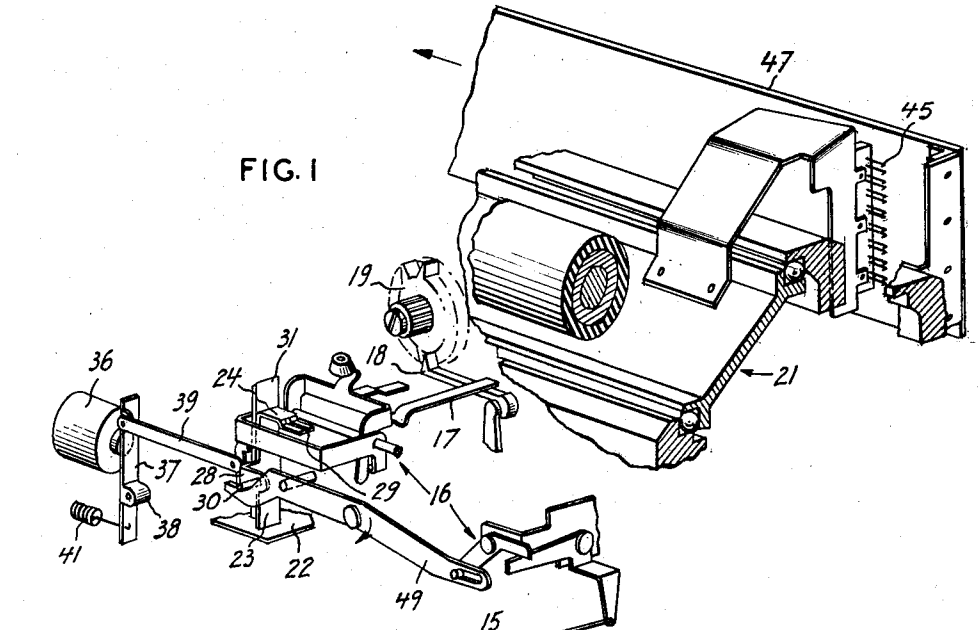
April 30, 1963 R. E. SEYMOUR ETAL 3,087,594

ELECTRICALLY CONTROLLED CARRIAGE TABULATING MECHANISM

Filed June 12, 1961 2 Sheets-Sheet 1

FIG. 1



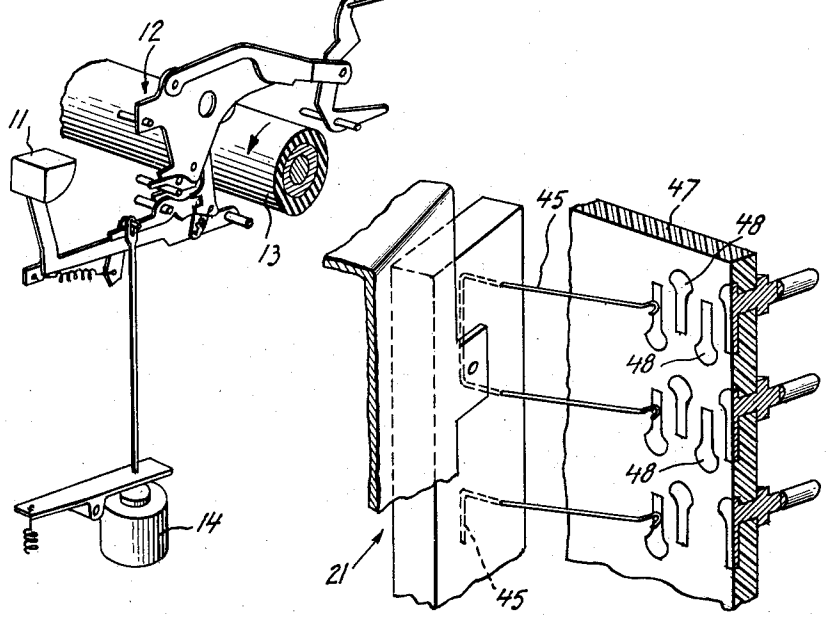


FIG. 6

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FIG. 2

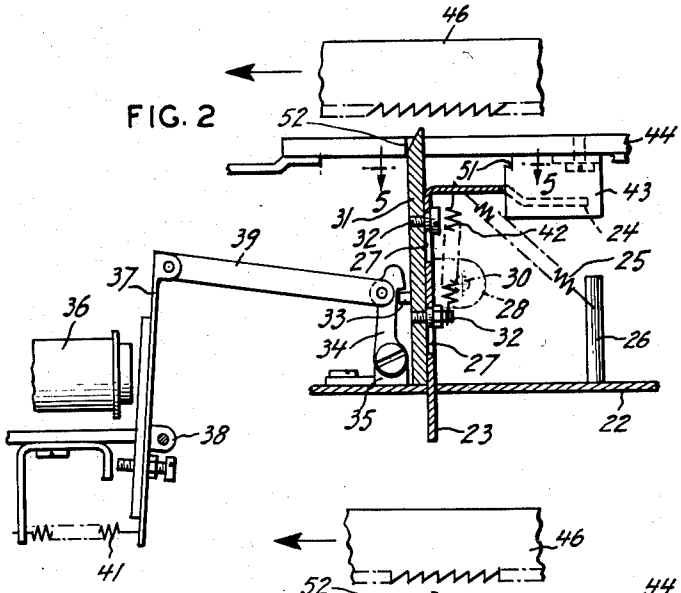


FIG. 3

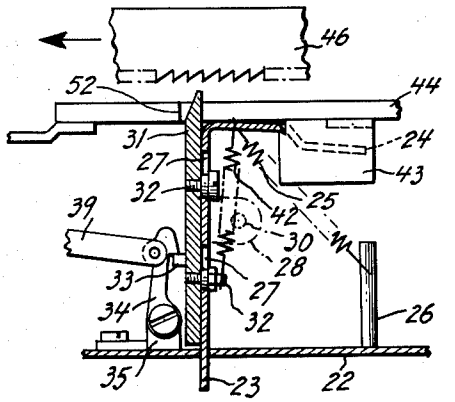


FIG. 5

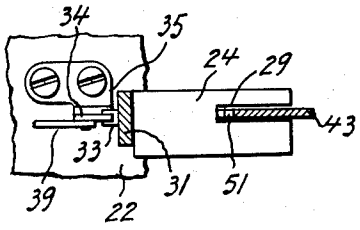
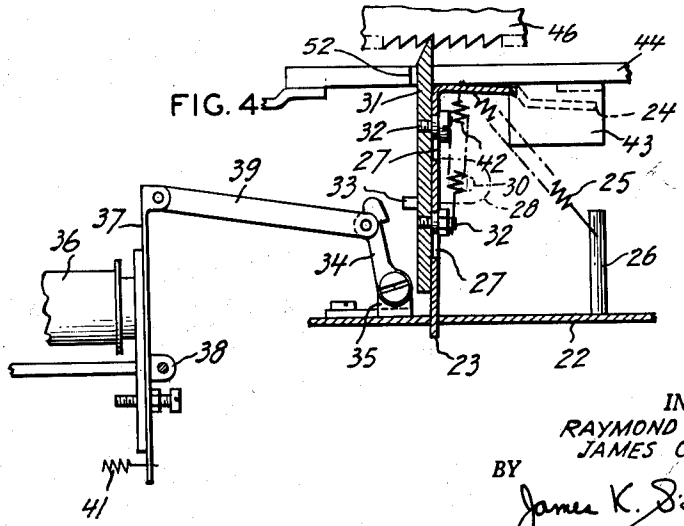


FIG. 4



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3,087,594

ELECTRICALLY CONTROLLED CARRIAGE TABULATING MECHANISM

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Filed June 12, 1961, Ser. No. 116,415
8 Claims. (Cl. 197—177)

This invention relates generally to an electrically controlled carriage tabulating mechanism for a power operated typewriter, calculator or other business machines. More specifically, the invention relates to means for providing electrically controlled tabulation to produce any desired format, formats being set up in electrical plugboards, with the plugboards readily interchangeable to provide any number of tabulation formats.

Typewriters today are being used to perform many functions in the automatic processing of information. Usually for information to be readily handled by a data processing machine, it is necessary that the information be properly located. Also, in many reports, particularly statistical reports, it is necessary that the information be in columnar format. Furthermore, it is quite often the case that many different formats will be required for data processing or reports.

One method of converting information from a typewriter to a form for automatic machine handling is by having the typewriter automatically produce encoded paper tape from the information put into the typewriter by an operator. In these instances, location of the information is of prime concern, and for different types of information different formats may be required.

Heretofore, in order to set a format in a typewriter tabulating mechanism, it was necessary to clear the tabulation stops and reset the desired ones individually. In changing formats, much unnecessary time was consumed. Once a format was cleared from the machine, it could only be obtained again by individually setting the tabulation stops.

Accordingly, it is an object of this invention to provide a power operated typewriter or similar machine with a tabulating device which is electrically operated.

Another object of this invention is to provide means for setting a tabulation format.

A still further object of this invention is to provide means whereby the format may be readily switched to one of any desired number of preselected formats.

Still other objects and advantages of the invention will be apparent from the specification.

Generally speaking, in accordance with this invention, a power operated typewriter is provided with an electrically controlled tabulating mechanism which will respond to any preselected format. When the tabulation key is depressed, the carriage is released and travels freely. At the same time, a carriage stopping mechanism is spring cocked prior to firing. When the carriage has travelled a chosen amount, a circuit is completed which causes the carriage stopping mechanism to fire and be interposed in a rack on the carriage to stop the carriage at the desired letter space position.

For a better understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, and its scope will be pointed out with particularity in the appended claims.

In the drawing:

FIG. 1 shows, in perspective, the interrelation between the tabulation key, the power mechanism, the carriage stopping mechanism, the carriage and the plugboard associated therewith, the view showing only those parts

necessary for an understanding of the invention, with some of the parts shown in section.

FIG. 2 is a partial sectional view showing the carriage stopping mechanism at the rest position.

FIG. 3 is a view similar to FIG. 2 showing the carriage stopping mechanism in the cocked position.

FIG. 4 is a view similar to FIG. 2 showing the carriage stopping mechanism after it has fired, with the mechanism interposed in the carriage rack.

FIG. 5 is a sectional view taken through line 5—5 of FIG. 2 showing the means for holding the mechanism in the cocked position.

FIG. 6 is a perspective view of the plugboard and the contacts mounted to the carriage for traversing the plugboard.

Referring now to FIG. 1, a tabulation key **11**, positioned in a typewriter keyboard (not shown) is mounted at the extremity of a power mechanism **12** adjacent to a power roll **13**, which constantly rotates in the direction shown. Key **11** may be depressed manually or by means of a solenoid **14** to commence the tabulating operation. The power mechanism **12** is of a type well known in the art and may be constructed, for example, as disclosed in Patent No. 2,737,279 issued to F. W. Schremp on March 6, 1956. Depression of tabulation key **11** causes power mechanism **12** to cooperate with power roll **13** to pull a rod **15** in the direction shown by the arrow. Rod **15** is attached to a tabulating mechanism **16** whose construction is also well known in the art. One type of tabulating mechanism is disclosed in FIG. 17 and described in columns 11 and 12 of Patent No. 2,874,369 issued to A. Blain et al. on February 17, 1959. The movement of rod **15** is transmitted through tabulating mechanism **16** and depresses an arm **17** which thereby frees a dog **18** from an escapement wheel **19** allowing the carriage **21** to move in the letter space or tabulating direction until the mechanism hereinafter described stops the carriage.

Referring now to FIG. 2, a base member **22** mounted within the typewriter has a sliding member **23** projecting vertically therethrough. Sliding member **23** is substantially L-shaped having a hook leg **24** at the top forming the horizontal portion of the member. Sliding member **23** is urged downwardly and to the right by means of the tension of a spring **25** attached between the hook leg **24** and a post **26** mounted to base member **22**. The vertical portion of sliding member **23** has two elongated slots **27** therein, said slots being elongated in the vertical direction and positioned one above the other. Projecting from sliding member **23** is an ear **28** (shown in phantom) having a pin **30** projecting therefrom. Ear **28** is more clearly shown in FIG. 1.

An interposing bar **31** is mounted vertically, adjacent sliding member **23** with the bottom of the bar resting on base member **22**. Two screws **32** are secured to interposing bar **31** through the elongated slots **27** to maintain sliding contact between sliding member **23** and interposing bar **31**. Also, projecting from interposing bar **31** is an ear **33**.

A latch **34** is pivotally mounted to bracket **35** which is attached to base member **22**. An actuator **36**, such as an electromagnet, is positioned within the typewriter to attract an armature **37** pivotally mounted at **38** to the typewriter frame. An arm **39** connects armature **37** to latch **34**. A spring **41** attached to armature **37** yieldably holds latch **34** in contact with ear **33**. Another spring **42** is attached between one of screws **32** and hook leg **24**. Spring **42** urges interposing bar **31** upwards in relation to sliding member **23**. A hook plate **43** having a hook segment **51** therein is attached to an upper frame member **44**. As seen in FIG. 5, hook plate **43** passes through a slot **29** in hook leg **24** so that the hook leg may be hooked

over hook segment 51. The carriage 21 (FIG. 1) carries a rack 46 having saw teeth along its edge. Rack 46 passes over interposing bar 31 during the letter space or tabulation movement of the carriage. The direction of carriage travel is indicated by the arrow in FIGS. 1 and 2.

Referring now to FIGS. 1 and 6, carriage 21 has one or more wiper contact sets 45 mounted thereon. A plug board 47 having horizontal rows of plug hole contacts 48 therein, the number of contacts in each horizontal row equal to the number of letter space positions of the typewriting machine, is mounted stationary with relation to carriage 21. A wiper contact set 45 passes over and makes contact with two adjacent rows of plug hole contacts 48 when the carriage moves in the letter space direction, selected pairs of said contacts being plugged in accordance with desired carriage escapment positions to partially establish a control circuit to the actuator 36.

To now describe the operation of the tabulating device, reference is again had to FIG. 1. When tabulation key 11 is depressed, power mechanism 12 cooperating with power roll 13 pulls rod 15 in the direction shown and, through the tabulating mechanism described in aforementioned Patent No. 2,874,369, removes dog 18 from escapement wheel 19 to permit carriage 21 to travel freely in the letter space or tabulation direction. An arm 49, which forms part of tabulating mechanism 16, is caused to rotate in a clockwise direction. Arm 49 engages pin 30 projecting from ear 28 and moves sliding member 23 in the vertical direction.

Referring now to FIG. 2, elongated slots 27 permit sliding member 23 to move vertically with relation to interposing bar 31 which is held securely by latch 34. As sliding member 23 rises vertically, hook plate 43 rides in slot 29 in the sliding member (FIG. 5). Spring 25 causes sliding member 23 to turn slightly clockwise as it rises. When hook leg 24 reaches hook segment 51 of hook plate 43, the sliding member turns an additional clockwise amount and becomes hooked on the hook plate as shown in FIG. 3.

The upward travel of sliding member 23 tensions spring 42, exerting an upward force on interposing bar 31; however, the interposing bar is held down by latch 34. Although sliding member 23 pulled interposing bar 31 with it as it turned slightly clockwise, such movement was not sufficient to remove ear 33 from engagement with latch 34. At this point the interposing bar 31 is cocked and ready for firing.

During the cocking of the device, carriage 21 moves to the left and a wiper contact set 45 scans plugboard 47 (FIGS. 1 and 6). When a pair of plugged plug hole contacts 48 is contacted by a wiper contact set 45, a circuit (not shown) is closed which sends current through actuator 36. Referring now to FIG. 4, when actuator 36 is energized it attracts armature 37 which removes latch 34 from engagement with ear 33. This allows interposing bar 31 to rise rapidly under the force exerted by spring 42, and interpose itself between two of the teeth in rack 46. Further movement of the carriage to the left moves interposing bar 31 in a counterclockwise direction until it abuts a fixed stop 52 on plate 44, thereby arresting carriage travel. The counterclockwise movement of the interposing bar and associated sliding member 23 unhooks leg 24 from hook plate 43. When carriage travel in the letter spaced direction has been arrested, the carriage rebounds slightly to the right and releases pressure from interposing bar 31, thereby allowing the interposing bar and the sliding plate to be returned to the rest position shown in FIG. 2 under the tension of spring 25. At the same time, dog 18 is inserted in escapement wheel 19 (FIG. 1), as described in aforementioned patent No. 2,874,369, to hold the carriage in the selected position. Wiper contact set 45 moves beyond contact with the plugged pair of plug hole contacts 48 in plugboard 47 before the carriage travel is arrested, deactivating actuator 36 and allowing latch 34 to engage ear 33 when the interposing bar returns to the rest position. The mechanism is ready for the next tabulation operation.

The plugboard 47 is positioned in relation to carriage 21 so that the carriage may be tabulated to any letter space position merely by plugging the proper pair of plug hole contacts 48 in adjacent rows which will be contacted by a wiper contact set 45.

From the foregoing it is evident that any number of tabulation formats may be produced by the proper plugboard settings. Furthermore, if the carriage carries a multiplicity of contact sets contacting a multiplicity of adjacent plug hole rows, many different formats may be set up in the plugboard, the format desired being readily selected by switching the circuit from one pair of plug hole contact rows to another pair of plug hole contact rows. It is also evident that many plugboards having formats set up therein may be quickly interchanged to provide any desired format.

This application has particularly pointed out and distinctly claims the part, improvement, or combination which is claimed as the invention or discovery, and there has been explained the principles thereof and the best mode contemplated for applying those principles so as to distinguish the invention from other inventions.

While there has been shown and described a preferred embodiment of the invention, it will be understood that modifications may be made without departing from the spirit and scope thereof, as will be clear to those skilled in the art.

What is claimed is:

1. In a business machine having a movable carriage normally urged in the letter space direction and a carriage release mechanism for allowing free travel of said carriage, the combination including a rack mounted on said carriage, an interposer spring biased to engage with said rack for stopping said carriage, cocking means controlled by said carriage release mechanism and including a fixed hook member for placing said interposer under spring bias in a ready position, firing control means for releasing said interposer for spring driven advance from the ready position to a position of engagement with said rack, and a circuit operating said firing control means in response to chosen amounts of travel of said carriage.

2. The invention according to claim 1 wherein said cocking means comprises a slide slidably attached to said interposer and a spring attached between said interposer and said slide, said slide being shifted sufficiently by said carriage release mechanism to be hooked on said hook, said spring thereby being tensioned to exert a force on said interposer urging said interposer in the direction for engaging with said rack.

3. The invention according to claim 1 wherein said firing control means comprises a latch for yieldably securing said interposer and an electrically controlled actuator cooperating with said circuit to release said interposer.

4. The invention according to claim 1 wherein said circuit includes a plugboard mounted stationary with relation to said carriage and contacts mounted on said carriage and cooperating with said plugboard for operating said firing control means.

5. The combination including a frame, a sliding member passing through said frame, an interposing bar slidably attached to said sliding member, a hook plate attached to said frame, said sliding member adapted to be hooked by said hook plate, a restoring spring attached between said sliding member and said frame, a second spring attached between said sliding member and said interposing bar, a latch pivotally attached to said frame and positioned to prevent movement of said interposing bar, and electrically controlled means attached to said latch for selectively releasing said interposing bar.

6. A carriage tabulating control mechanism comprising in combination, a carriage, an operating device for commencing tabulation, a power mechanism actuated by said

operating device, interposer means conditoned by said power mechanism for spring driven release, a rack attached to said carriage and positioned opposite said interposer means, and an electrically controlled latch cooperating with said interposer means for releasing same to engage said rack to halt carriage tabulation, said interposer means comprising a slide, a hook cooperating with said slide, an interposing bar slidably cooperating with said slide and yieldably secured by said latch, and a spring attached between said interposing bar and said slide, said slide being shifted sufficiently by said power mechanism to be engaged by said hook, said spring thereby being tensioned to exert a force on said interposing bar, said interposing bar being acted upon by said force to engage said rack when said latch is electrically controlled to release said interposing bar.

7. The invention according to claim 6 and further including a circuit for operating said electrically controlled

latch, said circuit including a plugboard mounted stationary with relation to said carriage and contacts mounted on said carriage and cooperating with said plugboard for closing said circuit to operate said electrically controlled latch upon chosen amounts of carriage travel.

8. The invention according to claim 6 and further including restoring means cooperating with said interposer means for removing said interposing bar from engagement with said rack.

References Cited in the file of this patent

UNITED STATES PATENTS

2,558,413	Becker	June 26, 1951
2,818,961	Toeppen	Jan. 7, 1958
2,885,052	Toggenburger	May 5, 1959
2,988,193	Donofrio et al.	June 13, 1961