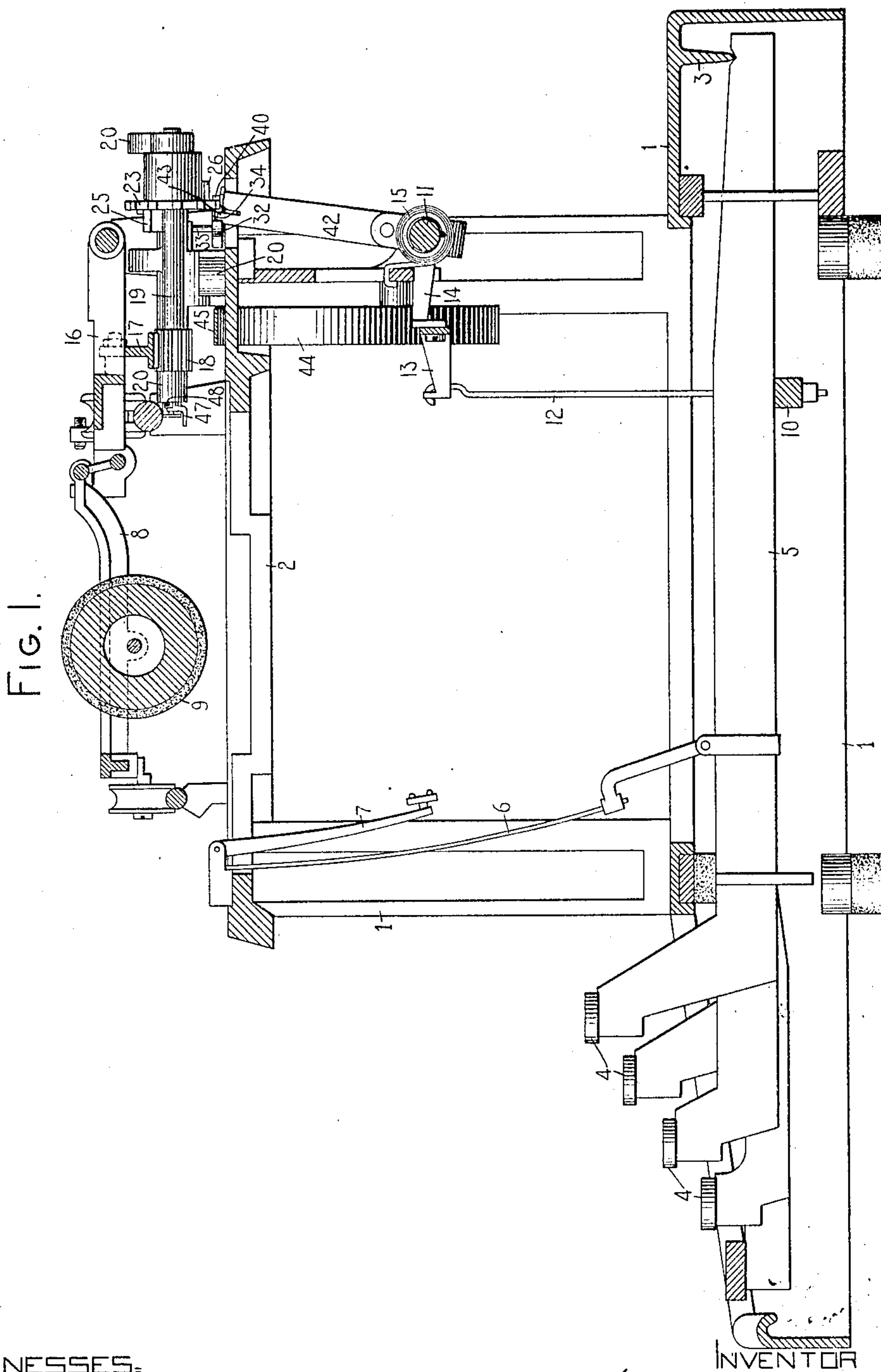


906,699.

W. C. FARNUM.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 21, 1903.

Patented Dec. 15, 1908.
2 SHEETS—SHEET 1.



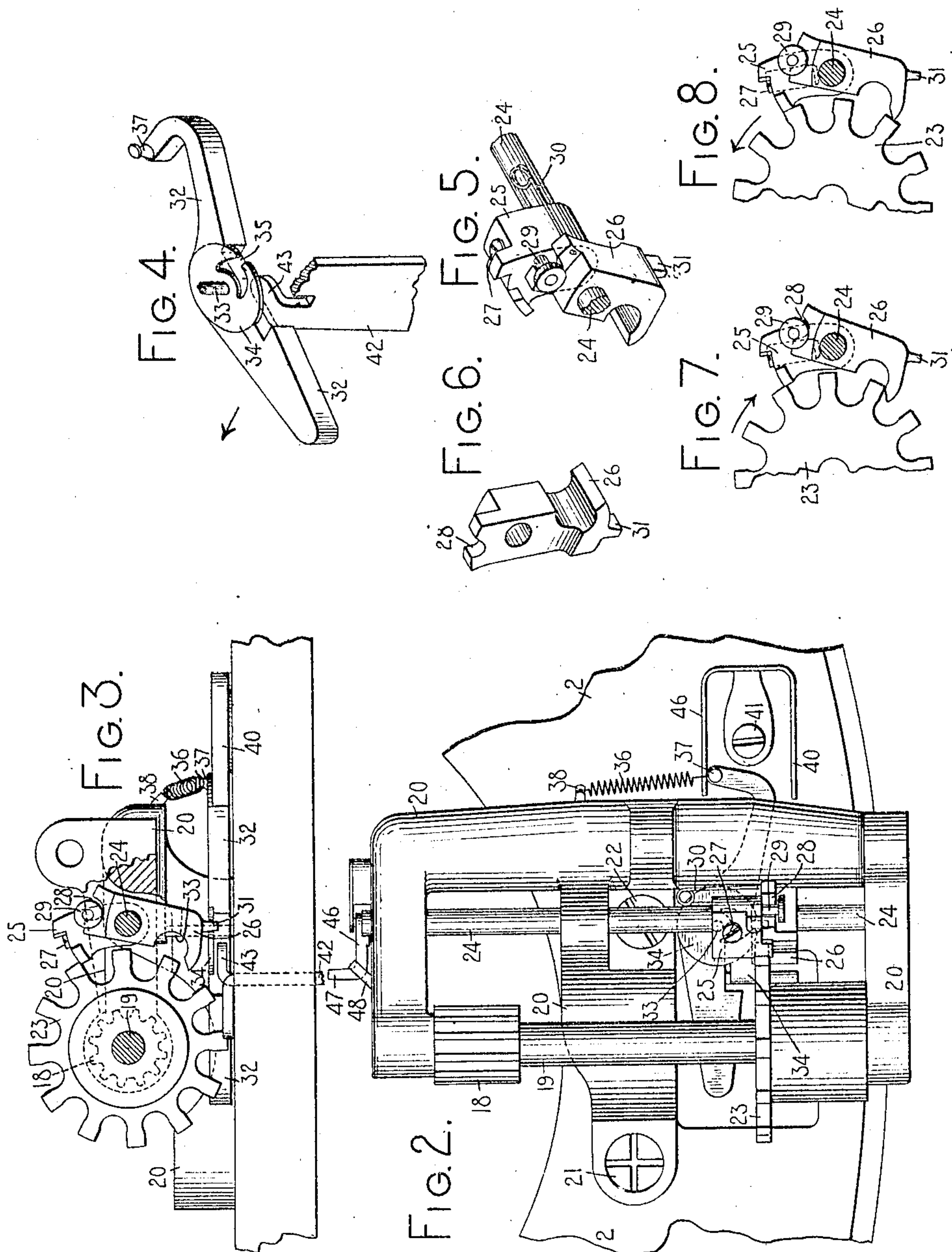
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UNITED STATES PATENT OFFICE.

WILLIAM C. FARNUM, OF ARLINGTON, VERMONT, ASSIGNOR TO WYCKOFF, SEAMANS & BENEDET, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 906,699.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed March 21, 1903. Serial No. 148,941.

To all whom it may concern:

Be it known that I, WILLIAM C. FARNUM, a citizen of the United States, and resident of Arlington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improvements in carriage-feed mechanism of typewriting machines, which comprises a toothed feed-wheel and feed-dogs to act thereon in controlling the feed movements of the wheel and carriage, the object of the invention being to render such feed-mechanism highly efficient, especially when a machine is operated very fast.

The invention consists of various features of construction, combinations and arrangements of parts, all of which are hereinafter fully described and particularly defined in the appended claims.

In the accompanying drawings, in which like reference numerals designate like parts in the various views, Figure 1 is a front to rear vertical section and elevation, showing certain parts of a typewriting machine embodying the invention; Fig. 2, a plan of parts of the feed-mechanism and fragment of the top of the frame of the machine; Fig. 3, a rear sectional elevation thereof; Fig. 4, a perspective on an enlarged scale of a lever, of which a plan and rear edge view are shown in Figs. 2 and 3 respectively, and of a fragment of an actuating device; Fig. 5, a perspective of a pair of feed-dogs and a fragment of the dog-shaft and a spring, included in the carriage-feed mechanism; Fig. 6, a perspective of one of the feed-dogs showing faces not shown in Fig. 5; and Figs. 7 and 8 are rear views of the feed dogs and fragments of the feed-wheel, illustrating the action of the dogs on the wheel.

The invention is shown for convenience applied to a machine differing from the common No. 6 Remington only with respect to the carriage-feed mechanism, but is generally applicable also to visible-writing machines, as well as to other understrike or swinging-carriage machines besides the Remington.

The machine to which the invention is shown applied comprises the frame 1 with

its top 2, the fulcrum-bar 3, the keys 4, the key-levers 5 each connected by a link 6 with a type-bar 7, the swinging-carriage 8 with the platen 9 carried thereby, the universal-bar 10, the rock-shaft 11, the links 12 and transverse bar 13 and arm 14 connecting the universal-bar with the rock-shaft, and the spring 15 acting on the rock-shaft, which will all be recognized as parts of a No. 6 Remington machine, and consequently a detailed description of these parts and their operations is unnecessary.

The carriage-feed mechanism acts on the rear part 16 of the carriage through the rack 17 and pinion 18. The rack is bolted to the rear part 16 of the carriage, it being movable with the carriage and in engagement with the pinion 18. The pinion is fast on a shaft 19 having bearings at its ends in a bracket 20 on the top 2 of the frame. This bracket is fastened to the frame by screws 21 and 22 extending through parts of the bracket into threaded holes in the top 2. A feed-wheel 23 is also fast on the shaft 19. In bearings in this bracket is mounted another shaft 24, hereinafter termed a dog-shaft, there being on it two feed-dogs 25 and 26. The dog 25 is fixed on the dog-shaft by means of a screw 27 extending through the dog to the shaft, while the dog 26 is loose on the dog-shaft, but is secured to the other dog by a lost-motion connection formed by the recess 28 in the upper end of the dog 26, and the pin 29 fixed in the dog 25 and extending through this recess. Hence each dog is movable on its axis in one direction under certain conditions without imparting movement to the other. A spring 30, attached at one end to the dog 26 and at the other to the dog 25, tends to keep the dogs in the relative positions in which they are shown in Fig. 5, the pin 29 then being in contact with that end of the recess 28 which is between the pin and the feed-wheel.

On the lower end of the dog 26 is a projection or stud 31, which extends behind a horizontal lever 32, whose fulcrum is a pin 33 fixed in the bracket 20 and top 2 of the frame. A steel plate 34 is affixed to this lever and in this plate is a slot 35, open at its rear and smaller end, as appears by Fig. 4. The stud 31 extends through the rear or narrow part of this slot, in which

it fits loosely, so when the lever is rocked to and fro on its fulcrum 33, the edges of the slot 35 act on the stud 31 and impart motion to the dog 26 towards and from the feed-wheel 23. A restoring spring 36, which pulls on the lever, is attached to a pin 37 on the lever and to a pin 38 fixed in the bracket 20. The rocking movement of the lever is limited by a stop composed of a base 39 and arms 40, the stop being fastened to the top 2 of the frame by a screw 41 passing through the base 39 into a threaded hole in the top 2. When the lever is in the position shown in Fig. 2, which is its normal position, it makes contact with the front arm 40 of the stop, and it is movable from that position into contact with the rear arm 40 of the stop. An arm 42, by which the lever is moved from its normal position, is fixed on the rock-shaft 11. This arm has at its upper end a lateral extension 43, bearing against the back of the lever 32.

The machine is provided with a common spring-drum 44 and flexible band 45, to move the carriage under the control of the feed-mechanism described.

The feed-dog 25 engages the feed-wheel 23, and the dog 26 is outside of the path of the teeth of that wheel, when the dogs are in their normal positions, or those shown in Fig. 3. Then that end of the recess 28 in the dogs 26, which is between the pin 29 and the feed-wheel, is in contact with the pin 29, and the lever 32 is in the position shown in Fig. 2. With the depression of a character-key or the space-bar, the rock-shaft 11 is turned and the lever 32 is actuated by the arm 42 on the rock-shaft 11, whereupon the dog 26 is advanced by the action of the slotted plate 34 on the stud 31 into the path of the teeth of the feed-wheel 23, and the dog 25 is forced out of engagement with the feed-wheel by the action of the dog 26 on the pin 29. The feed-wheel, as soon as it is released from the dog 25, turns a very little in consequence of the action of the spring-drum on the carriage, but is instantly arrested by the dog 26. With the return-movement of the character-key or space-bar, the lever 32 is restored to its normal position by the spring 36, and the dog 26 is thereupon disengaged from the feed-wheel, while the dog 25 is advanced by the spring 30 to the feed-wheel, with which it makes contact on the outer end of a tooth, and the feed-wheel turns, driven by the carriage, until the next tooth is engaged by the dog 25, which is advanced further by the spring 30 when the former tooth ceases to obstruct its movement. Hence with each return movement of a character-key or the space-bar, the carriage travels a single letter-space.

The action just described is particularly illustrated in Figs. 7 and 8, the former showing the feed-wheel engaged by the dog 26,

and the latter showing the dog 26 disengaged from the feed-wheel and the dog 25 in contact with the outer end of a tooth of the wheel, so that the feed-wheel is then free to move to allow the carriage to advance. The arrow on Fig. 7 indicates the direction in which the feed-wheel turns as the carriage travels from right to left, and the arrow on Fig. 8 indicates the direction of the rotation of the feed-wheel when the carriage is moved from left to right. It will be seen that each dog acts on the feed wheel at the edge of a dihedral angle formed by planes containing the axes of the feed wheel and feed dog respectively and intersecting each other at substantially right angles, the motion of that end of the dog which engages the wheel being almost at right angles to a plane which is tangent to the end of the engaged tooth of the wheel.

From the construction and arrangement of the feed-wheel and feed-dogs, and their coöperation, as shown and described, are derived advantages which materially improve the action of feed-mechanism such as that to which the invention relates. As the upper and lower ends respectively of the dogs 25 and 26 are movable almost directly towards and from the axis of the feed-wheel, and as the dogs act on the wheel, with an excellent mechanical advantage, close to the outer ends of its teeth, only slight movements of the dogs are required to enable them to properly control the action of the feed-wheel. Hence the parts of the feed-mechanism are so adjusted that when the dogs 25 and 26 are in their most advanced positions, they extend only just under the teeth of the feed-wheel, as shown in Figs. 3 and 7 respectively. At the end of a downward movement of a character-key or the space-bar, the relations of the dogs to the feed-wheel then being those shown in Fig. 7, the feed-wheel is prevented from turning by the engagement of the dog 26 with the outer edge of a tooth of the feed wheel. Instantly, therefore, after the key or space-bar begins to ascend, the lever 32, actuated by the restoring spring 36, retracts the dog 26, and the feed-wheel is released almost at the beginning of the upward movement of the key or space-bar, whereupon the feed-wheel turns and the carriage advances. The result is that the carriage reaches its next position even before the type-bar last actuated is retracted far enough from the platen to afford clearance for another type-bar advancing toward the platen. No matter, therefore, how fast the machine may be operated, a letter or character will not be printed over another on the paper.

The dog-shaft 24 is provided at its front end with a crank-arm 46, which is fast on the shaft and on which is a crank-pin 47. A stop-pin 48, fixed in the bracket 20 and

projecting over the crank-arm 46, limits the upward movement of the crank-arm.

The carriage may be released from the control of the carriage-feed mechanism, to
 5 move it from right to left, by forcing the crank-pin 47 upward and thus turning the dog-shaft and disengaging the feed-dog 25 from the feed-wheel. When this is done, the feed-dog 26 remains disengaged from the
 10 feed-wheel, for the pin 29 on the dog 25 travels in the recess 28 without acting on the dog 26, except through the spring 30, which yields as the dog 25 moves backward, the dog 26 being held still by the lever 32.
 15 Hence until the dog 25 is allowed to return to its normal position to reengage the feed-wheel, through the action on this dog of the spring 30, the carriage is free from the control of the feed-mechanism and movable
 20 either way with the hand. It is thus movable from left to right, when the dog 26 is in its normal position, although the dog 25 is in contact with the feed-wheel, for the action of the dog 25 on the feed-wheel, like that of
 25 a pawl on a ratchet-wheel, is only capable of controlling the feed-wheel when it tends to move in one direction. Means to act on the crank-pin 47, to release the carriage as above explained, may be attached to the carriage if
 30 desired, suitable means being shown and described in another application filed by me March 21, 1903, and bearing the Serial No. 148,942.

Various changes may be made in the mechanism above described without avoiding the spirit of the invention.

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

1. In carriage feed mechanism of type-
 40 writing machines, the combination with a feed wheel mounted on a horizontal axis, of a feed dog pivoted to a support on the rear of the frame of the machine and extending downward from its axis and operative on
 45 the feed wheel below the horizontal plane containing the axis of the feed wheel, a lever fulcrumed on the frame below said feed dog and operative on this feed dog at its lower end, said lever constituting means to hold
 50 this feed dog normally disengaged from the feed wheel, and another feed dog connected with the first-mentioned feed dog and normally engaged with the feed wheel above the horizontal plane containing the axis of the
 55 feed wheel and movable from its normal position when the other feed dog and said lever are at rest.

2. In carriage feed mechanism of type-
 60 writing machines, the combination with a feed wheel, of a feed dog pivoted to a support on the rear of the frame of the machine and extending downward from its axis and operative at its lower end on the feed wheel, a lever fulcrumed below said feed dog on a
 65 fixed vertical pivot and operative on this

feed dog at the lower end of said dog, and another feed dog operatively connected with the first mentioned feed dog.

3. In carriage feed mechanism of type-
 writing machines, the combination with a
 70 feed wheel, of a feed dog pivoted to a support on the rear of the frame of the machine and extending downward from its axis and operative at its lower end on the feed wheel, and having a projection on its lower end, a
 75 lever fulcrumed below this feed dog on a fixed vertical pivot and including a slotted device engaged with said projection, and another feed dog operatively connected with
 the first mentioned feed dog. 80

4. In carriage feed mechanism of type-
 writing machines, the combination with a
 feed wheel, of a feed dog pivoted on a hori-
 zontal axis and operative on the feed wheel,
 a lever pivoted on a fixed vertical axis and
 85 operative on said feed dog, a rocker mounted on a horizontal axis at right angles to a vertical plane containing the axis of said feed dog, said rocker including an arm operative on said lever, and another feed dog
 90 operatively connected with the first-mentioned feed dog.

5. In carriage feed mechanism of type-
 writing machines, the combination with a
 feed wheel, of a feed dog pivoted on a hori-
 95 zontal axis and extending downward therefrom and operative at its lower end on the feed wheel, a lever pivoted on a fixed vertical axis and operative on said feed dog at the lower end thereof, a rocker mounted on
 100 a horizontal axis at right angles to a vertical plane containing the axis of said feed dog, said rocker including an arm operative on said lever, and another feed dog operatively connected with the first mentioned feed dog. 105

6. In combination, with a rotary escape-
 wheel having detent-teeth, a normally en-
 gaged detent-pawl with its tooth removably
 held in the path of movement of the detent-
 teeth on the escape-wheel, a normally disen-
 110 gaged pawl with a detent tooth arranged to successively act upon the teeth engaged by the normally engaged detent-pawl, a trip device mounted on one of the pawls and arranged to engage the other pawl, both of said
 115 pawls being mounted upon the same support and having coincident axes of oscillation, and means for actuating the pawl bearing the trip device.

7. In combination with a rotary escape-
 120 wheel having detent-teeth, a normally engaged detent-pawl with its tooth removably held in the path of movement of the detent-teeth on the escape-wheel, a normally disengaged pawl independently mounted with re-
 125 spect to the engaged pawl but on the same support and having a tooth arranged to successively act upon the teeth of the escape-wheel engaged by the normally engaged pawl, a trip device mounted on one of the 130

pawls and arranged to engage the other pawl in disengaging the normally engaged pawl, both of said pawls having the same axis of oscillation and means for actuating
5 the pawl bearing the trip device.

Signed at the borough of Manhattan, city of New York, in the county of New York,

and State of New York, this 20th day of March, A. D. 1903.

WILLIAM C. FARNUM.

Witnesses:

E. M. WELLS,
K. V. DONOVAN.