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O. McCANN.
ESCAPEMENT MECHANISM.
APPLICATION FILED DEC. 6, 1910.

Patented Mar. 21, 1911.

2 SHEETS—SHEET 1.

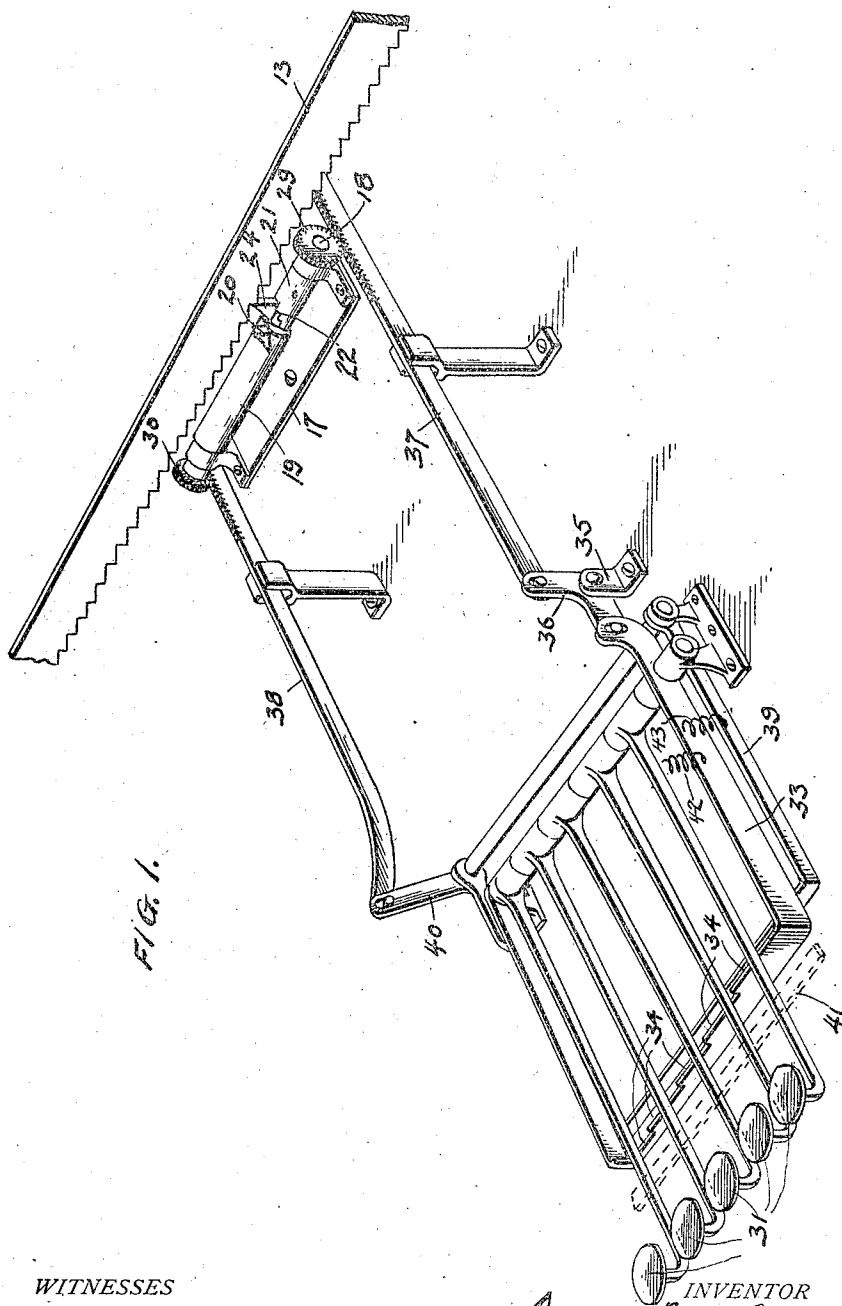


FIG. 1.

WITNESSES

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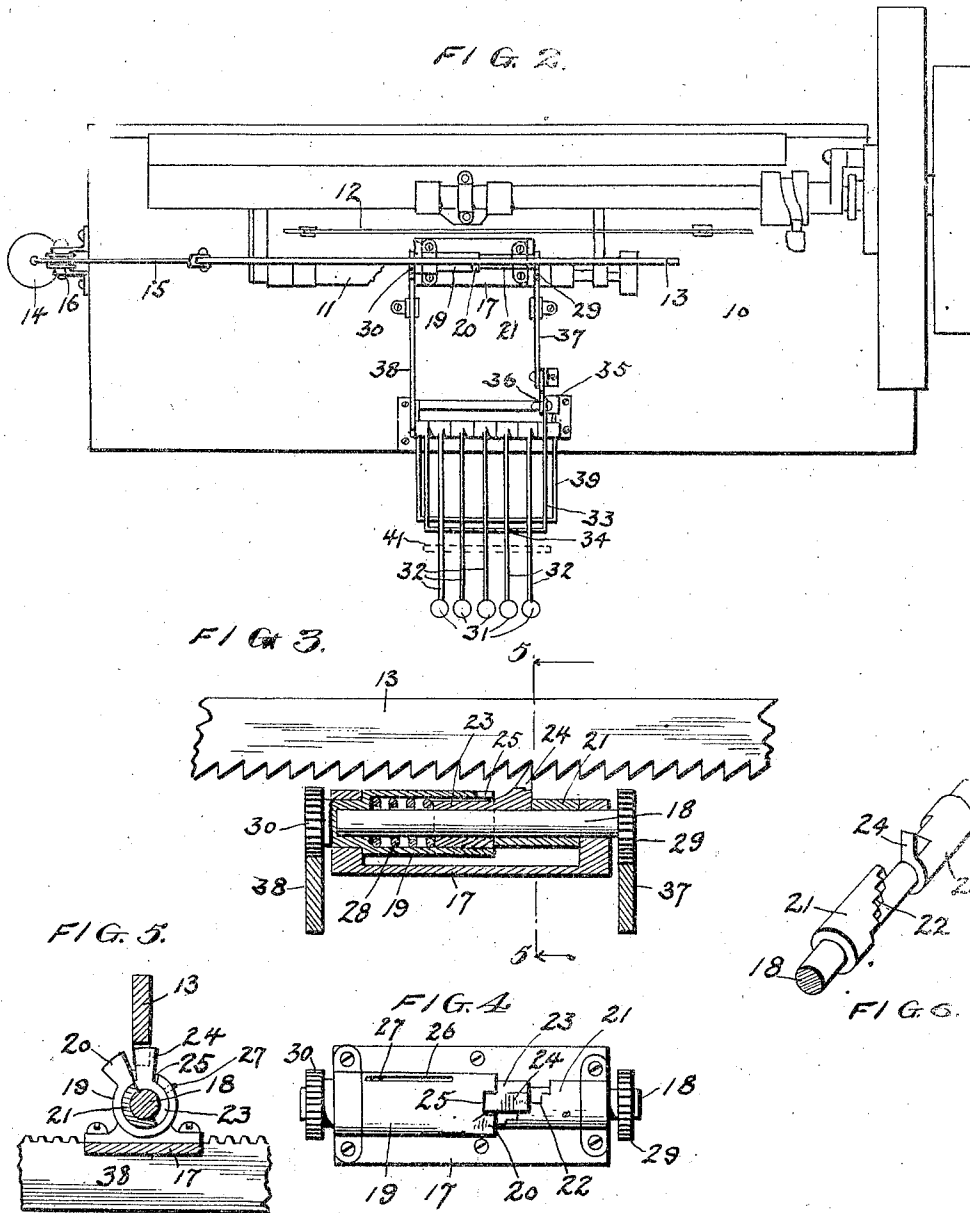
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2 SHEETS-SHEET 2.



WITNESSES

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ESCAPEMENT MECHANISM.

987,153.

Specification of Letters Patent. Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, OWEN McCANN, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Escapement Mechanism, of which the following is a specification.

This invention relates to typewriters and other machines having a carriage which is fed forward in a step-by-step manner by means of a spring or other suitable motive power, an escapement controlling such movement of the carriage.

The invention relates more particularly to the escapement, its object being to provide an improved mechanism of this kind whereby a variable feed of the carriage is obtained.

The invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed, and in order that it may be better understood, reference is had to the accompanying drawings forming a part of this specification.

The preferred embodiment of the invention has been shown and described, but it will be understood that various minor changes in the structural details may be resorted to without a departure from the invention. It is also to be understood that the invention is not limited to typewriters, but that it may be readily applied to perforating and other machines having a traveling carriage which is to be fed forward.

In the drawings—Figure 1 is a perspective view of the entire mechanism; Fig. 2 is a plan view of the mechanism applied to the machine, a fragment only of the latter being shown; Fig. 3 is a longitudinal section of the parts which co-act with the feed rack of the carriage; Fig. 4 is a plan view thereof; Fig. 5 is a cross section on the line 5—5 of Fig. 3; and Fig. 6 is a perspective view of a portion of the mechanism.

Referring specifically to the drawings, 10 denotes a fragment of the frame of the machine to which the invention is applied. The feed mechanism only has been shown, all other parts being left off for the sake of clearness, they forming no part of the present invention. The carriage 11 travels on rails 12 and carries a feed rack 13. A weight 14 is connected by a line 15 to one end of the feed rack, said line passing over a guide pulley 16. The weight serves to feed the

carriage forward when the escapement, which will now be described, is actuated.

Beneath the feed rack, in close proximity thereto, is located a bracket 17, said bracket being secured in a suitable manner to the frame 10. One end of the bracket supports a rotary shaft 18 on which is rotatably mounted a sleeve 19, the latter being supported by the other end of the bracket. The shaft and sleeve lie parallel to the feed rack. On one end of the sleeve is a tooth 20 which is adapted to engage the teeth of the feed rack. The shaft, adjacent to this end of the sleeve, carries a sleeve 21 which is provided with a number of steps 22, said sleeve being fixed to the shaft so as to turn therewith. The internal diameter of the sleeve 19 is greater than the diameter of the shaft 18, and on the shaft is a second sleeve 23 which is loose thereon and also fits loosely within the sleeve 19 so that it is free to move lengthwise on the shaft 18. The sleeve 23 has a tooth 24 on one of its ends which is also designed to engage the teeth of the feed rack, and to one side of the tooth 20 the end of the sleeve has a notch 25 adapted to be entered by the tooth 24, said tooth when thus located in the notch being on one side of the tooth 20, in alignment therewith, and close thereto. The steps 22 are in the path of the tooth 24. To prevent relative rotation of the sleeves 19 and 23, the former has a longitudinal slot 26 into which extends a pin 27 carried by the latter. The end of the sleeve 23, opposite its toothed end is engaged by one end of a spring 28 which is coiled around the shaft 18 within the sleeve 19, the other end of the spring abutting against a shoulder in said sleeve 19. On the shaft 18 is made fast a pinion 29, and on the sleeve 19 is made fast a pinion 30.

At 31 are indicated several spacing keys which are carried by levers 32 fulcrumed to a fixed part of the machine. Beneath these levers is located a yoke 33 also fulcrumed to some fixed part of the machine. The front bar of the yoke has a series of steps 34 corresponding in number to the number of levers 32, these steps being directly beneath the respective levers. Inasmuch as the yoke 33 is not actuated until it is engaged by the levers, it will be seen that the extent of the swing of the yoke is variable. The key which is above the lowest step imparts a minimum swing to the yoke, and the key

which is above the highest step imparts a maximum swing to the yoke. The purpose of this construction will be presently made clear. The number of keys corresponds to the number of steps 22.

To a bracket 35 mounted on some fixed portion of the machine is fulcrumed a bell-crank lever 36 having one of its arms connected by a pin-and-slot connection to one of the side arms of the yoke 33. The other arm of the lever is connected to a rack bar 37 which is slidably mounted in suitable guides on the machine. The pinion 29 is in mesh with this rack. The pinion 30 is in mesh with a rack bar 38 which is slidably mounted in guides similar to the rack bar 37.

Beneath the yoke 33 is located a second yoke 39 which is so located that it is actuated by the yoke 33 when the latter has reached nearly the end of its downward travel. The yoke 39 is also fulcrumed to a fixed part of the machine, and one of its side arms has an arm 40 to which the rack bar 38 is connected. Upon depressing any one of the keys 31, the yoke 33, through the corresponding lever 32, is swung downwardly and by reason of the connection between said yoke and the rack bar 37, the latter is moved lengthwise and thus actuates the pinion 29. At the end of the downward swing of the yoke 33, it engages the yoke 39 and also swings the same downwardly, thus rotating the pinion 30 through the rack bar 38, by reason of the connection of the latter with the yoke 39. The two rack bars move in opposite directions, and the pinions are therefore rotated in opposite directions.

Across the top of the levers 32 extends a stop bar 41 which limits the upward swing of their ends which are provided with the keys 31. A restoring spring 42 is provided for returning the levers upon being released after having been depressed. This spring may be connected to one of the side arms of the yoke 33. The yoke 39 also has a restoring spring 43.

The operation of the escapement is as follows: The tooth 24 is normally in engagement with the feed rack 13 and locks the carriage. To feed the carriage, key 31 corresponding to the number of spaces which it is desired that the carriage move, is depressed, whereupon the pinions 29 and 30 are rotated in opposite directions through the yokes 33 and 39 and the rack bars 37 and 38, as already described. The pinion 29 is actuated before the pinion 30, as the yoke 39 is not actuated until the yoke 33 has reached the end of its downward swing. Consequently the first movement is the rotation of the shaft 18 through the pinion 29. This places one of the steps 22 directly in the path of the tooth 24. When the yoke 39 is actuated, the sleeve 19 is rotated through the pinion 30 and rack bar 38, whereupon

the sleeve 19 is rotated, thus carrying the tooth 24 away from the feed rack 13 and placing the tooth 20 in engagement therewith. As soon as the tooth 24 leaves the feed rack it is shot forwardly, out of the notch 25, in the direction of the length of the feed rack, by the spring 28, until it is stopped by the step 22, as shown in Figs. 1, 3 and 4. The key 31 is now released, whereupon the springs 42 and 43 restore the parts to their normal position. During this movement the sleeve 19 is rotated in a direction to disengage the tooth 20 from the feed rack and simultaneous therewith to engage the tooth 24 with the feed rack. The weight 14 now pulls the carriage forwardly, the tooth 24 being carried along by the feed rack and stopping the carriage when it reenters the notch 25. The carriage thus travels forwardly the distance the tooth 24 was placed ahead of the tooth 20. The stepped sleeve 21 determines this distance, and is controlled by the keys 31. The key 31 selected therefore determines the number of spaces the carriage is moved. Thus, if the key of the lever 32, which imparts a maximum swing to the yoke 33, is selected, the shaft 18 is rotated a distance to place in alinement with the tooth 24 the step which is farthest from it during its normal position within the notch 25. By thus selecting the keys, a variable feed of the carriage is effected. One tooth does not leave the feed rack until the other tooth has engaged the feed rack, so that the carriage is always under control of the device. The movement of the teeth to release and lock the carriage is transversely of the feed rack.

I claim:

1. In an escapement mechanism, the combination with a carriage having a feed rack and feeding means; of holding members alternately engageable with the rack, one of said members normally engaging the feed rack, and being slidable in the direction of the length of said feed rack in one direction when disengaged therefrom, and in the opposite direction upon again engaging the same, stops between which said member is slidable, one of said stops being fixed, and the other stop being a rotatable member having a series of stops which are spaced different distances from the fixed stop to determine the extent of the first-mentioned sliding movement of the holding member, means for imparting a variable rotary movement to the aforesaid stop member to place a selected stop thereof into operative position.

2. In an escapement mechanism, the combination with a carriage having a feed rack and feeding means; of holding members alternately engageable with the rack, one of said members normally engaging the feed rack, and being slidable in the direction of

the length of said feed rack in one direction when disengaged therefrom, and in the opposite direction upon again engaging the same, stops between which said member is
 5 slidable, one of said stops being fixed, and the other stop being a rotatable member having a series of stops which are spaced different distances from the fixed stop to determine the extent of the first-mentioned
 10 sliding movement of the holding member, means for imparting a variable rotary movement to the aforesaid stop member to place a selected stop thereof into operative position, said means comprising a pinion on the
 15 rotatable member, a rack in mesh with the pinion, a pivoted member operatively connected to the rack for actuating the same, and having a stepped portion, and key-levers located above the steps of the pivoted
 20 member, and adapted to engage the same to impart a variable swing to said member.

3. In an escapement mechanism, the combination with a carriage having a feed rack and feeding means; of holding members alternately engageable with the rack, one of
 25 said members normally engaging the feed rack, and being slidable in the direction of the length of said feed rack in one direction when disengaged therefrom, and in the opposite
 30 direction upon again engaging the same, stops between which said member is slidable, one of said stops being fixed, and the other stop being a rotatable member having a series of stops which are spaced
 35 different distances from the fixed stop to determine the extent of the first-mentioned sliding movement of the holding member, means for imparting a variable rotary movement to the aforesaid stop member to
 40 place a selected stop thereof into operative position, said means comprising a gearing connected to the rotatable member, a pivoted member operatively connected to the gearing for actuating the same, and having
 45 a stepped portion, and key-levers located above the steps of the pivoted member, and adapted to engage the same to impart a variable swing to said member.

4. In an escapement mechanism, the combination with a carriage having a feed rack and feeding means; of a rotatable shaft extending parallel to the feed rack, a sleeve
 50 rotatable on the shaft and having a tooth adapted to engage the feed rack, said tooth normally engaging the feed rack and being
 55 slidable in the direction of the length thereof, a stop on the sleeve for the sliding tooth, an adjustable stop on the shaft for the sliding tooth to determine the extent of the sliding
 60 movement thereof, means for rotating the sleeve to alternately engage the teeth with and to disengage the same from the feed rack, and means for rotating the shaft to adjust the stop carried thereby.

65 5. In an escapement mechanism, the com-

bination with a carriage having a feed rack and feeding means; of a rotatable shaft extending parallel to the feed rack, a sleeve
 70 rotatable on the shaft and having a tooth adapted to engage the feed rack, said tooth normally engaging the feed rack and being slidable in the direction of the length thereof, a stop on the sleeve for the sliding tooth, a stepped member fixed to the shaft, the steps of said member being spaced different
 75 distances from the slidable tooth to determine the extent of the sliding movement thereof, means for rotating the sleeve to alternately engage the teeth with and to disengage the same from the feed rack, and
 80 means for rotating the shaft to place a selected step of the aforesaid member into operative position.

6. In an escapement mechanism, the combination with a carriage having a feed rack
 85 and feeding means; of a rotatable shaft extending parallel to the feed rack, a sleeve rotatable on the shaft and having a tooth adapted to engage the feed rack, said tooth normally engaging the feed rack and being
 90 slidable in the direction of the length thereof, a stop on the sleeve for the sliding tooth, a stepped member fixed to the shaft, the steps of said member being spaced different distances from the slidable tooth to determine the extent of the sliding movement
 95 thereof, means for rotating the sleeve to alternately engage the teeth with and to disengage the same from the feed rack, and means for rotating the shaft to place a selected
 100 step of the aforesaid member into operative position, said means comprising a gearing connected to the shaft, a pivoted member operatively connected to the gearing for actuating the same, and having a stepped
 105 portion, and key-levers above the steps of the pivoted member, and adapted to engage the same to impart a variable swing to said member.

7. In an escapement mechanism, the combination with a carriage having a feed rack
 110 and feeding means; of a rotatable shaft extending parallel to the feed rack, a sleeve rotatable on the shaft and having a tooth adapted to engage the feed rack, said tooth normally engaging the feed rack and being
 115 slidable in the direction of the length thereof, a stop on the sleeve for the sliding tooth, a stepped member fixed to the shaft, the steps of said member being spaced different distances from the slidable tooth to determine the extent of the sliding movement
 120 thereof, means for rotating the sleeve to alternately engage the teeth with and to disengage the same from the feed rack, and means for imparting a variable rotary motion to the shaft to place a selected step of the aforesaid member into operative position.

8. In an escapement mechanism, the com- 130

5 bination with a carriage having a feed rack
 and feeding means; of a rotatable shaft ex-
 tending parallel to the feed rack, a sleeve
 10 rotatable on the shaft and having a tooth
 adapted to engage the feed rack, said tooth
 normally engaging the feed rack and being
 slidable in the direction of the length there-
 of, a stop on the sleeve for the sliding tooth,
 15 an adjustable stop on the shaft for the slid-
 ing tooth to determine the extent of the slid-
 ing movement thereof, yielding means for
 advancing the sliding tooth against the ad-
 justable stop, means for rotating the sleeve
 to alternately engage the teeth with and to
 20 disengage the same from the feed rack, and
 means for rotating the shaft to adjust the
 stop carried thereby.

9. In an escapement mechanism, the com-
 bination with a carriage having a feed rack
 and feeding means; of a rotatable shaft ex-
 20 tending parallel to the feed rack, a sleeve
 rotatable on the shaft and having a tooth
 adapted to engage the feed rack, said tooth
 being on one end of the sleeve, and said
 25 end of the sleeve having a notch adjacent
 to the tooth, said tooth normally seating in
 the notch and engaging the feed rack, and
 being slidable in the direction of the length
 thereof, an adjustable stop on the shaft for
 30 the sliding tooth to determine the extent of
 the sliding movement thereof, means for ro-
 tating the sleeve to alternately engage the
 teeth with and to disengage the same from
 the feed rack, and means for rotating the
 35 shaft to adjust the stop carried thereby.

10. In an escapement mechanism, the com-
 bination with a carriage having a feed rack
 and feeding means; of a rotatable shaft ex-
 tending parallel to the feed rack, a sleeve ro-
 40 tatable on the shaft and having a tooth
 adapted to engage the feed rack, said tooth
 normally engaging the feed rack and being
 slidable in the direction of the length there-
 of, a stop on the sleeve for the sliding tooth,
 45 an adjustable stop on the shaft for the slid-
 ing tooth to determine the extent of the
 sliding movement thereof, means for ro-
 tating the shaft to adjust the stop carried

thereby, said means comprising a gearing
 connected to the shaft, a pivoted member 50
 operatively connected to the gearing for
 actuating the same and having a stepped
 portion, and key-levers above the steps of
 the pivoted member and adapted to engage
 the same to impart a variable swing to said 55
 member, and means for rotating the sleeve
 to alternately engage the teeth with and to
 disengage the same from the feed rack, said
 means comprising a gearing connected to
 the sleeve, and a pivoted member operatively 60
 connected to said gearing, said member be-
 ing in the path of the first-mentioned swing-
 ing member and actuated thereby.

11. In an escapement mechanism, the com-
 bination with a carriage having a feed rack 65
 and feeding means; of a holding member
 for the feed rack swinging transversely
 thereof, a second holding member swinging
 transversely and slidable in the direction of
 the length of the feed rack, said second 70
 holding member normally engaging the feed
 rack to lock the carriage, stops between
 which the second holding member is slid-
 able, one of said stops being fixed and the
 other stop being adjustable to determine the 75
 extent of the sliding movement of the mem-
 ber, means for setting the adjustable stop,
 means for releasing the second holding
 member from the feed rack and engaging
 the other holding member therewith, yield- 80
 ing means for sliding the second holding
 member against the adjustable stop when
 thus released from the feed rack, and means
 for releasing the first-mentioned holding
 member from the feed rack and restoring 85
 the second holding member to engagement
 therewith to effect the release of the car-
 riage, said second holding member travel-
 ing with the carriage and locking the same
 upon engaging the first-mentioned stop. 90

In testimony whereof I affix my signature
 in presence of two witnesses.

OWEN McCANN.

Witnesses:

LEE SHACKELFORD,
 L. DAUGHERTY.