

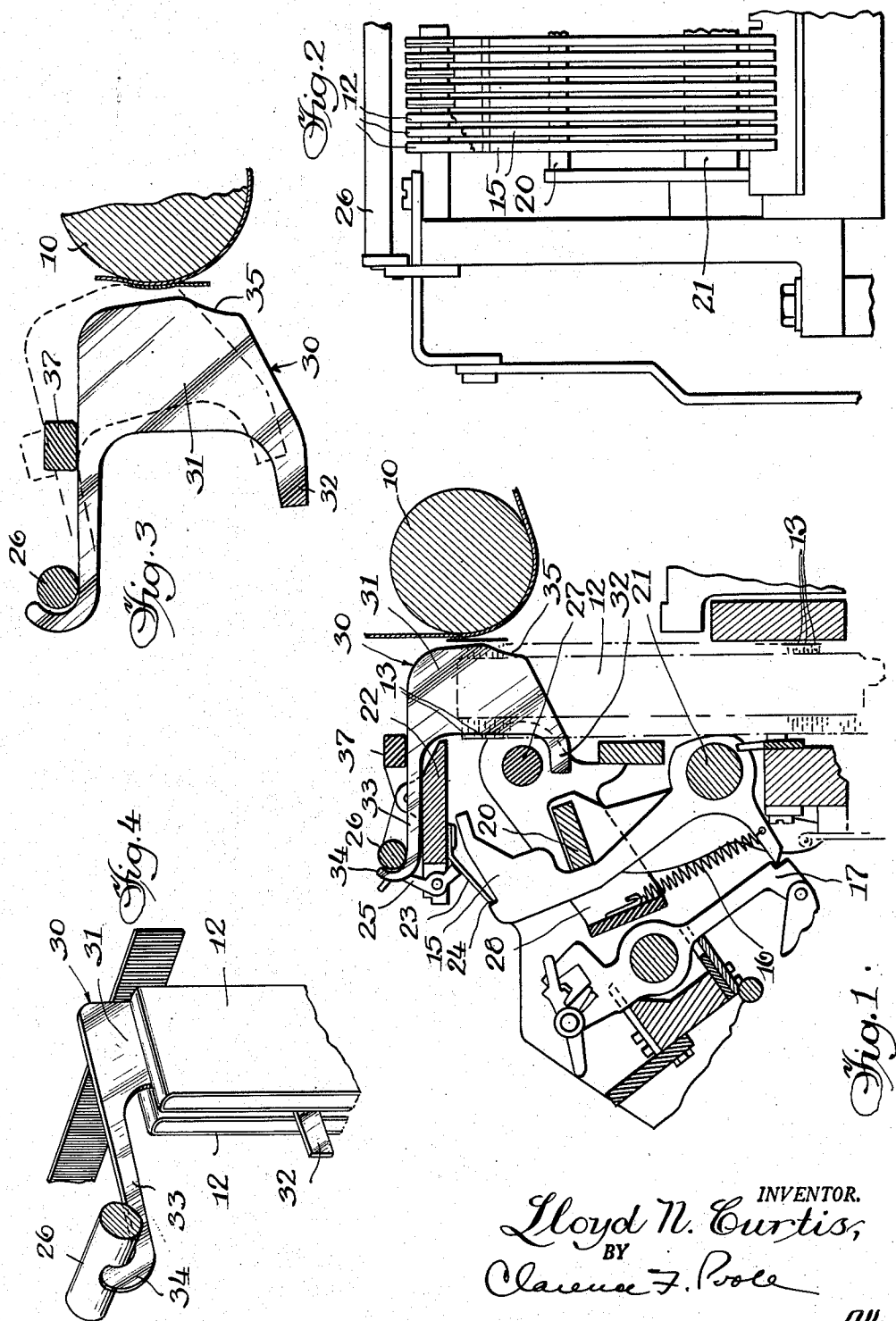
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COLUMN PRINTING ATTACHMENT FOR RECORD CONTROLLED MACHINES

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COLUMN PRINTING ATTACHMENT FOR
RECORD CONTROLLED MACHINES

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This invention relates to improvements in record controlled machines or tabulators and more particularly to printing mechanism for such machines.

The principal object of the invention is to provide a column-printing attachment for such machines, capable of being selectively mounted thereon to print a vertical line between any two adjacent columns of characters being printed on the record sheet without interfering with the normal printing operations of such machines. By using one or more of my attachments the many characters being printed can be segregated into different columnar groups for more ready visible reference, as occasion may require.

The device of my invention is especially designed for use on record controlled machines or tabulators now in general use, such as disclosed in United States Patents Nos. 1,867,026 and 2,131,918.

In carrying out my invention I provide one or more attachments, each consisting of a plate cut to proper shape and arranged to be fitted between any adjacent pair of type head elements and their respective type hammers, in position to be moved into and out of printing engagement at the printing line, by a moving part of the machine which operates in timed relation to, but independently of, the type head elements and their respective hammers. As a result, my improved attachments can be employed at one or more selected points to produce a substantially continuous vertical column marking or markings as the characters are being printed on the record sheet.

The invention may best be understood by reference to the accompanying drawings, in which:

Fig. 1 is a vertical section of a portion of a printing machine for which my column-printing attachment is designed, and showing said attachment mounted therein;

Fig. 2 is a view of a portion of the machine as viewed from the left in Fig. 1;

Fig. 3 is an enlarged view of my column-printing attachment, and

Fig. 4 is a fragmentary perspective view showing the manner in which the column-printing attachment is mounted in the machine.

Referring now to details of the embodiment of my invention illustrated in the drawings, Figs. 1 and 2 show portions of the printing mechanism of a tabulating machine such as is disclosed in United States Patent No. 2,131,918, which may be used to illustrate the use and application of my improved column-printing attachment or insert.

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This printing mechanism includes the usual platen 10 and a number of vertically movable type bar assemblies including type heads 12 each carrying a plurality of type elements 13 for printing different numerals or letters, in a manner well known with tabulating machines of this kind. Associated with each of the type heads 13 is a type hammer 15 operated by a spring 16, but normally restrained by a hammer latch 17 from being forced into contact with a head of a type element at the printing line. The hammers 15 are relatched after each operation by means of a bail or bar 20 mounted on a shaft 21, which bar extends the full length of the platen so as to return all of the hammers released during each printing cycle into re-latching position ready for the next printing cycle.

During the first part of each printing cycle the relatching bar 20 is moved forwardly a sufficient distance to permit those type hammers which are to be actuated, to swing forwardly into striking position when they are unlatched. Said re-latching bar thereafter swings rearwardly to return each type hammer which has been actuated to its initial latched position. The means for operating the re-latching bar 20 and the hammers 15 in timed relation with the type heads 12 may consist of mechanisms which are well known in machines of this type, and are not shown in detail herein as they form no part of the present invention.

Tabulating machines of the type contemplated usually have a horizontally extending bar 22 fixed along and above the type hammers 15 along which is mounted a plurality of leaf spring latches 23, each adapted to engage a shoulder 24 on an individual type hammer 15 to lock out the latter from printing. Control levers 25 are pivoted on the bar 22 for moving each of the latches into and out of locking engagement with its respective type hammer when desired. A lockout bail 26 is also pivotally mounted above the bar 22 in position to hold the control levers 25 against accidental displacement after they have been set in the lockout position, shown in Figure 1, wherein one or more levers 25 are held against their respective spring latches 23.

Between the shaft 21 and the bar 22 is a fixed rod or shaft 27 on which a bail 28 carrying the hammer-operating springs 16, 16 is usually mounted.

As will be seen from Fig. 2, the individual type heads 12 and their respective type hammers 15 are customarily disposed in parallel, slightly spaced relation to each other along the platen.

I make use of the spaces provided in this manner for the insertion of my novel column-printing attachments, as will now be described.

Each column-printing attachment 30 consists of a plate of suitable sheet material, sufficiently thin to fit in the space between proximate type heads 12, but of sufficient strength to resist bending when in operation. In practice I find a thickness of .005 to .010 inch is permissible for this purpose. Any suitable material may be employed, such as spring steel or bronze, provided it is sufficiently stiff to resist excessive bending.

As shown herein, each column-printing plate is cut or otherwise formed in the general shape of the letter J lying on its side, that is to say, the plate includes a relatively wide vertically extending body portion 31 having a relatively short rearwardly projecting lip 32 at its bottom, and a longer rearwardly extending arm 33 at its top, terminating in an upwardly curved hook 34. The widened body portion 31 has a slightly arcuate printing surface 35 formed at its forward lower corner, which is adapted to be moved into printing position with respect to the platen 10, as will presently appear. The rear portion of the plate 30 between the lower lip 32 and the lever arm 33 is cut away so that the plate can be inserted between adjacent type heads, with the lower lip 32 hooked under the fixed rod 21 on the machine. The lever arm 33 may extend over the bar 22, and the hook 34 at its end is preferably arranged to be fulcrumed loosely on a suitable crossbar, which for convenience may consist of the lockout bail 26 when the latter is swung to its normal lockout position as shown in Fig. 1.

Means may be provided for yieldingly urging the printing plate or plates 30 downwardly into non-printing position shown in Fig. 3. As shown herein, such means may consist of a bail 37 pivoted at opposite ends of the machine frame, and adapted to rest by gravity on the lever arms 33 of any printing plate or plates 30 which may be inserted in the machine at any given time.

The use and operation of the printing plate attachments above described may now be set forth as follows:

A printing plate 30 is inserted as just described above, in any space between adjacent type heads 12, 12 where it is desired to reproduce a vertical column on the printed sheet as the printing proceeds. Several such columnar printing plates may be employed simultaneously at different points, if desired.

At the beginning of each printing cycle of the machine, the type heads 12 are moved upwardly by the usual automatic record-controlled mechanism to position their respective type elements 13 in the proper printing position relative to the platen 10. The re-latching bail 20 is also rocked forward to provide operating clearance for the type hammers 15. As the re-latching bail 20 moves forwardly, it engages the rearward lips 32 of each printing plate 30 to swing the latter forwardly and upwardly about the fulcrum provided by the engagement of hooks 34 about the lockout bail 26. This movement of the plate 30 causes the respective printing surfaces 35 thereof to be swung upwardly toward printing position against the type ribbon 42 of the machine, as indicated in dotted lines in Fig. 3.

It may be further explained at this point that the friction set up between the type heads and the opposite sides of each plate may also be

employed to advantage in the operation of my column-printing insert devices.

For example, it will be seen that the initial upward movement of the type heads 12, 12 tends to swing the widened front portions 31 of printing plates 30 upwardly toward their printing position due to frictional engagement therewith, even before the re-latching bail 20 engages the lip 32 on said plates.

As each printing surface 35 is swung upwardly toward the platen, the upper portion of said surface may tend to engage the type ribbon initially with a wiping action, but in the preferred arrangement shown, the hook 34 on lever arm 33 is loosely fulcrumed on lockout bail 26 so that the final printing movement of the curved printing surface 35 toward the platen is not effected by the re-latch bail 20 until the printing surface 35 has been swung upwardly to a position where it is substantially concentric with the platen. In this manner, a substantially continuous columnar line is produced on the printed sheet at any desired point between adjacent normal spacings of the type heads.

The friction between the type heads 12 and the printing plates previously mentioned also tends to return said plates to their normal, non-printing position during the downward or return movement of said type heads, thus supplementing the action of the bail 37, or other means employed for this purpose. Accordingly I find that the thickness of the printing plates and the amount of warping or bending permissible in said plates, are not especially critical to the operation of my insert attachments, provided the amount of friction developed is maintained with reasonable limits.

On the other hand, it should be noted that it is not essential to make use of friction for the functioning of my printing inserts, since they will be actuated by the re-latch bail 20 even though there is not sufficient friction to assist in their movement.

It will now be understood that while the column printing plates 30 are operated in timed relation with the type heads 12 and their respective type-hammers, they are actuated by a different part of the mechanism, namely, the type hammer resetting bail 20, so that there is no interference with the normal printing operations of the machine at any time. Moreover, the printing attachment plates can be inserted or removed practically instantaneously at any desired point without requiring any readjustment of any operating parts of the machine.

Although I have shown and described a certain embodiment of my invention, it will be understood that I do not wish to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A column-printing attachment for tabulating machines of the kind having a platen, a series of type heads and type hammers and a re-latching bail for said hammers, said printing attachment consisting of a thin plate for insertion between proximate type heads, said plate having a lever arm for extending in rocking engagement with an abutment disposed on the machine above the path of movement of said re-latching bail, and also having a lower portion in position for actuation by said re-latching bail, to move the front edge of said plate into printing position.

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relative to said platen during each printing cycle of said machine, said plate being of such thickness as to be frictionally engaged by the type heads on the machine to effect rocking movement of said plate toward and away from its printing position. 5

2. A column-printing attachment for tabulating machines of the kind having a platen, a series of type heads and type hammers and a re-latching bail for said hammers, said printing attachment consisting of a thin plate for insertion between proximate type heads, said plate having a lever arm for extending in loosely fulcrumed engagement with an abutment disposed on the machine above the path of movement of said re-latching bail, and also having a lower portion in the path of movement of said re-latching bail, said plate being of such thickness as to be frictionally engaged by the type heads on the machine to effect rocking movement of said plate 10 15 20

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toward its printing position before it is engaged by said re-latching bail for printing movement toward the platen.

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