This invention relates to typewriting machines.

The object of the present invention is to provide an improved billing machine of the type using continuous forms comprising fanfold or superimposed separate webs, in which means is provided for repeatedly retracting the carbon paper. An object is to provide a fanfold billing machine with improved means for manually retracting the carbon sheets upon the completion of typing of each set of forms.

An object is to provide an improved manual member for retracting the carbon stock or truck which may be readily-adjusted by the operator by a simple wrist or finger motion at the front end of the operating member.

An object is to provide an improved means for adjusting the stop which limits the retracting movement of the carbon sheet carrier when it is necessary to sever the exhausted portions of the carbon sheets, which adjusting means is operated by a simple rotational movement of the operating member for the carbon carrier.

Summarizing the foregoing, the object is to provide means whereby not only is the limit stop for the carbon sheet carrier adjustable by a simple motion of the operating member therefor, but a second simple motion of a supplemental device forming part of said member enables the carbon sheet carrier to be completely adjusted with one hand by the operator.

Other objects of the invention will become apparent in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a perspective view of a billing machine embodying the present invention.

Fig. 2 is a plan view of the forms carrying attachment for the billing machine, parts thereof being broken away and the overall length compressed to enable showing the details of the attachment on a large scale.

Fig. 3 is a side elevation of the forms carrier attachment as disclosed in Fig. 2.

Fig. 4 is a large scale view showing the mechanism of the operating member for the carbon sheet carrier.

Fig. 5 is a rear view showing parts of the carbon sheet carrier or truck in section to illustrate the mechanism for adjusting the stop for the carbon sheet carrier.

Fig. 6 is a sectional view on the line 6—6 in Fig. 4.

In Fig. 1 there is shown in broken lines a typewriting machine to which is attached, as shown in solid lines, a fanfold or continuous billing attachment embodying the features of the present invention. Such a combination is commercially-known as a fanfold or continuous billing machine and employs either fanfold forms which comprise a single sheet accordion pleated transversely or packs comprising a plurality of superimposed separate strips of forms.

The typewriting machine may be any well-known commercial typewriter, manual or power, but for convenience of description the typewriter 10 disclosed in Fig. 1 is the well-known "IBM" electric typewriter. Since this machine is well-known commercially and since the mechanisms thereof in so far as the means for operating the type bars and other details are concerned are well known, no description will be given of the typewriter.

So far as the invention disclosed herein is concerned, it is only necessary that the typewriting machine be equipped with means for displacing the platen upwardly to permit drawing the forms straight to permit retraction of the carbon sheets in a well known way.

The "IBM" electric typewriter, as disclosed in Fig. 1, is equipped with the platen displacing mechanism shown in United States Patent No. 2,136,948 which includes an operating lever 11 (Fig. 1) the lifting of which causes the platen to rise vertically guided by the slotted plates 12 to a position enabling the completed set of forms to be stretched out flat while the carbon sheets are being retracted to the next set of forms. This manner of operation of a billing machine is well known and for that reason will not be described in greater detail herein.

The forms carrying attachment is attached to the rear of the typewriting machine by means of a framework comprising several rods 13 suitably bent and soldered or welded together at 15 to form a bracket-like framework which includes the rod 14 serving as a rail to support the moving parts of the forms carrying attachment for movement with the typewriter carriage in a well known way.

The moving parts of the forms carrier-attachment are best shown in Figs. 2 and 3 and include a track member 15 which conveniently is composed of an aluminum extruded strip having the central rib 15a and the stiffening ribs 15b which are shallower than the rib 15a. Both sides of the member 15 are provided with ribs 15b but only the top is provided with the rib 15a for a purpose which will be made clear hereinafter.

At a point approximately one-third the length of the member 15 from its left-hand end (Figs. 2 and 3), the member 15 is secured to a truck casting 16 preferably made of a light-weight alloy, such as magnesium or aluminum, and of hollow construction. The ends of the casting 16 are formed with the upwardly extending housings 18e in which are pivotally mounted the rollers 17 which ride on the rail 14. At its front end, the member 15 is provided with a bracket member 19, the ends of which are bent downwardly,
and formed with an open slot to straddle the rod 19 which is mounted on the side plates 20 of the typewriter carriage. The member 18 is provided with spring pressed latches 21 which are releasable to permit disconnection of the moving part of the carbon attachment from the typewriting machine. The rod 19 is provided with bushings 22 which are provided with shoulders to receive the slotted portions of the member 18 and the latches 21 engage the bushings to compel the bushings to slide with bracket member 18 on rod 19. The rod 19 is also provided with two collars 23 only one of which is shown in Fig. 2 and a spring 24 is interposed between each collar 23 and the adjacent bushing 22. The pair of springs 24 and collars 23 thus tend to centralize the member 18 with respect to the carriage of the typewriting machine and the springs act as shock absorbers to allow the check of rapid movements of the forms carrying attachment, such as the sudden arresting of the carriage during carriage return operations or at the end of tabulating movements, to be absorbed and the member 18 arrested with a minimum of violent shock.

The front (Fig. 1) or left-hand end of the strip 15 (Figs. 2 and 3) is provided with curved elements 25 which may be of spring steel and support the cross bar 25 carrying the side guides 27 for the forms, the edges of which are shown by the broken lines 28 in Fig. 2. The bar 25 is formed of sheet metal, somewhat C-shaped in section, and the side guides 27 are provided with suitable clamping devices 29 for advisable securing the side guides in any desired position in accordance with the forms used.

The rear (Fig. 1) or right-hand end (Figs. 2 and 3) of the strip 15 is provided with the wide bracket 30 supporting a bar 26a having the side guides 27a and clamping devices 29a similar to the bar 25 and guides 27.

The carbon sheet carrier comprises (Figs. 1, 2 and 3) a truck 31 taking the form of a lightweight casting, the central part of which is substantially square and provided with the side branches 31a, 31b, the left-hand (Fig. 1) or upper branch 31b (Fig. 2) being slightly wider than the other. The casting carries, as pairs of rollers designated 32, 33, of which the rollers 32 ride on the top surface of the member 15 while the rollers 33 engage the lower surface of the member 15 adjacent the edges thereof (see Fig. 5 also) to enable the carbon sheet carrier to be manually moved lengthwise of the strip 15. The casting 31 is also provided with two additional pairs of rollers 32c, 33c which engage opposite sides of the rib 15c.

It is apparent that the casting 31 is completely supported and guided on the member 15 by means of anti-friction rollers thereby ensuring that the carbon sheets may be retracted with very little effort on the part of the operator.

The top surfaces of the casting 31 and the branches 31a, 31b are level (Figs. 1, 2, and 3) and are of a cross section similar to both ends in the truck for use with continuous forms of the type comprising a pack of separate superimposed webs, but these blades also may be used with fanfold forms by equipping the blades with the web splitters 37 which are secured to the blades 36 by any suitable means. The posts 35 are L-shaped in horizontal section and horizontally slotted in parallel planes to receive the edges of the blades 35, one branch of the L extending transversely of the ends of the blades and being vertically bored to receive the loose pins 38 having the interference grooves 39 which may be removed by pulling them vertically by means of the finger piece 38a to release the blades which can then be slid horizontally out of the slots in the posts.

The left-hand or upper (Fig. 2) branch 31b of the casting 31 is provided with an upsetting post 39 which may consist of a separate hollow casting suitably secured to the branch 31b as by means of bolts (Fig. 5) or may be an integrally cast portion of the casting 31. This post 39 supports the operating handle for retracting the carbon carrier when it is desired to shift the carbon sheets from a completed set of forms to the next blank set. This operating handle is generally designated 40 in Figs. 1 to 5 and is manually adjustable to suit the extent of retraction of the carbon carrier and includes a handle which may be manually shifted by a simple wrist movement to adjustably limit the extent of retraction of the carbon carrier.

The retraction of the carbon carrier is controlled by an adjustable stop mechanism (Figs. 1, 2, and 5) which comprises the rack bar 41 secured to the top surface of the left hand rib 15b, that is, the upper one in Fig. 2. This stop bar is toothed and slidably supports a stop 42 (Figs. 2 and 5) having a block 42a having a tooth normally engaging one of the teeth in the stop bar 41. The stop 42 has stop portions 42b which extend horizontally over the surface of the strip 15 so as to be engageable with a rubber bumper 43 fixed to the carrier by the casting 31. A similar bumper 43a (Figs. 2 and 3) carried by a lug formed in the bracket member 18 limits forward or left-hand movement (Fig. 2) by engagement with casting 31.

A leaf spring 42c (Figs. 2 and 5) fixed to the stop 42 tends to press the right-hand portion of the stop 42 (Fig. 2) having the block 42a upwardly to hold the tooth in block 42a in engagement with the rack 41, the stop 42c adjusting the amount of retraction of the carbon carrier over the smooth edge of the bar 41. By pressing downwardly on the right-hand end of the stop 42 in Fig. 2, the block 42a may be released from the teeth of the rack 41 thereby permitting the stop 42 to be moved lengthwise of the rack 41.

This release and adjustment of the stop 42 is effected by a rotational movement of the operating handle 40 and will be made clearer hereinafter.

Figs. 4, 5, and 6 illustrate in detail the mechanism in the operating handle 40 which enables the movements thereof to adjust the stop 42 and also enables the length of the operating handle to be readily adjusted by the operator. The post 38 is bored horizontally to receive a tube 43 which is freely withdrawn therefrom by reason of a pin 44 which extends through two elongated circumferential slots in the tube 43 so as to permit a limited rotation of the tube 43, the pin being held in the post 39 by a set screw 45. Mounted in the right-hand bent ends of the tube 43 is an arm 43a which is shaped somewhat like a bracket and is keyed to tube 43 by being located in longitudinal slots cut in the tube. This arm 43a is formed with a lug 43b which extends parallel...
with the axis of the tube 43 into the forked end of a lever 46 which is pivoted on the stud 41 carried by the post 31. Stud 47 also holds a suitable cover plate 39c in place on suitable sleeves 39b formed in the rear edges of post 39. To the lower end of the lever 46 is pivoted a horizontal link 48; the left-hand end (Fig. 5) extending through a rectangular slot formed in the casting 31. The stop 42 is slotted as shown at 42d (Fig. 2) so as to be adapted to loosely receive the left-hand end of the link 48 but normally there is a clearance between the link 48 and the casting 31 so as to permit the link 48 to ride over the top surface of the stop 42 as it is shown in Fig. 2. The link 48 is enlarged at 48a and is provided with a spring 49 which presses against the outside surface of the casting 31 and urges the link 48 to the right in Fig. 5. The pin 44 acts as a stop to limit the right-hand movement of link 48 by contacting the left-hand wall of the upper slot in tube 43. When the tube 43 is rotated counterclockwise in Fig. 5, the lever 48 will be rocked clockwise and thrust the link 48 horizontally to the left. When the lever 48 is returned to its original position the link 48 is pushed to the right (Fig. 2) as far as it can go as limited by stop 42, the slot 42d will be positioned opposite the end of the link 48 enabling the aforementioned movement of the link to the left to carry the left-hand end of the link into the slot 42d and release block 42c from rack 41. With the parts held in this position, the truck may be drawn to the left by the operator and the stop 42 will travel with the truck. The operator draws the truck to a new position determined by the amount of carbon material exhausted from the forming and releases the operating handle which permits the spring 49 to withdraw the link 48 from the slot 42, thereby locking the stop in its new adjusted position.

The internal construction of the operating handle 40 is shown in Fig. 4. The forward or left-hand end of the tube 43 is reduced in diameter at 43c to guide a rod 50, which has secured to it, at its right-hand end, a bushing 51 slidable fitting the bore of the tube 43, the bushing being held in place on rod 50 by a plate 54. The bushing 51 has a transverse hole within which is slidable a bolt member or catch 52 capable of entering any one of a series of index holes 43d in the underside of tube 43 as shown in Figs. 3 and 4. In order to prevent the rod 50 from rotating freely in the tube 43, the rod 50 has a longitudinal slot 50c into which slidable projects a block 50e secured to the tube 43. The bolt or catch 52 is retracted, by means of an operating rod 53, the right-hand end 53a of which is bent obliquely of the axis of the main part of the rod 53 and is slidable in an oblique hole transversely of the bolt or catch 52.

The right-hand end of the rod 53 is formed with two right angle bends (Fig. 4) comprising a crank 53b one end of which is soldered or welded in a slot cut in a thick disk 53d sliding in a longitudinal bore 50b in the left-hand end of the rod 50. This disk 53d supports the rod 53 in the slot 50c close to the top thereof and substantially coaxial with the rod 50. The crank 53b normally lies in a substantially vertical plane and may be used as a trigger when the hand is grasping the operating knob, about to be described.

The pulling of the rod 53 to the left by means of the trigger 53c causes the bolt 52 to be cammed upwardly due to the bend adjacent the inclined end of the bushing 51, thus withdrawing the bolt 52 from the hole 43d and releasing the catch. This permits the rod 50 and sleeve 51 to be moved longitudinally of the tube 43 like a piston. The holes 43d are spaced sufficiently close together that a wide range of adjustment of the operating handle is possible within the normal working limits of the carbon sheet truck or carrier. The rod 50 is provided with an operating knob 55 which may be composed of a suitable plastic material molded around a bushing 56 having a bore adapted to receive the end of the rod 50. The knob 55 is removably secured on the rod 50 by means of a plate 57 shown in Fig. 6. This plate 57 is substantially circular in external outline; except for a downwardly projecting slotted portion 57c receiving the end of the crank 53d, and is attached to the sides of the bushing 56 by means of screws 58. The plate is formed with a bent over lug 57b extending into the slot 50c thereby preventing the knob 55 from rotating relative to the rod 50. The latter also is provided with a transverse slot 50e into which project portions of the plate 57 57a to hold the knob 55 in the position shown in Figs. 4 and 6 and prevents the knob from being withdrawn from the end of the rod 50.

Owing to the fact that the bolt 52 normally is held in the position shown in Fig. 4 by a spring 59 located in the bore 580 and pressing against the disk 54 and the knob 55, respectively, the rotation of the knob 55 will also rotate the sleeve 43 in the manner first described above to operate the slide 48. After the stop 42 has been positioned as described above to compensate for the removal of the used portion of carbon sheet, the trigger 520 may be drawn to the left and the bolt 52 released to permit the knob 55 to be adjusted to the new position of the carbon sheet carrier to suit the operator’s convenience.

In the past it has been customary to use an operating handle of fixed length in machines of this type with the result that, when the carbon sheets are near exhaustion, the operating handle extends inconveniently far forward of the comfortable position for the operator or alternatively, if to avoid this condition, the handle is made very short, it is necessary for the operator to reach inconveniently far back of the typewriter when the carbon sheets are fresh and the carbon sheet carrier is working close to its extreme rearward position. In billing machines of the type disclosed herein, when the exhausted part of the carbon sheets is removed, in the past it has been necessary to lift the forms with their assembled carbon sheets, to some extent at least, in order to reposition the stop which limits the rearward motion of the carbon sheet truck. As the assembled packs used in machines of this type are often quite bulky and in some cases wide, this is a very inconvenient operation, particularly where the desks are set end to end in the office making it less convenient for the operator to go behind the desk to reach the stop. Owing to the considerable length of the forms carried by the machine as a whole, it is very inconvenient for the operator to adjust the stop from the front of the machine as it requires bending over the machine and reaching a considerable distance rearwardly of the typewriter and at the same time lifting the forms and assembled carbon sheets, as described above, all adjustments may be required before the machine is operating satisfactorily, it can be readily seen that the ability to adjust the stop for the carbon sheet truck by itself is a very distinct advantage.
and is very useful in reducing fatigue. Machines of this type when loaded with a very heavy carbon pack are usually quite heavy for the operator to handle, particularly in manual machines, where the operator has to return the carriage by hand. Consequently, an improvement which reduces fatigue in a machine of this type, even when it is not loaded, is of great benefit and results in greater production of invoices.

When it is desired to remove the knob 55 for repairs or replacement, it is merely necessary to remove the screws 55 and allow the plate 51 to drop until it is free of the slot 56 whereupon the knob 55 may be drawn to the left and the plate 51 likewise be slipped off the end of the rod 56.

It is for this purpose that the plate 50 is formed with the large eccentric opening 52a (Fig. 6).

While there have been shown and described and pointed out the fundamental novel features of the invention, it will be understood that various modifications and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:
1. In a continuous billing typewriting machine, the combination of a billing attachment having a carbon sheet carrier retractable to displace carbon sheets from a completed set of forms to a succeeding blank set, a normally locked releasable step for limiting said retracting movements justifiable movable in the direction of retracting movement, an operating device movably mounted on said carrier, and means operated by a movement of said device on said carrier, when said carrier is in its retracted position, for releasing said stop and locking said stop to said carrier to enable adjusting movement of said stop by a movement of said carrier.
2. The invention set forth in claim 1, wherein the operating device includes an element pivotally mounted on said carrier for actuating said stop release means by said pivotal movement.
3. The invention set forth in claim 1 wherein the operating device comprises an extensible telescopic arm composed of at least two telescoped members rotatable in said carrier to actuate the stop releasing means.
4. The invention set forth in claim 3 in which locking means is provided for locking the members of the telescopic arm in a plurality of extended positions to adjust the length of the arm to the extent of rotation of the carrier.
5. The invention set forth in claim 4 wherein the locking means includes a bolt mechanism disposed internally of one of the telescoped members and a trigger device mounted on the other telescoped member for releasing said bolt mechanism.
6. In a continuous billing typewriting machine, the combination of a billing attachment including a carbon sheet carrier, a track along which said carrier is retractable to displace carbon sheets on said carrier from one set of forms to a succeeding set of blank forms, a stop rack mounted on said track parallel with the retracting movement, and a stop having releasable locking engagement with said rack to limit retraction of said carrier; an operating device for retracting said carrier including at least two members, one telescoped in the other, and one including a bolt mechanism for locking said members in a plurality of adjusted positions corresponding to different extents of retraction of said carrier, one of said members being mounted on said carrier and the other being provided with a hand element and a member adjacent said hand element for releasing said bolt mechanism.
7. In a continuous billing typewriting machine, the combination of a billing attachment including a carbon sheet carrier, a track along which said carrier is retractable to displace carbon sheets on said carrier from one set of forms to a succeeding set of blank forms, and an operating device for retracting said carrier including at least two members, one telescoped in the other, and one including a bolt mechanism for locking said members in a plurality of adjusted positions corresponding to different extents of retraction of said carrier, one of said members being mounted on said carrier and the other being provided with a hand element and a member adjacent said hand element for releasing said bolt mechanism.

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