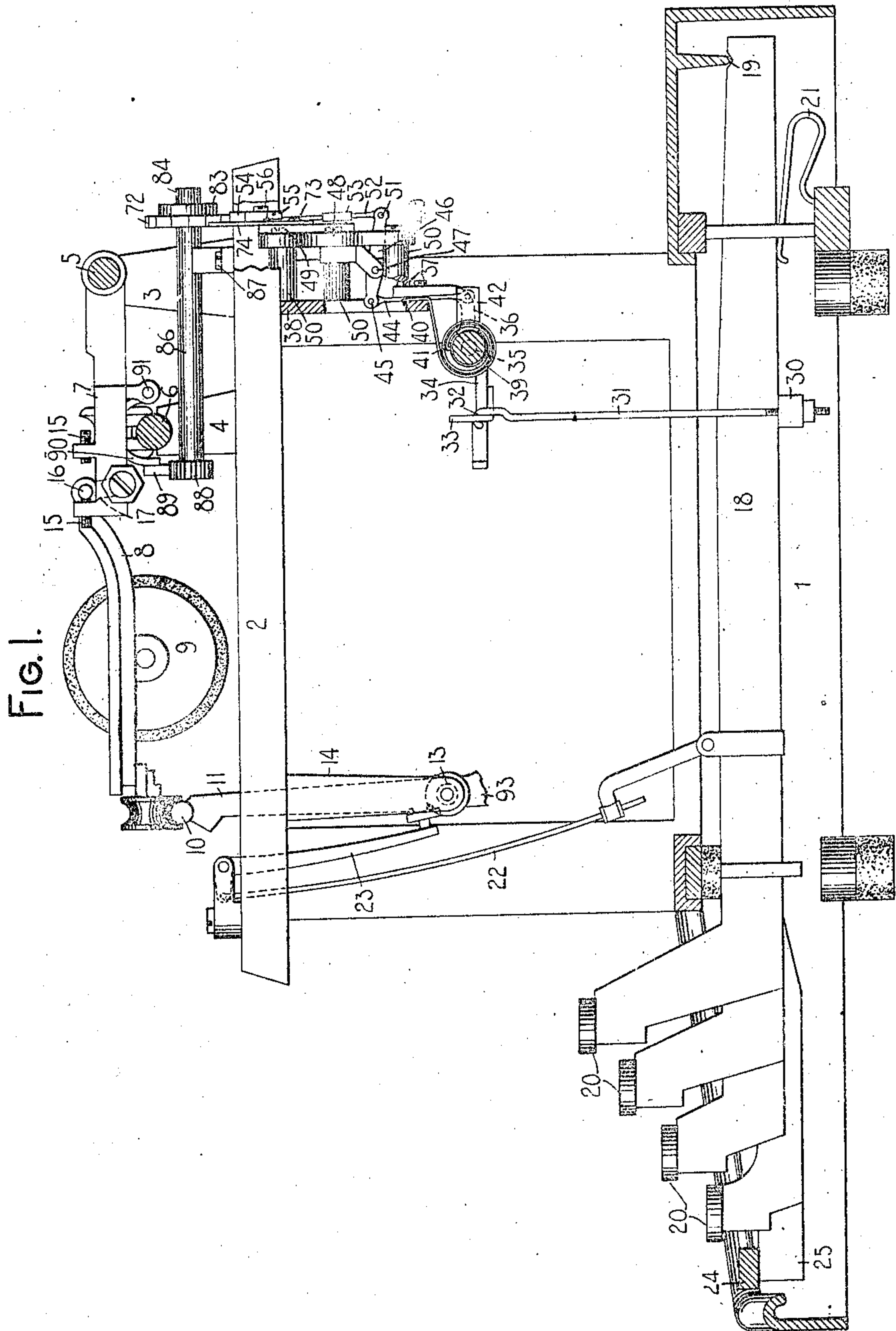


C. H. SHEPARD.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 6, 1902.

934,100.

Patented Sept. 14, 1909.
2 SHEETS—SHEET 1.



WITNESSES.

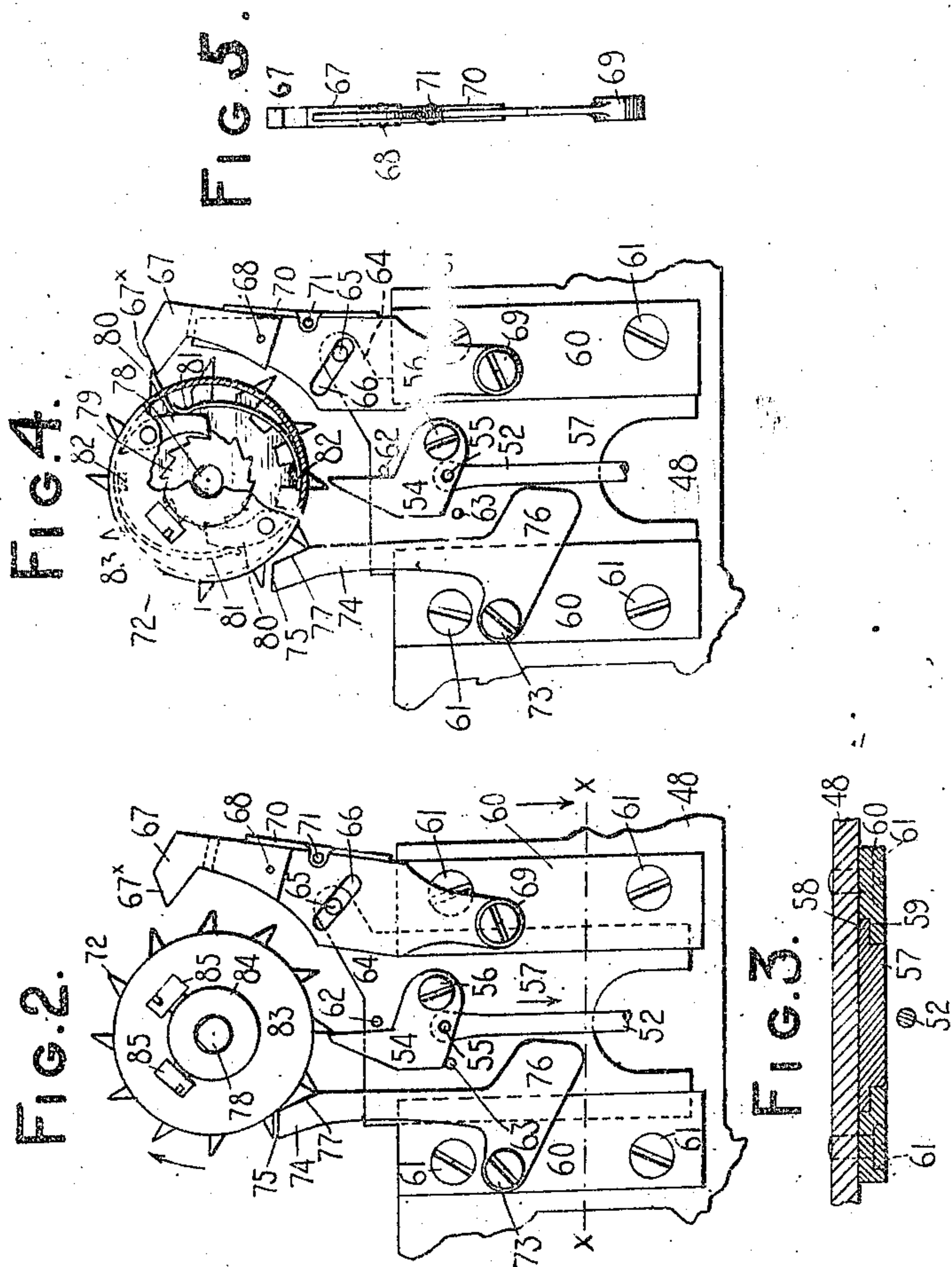
K. V. Donovan
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WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENE-
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TYPE-WRITING MACHINE.

934,100.

Specification of Letters Patent

Patented Sept. 14, 1909.

Application filed February 6, 1902. Serial No. 92,851.

To all whom it may concern:

Be it known that I, CHARLES H. SHEPARD, citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My present invention relates to escapement mechanism for typewriting machines.

The object of my invention is to provide a speedy, simple and efficient carriage, feed or escapement mechanism.

To the above and other ends which will appear in the following description, my invention consists in the novel constructions and arrangements and combinations of parts to be hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical sectional view partly in section of one form of typewriting machine embodying my invention; the section being taken from front to rear of the machine. Fig. 2 is an enlarged detail rear elevation of the carriage feed or escapement mechanism. Fig. 3 is a transverse horizontal sectional view of a portion of the same, the section being taken on the line *x x* of Fig. 2 and looking in the direction of the arrow at said line. Fig. 4 is an enlarged detail rear elevation, with parts broken away, of the carriage feed or escapement mechanism; the view showing a different disposition of the parts from that illustrated in Fig. 2. Fig. 5 is a detail edge view of the stepping or feeding dog.

In various views, parts have been omitted or broken away to more clearly illustrate other features of the structure.

I have shown my invention applied to a No. 6 Remington machine, though it should be understood that the invention or any one or more of the separate features thereof may be applied to any other character of typewriting machine.

The frame 1 is surmounted by a top plate 2 which supports uprights studs 3, 4, to which the traverse rods 5, 6, respectively, are connected. The usual carriage 7 moves from end to end of the machine on the traverse rods and carries a platen frame 8 in which a platen 9 is mounted to revolve. The front end of the platen frame is supported upon a

shift rod 10 which is connected to the upper ends of upright shift arms 11, located near the opposite ends of the machine and secured to a rock shaft 13 that is adapted to rock in bearings formed in arms or supports 14 which depend from the top plate 2. The shift rod 10 is moved transversely, in any suitable manner, to move the platen frame and platen in a direction transverse to its feed to change the "case" position thereof. This transverse movement of the platen and its frame is limited by stop pins 15 carried in the usual manner by the carriage 7 at each end thereof and which cooperate with each end of a projecting pivot rod or shaft 16 which pivotally connects the platen frame to the carriage 7 through the usual links 17.

Character key levers 18 are fulcrumed at 19 in the frame 1 of the machine and are provided with finger keys 20 and restoring springs 21. Each key lever 18 is connected to a link 22 which is in turn connected to a type bar or carrier 23. A spacing key or bar 24 is connected at each end to a key lever 25, both of which are likewise fulcrumed at 19 upon opposite sides of the key-board and are provided with restoring springs 21. The parts thus far described constitute a portion of the well-known No. 6 Remington machine and a more elaborate description thereof is deemed unnecessary.

Extending transversely beneath the key levers 18 and 25 is the usual universal bar 30 which has connected thereto at each end a link 31; the links being connected at their upper ends 32 to a transversely extending bar 33 which is carried by an arm 34 that extends from a rock shaft 35 mounted in bearings in the arms 36 that are secured at 37 to a plate-like bracket 38 which extends downwardly from the top plate 2. The rock shaft 35 is restored to the normal position by a spring 39 which is secured at one end to the bracket 38 and is secured at its opposite end 41 to the rock shaft. Extending rearwardly from the rock shaft 35 is a crank arm 42 which is pivoted at 43 to a link 44 that in turn is pivoted at 45 to a two-arm lever 46 that is pivoted at 47 to a depending bifurcated bracket arm that extends downwardly from a bracket plate 48 that is secured by screws 49 to studs 50 which project from the plate-like bracket 38. The rear end of the two-arm lever 46 is pivoted at 51 to a link 52. This link 52 is preferably made in two parts

and the parts are provided one with a right-hand screw-thread and the other with a left-hand screw-thread which coöperate with a turn buckle 53 that unites the two sections 5 of the link and constitute means for lengthening and shortening the link so as to vary the throw or regulate the movement of the feed dog 54, which is pivoted at 55 to said link. This feed dog 54 is pivoted at 56 to a 10 so-called feed dog carrier 57 that is in the nature of a reciprocatory plate and is formed with tongues 58 (Fig. 3) which take in suitable ways 59 formed by guide-pieces 60 which are secured by screws 61 to the plate-like bracket 48. The feed dog 54 has a limited movement independently of the feed dog carrier 57 by reason of its pivotal connection with said carrier, the independent movement of the dog being limited by stop 20 pins 62, 63. Extending laterally from one side of the dog carrier 57 is an arm 64 which is provided with a pin 65 that extends into an inclined slot 66 in a feed dog 67 so that a movement of the dog carrier 57 in opposite 25 directions in its ways will cause the feed dog 67 to be moved toward and away from the feed or escapement wheel. The feed dog 67 may be made as a single rigid piece, though I prefer to make it in two parts which are 30 pivotally united at 68, the feed dog as a whole being pivoted at 69 to a fixed portion of the machine, such as one of the guide pieces 60. The two parts of the feed dog 67 are normally maintained in a fixed relation 35 one to another by a leaf spring 70 which is secured to one of the parts at 71 and bears against both sections or parts of the feed dog upon opposite sides of the pivot 68 which unites them, thus exerting a pressure to 40 maintain the parts against movement one with relation to the other.

While I have referred to the dogs 54 and 67 as feed dogs, the dog 54 may be more specifically referred to as a stepping dog, 45 whereas the dog 67 may be more specifically designated as a holding dog. From an inspection of the drawings, it will be observed that the stepping dog is located beneath the center of the feed wheel 72 and moves in 50 substantially a radial path toward and away from the feed wheel, as distinguished from an oscillating movement, though it has a slight independent pivotal movement on its pivot 56, whereas the holding dog 67 only 55 oscillates on its pivot 69 into and out of contact with the escapement wheel and is located in advance of the stepping dog, considered with relation to the feed movement of the escapement wheel, and moves at substan- 60 tially right angles to the direction of movement of the stepping dog. Furthermore, the stepping dog 54 and holding dog 67 move in the same plane with the escapement wheel. Pivoted at 73 to one of the guide pieces 60 is 65 a blocking pawl 74, the face 75 of which co-

operates with the back of each of the teeth of the escapement wheel to prevent a movement thereof in a direction reverse to that of its feed. This pawl 74 is maintained in its coöperating position by a weighted 70 arm 76 which causes it to bear against the teeth and the pawl is moved to one side during the rotation of the escapement wheel in the direction of its feed by the teeth of the wheel contacting with the inclined 75 face 77 of the pawl, as indicated at Fig. 4. The feed wheel 72 is of the usual construction employed in the No. 6 Remington typewriting machine and comprises the wheel 72 which is loosely maintained upon 80 the shaft 78 and is provided with a ratchet wheel 79 that is connected to one face thereof and coöperates with pawls 80 which are pressed into engagement with the teeth of the ratchet wheel by springs 81, each of 85 which is secured at 82 to a cylindrical housing 83 that has a collar 84 projecting therefrom. This collar is provided with screw-threaded openings in which the set screws 85 engage and the inner ends of these screws 90 are adapted to bear upon the shaft 78 to connect the housing to the shaft. The shaft 78 is mounted in a bearing 86 which is secured at 87 to the top plate 2 of the machine. The forward end of the rock shaft is provided with the usual feed pinion 88 that is 95 adapted to mesh with a feed rack 89 that is carried upon arms 90 which are pivoted at 91 to the carriage 7. The disposition of the teeth on the ratchet wheel 79 and the co- 100 operating pawls 80 is such that a rotation of the escapement wheel 72 in the direction of its feed, will cause a feed movement of the carriage, whereas when the carriage is moved in a direction opposite to that of its feed or 105 from left to right, the shaft 78 will be rotated in reverse direction or in a direction opposite to that indicated by the arrow in Figs. 2 and 4, thus rotating the housing 83 110 in the same direction and causing the pawls 80 to ride freely over the teeth of the co-operating ratchet wheel, thereby permitting the feed wheel to remain fixed against movement during this movement of restoration of the carriage. The pawl 74 will maintain the 115 feed wheel against any accidental reverse movement that might take place through the frictional contact of the pawls 80 with the coöperating ratchet wheel.

The tension of the spring 39 of the rock shaft 35 tends normally to maintain the escapement mechanism in the position shown in Fig. 2, which is the position of rest, and while the tendency of said spring is to force the stepping dog 54 against the pin 62, its 120 tension is overcome by the carriage spring 92, exerted through the escapement wheel and the dog is normally maintained against the stop or pin 63. 125

In operation, a depression of a character 130

key or the spacing key will effect a downward movement of the link 52, which is effective to move the stepping dog 54 and the carrier 57 from the positions shown in Fig. 2 to those indicated in Fig. 4, and the pin and slot connection between the dog carrier and the holding dog 67 will cause a simultaneous movement of the holding dog toward and into the path of the advancing tooth of the escapement wheel. The movements of the parts just described will permit a slight rotation of the escapement wheel to the position shown in Fig. 4, and the stepping dog 54 being at this time out of contact with the escapement wheel and therefore no longer under compression of the carriage spring, will be forced by the spring 39 of the rock shaft 35 around its pivot 56 and into engagement with the stop or pin 62 as shown in Fig. 4. This movement of the stepping dog independently of its carrier is effective to cause it to clear the tooth with which it was in contact and to tend to project it into the path of the next adjacent tooth of the escapement wheel, as shown in Fig. 4. The various movements of the parts just described are effected by a depression of any of the character keys or the spacing key and when the operator releases the key the spring 39 will move the stepping dog and its carrier to the position shown in Fig. 2, and the stepping dog will arrest the advancing tooth of the escapement wheel after it has moved sufficiently far to effect a letter space feed of the carriage. This same movement of the stepping dog and its carrier is effective to move the holding dog to the disengaged position to permit this advance movement of the escapement wheel under the tension of the carriage spring. During this disengaging movement of the holding dog the flat or working face 67* thereof will be in the same plane or substantially the same plane as the working face of the engaged tooth of the escapement wheel and will move in the general direction of movement of said tooth, as well as at substantially right angles thereto, or in other words, the movement of the dog is such that it may be resolved into two components, one of which is in the same direction as the motion of the engaged tooth of the escapement wheel and the other of which is at right angles to the motion of the engaged tooth, the pivot of said dog being parallel to the axis of the escapement wheel and remote from a line drawn tangent to the escapement wheel at the point at which the dog engages said wheel, so that during the disengaging movement of the holding dog, the advancing movement of the escapement wheel takes place. It will therefore be seen that a rapid and efficient escapement mechanism is provided without the use of relatively beveled working faces on either

the feed dogs or the teeth of the escapement wheel. It will likewise be observed that during the movement of the holding dog toward and away from the escapement wheel, and in fact at all times, the working face of the dog is in a plane which is either the same or is substantially parallel with the plane of the working face of the next advancing tooth of the escapement wheel.

As pointed out above the peculiar manner of mounting the holding dog and the relation of the parts affords an advance or quick let-off of the carriage when pressure on a finger key is released and during the return stroke of the key.

The effect of the employment of the two-part holding dog 67, the parts of which are normally maintained in a fixed relation by the spring 70, is to cushion, so to speak, the contact between the advancing teeth of the escapement wheel and the holding dog. Thus it will be seen that when the holding dog is moved into contact with a tooth of the escapement wheel as it is advancing under the power of the carriage spring, said contact takes place during the down stroke on the finger key and the result of the employment of the spring is that the finger of the operator is relieved from shock of the advancing tooth of the escapement wheel by the resilient action of the spring 70 when the holding dog reaches contact with the escapement wheel. This is especially true where the operator has a long following stroke and it may or may not occur in the ordinary operation of the machine depending upon various conditions. It should be understood, however, that the resilient action just described is not essential to the operation of the escapement mechanism and that the holding dog 67 may as before stated, be made of a single rigid piece without in any way effecting the operation of the escapement as such.

While I have shown and described with considerable detail one form of typewriting machine embodying my invention, it should be understood that various changes may be made without departing from the spirit of my invention.

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

1. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, a dog normally engaged with said wheel, a dog normally disengaged from said wheel, both of said dogs being mounted for movement toward and away from said wheel in the plane thereof, and means for moving the working face of said normally disengaged dog toward the wheel in a direction opposed to the direction of motion of the next advancing tooth of said wheel and away from the wheel in a direc-

tion with said tooth before the normally engaged dog is brought into engagement with the wheel, thereby affording an advance of said escapement wheel during the receding movement of said normally disengaged dog and before said dog is out of engagement with said tooth.

2. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, a holding dog and a stepping dog both mounted for movement toward and away from the wheel in the plane thereof, and means for moving the working face of the holding dog toward the wheel in a direction opposed to the direction of motion of the next advancing tooth of the wheel and away from the wheel in a direction with the tooth before the other dog is brought into engagement with the wheel, thereby affording an advance of the escapement wheel during the receding movement of said holding dog and before said holding dog is out of engagement with said tooth, the working face of the holding dog being at certain times in a plane which is the same as, and at all other times being substantially parallel with the plane of the working face of the next advancing tooth of the escapement wheel.

3. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, and feed dogs which cooperate therewith, the movement of one of said dogs into and out of contact with said wheel being in the plane of the wheel and the movement thereof away from the wheel being partly in the direction of movement of the tooth of the wheel which is engaged by said dog and while said wheel is disengaged by the other dog, thus affording an advance of the escapement wheel during the receding movement of the first mentioned dog.

4. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, a radially movable stepping dog, and a holding dog, the movement of said holding dog into and out of contact with said wheel being in the plane of the wheel and in directions respectively opposed to and with the direction of movement of the tooth of the wheel which is engaged by said holding dog and while the stepping dog is out of engagement with said wheel, and means for moving the holding dog toward the wheel when the stepping dog is moved away from it.

5. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, a radially movable stepping dog, a holding dog, and means for controlling the movement of one of said dogs by the movement of the other, the dogs moving into and out of engagement with the wheel in the same plane as the wheel, the disengaging movement of the working face of

the holding dog being in a direction with the direction of the advancing movement of the tooth of the wheel which is engaged by said holding dog and while the stepping dog is out of engagement with said wheel.

6. In an escapement mechanism for typewriting machines, the combination of an escapement wheel, a radially movable stepping dog which in its movements toward and away from said wheel reciprocates in the plane of the escapement wheel, and an oscillating holding dog pivotally mounted independently of the stepping dog to move in the same plane as the escapement wheel during the movement of the dog toward and away from said wheel, and means positively controlled by the stepping dog for advancing the holding dog toward and withdrawing it from the working face of an oncoming tooth of the escapement wheel, the direction of the disengaging movement of the working face of the holding dog being partly in the direction of movement of the working face of the advancing tooth of the wheel which is engaged by said holding dog.

7. In a typewriting machine, the combination of printing instrumentalities, keys therefor, a carriage, a feed wheel for said carriage, a feed dog which is normally in engagement with said feed wheel, and a feed dog which is normally out of engagement with said feed wheel, said feed dogs being independently mounted and the normally engaged dog having a limited movement independently of the other which affords a movement of the normally engaged dog into the path of the teeth on the feed wheel before the normally disengaged dog is released from the wheel.

8. In a typewriting machine, the combination of a carriage, a feed wheel therefor, a stepping dog and a holding dog which is mounted independently of but is controlled by the movement of the stepping dog, means whereby a slight advance movement of the feed wheel is afforded when the stepping dog is disengaged therefrom, and for moving the stepping dog into the path of the teeth of the feed wheel before the holding dog receives a movement of disengagement therefrom.

9. In a typewriting machine, the combination of a carriage, an escapement wheel therefor, a stepping dog, a holding dog which is controlled by the movement of the stepping dog and both of which dogs move in the same plane as the escapement wheel, means for affording a movement of the stepping dog toward the escapement wheel in advance of a disengaging movement of the holding dog, and adjustable means directly connected to said stepping dog for regulating the timing of this advance movement of the stepping dog.

10. In a typewriting machine, the com-

- combination of a carriage, a feed wheel therefor, feed dogs that move in directions at substantially right angles to each other into and out of engagement with said wheel, the movement of one of which is controlled by the movement of the other, means positively and directly connected to the controlling dog for moving it, and adjustable means for regulating the throw of the controlling dog.
11. In a typewriting machine, the combination of a carriage, a feed wheel therefor, feed dogs, key actuated means for moving said feed dogs, and resilient means coöperating with one of said feed dogs for relieving the fingers from shock of the advancing tooth of the feed wheel when it is arrested by the feed dog with which the resilient means coöperate.
12. In a typewriting machine, the combination of a carriage, a feed wheel therefor, a stepping dog, a holding dog which is moved by the movement of said stepping dog and both of which dogs move toward and away from said escapement wheel in the plane thereof, key actuated means for moving the stepping dog and resilient means coöperating with said holding dog for relieving the fingers from shock when the holding dog is moved by the finger keys.
13. In a typewriting machine, the combination of a power driven carriage, an escapement wheel therefor, a feed dog, the working face of which advances toward the oncoming tooth of the escapement wheel in a direction opposed to the direction of the feed movement of said oncoming tooth, and a spring which normally maintains a fixed relation to the said feed dog and the part which moves it.
14. In a typewriting machine, the combination of a carriage, a feed wheel which is operatively connected thereto, a reciprocating dog carrier, a stepping dog carried by said carrier and which moves radially toward and away from said wheel, an oscillating holding dog which is pivoted independently of but is positively moved by said carrier during a movement of the stepping dog, and means connected directly to the stepping dog for moving it and said carrier.
15. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier which is mounted to slide in fixed bearings on the frame of the machine and at substantially right angles to the center of rotation of the feed wheel, a stepping dog carried by said carrier and having a limited vibratory movement thereon, a holding feed dog which is positively moved by said reciprocating carrier, and means connected directly to the stepping dog for moving it and the carrier together in one direction and for effecting an independent move-

ment of said stepping dog in an opposite direction, and then moving the said dog and carrier together.

16. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier, a feed dog carried by said carrier and having a limited vibratory movement thereon, means connected to said feed dog for moving it and the carrier, and a second feed dog which is positively moved by said reciprocating carrier.

17. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier, a feed dog carried by said carrier and having a limited vibratory movement thereon, means connected to said feed dog for affording a movement thereof for a limited distance independently of the carrier, means for moving the said dog and carrier together, and a second feed dog which is positively moved by said carrier.

18. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a stepping dog and an independently mounted holding dog which coöperate with said feed wheel and which are movable independently of each other for a limited distance, and means controlled through the stepping dog for positively moving the holding dog into and out of engagement with said wheel and for affording a feed movement of the wheel by the movement of first one dog and then the other into and out of engagement with said wheel.

19. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a stepping dog, a reciprocating carrier to which said stepping dog is pivoted and with relation to which it has an independent movement for a limited distance, a holding dog which is operatively connected to said carrier and which is positively moved thereby into and out of engagement with the feed wheel, and means directly connected to the stepping dog for moving it independently of the holding dog toward the feed wheel and for moving the carrier to effect a movement of the holding dog.

20. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, independently mounted positively connected feed dogs, and means directly connected to one of said dogs to move it and to thereby afford a positive movement of the other dog into and out of engagement with the feed wheel.

21. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a feed dog pivoted to a fixed portion of the machine, a second feed dog, a carrier upon which said second feed dog is carried, positive connections be-

tween said dogs, and key actuated means connected directly to the second feed dog to move it into and out of engagement with the feed wheel, and to afford by a positive movement an actuation of the first feed dog.

22. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a holding dog pivoted to a fixed portion of the machine, a stepping dog, a movable carrier upon which said stepping dog is carried, positive connections between said dogs, and key actuated means connected directly to the stepping dog to move it into and out of engagement with the feed wheel and to afford by a positive movement an actuation of the holding dog.

23. In a typewriting machine, the combination of a carriage, a feed wheel operatively connected thereto, a holding dog pivoted to a fixed portion of the machine, and movable in the same plane as the feed wheel, a stepping dog which moves in the same plane as the feed wheel, a reciprocating carrier upon which said stepping dog is carried, positive connections between said dogs, and key actuated means connected directly to the stepping dog to move it out of engagement with the feed wheel and then to afford by a positive movement through the carrier an actuation of the holding dog.

24. In a typewriting machine, the combination of a carriage, a cooperating feed wheel, a dog carrier, a stepping dog which is carried by said carrier and has a limited movement independently thereof, an independently mounted holding dog which moves at substantially right angles to the stepping dog and in substantially the same plane as the feed wheel, positive connections between the carrier and holding dog, and means connected directly to the stepping dog for moving it and the carrier, whereby the stepping dog may receive an independent movement toward the feed wheel and will then cause the holding dog to be positively moved in an opposite direction.

25. In a typewriting machine, the combination of finger keys, a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier, a stepping dog pivoted to said carrier and having a limited movement independently thereof, a holding dog pivoted to a fixed portion of the machine, a pin and slot connection between the dog car-

rier and the holding dog, and means controlled by the finger keys for moving the stepping dog.

26. In a typewriting machine, the combination of finger keys, a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier, a stepping dog pivoted to said carrier and having a limited movement independently thereof, a holding dog pivoted to a fixed portion of the machine and moving at an angle to the stepping dog, a pin and slot connection between the dog carrier and the holding dog, and means controlled by the finger keys and connected directly to the stepping dog for effecting a movement of stepping dog, carrier and holding dog.

27. In a typewriting machine, the combination of finger keys, a carriage, a feed wheel operatively connected thereto, a reciprocating dog carrier, a stepping dog pivoted to said carrier and having a limited movement independently thereof, key actuated moving means directly and positively connected to said stepping dog and effecting a movement of the carrier through said stepping dog, a holding dog pivoted to a fixed portion of the machine and moving at an angle to the stepping dog, the movement of the holding dog and stepping dog into and out of engagement with the feed wheel being in substantially the same plane as the feed wheel.

28. In a typewriting machine, the combination of a power-driven carriage, an escapement wheel, and cooperating escapement devices comprising a feed dog the working face of which is at all times cut by the plane of the escapement wheel, said feed dog being mounted to move toward and away from the oncoming tooth of the escapement wheel, the plane of said working face of the dog being at certain times coincident with and at all other times substantially parallel with the plane of the working face of said oncoming tooth of the escapement wheel.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this fourth day of February, A. D. 1902.

CHARLES H. SHEPARD

Witnesses:

K. V. DONOVAN,
E. M. WELLS.