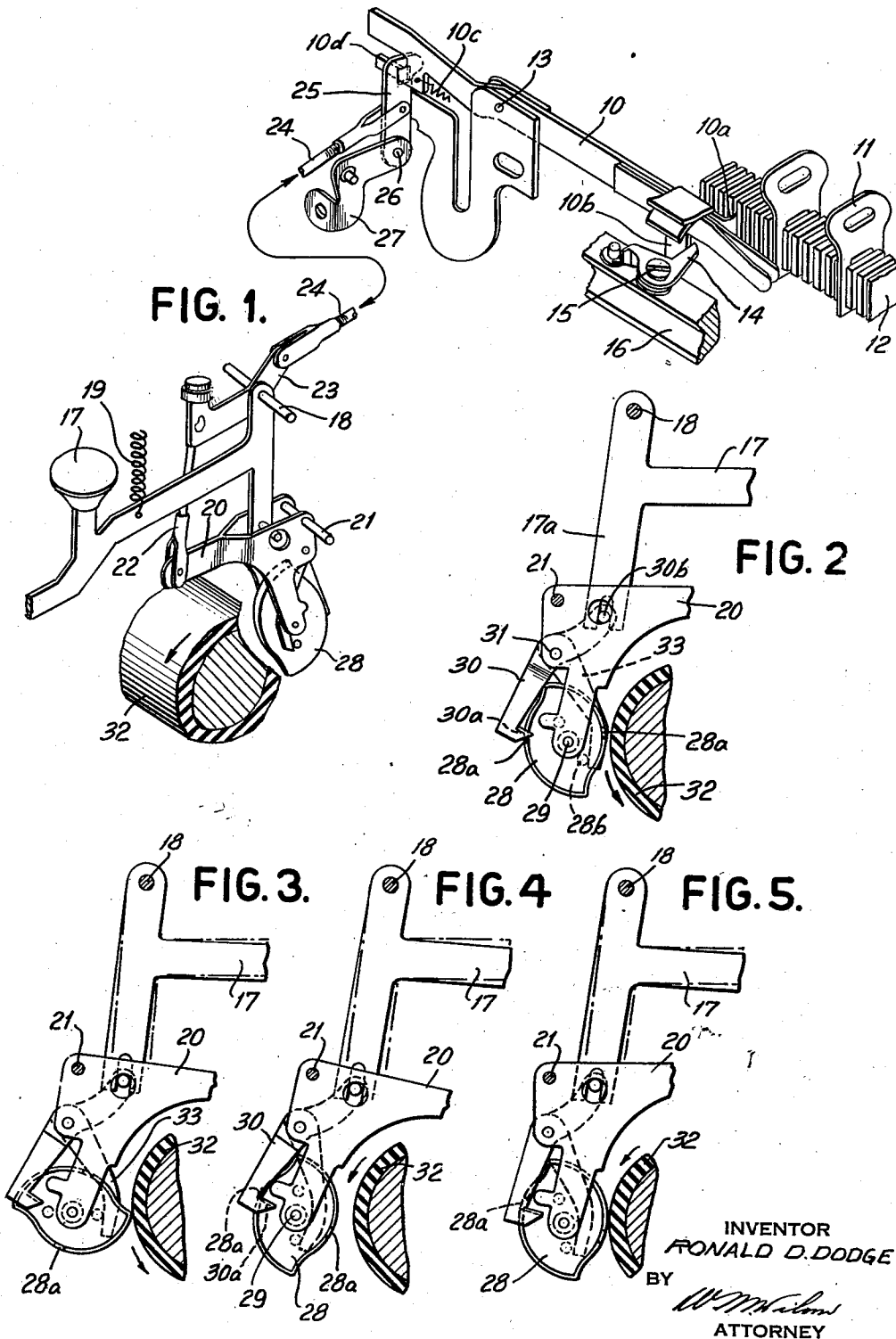


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POWER OPERATED SKIP TABULATING MECHANISM
FOR TYPEWRITING MACHINES
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POWER-OPERATED SKIP TABULATING
MECHANISM FOR TYPEWRITING MA-
CHINES

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This invention relates to typewriting machines. The primary object of the present invention is to provide an improved tabulating mechanism for typewriting machines.

An object is to provide a tabulating mechanism capable of functioning automatically under certain special conditions to skip the column at which the carriage would automatically be positioned and stop in the next succeeding column.

An object is to provide an automatic column skipping mechanism suitable for use in typing certain kinds of work sheets, such as invoices for instance.

An object is to provide a tabulating mechanism which is controlled by a key in such a manner that the manipulation of the key in one manner causes the carriage to move to a particular column and, when the key is operated in another manner, causes the carriage to skip this column and move to a succeeding column.

An object is to provide a tabulating mechanism which moves to one column when the tabulating key is momentarily depressed and skips said column and moves to another column when the tabulating key is held depressed a material length of time.

Other objects of the invention will be pointed out 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 shows a perspective view of a power operated tabulating mechanism embodying the present invention.

Fig. 2 is a detail view on a large scale showing the power operating device in normal or untripped position with the tabulating key in normal position.

Fig. 3 is a view similar to Fig. 2 showing the power device in a completely operated position with the key held depressed.

Fig. 4 is a view similar to Fig. 2 but shows the power device held in a fully operated position while tabulating movement of the carriage is taking place with the key held depressed.

Fig. 5 is a view showing the position assumed by the power device after the tabulating mechanism has been released with the key held depressed but before the second operation of the tabulating mechanism takes place automatically.

In Fig. 1 there is shown the power operated tabulating mechanism of the well known "Elec-

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tronic," which mechanism is constructed according to the disclosure of Patent No. 1,935,436.

The tabulating mechanism includes a tabular lever 10 having a tooth 10a functioning as a counterstop. This tooth cooperates with the usual tabular column stop 11 carried by the column stop bar 12 which is usually mounted in the carriage for movement therewith. The tabular lever is pivotally mounted at 13 so as to be capable of limited rocking movement in a horizontal plane so as to thrust the tooth 10a into the path of the column stop 11. When lever 10 is actuated in this fashion, a latch 14, pivoted at 15 on the rear rail 16 supporting the carriage, snaps behind a lug 10b on the tabular lever 10 and retains the tabular lever 10 in position with the lug 10a in the path of the column stop 11. Through the medium of other instrumentalities, not shown but well known in the art, the usual carriage escapement is released, allowing the carriage to run free, thus carrying the bar 12 to the left (Fig. 1) until the column stop 11 strikes the tooth 10a. As well known in the art, the final movement of the column stop pushes the tabular lever 10 far enough to the left to release it from the latch and permit restoration of the tabular lever 10 to the position of Fig. 1 by a spring 10c.

So far as the mechanism just described is concerned, it functions exactly as in the prior art; consequently, this mechanism will not be described in greater detail herein. The main point to be kept in mind in order to understand the operation of the present invention is that while the carriage is moved to a new columnar position, the lever 10 is held outwardly by the latch 14 and thereby any parts connected to the lever 10 will similarly be held in a fully operated position.

The lever 10 is operated by power mechanism under control of the usual tabulating key 17 which is pivoted on the fulcrum wire 18 supporting the other keys of the keyboard. The key 17 is held in its normal position by the usual spring 19. The key 17 controls a key unit 20 which is pivoted on the fulcrum wire 21 serving as a pivot for the other cam units in the machine which operate the type bar and other instrumentalities of the typewriter. This cam unit 20 is connected by a link 22 to a lever 23 pivoted on a fulcrum wire 18. Lever 23 is connected by a link 24 to a rock arm 25 pivoted at 26 to a lever 27 which is part of the usual equipment of the machine and which remains stationary while the operator is typing upon a work sheet carried by the carriage.

Fig. 2 shows the normal position of the cam

unit in which the tabulating mechanism is inactive with tabular lever 10 in the retracted position shown in Fig. 1. The cam unit 20, with reference to Fig. 2, is provided with a double lobe cam 28 which is rotatably mounted on a pin 29 carried by the frame of the cam unit. This cam 28 is constructed in the usual way and has the usual pair of lugs 28a located on diametrically opposite sides of the pin 29. Normally one or the other of these lugs 28a engages the underside of a lug 30a formed in a trip lever 30 of usual form pivoted at 31 in the frame of the cam unit and having a pin 30b in a slot formed in an extension 17a of the tabular key 17. This lever 30 prevents the cam 28 from rotating on the pin 29 and thereby prevents the cam 28 from rotating into engagement with the usual power roller 32 which rotates continually while the machine is in use.

Ordinarily the lever 30 would be provided with two lugs like 30a, one of which is formed in the end of the lever 30 below and to the left of the lug 30a so as to prevent repeating of the cam unit when the key is held down so as to limit the operation of the tabulating mechanism to once for each key depression. In the present case, the lug which would otherwise be provided as described, is omitted or cut off so as to permit the cam unit to repeat as desired under the special conditions to be explained hereinafter.

The left-hand end of the tabular lever 10 is slotted to provide a finger 10d which projects loosely through a rectangular hole in the rock arm 25 whereby the arm 25 and lever 10 are compelled to follow each other's movements.

The operation of the mechanism so far described will now be explained in detail, first referring to the problem which the mechanism is designed to solve.

In the typing of bills or invoices of certain kinds, such as the small invoices which are prepared by telephone companies listing the places called by the subscriber, it is necessary to list the untaxed items in one column and the taxed items in another column in order to segregate one from the other for the purpose of computing the tax which is a certain percentage on all calls over a stated amount. These bills have two amount columns which usually are side by side at the right-hand side of the invoice form and the operator of the machine will write an amount in one or the other of these columns but not in both according to whether the item is a taxed or a non-taxed item, the non-taxed items usually being placed in the first column and the taxed items in the second or right-hand column. As a large percentage of the items may be tax items, it is necessary for the operator, when using an ordinary machine, to operate the tabulating key twice in order to position the carriage in the tax column. Where there are a great many calls to be listed on a sheet, this represents a great deal of wasted time and not inconsiderable additional fatigue of the operator. To avoid this, it is desired to automatically skip the first column and proceed to the next column as a consequence of a single depression of the key. There also remains the desirability of moving the carriage to the first column with a single key depression. This difficulty is avoided by making the cam 21 a repeating cam and connecting the cam unit to the tabular lever 10 so that both the cam unit and the tabular lever must follow each other's movements instead of the tabular lever being more or less independent of the restoring move-

ment of the cam unit as in the ordinary construction of a power operated typewriter of this type. This makes it possible to depress the key momentarily and effect a single operation of the cam unit when it is desired to write in the first column and to hold the key down long enough for the cam 28a to complete half revolution and start the second half revolution necessary to tabulate the carriage to the tax column. The manner in which this result is accomplished will now be made clear.

It will be assumed that the operator wishes to write in the first or non-tax item column and accordingly depresses the tabulating key 17 once. A momentary depression of the key, with reference to Fig. 2, rocks the key 17 clockwise and the trip lever 30 counterclockwise thereby disengaging the lug 30a from the lug 28a. This permits the usual spring actuated lever 33 in the cam unit to rotate the cam 28 clockwise by cooperation with a pin 28b, of which each cam unit has two, as well known, and thereby enables the power roller 32 to rotate the cam 28a until the second lug 28a strikes lug 30a. Rotation of the cam 28a causes cam unit 20 to rock clockwise and thereby renders the tabulating mechanism effective by transmitting motion, through the link 22, lever 23, and link 24, to the arm 25, rocking the latter counterclockwise in Fig. 1 and rocking the tabular lever 10 horizontally as aforesaid to place the lug 10a in the path of the column stop 11 in the usual way, at the same time releasing the carriage escapement to permit the carriage to run free.

The inertia of the cam 28a enables the latter to move far enough to enable the spring actuated arm 33 to move the cam 28a to the position of Fig. 2 with respect to the cam frame. By reason of the fact that the frame of cam unit 20 is connected to the tabular lever 10 so as to be compelled to follow its movements, the cam unit will be held in the position of Fig. 4 due to the fact that latch 14 has become effective to hold the lug 10a in the path of the tabular stop. Thus, the cam unit 20 cannot be restored until the carriage has moved to the first tax column and released the tabular lever 10 in the manner described above, the mechanism functioning in this respect as it ordinarily does in a machine of this type. Since the key has been released immediately, it remains in the dotted line position of Fig. 4 but holding the trip lever 30 with the lug 30a in the path of the second lug 28a. Thus, when the cam 28a completes its movement under the stimulus of spring arm 33, the second lug 28a engages the lug 30 and prevents release of the cam unit for a second operation. When the tabular lever 10 is released automatically at the end of the tabulating movement to the tax column, the cam unit 20 will merely be restored by spring 10c to the position of Fig. 2.

Now let it be assumed that the operator wishes to write a taxed item and thereby desires to skip the first or non-tax column. This result is obtained by depressing the tabulating key 17 and holding it down until the carriage starts to move toward the non-tax position. This causes the tabulating mechanism to operate as described above to tabulate the carriage to the first column. Since the key is still held down, the trip lever 30 is held in the position of Fig. 4 with lug 30a out of the path of the second lug 28a, with the result that the cam 28a is moved a little beyond its former position by spring arm 33 so that the second lug 28a passes above the level of the lug 30a

and, for the moment, stops as in Fig. 4. As soon as the operator sees that the carriage has stopped or hesitated momentarily in the first tax column the tabular key may be released. At this point the cam unit 20 restores to the position of Fig. 5 in which the cam 28a engages the power roller 32 and is again operated as before so that the tabulating mechanism is operated a second time and, if the key is still held depressed long enough, a third time. It is thus possible to use the mechanism to skip as many columns as desired, although in the illustrative case it is only necessary to skip once.

While the operation of the machine has been described above as though the mechanism operated in very definite steps when skipping columns, the operation of the mechanism is so fast that it requires only a little more than hesitation of the finger on the tabulating key to cause the carriage to skip the non-tax column. Thus, in actual fact the carriage appears to be moving almost continuously in skipping the non-tax column and the only apparent difference in the operation may be a momentary hesitation of the carriage when it arrives in the tax column due to the short lapse of time required for momentary withdrawal of the tabular lever 10 and its immediate reoperation by the cam unit.

While there have been shown and described and pointed out the fundamental novel features of the invention, as applied to a preferred embodiment, it will be understood that various omissions 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 combination with a carriage, tabulating mechanism including a column stop and a counter stop, one of which stops is movable into the path of the other, and including means to hold the movable stop in the path of the other during a tabulating movement of the carriage, said means being releasable by engagement of the column stop and counter stop; power mechanism for moving the movable stop into the path of the other, including a power device connected to the movable stop and held in an operated position by the movable stop while the carriage is being tabulated; and a key for controlling said power device, said power device including an element actuated by the key for causing a single operation of the power device and preventing a second operation thereof when said key is only momentarily depressed, and for permitting a second operation of the power device when said key is held depressed long enough to permit release and return of said power device from operated position following the said single operation thereof.

2. In combination with a tabulating mechanism having a column stop and a counter stop, one of which stops is movable into the path of the other to determine a columnar position of the carriage, and including means releasable in response to engagement of the column stop and counter stop to hold the movable stop in its moved position; power mechanism for moving the movable stop including a main power actuator and a device engageable with the actuator and connected to said movable stop so as to be held in

a position disengaged from the power actuator while the movable stop is held in the path of the column stop; and a key for causing the engagement of the power device with the actuator, said key controlling said power device to cause the latter to reengage the power actuator to effect a second operation of the tabulating mechanism when the key is held depressed until the release and return of said power device from disengaged position, and to cause only a single operation of the power device and tabulating mechanism when the key is momentarily depressed.

3. In combination with a tabulating mechanism comprising a column stop and a counter stop, one of said stops being movable into the path of the other to determine a columnar position, and including means to hold the movable stop in its moved position; a power roller; a cam unit connected to said movable stop and engageable with the power roller to move said movable stop, said cam unit being held in an operated position, disengaged from the power roller, by the holding means for the movable stop to prevent a second operation of the cam unit by the power roller before the engagement between the column stop and the counter stop occurs, said holding means being releasable by said engagement to permit restoration of said movable stop and said cam unit together; and manipulative means for operatively engaging said cam unit with said power roller, said cam unit being of the repeating type so that a momentary operation of the manipulative means causes a single operation of the tabulating mechanism by said cam unit while a sustained operation of the manipulative means enables said cam unit to be automatically operated a second time by the power roller when the cam unit is released.

4. In combination with a tabulating mechanism including a plurality of column stops, each determining a different columnar position, and a counter stop, one of said stops being movable into the path of the other to determine different columnar positions; means releasable by engagement between a column stop and the counter stop for holding the movable stop in its moved position, a power device for operating the movable stop, including a member connected to the movable stop and actuated by power from an inoperative to an operative position in which it is held by said holding means until the latter is released; and a key for controlling said power device, said key when momentarily depressed causing only a single operation of the power device and the tabulating mechanism to cause one of said column stops to be effective and being operative when held depressed until the release and return of said member from operative position to control said member to cause the latter to be operated a second time automatically to render another column stop effective.

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