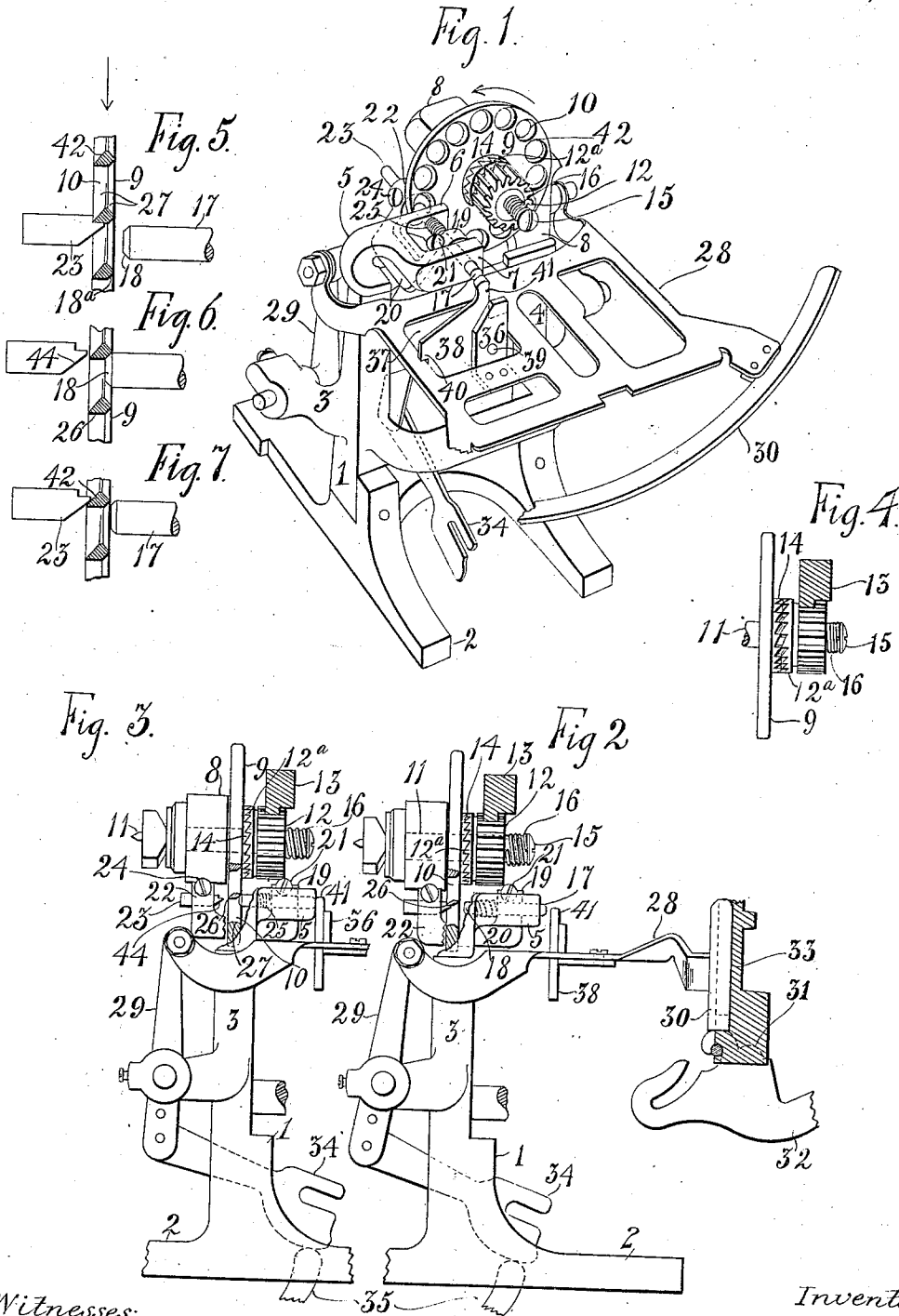


F. A. YOUNG.
TYPE WRITING MACHINE.
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1,054,739.

Patented Mar. 4, 1913.



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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

1,054,739.

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To all whom it may concern:

Be it known that I, FRANK A. YOUNG, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to carriage feeding mechanism of typewriting machines.

One of the objects of the invention is to simplify the construction and operation of the escapement devices, to render the same positive in action, and to avoid liability of the carriage over-feeding or jumping. I aim to provide a feed which will be extremely sensitive and rapid, without liability of erratic action.

Another object is to improve the clutch connection between the usual pinion and escapement wheel, with a view of simplifying the same, and decreasing the cost of manufacture.

Other objects and advantages will herein after appear.

In the accompanying drawings, Figure 1 is a perspective showing the escapement as applied to a typewriting machine of the Underwood front strike construction, illustrating the universal bar which actuates the escapement and showing a portion of the universal bar broken away. Fig. 2 is a side elevation and partial cross-section through the escapement mechanism, and showing also a portion of the segment, indicating the usual manner of actuating the universal bar by the type bars. This view shows the escapement mechanism in the normal position. Fig. 3 is a view similar to Fig. 2, but showing the escapement held by the spacing pawl. Fig. 4 is a side elevation, showing the carriage rack in cross-section, and illustrating my improved form of one-way clutch connection for permitting the return of the carriage without operating the escapement. Figs. 5, 6 and 7 are enlarged diagrams to indicate various relations which may exist between the escapement wheel and the feeding dogs which cooperate therewith.

1 represents the escapement frame, the lower portion of which is formed into feet 2 adapted to be attached to the typewriter frame, and the frame 1 further presents upwardly extending posts 3 and 4, the former of which is formed at its upper end into

a bifurcated guide head 5, having parallel forks 6 and 7. The post 4 is formed at its upper end with a horizontal inwardly projecting arm 8, which extends toward the bifurcated head 5, but to the rear thereof, as shown. On the forward side of this arm 8, an escapement wheel 9 is rotatably mounted, and this wheel is in the form of a disk having a series of equidistant circularly-disposed openings or perforations 10, preferably formed near the edge thereof.

On the shaft or pivot stud 11, upon which the escapement wheel is mounted, there is also mounted a pinion 12 having teeth which may be inclined in the usual manner, as indicated; and these teeth are adapted to mesh with the teeth of a rack 13 of the usual construction, which is attached in the usual manner to the carriage.

The forward face of the disk 9 is formed with a hub having ratchet teeth 14, and corresponding ratchet teeth 12^a are formed on the inner face of pinion 12; these teeth are inclined so as to permit a rotation of the pinion in one direction independently of the disk, but preventing independent rotation in the opposite direction. The end of the stud or shaft 11 is provided with a screw 15 which retains a coiled spring 16 disposed around the end of stud 11, and this spring tends to hold the inclined teeth of the pinion and the hub of the disk in engagement with each other. When the carriage is moved in a direction to return it, the teeth 14 on account of their inclination, will slip over the teeth of the pinion, compressing the spring and permitting a free backward rotation of the pinion. In this way, the inclined teeth 14 and the inclined teeth of the pinion cooperate together, and constitute a one-way clutch, permitting a relative rotation in one direction only. This clutch is of special advantage where it is desired to provide for manufacturing the pinions 12 of varying diameters for different kinds of typewriting machines: since all such pinions, (regardless of their respective diameters), may be provided with similar clutch members 12^a, and hence they may be readily placed upon the machine without the necessity of changes in the construction or adjustment of the clutching device.

In escapement devices of the type illustrated, usually the carriage is under tension, tending to move it in the feeding direction,

but the carriage is normally prevented from advancing or feeding by the escapement mechanism.

In the forks 6 and 7 there is mounted to slide horizontally, and laterally to the disk 9, a spacing pawl 17, the nose 18 of which normally projects slightly from the rear face of the fork 6, so as to lie adjacent to the forward face of the disk 9 as indicated in Fig. 2. Between the forks 6 and 7, lies an arm 19 of a yoke 20, and this arm is rigidly and adjustably secured to the pawl 17 by a set screw 21, as indicated. The rear portion of the yoke 20 has a similar arm 22, and in this arm there is adjustably mounted a detent pawl or dog 23, secured in position by a set screw 24. Between the fork 6 and the arm 19 a coiled spring 25 is provided around the spacing pawl, and this spring thrusts against the arm 19 and normally holds the spacing pawl, and yoke 20 in an extreme position toward the right, as indicated in Fig. 2.

As indicated in Figs. 2 and 3; the spacing pawl 17 and the detent pawl or dog 23 are substantially in axial alinement with each other; in the short space or gap between the two, the edge of the disk 9 lies so that as the wheel rotates, the escapement openings or holes 10 may pass in succession before the pawls. The direction of the feed of the escapement wheel is that indicated by the arrow in Fig. 1, and the escapement wheel is detained normally by the end of the detent dog 23 resting against an edge 26. In this connection, attention is called to the fact that the rearmost edges of the openings 10, with respect to the direction of rotation, are beveled, and furthermore, the forward edges of the holes are rounded or beveled on both faces of the disk as indicated at 27.

A universal bar 28 is mounted at its rear end on the usual rocker 29, and comprises the usual bow or bar 30 against which heels 31 of type bars 32 are adapted to strike during the type action, operating in the usual manner to shift the universal bar rearwardly. One of these type bars is illustrated as hung from the usual segment 33 in Fig. 2. The universal bar may be actuated also by means of the usual forked arm 34, which extends down from the rocker 29, and is adapted to be actuated by an arm 35 which is moved by the space key of the machine.

A bracket 36 is secured on the universal bar near an opening 37. In this opening there plays a shifting arm 38, secured at 39 to the bracket. The arm 38 has a supporting shoulder 40, and also a projecting tongue 41 to operate the spacing pawl 17. When the universal bar is driven rearwardly, the spacing pawl 17 will be driven back. Since this spacing pawl is rigidly connected with the detent dog 23, the detent

dog will also move back and become disengaged from the escapement wheel. As the dog 23 releases the escapement wheel, the nose 18 of the spacing pawl 17, which is beveled slightly, thrusts itself into the adjacent opening 10, and holds the escapement wheel 9 against rotation. As soon as the universal bar returns under the action of its spring, (not illustrated), the spring 25 returns the pawls or dogs 17 and 23. The arrangement of the pawls 17 and 23 is such, that before the spacing pawl 17 engages the escapement wheel, it permits a very slight rotation of the wheel to take place; and when spring 25 returns the pawls, there is no possibility that the detent dog or pawl 23 will return to the same opening 10, which it formerly occupied. The openings 10 are disposed very closely together, so that narrow bridges or septums 42 are formed at these points, these septums performing the functions of teeth.

The forward end or nose of the detent dog 23 is formed with a beveled or inclined lower edge 44.

Pivoting the shifting arm 38 at the point 39 enables the tongue 41 to be thrown to one side, so as to be out of alinement with the spacing pawl 17, and this permits a rearward movement of the universal bar without affecting the escapement wheel. This is desired sometimes in making repairs or adjustments.

Attention is called to the fact that the escapement wheel constructed as described, does not present teeth on its periphery, and this is advantageous for the reason that then no projections are formed at this point that may catch in a cloth when the typewriter is being cleaned, and this form of wheel also prevents any injury to the hands of the operator, such as might occur in striking against a sharp tooth.

At Fig. 5, the dogs 23, 17 are illustrated in normal positions, the escapement dog 23 being in engagement with the wheel, that is, inserted in one of the holes 10 in the wheel. Upon the depression of a key and a rearward stroke of the universal bar 30, the dogs 23, 17 are moved together to the Fig. 6 position, the dog 23 escaping from the wheel, and the beveled tip 18 of the dog 17 engaging the bevel 18^a formed on the wheel tooth or septum. The wheel, which is running in the direction of the arrow, at Fig. 5, advances slightly during the movements of the parts from Fig. 5 to Fig. 6, and consequently the dog 23 is prevented from resuming its normal position with relation to the tooth or septum from which it has just escaped. The bevel 18 of detent dog 17 engages the bevel 18^a on the wheel tooth, and the latter hence tends to return the dogs to normal positions, thus rendering the device very sensitive and quick-acting. Upon the relief

of the finger-key from pressure, the dog 17 escapes from the wheel, and the dog 23 moves into the next hole in the wheel, as seen at Fig. 7. Usually the wheel tooth 42 remains in contact with the dog 17 until the latter escapes, but Fig. 7 will show that in case the wheel should fail to do so, the dog 23 would nevertheless engage the next hole in the wheel, and its beveled surface, by engaging the back of the septum, would tend to advance the wheel in the direction in which it is being turned by the carriage driving spring (not shown).

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine having a reciprocating carriage, a member adapted to advance when said carriage advances and having a plurality of equidistant perforations formed therein, a detent pawl cooperating with the edges of said perforations on one side of said member, a spacing pawl fixed on said detent pawl cooperating with the edges of said perforations on the other side of said member, and means for shifting said pawls to permit a step-by-step advance of said member.

2. In a typewriting machine having a reciprocating carriage, a member adapted to advance when said carriage advances, and having a plurality of equidistant perforations formed therein, a detent pawl cooperating with the edges of said perforations on one side of said member, a spacing pawl fixed on said detent pawl cooperating with the edges of said perforations on the other side of said member, means for shifting said pawls to permit a step-by-step advance of said member, and a spring in connection with said pawls normally holding said detent pawl in engagement with said member.

3. In a typewriting machine, an escapement wheel having a plurality of equidistant openings formed therein, the walls between said openings being pointed on one side and beveled on the other, a detent pawl normally engaging the pointed edge of one of said openings on one side of said wheel, a spacing pawl fixed to move with the detent pawl normally disposed adjacent to the beveled edge of one of said openings on the opposite side of said wheel, means for advancing said spacing pawl to engage the beveled edge of the openings and simultaneously withdrawing said detent pawl to permit an escapement movement of said wheel between said pawls, and means for returning said detent pawl to engage in the next opening to arrest the rotation of said escapement wheel.

4. In a typewriting machine, an escapement wheel mounted to rotate, a detent pawl

on one side of said wheel, said wheel having a thin tooth on the face thereof adjacent to said pawl and cooperating with said pawl to prevent the rotation of said wheel, a second pawl on the opposite side of said wheel fixed relatively to the detent pawl, said wheel having means on the face thereof adjacent to said second pawl cooperating with said second pawl to permit a feeding movement of said wheel, the distance between said pawls being such that one always intercepts said wheel and said feeding movement sufficient to carry the edge of said tooth past said detent pawl, and means for shifting said pawls laterally with respect to said wheel to permit an escapement movement thereof.

5. In a typewriting machine, the combination with a traveling carriage of an escapement member, two pawls relatively fixed and reciprocating to alternately engage said escapement member, one of said pawls normally carrying a beveled tooth, engaging said escapement with its flat side against the corresponding flat side of a beveled edge on said escapement, the other pawl having a face arranged to arrest said member after a slight feed so that on one stroke said escapement member is fed slightly, and on the return stroke said first pawl fails to arrest said escapement by the face which it previously engaged.

6. In a typewriting machine, the combination with a traveling carriage of an escapement member, two pawls relatively fixed and reciprocating to alternately engage said escapement member, one of said pawls normally carrying a beveled tooth engaging said escapement with its flat side against the corresponding flat side of a beveled edge on said escapement, the other pawl having a beveled face arranged to cooperate with a beveled face on said escapement member giving a little lost motion, so that on one stroke said escapement member is fed slightly, and on the return stroke said first pawl arrests said escapement by a face beyond the one it previously engaged.

7. In a typewriting machine, the combination with a traveling carriage, of an escapement wheel, and cooperating pawls, said wheel being formed with a series of perforations, each perforation forming a surface perpendicular to the wheel and a diametrically opposite beveled surface.

8. In a typewriting machine, the combination with a traveling carriage, of escapement mechanism controlling the movement of the carriage and comprising an escapement wheel, and cooperating pawls, said escapement wheel being formed with an annular series of openings, each having a portion of its surface perpendicular to the wheel and an opposite inclined portion.

9. In a typewriting machine, the combi-

- nation with a traveling carriage, of escapement mechanism comprising a wheel provided with perforations, the forward surface formed by each perforation being perpendicular to the plane of the wheel, a detent pawl cooperating with said surfaces, the opposite surface of each perforation being inclined or beveled, and a spacing pawl opposite said detent pawl.
10. In a typewriting machine, the combination with a traveling carriage and escapement mechanism controlling the movement of the carriage, said mechanism comprising a wheel formed with an annular series of perforations separated by narrow webs forming ratchet teeth, each of said webs having a surface perpendicular to the plane of the wheel and an opposite inclined surface, a detent pawl cooperating with the perpendicular surfaces, and a spacing pawl cooperating with said inclined surfaces.
11. In a typewriting machine, the combination of a traveling carriage and escapement mechanism therefor comprising a disk provided with an annular series of circular perforations separated by webs forming ratchet teeth, a surface of each tooth formed by one of said perforations comprising a face perpendicular to its direction of movement and an inclined face, a detent pawl cooperating with said perpendicular face,

and a spacing pawl having a beveled or inclined surface cooperating with the inclined face of the said tooth.

12. In a typewriting machine, the combination of a traveling carriage and escapement mechanism therefor, said mechanism comprising a ratchet wheel provided with a series of circular openings, each of said openings having a beveled or inclined surface and a surface perpendicular to its direction of travel, said surfaces being disposed to form ratchet teeth tapering substantially to an edge at the face of the wheel, a detent pawl on one side of the wheel, and a spacing pawl on the opposite side of the wheel.

13. In a typewriting machine, the combination with a traveling carriage, of a vertically disposed escapement wheel formed with a series of perforations separated by ratchet teeth, a horizontally slidable frame having arms extending on opposite sides of the wheel, pawls secured in said arms, a universal type bar operated frame operable to move the pawl carrying frame in one direction, said pawl carrying frame being spring-actuated in the opposite direction.

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