

No. 896,789.

PATENTED AUG. 25, 1908.

O. WOODWARD.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 31, 1906.

3 SHEETS—SHEET 1.

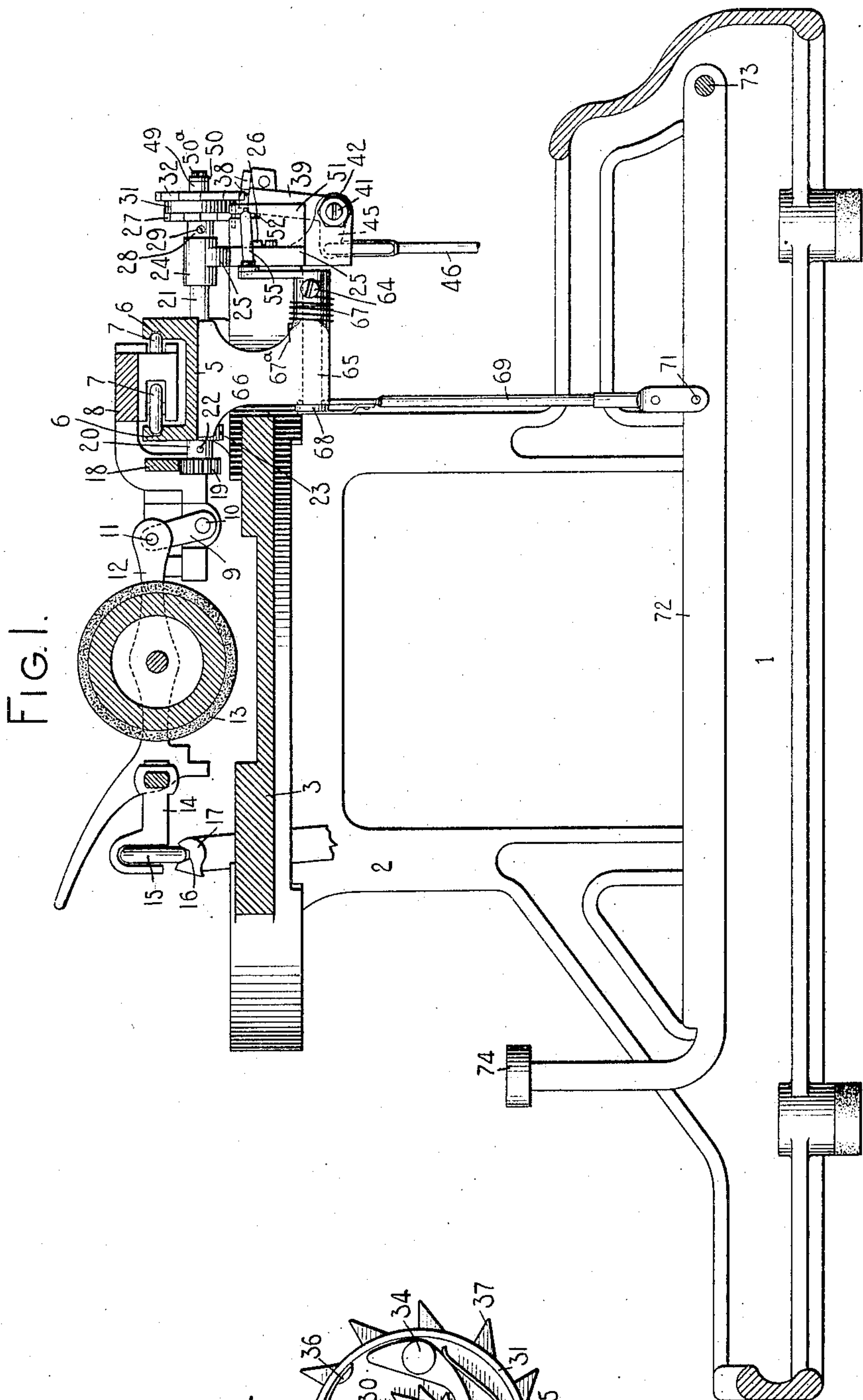
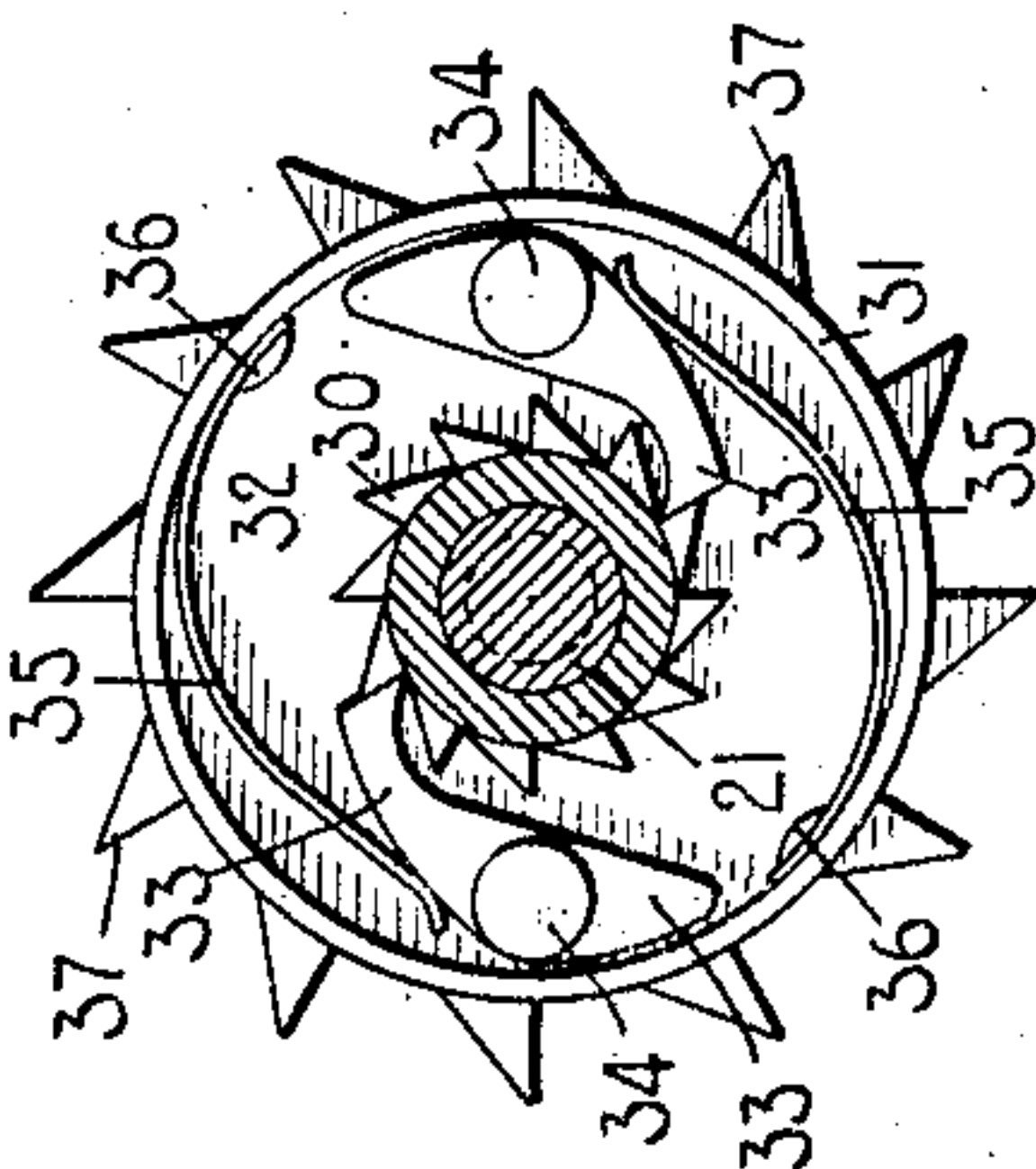


FIG. 1.

FIG. 6.



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Charles E. Smith

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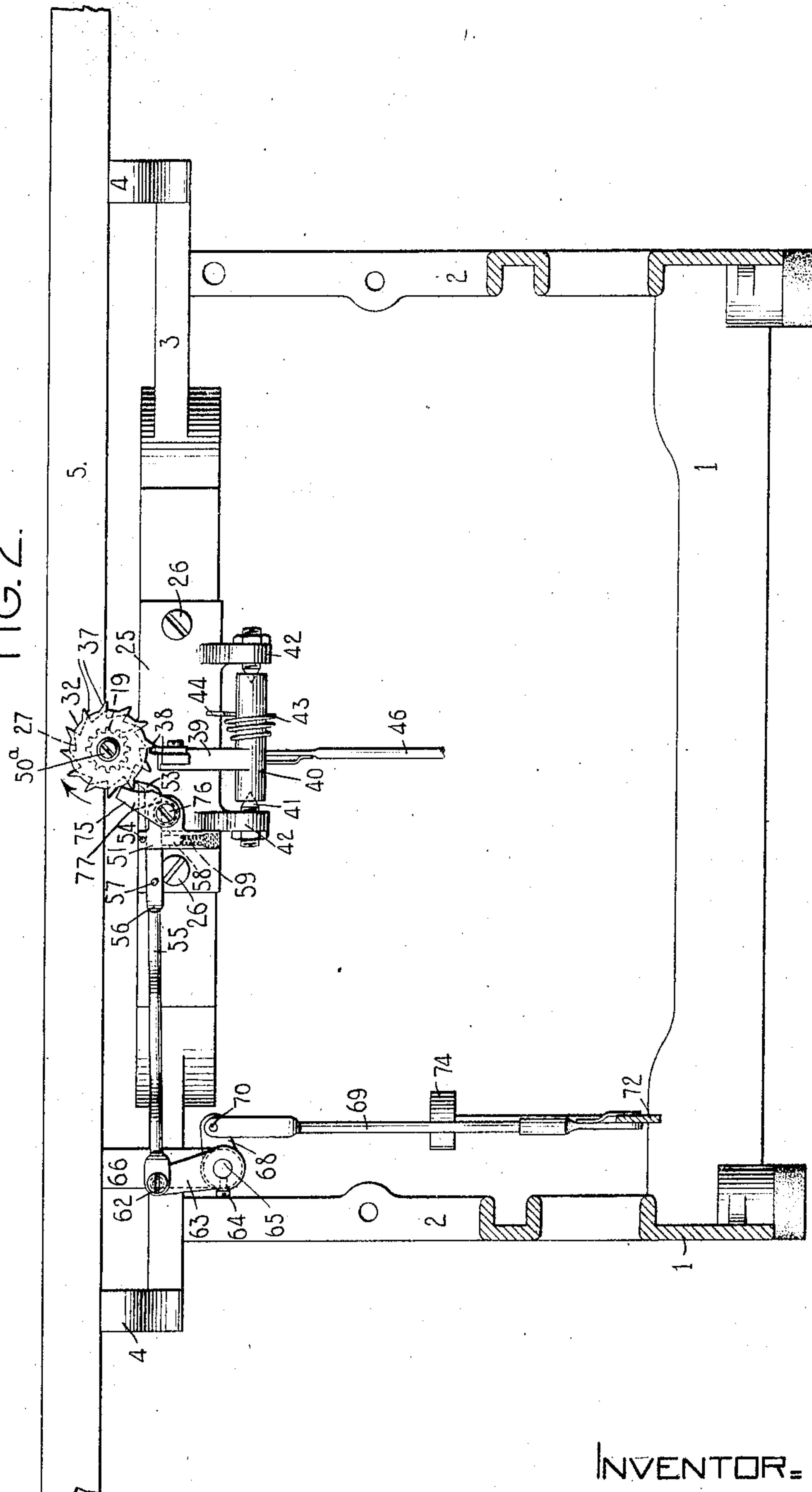
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3 SHEETS—SHEET 2.

FIG. 2.



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3 SHEETS—SHEET 3.

FIG. 3.

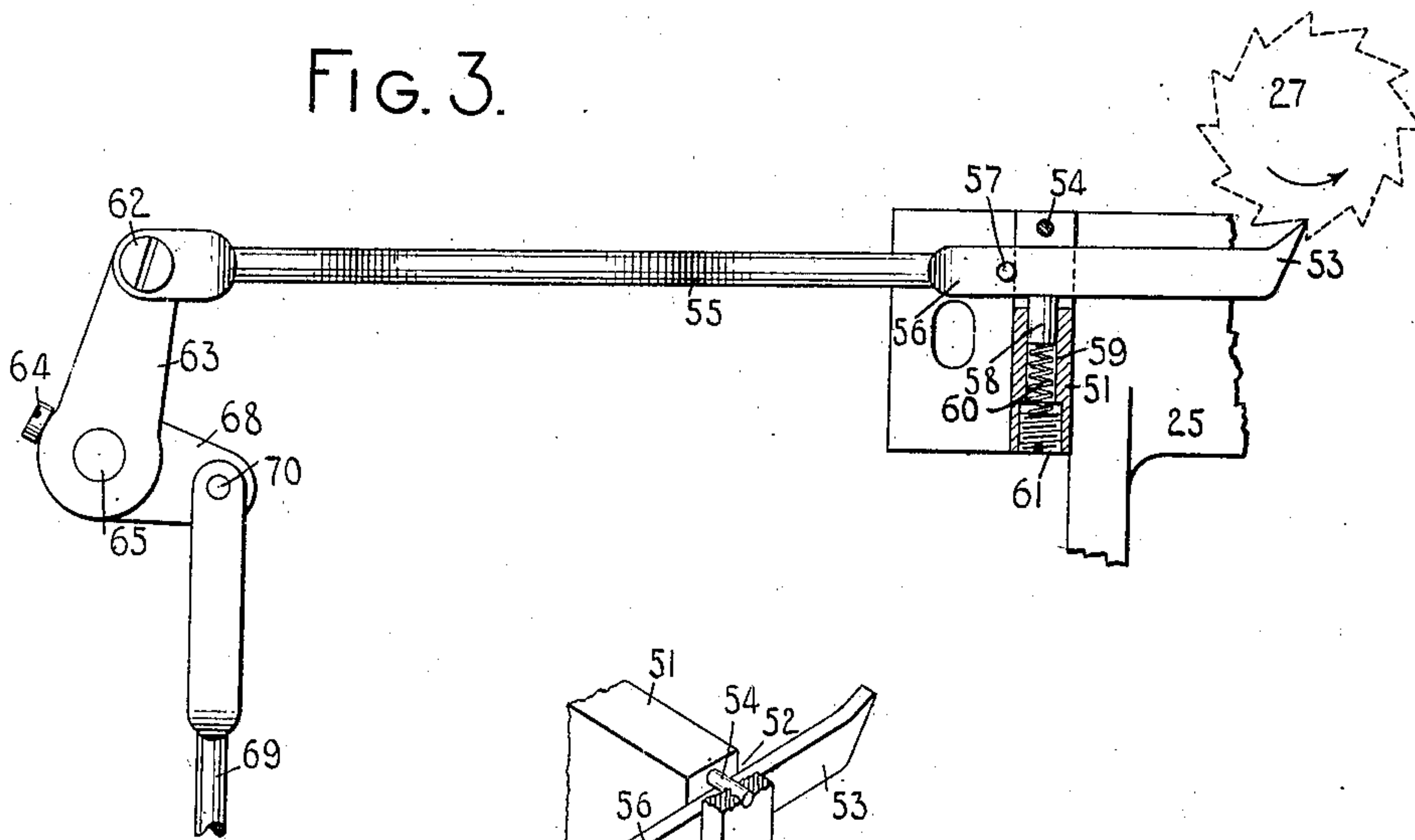


FIG. 4.

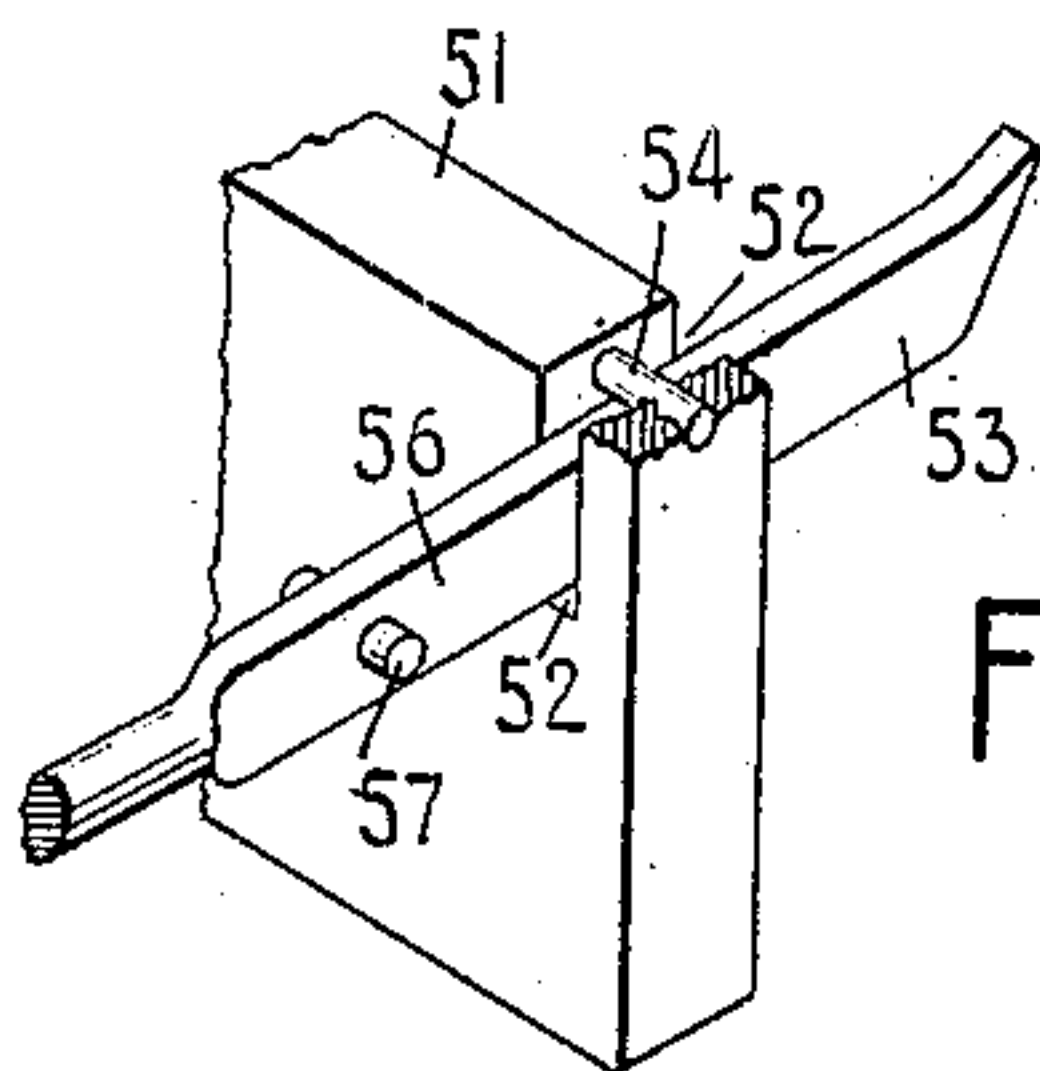
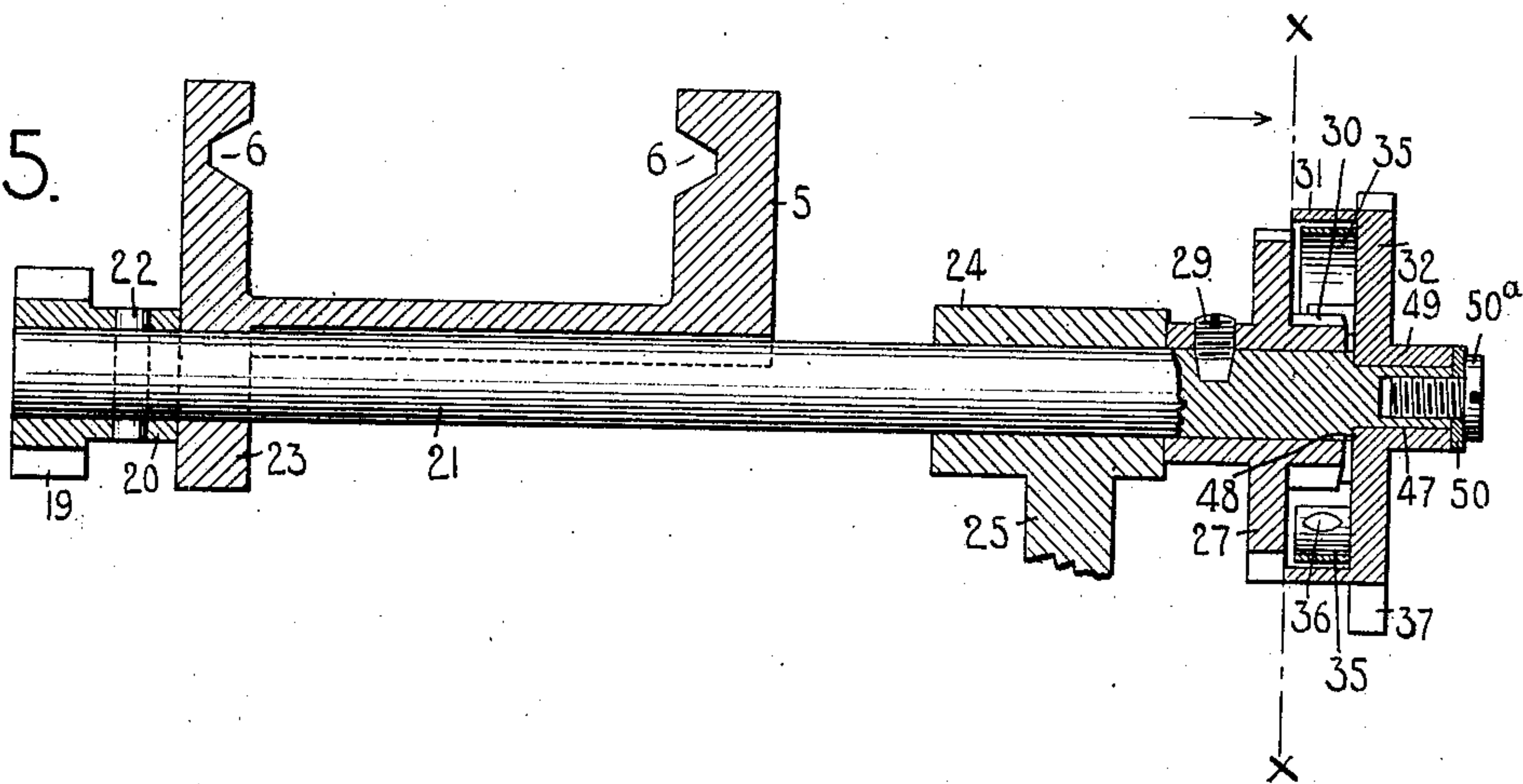


FIG. 5.



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UNITED STATES PATENT OFFICE.

OSCAR WOODWARD, OF NEW YORK, N. Y., ASSIGNOR TO DENSMORE TYPEWRITER COMPANY,
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TYPE-WRITING MACHINE.

No. 896,789.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed January 31, 1906. Serial No. 298,795.

To all whom it may concern:

Be it known that I, OSCAR WOODWARD, citizen of the United States, and resident of the borough of Manhattan, city of 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.

My invention relates to back spacing mechanism for typewriting machines, for effecting a step-by-step feed of the carriage from left to right, or in a direction opposite to that given it during the printing operation.

My invention is in the nature of an improvement on the construction shown in the patent granted to Barron & Merritt, No. 783,669, dated February 28th, 1905, and the object of said invention is to provide simple and efficient back spacing mechanism that can be readily applied to existing forms of typewriting machines, such, for instance, as one form of the Densmore machine, without materially changing the structural features of said machine, and to provide a construction in which the parts can be readily assembled, and removed when desired.

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

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical front to rear sectional view, taken centrally of the machine, and showing sufficient number of parts of one form of typewriting machine to illustrate my invention in its application thereto. Fig. 2 is a rear elevation of the same with the carriage omitted. Fig. 3 is an enlarged detail rear elevation, with parts in section, of a portion of the back spacing mechanism. Fig. 4 is an enlarged fragmentary perspective view of a portion of the same. Fig. 5 is an enlarged detail vertical sectional view showing a portion of the escapement and back spacing mechanisms, the section being taken longitudinally of the escapement wheel shaft. Fig. 6 is a transverse sectional view of the same, taken on the line $x-x$ of Fig. 5 and looking in the direction of the arrow at said line.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. Brackets 4 extend upwardly from the top plate and support a track 5 substantially U-shaped in crosssection with oppositely disposed grooved raceways 6 which cooperate with rollers 7 carried by a carriage truck 8. The truck has links 9 pivoted thereto at 10, the upper ends of said links being pivoted at 11 to a platen frame 12 in which the usual rotary platen 13 is mounted. A central arm 14 projects forward from the platen frame and supports a roller 15 which is received in a grooved trackway 16 of a shift rail 17, which may be moved by a key at the keyboard of the machine in the usual manner. The rollers 7 and 15 thus support the carriage for travel from side to side of the machine. A feed rack 18 is carried by the truck and cooperates with a feed pinion 19 which has a hub 20 secured to a shaft 21 by a pin 22 that extends through the hub and shaft. The shaft 21 is mounted at its forward end portion in a bearing 23 depending from the U-shaped track 5. The rear end portion of the shaft is supported in a bearing 24 formed as a part of a bracket secured by screws 26 to the top plate of the machine. The shaft 21 projects rearwardly beyond the bearing 24 and has a back spacing wheel 27 connected thereto. The back spacing wheel has a forwardly projecting hub 28 which bears against the rear end of the bearing 24 and a screw 29 is received in a threaded opening in the hub and projects through said opening into an opening in the shaft 21 so as to secure the back-spacing ratchet wheel 27 to the shaft. From an inspection of Fig. 5 it will be seen that the hub of the escapement pinion 19 bears against the forward face of the bearing 23 and prevents longitudinal movement of the shaft 21 in its bearings towards the rear of the machine, whereas the hub 28 bears against the rear face of the bearing 24 and prevents a longitudinal movement of the shaft towards the front of the machine. A backing ratchet wheel 30 is secured to or formed integral with the back spacing wheel 27 and is surrounded by a cylindrical housing 31 formed by a flange which extends forwardly from an escapement wheel 32 loosely mounted on the shaft 21. Backing pawls 33 (Fig. 6) are pivoted on headed pins 34 to the forward face of the escapement wheel, and flat springs 35

bear at their free ends against the pawls to force the noses thereof into engagement with the teeth of the cooperating backing ratchet 30, the other end of each of said springs being secured to the cylindrical housing 31, as indicated at 36. The escapement wheel 32 is provided with the usual teeth 37 with which feed dogs 38 cooperate, the dogs being carried by an upright arm 39 of a dog rocker 40 pivoted at 41 to depending arms 42 of the bracket 25. A restoring spring 43 is connected at one end to the dog rocker and bears at its opposite end 44 against the bracket 25 and tends to return the dog rocker to its normal position. A forwardly projecting arm 45 extends from the dog rocker and is pivotally connected to a depending link 46 which receives a downward movement at each actuation of a printing key (not shown) in order to afford a step-by-step forward feed of the carriage under the pressure of the usual spring drum (not shown).

It will be understood that the printing keys, type bars, spring drum, and means for actuating the dog rocker are of the usual construction employed, for instance, in the Densmore machine and the illustration of these parts is not deemed necessary.

The escapement wheel 32 is loosely mounted on a reduced part 47 at the rear end of the shaft 21 and bears at the forward side thereof against a shoulder 48 formed at the junction of the body of the shaft and the reduced part 47 thereof. A rearwardly extending hub 49 is formed on the escapement wheel and a washer 50 bears against the outer end of the hub and with the shoulder 48 prevents a longitudinal movement of the escapement wheel on the shaft 21. A headed screw 50^a has a stem which is received in a threaded opening in the rear end of the shaft 21; the head of the screw bearing against the washer 50, thus holding the parts in place.

The construction is such that the shaft 21 may turn independently of the escapement wheel in one direction but the engagement of the pawls 33, which are carried by the escapement wheel, with the backing ratchet 30 prevents a rotation of the shaft independently of the escapement wheel in an opposite direction. The escapement wheel may be removed without disturbing any other parts of the mechanism, by removing the screw 50^a and slipping the escapement wheel off the end of the shaft.

The bracket 25 has a rearwardly extending arm 51 which has a transverse guide slot or opening 52 extending therethrough for the reception of a back spacing pawl 53 that extends through the opening and is guided by the side walls thereof. A transverse pin 54 extends across the upper portion of the slot and limits the upward movement of the pawl and prevents removal of the pawl 53 upwardly from the guide slot. The back

spacing pawl is rigidly connected to or forms part of a horizontal, longitudinally moving rod 55 and is flattened on its sides, as indicated at 56, for cooperation with the side walls of the guide slot 52. A stop pin 57 is carried by the rod or pawl and is adapted at the last portion of the back spacing movement of the pawl to contact with a side of the rearwardly extending arm 51 to limit the feed movement of the pawl. The free end of the back spacing pawl and rod is supported on a sliding pin 58 which is received and guided within an opening 59 formed in the arm 51 and a spring 60 bears at one end against the under side of the pin and at its opposite end against an adjusting screw 61 which is received in a threaded opening in the under side of the arm 51. The construction just described affords a spring-pressed guiding support for the free, or pawl supporting, end of the rod 55 for purposes which will hereinafter more clearly appear. The right-hand end of the rod 55 is connected by a pivot screw 62 to a crank arm 63 secured by a screw 64 to a rock shaft 65. The rock shaft is supported in a bearing 66 which is secured to and projects downwardly from the track 5. A coiled spring 67 surrounds a part of the bearing 66 and is connected at one end to the screw 64 and at its opposite end 67^a to the bearing 66; the tension of the spring being exerted to turn the rock shaft so as to move the crank arm 63 thereon to the left in Figs. 2 and 3. The forward end of the rock shaft 65 projects beyond its bearing and has a crank arm 68 secured thereto. A depending link 69 is pivoted to the crank arm at 70 and has its lower end pivoted at 71 to a key lever 72 fulcrumed at 73 in the base of the machine and provided with a finger key 74 at the keyboard of the machine.

In the normal positions of the parts the back-spacing pawl 53 is maintained out of engagement and clear of the back-spacing wheel 27 so as not to interfere with the operation of the machine when the back-spacing mechanism is not in use.

Each actuation of a printing key will effect a movement of the dog rocker, thereby releasing the escapement wheel and allowing it to move the distance between two teeth in the direction of the arrow in Fig. 2. The movement of the escapement wheel is effected by the pressure exerted from the spring drum (not shown) on the carriage which transmits movement to the rock shaft 21 through the feed rack 18 and pinion 19. The movement thus transmitted to the rock shaft tends to turn the backing ratchet 30 in the direction of the arrow in Fig. 6 and motion is transmitted from said ratchet through the pawls 33 to the escapement wheel. When the carriage is moved back to begin a new line of writing the shaft 21 will be turned independently of the escape-

ment wheel; the pawls 33 at this time riding freely on and not engaging the teeth of the ratchet wheel 30. During this backward movement of the carriage, the escapement wheel is prevented from being displaced by a back stop pawl 75 (Fig. 2) which is pivoted at 76 to the rearwardly projecting arm 51 and is pressed into engagement with the wheel by a spring 77. This pawl is moved to the left in Fig. 2, during the movement of the escapement wheel in the direction of its feed indicated by the arrow in said figure.

Should the operator desire to effect a backward step-by-step feed of the carriage it is merely necessary to depress the finger key 74, thus transmitting movement to the rock shaft 65 which will cause the rod 55, connected therewith through the crank arm 63, to be vibrated towards the back-spacing ratchet wheel 27, bringing it into engagement with a tooth of said wheel and a further movement of the rod will transmit a turning movement from the back-spacing wheel 27 in the direction of the arrow in Fig. 3. This movement of the back spacing ratchet wheel will be transmitted through the shaft 21 to the pinion 19, and from the pinion to the carriage through the feed rack 18. A single depression of the key 74 is sufficient to move the carriage through the back spacing wheel and intermediate connections a single letter space distance. Thus, a depression of the key 74 causes the backing ratchet 30, connected to the back spacing wheel, to be moved the distance between two of its teeth and each of the pawls 33 engages the next succeeding tooth when the carriage will be held in the position to which it has been moved, it being borne in mind that at this time the escapement wheel and the pawls 33 carried thereby are fixed against rotation. As the pawl 53 is forced into engagement with the teeth on the back-spacing ratchet wheel and moves the same in the direction of the arrow in Fig. 3, the pawl will receive a downward movement as the wheel turns to the position indicated in Fig. 3, and the spring 60 will be compressed by this downward or lateral movement of the back spacing pawl in its guide. When pressure on the finger key is released the spring 67 will restore the rock shaft 65 and the parts connected therewith to their normal positions, thus withdrawing the pawl 53 from engagement with the back-spacing wheel 27. The supporting spring 60 will yield, if necessary, during the withdrawal of the pawl from engagement with the back spacing wheel, thereby preventing a jamming of the parts which would tend to lock them in the actuated position and prevent them from being restored to their normal positions by the spring 67. When the pawl 53 is withdrawn from engagement with the ratchet wheel 27, said pawl is raised by the spring-

pressed plunger 58 into engagement with the pin 54, when said pawl is in position to engage the next tooth of the ratchet.

The carriage construction shown is not claimed herein, as it is made the subject-matter of a separate application, Serial No. 299,536, filed February 5th, 1906.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a horizontally moving rod having a back spacing pawl formed integral therewith at one end of the rod, said pawl co-operating with the back spacing wheel, a rock shaft extending fore and aft of the machine, a crank arm on said rock shaft, which crank arm is connected to said horizontally moving rod, and a key at the keyboard of the machine for actuating said rock shaft.

2. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a rod having a back spacing pawl, a spring-pressed guiding support for said rod, and a key for actuating said rod.

3. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a horizontally moving rod having a back spacing pawl formed integral therewith at one end of the rod, said pawl coöperating with said back spacing wheel, a spring-pressed support on which said rod is supported and guided in its movements towards and away from the back spacing wheel, a rock-shaft extending fore and aft of the machine, a crank arm on said rock shaft, which crank arm is connected to said horizontally moving rod, and a key at the keyboard of the machine for actuating said rock shaft.

4. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but

not in the other, a back spacing pawl which coöperates with the back spacing wheel, a fixed guide having a guiding slot in which said pawl moves, a spring which coöperates with the pawl and yields when the pawl is deflected laterally in its guide by engagement with the coöperating back spacing wheel, and a key for actuating said pawl.

5. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a horizontally moving rod carrying a rigidly connected back spacing pawl, a fixed member having an opening through which the pawl passes and by which it is guided, a spring pressed pin on which the pawl bears and by which it is supported, and a key for actuating said pawl.

6. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a horizontally moving rod carrying a rigidly connected back spacing pawl, a fixed guide having a guide opening through which the pawl passes and by which it is guided, a stop carried by said rod and coöperating with said fixed guide to limit the spacing movement of said rod and pawl, a spring support on which the pawl bears, and a key at the keyboard of the machine for actuating said pawl.

7. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed

pinion meshing with said rack, a loose escapement wheel, a back spacing ratchet wheel operatively connected to said feed pinion, means for operatively connecting said back spacing wheel and the escapement wheel to turn together in one direction but not in the other, a back spacing pawl which coöperates with the back spacing wheel, a fixed guide having a guiding slot in which said pawl moves, a spring which coöperates with the pawl and yields when the pawl is deflected laterally in its guide by engagement with the coöperating back spacing wheel, means for adjusting the tension of said spring, and a key at the keyboard of the machine for actuating said pawl.

8. In a typewriting machine, the combination of a carriage, a feed rack therefor, a feed pinion meshing with said feed rack, a shaft for said pinion, a bearing for said shaft, a detachable escapement wheel loosely mounted on the rear end of said shaft and which may be mounted in place or removed without removing any of the other parts of the structure, a sleeve formed with back-spacing and backing ratchet wheels thereon and which is connected to said shaft by a set screw and bears at one end against the bearing for the shaft to prevent a longitudinal movement of the shaft in one direction, pawls carried by the escapement wheel and coöperating with the backing ratchet wheel, and a key actuated back spacing pawl which coöperates with said back spacing ratchet wheel.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 30th day of January, A. D. 1906.

OSCAR WOODWARD.

Witnesses:

E. M. WELLS,
M. F. HANNWEBER.