





# UNITED STATES PATENT OFFICE.

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## ESCAPEMENT FOR TYPE-WRITING MACHINES.

No. 801,052.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, WILLIAM WALL, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Escapement for Type-Writing Machines, of which the following is a full, clear, and exact description.

My invention relates to improvements in escapements for type-writing machines of that class wherein a paper-carriage is actuated with a step-by-step movement; and the object that I have in view is the provision of an improved mechanism which is so sensitive in action and in which the friction is minimized to such extent as to require a light tension on the paper-carriage, such mechanism embodying an improved form of escapement-wheel that secures proper clearance of the dogs of said mechanism and the control of the paper-carriage in an efficient and satisfactory manner.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical sectional elevation through so much of a type-writing machine as is necessary to an understanding of my invention and illustrating the improved escapement mechanism applied thereto, said view showing the carriage in a locked position wherein it is held by the action of a yieldable dog. Fig. 2 is a similar sectional elevation showing the dog mechanism adjusted to a position which permits the carriage to move one step on the depression of a key, the escapement-wheel being engaged by a rigid ratchet-dog and the yieldable dog being in a position to engage with another tooth of the escapement-wheel when the parts are returned to normal positions and the carriage shall have moved a step on the release of the key. Fig. 3 is an elevation looking from the rear of certain of the parts shown by Figs. 1 and 2. Figs. 4, 5, and 6 are diagrammatic views showing a manner of operating the device.

A designates a carriage-rod which is attached to a suitable framework of a type-writing machine. On this rod is adapted to run suitable wheels B of a paper-carriage C, the latter being provided with a rearwardly-

extending frame C', which is provided with a depending bar D, the latter having its lower edge formed with a series of gear-teeth  $d$ , forming a rack that is in coöperative relation to the escapement mechanism. As is usual in certain types of machines the frame is provided with rearwardly-extending lugs  $e$ , adapted to support a short horizontal shaft E, that is under the control of a coiled spring  $e'$ , the tension of which is regulatable by the adjustment of a collar  $e''$ , adapted to be clamped to a part of the shaft by a set-screw  $e'''$ .

The rock-shaft is provided with an upwardly-extending dog-carrier F, which in the present invention is equipped with a rigid dog 5 and a movable or yieldable dog 6. The rigid dog 5 is attached to or made fast with the carrier F, so as to rock or oscillate on the axis afforded by the shaft E; but the yieldable dog is mounted pivotally on the carrier F, so as to rock or turn on an axis afforded by a screw 7 or its equivalent, said yieldable dog 6 turning on an axis substantially at right angles to that of the dog 5. The dog 6 is designed to be held normally at an inclination to the dog 5 or to be offset therefrom, so that the teeth of the escapement-wheel can pass between the two dogs. It may be held rigidly in this position and it will operate effectively if so constructed; but I prefer to make it movable or yieldable, as stated. For this purpose a spring 8 is mounted on the carrier F and is equipped with two arms  $8^a$  and  $8^b$ , normally in contact with the opposite sides of the pivoted or yielding dog 6. The arm  $8^b$  normally holds the dog 6 at the inclination mentioned above, and the arm  $8^a$  prevents this dog from moving too far from the dog 5. The dog 5 has a positive stop  $5^a$  for the dog 6 to limit the movement thereof when pressed by the teeth of the escapement-wheel.

The rear part A<sup>2</sup> of the machine-frame is provided with a slot  $a$ , and over this slotted part of the frame is secured a bracket-plate 9, the latter having a suitable bearing 10 and a center screw 11. In the bearing and the center screw of this bracket 9 are journaled the respective end portions of an escapement-shaft 12, which is furnished with a spur-gear 13 and with an escapement-wheel 14, said gear and wheel being made fast with the shaft for rotation therewith. The gear 13 is arranged for intermeshing engagement with the teeth  $d$  of the rack on the frame C' of the paper-carriage; but the escapement-wheel is disposed in a position for its tooth to be engaged by



the rigid and movable dogs 5 6, respectively, of the dog-carrier on the rock-shaft E. As shown by Figs. 1 and 2, the escapement-shaft 12 is quite short, and the gear 13 and escapement-wheel 14 are arranged close together on the same shaft, thus providing an exceedingly compact and simple arrangement of parts.

One of the important features of my invention resides in the construction of the escapement-wheel 14, the same consisting of a body portion 15 and a plurality of teeth 16, said teeth being arranged in oblique positions across the peripheral edge portion of the body 15. The teeth 16 are parallel one to the other throughout the series provided around the peripheral edge of the escapement-wheel, and these teeth have rounded or curved edges 17, and they are spaced a short distance, so as to provide the proper clearance for the rigid and movable dogs of the escapement mechanism.

In the normal position of the parts comprising the escapement mechanism, as shown by Fig. 1, the movable dog 6 engages with the front edge of one diagonal tooth 16 of the escapement-wheel, as is indicated in Fig. 4, thus preventing the wheel, the gear, and the shaft from rotating under the tension of the driving-spring for the paper-carriage C, whereby the parts are at rest. When a key of the machine is depressed, the rock-shaft E is turned so as to move the dog-carrier F from the position of Fig. 1 to that of Fig. 2, wherein the movable dog 6 is thrown to a position clear of the teeth of the escapement-wheel, while the rigid dog 5 is moved into engagement with the front edge of the same tooth of the escapement-wheel, as is indicated in Fig. 5. Now when the key is released and the dogs return to their original positions, the diagonal tooth 16 slides through the space between the two dogs, as is indicated in Fig. 6. This permits a one-space feed, and the next tooth then comes in contact with the dog 6, the parts assuming the position shown in Fig. 4. For the purpose of convenience the dog 6 is represented in Figs. 4, 5, and 6 as being rigid with respect to the dog 5; but it is to be understood that in the preferred embodiment of my invention it is made movable and that in Fig. 4 it is held against the stop 5<sup>a</sup> by the tooth of the escapement-wheel, while in Figs. 5 and 6 it is swung back by the spring-arm 8<sup>b</sup>, so as to provide a greater clearance between the two dogs for the tooth of the escapement-wheel to pass through.

It will be obvious that the operation of the escapement-wheel would be the same with the rigid dog 6; but the latter is made a limber dog to promote the action and render it more certain in the rapid operation of the machine. It thus takes an inclined position, from which it can more readily enter the proper space between the teeth of the escapement-wheel. The limber character of the dog 6 further

permits the return of the carriage without actuating the usual carriage-release, the said dog being permitted to yield to any desired degree in the direction opposite to the normal tension of the wheel 15.

The escapement mechanism of my invention is extremely simple and efficient in construction, and the frictional engagement between the several working parts of the mechanism is so slight that the parts are very sensitive, quick, and positive in operation, thus enabling a light tension-spring to be employed for the operation of the paper-carriage C.

An advantage of my invention in connection with type-writing machines is that the type are prevented from striking in the same place on the paper of the carriage, thus overcoming the objection frequently encountered in ordinary machines of the letters "piling up," which is due to faulty action of the carriage-escapement mechanism. In my construction the escapement operates the full stroke on each key depression, so as to impart movement to the carriage.

I do not confine myself strictly to the use of the escapement in connection with type-writing machines, because it may be used in other kinds of machinery. I may also use the dogs in connection with a carriage-rack having inclined teeth, thus dispensing with the escapement-wheel, the gear, and the shaft, and thereby make the dogs operate directly on the rack.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An escapement mechanism for type-writing machines, comprising diagonal propeller-shaped teeth, a movable dog-carrier, a dog on the carrier, a second dog movably mounted on the carrier, spaced from the first dog, and a spring on the carrier having arms for engaging the opposite sides of the second dog.

2. An escapement mechanism for type-writing machines, comprising an escapement-wheel provided with diagonal propeller-shaped teeth, a pivoted dog-carrier, a rigid dog on the carrier, a limber dog pivotally mounted on the carrier and spaced from the rigid dog, and a spring on the carrier and having arms for engaging the opposite sides of the limber dog.

3. An escapement mechanism for type-writing machines, comprising an escapement-wheel provided with diagonal teeth, a pivoted dog-carrier, a rigid dog on the carrier adapted to engage with the front edges of the teeth, a limber dog pivotally mounted on the carrier, spaced from the rigid dog, and also adapted to engage with the front edges of the teeth, a stop on the rigid dog for limiting the movement of the limber dog in the direction of the movement of the teeth, and a spring on the carrier engaging with the opposite sides of limber dog.

4. An escapement mechanism for type-writ-



ing machines, comprising an escapement-wheel provided with diagonal propeller-shaped teeth, a pivoted dog-carrier, a rigid dog on the carrier adapted for engagement with the front edges of the teeth, a limber dog pivotally mounted on the carrier, spaced from the rigid dog in two directions and adapted to engage the front edges of the teeth of the escapement-wheel, said dogs being so located as to provide a space between them for the passage of the said teeth in a direction corresponding to the angle at which the teeth are set on the escapement-wheel, and a spring mounted on the carrier and having arms engaging with the opposite sides of said limber dog, one of said arms being adapted to normally hold the limber dog away from the rigid dog, and the other to limit its motion away from the rigid dog.

5. An escapement mechanism comprising an escapement-wheel provided with diagonal propeller-shaped teeth, a pivoted dog-carrier, a rigid dog on the carrier adapted for engagement with the front edges of the teeth, and a limber dog pivotally mounted on the carrier, spaced from the rigid dog in two directions and adapted to engage the front edges of the teeth of the escapement-wheel, said dogs being so located as to provide a space between them for the passage of said teeth in a direction corresponding to the angle at which the teeth are set on the escapement-wheel.

6. An escapement mechanism provided with diagonal propeller-shaped teeth, in combination with a pivoted dog-carrier, a rigid dog on the carrier, a limber dog pivotally mounted on the carrier and spaced from the rigid dog in two directions, whereby a space is provided for permitting the teeth to pass between the dogs in a direction corresponding to the angle of the teeth, and a spring on the carrier having arms for engaging the opposite sides of the limber dog.

7. The combination with an escapement-wheel having diagonal teeth each being provided with two lateral edges and with a single continuous surface from each edge to the other on each side of the tooth, of a movable dog-carrier, a rigid dog on the carrier, and a limber dog mounted on the carrier and spaced from the rigid dog, both of said dogs being adapted to engage with the front edges of the teeth.

8. The combination with an escapement having diagonal teeth each being provided with two lateral edges and with a single continuous surface from each edge to the other on each side of the tooth, of a movable dog-carrier, a dog on the carrier, and a second dog on the carrier, said dogs being adapted to engage with the teeth of the escapement alternately.

9. The combination with an escapement device having diagonal teeth each being provided with two opposite lateral edges and with a single continuous curved surface from each edge to the other on each side of the tooth, of a pivoted dog-carrier, a rigid dog on the carrier, a limber dog pivotally mounted on the carrier and spaced from the rigid dog, both of said dogs being adapted to successively engage with the front edges of the teeth, and a spring on the carrier for engaging the opposite sides of the limber dog.

10. An escapement-wheel for type-writing machines, having diagonal teeth each being provided with an edge at its extremities and with a single continuous surface from each edge to the other on each side of the tooth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM WALL.

Witnesses:

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