

June 16, 1936.

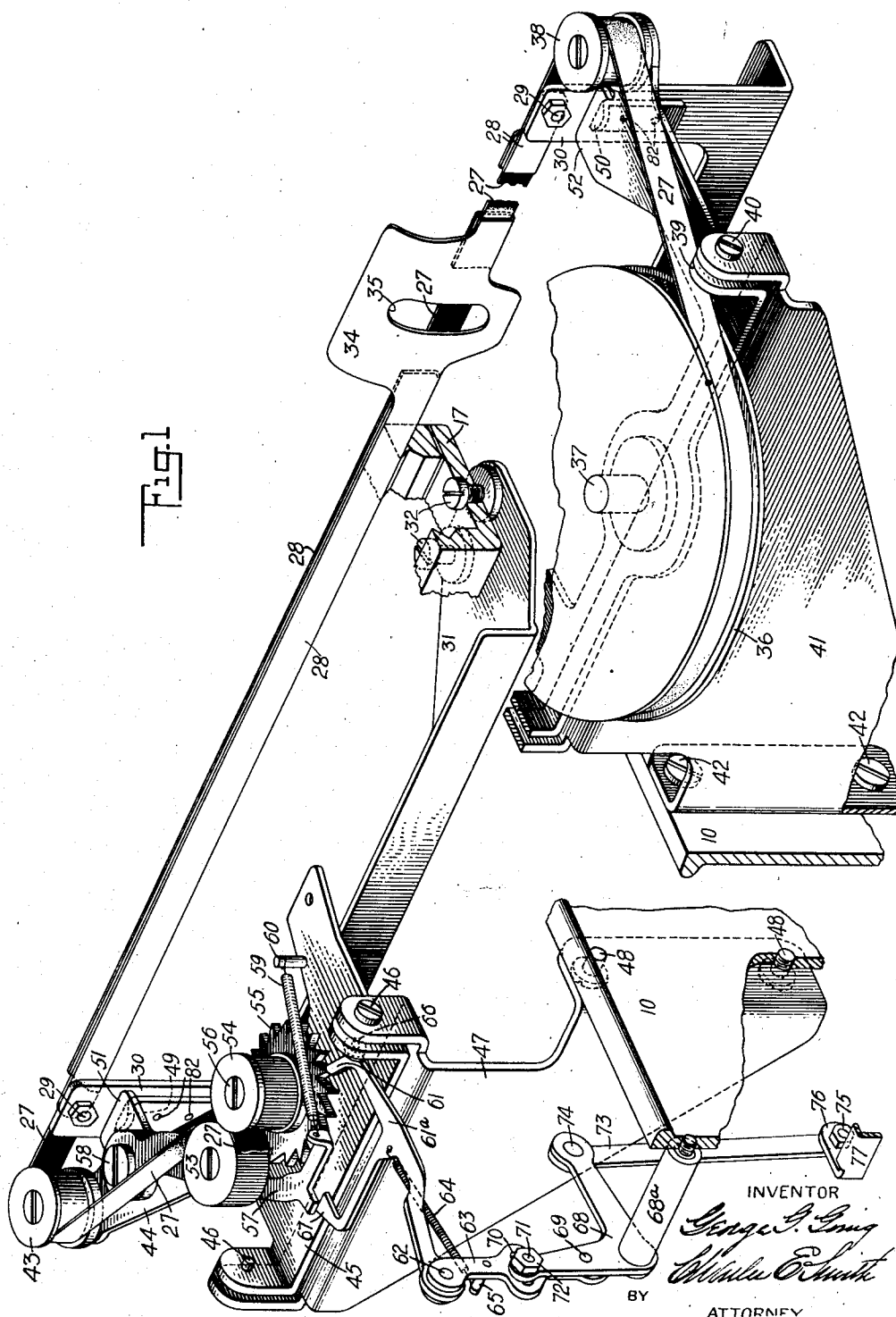
G. G. GOING

2,044,072

TYPEWRITING MACHINE

Filed Feb. 27, 1933

3 Sheets-Sheet 1



June 16, 1936.

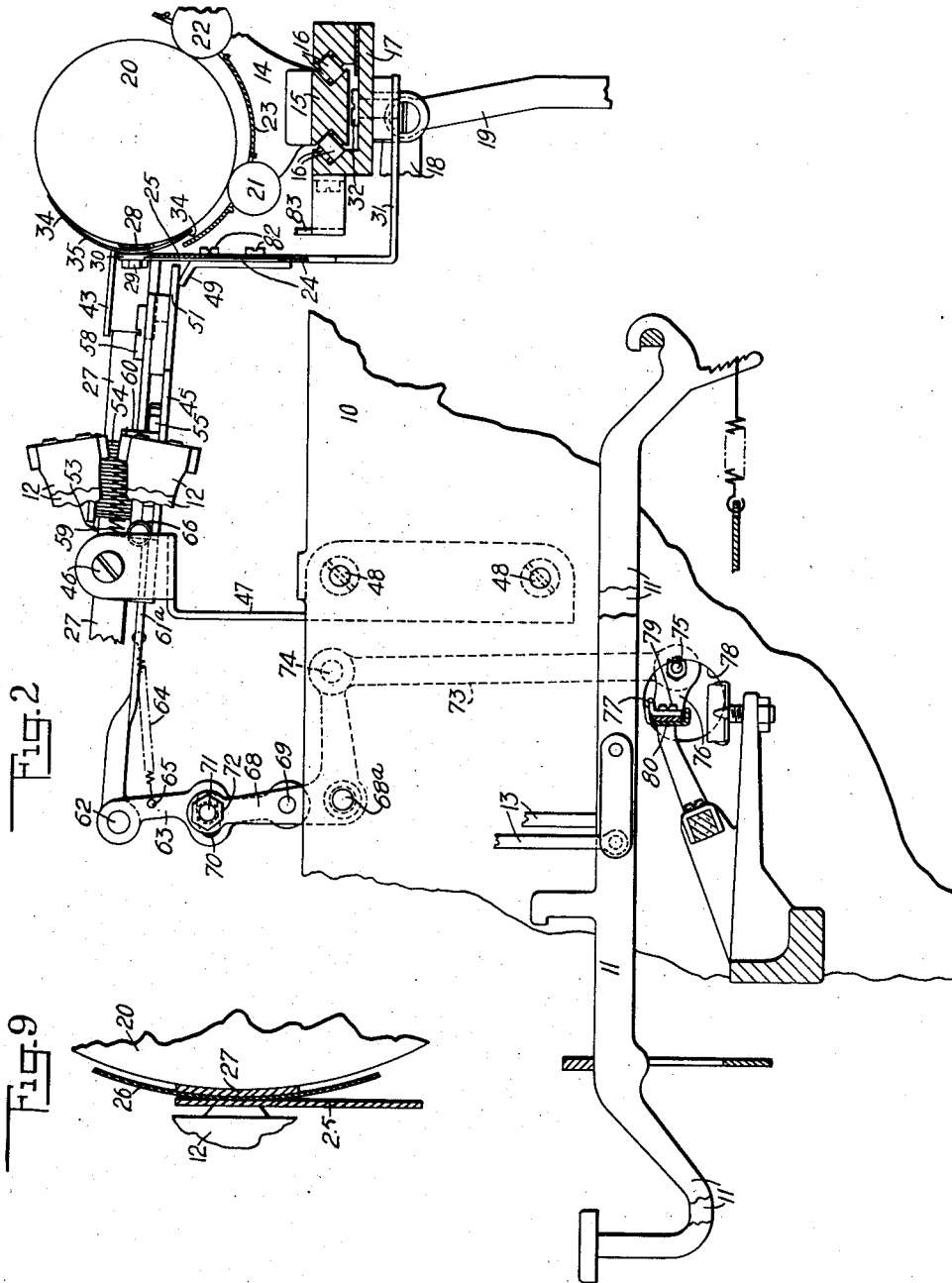
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TYPEWRITING MACHINE

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3 Sheets-Sheet 2



WITNESSES
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June 16, 1936.

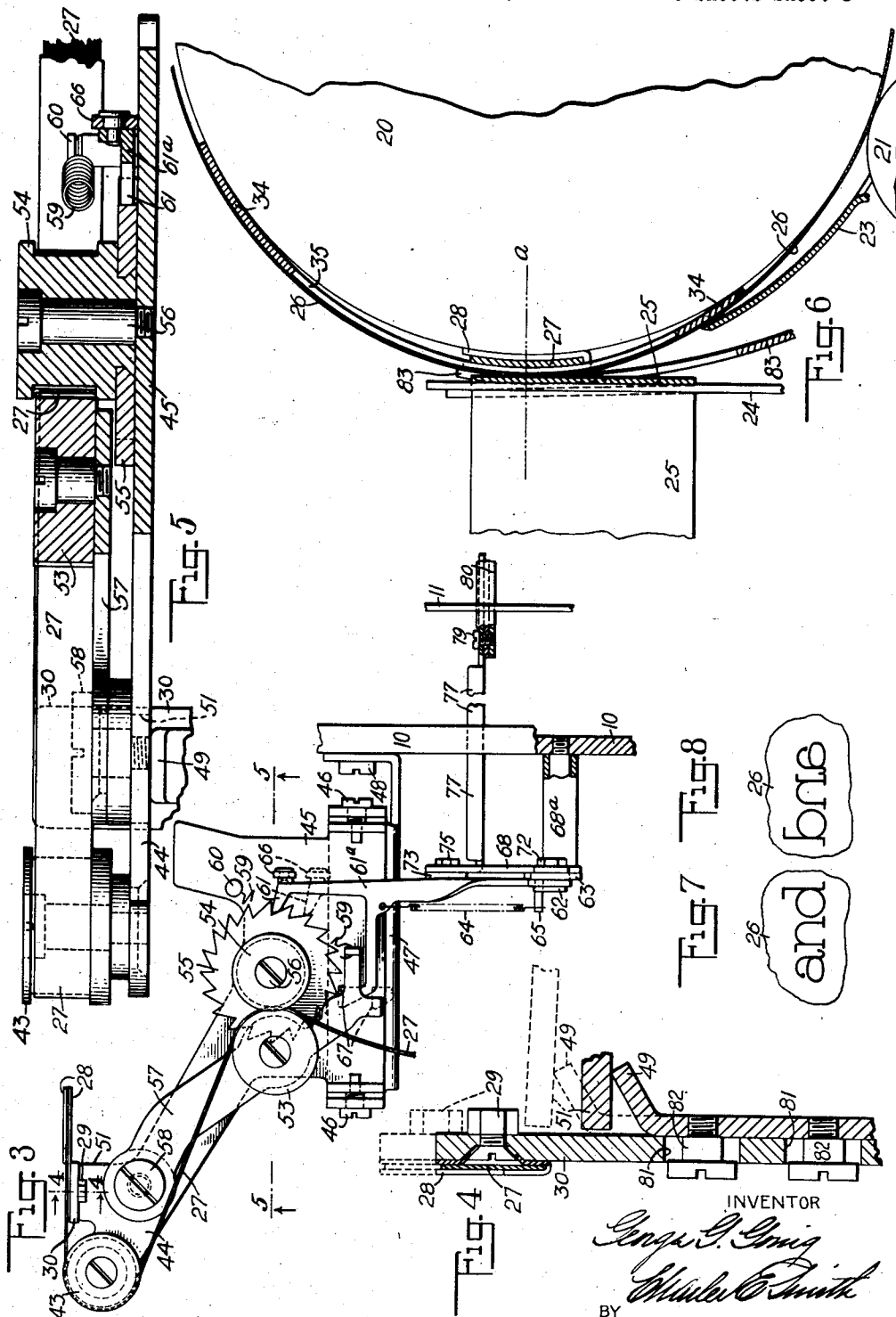
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2,044,072

TYPEWRITING MACHINE

Filed Feb. 27, 1933

3 Sheets-Sheet 3



and
and

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UNITED STATES PATENT OFFICE

2,044,072

TYPEWRITING MACHINE

George G. Goins, Glenbrook, Stamford, Conn.,
 assignor to Remington Typewriter Company,
 Ilion, N. Y., a corporation of New York

Application February 27, 1933, Serial No. 658,727

16 Claims. (Cl. 197—153)

My invention relates to typewriting and like machines and more particularly to means for effecting negative imprints on work sheets.

The machine of my present invention was designed more particularly for typewriting original sheets for use in the Standard new process duplicator. In said "duplicator" from one hundred to one hundred and fifty clear copies are made direct from one original typewritten sheet without the use of gelatine, stencil or other transfer medium than is involved in producing the original copy with the aid of a so-called "hektograph carbon" ribbon. The original copy is clamped to the drum of the Standard new process duplicator and copies can be made therefrom at the rate of about fifty per minute.

As each sheet to be copied is fed forward in the above mentioned duplicating machine, the surface of the sheet becomes slightly moistened with a special chemical solution. This moistened sheet comes into contact with the negative original and a positive copy is produced on the sheet. The copy is then automatically delivered into a receiving tray. Immediately after the copy is produced the chemical solution evaporates from the sheet so that when the copies are removed from the tray they are dry and ready for immediate use.

Heretofore the originals have been produced on a typewriting machine with the aid of so-called "hektograph carbon sheets."

One of the main objects of my invention is to dispense with the use of these so-called "hektograph carbon sheets" and to provide a highly effective machine in which the originals may be rapidly and effectively produced with the aid of so-called "hektograph carbon ribbon" and with a saving of over fifty per cent in the amount of "hektograph carbon" material used.

To the above and other ends which will hereinafter appear my invention consists in the features of construction, arrangements of parts and combinations of devices set forth in the following description and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views:

Fig. 1 is a detail, fragmentary, perspective view of the means of supporting and feeding the hektograph ribbon.

Fig. 2 is a detail, fragmentary, fore and aft, vertical, sectional view of the machine embodying the devices of my invention.

Fig. 3 is a detail, top plan view of a portion of the feed mechanism for the hektograph ribbon.

Fig. 4 is an enlarged, detail, fragmentary, vertical, sectional view taken on the line 4—4 of Fig. 3 and looking in the direction of the arrows at said line.

Fig. 5 is an enlarged, detail, fragmentary, sectional view of the hektograph ribbon feeding mechanism taken on the line 5—5 of Fig. 3 and looking in the direction of the arrows at said line.

Fig. 6 is an enlarged, detail, fragmentary, vertical, sectional view taken through the platen and showing some of the associated parts.

Fig. 7 is a fragmentary, face view of the work sheet with positive imprints on the front face thereof.

Fig. 8 is a rear view of the same work sheet with the same characters imprinted thereon in the reverse or negative.

Fig. 9 is an enlarged, detail, fragmentary, vertical sectional view taken through the printing point and showing the work sheet and ribbons at the time a pressure imprint is being effected.

I have shown my invention embodied in the present instance in a #6 Remington noiseless typewriting machine in which the novel devices of my invention may be readily embodied without modifying or materially modifying the existing structural features of said machine. It should be understood, however, that I am not restricted to the embodiment of the invention in the machine referred to, but that said invention may be employed in various styles of typewriting and like machines wherever found available.

In the accompanying drawings I have shown only so much of the #6 Remington noiseless machine as is deemed necessary to disclose my present invention in its embodiment therein.

The frame of the machine comprises side plates 10. The usual type actions are employed including the key levers 11, type bars 12 and intermediate actuating connections (not shown) controlled by the links 13.

The carriage in the main is of the usual construction and comprises end plates 14 fixed to a cross bar 15 supported by anti-friction rollers 16 on a supporting bar 17 which constitutes part of the case shift frame. This frame is guided by links 18 and is controlled from case shift keys (not shown) through the links 19 in the usual manner. A cylindrical platen 20 is mounted in the carriage and feed rollers 21 and 22 and a paper apron 23, all of the usual construction, may be employed. The usual paper fingers and paper

ball (not shown) are or may be employed, as well as the usual line gage and card guide 33 carried by the case shift frame.

The ordinary automatically actuated ribbon vibrator 24 (Fig. 6) which carries an inking ribbon 25 is used in the present construction, and by which positive imprints are produced on the front face of a work sheet 26, as indicated in Fig. 7.

In order to simultaneously effect negative imprints on the rear side of the same work sheet 26, as shown in Fig. 8, or on a second work sheet if desired, I employ a second narrow ribbon 27 constructed, arranged and controlled in a manner which will now be described.

The ribbon 27 is preferably a so-called "hektograph" paper ribbon and is inked only on the front face thereof for effecting a negative imprint on the rear side of a work sheet, as shown in Fig. 8, at the same time that a positive imprint is produced from the ribbon 25 on the front face of a work sheet, as shown in Fig. 7. This ribbon 27 is carried by a part of the machine that does not travel with the carriage and extends in a straight stretch in front of the platen 18, and the printing line indicated at *a* (Fig. 6), and in the rear of the ribbon 25 for a considerable distance beyond the side plates 10 on the frame of the machine. This latter is in order to afford free travel of the carriage with the work sheet carried thereby without interference from the ribbon 27 or the parts which support and control it.

This ribbon 27 passes through a ribbon guide 28 that extends substantially throughout the straight stretch of ribbon and partly surrounds the latter. Thus, the guide 28 is secured at 29 to upright bracket arms 30 which project from brackets 31 that are secured by screws 32 to the case shift frame, or to the supporting bar 17 which constitutes a part thereof. It will thus be understood that the ribbon guide 28 is fixedly supported by the case shift frame to move with the latter in its case shifting movements and thus present the hektograph ribbon 27 to the printing point in either case positions of the platen. The ribbon guide 28 is substantially U-shaped in cross section to receive and guide the hektograph ribbon 27 and prevent it from being deflected upwardly or laterally by the work sheets as they are fed forward in the machine. The substantially U-shaped formation of the ribbon guide 28 extends throughout the length thereof except at and near the printing point, where a single enlarged guide surface 34 is presented. This guide surface has an elongated aperture 35 formed therein at and near the printing point to enable the type bars to press the rear surface of the work sheet against the front face of the hektograph ribbon at a point where the uninked back of said ribbon bears against the platen, as shown in Fig. 9. The guide surface 34 of the ribbon guide is bent to conform substantially to the curvature of the platen and preferably bears against same at the upper and lower end portions of said guide surface, as indicated in Figs. 2 and 6 to insure the feed of the work sheet 26 to the front of the ribbon 27 as will hereinafter more clearly appear.

As hereinbefore pointed out the hektograph ribbon 27 is inked on the front face only thereof so that negative imprints may be made from this ribbon on the rear side of a work sheet. The hektograph ribbon is carried by a spool 36 free to turn on an upright fixed spindle 37. The upper flange of this spool may be made removable in order to place the roll of ribbon on the spool.

The ribbon 27 passes from the spool over a flanged guide pulley 38 carried by a pivoted supporting member 39 that also constitutes a support for the ribbon spool 36. This supporting member 39 is pivoted at 40 on a bracket 41 secured by screws 42 to one of the side plates 10 of the frame. After passing the guide pulley 38 the ribbon 27 extends through the guide 28 to a second flanged guide pulley 43 supported on a bracket arm 44 that forms part of a support 45 pivoted at 46 to a bracket 47 which is in turn secured by screws 48 to the opposite side plate 10 of the frame.

It has been explained that the ribbon guide 28 is connected to shift with the case shift frame 15 in the case shifting movements of the latter. In order that the pivoted supports 39 and 45 together with the parts carried thereby may be shifted with the platen in the case shifting movements of the latter I have provided two supports 49 and 50 each of which is connected to and projects forward from the front face of a bracket arm 30. These supports 49 and 50 coast with and support rearwardly projecting arms 51 and 52 which extend from the supports 45 and 39 respectively. It follows from this that the supports 39 and 45 will partake of the movement of the case shift frame and in such movements will turn on their pivots so as to maintain all parts of the hektograph ribbon in the same plane at 30 all times irrespective of the case position of the platen. This insures the free travel and feed of the hektograph ribbon at all times.

As the hektograph ribbon passes from the guide pulley 43 it is received between and is fed 35 by two cooperative feed rollers 53 and 54, the latter being a flanged roller between the flanges of which the hektograph ribbon and the roller 53 are received. These rollers 53 and 54 are preferably serrated in order to effectively grip 40 the ribbon 27. A ratchet wheel 55 is fixedly connected to the feed roller 54 to turn the latter and effect a feed of the ribbon from the supply spool 36. This ratchet wheel and the feed roller 54 are supported on a spindle 56 carried by the support 45. The feed roller 53 on the other hand is supported on the arm 57 pivoted at 58 on the arm 44 of the support 45. A contractile spring 59 is connected at one end to the arm 57 and is anchored at its opposite end to a pin 60 carried 50 by the support 45. The effective force of this spring is therefore exerted to press the feed roller 53 against the feed roller 54 and against the ribbon 27 interposed between the two feed rollers.

In order to effect a step-by-step feed of the ribbon 27 in the direction of its length, I provide automatically actuated means which coast with the ratchet wheel 55. These means comprise a pawl 61 carried by a pawl carrier 61^a pivoted at 62 to an actuating arm 63. A contractile spring 64 is connected at one end to the pawl-carrying member 61^a and is anchored at its opposite end to a pin 65 carried by the member 63. The effective force of this spring is exerted to move the pawl 61 into engagement with the tooth of the ratchet wheel 55, it being understood that there is sufficient play at the pivotal connection 62 to enable the pawl carrier to swing laterally as well as to receive a pivotal movement around the axis of the pivot 62. As best shown in Figs. 3 and 5 70 the pawl carrier 61^a carries a pin on which an anti-friction roller 66 is supported, said roller bearing against the support 45 and thereby supporting the rear end of the pawl carrier in its feed movements. Projecting to the left and then 75

rearward from the pawl carrier is a contact member 67 which at the end of the feed movement of the pawl from the dotted line to the full line position shown in Fig. 3 will be brought into contact with a tooth of the ratchet wheel 55 and prevent an overthrow of the ratchet wheel.

It will be understood that due to the pivotal connection 62 between the pawl carrier and the actuating member 63 said pawl carrier may partake of the case shifting movement of the platen and with the supporting plate or member 45, as also do the members 43, 44, 53, 54, 55, and 57 carried by said member 45.

The member 63 is adjustably connected to one arm of an angular lever 68 pivoted on the outer end of a supporting pin 69 secured to the left-hand side plate 10 of the frame. The adjustable connection between the member 63 and the angular lever 68 is effected by pivoting the member 63 at 69 to the angular lever. A slot 70 is provided in the member 63 and through this slot extends a screw bolt 71 that is received in an opening in the upper end of the angular lever; a nut 72 coacting with the screw bolt to maintain the member 63 in any position to which it may be adjusted around the pivot 69. A tightening of the nut 72 retains the member 63 in fixed relation to the angular lever and in its adjusted position thereon. The effect of this adjustment is to increase or decrease the extent of lost motion transmitted to the pawl 61 before it picks up the ratchet wheel 55, thereby increasing or decreasing the extent of feed of the ribbon at each actuation of the feed pawl 61.

An upright link 73 is pivoted at its upper end, as at 74, to the angular lever 68, the lower end of this link being pivoted at 75 to an ear 76 which constitutes part of an extension bar or member 77 that projects through an opening 78 in the left-hand side plate 10 of the frame and is connected by a screw 79 or otherwise with the usual universal bar 80. Each key lever 11 in the actuation of a type action depresses the universal bar 80 and transmits motion through the train of connections described to the pawl 61 to effect an intermittent rotation of the ratchet wheel 55, thus effecting a step-by-step feed of the ribbon 27, a small extent of feed being effected at each printing operation or at each depression of a printing key.

As the free used end portion of the ribbon 27 is fed forward from the feed rollers 53, 54 it is torn off from time to time as the hektograph ribbon is used but once.

It will be seen that by the use of the feed rollers 53 and 54 to feed or advance the hektograph ribbon such feed is always uniform for any given adjustment of the member 63, and the feed does not vary as in the case where a ribbon is wound onto a spool and the extent of feed varies with the amount of ribbon wound thereon.

From a consideration of Fig. 4 it will be understood that each of the supporting members 49 and 50 is adjustably connected to the companion bracket arm 30 by a screw and slot connection, each bracket arm 30 being slotted at 81 to receive headed screws 82. By loosening the screws 82 an up and down adjustment of the companion supporting member 49 or 50 may be effected. When the associated screws are tightened the supporting member 49 or 50 is secured in its adjusted position.

In the operation of the machine a work sheet 26 is introduced at the rear or introductory side

of the platen and is fed forward past the printing line by a rotation of the platen. The enlarged portion 34 of the ribbon guide 28 together with the paper apron and the usual card guide and line indicator 83, a fragmentary portion of which is shown in Fig. 6, insure the feed of the paper forward of the ribbon 27 and between said ribbon and the regular vibrator-carried ribbon 25. This insures bringing the paper into such position that a positive imprint may be effected on the front face of the work sheet by the ribbon 25 and a simultaneous negative imprint is produced on the rear side of the same work sheet by the hektograph ribbon 27. It will be understood that the guide 28 protects the ribbon 27 against lateral deflection and insures the proper feed of the work sheet to bring the rear side thereof into cooperative relation with the front face of the hektograph ribbon. The guide also prevents the rear side of the work sheet from being smudged by the inked side of the hektograph ribbon as the work sheet travels with the carriage relatively to said ribbon.

I am aware that with my machine it is possible to employ two work sheets at a time to be fed simultaneously through the machine in the same manner as a single sheet 26, as hereinbefore described. In this event the front sheet would receive the positive imprint on the front face thereof from the ribbon 25, whereas the rear sheet from which the hektograph copies are to be made would receive a negative imprint on the rear side thereof from the hektograph ribbon 27. However, this would result in a waste of paper and a possible subsequent loss of identity between the two companion sheets. I therefore, in practice, prefer to employ a single sheet 26 having a positive imprint on the front face thereof and a negative imprint on the rear side thereof. This enables the operator to examine the positive copy as the work proceeds and affords an assurance that the hidden hektograph copy is correct or enables her to readily discover any mistakes that have been made and correct them.

I also am aware of the fact that the regular ribbon 25 may be thrown out of use by means of the ordinary stencil control, for example, in which event a negative imprint only would be produced on the rear side of the work sheet. I prefer, however, to simultaneously effect a positive imprint on the front face of the work sheet as well as a negative imprint on the rear side of the work sheet for reasons which will be obvious from what has been pointed out above.

From certain aspects of my invention either of the above mentioned uses of my machine may be considered within the purview of my invention.

Various changes may be made in the construction, and certain features thereof may be employed without others, without departure from my invention as it is defined in the accompanying claims.

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

1. In a typewriting or like machine, means for simultaneously printing on opposite sides of work sheets, the imprint on one side being positive and the imprint on the other side being negative, said means comprising a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon having a coating only on the front side thereof for printing from its front side only on the rear side of a work sheet, a second ribbon for simultaneously printing from its rear side on the

front face of a work sheet, means for guiding the work sheet or sheets between said ribbons so that he work sheets will not have to be threaded by hand to such position, printing instrumentalities, automatically operating means actuated at each operation of a printing instrumentality for effecting a feed of said first mentioned ribbon, and adjustable means for varying the feed of the ribbon by said automatically operating means to any one of a number of different fixed extents in accordance with the setting of said adjustable means.

2. In a typewriting or like machine, means for simultaneously printing on opposite sides of work sheets, the imprint on one side being positive and the imprint on the other side being negative, said means comprising a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon coated with a copying ink on its front side only for printing from its front side on the rear side only of a work sheet, a second ribbon for simultaneously printing from its rear side on the front face of a work sheet, and a guide carried by the frame of the machine and fixed against traveling movement with the carriage, said guide being substantially U-shaped in cross section in the rear of the work sheet and equal in length to the travel of the carriage and through which said first mentioned ribbon is fed.

3. In a typewriting or like machine, means for simultaneously printing on opposite sides of work sheets, the imprint on one side being positive and the imprint on the other side being negative, said means comprising a carriage, a cylindrical platen carried thereby, a ribbon for printing from its front side on the rear side of a work sheet, a second ribbon for simultaneously printing from its rear side on the front face of a work sheet, and a guide carried by the frame of the machine and having an opening therein at and near the printing point, said guide being substantially U-shaped in cross section except near the printing point where said opening is located therein, said guide receiving and guiding the first mentioned ribbon and preventing a lateral deflection thereof by the work sheet or sheets as the latter are fed forward.

4. In a typewriting or like machine, the combination of printing instrumentalities, a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon vibrator, a ribbon carried thereby, a copying ribbon supported in the rear of the first mentioned ribbon and coated only on the front face thereof with a copying ink, means for guiding one or more work sheets intermediate said ribbons, whereby a positive imprint will be produced on the front face of a work sheet and a negative imprint will be simultaneously produced from the copying ribbon on the rear side of a work sheet to enable numerous positive copies to be made therefrom, means for effecting a case shift movement of the platen, a ribbon spool carried by the frame of the machine and fixed against traveling movement with the carriage and on which said copying ribbon is carried, and means for shifting said ribbon spool with the platen in the case shifting movements of the latter.

5. In a typewriting or like machine, the combination of printing instrumentalities, a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon vibrator, a ribbon carried thereby, a copying ribbon supported in the rear

of the first mentioned ribbon and coated only on the front face thereof with a copying ink, means for guiding one or more work sheets intermediate said ribbons, whereby a positive imprint will be produced on the front face of a work sheet and a negative imprint will be simultaneously produced from the copying ribbon on the rear side of a work sheet to enable numerous positive copies to be made therefrom, and a guide for and that partly surrounds said copying ribbon and that is held against traveling movement with the carriage and is positioned to receive the work sheet or sheets in front thereof.

6. In a typewriting or like machine, the combination of printing instrumentalities, a carriage, a case shifting cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon vibrator, a ribbon carried thereby, a copying ribbon supported in the rear of the first mentioned ribbon and coated only on the front face thereof with a copying ink, means for guiding one or more work sheets intermediate said ribbons, whereby a positive imprint will be produced on the front face of a work sheet and a negative imprint will be simultaneously produced from the copying ribbon on the rear side of a work sheet to enable numerous positive copies to be made therefrom, a supply spool for the copying ribbon carried by the frame of the machine and fixed against traveling movement with the carriage, means for shifting said supply spool with the platen in the case shifting movements of the latter, and automatically operating means actuated at each printing operation for feeding said copying ribbon off the supply spool.

7. In a typewriting or like machine, the combination of printing instrumentalities, a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon vibrator, a ribbon carried thereby, a copying ribbon supported in the rear of the first mentioned ribbon and coated only on the front face thereof with a copying ink, means for guiding one or more work sheets intermediate said ribbons, whereby a positive imprint will be produced on the front face of a work sheet and a negative imprint will be simultaneously produced from the copying ribbon on the rear side of a work sheet to enable numerous positive copies to be made therefrom, a guide for and that partly surrounds said copying ribbon and that is held against traveling movement with the carriage and is positioned to receive the work sheet or sheets in front thereof, a supply spool for the copying ribbon, and automatically operating means actuated at each printing operation for feeding said copying ribbon off the supply spool and through said guide.

8. In a typewriting or like machine, the combination of printing instrumentalities, a carriage, a cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a ribbon vibrator, a ribbon carried thereby, a copying ribbon supported in the rear of the first mentioned ribbon and coated only on the front face thereof with a copying ink, means for guiding one or more work sheets intermediate said ribbons, whereby a positive imprint will be produced on the front face of a work sheet and a negative imprint will be simultaneously produced from the copying ribbon on the rear side of a work sheet to enable numerous positive copies to be made therefrom, means for effecting a case

shifting movement of said platen, a guide carried by the frame of the machine and fixed against traveling movement with the carriage and which extends lengthwise of the platen and receives said copying ribbon, means for shifting said guide with the platen in the case shifting movement of the latter, and automatically operating means for feeding said copying ribbon at each printing operation.

9. In a typewriting or like machine, the combination of a case shiftable platen, two supports pivoted to the frame of the machine, a ribbon feed mechanism mounted in part on one of said supports and partaking in the pivotal movement thereof, a ribbon supply spool mounted on the other of said supports and partaking in the pivotal movement thereof, means for effecting a pivotal movement of said supports when the platen receives a case shifting movement, a ribbon guide carried by the frame of the machine and which coacts with the ribbon as it passes from said supply spool to said ribbon feed mechanism, and means for shifting said guide with the platen in the case shifting movements of the latter.

10. In a typewriting or like machine, the combination of a case shiftable platen, two supports pivoted to the frame of the machine, a ribbon feed ratchet wheel mounted on one of said pivoted supports and partaking in the pivotal movements thereof, means for turning said ratchet wheel, a ribbon feed roller driven by said ratchet wheel, a second ribbon feed roller spring pressed against said first mentioned feed roller and against the ribbon received between said rollers, a ribbon supply spool mounted on and partaking in the pivotal movement of the other of said supports, and means for shifting said supports on their pivots when the platen receives a case shifting movement.

11. In a typewriting or like machine, the combination of a case shiftable platen, two supports pivoted to the frame of the machine, a ribbon feed ratchet wheel mounted on one of said pivoted supports and partaking in the pivotal movements thereof, means for turning said ratchet wheel, a ribbon feed roller driven by said ratchet wheel, a second ribbon feed roller spring pressed against said first mentioned feed roller and against the ribbon received between said rollers, a ribbon supply spool mounted on and partaking in the pivotal movement of the other of said supports, means for shifting said supports on their pivots when the platen receives a case shifting movement, a ribbon guide that partly surrounds the stretch of ribbon intermediate the supply spool and ribbon feed rollers, and means for causing said guide to partake in the case shifting movement of the platen.

12. In a typewriting or like machine, the combination of a carriage, a case shiftable platen carried thereby, printing instrumentalities, and means for effecting a negative imprint in copying ink on the back of a work sheet to enable numerous positive copies to be made therefrom, said means comprising a ribbon inked with a copying ink on its front face only, a ribbon guide substantially U-shaped in cross section and apertured about midway in the length thereof at the printing point, said guide being equal in length to the travel of the carriage, means for supporting said guide on the frame of the machine against traveling movement with the carriage, means for shifting said guide with the platen in the case shifting movements of the latter, means for feeding the ribbon through said guide, and means for di-

recting a work sheet in front of said guide.

13. In a typewriting or like machine, the combination of a carriage, cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a case shift frame by which the platen receives case shifting movement, a ribbon inked with a copying ink only on its front face, a ribbon guide that partly surrounds the ribbon and is carried by and shifts with said case shift frame and is fixed against traveling movement with the carriage, means for directing work sheets in front of said ribbon guide and thus enable negative printing to be effected on the rear side of a work sheet, and automatically operating means for feeding a ribbon through said guide at each printing operation.

14. In a typewriting or like machine, the combination of a carriage, cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a case shift frame by which the platen receives case shifting movement, a copying ribbon inked only on its front face, whereby negative imprints are produced only on the rear side of a work sheet to enable numerous positive copies to be made therefrom, a ribbon guide that partly surrounds the ribbon and is carried by and shifts with said case shift frame and is fixed against traveling movement with the carriage, means for directing work sheets in front of said ribbon guide, and automatically operating means for feeding a ribbon through said guide at each printing operation, said ribbon feeding means comprising a universal bar actuated at each printing operation, and ribbon feeding devices controlled by said universal bar.

15. In a typewriting or like machine, the combination of a carriage, cylindrical platen carried thereby and by which the work sheets are line spaced when the platen is turned, a case shift frame by which the platen receives case shifting movement, a ribbon guide that partly surrounds the ribbon and is carried by and shifts with said case shift frame, means for directing work sheets in front of said ribbon guide, and automatically operating means for feeding a ribbon through said guide at each printing operation, said ribbon feeding means comprising a universal bar actuated at each printing operation, ribbon feeding devices controlled by said universal bar, and means for shifting certain of said ribbon feed devices with the platen in the case shifting movements of the latter.

16. In a typewriting or like machine, means for simultaneously printing on opposite sides of work sheets, the imprint on one side being positive and the imprint on the other side being negative, said means comprising a carriage mounted for case shifting movement, a cylindrical platen carried thereby and shiftable therewith and by which the work sheets are line spaced when the platen is turned, a ribbon coated with a copying ink on the front side only thereof for printing from the front side only of the ribbon on the rear side of a work sheet, a ribbon spool on which said ribbon is wound, said ribbon spool being carried by the frame of the machine against traveling movement with the carriage, means for shifting said ribbon and ribbon spool with the platen in the case shifting movement of the latter, a second ribbon for simultaneously printing from its rear side on the front face of a work sheet, and means for guiding the work sheet or sheets between said ribbons so that the work sheets will not have to be threaded by hand to such position.

GEORGE G. GOING.

CERTIFICATE OF CORRECTION.

Patent No. 2,044,072.

June 16, 1936.

GEORGE G. GOING.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, second column, line 14, claim 13, after the word "sheet" and before the comma insert and enable numerous positive copies to be made therefrom; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of March, A. D. 1937.

Seal)

Henry Van Arsdale
Acting Commissioner of Patents.