Nov. 24, 1925. 1,562,491

F. W. BERNAU

AUTOMATIC NONPRINTING MECHANISM

Filed Sept. 24, 1921 2 Sheets-Sheet 1

FIG. 1

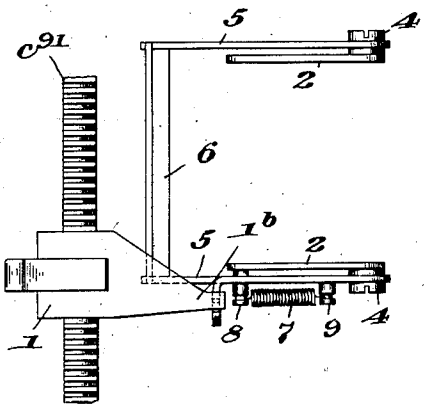


FIG. 2

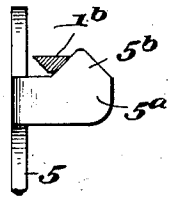


FIG. 3

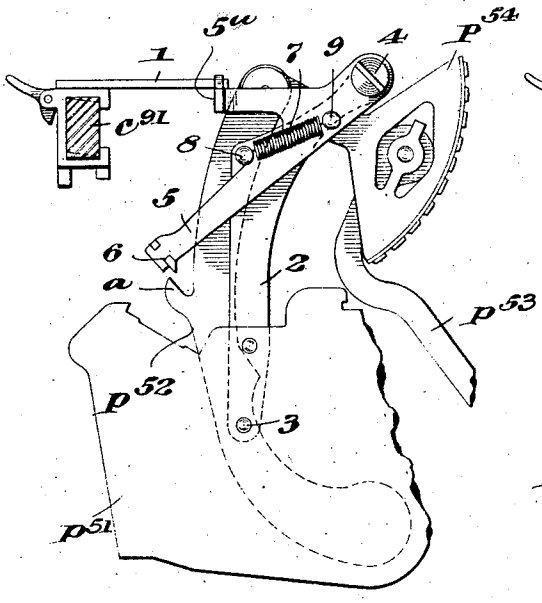
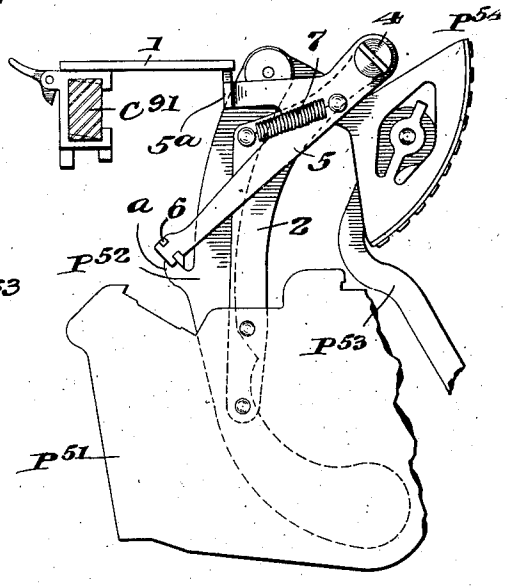


FIG. 4



Frederick W. Bernau INVENTOR

BY

Geo. H. Strauch his ATTORNEY

Nov. 24, 1925. 1,562,491

F. W. BERNAU

AUTOMATIC NONPRINTING MECHANISM

Filed Sept. 24, 1921 2 Sheets-Sheet 2

FIG. 5.

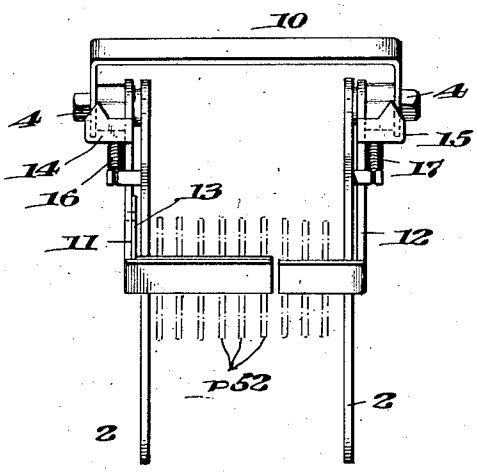


FIG. 6.

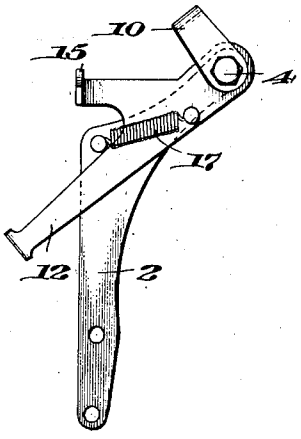


FIG. 7.

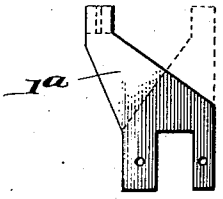
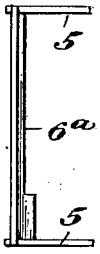


FIG. 8.



Inventor,
Frederick W. Bernau
By Geo. N. Staunton
his Atty

Patented Nov. 24, 1925. 1,562,491

UNITED STATES PATENT OFFICE.

FREDERICK W. BERNAU, OF NEWARK, NEW JERSEY, ASSIGNOR TO ELLIS ADDING-TYPEWRITER COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

AUTOMATIC NONPRINTING MECHANISM.

Application filed September 24, 1921. Serial No. 502,853.

To all whom it may concern:

Be it known that I, FREDERICK W. BERNAU, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Automatic Nonprinting Mechanism, of which the following is a specification.

This invention relates to means for effecting "splits" in adding, subtracting, or listing machines having printing mechanism.

While the present invention may be used in connection with any adding, subtracting or listing machine having printing means, and a traveling carriage, it is particularly adapted for use with the "Ellis" machine, and reference may be had to the patents granted to Halcolm Ellis, more particularly Patents No. 1,197,276, September 5, 1916, and No. 1,203,863, November 7, 1916. The Ellis printing and punctuating mechanism with which my improvement may be used is set forth in patent to Halcolm Ellis, No. 1,197,277, September 5, 1916.

My invention provides for the blocking or latching of certain ones, or all, of the type sectors to prevent them from being driven against the platen, according to control by the position of the traveling carriage. The mechanism which effects the "split" or the blocking of certain ones, or all, of the type sectors, is under the control of one or more adjustable stops on the carriage, whereby the desired number of type sectors may be blocked according to the number and position of the stops which, in turn, determines the effect of the split in the different columns according to the nature of the work being carried on.

According to the nature of the work, the blocking mechanism for the type sectors may comprise a bail or bar adapted to block all of the type sectors, or, a bail which is cut out or provided with effective and non-effective parts so that certain of the type sectors will be blocked while others will be free to print, or, the bail may be multiple, with its different parts subject to independent control by independent stops on the carriage.

By use of my invention it is possible to determine what is commonly known as an automatic split and a normal printing section, for instance, in work where it is necessary to print in a given column numbers corresponding to a folio, the printing will be automatically punctuated as in number work, to wit, 3,256,798, and when the carriage has been moved to another tabular position, printing will be in terms of United States money, thus, 32,567.98.

When that form of the mechanism is used where a cut out bar or bail is employed, a part of the bar will hold back certain of the type sectors to prevent the printing of ciphers at the right of those orders of type sectors which are free for printing, assuming the carriage is in position where the stop thereon will engage the mechanism to render it effective. This form of the mechanism enables the carrying on of work such as just described.

In many instances it is advantageous to effect a split so that two separate columns may be added in a single accumulator and the total of which column may be printed separately. In that event I employ separate bails or blocking bars, each adapted for setting independently of the other, by independent stops on the carriage. When this form is used, two separate columns may be added on a given accumulator and the totals independently printed, without interference with the use of another accumulator for the accumulation of items printed in another column and for the taking of the totals of said items when desired.

The mechanism enables various kinds of work to be carried on and it is to be understood that the illustrations heretofore given and which appear hereinafter are only a few examples of work that may be carried on.

The invention is susceptible of modification and the disclosure of certain embodiments thereof is, therefore, to be considered as illustrative, instead of in limitation, of the scope of the invention.

In the accompanying drawings:

Figure 1 is a plan view showing one form of the mechanism, together with a part of the rack stop bar of the carriage, and a stop, relatively arranged to render the mechanism operative.

Fig. 2 is a detail front elevation of the

point or stop on the bail, the stop on the carriage being shown in section.

Fig. 3 is a side elevation showing the mechanism applied to the Ellis type of printing sectors, a portion of the frame of the machine being shown, together with the rack stop bar and a stop, the parts being in unlocked position.

Fig. 4 is a view like Fig. 3, the parts being in locked position.

Fig. 5 is a front elevation of another form of the mechanism where two separate bails, each having its own point or stop, are employed.

Fig. 6 is a side elevation of the mechanism of Fig. 5.

Fig. 7 is a detail plan view showing by full and dotted lines, different forms of stops which may be employed on the carriage; and

Fig. 8 is a detail plan view of a bail having wide and narrow parts.

One of the vertical side plates of the printing section of the Ellis machine appears at P^{51}; the group of pivoted, printing arms is shown at P^{52}, and a type sector which is pivoted to one of the arms P^{52} appears at P^{54}, Figs. 3 and 4. In Fig. 5 the dotted lines P^{52} represent the group of nine printing arms which represent nine numerical orders, it being understood that any number of printing arms, corresponding to the rows or banks of keys of the machine, are employed. Arms P^{53}, one for each printing sector, set the printing sectors P^{54} according to the previous setting of the keyboard, when the machine is operated, as explained in Ellis Patent No. 1,197,276, for instance.

The arms P^{52} are provided with fingers *a* to enable them to be held back, locked or blocked by the mechanism of the present invention.

The rack bar C^{91} is carried by the traveling carriage as in the Ellis Patent 1,197,276 and serves to carry any desired number of removable or adjustable stops of which one is shown at 1 in Figs. 1, 3, 4, and appears in a slightly modified form, 1^a, in Fig. 7. It will be understood that while only one stop is illustrated, the bar C^{91} may be provided with as many stops as desired, each being settable to any desired position thereon, to carry out the purposes of the present invention. The stop 1^a, whose tip 1^b is provided with a double bevel on its lower face as shown in Fig. 2, is for the purpose of rendering the "split" mechanism effective when the carriage is in such position that said tip 1^b will engage the appropriate part of the split mechanism.

Referring first to Figs. 1, 3 and 4, arms 2 are secured at 3 to the plates P^{51} for the purpose of supporting the split mechanism in proper relationship to the group of printing arms P^{52}. Suitably pivoted to the arms 2 at 4 is a bail comprising arms 5 and a locking bar 6.

A contractile coil spring 7 connected to a pin 8 on arm 2 and to a pin 9 on arm 5 normally elevates the bail so that the bar 6 will be out of engagement with the fingers *a* on the printing arms P^{52} as shown in Fig. 3 and will not interfere with the operation of any of the arms. One of the arms 5 has an angularly arranged part 5^a which has a point 5^b whose edges converge upwardly. When the point 5^b is engaged by the point 1^b, due to the carriage having assumed the desired position for effecting a nonprinting condition of any or all of the arms P^{52}, according to the form of the bar 6, the bail is depressed, bringing the bar 6 into engagement with the fingers *a*. Consequently as long as the carriage remains in that position so many of the arms P^{52} will be latched or blocked in the manner shown in Fig. 4 as will correspond to the effective part of the bar 6. If that bar has a straight lower edge, as shown by full lines in Figure 1, all of the printing arms P^{52} will be latched. If, however, the bar 6 is provided with a cut out portion, as shown at 6^a, Figure 8, certain of the arms P^{52} will be latched and others will be free. Either form of the bar 6 may be employed. If the cut out form be used, the arms P^{52} which are opposite the cut out part 6^a will print when the machine is put through its cycle of operation and the remaining arms P^{52} to the right of those which are printing will not operate, thereby cutting off or splitting ciphers from the right of the number printed.

In Figures 5 and 6 there is illustrated a form of the invention where the bail is made in two parts, each being adapted for control independently of the other according to the use of an additional stop 1 and its position on the rack stock bar C^{91}.

The mechanism is supported from plates P^{51} by arms which carry at their upper ends the screws 4. By reason of two bails or latching mechanisms being employed, it is preferable to brace the arms 2 by the provision of a yoke 10. Pivotally mounted on the blank portions of the screws 4 are the independent bails 11, 12, the former being longer than the latter, and, if desired, braced against flexing by a supplemental L-shaped piece 13. The bail 11 carries an offset point 14 corresponding to the point 5^a, 5^b. The bail 12 carries a point 15 of similar form. The respective bails 11, 12, are retracted to inoperative position, under normal conditions, by the springs 16, 17, anchored and operating as heretofore described.

Normally the bails 11, 12, are raised and free from engagement with the fingers *a* of the arms P^{52}. According to the arrange-

ment of independent stops corresponding to stops 1 on the bar C^{91} of the carriage, one or the other, or both, or neither of said bails will be operated. This form of the mechanism has the advantage of enabling items in two separate columns to be added in a single accumulator and the total of each column to be printed separately.

My invention may be put to many uses and I only give certain examples of the work of the embodiments hereinbefore described.

The following examples illustrate how the stops may be set on the carriage, and the carriage positioned, to effect cooperation between the stops and cut-out bars or bails in any desired manner.

Referring to the embodiment of the invention shown in Figs. 1, 2, 3, 4, and with the bar cut out as shown at 6^a, a split may be effected according to the following examples:

Example "A"

Folio	Amount
1,245	76.98
1,247	100.00
1,249	1,245.65

Example "B"

District No.	Bank No.	Amount
12	450	47.65
18	472	147.96
19	140	1,246.78

Example "A" is accomplished as follows: A cut out bail 6^a as shown in Fig. 8, is employed that will be effective only on the first and second sectors P^{52}, Fig. 5, beginning at the right side. It is understood, however, that the stop 1, Fig. 1 is arranged on the marginal bar C^{91} to depress the bail 6^a as shown in Fig. 4, prior to the entering of the folio number. The folio number 1,245 is set up on the keyboard in those orders to the left of the 1st and 2nd orders and the machine is then operated. The number 1,245 is printed (but not added) by the use of other mechanisms explained in an earlier Ellis patent namely, No. 1,197,276, dated September 5, 1916. At the completion of printing the folio number, the carriage automatically tabulates or moves to the amount column whereupon the amount of 76.98 is then set up on the keyboard in the ordinary manner and the machine is thereafter operated. The amount of 76.98 is printed and added in either one or both of the two accumulators provided therefor.

The accumulator used for this addition is determined by the selection of a stop that is placed on the bar C^{91} opposite the column that is provided in which the amount is printed (the above stop being more fully explained in earlier Ellis patents). This operation is continued until a total of the various amounts is to be taken which is usually done at the bottom of the same column where the amounts are printed. However, the operation of taking a total need not be limited to this one column as this operation can be performed in any position on the printing surface, although it is not desirable to print this total in the same column that is provided for the folio number.

Example "B" can be accomplished in somewhat the same manner as Example "A". In this case two of the stops 1 shown in Fig. 1, are used. One of the stops is arranged on bar C^{91} so the printing will take place in the column provided for the District No. The other is set to permit the printing to take place in the column arranged for the Bank No. The general operations are very much the same as those required for Example "A" except there are two folio numbers instead of one; therefore, three operations of the machine are required. For instance, number 12 is set up on the keyboard and the machine is operated. After the printing has taken place the carriage automatically tabulates to the "Bank" column where the 450 is set up on the keyboard and the machine is operated. The 450 is printed and the carriage again tabulates to the "Amount" column where the amount is set up and is printed and added.

The mechanism shown in Figs. 5 and 6 may be used for splitting so that items in two adjoining columns can be accumulated on a single accumulator, for instance the "Dr." accumulator of the machine, with the ciphers at the right omitted; and another column may be accumulated on another accumulator, as, for instance, the "Cr." accumulator. To illustrate the use of this embodiment of the mechanism, the two columns whose numbers are carried in the same accumulator and whose totals are printed separately are designated "Dr." and the other column is designated "Cr." The example follows:

Example "C"

Yds.	Pieces	Net weight
Dr.		Cr.
1,324,	123	4,356
1,324,	140	4,356
1,435,	345	2,245
4,083,	608^D	$10,957^C$

In the above Example "C" the item "1,324," is set up on the keyboard and printed and added, the remaining orders of type

sectors being blocked so that ciphers will not be printed to the right. The bail 12 accomplishes this blocking action. After this operation the tabulating key of the machine is pressed and the carriage automatically moves to the "Pieces" column. The number "123" is then set up on the keyboard and printed. Numbers are set up and printed in this fashion until it is desired to take the totals. The carriage is then brought into position to take a sub-total of the "Yds." column. This is then printed as evidenced by the number "4,083,". A sub-total is taken instead of a total because the taking of a total would clear the "Dr." accumulator and as items representing "Pieces" have been accumulated in the right hand section of that accumulator, it is, obviously not desired to eliminate them, but, on the other hand to retain them in the accumulator. The bail 12 locks the arms P^{52} which represents the items in the "Pieces" column and hence when the sub-total of the items in the " Yds " column is printed, no printing occurs in the "Pieces" column.

Having taken the sub-total representing the items in the "Yds." column, the carriage is moved to take the total of the items in the "Pieces" column. Now the bail 11 blocks all arms P^{52} related to the left hand section of the accumulator so that no printing corresponding to the "Yds." column will occur. The total of the "Pieces" column may then be taken. Thus, two columns may be carried in the "Dr." accumulator and another column, for instance, items under "Net weight" may be carried in the Cr." accumulator.

The foregoing actions are, of course, dependent upon proper setting of the stops 1 for engaging the points 14, 15, to render the bails 11, 12, effective when the carriage is in the predetermined column positions.

With the provision of a cut out bar such as shown in Fig. 8, it is possible to hold back either the entire group, or only a predetermined number, of type sector arms P^{52}, according to the form of stop used on the carriage. For instance, by the use of a given stop on the carriage, the bail 6^a will be depressed only far enough to render effective the wider part of the bail to hold back certain type sector arms, the narrower or cut out portion of the bail allowing the remaining arms to operate. On the other hand, if a stop having a deeper point 5^b, (i. e. one which extends down farther) or one which is bent down or inclined, is used, the bail 6^a will be depressed to a greater extent and the cut-out edge will engage those type sector arms which are normally free and retain them against movement.

I claim:

1. In an adding, subtracting, or listing machine having a traveling carriage, the combination with a group of movably mounted printing elements representing different numerical orders, of a locking device operable by the carriage and common to a plurality of predetermined ones of said printing elements and adapted to restrain them against movement when said locking device is set by the carriage.

2. In an adding, subtracting, or listing machine having a traveling carriage, the combination with a group of movably mounted printing elements representing different numerical orders, of a locking bail operable by the carriage and common to a plurality of predetermined ones of said printing elements and adapted to directly engage with and lock them against movement when said bail is set by the carriage.

3. In an adding, subtracting, or listing machine having a traveling carriage, the combination with a group of printing elements representing different numerical orders, of a plurality of locking devices independently operable by the carriage, each locking device being common to a plurality of predetermined ones of said printing elements and adapted to restrain them when said locking device is set.

4. In an adding, subtracting, or listing machine having a traveling carriage, the combination with a group of printing elements representing different numerical orders, of a plurality of locking bails independently operable by the carriage, each locking bail being common to a plurality of predetermined ones of said printing elements and adapted to restrain them when said locking bail is set.

5. In an adding, subtracting, or listing machine having a traveling carriage, the combination with printing means, of a swinging spring retracted bail normally free of the printing means and adapted to directly cooperate with, and lock predetermined orders of said printing means against printing operation when said bail is operated, and a settable stop in the carriage adapted to set the bail in locking position when engaged therewith.

6. In an adding, subtracting, or listing machine having a traveling carriage, the combination with printing means comprising a group of printing elements representing different numerical orders, of means for effecting " splits " in the printing means, comprising a plurality of independent devices each adapted to act independently of the other and to directly engage with, and lock, a plurality of predetermined ones of said printing elements and independent means operated by the carriage adapted to actuate the respective locking devices aforesaid.

7. In an adding, subtracting, or listing machine having a traveling carriage, the

combination with printing means comprising a group of printing elements representing different numerical orders, of means for effecting "splits" in the printing means, comprising a plurality of independent devices, each device being common to, and directly engageable with, a plurality of predetermined ones of said printing elements and adapted to lock them when set, each of said locking devices being spring actuated so that it will remain normally in unlocked position independently of the other locking device, and controllable stops on the carriage adapted for independent setting and independent engagement with the aforesaid devices for the purpose of setting them independently in locking position according to the position of said stops when the carriage is in its different positions.

In testimony whereof I affix my signature.

FREDERICK W. BERNAU.