Sept. 1, 1942. W. A. DOBSON 2,294,721

TYPEWRITING MACHINE

Filed June 29, 1940

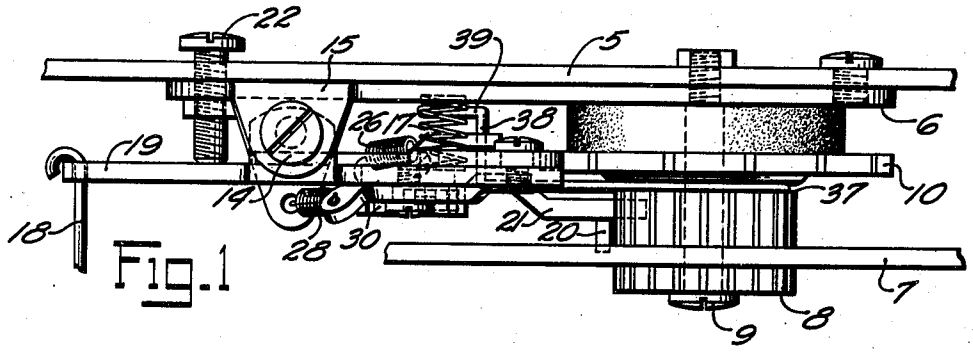


Fig. 1

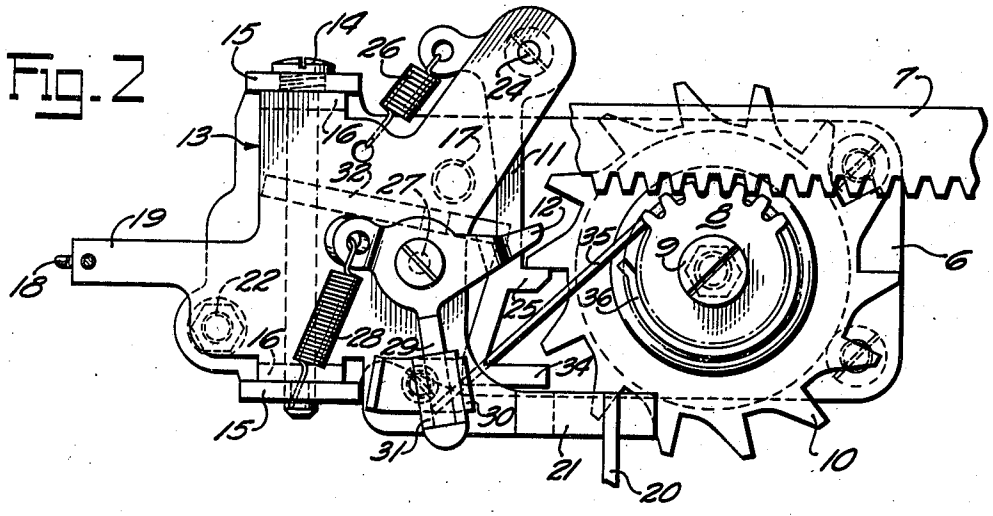


Fig. 2

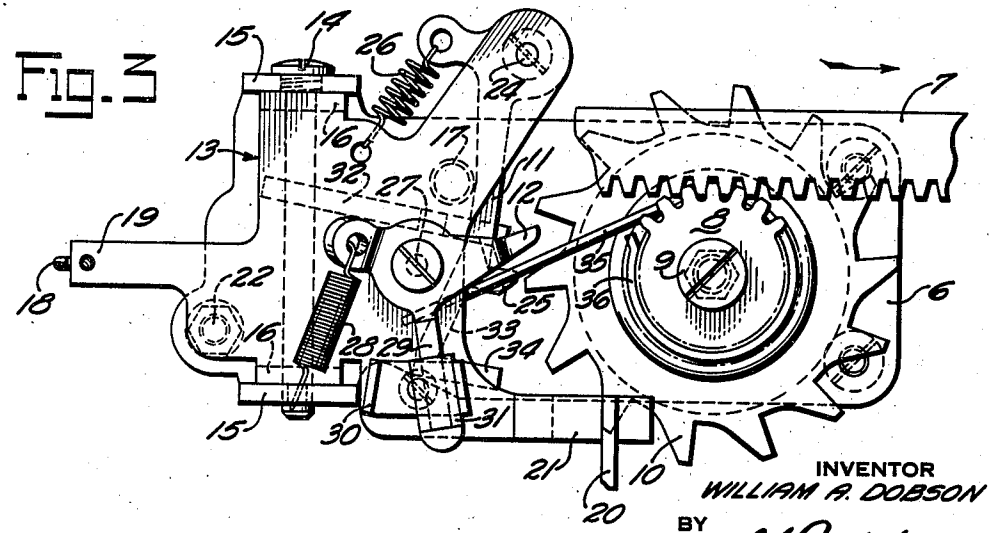


Fig. 3

INVENTOR
WILLIAM A. DOBSON

BY
K. G. Julihn
ATTORNEY

Patented Sept. 1, 1942

2,294,721

UNITED STATES PATENT OFFICE

2,294,721

TYPEWRITING MACHINE

William A. Dobson, Wethersfield, Conn., assignor to Underwood Elliott Fisher Company, New York, N. Y., a corporation of Delaware

Application June 29, 1940, Serial No. 343,110

2 Claims. (Cl. 197—88)

This invention relates to letter-feed escapement mechanisms for typewriting machines, controlling the step-by-step advance of the carriage in typing, and adapted to overrun during carriage return to begin a new typing line.

In conventional escapement mechanisms, the step-by-step carriage control is effected by cooperation of reciprocating dogs with a rotary escapement wheel operatively connected to the carriage by a rack and a pinion gear rotatable with the escapement wheel. Such mechanisms are adapted for return carriage movement, usually by including a pawl-and-ratchet device or by allowing the holding dog to ratchet over the escapement wheel teeth; either arrangement producing a noisy ratcheting action during carriage return.

This present invention is directed to provide an improved mechanism which eliminates this ratcheting action, and which is capable of embodiment in an appreciably simplified, economic structure assuring quiet, dependable operation during return of the carriage for a new typing line.

In its more specific aspect, the invention provides an improved device for automatically retracting the escapement holding dog incident to a reverse rotation of the escapement wheel during return of the carriage, the device being readily adaptable to the conventional escapement mechanism by a minimum of changes, requiring the addition of only a few simple, low-cost parts.

Other objects and advantages will hereinafter appear.

In the drawing,

Figure 1 is a plan view of the improved letter-feed escapement mechanism embodying the invention, with the parts in the normal condition during line typing,

Figure 2 is a front elevational view of the escapement mechanism as shown in Figure 1, and

Figure 3 is a view similar to Figure 2 but showing the condition of the mechanism during restoration of the carriage.

Referring to the drawing for a more detailed description thereof, the numeral 5 indicates a normally fixed frame member of the typewriter adjacent the platen carriage, to which a bracket plate 6 is secured to provide a mount for the mechanism of the letter-feed escapement. An elongate rack 7 is mounted for endwise travel with the usual platen carriage, not shown, and is normally in mesh with a pinion 8 rotatably mounted on the bracket plate 6 by suitable means such as a bearing screw 9.

The platen carriage is actuated in letter-feed direction, to the left as viewed in the drawing, by the usual drum spring and, by a corresponding travel of the rack 7, causes an escapement wheel 10 to rotate in a clockwise direction. The escapement wheel 10 is mounted for rotation with the pinion 8 on the bearing screw 9 and controls the advance of the carriage through the coaction of a holding dog 11 and a stepping dog 12, each carried on a rocker 13. The rocker 13 is mounted on the bracket plate 6 for rocking movement about a shaft 14 held in lugs 15 of the bracket plate and forming a bearing for ears 16 of the rocker 13. The rocker 13 is urged in one direction by a spring 17 interposed between the rocker and bracket plate 6, and is actuated in the well-known manner during typing to effect step-by-step advance of the carriage, either by the usual space bar connected with the rocker by a link 18 engaging an arm 19 of the rocker, or by operation of any of the type actions of the machine through the medium of the usual universal bar, a member 20 of which engages an arm 21 of the rocker. A screw 22 threadedly carried in the bracket plate 6 and provided with a lock nut, forms an adjustable stop for the rocker 13 to determine the quiescent position of the escapement dogs 11 and 12.

The holding dog 11 is pivoted on the rocker 13 at 24 and includes a tooth 25 normally disposed in the path of the ratchet wheel teeth 10, which tooth is yieldably held in said path by a spring 26 tending to rotate the holding dog counterclockwise as viewed in Figure 2, against stop means hereinafter described. The stepping dog 12 is pivotally mounted on the rocker 13 at 27 and is yieldably held in the normal advanced position shown by a spring 28 holding an arm 29 of the dog 12 against a two-way stop 30 which limits the extent of oscillation of the dog 12 in either direction. The arm 29 may have a sleeve 31 of suitable impact-dampening material such as rubber, engageable with the stop 30 to quietly arrest motion of the dog 12.

The tooth 25 of the holding dog 11 normally abuts an escapement wheel tooth to check carriage advancement in the letter-feed direction by the usual drum spring. When the rocker 13 is actuated either by the conventional space bar or by one of the type bars during typing, the rocker is rotated about the shaft 14 in a counterclockwise direction as viewed in Figure 1, to an extent limited by a suitable stop, such as that effected

by compacting spring 17. This limited movement carries the holding dog tooth 25 laterally just clear of the escapement wheel path and concomitantly brings the stepping dog 12 into said path to intercept the succeeding escapement wheel tooth, in the well-known manner. The ensuing rotation of the escapement wheel 10 brings its succeeding tooth into engagement with the tooth of dog 12 and causes the dog 12 to rotate to the limit defined by the stop 30, thus arresting rotation of the escapement wheel. Upon release of the space bar or restoration of the actuated type bar, the rocker 13 is restored to normal position under influence of its spring 17 and the holding dog tooth 25 is thereby again brought into the escapement wheel tooth path to engage the tooth being released by the stepping dog 12. As soon as the stepping dog 12 is free of the ratchet tooth, it swings to its advance position shown, under influence of spring 28. This action results in the advance of the carriage one letter-space and occurs at each step-by-step movement of the carriage in letter-feeding direction, in the well-known manner.

The holding dog 11 is pivotally mounted at 24 so as to be retractable radially of the escapement wheel to release the wheel for unencumbered rotation at certain times as during return movement of the carriage. The holding dog is guided laterally between the rocker 13 at ane side and an offset guide member 32 at the other side, secured to the rocker. The body of holding dog 11 is extended beyond the tooth 25 thereof to provide a cam 33 and a stop arm 34, the latter projecting substantially at right angles to the body of the holding dog.

A throw-out arm 35 adapted for fabrication entirely of a single length of wire, is arranged to project in a generally radial direction from the escapement wheel 10 and includes a resilient ring portion 36 positioned in a peripheral groove 37 in the hub of the escapement wheel 10 and having an inherent tension by which the ring frictionally engages the hub surface at the groove. The spring ring 36 is preferably arranged to contract upon the hub at the bottom of the groove 37, and fit the hub snugly within the side faces of the groove to guide the projecting arm portion laterally. The projecting portion of arm 35 is preferably tangential to the ring portion 36, and the free end portion of the arm is bent laterally to form a pin 38 and thence again bent at right angles to provide a guide member 39. The arm 35 preferably determines the normal position of the holding dog 11 by limiting the extent of swing thereof under influence of its spring 26, the pin 38 of the arm being engaged in the corner of dog 11 formed by cam 33 and stop arm 34. The arm 34 is preferably of such length that the pin 38 is always retained within the limits of the cam 33, or in cooperative relation with the dog 11 and may not be dislodged therefrom when the holding dog 11 is swung on its pivot 24 by other means than the arm 35 for such purposes as, for example, releasing the escapement mechanism to free the carriage for a tabulating run. The member 39 assists in preventing lateral displacement of pin 36 from the cam, being engageable with the bracket 6 when the dog 11 is moved laterally in one direction.

The arm 35 functions in a manner now to be described to swing the holding dog 11 on its pivot to automatically bring the tooth 25 thereof radially out of the path of the escapement wheel teeth 10 when the carriage is returned to begin a new line of typing. During such carriage movement, the rack 7, traveling with the carriage, moves lengthwise in the direction indicated by the arrow in Figure 3 and imparts a corresponding rotation to the escapement wheel 10. The frictional engagement of the spring ring 36 with the escapement wheel hub causes arm 35 to initially rotate with the escapement wheel. The pin 38 of arm 35 is thus moved along the cam 33, cooperating therewith to wedge the holding dog 11 against the tension of spring 26 to the position shown in Figure 3, in which position pin 38 has engaged a stop formed by the holding dog tooth 25, and the rotation of arm 35 with the escapement wheel ceases. The escapement wheel, however, may continue to rotate in that a slippage occurs between the spring ring 36 and the escapement wheel hub.

It will be noted that the extent of angular movement of arm 35 to fully actuate the holding dog 11 is equivalent to less than the spacing of the escapement wheel teeth, so that no discrepancy in the positioning of the carriage is introduced, as by the loss of a letter space during the operation of the mechanism in carriage banking. When the carriage reaches the limit of return movement, determined by banking against the usual margin stop, the escapement wheel comes to rest substantially in the position shown in Figure 3. After engaging the margin stop, the carriage advances slightly under influence of its drum spring a fraction of a letter space, during which the escapement wheel rotates slightly a corresponding degree in letter-feed direction, carrying with it arm 35 to move the arm pin 38 back along cam 33 and thus allow the holding dog to be restored by its spring 26 until the tooth 25 again engages the escapement wheel and determines the carriage position. The fractional letter-space angular movement of arm 35, to either release or restore the holding dog, is substantially constant in that the selective setting of the margin stop, as usual, is at uniform letter spacings, with which the pitch of the escapement wheel teeth corresponds. Therefore, when the carriage is banked against the margin stop, the escapement wheel stops at stantially the position shown in Figure 3, sufficiently back of its normal position to assure ample movement of arm 35 to allow the holding dog to be restored to normal position in control of the escapement wheel.

The economy of construction in the improved mechanism is apparent in that relatively few simple parts are required over the conventional escapement mechanism, and each element is adapted for low-cost, quantity production in rugged, durable form. A quiet, dependable operation is assured in releasing the escapement wheel for carriage return, by the constant pressure engagement of the holding dog cam 33 with the throw-out arm 35, the quiet operation being further assured by the light-weight, resilient construction of the throw-out arm. The geometric relation of the spring ring 36 with the projecting portion of arm 35, the ring issuing from the arm in a counter-letter-feed direction, is advantageous in operation to minimize wear, in that the ring 36 tends to unwind itself from the escapement wheel hub as the latter is rotated in letter-feed direction during which the arm 35 is not operating. However, with the escapement wheel rotating reversely during carriage return, the ring tends to wind up on the wheel hub by the snubbing action induced by

friction, thus imparting ample force to the arm 35 to release the holding dog 11 against the force of its spring.

What is claimed is:

1. In an escapement feed mechanism for typewriting machines, having an escapement wheel spring-impelled to rotate forwardly and a holding dog normally engaging the wheel against forward rotation and movable out of wheel engagement; means for so moving the holding dog in response to reverse rotation of the wheel, comprising a cam on the holding dog having a stop at each cam end, and a throw-out member frictionally mounted to rotate with the wheel and having a part cooperative with said cam and engageable with said stops to limit rotation of said throw-out member.

2. In an escapement mechanism for typewriters, having an escapement wheel spring-impelled to rotate forwardly, a dog rocker and a holding dog pivoted on the rocker to swing radially from the wheel and spring-pressed to engage the wheel, the wheel having groove-forming portions; means for swinging the holding dog free of the wheel incident to reverse rotation of the wheel, comprising a cam on the holding dog having a stop at each cam end, and a dog throw-out member formed of a single length of resilient wire including a ring portion disposed in and frictionally engaging the groove-forming wheel portions and an arm projecting substantially radially from said ring, said arm having an offset portion cooperative with said cam and engageable with said stops to limit rotation of said throw-out member with the wheel.

WILLIAM A. DOBSON.