

Nov. 30, 1943.

A. H. REIBER

2,335,310

PRINTING TELEGRAPH APPARATUS

Filed Oct. 27, 1941 .

FIG. 2

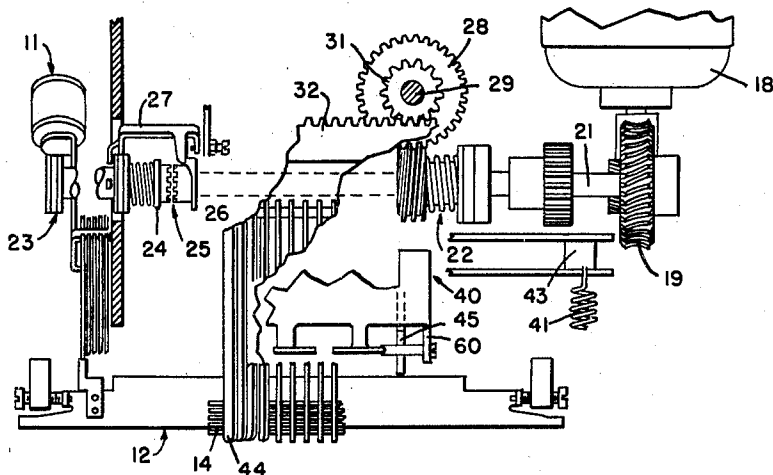


FIG. 3

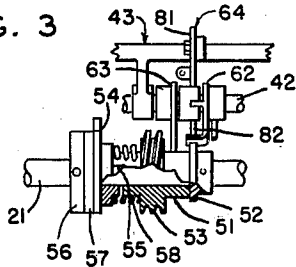
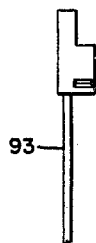


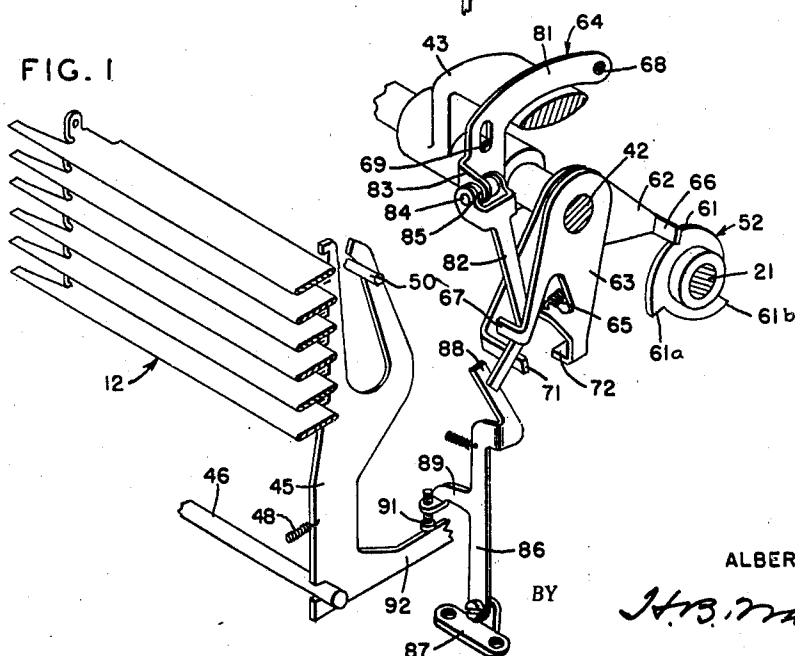
FIG. 4



WASHINGTON D.C. NOV. 1
CABLED DISPATCHES THAT
IN THE UNITED STATES

FIG. 5

FIG. 1



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2,335,310

PRINTING TELEGRAPH APPARATUS

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15 Claims. (Cl. 178—27)

This invention relates to printing telegraph apparatus and more particularly to improvements in character spacing mechanisms therefor.

A primary object of the invention is to provide an arrangement effective under certain predetermined conditions of operation for indicating change of case in the printed record.

A feature of the invention resides in modifying the spacing mechanism of a telegraph printer so that it may under certain selective conditions effect automatically, during the printing of a character, the suppression of the character spacing operation incident thereto.

Specifically, in printers which are not provided with upper and lower case characters, but only with capital letters, it is at times desirable to produce a printed record which is representative of both cases, and in accordance with the present invention this is achieved by underscoring those letters which are to be capitalized, all other alphabet characters being considered as lower case letters.

To accomplish the objects and features of the invention, a type bar page printer of the type disclosed in U. S. Patent 1,904,164 is provided with means responsive to a "blank" signal code for rendering the spacing mechanism ineffective by disabling it momentarily, and simultaneously causing a type bar to be operated to print an underscoring mark. The spacing mechanism of said printing apparatus comprises a multi-toothed ratchet adapted to cooperate with a pair of pawls which are actuated by a control arm associated with the printing bail to function as an escape-mechanism so that, upon each revolution of the main shaft, the spacing worm gear associated with the spacing ratchet is permitted under normal operating conditions to escape one tooth at a time and hence to rotate through a corresponding angle.

According to the afore-mentioned patent, a series of function levers is provided which operate in accordance with the setting of a series of selector vanes. Within this series of function levers, the present invention contemplates the provision of a space suppression function lever which, when selected, is drawn forward under spring tension into selective relation with the selector vanes. When this occurs, the rear extension of the function lever raises and, through a system of levers, moves said control arm out of operative relationship with the upper one of said pair of pawls, thereby preventing the consummation of a spacing operation, although the printing bail is operated in the usual manner. At the same time, how-

ever, a type bar, carrying an underscoring symbol on its type head, is operated so that the printing operation is performed without the performance of the spacing function usually incident thereto. Thus, upon the next printing operation, the character will be printed over the underscoring mark, after which the spacing operation incident thereto will occur. A modified form of the present invention is also disclosed wherein the underscoring mark is printed after the character to be indicated as capitalized is printed.

A better understanding of the invention may be had from the following description taken in conjunction with the accompanying drawing, wherein,

Fig. 1 is a perspective representation of the spacing mechanism suppression means according to the present invention;

Fig. 2 is a sectional plan view of the printer embodying the present invention showing the spacing mechanism;

Fig. 3 is a detail rear elevational view of the spacing mechanism of the printing apparatus;

Fig. 4 is an elevational view of the upper portion of a type bar showing a special type pallet; and

Fig. 5 is a view illustrating a sample of the printed record made in accordance with the present invention.

In the accompanying drawing like reference characters indicate similar parts throughout the several views. For a complete understanding of details not disclosed herein and which form no part of the present invention, reference may be had to U. S. Patent No. 1,904,164 issued April 18, 1933, to S. Morton et al.

Briefly, a printing apparatus through which the space suppression mechanism of the present invention is applied, comprises a typing unit 15 (shown in sectional plan view in Fig. 2) which includes a primary selecting mechanism, indicated generally as 11, which is of the sword-and-T type disclosed in U. S. Patent 1,745,633 to S. Morton et al. (fully disclosed in above-mentioned patent), and a secondary selector or selector vane assembly, indicated generally as 12. The selector vane assembly 12 controls through a series of bell crank levers (not shown) a corresponding series of curved code bars 14 carried in a movable type carriage. As set forth in the above-mentioned patent, this type carriage, indicated generally as 15, is movable longitudinally with respect to a stationary platen (not shown).

Referring to Fig. 2, a motor 18 applies or supplies power through gear 19 to a main operating

shaft 21 which carries the spacing mechanism indicated generally as 22, and the selector cam assembly indicated generally as 23. As is known in this type of device, power is communicated from the motor to an operating cam assembly through a grab clutch such as 25. Pinned portion 24 of the grab clutch 25 constantly rotates with the shaft 21, which has also frictionally connected thereto the spacing mechanism 22 and the selecting cam assembly 23. Portion 24 is cooperatively engaged with the splined portion 26 when throw-out lever 27 is operated in timed relation with the reception of code signals.

The spacing mechanism 22, which will be described more in detail hereinafter, controls, through gear 28, shaft 29, gear 31, and rack 32, the movement of type carriage 15 to form character spaces, tending in this movement to wind up a carriage return spring mechanism (not shown).

Positioned parallel to the main operating shaft 21 is a rocking shaft 42 on which are carried various mechanisms, for example, printing bail 43, function lever bail 40, and the escapement mechanism for the spacing mechanism 22. The printing bail 43 which is actuated by a printing spring 41 in proper timed relation in the operative cycle functions to reciprocate a pull bar 44 to cause the operation of a type bar, clearly described in U. S. Patent 1,904,164.

The selector vanes 12, as set forth in Patent 1,904,164, control a series of function levers among which is provided, especially for accomplishing the object of the present invention, a space suppression function lever 45 which like the other function levers is pivoted on a common pivot rod 46. This function lever 45, like the rest of the function levers of the series, is provided with an individual spring 48 tensioned between it and the printer frame and which tends to rotate the function lever 45 about pivot 46, but, as clearly set forth in Patent No. 1,904,164, is restrained by the function lever bail 40, acting through rod 50 and arm 60.

Before describing further the function of lever 45, a detailed description of the spacing mechanism will be given. Having reference to Fig. 3 there is shown mounted on the main shaft 21 and located centrally of the apparatus, a sleeve member 51 which comprises escapement ratchet 52 and escapement worm 53 which are integral therewith. Sleeve member 51 is operably connected to the hub of a disc 54 by means of a pair of interengaging tongue and groove members 55. Collar 56 is pinned to main shaft 21 and is rotatable therewith. Interposed between disc 54 and collar 56 is a disc 57 of frictional material; for example, felt. By means of a helical compression spring 58, which exerts a thrust tension between disc 57 and the pinned collar 56, sleeve 51 is frictionally connected to shaft 21 through the friction clutch comprising members 54, 56, and 57. Sleeve 51 is thereby rotatable with the main shaft 21 unless arrested by the escapement pawls of the spacing mechanism 22, as will presently appear.

Referring to Fig. 1, it will be noted that ratchet wheel 52 is provided with three teeth 61, 61a, and 61b, the escapement of which will allow the type carriage 15 to be moved forward one step or character space for each actuation of the printing bail 43. As indicated, the escapement mechanism comprises levers 62 and 63, pivotally mounted on bail shaft 42, and lever 64 adjustably fixed to printing bail 43. Spring 65 nor-

mally tends to rotate levers 62 and 63 in opposite directions, since it is common to both levers. Lever 62 is normally urged by spring 65 in a clockwise direction so that laterally disposed end 66 engages tooth 61 of ratchet 52, thus arresting the rotation of said ratchet. Lever 63 is normally held out of engagement with ratchet 52 against the tension of spring 65 by the action of lever 64 against laterally disposed end 67.

Lever 64 is pivotally connected to printing bail 43 at 68 and is provided at 69 with a slot and screw adjusting means, whereby the correct relative position of escapement levers 62 and 63 with respect to ratchet 52 may be determined. The spacing operation occurs immediately following or subsequent to the printing of a character in the following manner.

Upon the printing of a character, lever 64 is caused to rotate slightly in a counterclockwise direction (as viewed in Fig. 1) about the axis of bail shaft 42, thereby transferring this motion to lever 62 through its laterally disposed end 71, tripping its end 66 out of engagement with tooth 61 and permitting ratchet 52 to rotate slightly in a counterclockwise direction under the influence of friction clutch members 54 to 57 (Fig. 3) until arrested by the engagement of tooth 61a with laterally disposed end 72 of the lever 63, which lever by movement of lever 64 was rendered free to rotate in a counterclockwise direction under the tension of spring 65 into the path of oncoming tooth 61a. Ratchet 52 is thus restrained from rotation by lever 63 until the completion of the printing of a character at which time printing bail 43 and associated lever 64 are caused to rotate in the opposite direction by the action of a printing cam (not shown). The restraint of lever 62 by lever 64 through end 71 is thereby removed, permitting lever 62 to rotate in a clockwise direction under the influence of spring 65 into the path of oncoming tooth 61b of ratchet 52. During this clockwise movement of lever 64, and immediately after the afore-mentioned release of lever 62, lever 63 is caused to rotate in a like direction due to the action of lever 64 and end 67 thereof, thereby disengaging end 72 of lever 63 from tooth 61a and allowing ratchet 52 to continue its rotation until arrested by the engagement of end 66 of lever 62 with tooth 61b.

It is obvious that since worm 53 and ratchet 52 are integrally connected to sleeve 51, said worm 53 will have normally the same intermittent or step-by-step motion as was hereinbefore seen to be imparted to ratchet 52. Worm 53 is meshed with worm gear 28 (Fig. 2) which is loosely mounted on vertical shaft 29, and is operably connected thereto by means of a grab clutch as disclosed in the above-mentioned Patent 1,904,164. Worm 53 and gear 28 are so related that one-third revolution of worm 53 will rotate the gear 28 through a distance which through gear 31 and rack 32 causes the type carriage to be stepped forward one character space.

From the foregoing, it will be observed that character spacing takes place automatically with the printing of each character; that is, character spacing is incident to printing. It is well known that there is a code combination allotted to each type bar, but it is possible to employ a code combination, commonly known as the spacing signal, which is identified with no type bar, but which will nevertheless initiate the printing operation. Therefore, the spacing between words is accomplished in exactly the same manner as set forth

when a spacing signal is received, except when no type bar is operated and consequently no character is printed.

In accordance with the present invention, it is desired to print a character without spacing the type carriage, and accordingly a feature of the present invention is to provide a spacing suppression mechanism. It is also a feature of the present invention to print a character without effecting a spacing operation normally incident thereto; thus, to effect a printing operation, it is necessary to operate the printing bail 43, and since the spacing control lever 64 is movable therewith, said lever 64 would in prior devices invariably actuate the spacing escapement pawls 62 and 63 to effectuate a character spacing function.

With the present invention, however, means is provided which is effective under the control of the selector mechanism to disable momentarily the spacing mechanism during a character printing operation, thus causing a printing operation to be effected without the attendant spacing action. To achieve this object, the spacing control lever 64 is made up of two parts; namely, portion 81 adjustably fixed to the printing bail 43, and a portion 82 hinged to the portion 81. As seen in Fig. 1, the portion 81 is provided with a lateral portion 83 carrying a pin 84 which pivotally supports the portion 82. A spring 85 is coiled around the pin 84 and is secured at one end to the lug 83 and the other end to the portion 82 to cause the member of portion 82 to be normally biased in a clockwise direction (as viewed in Fig. 1) against a stop (not shown). The portion 82 in its clockwise position against its stop is effective to act upon the lateral portion 71 to rotate the escapement member 62 clockwise during a spacing operation previously described. To render the spacing mechanism ineffective to perform spacing functions, the hinged portion 82 when rotated counterclockwise about its pin 84 will be moved so that its lower free end will be free of the lateral portion 71, so that when the lever indicated generally as 64 is rotated counterclockwise during a printing operation, the hinged portion 82 will escape the lateral portion 71 thus precluding rotation of the escapement member 62.

To effect this control of hinged portion 82 selectively, a space suppression member 86 is provided which is pivotally mounted on a bracket 87 fixed to the printer frame. Member 86 is provided at its upper extremity with a projection 88 so conformed as to cooperate with the lower extremity of the hinged portion 82. Member 86 is also provided with a laterally extending portion 89 on which is carried an adjustment screw 91 which is cooperative with a rearwardly extending tongue 92 of the function lever 45.

When the function code lever 45 is selected in response to a predetermined code signal, for example, "blank" code signal, it will be permitted, upon the initiation of operation of bail 43, to rotate counterclockwise under the pull of its spring 48 thus raising the rearwardly disposed tongue 92, and through the screw 91 impart clockwise rotation to the space suppression lever 86 thereby causing the projection 88 of said lever 86 to cooperate with the lower end of the hinged portion 82 of the space control lever 64. In response to this movement of lever 86, the hinged portion 82 will be rotated counterclockwise about its pivot 84 so as to be brought out of cooperative relation with the lateral portion 71 of the escapement pawl 62 so that as the bail 43 continues its coun-

terclockwise movement during the operative cycle, said portion 82 will avoid or dodge the lateral portion 71 whereby the escapement pawl 62 will not be released from the escapement wheel 52.

However, there is associated with the particular code signal identified as the space suppression code signal, a pull bar 44. When the printing bail 43 is operated, it will operate the pull bar 44 so that the type bar associated with the selected pull bar 44 will be actuated to print a characteristic symbol on the record material. The particular character selected for this type bar is an underscoring mark so that, since there is no spacing operation performed with the printing of this mark, the next character selected for a printing operation will be printed over the underscoring mark. This is manifest, since in the normal operation of the printer apparatus according to the Patent 1,904,164, the spacing operation occurs after the printing operation. Then, when the character is printed over the underscoring mark previously printed, a spacing operation usually incident to the printing operation will occur at this time to space the type carriage 15 one character space.

According to the present invention, the purpose of underscoring the character in this manner is to indicate upper case or capital letters. In certain forms of the printer according to U. S. Patent 1,904,164, there has been provided a six-unit code whereby upper case and lower case characters can be printed. However, by using a five-unit code printer wherein only capital letters are printed, it sometimes becomes desirable to produce a record indicative of both upper and lower case. Therefore, with the present invention and with the means for underscoring capital letters in this manner, the five-unit code printer according to the U. S. Patent 1,904,164, can readily be utilized for producing such a record wherein the capital letters are indicated, as well as characters in the lower case.

In Fig. 5 there is shown a representation of the type of printed record produced by the printer according to the present invention. It is noted here that the first letter in the proper nouns, and the first letter in the beginning words of the sentence, are underscored to indicate capital letters on the record sheet 95.

In one embodiment of the printer according to the present invention, a blank signal is transmitted before the character signal which is to be identified as the capital letter, the printer being arranged to print the underscore on this "blank" signal (without spacing). The blank signal, in response to which the underscoring mark is printed, is followed by the character signal, in response to which the character is printed over the underscore. In certain forms of printers where the spacing operation follows the printing operation, as in the present disclosure, a form of type bar for the "blank" signal may be employed such as shown in Fig. 4. In this form of type bar, the underscoring mark is shown offset, so that when a character is printed and spaced, and it is desired to underscore said character, the underscoring type bar 93 (Fig. 4) is selected and operated. In view of the fact that the underscoring mark is offset on the type head, the underscoring mark will be printed under the character, and since no spacing occurs as a result of the operation of the type bar 93, the next character in the word will be printed adjacent the underscored character. To use the form of type bar 93 shown.

in Fig. 4, appropriate modifications will, of course, have to be made to the printing zone, or type bar guide thereat.

Although the foregoing disclosure has been made in connection with certain specific embodiments of the invention, it is understood that all changes which come within the scope of equivalency of the appended claims are intended to be included within the purview of this invention.

What is claimed is:

1. In a telegraph printer, printing mechanism including a printing actuator, spacing mechanism comprising escapement instrumentalities normally operative by said actuator as an incident of the printing operation, signal responsive means, a pivoted arm carried by said printing actuator, and motion transferring means effective in response to certain selective conditions of said signal responsive means whereby said pivoted arm renders said escapement instrumentalities ineffective.

2. In a recorder, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls attractantly, means cooperable with said pair of pawls to control the operation thereof in escapement manner, and means effective under certain predetermined operating conditions to render said last recited means ineffective to control one of said pawls.

3. In a telegraph printer, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls attractantly, permutation code mechanism to control operations other than recording comprising a plurality of function code levers, means cooperable with said pair of pawls to control the operation thereof in escapement manner, and means selectively controlled by one of said function code levers to render said last named means ineffective to control one of said pawls.

4. In a telegraph printer, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls toward each other, permutation code mechanism to control operations other than recording comprising a plurality of function code levers, a periodically operable printing control means, an instrumentality carried by said printing control means and cooperable with said pair of pawls to control the operation of said pawls in escapement manner during each periodical operation of said printing control means, and means selectively controlled by one of said function code levers to render said instrumentality ineffective to control one of said pawls.

5. In a recorder, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls toward

each other, a periodically operable means, an instrumentality carried by said periodically operable means and cooperable with said pair of pawls to control the operation of said pawls in escapement manner during each operation of said periodically operable means, and means to render said instrumentality ineffectual to control one of said pawls.

6. In a recorder, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls attractantly, a cyclically operable means, a swingable instrumentality carried by said cyclically operable means and engageable with said pair of pawls to control the operation of said pawls in escapement manner during each cyclic operation of said cyclically operable means, and means to render said instrumentality ineffectual to engage one of said pawls.

7. In a telegraph printer, printing mechanism including a control instrumentality, spacing mechanism comprising escapement instrumentalities normally operative under the control of said control instrumentality as an incident to the operation of said printing mechanism, signal responsive means, and means effective under the control of said signal responsive means to render said control instrumentality ineffectual upon said escapement instrumentalities.

8. In a telegraph printer, printing mechanism including a control instrumentality, spacing mechanism comprising a pair of attractantly biased pawls normally cooperable with said instrumentality as an incident to the operation of said printing mechanism, signal responsive means, and means effective under the control of said signal responsive means to render said instrumentality ineffectual to cooperate with one of said pawls.

9. In a telegraph printer, printing mechanism including a control instrumentality, spacing mechanism comprising a pair of attractantly biased pawls normally cooperable with said instrumentality as an incident to the operation of said printing mechanism, permutation code mechanism to control operations other than recording comprising a plurality of function code levers, and means effective under the control of one of said function levers to render said instrumentality ineffectual to cooperate with one of said pawls.

10. In a telegraph printer, signal responsive means, printing mechanism including a control instrumentality, said mechanism operable in accordance with the operation of said signal responsive means, spacing mechanism comprising a pair of attractantly biased pawls normally cooperable with said instrumentality as an incident to the operation of said printing mechanism, permutation code mechanism to control operations other than recording comprising a plurality of function code levers, and means effective under the control of one of said function levers to render said instrumentality ineffectual to cooperate with one of said pawls.

11. In a recorder, a carriage movable to form character spaces, spacing mechanism therefor normally adapted to control the advancement of said carriage one character space upon each operation thereof, said mechanism comprising an escapement device including a spacing ratchet, a pair of pawls and means to bias said pawls at-

trahently, a cyclically operable means, a swingable instrumentality carried by said cyclically operable means and engageable with said pair of pawls to control the operation of said pawls in escapement manner during each cyclic operation of said cyclically operable means, and selectively controlled means for swinging said instrumentality out of operative relation with one of said pawls.

12. In a telegraph printer, signal responsive means, printing mechanism including a swingable instrumentality, said mechanism operable in accordance with the operation of said signal responsive means, spacing mechanism comprising a pair of attractively biased pawls normally cooperable with said instrumentality as an incident to the operation of said printing mechanism, permutation code mechanism to control operations other than recording comprising a plurality of function code levers, and means effective under the control of one of said function levers to swing said instrumentality out of operative relation with one of said pawls.

13. In a telegraph printer, signal responsive means, printing mechanism including a yieldable instrumentality, said mechanism operable in accordance with the operation of said signal responsive means, spacing mechanism comprising a pair of pawls normally cooperable with said

instrumentality as an incident to the operation of said printing mechanism, means to control operations other than recording comprising a plurality of function levers, and means effective under the control of one of said function levers to bias said instrumentality out of operative relation with one of said pawls.

14. In a telegraph printer, printing mechanism including a yieldable instrumentality, spacing mechanism comprising escapement instrumentalities normally operative under the control of said yieldable instrumentality as an incident to the operation of said printing mechanism, signal responsive means, and means effective under the control of said signal responsive means to bias said yieldable instrumentality to render said escapement instrumentalities ineffectual to operate said spacing mechanism.

15. In a recorder, printing mechanism including a control member, spacing mechanism comprising a pair of pawls normally operative positively in escapement manner by said control member as an incident to the operation of said printing mechanism, and means to pivot said control member to annul the escapement effect of said pawls to prevent the operation of said spacing mechanism.

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