Sept. 27, 1955 H. P. ELLIOTT 2,718,955

STENCIL-CHARACTER-FORMING TYPEWRITERS

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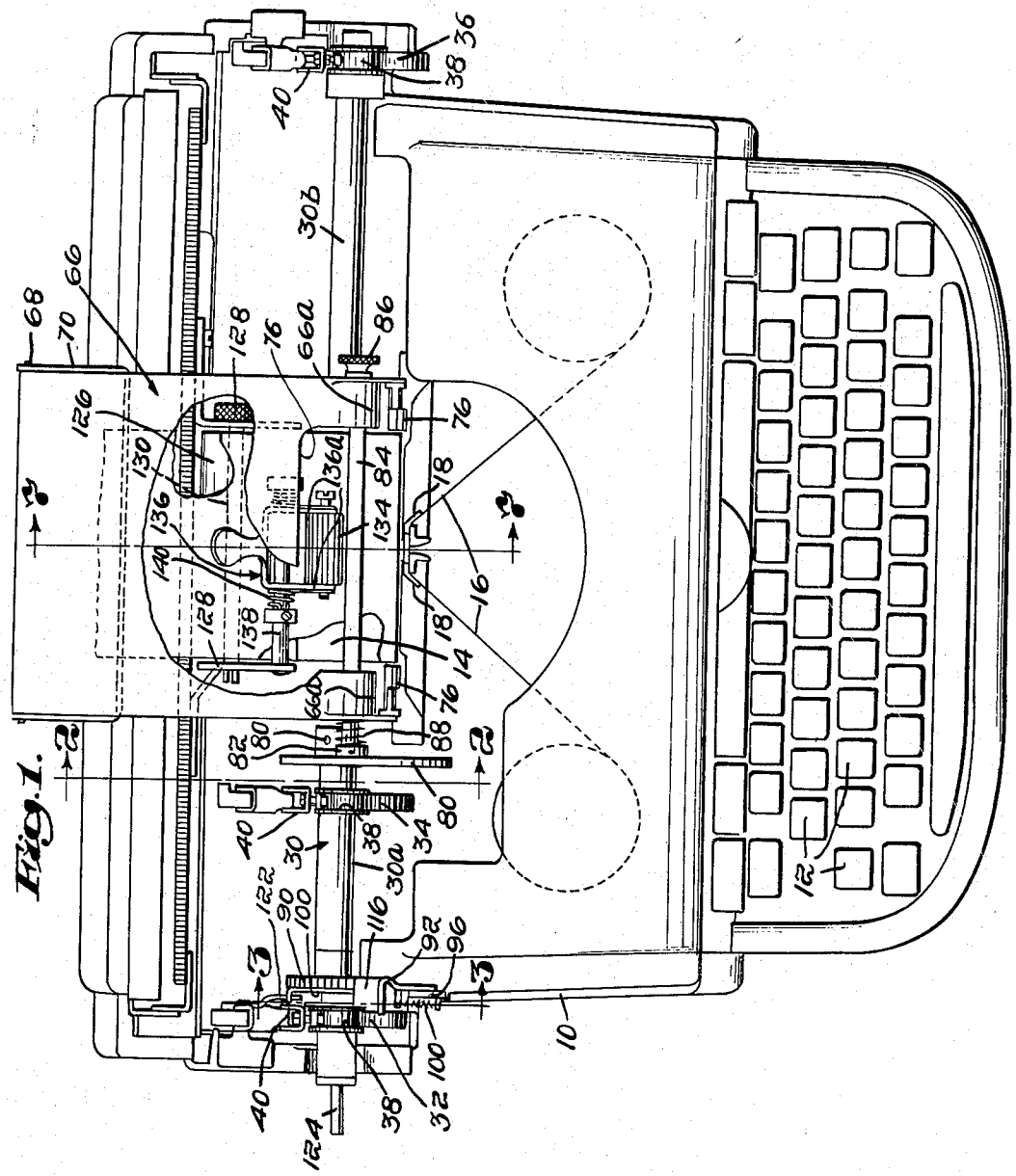


Fig. 1.

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Fig. 2.

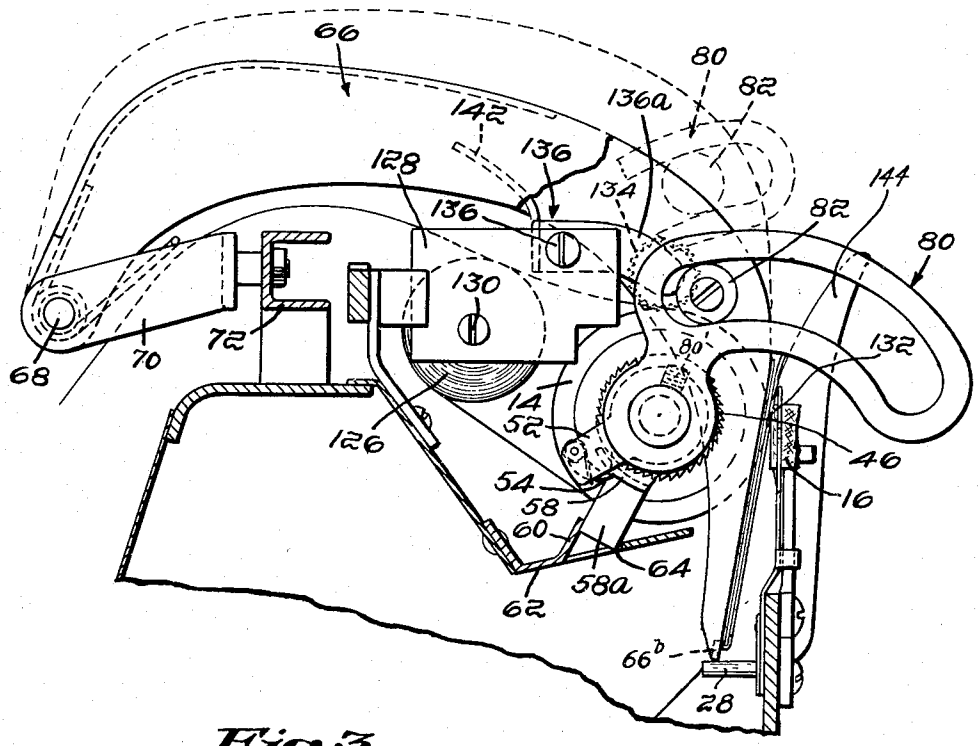


Fig. 3.

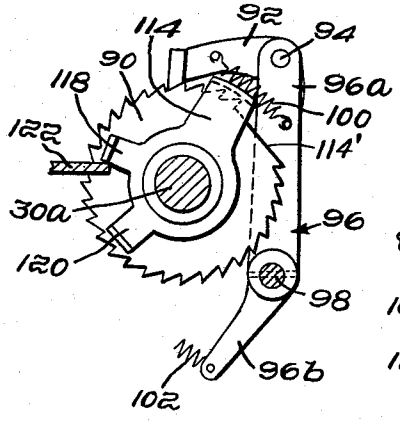
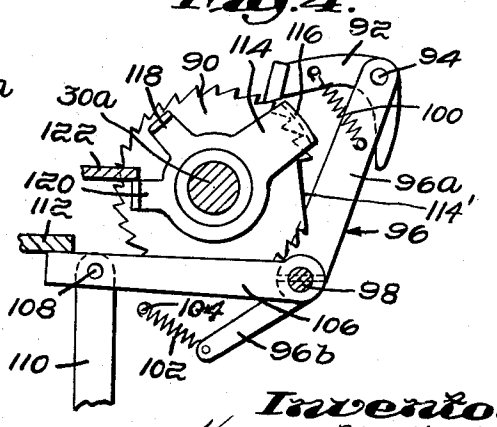


Fig. 4.



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STENCIL-CHARACTER-FORMING TYPEWRITERS

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Fig. 5.

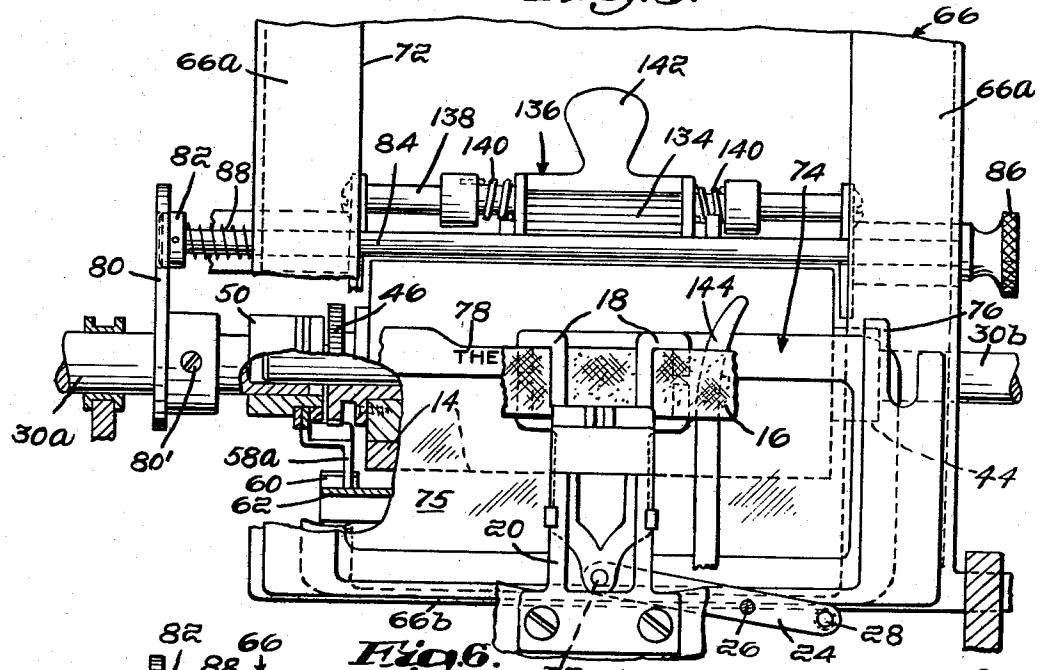
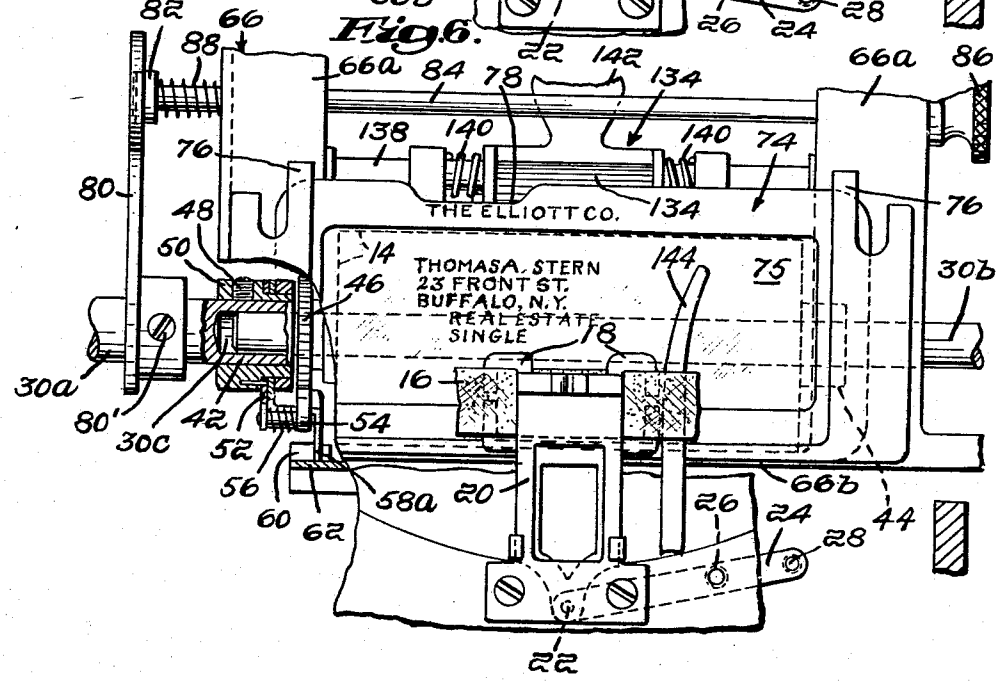


Fig. 6.



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Fig. 7.

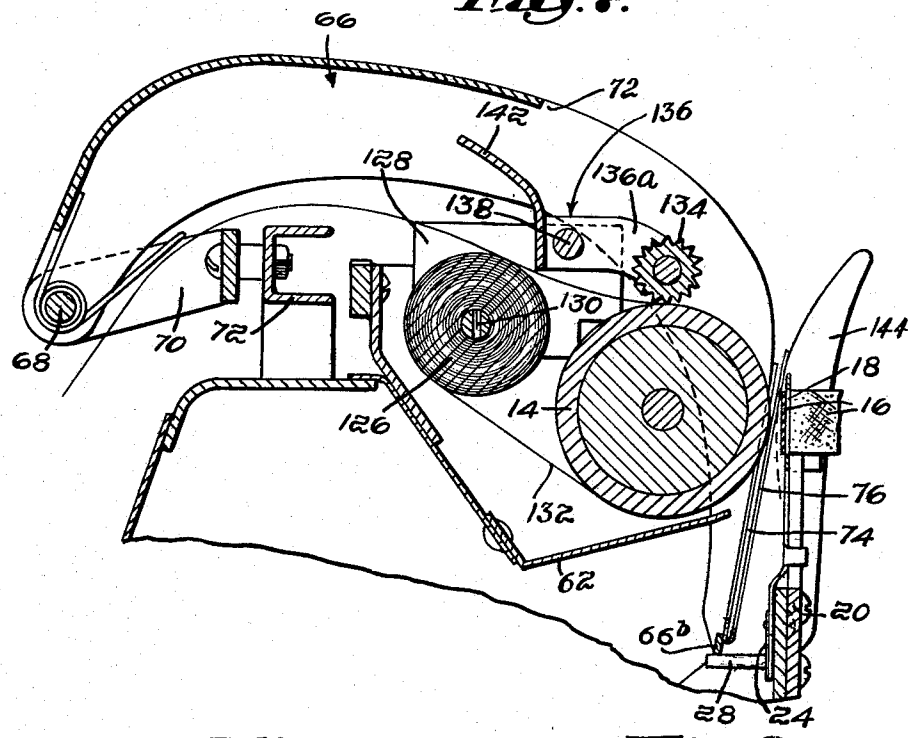


Fig. 8.

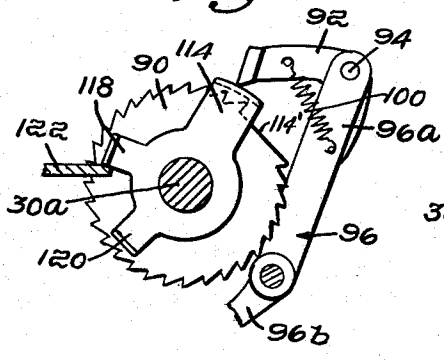
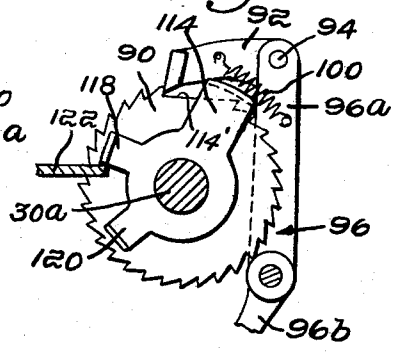


Fig. 9.



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2,718,955

STENCIL-CHARACTER-FORMING TYPEWRITERS

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Application October 23, 1952, Serial No. 316,439

6 Claims. (Cl. 197—135)

This invention relates to improvements in stencil-character-forming typewriters. More particularly it provides improvements in typewriters whereby the type characters of a typewriter may ribbon-print on a frame part of a stencil and may act directly on a tissue panel of the stencil to impress printing characters therein.

Stencils of the general type employed in addressing machines and the like have a relatively stiff frame extending around and supporting a tissue panel which carries the printing characters which are printed on work sheets, or other work elements, as the stencils are brought into printing coaction with the work in addressing machines and the like. The tissue panels ordinarily have a film thereon and the printing characters of a typewriter may be impressed therein following preliminary moistening of the tissue panels.

The invention relates to a typewriter having improved means for receiving and holding such stencils, and improved means for automatic presentation to the actuated typewriter printing characters of different portions of the stencil so that a frame portion thereof may be ribbon-printed with any desired type characters, and the tissue panel may have impressed therein any desired type characters which may be arranged in as many predetermined spaced lines as any particular stencil panel will accommodate.

It is among the objects of the invention to provide a typewriter wherein a stencil holder is pivotally supported on the typewriter carriage with means thereon for removably supporting a stencil in coacting relation to a platen roll in positions to be struck by printing characters of the typewriter in response to finger selection of particular printing characters by the typist, or other machine operator, the said stencil holder being manually operable to an initial position in which the typewriter ribbon intervenes between a frame portion of the stencil and any particular actuated type characters, whereby ribbon-printed characters may be typed on said frame portion, and the said stencil holder being automatically responsive to successive operations of advancing mechanism to lift the stencil intermittently for presenting different portions of the stencil opposite the location of striking of the type characters, the initial lift of the stencil being a plural space lift, accompanied by a drop of the typewriter ribbon, and each of a series of following lifts of the stencil being a single space lift thereof.

Another object of the invention is to provide a typewriter wherein a stencil holder removably supports a stencil in a succession of different positions and wherein the stencil holder is automatically moved a plurality of line spaces from an initial position to a second position and is automatically moved a single line space from said second position to a third position, and again is automatically moved a single line space from said third position to a fourth position, whereby the type characters of the typewriter may print their characters on a frame portion of the stencil in said initial position and may impress their characters in a tissue panel portion of the stencil in said second position and, with single line spacing, successively in said third and fourth positions of the stencil.

Yet another object of the invention is to provide a stencil-character-forming typewriter wherein a stencil may be ribbon-printed on a frame portion thereof and may have type characters impressed in a panel portion thereon while an intermittently advancing sheet presents fresh portions thereof successively between the stencil and a platen roll at the region of impingement of the actuated type characters of the typewriter.

It is, moreover, my purpose and object generally to improve the structure and utility of stencil-character-forming typewriters, and more especially such typewriters of the electric variety.

In the accompanying drawings:

Fig. 1 is a top plan view of a typewriter embodying features of my present invention;

Fig. 2 is a cross-sectional view approximately on line 2—2 of Fig. 1, on a larger scale;

Figs. 3 and 4 are detail cross-sectional views on line 3—3 of Fig. 1, showing two positions of the actuating mechanism for the cam-carrying shaft of the typewriter;

Fig. 5 is a front elevation, with portions in cross-section, looking at a stencil in the stencil holder, with the stencil and holder in their lower-most positions;

Fig. 6 is a view similar to Fig. 5 but showing the stencil and holder elevated a plurality of line spaces from their positions of Fig. 5;

Fig. 7 is a cross-sectional view on line 7—7 of Fig. 1, showing the parts in their positions for ribbon-printing on the top frame portion of the stencil; and

Figs. 8 and 9 are views similar to Figs. 3 and 4 but showing the shaft-actuating mechanism in two other positions of the mechanism.

Referring to the drawings, the invention is illustrated as it may be embodied in an electric typewriter having a usual frame **10** within which are the conventional keys **12** for selection and actuation of the type characters, not shown.

According to the invention, the usual relatively long platen roll of the conventional electric typewriter is replaced by a relatively short platen roll **14** which is located substantially centrally between the opposite sides or ends of the typewriter in position for typing coaction with the usual typewriter ribbon **16** which passes through the ribbon guide **18** mounted adjacent to platen roll **14**. Ribbon guide **18** is movable vertically on the fixed support **20**, and its lower end is pivotally connected at **22** to one end of actuating lever **24** which is pivotally supported at **26** on a fixed part of the machine. The other end of lever **24** has a pin or lug **28** projecting therefrom for a purpose which later will appear.

Platen roll **14** is rotatably mounted on shaft **30** which, in turn, is mounted rotatably in bearings **32, 34, 36** on the typewriter carriage, the shaft having the flanged bearing elements **38** loose thereon for seating in the bearings **32, 34, 36**, with a well known type of over-center snap retainer **40** engageable with each bearing portion **38** to maintain it seated. Preferably, the shaft **30** is made in two sections fitted together as shown at **42** in Fig. 6, to facilitate mounting and removal of the shaft and platen roll **14**. With this two-section shaft construction, only the right hand section 30^a of the shaft needs to rotate and the section 30^b may rotate or not as may be convenient.

As represented in Fig. 6, the left hand end of shaft section 30^b engages in a socket 30^c in the right hand end of shaft section 30^a. Platen roll **14** is rotatably mounted on the left hand end portion of shaft section 30^b and collar **44** is adjustably fixed on shaft section 30^b to maintain roll **14** against movement along the

shaft section 30b to the right in Fig. 6. The left-hand end of platen roll 14 has the ratchet wheel or gear 46 fixed thereon adjacent to the right-hand end of shaft section 30a, and this right-hand end of shaft section 30a constitutes an abutment limiting movement of the platen roll to the left in Fig. 6. Also, this right-hand end of shaft section 30a has adjustably fixed thereon, as by set screw 48, a sleeve member 50 to which is fixed the projecting arm 52 carrying the pawl 54 which is constantly biased by spring 56 toward engagement with the ratchet wheel or gear 46 whereby, when pawl 54 is in engagement with the ratchet wheel 46, a rotation of shaft section 30a in one direction such as counter-clockwise in Fig. 2, the platen roll 14 will be correspondingly rotated. It should be observed, however, that, in Fig. 2, the pawl 54 is held out of engagement with ratchet wheel 46 by the shield 58 which is loosely mounted on sleeve member 50 but which is held against any appreciable movement around the axis of sleeve member 50 by reason of its projecting part 58a (Fig. 2) being held between the struck-up tongue 60 on member 62 which is a fixed part of the carriage, and the edge 64 of the opening in member 62 vacated by tongue 60. Hence, while the pawl 54 is riding on shield 58, the platen roll 14 will remain stationary notwithstanding rotation of shaft section 30a in either direction.

A stencil holder, indicated generally at 66, is pivotally mounted at 68 on a bracket 70 which is suitably secured to a fixed part 72 of the carriage at the rear of the typewriter. The stencil holder is adapted to receive and hold a stencil in generally vertical position in front of the platen roll 14, and is movable about its pivot 68 to present different portions of the stencil in position to be struck by type characters of the typewriter, with the platen roll backing the stencil.

As herein represented, the stencil holder is in the nature of a hinged cover or hood whose forward wall is cut away at 72 leaving marginal portions 66a of the forward wall at opposite ends of roll 14, and these marginal portions 66a extend downwardly and are rigidly connected together at their lower ends by the intact narrow strip 66b of the forward wall. The stencil, indicated generally at 74 in Figs. 5 and 6, is removably held by the resilient clips 76 on the marginal portions 66a. The stencil holder, with a stencil therein, may be pressed downwardly until its lower edge portion 66b engages and depresses the pin or lug 28 on the actuating lever 24, thereby to elevate the ribbon guide 18 and the ribbon 16 therein to bring the ribbon opposite the top frame portion of stencil 74, as shown in Fig. 5, this top frame portion of the stencil stopping in position to be printed upon by the type characters of the typewriter in response to actuation of the typewriter keys 12. Hence, any desider information, such as a customer's name, for example, may be typed on the top frame of the stencil, as indicated at 78 in Fig. 5.

The tissue panel 75 of stencil 74 receives printing characters thereon by being struck directly by the printing characters of the typewriter without the ribbon 16 intervening. Also, following the typing of a name, or the like, on the top portion of the stencil frame, the next subsequent return movement of the typewriter carriage, or separate manually operable means, is required to elevate the stencil three line spaces to bring the upper portion of the tissue panel in position to be struck by the type characters of the typewriter, and this same movement raises the lower edge 66b of stencil holder 66 out of depressing contact with pin or lug 28 on the ribbon actuating lever 24, whereby the ribbon guide 18 and ribbon 16 drop down below the region of contact of type characters with the stencil panel 75.

The conventional typewriter mechanism for single space or plural-space advance of the conventional platen roll is utilized for intermittently rotating shaft section 30a, but provision is made whereby each rotation of shaft section 30a, in response to return travel of the carriage, or to separate manually operable means, effects a predetermined lifting of the stencil, such as an initial three-space lift followed by single space lifts.

The automatic intermittent raising of the stencil is accomplished by the slotted cam 80 which is fixed on shaft section 30a, as by the set screw 80'. Stencil holder 66 has a roller 82 thereon arranged to engage in and ride along the slot of cam 80 which latter is designed to effect the said intermittent raising of the stencil in response to predetermined intermittent rotations of shaft section 30. Roller 82 is fixed on the left-hand end of a rod 84 which is slidably mounted on the stencil holder 66, with a knob 86 on its right-hand end, and a spring 88 on its left-hand end portion intervening between the roller 82 and the left-hand end of the stencil holder, whereby the roller 82 is constantly biased by spring 88 toward engagement in the slot of cam 80. Knob 86 constitutes a stop limiting the amount that roller 82 can enter into the cam slot, thereby making it easier to withdraw the roller when it may be desired to swing the stencil holder rearward to its out-of-the-way position.

In the present embodiment, the cam 80 is designed to raise the stencil three line spaces from its lowermost position of Fig. 5 in response to the return of the typewriter carriage following typing at 78 on the top frame of the stencil, this carriage return effecting a predetermined rotation of shaft-section 30a and cam 80 which latter cams the roller 82 and the stencil holder upward an amount equal to the said three line spaces. The upper portion of the stencil panel 75 now will be in position to be struck directly by the type characters inasmuch as ribbon 16 will have dropped down to a position where it cannot be engaged by the actuated type characters. Subsequent returns of the carriage effect single-line-space rotation of the shaft section 30a and cam 80 so that several lines of single spaced information may be impressed on the stencil panel. The illustrated embodiment provides for five single spaced lines of information to be impressed on the illustrated stencil panel 75.

The usual typewriter mechanism for single space and plural space advance of the platen roll of the conventional electric typewriter is utilized for rotation of shaft section 30a and cam 80 but is modified to accomplish applicant's particular purposes. A ratchet wheel 90 is fixed on the left-hand end portion of shaft section 30a (Fig. 1), and a pawl 92 coacts with the ratchet wheel 90, as best seen in Figs. 3 and 4. The pawl 92 is pivoted at 94 on the free end of the longer arm 96a of a lever 96 which is fixed on a rotatably mounted stub shaft 98. The pawl is constantly biased by tension spring 100 toward engagement with the teeth of the ratchet wheel 90, and another tension spring 102 has one end anchored at 104 and its other end connected to the shorter arm 96b of lever 96, whereby the lever is constantly biased clockwise about the axis of stub shaft 98, as viewed in Figs. 3 and 4. A lever bar 106 has its forward end fixed to stub shaft 98 and has its rearwardly extending portion pivotally connected at 108 to the actuating member 110 of the conventional electric typewriter. Each return movement of the typewriter carriage is accompanied by a predetermined drop of the actuating member 110 which effects a movement of lever 96 from its Fig. 4 position to its Fig. 3 position, and spring 102 restores the lever to its Fig. 4 position, in conjunction with the customary means for restoring actuating member 110 to its Fig. 4 position, following each return movement of the typewriter carriage. Any suitable stop means, such as abutment 112 (Fig. 4), may limit the clockwise movement of lever bar 106 and lever 96, as viewed in Figs. 3 and 4.

A shield member 114 is loose on shaft section 30a and has the part 116 thereon extending over the toothed periphery of ratchet wheel 90 (Fig. 1). Also, the shield member 114 has the two projections 118, 120 (Fig. 4) disposed on opposite sides of a fixed abutment 122,

whereby rotational movements of the shield member are limited in each direction by engagement of one or the other of the projections **118**, **120** with the abutment **122**. The shield member is loose on shaft section **30a** but friction carries it around with the shaft section excepting when one of the projections engages abutment **122** to stop it. Hence, when the stencil holder roller **82** is engaged in the slot of cam **80** and the stencil holder pushed down to bring stencil **74** to its lowermost position of Fig. 5, roller **82** forces the cam **80** downward causing a clockwise rotation of shaft section **30a**, as viewed in Fig. 4. Shield **114** is carried around with the shaft section **30a** until projection **120** engages abutment **122** to stop the shield in its position of Fig. 4 wherein it permits pawl **92** to engage the ratchet wheel **90** and an actuation of lever **96** from its Fig. 4 position to its Fig. 3 position causes pawl **92** to rotate the ratchet wheel **90** and shaft section **30a** an amount to effect a lifting of the stencil holder three line spaces from its position of Fig. 5. It may be assumed that a name, or other information, will have been typed at **78** on the top frame of the stencil while in its position of Fig. 5, and that the return movement of the typewriter carriage effects or is accompanied by a drop of actuating member **110** for actuating lever **96** and its pawl **92**.

The initial three space rotation of shaft section **30a** causes shield **114** to be carried counterclockwise around the axis of the shaft section **30a**, as viewed in Fig. 4, until projection **118** engages abutment **122** to stop it in its position of Fig. 3 wherein it will hold the pawl out of engagement with the ratchet wheel when the lever **96**, carrying the pawl, returns to its position of Fig. 4. In other words, the return movement of lever **96** will cause pawl **92** to ride on the portion **116** of shield **114**, as in Fig. 8, and the next actuation of the pawl can rotate the ratchet wheel and shaft section **30a** only an amount to effect a rise of stencil holder **66** and the stencil therein one line space. Subsequent actuations of the pawl **92** will effect similar single space lifts of the stencil holder and stencil until the maximum number of lines of information have been impressed, with single spacing, on the panel **75** of the stencil, at which time the pawl becomes ineffective for rotating the ratchet wheel further, as in Fig. 9, due to the fact that the ratchet teeth are cut away or omitted at the portion **114'** of the periphery of the ratchet wheel. Hence, in the disclosed embodiment, the pawl **92** effects an initial three space advance or rotation of the ratchet wheel followed by four single space advances or rotations of the ratchet wheel, after which any further actuations of the pawl leave the ratchet wheel unaffected. The stencil in the stencil holder may be withdrawn and another stencil inserted and pressed downward to the lowermost position of Fig. 5 to re-set the ratchet wheel **90** and shield **114** in their positions of Fig. 4. A handle **124** on the left hand end of shaft section **30a** (Fig. 1) facilitates manual lowering of the stencil holder and the stencil therein to their lowermost positions of Fig. 5.

According to the invention, a sheet of paper extends around the platen roll **14** and intervenes between the roll and the stencil which is mounted in the stencil holder **66**. A supply roll **126** of paper, or the like, is mounted rearwardly of the platen roll **14** between the brackets **128** which are secured to a fixed part of the typewriter carriage as best seen in Figs. 1 and 2. A removable rod **130** is removably inserted through holes in the opposite side portions of the bracket **128** and through an axial opening in the roll **126** whereby the roll is rotatable on the rod **130**. The paper is drawn forward from the supply roll **126** under and around the forward surface of platen roll **14**, as at **132**, and thence rearwardly over the platen roll between the latter said roll and a scored presser roll **134** located under the stencil holder **66**. The scored roll **134** is rotatably mounted between the forward ends of two arms **136a** of a yoke member **136** pivotally supported on shaft **138** which extends between the brackets **128**. Springs **140** constantly bias the yoke member **136** and the scored roll **134** about shaft **138** in direction to maintain roll **134** pressed against platen roll **14** with the paper sheet **132** intervening. A finger piece **142** on yoke member **136** facilitates manual rocking of the yoke about shaft **138** to lift the scored roll **134** away from the platen roll when threading paper **132** between the rolls or for manually advancing the paper.

It is a feature of the invention that the platen roll **14** and paper sheet **132** are advanced one line space each time that the main actuating pawl **92** advances or rotates shaft section **30a** to lift the stencil held in stencil holder **66** notwithstanding that each initial advance of shaft section **30a** is a three line space advance. This is accomplished by the pawl **54** which coacts with the ratchet wheel **46** on the platen roll **14**, in conjunction with the shield **58**, which is held substantially stationary in its position of Fig. 2. Hence, when the stencil is in its lowermost position of Figs. 2 and 5, the pawl **54** is held out of engagement with the ratchet wheel **46** by the shield **58** during the major portion of each initial three space advance of the shaft section **30a** and engages the ratchet wheel **46** only during the final portion of each said initial advance. As a result, the pawl **54** can advance the ratchet wheel **46** and the platen roll **14** only one line space. However, since the pawl-carrying arm **52** is fixed to sleeve **50** which in turn is adjustably secured to shaft section **30a**, the pawl is carried around with the advanced shaft section **30a** and stops in contact with the ratchet wheel, ready to advance the ratchet wheel **46** and platen roll **14** one line space in response to the subsequent one line space advances of shaft section **30a**. The paper sheet **132**, of course, advances one line space with each advance of the platen roll **14** and presents a fresh portion thereof between the platen roll and stencil for each successive line that is typed or impressed on the stencil by the type characters of the typewriter.

An upstanding cam member **144** is shown fixed on the carriage in position for camming the stencil holder inward to clear the ribbon **16** and ribbon guide **18** when the stencil holder is being swung forwardly and downwardly into its operative position, it being understood that the stencil holder may be swung rearwardly to an out-of-the-way position after manual withdrawal of roller **82** from the slot in cam **80**.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

I claim as my invention:

1. In a typewriter having a frame, a collection of individually actuatable type characters, a carriage supporting said type characters and mounted on said frame for step-by-step advance in one direction in response to actuations of the type characters, with means for restoring the carriage to a predetermined starting position on said frame, and having an ink-ribbon and a ribbon guide, the combination therewith of a relatively short platen roll rotatably mounted on said carriage in the path of actuated travel of said type characters, a stencil holder pivotally mounted on said carriage for holding a stencil between said platen roll and any particularly ones of said actuated type characters, said stencil holder having means thereon for gripping frame portions of a stencil therein at opposite ends of the stencil and leaving a top frame portion of the stencil free, and having one operative position in which it holds the stencil with said free top frame portion thereof disposed in the path of actuated travel of said type characters, coacting means on said stencil holder and on an element connected to said ribbon guide whereby the ribbon guide is maintained in an elevated position when said stencil holder is in its said one operative position and said ribbon is maintained in position to coact with actuated type characters for ribbon-printing on said top portion of the stencil frame, means on said carriage responsive to each said restoration of the carriage

for moving the stencil holder about its pivot in direction to raise the stencil a predetermined amount in response to each said restoration of the carriage, the latter said means including a slotted cam rotatable about the axis of said platen roll and a member on the stencil holder engaged in the cam slot, with mechanism for actuating said cam about said axis to raise the stencil a plurality of type-line spaces in response to one said restoration of the carriage and to raise the stencil a single type-line space in response to a next succeeding restoration of the carriage, said ribbon guide being released for lowering of said ribbon out of the path of actuated type characters in response to the initial raising of the stencil holder from its said one operative position, whereby type characters actuated subsequent to said initial raising of the stencil holder engage the stencil directly.

2. The combination as defined in claim 1 wherein the said member which is engaged in the cam slot is a roller which is movable on said stencil holder in direction to remove the roller from said cam slot, whereby the stencil holder may be manually swung about its pivot away from said platen roll when said roller is removed from said cam slot.

3. The combination as defined in claim 1 wherein a supply of sheet material is mounted on said carriage rearward of said platen roll with a portion of the sheet material extending around the forward portion of the platen roll for intervening as a cushion between the platen roll and a stencil in said stencil holder, and wherein there is means for advancing said platen roll and said sheet material a single type-line space in response to each said restoration of said carriage notwithstanding that any particular restoration of said carriage may effect a said raising of the stencil holder a plurality of type-line spaces.

4. The combination as defined in claim 1 wherein a supply of sheet material is mounted on said carriage rearward of said platen roll with a portion of the sheet material extending around the forward portion of the platen roll for intervening as a cushion between the platen roll and a stencil in said stencil holder, and wherein said cam is actuated by one ratchet and pawl mechanism in response to each said restoration of said carriage, and said platen roll and sheet material are advanced a single type-line space by a second ratchet and pawl mechanism substantially simultaneously with each said actuation of said cam and notwithstanding that a said actuation of the cam may effect a raising of said stencil holder a plurality of type line spaces.

5. The combination as defined in claim 1 wherein said ribbon guide constantly tends to assume a position in which said ribbon is out of the path of actuated travel of said type characters, and wherein said coacting means on said stencil holder and on an element connected to said ribbon guide comprises a projection on said stencil holder, a lever pivoted intermediate of its ends on a fixed part of said frame a lug on one arm of said lever in position to be engaged and depressed by said projection on the stencil holder when said slotted cam is actuated to move said stencil holder to its said one operative position, and means pivotally connecting the other arm of said lever to said ribbon guide whereby said ribbon guide moves downward in response to rise of said stencil holder out of its said one operative position in which it depresses said lever lug.

6. The combination as defined in claim 1 wherein said platen roll and said cam are mounted on different sections of a plural section shaft all of whose sections are supported on said carriage, and wherein one ratchet and pawl mechanism effects successive actuations of said cam to effect plural and single type-line rises of said stencil holder in response to successive restorations of the carriage to its said predetermined starting position and another ratchet and pawl mechanism effects successive single type-line space advances of said platen roll in response to the same said successive restorations of the carriage.

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