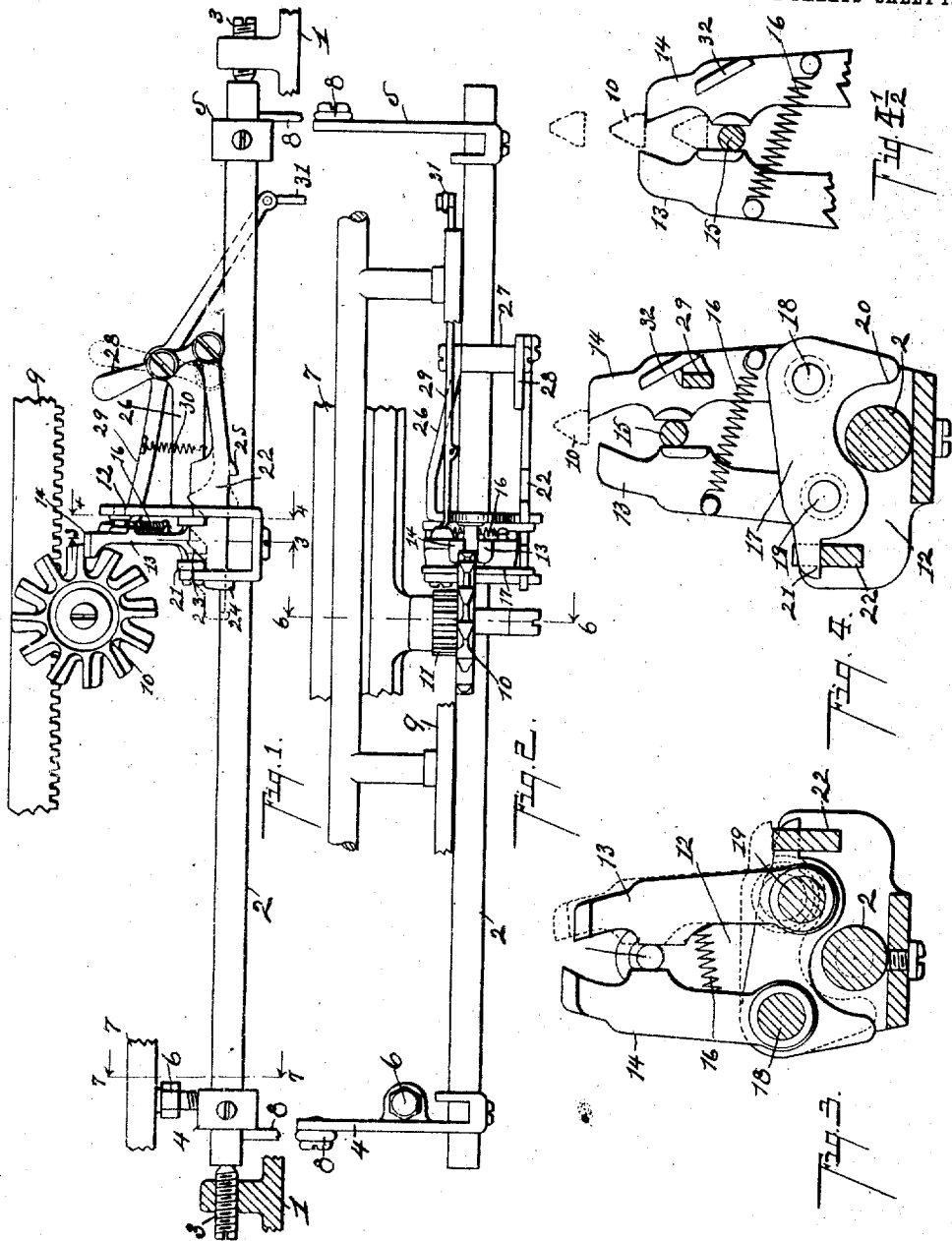


W. R. FOX.
 ESCAPEMENT MECHANISM FOR TYPE WRITERS.
 APPLICATION FILED JAN. 21, 1907.

978,871.

Patented Dec. 20, 1910.
 2 SHEETS—SHEET 1.



Witnesses:

W. F. M. Fox
Lucie Greenfield

Inventor,

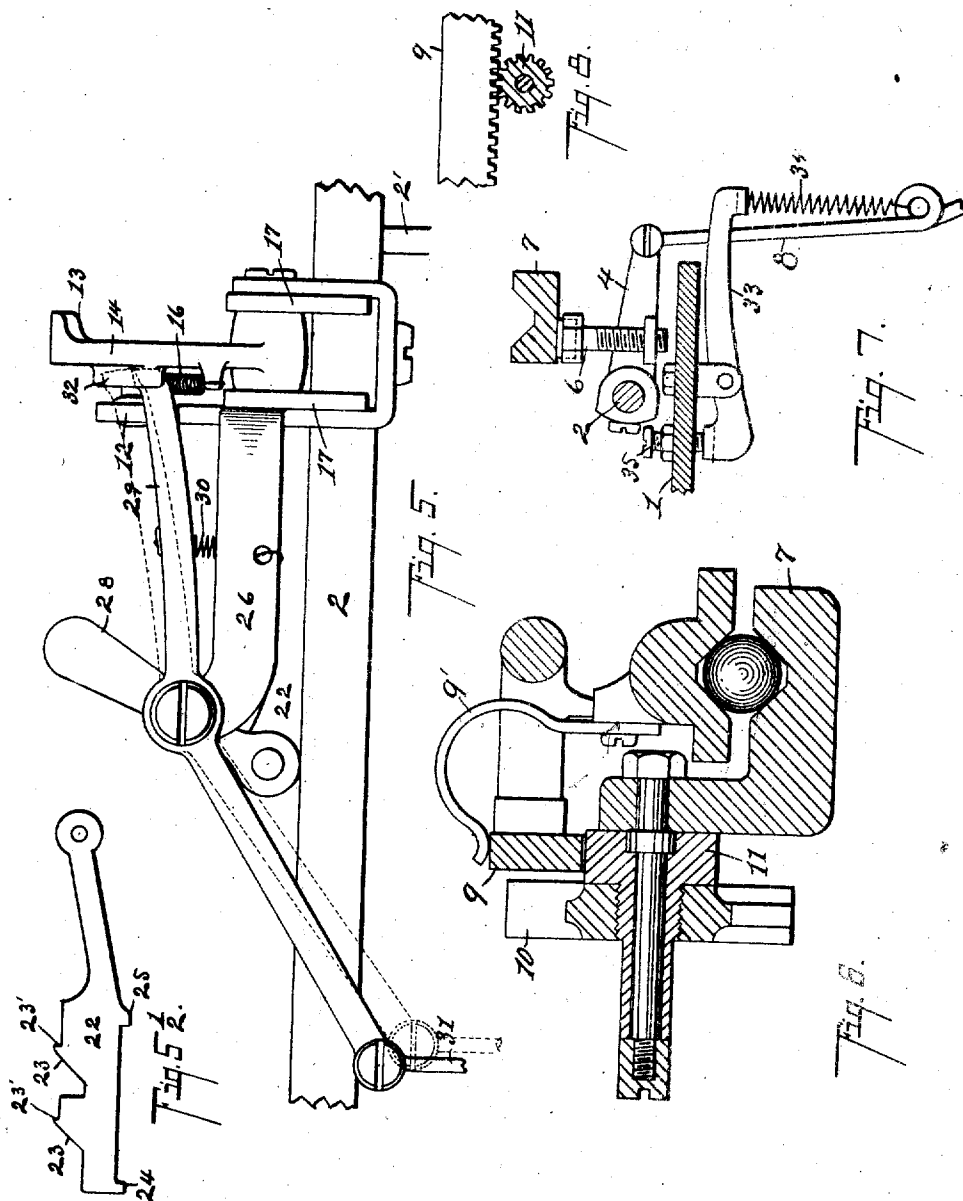
William R. Fox

By *Chapman & Co.*
 Att'y.

W. R. FOX.
 ESCAPEMENT MECHANISM FOR TYPE WRITERS.
 APPLICATION FILED JAN. 21, 1907.

978,871.

Patented Dec. 20, 1910.
 2 SHEETS-SHEET 2.



Witnesses:

W. A. H. Smith
Lucas Greenfield

Inventor
William R. Fox
 By *Chapman & Co.*
 Att'y's

UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN.

ESCAPEMENT MECHANISM FOR TYPE-WRITERS.

978,871.

Specification of Letters Patent.

Patented Dec. 20, 1910.

Application filed January 21, 1907. Serial No. 353,288.

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, a citizen of the United States, residing at Grand Rapids, in the county of Kent, State of Michigan, have invented certain new and useful Improvements in Escapement Mechanism for Type-Writers, of which the following is a specification.

This invention relates to improvements in typewriting machines, and especially to the escapement mechanism thereof, whereby the carriage is actuated by a suitable step by step movement across the frame of the machine.

The objects of the invention are: first: to provide a simple and efficient escapement mechanism for typewriting machines, especially of the wheel escapement type; second: to provide an effective and simple means of shifting the relation position of the escapement dogs, whereby the escapement can be shifted from the regular to a high speed escapement, and vice versa; and third: to provide a construction of escapement dogs which can be readily released and thrown out of engagement with the escapement wheel for liberating the carriage to permit it to move through considerable distance, as in tabulator work or work which may require long intervals of spacing.

Further objects will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

Portions of a typewriter sufficient to illustrate my improvement are clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure 1 is a detail rear elevation view of the escapement mechanism of a typewriter, other parts of the machine being broken away; Fig. 2 is a plan view of the portions illustrated in Fig. 1; Fig. 3 is an enlarged detail sectional view, taken on a line corresponding to line 3-3 of Fig. 1, the dogs being shown in full lines, looking toward the right of that figure; Fig. 4 is a similarly enlarged detail sectional view taken on a line corresponding to line 4-4 of Fig. 1, looking toward the left of that figure, the dogs being set for the regular feed; Fig. 4¹ is a view of the upper parts of the dogs appearing in Fig. 4, set for a

speed escapement; Fig. 5 is an enlarged detail elevation from the front side of the machine, of the escapement, being from the rear side of Fig. 1 as it stands, showing especially the release lever and the adjusting lever in their relation to the escapement dogs or pawls; Fig. 5¹ is a detail elevation view of the slide 22; Fig. 6 is an enlarged detail sectional view, taken on line 6-6 of Fig. 2, showing the relations of the carriage and its rack bar to the escapement wheel; Fig. 7 is an enlarged detail sectional view taken on line 7-7 of Fig. 1, showing the tension connection and stop mechanism for controlling the throw of the escapement, showing the connecting rod to the usual or any convenient escapement bar beneath the key levers of the machine; and Fig. 8 is a detail sectional view through the pinion 11 showing its relation to the rack 9 of the carriage.

In the drawing, similar numerals of reference refer to similar parts throughout the several views, and all of the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the numbered parts of the drawing: portions of the frame, 1-1, support upwardly extending lugs on which the rock bar or shaft 2 of the escapement is supported by pointed screw pivots 3-3 therethrough (see Fig. 1). (The central part of the rock shaft 2 is supported near the escapement dogs by a part 2' on the machine frame.) This rock bar is actuated by a pair of arms 4, 5, preferably struck out of sheet metal and retained by suitable set screws. Adjustable stops 6 are provided to limit the upward motion of the said arms. Connecting rods 8 extend downwardly from the forward ends of these arms 4 and 5, to a suitable spacer bar beneath the key levers. The said spacer bar and key levers, being of the usual form, are not here illustrated, as my invention does not pertain to the same. An adjustable lever or arm 33, adjustable by the set screw 35, is connected by a spring 34 to an eye in one of the rods 8, and, by this means, the tension of the escapement is adjusted, this tension being made sufficient to insure the prompt return of the dogs when the spacer bar is released and just sufficient tension to accomplish this properly without occasioning unnecessary work.

To the rock shaft 2 is secured the dog block 12 which is preferably made of sheet

metal folded upon itself and placed upon the rock shaft 2 and secured in position by a suitable set screw. Secured between the sides of this dog block are a pair of levers 17 which are transverse to the shaft 2, and on the fulcrum of these levers is pivoted one of the dogs 14 on the pivot 18, and toward the free ends of the levers on the pivot 19 is secured the opposite dog 13. A pin 15 is on the upwardly projecting side of the dog block 17 between the projecting portions of the dogs to retain them properly separated from each other and in operative position.

The dogs 13 and 14 are urged toward each other by a coiled spring 16 which couples them together. The dogs 13, 14, engage under the teeth of the escapement wheel 10 which are square on the under side and beveled on the upper side, and release the same by the rocking of the bar 2 which, when the dogs are in one position—that indicated in Fig. 4—releases the escapement wheel on the upstroke; and actuating the dog 14 so that it is released and the tooth of wheel 10—indicated by dotted lines—drops a short distance onto the dog 13, and the feed of the carriage occurs on the upstroke when the dog 13 is withdrawn. When the dogs are adjusted to the opposite direction—indicated in Fig. 4—the escapement wheel is released on the down-stroke. The dog 13 then being just above the square face of the tooth of the escapement wheel 10 permits the full spacing, and the dog 14 swings just under the next tooth of the wheel 10 on the upstroke, to permit the dogs 13 to disengage the teeth of the escapement wheel and be slightly above this square under surface, ready for the next evolution.

The dogs are shifted into the different positions by the slide 22 through the dog block 12 which has stops 24, 25, to limit its movement, and inclined portions 23, 23, under each of the levers 17, the ends of the levers being extended at 21 and arranged to be acted upon by the inclined surfaces 23, with locking depressions 23' into which the ends of the levers 21 drop when they are elevated by this slide (see Fig. 1). The notches forming the depressions 23' are not square-shouldered, but rounded or inclined so that the slide can be moved to the original position by overcoming the resistance. The slide 22 is actuated by the lever 28 which is pivoted to an arm 26 which is formed integral with the dog block 12 although it might be a separate arm secured thereto. This arm 26 also carries the lever 29 which is actuated by the connection 31 to a suitable key lever or other part in the machines, for releasing the escapement dogs. As the arm 26 to which the lever 29 is secured is formed integral with the dog block, it is possible to fit and support the lever and adjust it before the dog

block is inserted in the machine, so that the connection can be made afterward, and the adjustment of the pivots for the shaft will not interfere with the proper relation of the lever and the dogs. The end of the lever 29 is arranged to act upon an inclined lug 32 on the face of the dog 14 to throw it out of engagement with the escapement wheel 10, thereby liberating the escapement wheel and permitting the carriage to move freely to some predetermined position, without hindrance by the dogs. The levers 17 drop by gravity when the slide 22 is withdrawn and are also depressed by the spring 16 which is arranged obliquely for that purpose in addition to drawing the dogs toward each other.

The escapement wheel 10 and its pinion 11 supported on a suitable bracket 7 on the frame of the typewriter, is clearly illustrated in Fig. 6, the rack 9 which engages the pinion 11 also being there indicated as held yieldingly in position by a suitable spring 9'. I do not describe this key connection at this time, because my invention is here confined to the particular arrangement of the lever for actuating the dogs. This is found very useful in connection with tabulating devices, or any other devices which require the freeing of the dogs to permit the rapid movement of the carriage to some predetermined point.

I desire to remark that I have shown a rock shaft 2 of considerable length with a support 2' at or near the dog block to prevent the sagging or depression of the same. It is obvious, however, that a shorter one might be used and many of the operative advantages of my device secured, the shaft in fact being shortened until it amounts to substantially no more than a journal bearing; and I wish the term rock shaft as used in my specification, to be broadly considered in this light. There is, however, advantage in using a rock shaft of considerable length supported as I have indicated, because it permits the arrangement and the connection of the various operative parts to much better advantage.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In the escapement mechanism for a typewriter, the combination with the frame of the typewriter of a carriage; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled on the frame of the machine; a rock shaft 2 with suitable means for connecting the same to the spacer bar of a typewriter; a dog block 12 with an arm 26, secured to the rock shaft 2, the same being formed of sheet metal curved upon itself, the plane of which is transverse to the rock shaft; a pair of levers 17 pivoted between the sides of the dog

block; a dog 14 pivoted on the fulcrum of the levers; a dog 13 pivoted on the long arms of the levers; a pin 15 between the dogs to retain them properly spaced; a spring 16 for holding the escapement dogs normally toward each other and against the pin 15; an adjusting slide 22, with inclined face, for controlling the levers 17 to control the relative heights of the dogs 13-14; a lever 28 on the arm 26 for controlling the adjustable slide 22; an inclined lug 32 on the dog 14; a lever 29 fulcrumed on the arm 26 and arranged to engage the said inclined lug 32 on the dog 14 for throwing the dog out of engagement with the escapement wheel; and connections to said lever for actuating the same, whereby the escapement mechanism is readily under the control of the operator and can be released, all co-acting substantially as described and for the purpose specified.

2. In the escapement mechanism for a typewriter, the combination with the frame of a typewriter, of a carriage; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled on the frame of the machine; a rock shaft 2 with suitable means for connecting the same to the spacer bar of a typewriter; a dog block 12 secured to the rock shaft 2, the same being formed of sheet metal curved upon itself, the plane of which is transverse to the rock shaft; a pair of levers 17 pivoted between the sides of the dog block; a dog 14 pivoted on the fulcrum of the levers; a dog 13 pivoted on the long arms of the levers; a pin 15 between the dogs to retain them properly spaced; a spring 16 for holding the escapement dogs normally toward each other and against the pin 15; an adjusting slide 22, with inclined face, for controlling the levers 17 to control the relative heights of the dogs 13-14; a lever 28 for controlling the adjustable slide 22, all co-acting substantially as described and for the purpose specified.

3. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled upon the said typewriter frame; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to the fulcrum of the said lever member; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever members to control the relative height of the dogs, co-acting for the purpose specified.

4. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating

thereon; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled upon the said typewriter frame; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to said dog block; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever member to control the relative height of the dogs, co-acting for the purpose specified.

5. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled upon the said typewriter frame; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to the fulcrum of the said lever member; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever members to control the relative height of the dogs, consisting of an adjustable slide, with a lever for controlling the same, co-acting for the purpose specified.

6. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; a rack on said carriage; an escapement wheel with a pinion meshing with said rack, journaled upon the said typewriter frame; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to said dog block; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever member to control the relative height of the dogs, consisting of an adjustable slide with a lever for controlling the same, co-acting for the purpose specified.

7. In an escapement mechanism for a typewriter, the combination of the typewriter frame; a carriage reciprocating thereon; a rack on said carriage; an escapement wheel with a pinion meshing with said rack journaled upon the said typewriter frame; a rock shaft suitably supported by the said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft, having a projecting arm extending in the direction of the said rock shaft; a pair of dogs carried by the said dog block, one of which carries an inclined lug; a lever pivoted on the arm on the said dog block and arranged to contact

with the inclined lug for swinging the dog out of the operative position; and connections to said lever, for the purpose specified.

8. In the escapement mechanism for a typewriter, the combination with the frame of a typewriter, of a carriage; an escapement mechanism therefor; a rock shaft 2 with suitable means for connecting the same to the spacer bar of a typewriter; a dog block 12 secured to the rock shaft 2, the same being formed of sheet metal curved upon itself, the plane of which is transverse to the rock shaft; a pair of levers 17 pivoted between the sides of the dog block; a dog 14 pivoted on the fulcrum of the levers; a dog 13 pivoted on the long arms of the levers; a pin 15 between the dogs to retain them properly spaced; a spring 16 for holding the escapement dogs normally toward each other and against the pin 15; an adjusting slide 22, with inclined face, for controlling the levers 17 to control the relative heights of the dogs 13-14; a lever 28 for controlling the adjustable slide 22, all co-acting substantially as described and for the purpose specified.

9. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; an escapement mechanism therefor; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to the fulcrum of the said lever member; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever member to control the relative heights of the dogs, co-acting for the purpose specified.

10. In the escapement mechanism for a typewriter, the combination of the frame of a typewriter; a carriage reciprocating thereon; an escapement mechanism therefor; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to said dog block; a second dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever to control the relative height of the dogs, co-acting for the purpose specified.

11. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; an escapement mechanism therefor; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to the fulcrum of the said lever member; a second dog pivoted to the said lever member; suit-

able stop means for the said dogs; and means for adjusting the said lever member to control the relative height of the dogs, consisting of an adjustable slide with a lever for controlling the same, co-acting for the purpose specified.

12. In the escapement mechanism for a typewriter, the combination of the frame of the typewriter; a carriage reciprocating thereon; an escapement mechanism therefor; a rock shaft suitably supported on said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft; a lever member on said dog block; a dog pivoted to said dog block; a dog pivoted to the said lever member; suitable stop means for the said dogs; and means for adjusting the said lever member to control the relative height of the dogs, consisting of an adjustable slide with a lever for controlling the same, co-acting for the purpose specified.

13. In an escapement mechanism for a typewriter, the combination of the typewriter frame; a carriage reciprocating thereon; an escapement mechanism therefor; a rock shaft suitably supported by the said typewriter frame, with means for connecting it to the spacer bar; a dog block carried by the said rock shaft, having a projecting arm extending in the direction of the said rock shaft; a pair of dogs carried by the said dog block, one of which carries an inclined lug; a lever pivoted on the arm on the said dog block and arranged to contact with the inclined lug for swinging the dog out of the operative position; and connections to said lever, for the purpose specified.

14. In the escapement mechanism of a typewriter, the combination of the typewriter frame; a carriage with escapement means therefor; a dog block; a lever on the dog block with a pair of dogs one of which is suitably supported thereon; and an adjustable slide underneath the lever, having inclined faces for moving the lever and notches for engaging the lever and locking the slide in place, co-acting for the purpose specified.

15. In the escapement mechanism of a typewriter, the combination of the typewriter frame; a carriage with escapement means therefor; a dog block; a lever on the dog block with a pair of dogs one of which is suitably supported thereon; and an adjustable slide underneath the lever, having inclined faces for moving the lever, co-acting for the purpose specified.

16. In the escapement mechanism for a typewriter, the combination with the frame of the typewriter of a reciprocating carriage thereon; escapement means between the said carriage and typewriter frame; a dog block pivoted on the frame of the machine; a pair

of pivoted dogs suitably supported; an inclined lug on one of said dogs; a lever fulcrumed on the dog block, one end of which contacts with the inclined lug for the purpose of moving the same; and connections to the said lever, for the purpose specified.

17. In the escapement mechanism for a typewriter, the combination with the frame of the typewriter of a reciprocating carriage thereon; escapement means between the said carriage and typewriter frame; a dog block pivoted on the frame of the machine; a pair of pivoted dogs suitably supported; an in-

clined lug on one of said dogs; a lever fulcrumed on the dog block, one end of which contacts with the inclined lug for the purpose of moving the same, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

WILLIAM R. FOX. [L.S.]

Witnesses:

ELLA DE VRIES,
A. WACOTT.