

N. H. ANDERSON.  
TYPE WRITING MACHINE.

APPLICATION FILED JUNE 5, 1908. RENEWED JUNE 5, 1913.

1,084,385.

Patented Jan. 13, 1914.

3 SHEETS-SHEET 1.

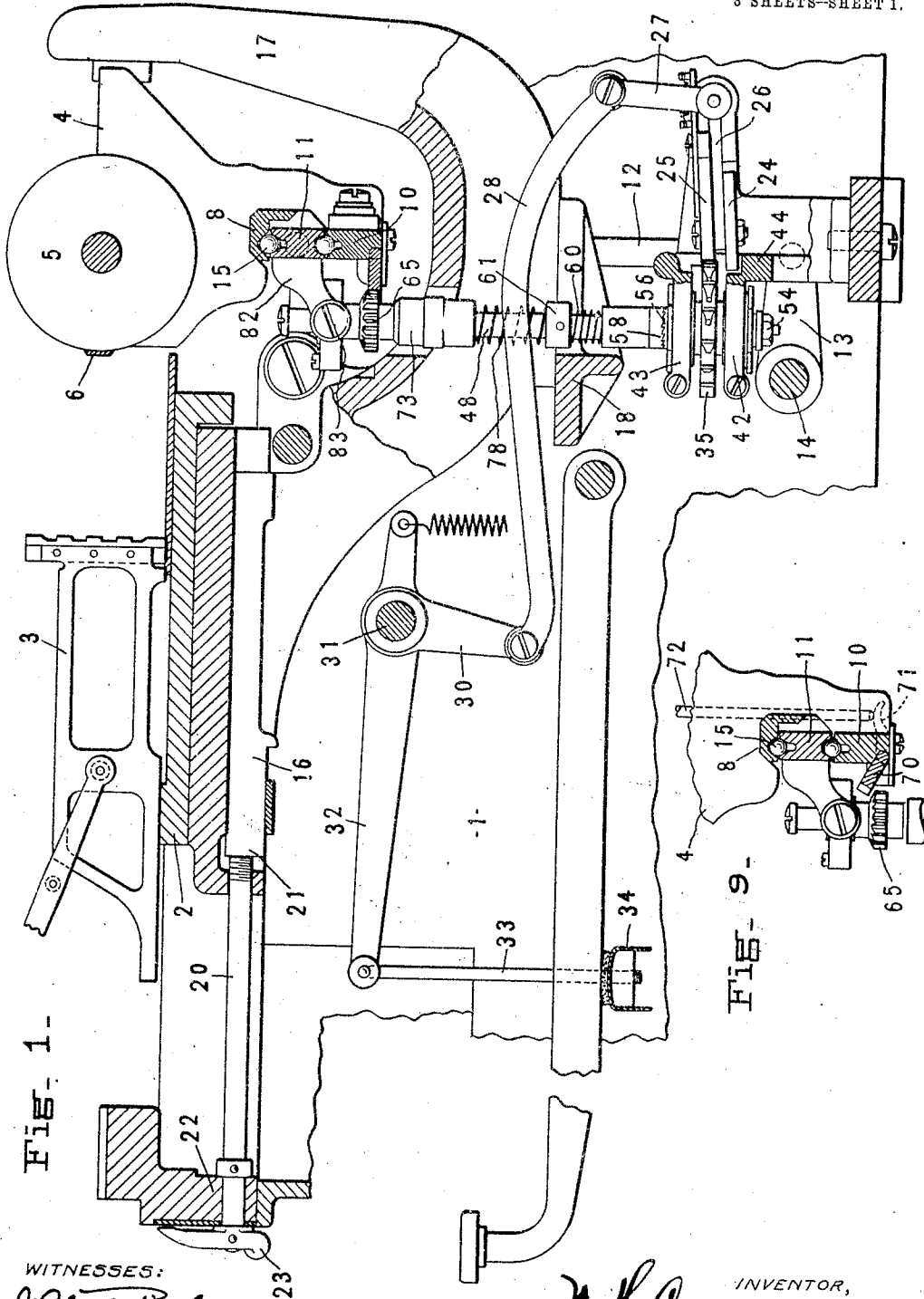


FIG. 1-

FIG. 9-

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3 SHEETS--SHEET 2.

Fig. 2.

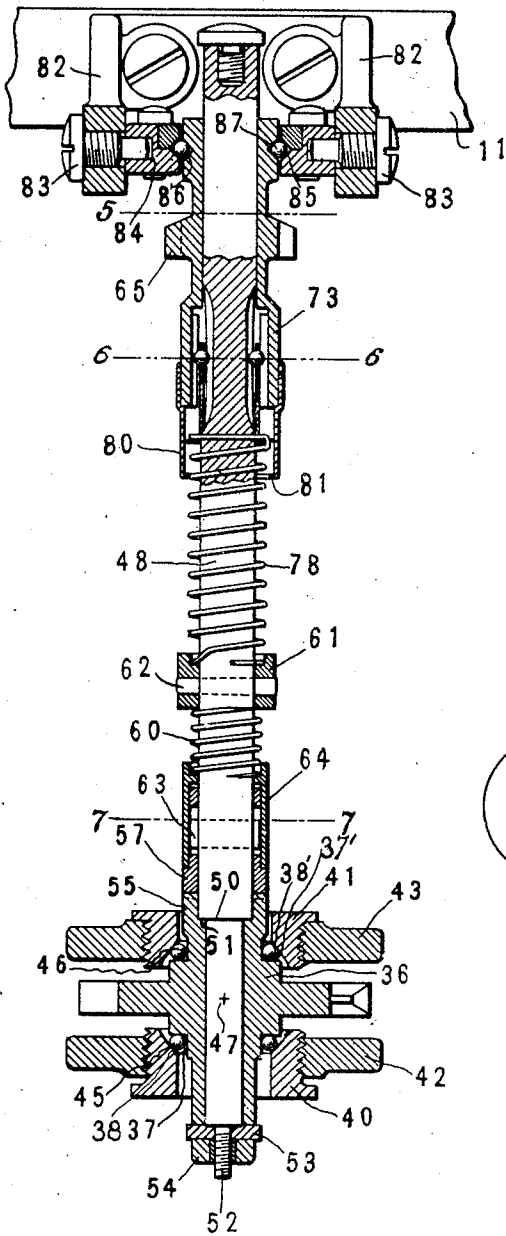
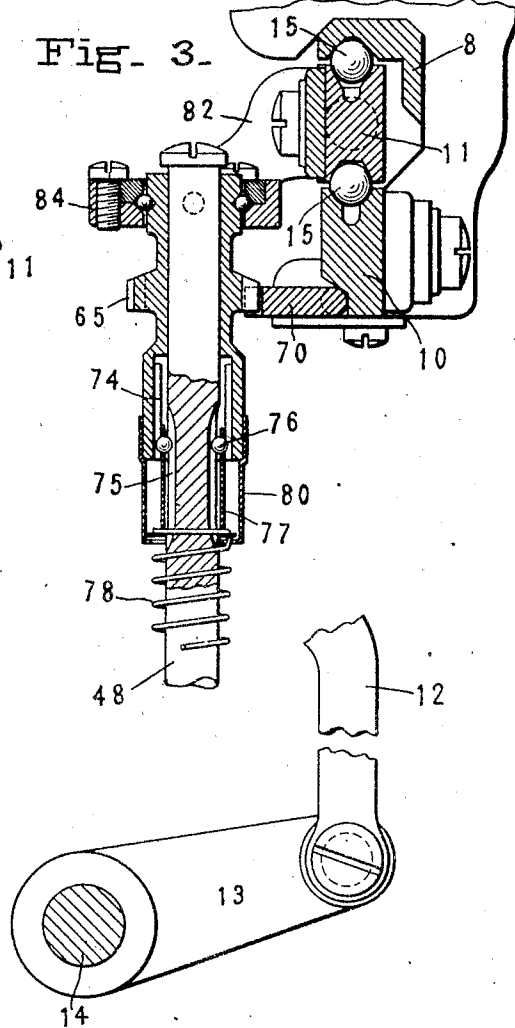


Fig. 3.



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8 SHEETS—SHEET 3.

FIG. 4.

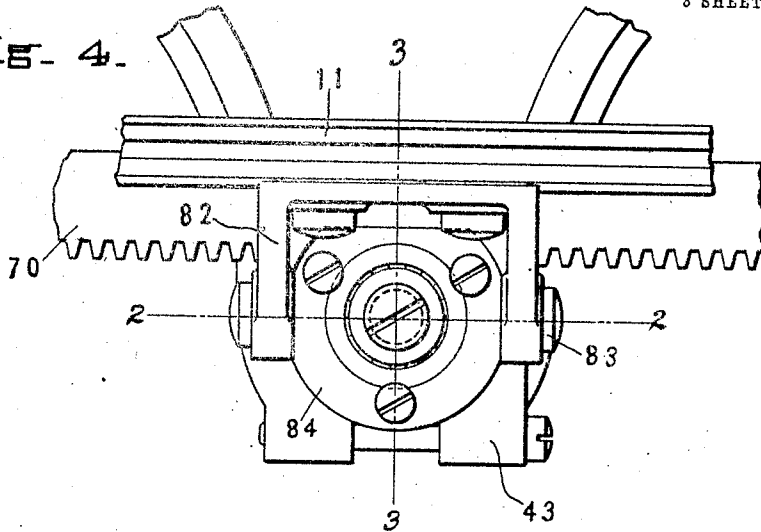


FIG. 5.

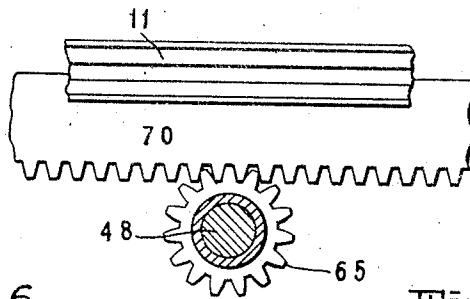


FIG. 6.

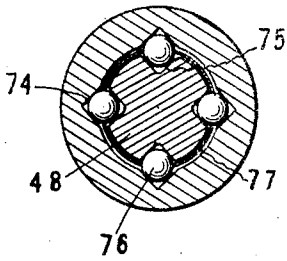


FIG. 7.

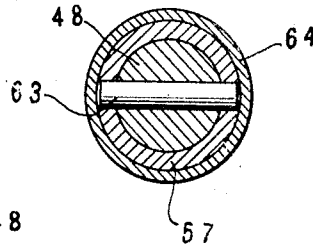
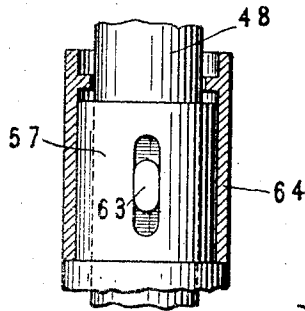


FIG. 8.



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# UNITED STATES PATENT OFFICE.

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## TYPE-WRITING MACHINE.

1,084,385.

Specification of Letters Patent.

Patented Jan. 13, 1914.

Application filed June 5, 1908, Serial No. 436,747. Renewed June 5, 1913. Serial No. 772,002.

### To all whom it may concern:

Be it known that I, NILS H. ANDERSON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to typewriting machines, and more particularly to the carriage feeding mechanism thereof.

One of the objects of the present invention is to provide new and improved means for effecting a connection between the escapement mechanism and a feed-rack of the platen carriage.

Another object is to provide mechanism of the above character which will be substantially noiseless in operation, and wherein friction between moving parts will be reduced to a minimum.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is illustrated one of the various possible embodiments of my invention, Figure 1 is a view taken transversely through the machine, the mechanism constituting the present invention being shown in elevation; Fig. 2 is a sectional view upon an enlarged scale, taken through portions of the escapement shaft and the associated parts of the mechanism; Fig. 3 is a similar view of the upper portion of the mechanism illustrated in Fig. 2, but looking in a direction at right angles thereto, the platen carriage being shown in a shifted position; Fig. 4 is a view in plan of the mechanism shown in Fig. 3; Fig. 5 is a plan view showing a portion of the feed-rack and the feed-pinion; Fig. 6 is a sectional view on an enlarged scale, taken on line 6-6, Fig. 2; Fig. 7 is a similar view on an enlarged scale, taken on line 7-7, Fig. 2;

Fig. 8 is a view showing a portion of the escapement shaft and the manner of keying the clutch-member thereon; and Fig. 9 illustrates a portion of the mechanism illustrated in Fig. 1 and shows the manner in which the feed-rack is disengaged from the feed-pinion.

Similar reference characters refer to similar parts throughout the several figures of the drawings.

Referring now to the drawings, 1 denotes a portion of the framing of the machine, and 2 denotes bed or table upon which the type-bars, one of which is shown at 3, are supported and across which they are projected to impression by actuating mechanism not shown herein.

4 indicates the platen frame which carries the paper roll 5. The platen, which, in the present instance, is comprised by a thin strip of metal 6, lies in contact with the platen roll. The platen carriage, in the present instance, is provided with a pair of longitudinally extending rails 8 and 10, provided with ball runways, and between these rails is located a shift rail 11 which is supported at its ends by means of links, one of which is shown at 12, said links being in turn connected at their lower portions with arms 13, extending from a shift shaft 14. Balls 15 are interposed between the shift rail and the rails 8 and 10 of the platen carriage, the construction being such that during the letter-feeding movements of the longitudinally moving part of the platen carriage said rails will ride upon rail 11, and the entire platen carriage will be shifted vertically upward or downward from a normal intermediate position when said rail 11 is actuated by the shift mechanism which, in the interest of clearness of illustration, is not shown herein. It should be understood, however, that when shift shaft 14 is rotated in opposite directions the platen carriage will be correspondingly shifted through its connections therewith.

16 indicates a tie-rod which extends transversely through the central portion of the machine and has an upwardly extending portion or horn 17 which forms an abutment for the platen carriage and holds the same against recession when the platen is engaged by the types. The intermediate portion of

the tie-rod rests upon a table or bed 18 which is fixed in the framework of the machine, and the rear portion of said tie-rod may be moved backward or forward to change the disposition of the platen with respect to the faces of the types by means of a threaded screw 20 which forms a portion of the tie-rod and which is threadedly connected to the rear portion, as at 21, the opposite end of said rod being anchored in the front wall 22 of the framing of the machine and is provided with an operating handle 23. It is believed that the above brief description of this tie-rod mechanism will suffice to render the objects of the present invention clear of understanding. This mechanism, moreover, is described and claimed in the United States Letters Patent to W. P. Kidder and C. W. Sponsel, No. 879,107, February 11, 1908. It will be understood that the relatively movable parts of the tie-rod may be manipulated to cause the platen carriage to move forward or backward with respect to the faces of the types.

The escapement devices, comprising a fixed dog 24 and a movable dog 25 are shown mounted upon a rocker member 26 which is adapted to be actuated by means of an arm 27 and a link 28, the latter of which is connected with the arm 30 extending from the universal rock shaft 31, said shaft being in turn actuated by means of arms and links, shown at 32 and 33, respectively, the links supporting a universal bar 34 upon which the key levers rest.

The mechanism above described forms no part of my present invention, but it has been described in order to render the objects hereof clearer of understanding.

Referring now to the escapement mechanism, 35 indicates the escapement wheel with which the escapement devices cooperate to afford a feed of the carriage, said escapement wheel resting, as usual, against the movable dog 25. The hub 36 of escapement wheel 35, in the present instance, is provided, as at 37 and 37', with ball-runways, one of these runways being provided at either side of the escapement wheel. Members 40 and 41 threaded in brackets 42 and 43 extending from a fixed portion of the framing of the machine, as at 44, support the escapement wheel and the associated parts through the interposition of balls 45 and 46, respectively, which are located in runways 38 and 38'. At this point, it may be noted that the ball-runways 38 and 38' are so formed as to constitute zones of a sphere the center of which is located at 47, upon the central axis of the escapement wheel midway between the planes of the sides thereof. Members 40 and 41, therefore, being spherically grooved and engaging the balls 45 and 46, which are located in the runways of the hub of the escapement wheel,

constitute a universal bearing for said escapement wheel and prevent any binding between the engaging parts of the bearing in whatever position the escapement wheel may assume. In other words, the escapement wheel can rotate as well as oscillate in its bearings.

The escapement shaft shown at 48 is extended through the hub of the escapement wheel and is supported therein by means of a shoulder 50 which rests upon a shoulder 51 formed within said hub. The lower end of the escapement shaft, in the present instance, is provided with a threaded pin 52 which receives a collar 53 and a nut 54, this construction preventing a relative longitudinal movement between the escapement wheel and the shaft.

The upper portion of the hub 55 of the escapement wheel is provided with a plurality of teeth 56 and cooperating with these teeth is a member 57 located upon the escapement shaft, which has oppositely disposed teeth 58 which interfit with the teeth 56 formed upon the hub. Member 57 is allowed a slight sliding movement upon the escapement shaft, and the teeth thereof are held in engagement with the teeth of the hub portion by means of a spring 60 interposed between said member and a collar 61, keyed as at 62 upon the escapement shaft. A key 63 is extended loosely through an aperture provided in the escapement shaft and prevents relative rotation between the clutch member 57 and said escapement shaft, a hood 64 being provided to prevent the escape of the loose key 63. From the above description, it will be understood that when the escapement wheel is rotated in one direction, the interfitting teeth upon the hub 55 of the escapement wheel and the clutch member 57 will compel a rotation of the escapement wheel with said escapement shaft, but during a reverse rotation of the escapement shaft, the teeth 56 and 58 will merely ride over each other, whereby the escapement wheel may remain stationary.

Referring now to the feed mechanism, a feed-pinion 65 is carried upon the upper end of the escapement shaft 48 and meshes with the feed rack 70 which is swiveled upon the platen carriage so as to enable it to be swung upward and thereby disengage from the teeth of the feed-pinion, an arm 71 being extended rearwardly from the pivotal portion of the rack in position to be engaged by a plunger rod 72, the upper end of which is provided with a button (not shown), which button may be engaged by the finger of the operator. The feed-rack is normally spring-pressed in a position shown in Figs. 1 and 3, Fig. 9 showing the same disengaged from the feed-pinion. Feed-pinion 65 is provided, in the present instance, with an internally

grooved depending hub portion 73, the grooves thereof being best shown at 74 in Fig. 6 of the drawings, and the escapement shaft 48 is provided with correspondingly located grooves 75. Located in grooves 74 and 75 of the hub portion 73 of the feed-pinion and the escapement shaft 48, respectively, are balls 76, said balls operating as keys to prevent any relative rotation between the feed-pinion and the escapement shaft, but permitting the feed-pinion to slide freely upon said shaft. In order to retain the balls in position in their proper places within their grooves, a retainer 77 is provided, said retainer being notched at its upper portion, each notch thereof receiving one of balls 76, and a spring 78 which rests upon collar 61 of the escapement shaft 48, and is attached thereto, is, at its upper end, connected with said retainer and holds the same in operative position. A hood 80 pressed upon the hub portion 73 of the feed-pinion and depending therefrom has a shoulder 81 which is adapted to engage retainer 77 and prevent the same from being carried out of operative position.

Extending forwardly from the shiftable rail 11 of the platen carriage are arms 82 in which are threaded trunnion screws 83, upon the inner ends of which is journaled a circular head 84. This head is provided internally with a groove or ball-runway 85, and the hub 73 of the feed-pinion is provided with an oppositely located and similarly formed runway 86, balls 87 being provided between said runways.

Having thus described the construction of this embodiment of my invention, the operation thereof may now be explained: it will be understood that during the operation of the machine the escapement devices cooperating with the escapement wheel will afford a feed of the carriage in the usual manner. When the carriage is returned by the hand of the operator to a new line-commencing position, the spring-controlled clutch constituted by the toothed member 57 and the teeth provided upon the hub of the escapement wheel, will be automatically disengaged, whereby the escapement shaft may be rotated freely in a reverse direction without compelling a rotation of the escapement wheel which will be allowed to remain stationary in engagement with the escapement devices. Whenever the platen carriage is shifted for different case printing, the feed-pinion 65 being supported thereby will move therewith and slide upward or downward on the escapement shaft, and during this operation the ball key members will operate to eliminate any friction between the feed-pinion and said shaft. When it is desired to change the disposition of the platen with respect to the faces of the types, such operation may be effected by lengthening or

shortening the tie-rod through a manipulation of rod 20, as above explained, and during this operation the feed-pinion will be carried forward or backward, thereby tilting the escapement shaft and causing the escapement wheel to oscillate slightly in its spherically formed supporting bearing. It will accordingly be seen that I have provided mechanism well adapted to attain the above, among other, ends in a simple, yet efficient manner, and which will operate to remove any chance of binding in the bearings for the escapement wheel or the feed-pinion when the platen carriage is moved toward or from the faces of the types or is shifted for different case printing. The feed-pinion being supported upon the platen carriage is always in mesh with the feed-rack and is shiftable therewith when the platen carriage is shifted.

As many changes could be made in the above, construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. In a typewriting machine, the combination with the type carriers, of a platen carriage movable toward and from the types, a feed rack mounted upon the platen carriage and movable therewith, and an escapement shaft having a pinion meshing with said feed rack and adapted to move therewith.

2. In a typewriting machine, in combination, with the type carriers, of a shiftable platen carriage, a feed rack mounted upon the platen carriage, and an escapement shaft having a pinion meshing with said feed rack and adapted to shift with the platen carriage whereby said rack and pinion are always in mesh.

3. In a typewriting machine the combination with the type carriers, of a platen carriage, a feed rack mounted upon the platen carriage, an escapement shaft having a pinion meshing with said feed rack, and a relatively fixed universal bearing for one end of the escapement shaft.

4. In a typewriting machine, the combination with the type carriers, of a platen carriage movable toward and from the types, a feed rack mounted upon the platen car-

riage, an escapement shaft having a pinion meshing with the feed rack and adapted to move therewith, a bearing in which one end of said escapement shaft has rotary and oscillatory movements, and a bearing swiveled upon the platen carriage for the other end of said escapement shaft.

5. In a typewriting machine, the combination with the type carriers, of a platen carriage movable toward and from the types, a feed rack mounted upon the platen carriage, an escapement shaft having a pinion meshing with said feed rack and adapted to move therewith, a fixed bearing for one end of said escapement shaft of such construction that the same may have rotary and oscillatory movements with respect thereto, and a bearing on the platen carriage for the other end of said escapement shaft.

6. In a typewriting machine, the combination with the type carriers, of a platen carriage movable forward and backward with respect to the types, a feed rack mounted upon the platen carriage, an escapement shaft, a feed pinion mounted upon said escapement shaft and meshing with said feed rack, a bearing for one portion of said escapement shaft carried by the platen carriage and movable therewith, an escapement wheel mounted upon said escapement shaft, feed dogs cooperating with said escapement wheel to afford a feed of the carriage, and a fixed universal bearing for another portion of said escapement shaft.

7. In a typewriting machine, the combination with the type carriers, of a platen carriage movable forward and backward with respect to the types, a feed rack mounted upon the platen carriage, an escapement shaft, a feed pinion carried by said escapement shaft and meshing with said feed rack, a bearing for one portion of said escapement shaft carried by the platen carriage and arranged adjacent said feed pinion, an escapement wheel mounted upon said escapement shaft, feed dogs cooperating with said escapement wheel to afford a feed of the carriage, and a fixed universal bearing for another portion of said escapement shaft arranged adjacent the escapement wheel.

8. In a typewriting machine, the combination with the type carriers, of a platen carriage movable forward and backward to change the disposition of the platen with respect to the faces of the types, a feed rack mounted upon the platen carriage and movable therewith, a feed pinion mounted upon said escapement shaft and meshing with said feed rack, and bearings for said escapement shaft, the construction being such that said escapement shaft may tilt slightly when the platen carriage is moved toward or from the faces of the types.

9. In a typewriting machine, the combi-

nation with the platen carriage provided with a feed rack, an escapement shaft having a pinion meshing with the feed rack, and bearings for said escapement shaft, one of which is located upon the platen carriage and the other in a fixed portion of the machine.

10. In a typewriting machine, the combination with the type carriers, of a platen carriage movable forward and backward with respect to the faces of the types so as to change the disposition of the platen with respect thereto, of a feed rack mounted upon the platen carriage, an escapement shaft having a pinion meshing with said feed rack, a trunnioned bearing for one end of said escapement shaft carried by said platen carriage, and a universal bearing for the other end of said escapement shaft carried by a fixed portion of the machine.

11. In a typewriting machine, the combination of a shiftable platen carriage provided with a feed rack, an escapement shaft, and a pinion mounted upon said escapement shaft, meshing with said feed rack and shiftable therewith.

12. In a typewriting machine, the combination with the type carriers each of which is provided with a plurality of types, a platen carriage adapted to be shifted to change the disposition of the platen with respect to said types, an escapement shaft having a feed pinion meshing with said feed rack, and a support for said feed pinion upon the platen carriage whereby the pinion is shiftable with the platen carriage.

13. In a typewriting machine, the combination with the type carriers each of which is provided with a plurality of types, of a platen carriage shiftable to change the position of the platen with respect to said types, a feed rack mounted upon the platen carriage, an escapement shaft, and a feed pinion mounted upon said escapement shaft which meshes with said feed rack and which moves therewith when the platen carriage is shifted.

14. In a typewriting machine, the combination with the type carriers each of which is provided with a plurality of types, of a platen carriage movable forward and backward to change the position of the platen with respect to the faces of the types and shiftable for different case printing, a feed rack mounted upon said platen carriage, an escapement shaft, and a feed pinion mounted upon said escapement shaft which meshes with said feed rack and which remains constantly in mesh therewith when the platen carriage is moved forward and backward with respect to the faces of the types or is shifted for different case printing.

15. In a typewriting machine, the combination with the type carriers each of which

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is provided with a plurality of types, of a platen carriage movable toward and from the types to change the disposition of the platen with respect to the faces thereof, said platen carriage being also shiftable vertically for different case printing, a feed rack carried by the platen carriage, an escapement shaft, a feed pinion carried thereby and meshing with said feed rack, said feed pinion being movable with said rack when the platen carriage is shifted for different case printing, a trunnioned bearing for one end of said escapement shaft mounted upon the platen carriage, and a universal bearing for the other end of said escapement shaft whereby said escapement shaft may tilt slightly when the platen carriage is moved forward or backward.

16. In a typewriting machine, the combination with a shiftable platen provided with a feed rack, of a feed pinion meshing with said feed rack and shiftable therewith, an escapement wheel, feed dogs cooperating with said escapement wheel to afford a feed of the carriage, and an escapement shaft upon one end of which said feed pinion is adapted to slide and upon the other end of which said escapement wheel is mounted.

17. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed rack, an escapement shaft, a feed pinion mounted to slide upon one end of said shaft, and meshing with said feed rack and movable therewith when the latter is shifted, an escapement wheel upon the other end of said escapement shaft, and feed dogs cooperating with said escapement wheel to afford a feed of the carriage.

18. In a typewriting machine, the combination with the platen carriage provided with a feed rack, an escapement shaft provided with a feed pinion which meshes with said feed rack and an escapement wheel, of feed dogs cooperating with said escapement wheel to afford a feed of the carriage, a swiveled ball bearing mounted upon the platen carriage for one end of said escapement shaft, and a universal ball bearing mounted in a fixed portion of the framing of the machine for the other end of said escapement shaft.

19. In a typewriting machine, the combination of a platen carriage provided with a feed rack, an escapement shaft provided with a feed pinion which meshes with said feed rack, and an escapement wheel, feed dogs cooperating with said escapement wheel to afford a feed of the carriage, a trunnioned head mounted upon said platen carriage for supporting one end of said escapement shaft, a ball bearing within said head, and a universal ball bearing for the other end of said escapement shaft arranged adjacent said escapement wheel.

20. In a typewriting machine, the combination with the type carriers each of which is provided with a plurality of types, a platen carriage movable toward and from the types to change the position of the platen with respect to the faces thereof and shiftable vertically for different case printing, and the escapement devices comprising a fixed and a movable dog, of means for effecting a connection between the escapement devices and the feed rack of the platen carriage, comprising an escapement shaft, a feed pinion slidably mounted upon said shaft, and meshing with said feed rack, means for preventing a relative rotary movement between said feed pinion and said shaft, a trunnioned bearing carried by said platen carriage for supporting said feed pinion whereby the latter is shiftable with the carriage and is maintained in constant mesh with said feed rack during the shifting movements thereof, an escapement wheel mounted upon said shaft and adapted to be engaged by the escapement devices, and a fixed bearing for said escapement shaft in which the same may have oscillatory as well as rotary movements.

21. In a typewriting machine, the combination with the type carriers each of which is provided with a plurality of types, a platen carriage which is movable toward and from the faces of the types to change the position of the platen with respect thereto and is shiftable for different case printing, said carriage being provided with a feed rack, and the escapement devices consisting of fixed and movable feed dogs, of means for effecting a connection between the escapement devices and said feed rack, comprising an escapement shaft having an escapement wheel which cooperates with said escapement devices, a universal bearing for said escapement shaft arranged adjacent said escapement wheel, a feed pinion slidably mounted upon said escapement shaft, ball bearing key devices interposed between said feed pinion and said escapement shaft whereby the former may slide freely thereon but is held against rotation with respect thereto, said feed pinion meshing with said feed rack and moving therewith when the platen carriage is shifted, a trunnioned head supported by the platen carriage, and a ball bearing for said pinion located within said head.

22. In a typewriting machine, the combination with a shiftable carriage provided with a feed-rack and the escapement devices, of means for connecting the escapement devices with said feed-rack, comprising an escapement shaft, a feed-pinion slidably mounted upon said escapement shaft and keyed against rotation with respect thereto, a bearing for said feed-pinion supported upon the platen carriage, an escapement



wheel mounted upon said escapement shaft with which said escapement devices cooperate, and a bearing for said escapement shaft supported in a fixed portion of the machine.

23. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, of means for connecting the escapement devices with the feed-rack, comprising an escapement shaft, a feed-pinion slidably mounted upon one end of said shaft and meshing with said feed-rack, a bearing for said feed-pinion, supported upon the carriage, whereby said feed-pinion is shiftable with the carriage, ball bearing key devices for connecting the feed-pinion with the escapement shaft, whereby these parts are held against relative rotation, and an escapement wheel carried by said escapement shaft with which the escapement devices cooperate to afford a feed of the carriage.

24. In a typewriting machine, the combination of a shiftable platen carriage provided with a feed-rack and the escapement devices, of an escapement shaft, a feed-pinion mounted upon said escapement shaft and meshing with said feed-rack, and an escapement wheel mounted upon said escapement shaft with which said escapement devices cooperate, said feed-pinion being relatively movable lengthwise of said escapement shaft to mesh with said feed rack when said carriage is shifted.

25. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, of an escapement shaft, an escapement wheel carried by said shaft, with which said feed-dogs cooperate to afford a feed of the carriage, a feed-pinion mounted to slide upon said shaft and meshing with said feed-rack, a ball bearing key device interposed between said escapement shaft and said feed-pinion, whereby the latter may slide upon said shaft but is held against rotation with respect thereto, a ball bearing for said feed-pinion, and arms extending from the platen carriage for supporting said bearing.

26. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, an escapement wheel mounted upon said shaft with which the feed-dogs cooperate to afford a feed of the carriage, a feed-pinion mounted upon said escapement shaft and meshing with the feed-rack, said feed-pinion being provided with an internally grooved portion and said shaft being provided with grooves arranged adjacent those of the feed-pinion, balls located in said grooves and interposed between said shaft

and said feed-pinion, whereby those parts may be moved longitudinally with respect to each other but are held against relative rotation, and a trunnioned head carried by the platen carriage which supports said escapement shaft and said feed-pinion and in which the latter rotates.

27. In a typewriting machine, the combination with a shiftable platen carriage carrying a feed-rack and the escapement devices, comprising fixed and movable dogs, of means for connecting the escapement devices with the feed-rack, comprising an escapement shaft, an escapement wheel mounted upon said shaft with which said dogs cooperate to afford a feed of the carriage, said shaft being provided with a plurality of longitudinally extending grooves, a pinion having an internal, longitudinally grooved portion mounted upon said shaft and meshing with said feed-rack, balls located in the grooves of said shaft and said feed-pinion and interposed between said parts, whereby the latter may slide upon said shaft but is held against rotation with respect thereto, a retainer for holding said balls in position within said grooves, and a bearing for said feed-pinion carried by the platen carriage, whereby said pinion is shiftable with said carriage and is constantly maintained in mesh with said feed-rack.

28. In a typewriting machine, the combination with a vertically shiftable platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, the escapement wheel carried by one end of said shaft with which said feed-dogs cooperate to afford a feed of the carriage, said escapement shaft being provided with one or more longitudinally extending grooves, a feed-pinion mounted to slide upon said shaft and meshing with said feed-rack, said pinion being provided with a depending internally grooved hub portion, the groove or grooves of which are disposed adjacent those of the escapement shaft, a ball located in each pair of adjacent grooves of said shaft and said hub portion, a retainer for said balls mounted upon said shaft, a spring for holding said retainer in operative position, a bearing for said escapement wheel supported in a fixed portion of the framing of the machine, and a bearing for said feed-pinion supported upon the shiftable carriage.

29. In a typewriting machine, the combination with the platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, of an escapement shaft, an escapement wheel loosely mounted upon said escapement shaft with which said feed-dogs cooperate, a clutch interposed between said shaft and said escapement wheel, whereby said shaft

is free to rotate in one direction with respect to said escapement wheel but compels a rotation of said escapement wheel therewith when said shaft is rotated in an opposite direction, a bearing for said escapement wheel, supported in a fixed portion of the framing of the machine, a feed-pinion mounted upon said shaft and meshing with said feed rack, and a bearing for said feed pinion supported by said platen carriage.

30. In a typewriting machine, the combination with the platen carriage provided with a feed-rack and the escapement devices, of means for connecting the escapement devices with the feed rack of the platen carriage, comprising an escapement shaft, an escapement wheel loosely mounted upon one end of said shaft, a clutch interposed between said escapement wheel and said shaft, one portion of said clutch being carried by the escapement wheel, and the other portion thereof being slidably mounted upon said escapement shaft and keyed against rotation with respect thereto, spring means for holding the members of said clutch in engagement, said clutch compelling a movement of said escapement wheel with said escapement shaft when the latter is rotated in one direction but permitting a free rotative movement of said escapement shaft when the latter is rotated in a reverse direction, a bearing for said escapement wheel supported in a fixed portion of the framing of the machine, a feed-pinion mounted upon the escapement shaft and meshing with said feed-rack, and a bearing for said feed-pinion, supported upon the carriage.

31. In a typewriting machine, the combination with the platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, of an escapement shaft, an escapement wheel loosely mounted upon said escapement shaft, a clutch interposed between said shaft and said escapement wheel, comprising a toothed member formed upon the escapement wheel, and a longitudinally movable toothed member mounted upon said escapement shaft and keyed against rotation with respect thereto, said clutch being adapted to compel a rotation of said escapement wheel when said shaft is rotated in one direction and to allow the escapement wheel to remain stationary when said shaft is rotated in a reverse direction, a spring mounted upon said shaft and holding said clutch members in operative position, a feed-pinion mounted upon said shaft and meshing with said feed-rack, a bearing for said escapement wheel, supported in a fixed portion of the machine, and a bearing for said feed-pinion, supported by the platen carriage.

32. In a typewriting machine, the combination with the platen carriage provided with a feed-rack and the escapement de-

vices, comprising fixed and movable dogs, of means for connecting the escapement devices with the feed-rack, comprising an escapement shaft, an escapement wheel loosely mounted upon said escapement shaft, a clutch interposed between said escapement shaft and said escapement wheel, comprising a pair of toothed members, one of which is formed upon the escapement wheel, and the other of which is mounted to slide upon said shaft, a spring for holding said clutch members in operative relation, the construction being such that when said escapement shaft is rotated in one direction, said escapement wheel will be compelled to rotate therewith, but when said escapement shaft is rotated in a reverse direction the escapement wheel may remain stationary, a feed-pinion mounted upon said escapement shaft and meshing with the feed-rack, a bearing for said escapement wheel supported in a fixed portion of the framing of the machine, and a bearing for said feed-pinion supported upon the platen carriage.

33. In a typewriting machine, the combination with a platen carriage provided with a feed-rack and the escapement devices, comprising fixed and movable dogs, of an escapement shaft, an escapement wheel mounted loosely upon said shaft, a bearing for said escapement shaft supported in a fixed portion of the framing of the machine, a clutch interposed between said escapement shaft and said escapement wheel, said clutch comprising a toothed member formed upon the escapement wheel, and a cooperating toothed member mounted to slide upon said escapement shaft, a key extended through said escapement shaft, the ends of which engage with said last named toothed member and hold the same against rotation with respect to said shaft but allows the same to slide freely thereon in a longitudinal direction, means for holding said key in operative position, a spring engaging the toothed member upon said escapement shaft and urging it into engagement with the toothed member provided upon the escapement wheel, a feed-pinion mounted upon said escapement shaft and meshing with said feed-rack, and a bearing for said feed-pinion.

34. In a typewriting machine, the combination with a shiftable platen carriage, of a feed-rack carried thereby and the escapement devices, means for connecting the escapement devices with the feed-rack, comprising an escapement wheel with which said escapement devices cooperate, an escapement shaft upon which said escapement wheel is loosely mounted, a bearing for said escapement wheel, supported in a fixed portion of the framing of the machine, a clutch interposed between said escapement shaft and said escapement wheel, said clutch com-

prising a pair of relatively movable toothed members spring-held in engagement, the co-acting teeth thereof being so disposed that the escapement wheel is compelled to rotate with said shaft when the latter is rotated in one direction but may remain stationary while said shaft is rotated in a reverse direction, a feed-pinion mounted to slide upon said escapement shaft, key devices for preventing relative rotation between said feed-pinion and said shaft, and a bearing for said feed-pinion trunnioned on arms which extend from said platen carriage.

35. In a typewriting machine, the combination with a shiftable platen carriage which is provided with the usual feed-rack of the escapement devices, comprising fixed and movable dogs, an escapement wheel with which said dogs cooperate to afford a feed of the carriage, a ball bearing support for said escapement wheel, portions of which are located near either end of the hub thereof, means interposed between said shaft and said escapement wheel, whereby the latter is compelled to rotate when said shaft is rotated in one direction, said means being automatically releasable, whereby the escapement wheel may remain stationary when said shaft is rotated in a reverse direction, a feed-pinion loosely mounted upon said escapement shaft and freely movable longitudinally thereof, said pinion meshing with said feed-rack and being provided with an internally grooved hub portion, said shaft being also provided with a grooved portion disposed adjacent the hub portion of said pinion, balls located in said grooves which operate as keys to prevent relative rotation between said shaft and said pinion, a retainer engaging said balls and holding them in operative position within said grooves, a spring for holding said retainer in operative position, and a bearing for said pinion swiveled in arms which extend from the platen carriage, whereby said pinion is supported from the platen carriage and is shiftable therewith.

36. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed rack, and the carriage feeding devices, comprising a fixed and a movable dog, of means for effecting a connection between the feed-dogs and the feed-rack, comprising an escapement wheel with which said feed-dogs cooperate, a bearing for said escapement wheel carried by a fixed portion of the framing of the machine, an escapement shaft extended loosely through the hub portion of said escapement wheel, a toothed member formed upon the escapement wheel, a toothed member slidably mounted upon the escapement shaft, said escapement shaft being provided with an opening extending therethrough, a key loosely extended through said opening and

engaging said last named toothed member, whereby the same is freely slidable upon said shaft but is held against rotation relative thereto, a hood for holding said key in operative position, a spring engaging the toothed member upon said shaft and normally holding the teeth thereof in engagement with those upon the escapement wheel, said toothed members operating as a clutch to compel a rotation of the escapement wheel with said escapement shaft when the latter is rotated in one direction but which is automatically releasable to allow a free rotation of the escapement shaft in a reverse direction while the escapement wheel remains stationary, a feed-pinion mounted to slide upon said escapement shaft and meshing with said feed-rack, said feed-pinion being provided with a depending internally grooved hub portion, said shaft being externally grooved at a point adjacent the grooves of said hub portion, balls located in said grooves and interposed between said shaft and said hub portion, whereby said pinion is keyed against rotation with respect to said shaft, a retainer for holding said balls in operative position, a spring for positioning said retainer, a hood supported by said hub portion which incloses said retainer, said hood being provided with shoulders adapted to engage said retainer and prevent the same from being carried out of operative position when said feed-pinion slides upon said escapement shaft, and a bearing for said feed-pinion which is supported upon arms extending from said platen carriage.

37. In a typewriting machine, the combination with a shiftable platen carriage provided with a feed-rack and the escapement devices, comprising a fixed and a movable dog, of an escapement wheel with which the escapement devices cooperate to afford a feed of the carriage, an escapement shaft which extends loosely through the hub of said escapement wheel, a clutch interposed between said shaft and said escapement wheel, whereby the latter is compelled to rotate with said shaft in one direction but which may remain stationary when the escapement shaft is rotated in an opposite direction, a feed-pinion slidably mounted upon said shaft, ball bearing key-devices interposed between said feed-pinion and said shaft, whereby they are maintained against relative rotation, a bearing for said feed-pinion supported upon the platen carriage, whereby said feed-pinion is maintained in constant mesh with said feed-rack during the shifting movements of the carriage.

38. In a typewriting machine, the combination with the type carriers, each of which is provided with a plurality of types, of a platen carriage movable forward and backward to change the position of the platen with respect to the faces of the types and

- shiftable vertically for different case printing, a feed-rack carried by the platen carriage, escapement devices, comprising a fixed and a movable dog, a universal ball bearing for the escapement wheel, portions of which engage the hub of said escapement wheel near opposite ends thereof, a feed-pinion mounted upon said escapement shaft and meshing with said feed-rack, ball bearing key-devices interposed between said escapement shaft and said feed-pinion, whereby the latter may slide thereon but is maintained against rotation relative thereto, and a ball bearing for said feed-pinion trunnioned upon the platen carriage.
39. In a typewriting machine, the combination with the type carriers, each of which is provided with a plurality of types, of a platen carriage movable forward and backward to change the position of the platen with respect to the faces of the types and shiftable transversely of its length for different case printing, a feed-rack mounted upon the platen carriage, escapement devices, comprising a fixed and a movable dog, an escapement wheel with which said escapement devices cooperate, a universal bearing for said escapement wheel, comprising oppositely disposed spherically grooved bearings, said escapement wheel being provided with ball-runways, balls located in said runways, engaging said spherically grooved bearings, an escapement shaft extended loosely through said escapement wheel, a spring controlled clutch interposed between said escapement shaft and said escapement wheel, whereby said escapement wheel is compelled to rotate with said escapement shaft when the latter is rotated in one direction but is automatically released therefrom and allowed to remain stationary when said escapement shaft is rotated in an opposite direction, a feed-pinion slidably mounted upon said escapement shaft, which meshes with said feed-rack, ball bearing key-devices interposed between said feed-pinion and said shaft for preventing relative rotation between said parts, a head trunnioned upon the carriage, and a ball bearing interposed between said head and said feed-pinion.
40. In a typewriting machine, the combination with type carriers, each of which is provided with a plurality of types, a platen carriage normally occupying an intermediate position with respect to said types and shiftable in opposite directions from said intermediate position for different case printing, escapement devices, comprising fixed and movable dogs, an escapement shaft, an escapement wheel mounted upon said shaft with which said dogs cooperate to afford a feed of the carriage, and a feed-pinion mounted to slide upon said shaft and keyed thereon against rotation with respect thereto, said feed-pinion being supported by the platen carriage and sliding upon said escapement shaft when the platen carriage is shifted.
41. In a typewriting machine, the combination with the type carriers, of a platen carriage having a rail along which it travels, a feed rack mounted on said carriage, and an escapement shaft having a pinion meshing with said rack and adapted to move therewith, said shaft having a bearing at one end in said carriage rail.
42. In a typewriting machine, the combination with a shiftable platen carriage having a feed mechanism connected therewith, an escapement mechanism, and intermediate means for transmitting motion from one to the other, so constructed as to permit a relative shifting movement of said feed mechanism and escapement mechanism as the carriage is shifted.
43. In a typewriting machine, the combination with a shiftable platen carriage having a feed mechanism connected therewith, an escapement mechanism, and intermediate means for transmitting motion for one to the other, said means being telescopically constructed to permit a relative shifting movement of said parts.
44. In a typewriting machine, the combination with a shiftable platen carriage having a feed mechanism connected therewith, an escapement mechanism, and intermediate means for transmitting motion from one to the other, said means having a bearing at one end to permit an oscillatory movement thereof.
45. In a typewriting machine, the combination with a shiftable platen carriage having a feed mechanism connected therewith, an escapement mechanism, and intermediate means for transmitting motion from one to the other, said means having a bearing at one end to permit an oscillatory movement thereof and so constructed as to permit a relative shifting movement of the platen carriage and escapement mechanism.
46. In a typewriting machine, in combination, type carriers, a platen carriage movable toward and from the type carriers, a feed rack mounted upon the platen carriage and movable therewith, an escapement shaft having a pinion meshing with said feed rack and adapted to move therewith, and means for throwing said feed rack and pinion out of engagement.
47. In a typewriting machine, in combination, a platen carriage, a support therefor, a feed rack on said carriage, an escapement shaft having a pinion meshing with the feed rack, bearings for said escapement shaft, one of which is located in said platen carriage support and the other in a fixed portion of the machine, and manually controlled means for moving said feed rack and pinion out of engagement.

48. In a typewriting machine, in combination, type carriers, a shiftable platen carriage, a feed rack mounted upon the platen carriage, an escapement shaft having a pinion meshing with said feed rack and adapted to shift with the platen carriage whereby said rack and pinion are always in mesh, and means carried by the carriage for

moving said feed rack and pinion out of engagement.

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

NILS H. ANDERSON.

Witnesses:

C. H. WILSON,  
H. M. SEAMANS.