

Feb. 6, 1934.

C. W. CRUMRINE

1,945,847

TYPEWRITING MACHINE

Filed June 26, 1931

2 Sheets-Sheet 1

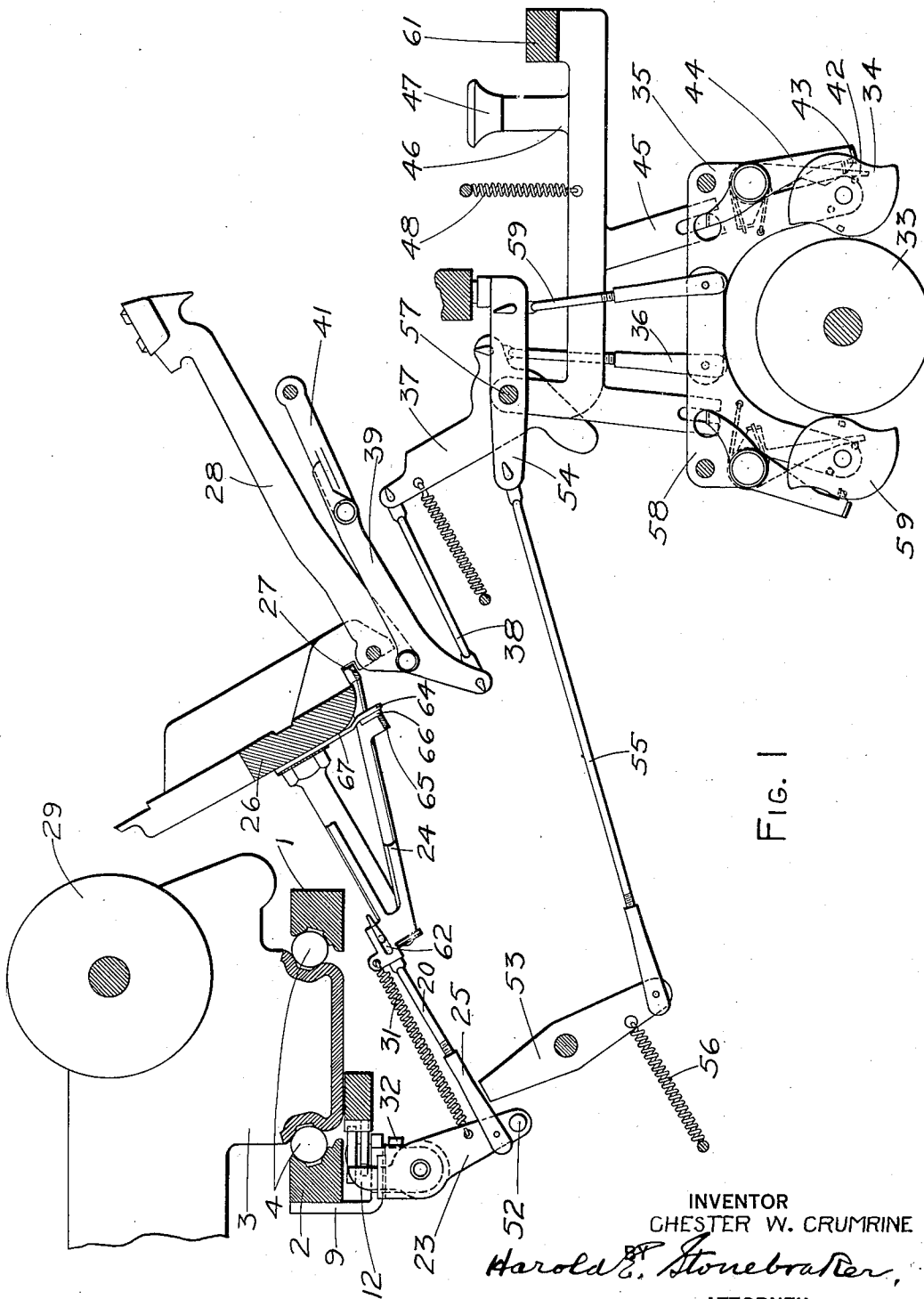


FIG. 1

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2 Sheets-Sheet 2

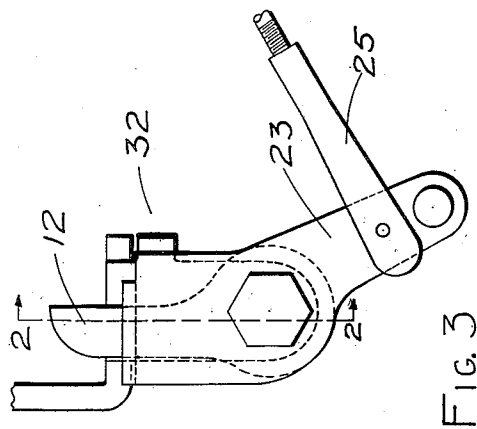


FIG. 3

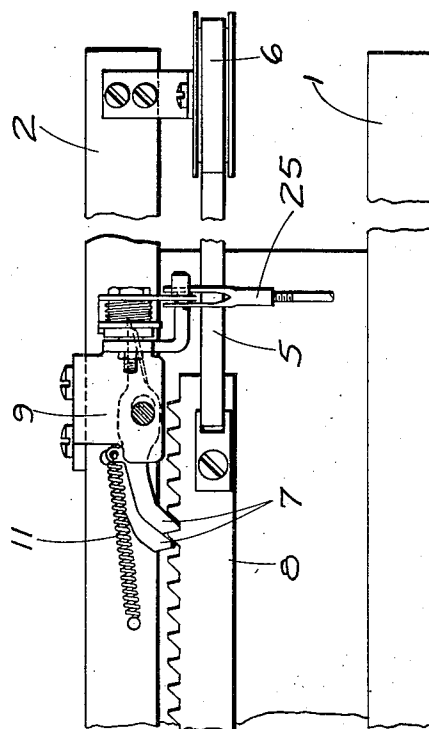


FIG. 4

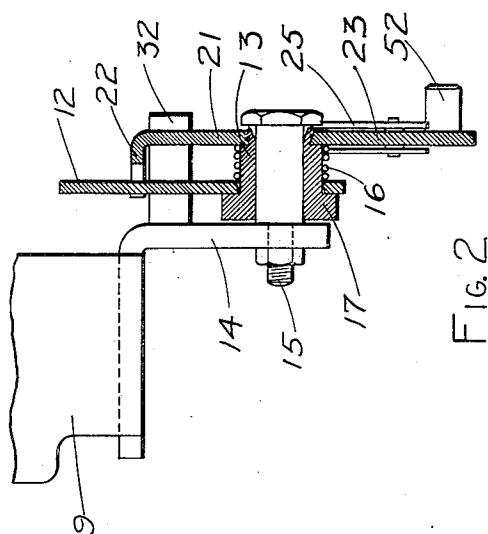


FIG. 2

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UNITED STATES PATENT OFFICE

1,945,847

TYPEWRITING MACHINE

Chester W. Crumrine, Rochester, N. Y., assignor
to Electromatic Typewriters, Inc., Rochester,
N. Y., a corporation of New York

Application June 26, 1931. Serial No. 546,965

7 Claims. (Cl. 197—85)

This invention relates to improvements in typewriting machines, and particularly to improvements in escapement devices which control the movement of the carriage for letter and word spacing.

The principal object of the invention is the provision of improved means for actuating the escapement dogs, which is capable of more rapid actuation and less liable to get out of order.

10 Another object of the invention is the provision of an arm for actuating the escapement dogs which has a limited movement in the direction of movement of the carriage, which arm is actuated by means controlled automatically by the universal bar or manually by the space bar.

15 Another object of the invention is the provision of means connecting the universal bar with the escapement pawl actuating devices which permits said devices to operate independently of the universal bar.

20 Still another object of the invention is the provision of a resilient stop for the universal bar to avoid the noise of impact.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claims at the end of the specification.

30 In the drawings:

Fig. 1 is a transverse section of a well known type of power driven typewriting machine illustrating one possible embodiment of the invention;

35 Fig. 2 is an enlarged fragmentary view partly in section of devices for actuating the escapement pawls;

Fig. 3 is a side elevation of the same, and

40 Fig. 4 is an inverted plan view of the escapement devices.

Similar reference numerals refer to the same part in all views of the drawings. The invention is illustrated applied to a power driven typewriting machine of well known type, although it will be understood that it is equally applicable to other types of typewriting machines. Said machine comprises a frame having front and rear guide rails 1 and 2 in which a carriage 3 is movably mounted on anti-friction bearings 4 for movement transversely of the frame for letter and word spacing. A suitable flexible tape 5 connects the carriage with the usual spring drum 6 for resiliently moving the carriage in letter space direction, which movement is controlled by escapement devices comprising a pair of pawls 7

mounted on the frame and cooperating with a rack 8 on the carriage. The pawls 7 are provided with elongated openings or slots whereby they are pivotally mounted on a bracket 9 secured to the guide rail to have a limited bodily movement thereon in the direction of the movement of the carriage. Springs 11 connect the pawls with a fixed part and tend to resiliently move them over the teeth of the rack and swing them into engagement therewith. One of the pawls is slightly longer than the other so that only one engages a tooth of the rack at a time to hold the carriage against the action of its spring drum. The carriage moves the operative pawl with it against the resiliency of the springs 11 and projects its other end past the end of the other pawl and into the path of an arm 12 mounted on a bearing 13 secured to an arm 14 projecting from the bracket 9 by means of a bolt 15.

A spring 16 resiliently moves the arm into engagement with a flange 17 on the bearing. When the arm 12 is moved toward the pawls, it engages that pawl which engages the rack and is projected into its path and swings it out of engagement with the rack to release the carriage to move under the action of its spring drum until the rack engages the other pawl and moves it into engagement with its pivot to stop the carriage at the end of a letter space movement. This operation permits the spring 11 to retract the first pawl from the path of the arm 12 and the second pawl is projected into its path, so that on the next operation of the arm 12 the second pawl is moved from engagement with the rack. By this arrangement, the pawls alternately engage the rack to hold the carriage against its spring, and the arm 12 alternately engages the pawls to move them from engagement with the rack. The arm 12 is slidably mounted on the hub 13 so that it may yield bodily or swing on the hub in the direction of the carriage movement against the resiliency of the spring 16 if its free end is accidentally struck by the forward moving pawl, thus avoiding possible injury to the parts.

Means adapted to be operated either by the universal bar or the space key are provided for operating the arm 12 to release the pawls from the rack. Said means comprises a lever 21 fixed to the hub 13. The lever 21 has an arm 22 which is bent at substantially right angles thereto and bifurcated or slotted to engage opposite sides of the arm 12. By this arrangement, the arm 12 swings with the lever 21 concentric therewith, but moves independently of the lever against

the resiliency of the spring 16 in the slot of its arm 22. The other arm 23 of the lever 21 is operatively connected with a universal bar 24 by means of a link 25. The universal bar 24 is resiliently mounted on the rear of the type basket 26 and has an arcuate portion 27 which projects forwardly into the paths of the type bars 28. The type bars 28 are pivotally mounted in the type basket for movement to and from engagement with the platen 29 revolubly mounted on the carriage. When the type bar is actuated to print, it engages the universal bar and moves it rearwardly against the resiliency of its mounting and swings the lever 21 through the link 25 to release the escapement pawl from the rack. A spring 31 connects the arm 23 with the frame of the universal bar and resiliently returns the lever 21 to normal position. An arm or stop 32 projects from the bracket 9 into the path of the lever 21 and limits its movement when operated to prevent overthrow.

The type bars are actuated by power operated means of old and well known type, comprising a power driven roller 33 with which cams 34 are adapted to cooperate to actuate the type bars. The cams 34 are revolubly mounted in bell crank levers 35 adjacent the power driven roller. The levers 35 are operatively connected with the type bars by means of links 36 which operate levers 37, which in turn are operatively connected with the type bars by means of the links 38 and toggle levers 39, said toggle levers being pivoted to the type bars and to links 41 pivoted on the frame. The cams 34 are normally out of engagement with the power driven roller but resiliently urged into engagement therewith by spring-pressed arms 42 which engage projections on the cams. The cams have laterally projecting lugs or stops which engage stops 43 on levers 44 pivoted on the bell cranks and retain the cams out of engagement with the power driven roller against the tension of the arms 42. The upper ends of the levers 44 are provided with offsets which are engaged by the bifurcated ends of arms 45 on key levers 46 having keys 47 whereby they may be manually operated. When a key is depressed, it swings the lever 44 and moves the stop 43 out of the path of the lug on the cam and permits the arm 42 to turn the cam into engagement with the power driven roller to be operated thereby to actuate the type bar. A spring 48 connects the key lever with a fixed part and resiliently retains it in normal position.

Power operated means controlled by the usual space bar are also provided for actuating the escapement devices. To this end, the lever 23 is provided with a laterally projecting lug or stud 52 which is arranged in the path of one arm of a lever 53 pivoted on a fixed part and having its other arm operatively connected with a lever 54 by means of a link 55. A spring 56 connects the lever 53 with a fixed part and resiliently retains the lever in normal retracted position. The lever 54 is mounted on the common pivot rod 57 and is operatively connected with a bell crank 58 by means of a link 59. The bell crank 58 has a key controlled cam 59 mounted thereon and is like the bell crank 35 in all respects except that it operates on the other side of the power driven roller and its cam is controlled by the space bar 61 extending across the front of the keyboard in a well known manner. When the space bar is depressed, the cam 59 engages the power driven roller and actuates the lever 54 which, through the link 55, swings

the lever 53 in a direction to engage the projection 52 on the lever 23 and swing said lever in a direction to operate the escapement devices.

It will be noted that when the lever 23 is actuated by the universal bar, it swings away from the lever 53 and operates independently thereof. The link 20 engages a slotted opening 62 in the universal bar so that it moves freely therein independently of the universal bar when the lever 23 is actuated by the space bar. This arrangement also permits the universal bar to return to normal position in the path of the type bars when actuated in advance of the return movement of the actuating lever 23.

When the universal bar engages a fixed stop on its return movement after actuation by the type bar, considerable noise is caused by the force of impact, which becomes annoying to the operator. It is therefore desirable to eliminate this noise entirely or reduce it to a minimum. To this end, a stop 64 is arranged in the path of a projection 65 on the universal bar and may be provided with a resilient pad 66 of leather or other suitable material to be engaged by the projection 65. The stop 64 is mounted on the end of a resilient arm 67 secured to the rear of the type basket by any suitable means and projecting therefrom. When the universal bar is actuated by the type bar, the projection 65 engages the stop 64 on its return movement which yields under its pressure so that it comes to rest slowly and reduces or eliminates the noise caused by the force of impact.

Although only one embodiment of the invention is shown and described herein, it will be understood that this application is intended to cover such changes or modifications as come within the spirit of the invention or scope of the following claims.

I claim:

1. In a typewriting machine, the combination of a frame, a carriage movable thereon for letter spacing, a rack on the carriage, a pair of pawls on the frame movable alternately into and out of engagement with said rack to stop the carriage at letter space distances, a key controlled lever, and an arm movable relatively to said lever in the direction of the movement of the carriage but actuated by said lever to operate said pawls.

2. In a typewriting machine, the combination of a frame, a carriage movable thereon for letter spacing, a rack on the carriage, a pair of pawls on the frame movable alternately into and out of engagement with said rack to stop the carriage at letter space distances, an arm movable in the direction of the movement of the carriage, resilient means for retaining said arm in normal position, and a key controlled lever for operating said arm to alternately release said pawls from the rack.

3. In a typewriting machine, the combination of a frame, a carriage movable thereon for letter spacing, a rack on the carriage, a pair of pawls pivoted on the frame and separately movable to alternately engage said rack to control the movement of the carriage, a pivoted arm for alternately engaging said pawls to move them from engagement with the rack, and a key controlled lever for actuating said arm.

4. In a typewriting machine, the combination of a frame, a carriage movable thereon for letter spacing, a rack on the carriage, a pair of pawls pivoted on the frame and movable alternately into and out of engagement with said rack to control the movement of the carriage, a key controlled lever pivoted on the frame, a pivoted arm movable

bodily in the direction of movement of the carriage, and means operatively connecting said arm with the key controlled lever to be actuated thereby to operate the pawls.

5 5. In a typewriting machine, the combination of
a frame, a carriage movable thereon for letter
spacing, a rack on the carriage, a pair of pawls
pivoted on the frame and movable alternately
10 into and out of engagement with said rack to control the movement of the carriage, a key controlled lever pivoted on the frame, a pivoted arm arranged to operate the pawls and movable bodily in the direction of movement of the carriage, and means loosely connecting said key controlled lever
15 with said arm whereby the arm is turned on its pivot by the lever to operate the pawls but is movable bodily relative to the key controlled lever.

6. In a typewriting machine, the combination
of a frame, a carriage movable thereon for letter
spacing, a rack on the carriage, a pair of pawls
20 pivoted on the frame and movable into and out of engagement with said rack to control the movement of the carriage, a key controlled lever piv-

oted on the frame, an arm, a pivot on which said arm is revolvably and slidably mounted, resilient means for retaining said arm at one limit of its sliding movement, and means operatively connecting said arm with said lever to be turned thereby to and from operative engagement with said pawls but permitting independent sliding movement of the arm on its pivot. 80

7. In a typewriting machine, the combination of
a frame, a carriage movable thereon for letter
spacing, a rack on the carriage, a pair of pawls
pivoted on the frame and movable into and out of
engagement with said rack to control the move-
ment of the carriage, a key controlled lever, an
arm, a pivot for said arm concentric with the axis
of said key controlled lever on which the arm is
slidably mounted, resilient means for retaining
said arm at one limit of its sliding movement, and
an arm on said key controlled lever operatively
connected with said arm but permitting the arm
95 to slide on its pivot against said resilient means.

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