

J. A. RONCHETTI.
 ESCAPEMENT MECHANISM FOR TYPE WRITING MACHINES.
 APPLICATION FILED APR. 19, 1908.

1,049,767.

Patented Jan. 7, 1913.

3 SHEETS—SHEET 1.

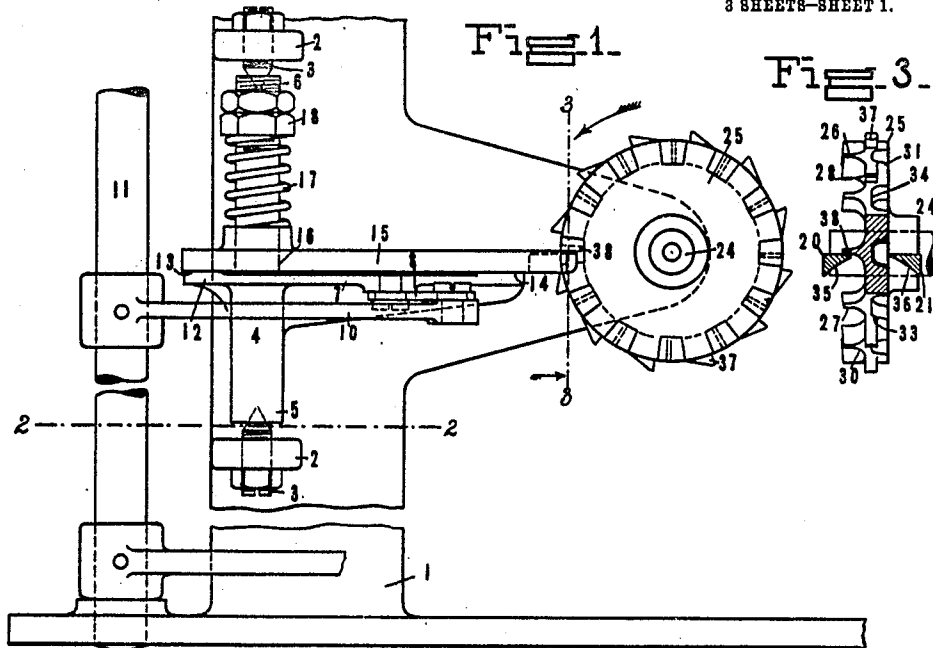
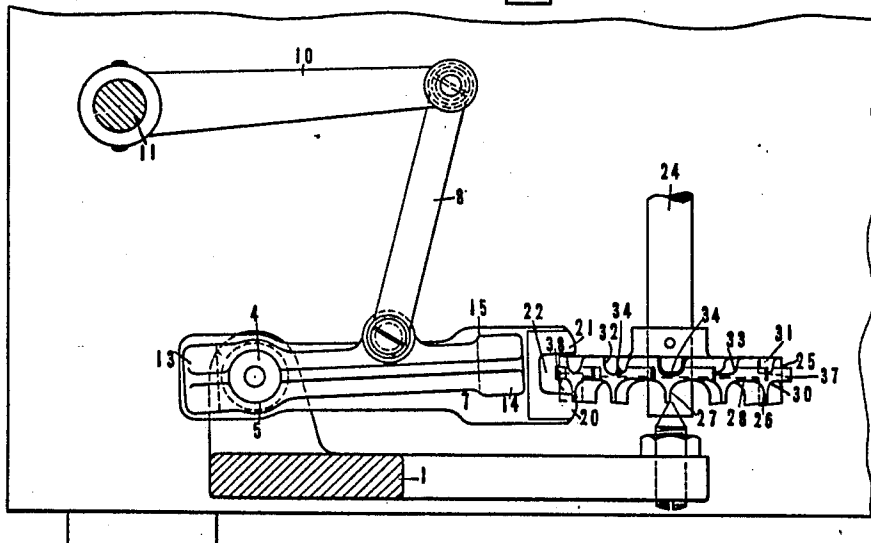


Fig. 2.



WITNESSES
Nov 1912
Daniel J. Dunn

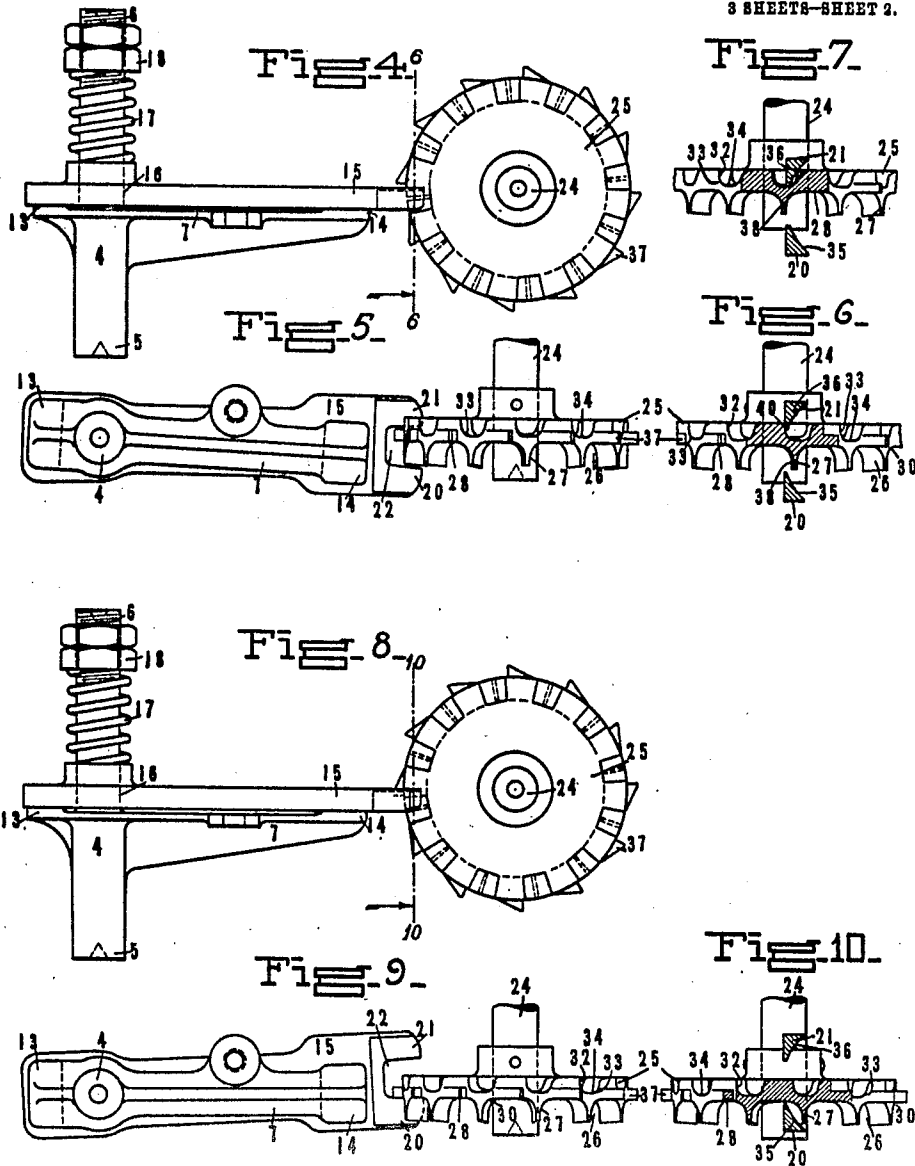
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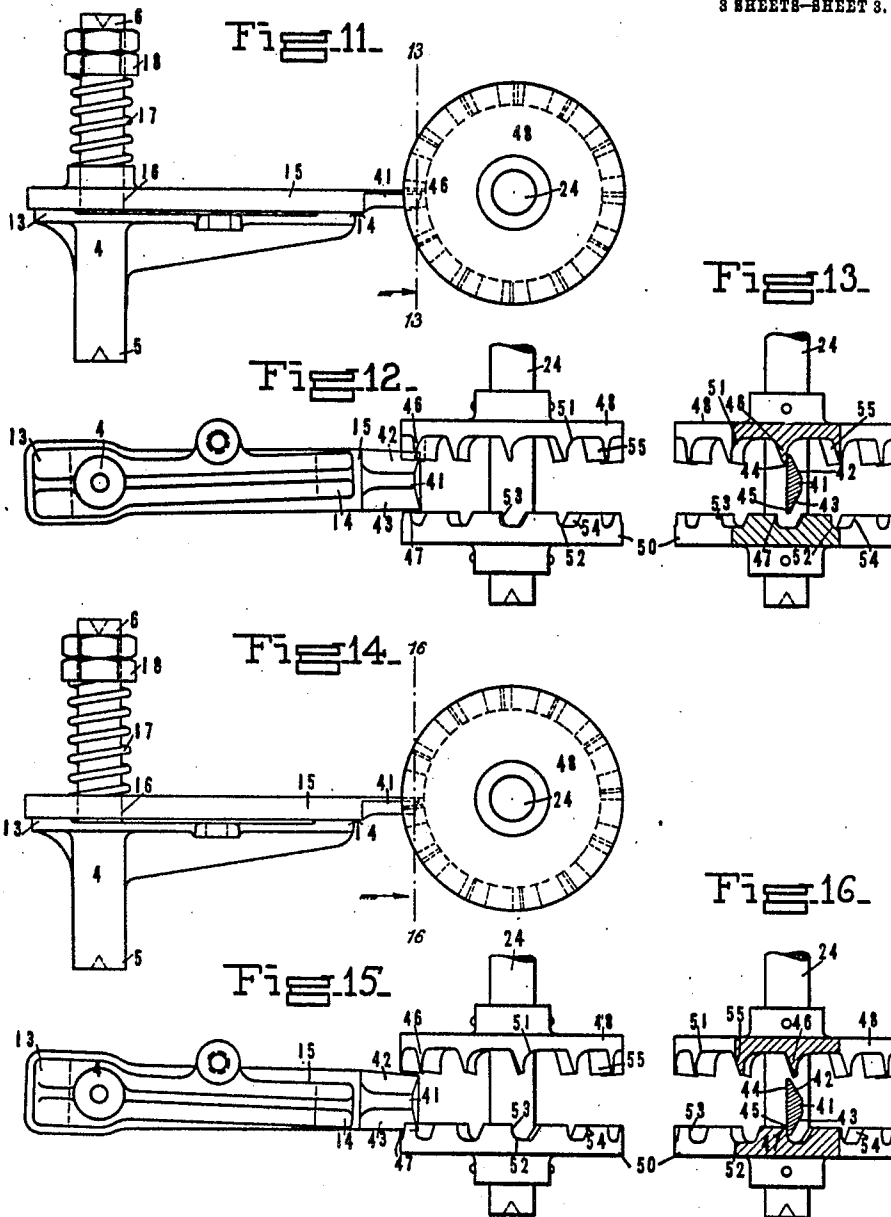
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Daniel J. Dunn

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UNITED STATES PATENT OFFICE.

JOSEPH ALBERT RONCHETTI, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NOISELESS TYPEWRITER COMPANY, OF MIDDLETOWN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ESCAPEMENT MECHANISM FOR TYPE-WRITING MACHINES.

1,049,767.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 19, 1909. Serial No. 490,919.

To all whom it may concern:

Be it known that I, JOSEPH A. RONCHETTI, a subject of the King of Italy, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Escapement Mechanism for 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 escapement mechanism for a machine of the type designed to effect printing without producing noise.

In typewriting machines as hitherto constructed the greater part of the noise incident to the operation thereof has been produced by the clicking of the various parts employed to effect the spacing of the carriage, and one of the objects of my present invention is to provide new and improved means for overcoming this objection, and such as will render the operation of the carriage feeding mechanism substantially noiseless.

Another object of the invention is to provide new and improved means for actuating the feed dog of an escapement mechanism.

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 two of various possible embodiments of my invention, Figure 1 is a plan view illustrating the preferred embodiment thereof; Fig. 2 is a view in side elevation of the mechanism illustrated in Fig. 1; Fig. 3 is a sectional view on line 3—3 of Fig. 1, looking in the direction of the arrow; Figs. 4 and 5 respectively show in plan and side elevation the position assumed by the parts of the escapement mechanism when the rocker member carrying the feed dog is moved downwardly; Fig. 6 is a sectional

view on line 6—6 of Fig. 4, looking in the direction of the arrow; Fig. 7 is a sectional view on the same line showing the escapement wheel in an intermediate position; namely, the position assumed when the movable feed dog has been depressed and before the escapement wheel has been allowed to rotate to its normal position of rest; Figs. 8 and 9 are plan and side views respectively, of the escapement mechanism showing the intermediate position upon the return stroke of the movable dog, the escapement wheel not having been allowed to rotate to its normal position of rest; Fig. 10 is a sectional view taken on line 10—10 of Fig. 8; Fig. 11 is a view in elevation and plan of a different embodiment of the escapement mechanism; Fig. 12 is a view in side elevation of this embodiment; Fig. 13 is a view in section taken on line 13—13 of Fig. 11; Figs. 14 and 15 show plan and side views of the escapement mechanism employed in this embodiment of the invention and the position assumed by the parts before the feed dog has reached the limit of its downward stroke; Fig. 16 is a sectional view taken on line 16—16 of Fig. 14.

Similar reference characters refer to similar parts throughout the various views of the drawings.

Referring now to the preferred embodiment of my invention illustrated in Figs. 1 to 10 inclusive, 1 designates a portion of the frame of the machine provided with lugs 2 each of which carries a pivot screw 3. These pivot screws support an oscillating rocker member 4 provided with trunnions 5 and 6 respectively, said rocker being also provided with an arm 7 to which is pivoted the link 8 whose other end is connected to an arm 10 extending from the universal rock shaft 11. This latter shaft is oscillated by the key levers or space bar, as will be understood. The rocker member 4 is provided with a rearwardly projecting portion 12, which is provided with raised friction portion 13; a similar raised friction portion 14 is provided upon arm 7. The movable dog 15 is loosely mounted upon a trunnion 16 of the rocker member and bears against the two raised portions 13 and 14 thereof, being pressed into engagement with such raised

portions by a spring 17 pressing against the hub of the dog and interposed between said hub and an adjustable nut 18 threaded upon the rocker member. The movable dog 15 is bifurcated at its outer end to provide the two projecting fingers 20 and 21 respectively, said fingers being wide at the top as shown, and narrow at the point adjacent the space 22 between them, this feature of construction being clearly shown in Fig. 3 of the drawings. The escapement shaft is shown at 24 and is provided with an escapement wheel 25. This wheel is provided with two sets of escapement teeth, one set being provided upon each of the lateral faces of the wheel adjacent the periphery thereof. The lower teeth 26 are provided with relatively short, radial, flat faces 27 and between these teeth the surface is flat as at 28 at the central portion thereof and curved at the ends, as shown at 30, the curved portions merging into the flat intermediate portion and the flat engaging faces of the teeth. The upper teeth 31 are also provided with flat or straight surfaces as at 32 and curved portions 33, the portions of the wheel intermediate said curved portion being substantially flat as shown at 34. The engaging face 32 of each of the upper teeth is slightly offset from the engaging face of the corresponding lower tooth and is disposed behind it with respect to the direction of normal rotation of the escapement wheel. The engaging faces of the fingers 20 and 21 of the movable dog 15, which are formed flat, are in alignment, the rear faces 35 and 36 of fingers 20 and 21 being beveled as shown to engage with the correspondingly beveled rear or receding faces of the teeth of the escapement wheel. The escapement wheel 25 is also provided with a plurality of teeth 37 upon its periphery, said teeth being adapted to be engaged with a pawl or dog employed in back spacing mechanism, not shown. Having described the construction of the mechanism constituting this embodiment of my invention, the operation thereof may now be understood.

It will be understood that the escapement wheel 25 is normally urged to rotation in the direction indicated by the arrow in Fig. 1 as, for instance, by means of the usual carriage propelling spring acting through the carriage rack and the pinion mounted upon the escapement shaft 24, these latter parts not being shown. The several parts constituting the escapement are shown in their normal positions of rest in Figs. 1, 2 and 3 of the drawings, in which tooth 38 is in engagement with a finger 20 of the vibratory feed dog, and consequently the feed dog 15 is pressed against the friction faces 13 and 14 of arm 7 of the rocker member, the pressure exerted between these parts being proportional to the amount of tension exerted by

the propelling spring acting through the escapement wheel plus the tension of the coil spring 17.

When the universal shaft 11 is oscillated, rocker 4 will be depressed to the position shown in Figs. 4 to 6 inclusive. In this position, finger 20 will be disengaged from the tooth 38 of the escapement wheel, and the upper finger 21 will be forced downwardly against the bottom portion of the space between the teeth 31, as shown in Fig. 7. The escapement wheel being thereby released and continuing its rotative movement, will cause the finger 21 to ride up the curved portion 33 of the escapement wheel, the finger finally reaching the position shown in Fig. 6, whereupon further rotative movement of the escapement wheel is restrained. The riding of the finger 21 up the curved surface 33 retards the rotative movement of the escapement wheel, and the engagement of said finger with the straight face 32 of the tooth 40 of the escapement wheel being gradual, no noise is produced during this operation. When the universal rock shaft is moved in the opposite direction, the rocker member will be moved upwardly to the position shown in Fig. 2. The operation of the various parts during this upward movement of the rocker member are as follows: After a portion of the upward movement of this part has been consummated, the inner portion of the tooth 20 will strike the bottom of the space between the teeth as it moves from the position of Fig. 6 to that shown in Fig. 10. When this engagement occurs, the rocker member 4 may complete its full upward stroke to the position shown in Fig. 2. The escapement wheel, meanwhile, rotates and is frictionally resisted by the tooth 20 not only while the same is sliding upon the flat portion 28 between the adjacent teeth, but also in striking the curved portion 30 of the next tooth. While sliding over the curved portion 30, the finger 20 will be forced outwardly to the position of rest shown in Figs. 1, 2 and 3. This resistance to the rotative movement of the escapement wheel causes that wheel to be arrested noiselessly and without shock to any of the parts.

Referring to Fig. 1, it will be seen that the offsetting or staggering of the engaging faces of teeth 38 and 40 permits of the slight drop of the carriage during the downward movement of the finger 21. This distance is just sufficient to enable tooth 20 to pass over the end of tooth 38 during the upward movement of that finger, as is clearly illustrated in Fig. 3.

In the embodiment of my invention illustrated in Figs. 11 to 16 inclusive, the movable dog 15 is provided with the single finger 41 which is beveled at its upper and lower edges, as at 42 and 43, and provided with flat engaging faces 44 and 45 respec-

tively. These flat faces bear against the flat portions of the faces of the teeth 46 and 47 respectively. The teeth 46 are carried by the upper escapement wheel 48 and the teeth 47 by the lower escapement wheel 50, both being secured to the escapement shaft 24, the distance between the points of the teeth of the two escapement wheels being somewhat less than the extreme width of the escapement finger 41. The teeth 46 of the upper wheel 48 are provided with curved intermediate portions 51, and the teeth 47 of the lower escapement wheel are similarly provided with curved portions 52 and flat engaging faces 53, the portion of the wheel intermediate the curved portions being preferably substantially flat as shown. The feed dog 15 is carried upon the rocker member in a manner similar to that shown in the first described embodiment of the invention. The operation of this embodiment, which should be readily understood in view of the above description, is substantially as follows: The parts constituting the escapement mechanism occupy their normal positions of rest in Figs. 11, 12 and 13. When the rocker 4 is swung downwardly, the frictional resistance against the movable dog 15 causes that dog to move downwardly until the tooth 45 strikes the bottom between the teeth of the lower escapement wheel, then the escapement wheel comes gradually against the tooth 47, as shown in Figs. 14 to 16 inclusive, the rocker 4 being permitted to continue its downward movement owing to the frictional contact between the same and the feed dog. When the rocker member 4 swings upwardly to the position shown in Fig. 12, the tooth 44 first strikes the bottom of the space between the teeth of the upper wheel 48 and that wheel is brought gradually to rest until the parts assume the position shown in Fig. 13. The operation of this embodiment of my invention, as will be understood, is similar to that shown in the embodiment hereinbefore described, except that in the present instance the dog is provided with a single finger cooperating with the double escapement wheel, whereas in the first described embodiment the feed dog is bifurcated and a single escapement wheel carrying two sets of teeth is employed.

When the escapement wheel is rotated backward as by means of pawl, not shown, engaging with the circumferential teeth 37, the beveled rear portions 54 and 55 of the teeth will strike the beveled portions 42 and 43 of the fingers, forcing the feed dog upwardly and downward against the frictional resistance caused by the action of spring 17 against dog 15, thus allowing the escapement wheel to be moved back to the extent of one or more teeth if desired.

It will, accordingly, be seen that I have

provided escapement mechanism particularly well adapted to attain, among others, all the ends and objects above pointed out in an exceedingly simple yet efficient manner.

The embodiments of the invention herein described, for carrying the various objects, is constituted by comparatively few parts, thereby diminishing the liability of any part becoming deranged. It will be obvious that since no impact or concussion of the parts takes place during the operation of the escapement mechanism, no noise can be produced, and yet the parts are arrested accurately and positively in their various positions.

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.

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

1. In an escapement mechanism, in combination, a member to be spaced provided with teeth having flat faces and curved portions interposed therebetween, and an escapement member cooperating with said teeth and curved portions whereby the movement of the movable part is silently arrested.

2. In an escapement mechanism, in combination, a member to be spaced having curved portions separated by teeth having flat faces, and an escapement member cooperating with said curved portions and teeth of the member to be spaced and adapted to space the same.

3. In an escapement mechanism, in combination, a member to be spaced having curved portions which merge into teeth provided with straight faces, and an escapement member cooperating with said teeth and curved portions and adapted to space said first-mentioned member whereby its movement is silently arrested.

4. In an escapement for typewriting machines, the combination of a member to be spaced, having curved portions which merge into teeth provided with straight faces, and an escapement member adapted to engage with said curved portions to retard the movement of said first-mentioned member and to engage with said teeth, whereby said member is restrained against movement after retardation.

5. In an escapement mechanism, in combination, a member to be spaced provided with teeth having curved intermediate portions which separate the teeth, the latter having straight face portions, and an oscil-

lating escapement element adapted to engage with said curved portions to retard the movement of the spaced member, and to engage the straight face portions of the teeth to hold said member against movement after such retardation.

6. In escapement mechanism for type-writing machines, the combination of a member to be spaced which is normally urged to movement, and having a plurality of flat-sided teeth separated by curved intermediate portions which merge into said teeth, and an escapement element which first engages said curved portions to retard the movement of the member to be spaced, and then engages said teeth to arrest the movement thereof.

7. In escapement mechanism for type-writing machines, the combination of a member to be spaced provided on its lateral faces with oppositely disposed teeth, and a movable dog having fingers cooperating with said teeth whereby said member may be spaced.

8. In escapement mechanism for type-writing machines, the combination of an escapement wheel provided with oppositely disposed teeth upon its lateral sides adjacent the periphery thereof, and a movable dog having fingers for engaging said teeth.

9. In escapement mechanism for type-writing machines, the combination of an escapement wheel provided upon its lateral surfaces adjacent the periphery thereof with a plurality of oppositely disposed teeth, and a movable dog provided with fingers, said fingers being adapted alternately to engage with teeth upon opposite sides of said escapement wheel, whereby the latter is spaced.

10. In an escapement mechanism, the combination of an escapement wheel having laterally extending teeth provided adjacent the periphery upon opposite sides thereof, said teeth being arranged in staggered relation, and a movable dog provided with fingers each of which is adapted to engage with the teeth upon one side of said escapement wheel, and means for oscillating said dog whereby said fingers are alternately engaged with said teeth.

11. In an escapement mechanism for type-writing machines, the combination of an escapement wheel provided upon its lateral surfaces adjacent the periphery thereof with a plurality of teeth, said teeth being provided with flat faces and curved intermediate portions and said intermediate portions having flat portions interposed between, a movable dog provided with fingers adapted to cooperate with said teeth to space said escapement wheel, and means for moving said dog whereby said fingers are first engaged by said curved portions to retard the rotation of said escapement wheel and are then engaged with the flat portions

of said teeth to positively arrest rotation thereof.

12. In an escapement mechanism for type-writing machines, the combination of an escapement wheel having radially arranged teeth provided upon its lateral sides adjacent the periphery thereof, said teeth having straight working faces and curved separating portions, an oscillatory feed dog having fingers which straddle said escapement wheel and cooperate with the teeth thereof, and means for oscillating said dog whereby said teeth are alternately engaged, first with said curved portions to retard the rotative movement of the escapement wheel and are then engaged with the straight faces thereof to restrain the escapement wheel against rotation.

13. In an escapement mechanism for type-writing machines, the combination of an escapement wheel provided with radially arranged teeth upon its opposite lateral faces adjacent the periphery thereof, said teeth having flat engaging faces and curved intermediate portions, and an oscillatory feed dog having fingers which straddle said escapement wheel, and frictional means for oscillating said dog whereby said fingers are first engaged with said curved portions to retard the rotative movement of said escapement wheel and are next engaged with said flat faces to restrain the movement thereof.

14. In an escapement mechanism for type-writing machines, the combination of an escapement wheel provided with teeth upon its lateral surfaces, said teeth being radially arranged adjacent the periphery thereof, an oscillatory dog provided with fingers to straddle said teeth, and means for oscillating said dog to alternately engage said fingers with said teeth.

15. In escapement mechanism for type-writing machines, the combination of an escapement wheel provided with radially arranged lateral teeth upon its opposite sides adjacent the periphery thereof, an oscillatory dog having fingers which straddle said escapement wheel, and frictional means for oscillating said dog whereby said fingers are alternately engaged with said teeth.

16. In an escapement mechanism for type-writing machines, the combination of an escapement shaft having means carrying oppositely disposed teeth extending in the direction of the escapement shaft, an oscillatory feed dog adapted alternately to engage with said teeth, and means for oscillating said dog.

17. In an escapement mechanism for type-writing machines, the combination of an escapement wheel having teeth upon its opposite sides adjacent the periphery thereof, a bifurcated feed dog cooperating with said teeth, and means actuating said feed dog

whereby the bifurcated portions thereof are alternately engaged with said teeth.

18. In an escapement mechanism for type-writing machines, the combination of an escapement wheel having upwardly extending lateral teeth adjacent its periphery, a bifurcated feed dog adapted to engage with the teeth of said escapement wheel, and actuating means for said dog frictionally engaged therewith.

19. In an escapement mechanism for type-writing machines, the combination of an escapement wheel provided with laterally extending teeth upon its opposite sides adjacent the periphery thereof, a vibratory feed dog, said dog being bifurcated to provide fingers which are adapted alternately to engage with the teeth on opposite sides of said escapement wheel, an actuator for said dog, and means for maintaining said actuator and said dog in frictional engagement.

20. In escapement mechanism for type-writing machines, the combination of an escapement wheel normally urged to rotation, an oscillatory feed dog adapted to cooperate with the teeth of said escapement wheel, and means frictionally engaging said dog adapted to actuate the same, said dog being urged into engagement with said last-mentioned means by said escapement wheel.

21. In an escapement mechanism for type-writing machines, the combination of an escapement wheel normally urged to rotation, an oscillatory feed dog adapted to cooperate with the teeth of said escapement wheel, and means frictionally engaging said dog to actuate the same, the friction between the movable dog and said actuating means being proportional to the pressure exerted upon said dog by the escapement wheel.

22. In an escapement mechanism for type-writing machines, the combination with an escapement wheel having oppositely disposed lateral teeth arranged adjacent the periphery thereof, an oscillatory feed dog having bifurcated portions adapted to cooperate with the teeth of said escapement wheel, and an actuator frictionally engaging said dog adapted to oscillate the same, the friction between the movable dog and the actuator being proportional to the pressure exerted upon said dog by the escapement wheel.

23. In an escapement mechanism, in combination, a member to be spaced having curved portions which merge into teeth provided with straight faces, an oscillatory dog adapted when oscillated first to engage said curved portions to retard the movement of the member to be spaced and then engage the straight faces of the teeth to restrain said member against movement, and means frictionally engaging said dog adapted to oscillate the same.

24. In an escapement mechanism for type-writing machines, the combination with a member to be spaced provided with oppositely disposed lateral teeth, the latter having straight faces separated by curved intermediate portions which merge into said straight faces, a bifurcated feed dog adapted alternately to engage first with the curved portions between said teeth to retard the movement of the member to be spaced and then engage the flat faces of the teeth to restrain such movement, and an actuator frictionally engaging with said dog and adapted to oscillate the same.

25. In an escapement mechanism for type-writing machines, the combination with a member to be spaced which is normally urged to movement, said member being provided with a plurality of teeth, an escapement element cooperating with said teeth to space said member, and an actuator frictionally engaging said escapement element to vibrate the same, the friction between said actuator and said escapement element being proportional to the pressure exerted upon the latter by the member to be spaced.

26. In escapement mechanism for type-writing machines, the combination with an escapement wheel provided with oppositely disposed lateral teeth, said escapement wheel being normally urged to rotation, a vibratory feed dog having fingers adapted alternately to engage with said teeth whereby said escapement wheel may be spaced, a rocker member carrying said vibratory dog, the latter being loosely mounted thereon, a frictional actuator carried by said rocker member, and spring means for maintaining said dog and said actuator in frictional engagement.

27. In escapement mechanism, in combination, an escapement shaft normally urged to rotation, a plurality of sets of escapement teeth mounted upon said shaft, a rocker member, a dog adapted to be oscillated thereby and moved from one set of teeth to another to permit the shaft to rotate step by step, and cam means associated with said sets of teeth mounted upon said shaft whereby the rotative movement of said shaft is silently and gradually arrested without impact or concussion.

28. In an escapement mechanism for type-writing machines, the combination of an escapement wheel having laterally disposed escapement teeth extending in a direction parallel with the axis thereof and back spacing teeth located upon the periphery of said wheel.

29. In an escapement mechanism for type-writing machines, the combination of an escapement wheel having laterally disposed teeth arranged adjacent the periphery thereof, and a frictionally actuated vibratory feed dog having fingers cooperating with said

teeth to space said escapement wheel, said escapement wheel being provided with a plurality of back-spacing teeth upon its periphery.

- 5 30. In a typewriting machine, the combination of an escapement wheel provided with a plurality of teeth having straight working faces and beveled opposite faces with curved portions therebetween for
10 silently arresting the movement of the escapement wheel, and a vibratory feed dog having a straight engaging face and a face beveled to engage the beveled faces of said teeth.
- 15 31. In a typewriting machine, the combination of an escapement wheel provided with a plurality of laterally extending teeth, the working faces of which are
20 beveled, said teeth having curved portions therebetween for silently arresting the movement of said escapement wheel, a vibratory feed dog provided with means for engaging the straight portions of said teeth, the en-
25 gaging portion of said dog being straight and the opposite face thereof being beveled to engage with the beveled portions of said teeth, whereby the escapement wheel may be freely moved in a reverse direction.
- 30 32. In an escapement mechanism, in combination, an escapement wheel, an oscillatory member, a dog movable therewith, and

means to yieldingly press the dog and the member into contact transversely to their oscillating movement.

33. In a typewriting machine, the combination of an escapement wheel, an oscillatory member, and a loosely mounted dog spring-held in frictional engagement with said member adapted to coact with said
40 escapement wheel.

34. In a typewriting machine, the combination with a rack member adapted to be spaced, an oscillatory member, and a loosely
45 mounted dog held in frictional engagement with said member and dependent for its movement upon its frictional contact with said member.

35. In a typewriting machine, the combination of an escapement wheel having teeth
50 thereon, an oscillatory member, and a dog held in frictional engagement with said oscillatory member adapted to coact with said teeth, said teeth having curved portions therebetween with which said dog coacts
55 silently to arrest the movement of said escapement wheel.

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

JOSEPH ALBERT RONCHETTI.

Witnesses:

ARTHUR J. B. HUDSON,
ROY J. SOULER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."