drive shaft and its bevel gear in mesh with a bevel gear of a vertical shaft.

Fig. 7 is a fragmentary view of a spool shaft on which two gears are mounted, and showing three additional gears.

Fig. 8 is a view of a support for a spool of ribbon.

Fig. 9 is a view of a tension, ball-bearing member.

Fig. 10 is a view of a desk showing a compartment containing typing machine apparatus, pulleys, a motor and a belt and friction clutch, for use in connection with a typing machine.

Fig. 11 is a view of a ribbon spool, ribbon, gears, pulleys, inking mechanism for an inked ribbon, a belt and an electric motor, all mounted in a compartment for use with a typing machine.

Fig. 12 is a view of a typing device with its cover which extends over the typewriter proper, the compartments on each side and which may be actual parts of said machine, with the frame of the device, which may be of metal throughout and may form one unit.

Fig. 13 is a view of a ribbon spool in a compartment of a typing device, or a typing machine, with a metal plate connected with the spool and said plate being fastened at each end securely.

Fig. 14 is a view of another form of my invention.

Fig. 15 is a view of another form of my invention.

Fig. 16 is a view of a portion of the typing device invention showing the shelf support for the machine and also compartments suitable for receiving metal compartments attached to the machine, holding ribbon spools and other apparatus for the typist's use.

Fig. 17 is a view of a portion of a typing device, together with one compartment containing a large spool

of ribbon and a second ribbon which passes through the vibrator and is fastened securely to the first ribbon.

Fig. 18 is a view of a cabinet with 2 spools on a spindle. The cabinet may hold one or more spools of ribbon of one or more kinds and the cabinet may fit on at least one side of a desk, or the cabinet may be permanently attached to the typewriter. Or the typist may have a desk of my invention with special, upper compartments for holding the spools of ribbon, any motors desired, etc.

The typing mechanism may have a larger frame and can enclose a larger carriage drive spring drum in a new position, carrying a larger gear and rotating the spool shaft 15-B of Fig. 2 and the transverse shaft beneath the type bars, and also the separate, extension, transverse shaft to the left which extends into the left compartment of Fig. 2. I refer to the short shaft connecting gears 135-A and 135-B of Fig. 2. Worm gear 135-C may readily be placed in mesh with either gear 135-B to rotate gear 15-B in the left compartment or said worm gear 135-C may be moved down to mesh with gear 135-D to drive the shaft under the type-bars. The compartments on each side of said desk (or cabinets) will be supplied with the needed spindles for one or more spools of ribbon, and other apparatus but the typist may have inking mechanisms as shown in Fig. 3 or Fig. 11. The ink used may be heated as described in co-pending application Serial No. 188,592, now Patent No. 2,695,092, to give writing from wax ink or other ink.

In Fig. 18 a cabinet is shown with two spools of ribbon on the same spindle. Collars which do not touch the sides of the spools keep one spool only in rotation, usually. Both spools can feed ribbons to the mechanism for typing if this is desired. Applicant has invented improvements which make it now possible for the typist to use a carbon paper ribbon that is 20 or 30 or even 40 times as long as the longest paper ribbon on the market. This ribbon may be of any inking or color desired and the typist may have writing that is much less expensive than from other carbon paper ribbons because the ribbon may feed very much slower than other paper ribbons now on the market and may give sharper, more clean-cut impressions on the writing surface. This is due to the scientific use of the ink supply of the carbon paper ribbon of the present invention. The movement of the ribbon may be at constant rate but at different speeds as needed.

This invention may be applied to a Teletype machine, typewriter, or type mechanism of any kind using an ink transfer member.

In the accompanying drawings, for the purpose of illustrating certain embodiments of my invention, it is shown as applied to a type-writing machine 1, having a frame 2, and platen 3, which supports or carries the paper upon which the writing is done. The invention contemplates the use of a ribbon of any desired length.

Conventional portions of the typing machine, not elements of the invention, have been omitted from the drawings as not needed.

Applicant wishes to call attention to the important fact that if the usual fabric ribbon is employed and small standard typewriter ribbon spools are used which limit the ribbon to a short length, then the ribbon will, in the hands of a speedy typist, quickly wear from one that gives out too much ink for neat writing to a ribbon that gives gray or dim writing in a short time and all of the writing is of necessity dependent upon the ink supply. If the same type of ribbon is used but it is several hundred yards in length, the typist will have writing that has good color for a long time, even though no ink is fed to the ribbon. If the fabric ribbon is medium inked, the ink will feed up from the lower half of a ribbon  $\frac{3}{4}$  inch wide or half inch wide, by capillary action and, due to the long period elapsing for rest periods for the particular portions of the ribbon struck by the type, it is apparent that the typist will for this reason also have writing that remains of good color longer than is the case when a short ribbon is used.

In the early days when only thousands of typewriters were in use in the entire country, the small spools of ribbon did not work as great a hardship and annoyance and loss as is the case today when millions of typewriters are in daily use, most of them by trained typists who do an enormous amount of typing each day. It cannot be emphasized too strongly that for many years the typewriter should have been giving the typist writing of good

color and vast quantities of writing from one ribbon so that the ribbon did not have to be changed oftener than once in a month at the least. It is common for expert, speedy typists to use up the ink supply of a medium inked fabric ribbon of cotton within 10 days. It is a common thing for the portions of the ribbon near the ribbon ends to become drier and have less oil in them than the rest of the ribbon and this accounts for the lighter writing done as the typist writes from near the end portions of the inked ribbon. Where very long ribbons are employed, this trouble will be lessened.

In Fig. 1, the typewriter ribbons are of carbon paper of any desired width. I may use a ribbon  $\frac{1}{16}$  of an inch wide. Spools of ribbon are placed in the upper compartments of desk 100, to the right of said typewriter and also in the compartment 101 under said typewriter. These ribbons may be of the same inking and may all be black record; or each ribbon may be of a different type of inking and a few of the ribbons may be of different colors of ink. Ribbon 5 is fed from drawer 101 beneath the typewriter. As it passes through an aperture in the supporting shelf under the said typewriter, it may pass over a guide pulley, or other suitable guide and through an opening in the side frame of the typewriter, to a pulley 29 and across to ribbon vibrator 4, and then to guide 30, which may be a plain slotted guide fastened securely to a metal plate 31. Gear 11 is mounted on lever 11-A. Ribbon 5 goes through slotted guide 30 and passes between gears 11 and 9 and into a waste receptacle. As gear 15 rotates with spool shaft 16, then gears 9 and 11 are rotated. (Please see Patent #2,471,238.) Ribbon 5 may be passed into a pipe leading to a waste receptacle. This pipe may be secured to the frame of the typewriter and may have its upper end very close to gears 9 and 11 to receive ribbon.

In Fig. 2, ribbon spool 6 is in a compartment on the left of the typewriter and said spool is in desk 100-A. Spool 6 is also mounted on a movable lever 13. Gears 96 and 97 are mounted on said lever 13 directly under spool 6. Gear 97 has a spindle 9-B which projects upwardly from hub 10 of said gear. Spool 6 is provided at the center of hub 7, with socket 8 to receive spindle 9-B of said gear 97. A pin 17 projects upwardly from gear 97 for engagement in a socket 18 of said spool 6, applied to spindle 9-B, resting upon hub 7. Gear 97 and gear 96 are both mounted on the said lever 13 and said gears are always in mesh. Spool 6 will turn slowly when gear 96 is in mesh with smaller gear 15-B which is mounted on a short vertical shaft 16-B. Gears 96 and 97 may be mounted by ball bearings as described in detail as to gear 11 of said U. S. Patent 2,471,238 and as illustrated therein. Spool 6 may be of sufficient diameter to wind a fabric ribbon 576 yds. in length. Said ribbon may be as thin as .003 of an inch, or it may be much thinner, if desired. Since the form of my invention in Fig. 2 is especially for fabric ribbons or for carbon paper ribbons which are wider than  $\frac{1}{4}$  inch, or for both, it is possible for the typist to have as long a ribbon as she may desire. The only limitation is the available space in the compartments to the right and left of the typewriter. Some desks afford a space on each side of the typewriter for shallow compartments that are quite capable of accommodating a fabric ribbon 576 yds. long and the other members shown in Fig. 2.

The shaft which supports gear 15-B is preferably extremely short, that is about one inch long; and at the bottom of said shaft 16-B is a beveled gear 135 which permanently meshes with gear 135-A of horizontal shaft 99, which may have a union 98 between gears 135-A and 135-B. Shaft 99 may be located in an upper left compartment of desk 100-A and said shaft may extend through an opening 91 in the left side of the frame 2 of said typewriter, and gear 135-B may mesh with worm gear 135-C at the front end of a drive shaft. For a drawing of the drive shaft and of gear 135-C and for a complete description of the standard spool shafts of a standard office typewriter, please see applicant's U. S. Patent 1,826,568. Shaft 99 may have end portion 90 turn in a bearing at 89. Metal plates 86 and 87 are supporting members for shafts 16-B and 99. Plate 87 is fastened securely to the bottom portion of the compartment of said desk 100-A. Please see 88.

Reference is made to Figs. 8, 9, 10, 11 and 12 of said U. S. Patent 1,826,568 and to the lengthy, detailed de-

scription of said figures in said patent and all of the same is made a part hereof. In Fig. 10 of said patent, shaft 38, which lies below the type-bars of a standard typewriter, is shown with a bevel gear 38 which is in mesh with bevel gear 36 on the lower end of spool shaft 34 of said Fig. 10. Spool shaft 34, while shown on the left in said Fig. 10, is the spool shaft that is used on the right end of shaft 38, with gear 37 meshing with gear 36 of the vertical spool shaft 34, but in applicant's structure the shaft underneath the type-bars is extended as shown in Fig. 4 of the present application at 138. The mechanism and the vertical spool shaft within the desk compartment 85 at the right of the typewriter, and the ribbon spool and other members are similar in every respect to those hereinabove described as being located in the compartment of desk 100-A to the left of the said typewriter. Since the vertical spool shaft within the compartment 85 of desk 100-A is approximately one inch in length and about the same length as vertical spool shaft 16-B in the compartment to the left of said typewriter, in desk 100-A, and since compartment 85 and the similar desk compartment to the left of the said typewriter are quite low enough for the carriage of the typewriter to pass back and forth in a plane above said compartments, and since the bottom portions of said compartments of desk 100-A are sufficiently low for shaft 99 to have its worm gear 135-B mesh with the worm gear 135-C at the forward end of the drive shaft in the typewriter, it is plain that the large ribbon spools 6 will lie in a plane materially lower than is customary in such typewriters as the Royal, Underwood and L. C. Smith machines. Suitable guide pulleys such as pulley 84 of Fig. 4 may be employed in guiding ribbon 5 as it moves from ribbon vibrator 4 into desk compartment 85 and into the ribbon spool 6 within said compartment; and a similar guide pulley may be used to the left of typewriter when the ribbon is winding into spool 6 in the left compartment of the desk 100-A. When the ribbon has travelled in one direction for its full length, it is necessary to swing the arm of lever 11-A to adjusted position or lower gear 15-B  $\frac{1}{6}$  inch temporarily and thus cause the previously power driven spool 6 to be free from any connection with the rotating shaft 16-B upon which the gear 15-B is mounted. This is true of both ribbon spools.

Referring to the ribbon ends in the typewriter of Fig. 1 of this application, these ends are portions of large spools of inked ribbon in compartments 102, 103 and 104 of desk 100. Instead of the conventional ribbon spool to the left in the usual typewriter, gear 15 is mounted upon the upper end of shaft 16. Gear 9 is mounted on shaft 17 and gears 9 and 15 are always in mesh. Gear 11 is rotatably mounted on the head 12 (see Fig. 9 of U. S. Patent 2,471,238) at the outer end of lever 11-A, which is pivotally mounted by a stud 14 and extends diagonally of the frame 2, with the end of the lever projecting inwardly toward the platen 3, so that the lever may be grasped and the lever swung about its pivot and thus move the gear 11 against ribbon 5, pressing ribbon 5 tightly against gear 9 thus crimping ribbon 5. As driving gear 15 rotates gear 9, ribbon 5 will be moved by the pressure of gear 9 against ribbon 5, pressing said ribbon against gear 11, as gear 9 rotates large lever gear 11 thus crimping the ribbon 5 lightly or medium or heavily according to the pressure against ribbon 5. Gear 11 may be mounted by ball bearings in the head 12 of lever 11-A so that gear 11 will rotate very freely. As the ribbon 5 passes from the large roll of ribbon in desk compartment 102 through the guide pulley 83 and across to ribbon vibrator 4 and then across to slotted guide 30, and then passes between gears 9 and 11, ribbon 5 is drawn along and passes by gravity through a small metal or plastic tube 24 and into a waste receptacle 26. In the conventional typing machine there is a metal bracket 26-A which helps support shaft 16, which in turn supports gear 9; and shaft 16 supports gear 15 and shaft 16 passes through said metal bracket 26-A.

Ribbon 5 of compartment 102 may be a black record carbon paper ribbon of any suitable type of inking, light, medium or heavy; and ribbon 5 of compartment 103 may be a blue record ribbon of carbon paper. Should the typist be writing with a black record ribbon and desire to quickly change to a blue record ribbon of compartment 103, the typist may tear the black ribbon across a few inches to the right of the ribbon vibrator and then

use a short piece of Scotch tape (or other suitable tape) no wider than the carbon paper ribbon and fasten the blue ribbon on the side next to the black ribbon, that is on the uninked side of the blue ribbon and also on the uninked side of the black ribbon so that the blue ribbon is towards the writing paper and next to the paper, and so the blue ribbon's end extends slightly over the end of the black ribbon and then use a piece of Scotch tape (or other tape) not any wider than the carbon paper ribbon, and fasten it across the inked face of the blue ribbon and the inked end of the black ribbon; or it is usually a strong enough joint if the end of the blue ribbon is fastened to the end of the black ribbon with the Scotch or other tape; and then the typist moves the carriage slightly and the joint will quickly move through the vibrator without the typist having to re-thread the ribbon vibrator. The typist may now type for as long a period as desirable with a blue record carbon paper ribbon. When she is ready to use a black ribbon, she may tape an end of one of the black ribbons (the ribbon in the compartment 101 is a black ribbon and the ribbons in compartments 102 and 104 may be black ribbons) to the blue carbon paper ribbon and write with the type striking the uninked face of the black ribbon and black ink will be used in making the impressions on the writing paper. However, if the typist wishes to write for only five or ten minutes with black ink and then write again with the blue carbon paper ribbon for a long time, she may do as follows: Instead of fastening the black ribbon to the end of the blue ribbon which she has been using, she can fasten the end of the black ribbon to the blue ribbon with the inked face of the black ribbon next to the writing paper and she will then have two ribbons and she will move the carriage back and forth a moment until the double ribbons have passed through the ribbon vibrator and she will then write with the type striking the uninked face of the blue ribbon and ink from the black ribbon will do the writing on the paper. To return to the blue ribbon writing, the typist when finished with the black writing, will tear (or cut) the black carbon paper ribbon and put the end of the black ribbon in a suitable place to await further use later and the typist will continue from then on to write with the blue carbon paper ribbon.

Suppose the ribbon in compartment 104 was a brown carbon paper ribbon and the typist wished to write for some hours (or longer) with a brown ribbon; she would attach the end of the brown ribbon to the end of the blue carbon paper ribbon with Scotch tape (or other suitable means) and would move the carriage back and forth for a few seconds until the joint had passed through the ribbon vibrator and then the typist would write with the brown carbon paper ribbon until she finished all work that needed to be written with brown ink. The tape that joined the brown ribbon to the blue ribbon need not be more than a half inch to three-quarters of an inch in length and after passing through the ribbon vibrator, the joint will soon pass into the pull-gears, hereinabove described in column 6, being gears 9 and 11 between which the joint will pass and then on into the waste receptacle, if the ribbon is a very narrow ribbon for one-time use. If it is a carbon paper as much as half inch wide, then it may be wound into a spool to the left of the typewriter as shown in Figs. 2 and 11.

It is easily possible to give those who use letter-heads made with a blue or brown heading (or other color or black heading) typed impressions that substantially match as to color the color of the ink in the heading of the letter-head. Carbon paper ribbons can be readily made in a great variety of blue shades, brown shades or other shades of different colors to meet exacting requirements in matching the color of letter-heads whether the letter-heads are steel-die-embossed, printed or lithographed. With present typewriter ribbons, of usual commercial grades, it is impossible for the typist to have her typed work match the inked heading of the letter paper since as a common thing the color of the impressions made from the typewriter ribbon she uses, changes on the wear-down and soon becomes dim. It begins too heavy and with fairly strong color and when too heavily inked the appearance of the fine letter paper is spoiled and she can never be sure of the ink matching the fine heading of steel-die-embossed or other expensive letter paper. If the employer uses business letter-heads with a black heading he naturally wants the writing to match the color of



the heading and if the heading is a rich black, he can have a rich black for all of his typed impressions, or typewriting work. He may also have steel-die-embossed personal letter paper and envelopes that have brown ink for his name and address and he may have typing work with brown ink that matches the brown ink of his name and address.

Referring again to the ribbons of Fig. 1, these ribbons may pass under guide pulleys, below, and then the ribbons may pass straight up to other guide pulleys which are almost on a level with the bottom of the ribbon vibrator, and the ribbons may not enter an opening in the side frame of a typewriter or other typing machine; also the ribbons may pass from their compartments to guide pulleys which are at different heights to suit the requirements of each of the ribbons. The typing machine may itself have side compartments for ribbons, even for six or eight ribbons of different inkings and there may be ribbons of various colors of ink and this machine may not have the usual type of frame and the frame of the typing machine may be very much wider than the usual typewriter frame of a typewriter used for correspondence work by the average typist. No matter what the shape of the frame of the typewriter or typing machine employed, even if the frame is 2 ft. wide or wider, and is outside and beyond any large spools of ribbon used in the machine, each ribbon may pass from the roll of ribbon in any suitable manner to the place where the type contacts a ribbon in writing on a writing surface to produce inked impressions.

I may also employ one large roll of uninked, plain, paper ribbon. This ribbon may be fastened to a carbon paper ribbon of any color and the two ribbons used with the type contacting the uninked paper ribbon. The use of the uninked ribbon in this way results in heavier impressions from the inked ribbon on the writing surface due to the thicker obstruction between the type and the writing surface. I have also found that when a carbon paper ribbon travels at a low rate of speed, for example, with pica type, and using a half inch gear at the top of the left spool-shaft and a one inch diameter gear in mesh with the half inch gear, and a lever gear such as gear 11 of Fig. 1, the typist secures a very economical use of a black carbon paper ribbon. In using the invention attached to a standard, popular, office typewriter, this applicant wrote 236 neat, clean-cut impressions, with the gear train made up of a ½ inch gear on the spool shaft and a 1 inch gear next and in mesh with said ½ inch gear and a 1¼ inch lever gear, with the ribbon passing between the 1 inch gear and the 1¼ inch gear, the space on the ⅝ inch width carbon paper ribbon that was used to write the 236 impressions was four and one-half inches. The 236 impressions written with 4½ inches of black carbon paper ribbon occupied twenty-eight and seven-sixteenths (28⅞) inches of writing on the writing paper. Pica type was employed.

When applicant used a 1 inch gear on top of the spool shaft instead of a ½ inch gear, and when he used a ½ inch gear between the 1 inch spool shaft gear and the 1¼ inch lever gear, there was a substantial increase in the amount of ink used from the carbon paper ribbon in each impression of the writing but the writing continued to be extremely sharp and clean-cut and very neat. The gear mounted on the spool shaft of a standard typing machine, turns with the spool shaft. As shown in Fig. 7, it is a simple matter to quickly place gears of different sizes on the spool shaft 16 and the shaft next to it, 17. I have made the discovery that the stenographer may have very economical use of the ink supply of a carbon paper ribbon for certain classes of work where more ink in the impressions is not essential and she can almost instantly have richer color in the impressions from the same ribbon simply by changing the gears so as to materially speed up the rate of travel of the carbon paper ribbon; and I have discovered that when certain gears of certain sizes are used as gears 15 and 9, the stenographer will always get certain fixed rates of travel for the carbon paper ribbon past the printing point where each type contacts the ribbon as the writing is done on the writing surface. In other words, in this standard, office typewriter, equipped with pica type, when applicant used a 1 inch gear attached to the spool shaft and a ½ inch gear next to the spool shaft gear and a 1¼ inch gear mounted on a lever, with the ribbon drawn between the

½ inch gear and the 1¼ inch gear, the ribbon travelled twice as fast and there were only half as many impressions written from 4½ inches of the ⅝ inch width carbon paper ribbon. If a 2 inch gear is substituted for the 1 inch gear on the top of the spool shaft, with the middle gear ½ inch and the last gear 1¼ inch in diameter, then the rate of travel of the ribbon is much faster and only half as many impressions will be written from 4½ inches of the inked ribbon mentioned above as when the spool shaft gear was 1 inch in diameter.

From five inches of carbon paper ribbon, using the ½ inch gear attached to the top of spool shaft, with a 1 inch gear next to the ½ inch gear and a 1¼ inch gear next, applicant secured 262 impressions. Applicant secured half this many impressions from five inches of carbon paper ribbon when he used a 1 inch gear on the spool shaft and a ½ inch gear between said 1 inch gear and the 1¼ inch gear. In other words he secured 131 impressions from the machine when using the 1 inch gear on the spool shaft. From a 2 inch diameter gear on the spool shaft, with a gear of suitable diameter in mesh with it and the ribbon passing between the latter gear and the 1¼ inch gear, the number of impressions would be only half of 131. A slight allowance may be made, when a large spool shaft gear is used, such as a three inch gear, because of the movement of the ribbon for each time the space bar is used making a space of about ⅓ inch between the words; and with this allowance in mind, applicant states that the writing is at its best for rich color from a lightly inked carbon paper ribbon, when the gear attached to the shaft, commonly used as a spool shaft, is 3 inch. Applicant prefers to use a larger metal plate than is commonly employed on the left and on the right under the spools of the Royal office typewriter and install shaft 17 in the correct location to support a half inch diameter gear next to a two inch gear mounted on the spool shaft 16, if the work being done by the typist needs real good color in the writing from a lightly inked ribbon; and for the finest writing, applicant may use a 3 inch gear mounted on spool shaft 16, with suitable gears 9 and 11. In Fig. 7, the gears 15 and 15' are separated by a metal member 10-A. The gears 15 and 15' are permanently fastened together and are securely attached to shaft 16. They may be unscrewed from said shaft 16, if the typist desires to mount other gears of suitable sizes upon the said shaft. Plate 105 has threaded holes of correct size to take threaded shaft 17 in any desired location so that the correct gear mounted on shaft 17 will mesh with the correct gear mounted on shaft 16. Gear 11 is mounted on a lever 11-A and said lever 11-A is screwed to a suitable part of the frame of the typing machine. In the machine used by applicant in writing this application, said lever is mounted on said frame between gear 9 (on shaft 17) and the platen of the machine. Guide 30 and lever 11-A may occupy any suitable positions to secure the desired results. Applicant prefers to use gears with wide faces for gears such as lever gear 11. In Fig. 7, the spool shaft gear 15 is in mesh with gear 9, a ½ inch gear, and the ribbon would pass between gear 9 and lever gear 11. The typist may turn the top portion 106 of shaft 17 and lower gear 9 until gear 9' is in mesh with gear 15' and then swing lever gear 11 in mesh with gear 9'. Or the typist may move lever gear 11 out of mesh with gear 9'; she may unscrew shaft 17 from metal plate 105 and then screw said shaft into hole 106 of said plate 105. The typist may then unscrew connected gears 15 and 15' from spool shaft 16 and mount on said shaft 16 a 2 inch gear; the typist will screw shaft 17 down through hole 106 until gear 9' is in mesh with said 2 inch gear on shaft 16; and then the typist may move lever gear 11 into mesh with gear 9'. Gears of any suitable diameter or desired sizes of teeth may be utilized to give the desired speed of travel of the carbon paper ribbon 5; once certain gears are operating for a desired rate of travel with a desired expenditure of ink from the ribbon 5 to the writing paper, ribbon 5 will maintain exactly that same rate of travel until the typist desires to change the rate of travel for a different expenditure of ink to the writing paper and the writing will always match in color for so long as the same size gears are employed in their respective locations and so long as the same carbon paper ribbon is used. Since very large rolls of carbon paper ribbon may be located as shown and described herein, and since the typist may use a carbon paper ribbon of the particular inking preferred by the employer, it is plain that for long periods, the

typist may have writing that matches exactly in color and in weight of ink in each impression to meet the most exacting requirements and taste as to appearance of the work.

Referring to the U. S. Patent 1,826,568 of applicant, and to spool shaft 33 of Fig. 8 thereof, applicant states that said spool shaft 33 has a bevel gear 35 fixed on the lower end. Drive shaft 41 of said Fig. 8 of said patent has a worm gear 40 near the bevel gear 35 on spool shaft 33. In the form of applicant's invention which uses a  $\frac{5}{16}$  inch carbon paper ribbon which is used only once and passes from the ribbon vibrator 4 to guide 30 and then between gears 9 and 11 and into a waste receptacle, there is no need for the transverse shaft 38 and no need for spool shaft 34 which is on the right side of the standard typewriter applicant is now using to write this application. Applicant knows of no need for worm gear 40 of drive shaft 41 for this particular form of his invention but would substitute for bevel gear 35 on lower end of spool shaft 33 a very small bevel gear 5-A and would substitute for worm gear 40 a bevel gear 40-A that would drive said very small bevel gear of spool shaft 33. If it was desirable to have the ribbon travel at such rate of speed, as a minimum, as would always give the richest color from a lightly inked carbon paper ribbon, then applicant would use a pair of bevel gears, see Fig. 6, gears 5-A and 40-A, for driving spool shaft 16 of the present application that would increase the normal, conventional speed of travel of said spool shaft 16 at least three times. This would make it possible to utilize a very much smaller gear mounted on the upper end of the left spool shaft, which in the present application is shaft 16, and still get the desired rate of travel of the said carbon paper ribbon 5. If it is desirable to have the bevel gear 40-A that replaces worm gear 40 four times as large as the bevel gear at the lower end of shaft 16 this can easily be done. A ratio of 4 to 1 is usual for bevel gears and there is ample room in the standard typing machine applicant is using to substitute such gears for the present worm 40 of drive shaft 41 and bevel gear 35 of spool shaft 33 of Fig. 8 of the said Patent 1,826,568. The large bevel gear 40-A is for shaft 41.

I do not limit myself to this particular way of increasing the speed of travel of the ribbon but this is an inexpensive way.

I have made the important discovery that from a carbon paper ribbon inked for very beautiful, clean-cut, sharp, neat writing which shows no slightest sign of woven threads, it is possible to have a uniform, even feed of ink to the writing surface at a slow rate of travel of the ribbon and that this rate of travel may be maintained constantly and exactly throughout the use of the carbon paper ribbon; and I have shown that regardless of the rate of travel of the ribbon, a certain rate always means a certain amount of ink expended for writing that always matches at that particular rate of travel; and I have shown that the typist may economize in the expenditure of the ink supply of the ribbon by setting the rate of travel of the ribbon low. I have also shown that the typist may easily have extremely sharp, neat, clean-cut impressions of the richest color and have them at all times if that is desired. And she may continue to have such impressions for long periods of time due to the very long ribbon she may employ; and if she so desires she may have other long ribbons of the same type of inking exactly, ready for almost instant use at any time or she may attach a new ribbon of blue ink or other ink of other color to the black record ribbon she usually uses and may have beautiful writing for long periods from the blue inked ribbon or other ribbon and may at any time quickly return to black ribbon.

During all of her use of such ribbons, the type will never contact any ink and will never have to be cleaned.

I first began using carbon paper ribbons of such length as would wind into standard office typewriter spools. Such ribbons are not practical in a busy office because they do so little writing and in less than two hours an expert typist will have to have a new ribbon, which means removing the spool of used ribbon and putting a new spool of ribbon in the machine and threading the vibrator and attaching the end of the ribbon to a second spool and installing that spool in the typing

machine. Longer ribbons are now sold but the longest carbon paper ribbon now on the market will not last a very speedy typist more than one day, if she works from a dictating machine and does not stop to do anything but type. If the typist has to stop and put a new carbon paper ribbon in the I. B. M. Corporation electrical typewriter, when she is working under pressure, late in the afternoon, it is a very annoying and nerve-wracking task and may come just when an important document needs to be finished and persons are waiting to sign the same. It is a fact that the ribbon for this machine writes only one time across and a very speedy typist can do this in less than one day; and it takes at least five minutes of careful work to replace the used ribbon with a new carbon paper ribbon. The prior art affords no means of insuring the same slow, economical rate of travel of the ribbon during its use by the typist and the prior art affords no way of using the ribbon at different rates of speed for different feeds of ink to the writing paper, and there is no way shown in prior art to use the ribbon with great economy and efficiency when a slow rate of travel would give impressions that were entirely satisfactory for that work.

Referring to Fig. 3 of the present application, this is very similar in principle to Fig. 1 of my pending application Serial No. 188,592. I also wish to refer to the inking mechanisms of my Patents Nos. 2,158,944 and 2,471,238. In the present application, I make use of the inking mechanisms in the compartments of the typist's desk in inking the writing ribbon of a typing machine and secure new results in that a vastly increased amount of writing may be had from the longer nylon or silk or cotton ribbon and at much less cost because the changes that have to be made in typing machines may be very slight when the inking mechanisms are mounted in compartments of desks or cabinets near the machine, or when the inking mechanisms are located near the typing machine and connected therewith but are not located very close to the type-bars as is the case with the mechanisms of my said Patents 2,158,944 and 2,471,238.

This discovery that the inking mechanisms can be utilized to much greater degree of efficiency and at much less expense and can easily be used for a much greater variety of typing machines regardless of their streamlined frames and covers, means new results that are revolutionary from the typists' standpoint.

I desire to include in this present application all that is stated in my pending application Serial No. 188,592 on the subject of inking mechanisms and heating apparatus for heating wax ink and other ink. In addition to the improved writing results secured from the use of an ink which contains wax, there is an additional value in using heated ink. The ink becomes so thin that the ink mixer, the ink roller and the other rotary members operate with higher efficiency. The ink spreads more efficiently on the ink rolls and the flanged inking wheel 38 of Fig. 3 of the present application and the heated ink also spreads in a thinner and more efficient manner on the face of a nylon or silk ribbon or a cotton ribbon or non-woven ribbons.

In Fig. 3, only one gear 68 is used in the ink reservoir for mixing the ink and attached to gear 68 are the four upright members 58 which act to thoroughly mix the ink above gear 68 and keep it flowing freely to the ink roller 53, which is within housing 52. A smooth roller or a threaded roller may be used, as preferred for the needs of the work done by the particular typing machine. I prefer to drive the rotary parts of the inking mechanism of Fig. 3 from a gear mounted on spool shaft 16 of Fig. 10 and Fig. 11 of my Patent 2,471,238. In Fig. 3 of the present application, gears are mounted at the bottom of some of the rotary members, at the top of certain of the rotary members, while in the pending application Serial No. 188,592 most of the gears are below the rotary members. Also in said Fig. 3 of the present application, a metal or plastic plate may be used to support shafts 67 and 67'. This plate 65 acts to keep the said shafts 67 and 67' steady and in line and said plate 65 may be fastened securely to metal plate 56 by suitable means. I may use an inking mechanism such as shown in Fig. 3 in each of the compartments on each side of a typing machine, in which case I may drive the rotary parts of the inking mechanism

from gear 15-B of Fig. 2 for the inking mechanism in the compartment to the left of the typewriter; and I may drive the rotary parts of the inking mechanism in the compartment to the right of the typewriter from a similar gear in said compartment, mounted on a spool shaft similar to spool shaft 16-B of Fig. 2. Or I may install an extremely small electric motor 109 in the compartment to the left of the typewriter and another electric motor may be installed in the compartment to the right of the typewriter and these motors may be used to rotate the gear 15-B mounted upon shaft 16-B of Fig. 2 of each compartment; the gear mounted on the spool shaft of the compartment to the right of the typewriter is exactly like gear 15-B and the spool shaft of said compartment is like spool shaft 16-B. Or I may use very small motors in each of said compartments to rotate a spool 6 located in each compartment. I may mount a pulley of any desired size on the motor of each compartment and may also mount a pulley of suitable size on each ribbon spool 6 in each compartment. I may use a suitable small belt, 111-A, somewhat loose, connecting the motor pulley and the spool pulley in each of the said compartments; the said belt will slip easily when for any reason the typewriter stops and the winding spool cannot wind any ribbon until the typewriter is being operated again; and in this manner there will be insufficient tension on the ribbon 5 to in any way injure it, if it is a nylon ribbon or a silk ribbon, or a fairly strong cotton ribbon. The moment the typewriter is operated, the ribbon will pass from the vibrator 4 to suitable pulling means, which may be gears or rollers, which serve to pull the ribbon at a constant and fixed rate of speed at all times, and as the ribbon 5 passes from the pulling members, it is wound into the winding spool in the compartment which at the time holds the spool that is winding.

Or I may use spools in said compartments, with at least one flange of each spool serving as a gear with teeth that will readily mesh with the teeth of gear 15-B and each motor in each compartment may be used to drive ribbon spools 6, in any suitable manner, and I do not limit myself to the one way of using belts as stated herein above. Referring to applicant's U. S. Patent No. 1,826,568 and to drive shaft 41 of Fig. 8, with its universal joint connection 42 at its rear end with a stub shaft 43 journaled in the frame-work, and referring to pinion 44 loose on shaft 43 meshing with gear 45 fixed on the platen carriage driving spring drum 46 which draws the carriage 48 to the left through the medium of the usual draw band 55 attached to the drum and carriage, all of these members, except the carriage, may be built into a typing machine with a much wider frame, so that there is ample space for a larger driving spring drum 46 and a larger gear 45 fixed on said drum and a longer draw band 55 may be employed. The driving shaft 41 of Fig. 8 of said patent may be within said wider frame of the typing machine and may be any desired distance from its location as shown in said Fig. 8 of said patent and may positively drive the left spool to wind the ribbon thereon but said driving shaft 41 and stub-shaft 43 journaled in the framework may be located in a compartment to the left of the typewriter and driving spring drum 46 and gear 45 fixed on said drum may be in said compartment and the longer draw band 55 may reach into said compartment, with its one end fastened to said drum and its other end fastened to the carriage 48 of said patent; and said frame may be entirely outside said compartment; and the said driving shaft 41 may in this form of said invention have a worm gear 40 which may be held in mesh with gear 35 as shown in Figs. 9 and 12 of Patent 1,826,568; and these various members may be located within the said compartment; and said drive shaft 41 may drive spool shaft 16 in said compartment but since said spool shaft 16 is now shorter I call it spool shaft 16-B, especially since it is located within said compartment and may have a much lower position than said shaft occupies in a standard typewriter such as shown in Figs. 8 to 12 inclusive of Patent 1,826,568. Since the spools 6 are reversed manually at long intervals, it is not essential to make use of the trip device 60 of Fig. 12 of said patent. Arm 62, rock shaft 63, lever 64 and link 65 and upper arm of lever 66 and pivot 67 are not utilized. But I do utilize a

shaft underneath the typebars and this shaft may extend from the left compartment mentioned above some distance to the typebars and may pass underneath the typebars and into a compartment on the right of the typewriter and said compartment may be similar to the compartment on the left of the typewriter, as to size. However, this compartment on the right of the typewriter need not have any driving shaft 41. Referring again to Patent 1,826,568, I may use in the right compartment bevel gears similar to 36 and 37 of Fig. 10 of said patent, and transverse shaft 38 of said patent may be journaled in a supporting member in said right compartment instead of being journaled in the framework of the typewriter. The framework of the typewriter may be outside of and to the right of the right compartment which holds a spool 6 similar to spool 6 of the compartment to the left of the typewriter. I may use a short vertical shaft in said right compartment similar to the shaft 34 of my Patent 1,826,568 and may mount on said short shaft, which I call in this application 16-B, a gear 15-B. When spool 6 is full of ribbon, or nearly so, and I wish the ribbon 5 to begin winding into spool 6 of the right hand compartment, I move lever 11-A of the left compartment until the teeth of a flange of spool 6 no longer mesh with the teeth of gear 15-B of the left compartment or I may lower gear 15-B temporarily  $\frac{1}{16}$  inch to get it out of mesh. This moving of lever 11-A also frees the spool 6 of the left compartment to unwind very freely. I move drive-shaft 41 with its worm gear 40 until it is in mesh with gear 39 as shown in Figs. 8 and 10 of said Patent 1,826,568. Since I locate gear 39 and a portion of transverse shaft 38 of Patent 1,826,568 in the left compartment, it is plain that when gears 39 and 40 are in mesh, the transverse shaft (which now extends from within the left compartment into the typewriter and across into the right compartment) will drive the shaft 16-B in the compartment to the right of the typing machine. And in rotating said shaft 16-B, the inking mechanism of the right compartment will be rotated and ink will be applied to said ribbon as it winds into the large ribbon spool 6 of the right compartment.

I may use an inking mechanism such as shown in Fig. 11 (see my U. S. Patent 2,471,238) and may have the lower flange or side of the ribbon spool 6 made with the gear teeth as shown which mesh with teeth of vertical shaft gear 15-B. I may use a driving motor 109 with a belt 111-A which connects pulley 110 with pulley 111. Or I may also use a friction clutch 112 as shown in Fig. 10, when it is desirable to do so. Gear 15-B may be lowered when not in use.

I may use a thin, metal or plastic member such as shown in Fig. 8, underneath a spool of carbon paper ribbon of any desired size, e. g. 18 or 20 inches diameter, as a support, and over the top of the shaft, or spindle, 9-B of Fig. 2, I may use a thin plastic or metal plate 113 as shown in Fig. 13. The ends of this plate may be securely fastened to the sides of the compartment as shown. In using a very large spool of ribbon, I prefer to have spindle 9-B longer so that it passes through the thin plate 113. This plate acts to steady the large roll as it slowly revolves and allows the ribbon 5 to travel into the vibrator and through guides, etc.

In Fig. 9, 114 is a ball bearing member which acts as a brake to create tension as spool 6 revolves. Rim 120 of the lower flange or side of spool 6 extends downwardly and member 114 rotates in contact with rim 120. Arm 115 extends to joint 116 and said joint is made up of a fastening through arms 115 and 117. An end of arm 117 has a hole in it through which screw 118 passes and then said screw passes into supporting bracket 119 which is fastened securely by means of screws 121 on each side of screw 118. As the screw 118 is moved inwardly towards bracket 119, the tension of ball-bearing member 114 against rim 120 is decreased and as the screw 118 is moved outwardly and away from bracket 119, said tension may be increased. It is desirable that spool 6 doesn't spin. With my spool invention, it rotates with feather-light touch when feeding carbon paper ribbon from a compartment to the typewriter

In Fig. 10 the desk may have two large, upper compartments each with its motor 109, friction clutch 112, bracket to support motor and clutch, said bracket being numbered 122 and pulleys 110 and 111 mounted on the

motor and spool respectively. A belt of any suitable size and material, 111-A, may be used. When the ribbon is winding into the spool 6 shown, from a similar spool in the compartment on the opposite side of a typing machine (not shown in Fig. 10) the motor driven belt may wind ribbon 5 into spool 6. And when the typist stops writing even for a moment, the spool will not wind the ribbon and the friction clutch will operate to keep the belt slipping and to take the tension until the typist again operates the typing machine. The friction clutch serves a very useful purpose in any form of my invention shown herein especially if the ribbon is a fabric ribbon or a ribbon which is used many times. I do not limit myself to desk compartments but the typewriter may be built with metal or plastic compartments which are actually a part of the machine as is the case in Fig. 12 and such a machine as shown in Fig. 12 may be used in the desk of Fig. 16. In Fig. 12, the cover 124 may be hinged and lift up. The platen may be much higher than said cover and the large spools of ribbon in the compartments 125, 126, 127, 128, 129, 130, 131, 132, 133 and 134 may be of any inking and of any color of carbon paper ribbon desired. The typing machine may be of the design shown in Fig. 12 but I do not in any way limit myself to this particular design of said machine, as it may be desirable to have metal compartments or other compartments of different sizes and shapes which are fastened to the typing machine or form a part thereof, or they may be part of a desk, or of some other member, or I may use cabinets of any desired form. I do not limit myself to this particular type of cover 124 as the cover may be much narrower than the one shown and may not extend as far back as indicated in Fig. 12 and there may be a separate cover for the typing machine proper and compartment covers on each side.

In using the inking mechanism of Fig. 11, a friction clutch may be employed similar to the friction clutch shown in Fig. 10 and when the spool 6 is unwinding the motor may be shut off and the gear 15-B may be lowered by any suitable manner approximately  $\frac{1}{16}$  of an inch in order to have it out of mesh with the thin side of spool 6 which is actually a large gear. The gear teeth of gear 15-B and of spool gear (or side) 15-C, are extremely short; the thin spool gear 15-C is not over  $\frac{1}{32}$  of an inch thick. Before the motor has to be turned on again and the gear 15-B raised  $\frac{1}{16}$  of an inch to mesh with gear 15-C, several hours will elapse as the rate of travel of the long ribbon 5 is slower than usual rate.

In Fig. 12, the typist's device 100-C may be entirely of metal and the ribbon compartments mentioned on the preceding page may be of any desired size to accommodate such size spools of ribbon as the user may require and prefer. Much of the conventional frame of a typing machine may be eliminated in this form of my invention and the frame may be the outside frame of the long, narrow device.

In Fig. 14, spool 6-B may wind the used ribbon. This form of the invention is for the typist who types only a small part of the time and who may be some weeks using one small spool of ribbon of the size shown as spool 6-B; the spools in compartments will accommodate sufficient ribbons to last such a typist for some years. When spool 6-B is full of used ribbon, a new spool is used to which the end of ribbon 5 is connected and the spool is placed in position on top of the usual, conventional spool shaft. I do not limit myself to using just the left side for the said spool 6-B as the compartments of ribbon may be on the left side of the machine and spool 6-B may be mounted on the right-hand spool shaft.

In Fig. 15 pull means are provided on each side of the typing machine. When ribbons on the one side of the typing machine have been used and have fed into a waste receptacle, then the ribbons in the compartments on the opposite side of the machine may be used and may feed through the vibrator in the proper direction and may be pulled by the proper train of gears and pass into the waste receptacle on the proper side.

In Fig. 16, shelf 33 and compartments 31 and 31' are suitable for supporting a very wide typing device with large compartments attached right to the device or typing mechanism; said compartments so attached being for holding the apparatus shown in the preceding figures herein and for holding ribbon. Compartments 31 and 31' may be of any suitable material and may be large enough to accommodate any items which are part of

a typing device or machine. The typing device or mechanism may be extremely long and narrow due to the compartments fastened to it and these may fit into unit 110-C with part being supported on shelf 33 and part on the bottom of compartments 31 and 31'. When said typing device or mechanism is installed in member 110-C, there may be various shallow compartments holding apparatus and spools and ribbons as described hereinabove and said compartments may be of any suitable size, such as for example compartments 102, 103 and 104 of Fig. 1 herein. Some compartments may be used for plain, uninked ribbon of different thickness and different absorptive qualities. The thickness and absorptive quality of an uninked ribbon used next to the type when writing with an inked carbon paper ribbon has much to do with the appearance of the writing secured on the writing surface. It is plain that the typist may have ends of different ribbons in the typing machine, besides the ribbon the typist regularly uses and that any ribbon of any color desired may be quickly used and also it is true that the typist may have ends of ribbons of one kind, say black record ribbons, and also different amounts of ink too according to the speed of travel of the writing ribbon and also according to the following factors: 1, whether or not the ribbon travels through the ribbon vibrator all the time by itself, or 2, whether there is an uninked, plain, paper ribbon on the side of the writing ribbon next to the type, or 3, whether or not the typist quickly connects a writing ribbon of a different inking to the ribbon in the vibrator and passes the two ribbons through the vibrator by quickly moving the carriage and then tears in two parts the ribbon first in the vibrator and puts its end in suitable position in the machine to wait until it is needed again. Then the typist may write for so long a time as she wishes with the ribbon last passed through the vibrator. In like manner, she may at any time change almost instantly to a ribbon of any desired color and when she no longer requires that ribbon, can change back quickly.

In Fig. 17, ribbon 5 is shown as the ribbon that has been in use and it is plain that it has been feeding from the spool of ribbon in the large compartment to the right and has passed through the ribbon vibrator and then through a ribbon guide to the pulling means, represented by gears as hereinabove explained in detail. Ribbon 5-B was fastened quickly to ribbon 5 at a place on the right of the ribbon vibrator and by moving the carriage quickly, the joint was passed through the ribbon vibrator and may now be seen on the left as 136. This ribbon 5-B may be an uninked ribbon or a black ribbon, or a ribbon of any desired color. If it is a plain, uninked, paper ribbon then the two ribbons 5 and 5-B will be used by the typist for certain work where heavier writing is needed than can be given by ribbon 5 alone. When the typist wishes to return to the sharper, finer writing of ribbon 5, she will tear the uninked ribbon 5-B in two parts and fasten the unused end portion in any suitable manner on plate 137 until again needed. If she tears off the uninked ribbon on the right side of vibrator, she will quickly move the carriage until the uninked ribbon has all passed through the vibrator to leave the vibrator for the ribbon 5 alone, if the typist wishes to continue writing with it alone. Or she may connect another ribbon in place of ribbon 5-B.

If the typist is writing with a black record, carbon paper ribbon and wishes to write with a red ink or with blue ink, or ink of some other color, for a short time and then return to this black record ribbon, it is reasonable, especially if she is working under great pressure and short of time, for her to attach the new ribbon to the black ribbon with the black ribbon's uninked face towards the type and use the black ribbon instead of a white, uninked ribbon, if the writing has to be heavier, or simply leave the black ribbon next to the type, if the work is such that the somewhat heavier writing will not matter at all. It is true that the inked black ribbon will cost more than an uninked white ribbon but if the typist is going to use the black ribbon next to the type for only a short time, the loss is extremely tiny.

I have done much writing with the carbon paper ribbon feeding from a spool in a large compartment. Sometimes I have removed the top disk from the spool and observed the roll of ribbon as it very slowly unwinds. The ribbon feeds through two guides usually and to the vibrator and then through another guide and between two gears and passes through a pipe and into a waste

receptacle. There are some thousands of yards of ribbon in the roll. The lightest feather touch moves the spool of ribbon smoothly because it is so nicely balanced and has a ball-bearing mechanism. It may be desirable for some uses to have the typing device one unit which is 5 some feet wide and which has large compartments for ribbons on at least one side of the typing machine or mechanism proper, with a new type of supporting member to hold the new outfit such as the one shown in Fig. 16 herein; or some other type of supporting member may 10 be desirable. I do not limit myself in this respect. The typing device may have parts of the conventional typing machine in upper compartments of a desk or other member, or in various types of cabinets, or elsewhere, to suit special needs of typists. Or the compartments or cabi- 15 nets may be fastened to a typewriter.

All of the present commercial typewriters which use carbon paper ribbons have accelerated spool drives so that when the ribbon begins to wind into an empty spool, the spool will rotate at a sufficient speed that each letter 20 impression will be made from an entirely new, fresh place on the ribbon. There is one electric typewriter which is on the market which moves its carbon paper ribbon  $\frac{5}{32}$  of an inch each time a letter impression is made on the paper and each time a comma or a period is made 25 on the writing paper. The ribbon also moves  $\frac{5}{32}$  of an inch each time the typist touches the space bar. The ribbon used in this electric typewriter is  $\frac{3}{16}$  of an inch wide and is just used from one end to the other. It winds into a spool. The ribbon is 4 in. in diameter and is 30 approximately 600 ft. long. Since the ribbon gives 33 letter impressions from every six inches of the ribbon used, on an average, from the special type, which is book type, and allowing a movement of the ribbon of  $\frac{5}{32}$  of an inch for each letter impression we have 39,600 35 letter impressions from said 600 ft. ribbon  $\frac{5}{16}$  inch wide. Each time the type struck the ribbon in writing the line below, and each of the six times the typist spaced between words, the ribbon moved  $\frac{5}{32}$  of an inch. 40

This will acknowledge and thank you for

The 33 letters and the 6 spaces means 39 times the ribbon moved  $\frac{5}{32}$  of an inch, or a distance of  $105\frac{5}{32}$  which equals 6.09 inches. Another typewriter company has a carbon 45 paper ribbon machine on the market which uses a half inch carbon paper ribbon and it is 550 ft. long. The typist usually refuses to write on the lower half of the half inch carbon paper ribbon because to do so, she is forced to throw her ribbon vibrator and ribbon very high 50 for each type-bar stroke and this is very tiresome and often tears the carbon paper ribbon. This company also uses a special accelerated drive for its carbon paper ribbon machine so that even when the winding spool is empty, and just starting to wind the used ribbon, the ribbon will travel so rapidly that it will give a new area 55 of ribbon for each letter impression and each punctuation mark.

There is a tremendous advantage in using a small amount of ribbon to do a large amount of writing since it makes the use of carbon paper ribbons economical 60 wherever good letter paper is used.

There is a tremendous advantage also in using thousands of yards of carbon paper ribbon in each spool and in providing the typist with at least two or three 18 to 24" 65 diameter spools of the kind of carbon paper ribbon she needs to use right along; and also providing her with 5 inch diameter rolls of red carbon paper ribbon and a 5 inch roll of uninked, plain paper ribbon.

Where the work is mostly letter writing, large rolls of ribbon should be provided for this, but where there is 70 also a considerable amount of legal work requiring more ink in the impressions, spools of ribbon should be provided containing ribbon that writes darker.

The carbon paper ribbon is from a standard typewriter that has been on the market for sometime and it is plain the present use of carbon paper ribbons is so 75 expensive for the amount of writing they give, as to make them luxuries. The expert typist writes across a four or five inch diameter roll of such ribbon in one day if she works from a dictaphone steadily. I have done a great deal of writing with the type of ribbon spool described and shown in my U. S. Patent 2,471,238 which has a large core and it is a fact that with a core as much 80 as 8 inches in diameter and using a spool as much as 24 in. in diameter, and driving said spool at low rate of

speed, the writing from a ribbon such as this can be very neat and of good color and yet the use of the ribbon will be extremely economical since the amount of writing done for each inch of ribbon used, will be much more, 5 just as it is now for all the writing of this application, and the writing will nearly match in color and degree of inking too. The 24 inch diameter spool must be well balanced and must be so adjusted, with a ball-bearing movement, that it will move with very slight power 10 needed. When the typist is compelled to make an erasure, it is much easier to erase neatly, if too much ink has not been used on the paper in writing.

I do not limit myself as to the location of the spool or spools of carbon paper ribbon used with the typing machine. They may be below the machine as in Fig. 5 15 herein, or they may be back of the machine or on either side of said machine, or they may be some distance from the machine, or in close proximity. I do not limit myself as to the particular types of inked ribbons or uninked ribbons. I may use a coated fabric ribbon for certain work and occasionally and intermittently fasten a carbon paper ribbon to the fabric ribbon on the coated side and write with the paper ribbon next the paper. 20 In such a case, the type would strike the uncoated side of the fabric ribbon. I might sometimes attach the paper ribbon to the fabric.

The inking mechanism may be without a substantial frame near the keys and the type-bars and the driving shaft and carriage spring drum and the frame may be 25 very much larger than on any conventional typewriter and may enclose a series of compartments on both sides of the mechanism and the compartments may be wider and much deeper than the mechanism itself. I know of no reason why the spools of carbon paper ribbon should not be as much as two or three feet in diameter if the private secretary desires such large spools and has space 30 for a typist's apparatus that will be capable of housing such large spools of carbon paper ribbon. The executive and the private secretary will be aided by very large spools of ribbon that are well balanced and that unwind under the slightest push or pull. 40

It is not possible to stop progress and so long as the little metal spools of ribbon must be used, the secretary has been unable to have fine writing all the time of good color that matches and now she can take great pride in the appearance of her work and deep satisfaction too. The longer the ribbon, the better the results.

The moment the ribbon must space  $\frac{5}{32}$  of an inch for each period, comma, semi-colon and for each letter i or l or b or t or p and for all the other letters and punctuation marks and figures, it is plain that the carbon paper ribbons will be a luxury for the few. It has always been my desire to see everyone who has to work for years as a typist provided with the apparatus and equipment for 55 beautiful results in writing at reasonable cost. This invention isn't a luxury.

In Fig. 18, a cabinet or compartment is shown in which two spools of ribbon are mounted on spindle 140. Support plate 113 of Fig. 13 has a pivot bearing 141 which fits snugly in spindle 140. Each spool 6 has a ball-bearing center so that even if the spool 6 is as much as 3 ft. in diameter, it will move very freely. Collar 139 is fastened securely to shaft or spindle 140 by means of screw 142 and said collar is slightly above spool 6 65 in the lower part of said cabinet. The spool (6) in the upper part of the cabinet is supported by collar 139 and the upper collar 139' is situated far enough above the upper spool of ribbon 5 as not to create any friction between the collar and the upper flange of the said spool. The spindle 140 is fastened in any suitable manner to the bottom of the compartment or cabinet 143 by means of screws. These screws may be countersunk in metal 70 plate 144.

Many weeks passed before I was able to have a roll of carbon paper ribbon wound into a spool 18 inches in diameter. All companies took the position that they had 75 no means of supplying such a long, narrow ribbon and none had a suitable spool so large. I wished to balance such a large spool with thousands of yards of ribbon wound into it and balance it so that it would move under the very lightest, feather push or pull. All efforts to get aluminum flanges made that were  $\frac{1}{32}$  inch thick failed. I finally tried various materials and the 18 inch spools that were first made to order were either of too heavy plywood or too light fibreboard. Finally, after 85



writing many letters to various companies, I succeeded in getting suitable metal disks made and I learned of a company which could slit very large diameter rolls of carbon paper into the necessary narrow ribbons. For some uses, I prefer to have at least one face of the rolls of such ribbons given a very light coating of a suitable adhesive material. I do not put any limit on the number of disks of ribbon, or spools of ribbon, I may mount on one spindle. I do not limit the style of bearings used for the spools or their location. A different type of shaft may be used. It may be like the shaft of a phonograph and there may be suitable means for bringing one spool or roll of ribbon into use at a time automatically as needed.

Since the writing from carbon paper ribbons may be extremely printlike and of very sharp outlines, it is reasonable that type should be smaller than present elite type and the letters should be closer and capital letters and small "m" should be kept very narrow (less than  $\frac{1}{8}$  inch) so that for many kinds of writing, and especially for many business and social letters, the writing should be as small as the printing found in magazine pages. This will mean much more efficient use of a carbon paper ribbon because the ink supply of the ribbon will go so much farther. The metal type used should have dull, knife edges rather than cutting edges. They will make better original sheets and better carbon copies if the type are not book type when carbon paper ribbons are used. My discovery as to a more efficient use of the type will mean a substantial saving for the executive on fine paper. My discovery that neat, clean-cut, printlike writing may be had even though the type marks on the ribbon overlap most of the time means that carbon paper ribbons may be used at low cost if large rolls of carbon paper ribbon are bought and used in compartments which may be attached to the typing mechanism as part thereof, or they may be separate but near the typing mechanism, or may be in a special desk such as described hereinabove and shown in the drawings.

The secretary may be free for all time from having to put the spools of ribbon in the machine and remove used spools of ribbon, if she uses ribbons that are thousands of yards in length, each, and are furnished on spindles and installed by someone else once a year or once in six months and the writing may be truly correct.

After work with the most intense interest in the subject, beginning in 1915, I have discovered how to use carbon paper ribbons so that the secretary may have the kind of writing the executive prefers and have it all the time month after month, and have any color of writing desired without removing the regular ribbon and have all this at reasonable cost, and without the use of inking mechanisms. Fortunately, for me, the typewriter manufacturers can make enormous profits from the sale of the large spools of ribbons. They can make large profits from the sale of special desks of my invention, herein, which can accommodate the typist's apparatus as shown in the drawings of this application, and they can make large profits from the sale of special cabinets that will be attached to the frame of the typing machine, or will be separate units fitting the top portions of the desk on one side, or both sides, of the typing machine. A service can be sold to executives who use fine letter paper and legal paper and who want their writing correct all the time and do not want their secretaries to waste time with little spools of ribbon. The carbon paper ribbons of present typing machines are impractical because the speedy, expert secretary who has much typing to do each day, always, is compelled to waste her time removing used ribbon from the machine and installing a new spool of ribbon. This duty may come at the busiest time of the day when her employer is waiting for her to finish work that clients in his office wish to execute. As I write this, an 18 inch diameter spool containing thousands of yards of  $\frac{5}{16}$  inch width ribbon is very, very slowly unwinding and feeding ribbon to the machine. The spool is mounted on a spindle and it has a ball-bearing movement that responds to the lightest pull. There isn't the slightest reason why the spool should not be three feet in diameter if the secretary's desk is a very large one. In Fig. 18 I have shown show a series of ribbons wound on spools, with collars between, may be mounted on a spindle. The depth of the cabinet or compartment or space in the desk (or as part of type-

writer) needed is slight. There is no need for the typist to be bothered any more. She can have light, medium or heavy inking for her work and any color of writing desired at any time. The desk of my invention is of new type and of great importance for the typist who does lots of work. I gave much time to carbon paper ribbon work with a chemist I employed years ago. What long years elapsed and what a lot of experimenting before I discovered how to utilize the space near the typing machine for very large rolls of ribbons and let the ribbon that I use go right into a waste receptacle to be thrown away. None of the ribbon used in writing this application has been wound into a spool. It has gone right into a waste receptacle. It is much less expensive to build a typing machine like this one. I have no need for the various parts listed in column 1 hereof if I am using a  $\frac{5}{16}$  inch width or a  $\frac{1}{4}$  inch width carbon paper ribbon. The carriage moves along lightly, the type-bars move easily and very lightly, the key action of this machine is easy as the 18" spool containing thousands of yards of  $\frac{5}{16}$ " width ribbons very slowly unwinds. And if I have to make an erasure, what a small amount of ink has to be removed from the paper because the writing is sharp and keen.

It is to be understood that the construction shown herein as to the typist's apparatus and mechanisms is for purposes of illustration and variations may be made in sizes and styles of parts and in details without departing from the scope and spirit of my invention. I do not limit myself as to the kinds of materials used. I may use a synthetic material for the ribbons. I may use other inks. I do not limit myself as to the space between the teeth of the gears of Fig. 7. Typist may move lever 11-A so as to put desired pressure on gear 9, that is next to ribbon. She may cause gear 11 to mark the ribbon slightly. She may force the ribbon into the spaces between the gear teeth, thus crimping the ribbon. The size of the teeth and the size of the spaces between said teeth, control the length of ribbon crimped by the gear teeth and pressure of teeth.

What I claim is:

1. An apparatus for a typist including a typist's desk, having at least one drawer containing a freely rotatable horizontal support for a roll of writing ribbon and having ink on only one face thereof; a spoolless typing machine including a ribbon vibrator, supported by said desk adjacent said drawer; means for guiding said ribbon from said drawer and into said machine on one side of said ribbon vibrator; and means on the opposite side of the said vibrator for drawing said ribbon through said vibrator and past the typing station during operation of said typing machine.

2. An apparatus for a typist including a typist's desk, having at least one drawer containing a freely rotatable support for a roll of writing ribbon, said ribbon being extremely thin and frail and less than .002 of an inch in thickness and having an extremely thin, uniform coating of ink throughout its entire length and on only one face thereof; a spoolless typing machine including a ribbon vibrator, supported by said desk adjacent said drawer; means for guiding said ribbon from said drawer and into said machine on one side of said ribbon vibrator; and means on the opposite side of the said vibrator for drawing said ribbon through said vibrator and past the typing station during operation of said typing machine; said ribbon being not more than 10,000 yds. long.

3. A typist's apparatus and tools including a spoolless, visible writing, typing mechanism having a ribbon vibrator and pull means for drawing a ribbon therethrough; a typist's desk supporting said mechanism and having a separate drawer some distance from said mechanism, a suitable permanent mounting in the said drawer for holding at least one roll of carbon paper ribbon and permitting the ribbon to move from said drawer freely and without tension and into said mechanism and through its vibrator and pull means; said ribbon occupying a vertical position in said vibrator at the typing station; a cover extending over a portion of said mechanism and over said drawer; and said apparatus including other drawers separate and apart from said mechanism having permanent mountings for additional rolls of carbon paper ribbon, and also including tape adhesive means whereby said additional rolls may be brought into use instantly at any time.

4. A typist's apparatus including a visible typing machine for making inked impressions on a writing surface, a support for said typing machine, having compartments containing at least two rolls of paper ribbon; one ribbon being a writing ribbon for use next to a writing surface, and the other ribbon being uninked and for use as desired by the typist on the side towards the type; means for quickly attaching the latter ribbon to the writing ribbon to be fed therewith through said typing machine; and pull means comprising a pair of feed rolls engageable with one or both of said ribbons to feed the latter through said typing machine; said ribbon on the type side serving to cause said writing ribbon to give heavier impressions than when said writing ribbon is used alone; and the length of said ribbons being not more than ten thousand yards each.

5. In a typing machine, the combination of two inked paper ribbons having wax-containing ink of different colors on just one face thereof; a vibrator; means for quickly attaching one of said ribbons to the ink side of the other; and means for moving said ribbons instantly and together through the vibrator at different rates of speed, each rate being a fixed, constant rate and under the instant control of the typist; and one rate of travel giving more ink in the type impressions from the ink side of one ribbon and towards the writing surface; and the other rate of travel being slower and causing the marks of the type on the uninked face of said one ribbon to overlap and the vertical lines of successive characters to fail to clear and causing the writing to be of lighter color than the writing secured by the faster rate of travel of said ribbon; and said ribbon moving through said vibrator smoothly and easily; and said machine being limited to one spool-shaft for driving said ribbon moving means, and one shaft that drives said spool-shaft.

6. In a typist's apparatus, a support for a typing mechanism; a typing mechanism on said support; a vibrator in said mechanism; a holder for at least three rolls of ribbon outside of and separated from said mechanism; and each ribbon being not more than five thousand yards long; gears for moving and drawing at least one of said ribbons to said mechanism from said holder and for drawing same to and through said vibrator and between two of said gears at a rate of travel sufficiently slow that the vertical portions of successive characters made by said typing mechanism, during its operation, at times fail to clear each other; and said mechanism having just one horizontal drive-shaft and just one vertical shaft driven by said horizontal drive-shaft; both shafts being located on one side of said mechanism, with the horizontal drive-shaft extending to the rear and the vertical shaft driving said gears.

7. In a typist's apparatus, a support for rolls of carbon paper ribbon; a separate support for a typing mechanism; a typing mechanism on said separate support having just two shafts; rolls of carbon paper ribbon; a holder that rotates in said first support for at least one roll of said ribbon; said rolls of ribbon being at least one foot in diameter, and said support for said rolls being in any suitable position and location at least four inches from the said mechanism; and each ribbon being much longer than five thousand yards; pull means for said ribbon, including gears; said mechanism including a vibrator, keys and key-levers, a carriage, a platen, type and type-bars; said type-bars having type that are a permanent and fixed part of said mechanism; and said pull means drawing at least one of said ribbons from said rotating holder to said vibrator in said mechanism and to said gears and between two of said gears during operation of said keys and key-levers by said typist at a rate of travel that is slower than the rate of travel of said carriage; and at a rate that permits vertical portions of successive characters marked on said ribbon by said type to fail to clear each other; and one of said shafts being horizontal and one being vertical and both being on the same side of the said machine and one driving the other and the other driving the said pull means; and both being plain, straight shafts.

8. In a typist's apparatus, a support for rolls of carbon paper ribbon; a separate support; a typing mechanism on said separate support; said mechanism having a vibrator, keys, key-levers, permanent type-bars and type of one size; a carriage that moves the same distance always for each type impression on a work-sheet;

and said mechanism having just two shafts; pull means for at least one writing ribbon, including gears and a lever adjustably supporting one gear; a rotating holder for at least one roll of said ribbon; and said pull means drawing at least one of said ribbons from said holder through said vibrator and to said gears and between two of said gears at a rate of travel that is so slow that the vertical portions of successive characters fail to clear each other at times and one shaft driving the other and both being on the same side.

9. An apparatus for a typist including a typist's desk, having at least one compartment containing a ball-bearing mounting and a disk rotatably mounted thereon, said disk being at least (8) eight inches in diameter for supporting an extra large supply of carbon paper ribbon inked for writing from one face thereof; a spoolless typing machine, including a ribbon vibrator and means for writing visibly, supported by said desk adjacent said compartment; means for guiding said ribbon from said compartment to said vibrator; and means for moving said ribbon from said supply of carbon paper ribbon through said vibrator for writing which always matches in color.

10. An apparatus for a typist including a spoolless typing machine equipped with a ribbon inked on one face only and being less than .0025 of an inch thick; and including a ribbon vibrator and pull means for said ribbon; said apparatus also including a large compartment less than twelve inches from the said vibrator and disposed on one side thereof for holding a supply of said ribbon ready for feeding to said machine for writing at the typing station; and said pull means comprising a pair of feed members engageable with said writing ribbon on the other side of said vibrator for pulling said ribbon into the machine and through said vibrator and past the typing station.

11. An apparatus for a typist in accordance with claim 10 in which the frame of said machine is sufficiently enlarged to accommodate said compartment within the confines thereof, and said machine and said compartment having at least a partial covering capable of being easily raised.

12. A typist's apparatus which includes a visible writing, spoolless typing machine for printing alphabetical and other characters on a work-sheet; said machine including a ribbon vibrator, pull means on one side of a vibrator for advancing a writing ribbon, a drawer adjacent said machine on the other side of said vibrator containing at least one large roll of non-woven writing ribbon; and a ball-bearing mounting in said drawer for said large roll of ribbon and for quick, easy rotation of said roll free from any tension as said pull means pull said ribbon from said drawer into the said typing machine and through the said vibrator and through the said pull means; said drawer being of sufficient size to hold not more than ten thousand yards of said ribbon; and said mechanism being free from reels and spools of ribbon and free from spool housings and free from any ribbon reverse mechanism; and said ribbon being inked for writing from just one face thereof.

13. A typing apparatus which includes a spoolless, visible writing typing mechanism for printing alphabetical characters on a work-sheet; a non-woven writing ribbon which has ink on just one face thereof; said mechanism having a ribbon vibrator, permanent type-bars and type of one size and a carriage which moves the same distance for each alphabetical impression on the work-sheet; said mechanism having just two drive-shafts, pull gears for said ribbon driven by said shafts, and a lever adjustably supporting one of the said gears; said apparatus also including a drawer with permanent apparatus therein for supporting a large roll of said ribbon and for rotation of said roll free from tension as said pull gears pull the said ribbon from said drawer into said mechanism and through said vibrator and through said pull gears; the position of said lever and its gear being instantly adjustable for changing the speed of travel of said ribbon, and said lever and its gear being separate from said carriage.

14. In a typist's apparatus, a typing machine having a ribbon feed mechanism comprising a pair of intermeshing pull gears adapted to receive and feed a writing ribbon therebetween, means for driving one of said gears, a lever supporting the other of said gears and adjustable to different positions to vary the degree of mesh of said

gears and thereby regulate the rate of advancement of the ribbon thereby, and means for securing said lever in its various positions of adjustment.

15. A typist's apparatus including a typist's desk; a spoolless typing machine supported by said desk; a five thousand yard writing ribbon ready for use; said machine including a ribbon vibrator, a platen, a carriage and pull means for said writing ribbon; said desk including at least one drawer containing at least one mechanism for free unwinding of at least one roll of said writing ribbon, said mechanism being separate from said machine and including ball-bearings and at least one other rotary member for supporting said ribbon roll; said pull means comprising feed members engageable with said writing ribbon for feeding said ribbon through said vibrator from said roll and for feeding said ribbon from said vibrator between said feed members for deposit in a waste receptacle.

16. A typist's apparatus including a typing machine having its frame extended laterally on one side thereof to provide a compartment for an extra large supply roll of writing ribbon, a ribbon vibrator, reeling means in said compartment and one side of said vibrator for supporting said supply roll, reeling means on the other side of said vibrator co-operating with said first reeling means to feed said ribbon back and forth past the typing station, and an inking mechanism disposed in said compartment for feeding ink to said ribbon during its feeding back and forth between said reeling means.

17. A typist's apparatus including a typing machine, a compartment entirely separate and apart from said ma-

chine for receiving an extra large supply roll of writing ribbon, a ribbon vibrator, reeling means in said compartment and on one side of said vibrator for supporting said supply roll, reeling means on the other side of said vibrator co-operating with said first reeling means to feed said ribbon back and forth past the typing station, and an inking mechanism disposed in said compartment for feeding ink to said ribbon during its feeding back and forth between said reeling means.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

	193,642	Deming -----	July 31, 1877
	229,707	Jenne -----	July 6, 1880
	494,356	Walkup -----	Mar. 28, 1893
5	1,021,953	Steele -----	Apr. 2, 1912
	1,212,166	Amiss -----	Jan. 16, 1917
	1,457,625	Freydberg -----	June 5, 1923
	2,044,072	Going -----	June 16, 1936
	2,127,812	Gabrielson -----	Aug. 23, 1938
	2,161,856	Coxhead -----	June 13, 1939
	2,236,611	Smith -----	Apr. 1, 1941
	2,258,769	Kittel -----	Oct. 14, 1941
25	2,475,336	Petz -----	July 5, 1949
	2,554,028	Helmond -----	May 22, 1951

##### FOREIGN PATENTS

	517,076	Germany -----	Jan. 31, 1931
30	542,938	Great Britain -----	Feb. 3, 1942