J. D. DAUGHERTY.

TYPE WRITING MACHINE.

APPLICATION FILED MAY 11, 1906.

915,662.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.

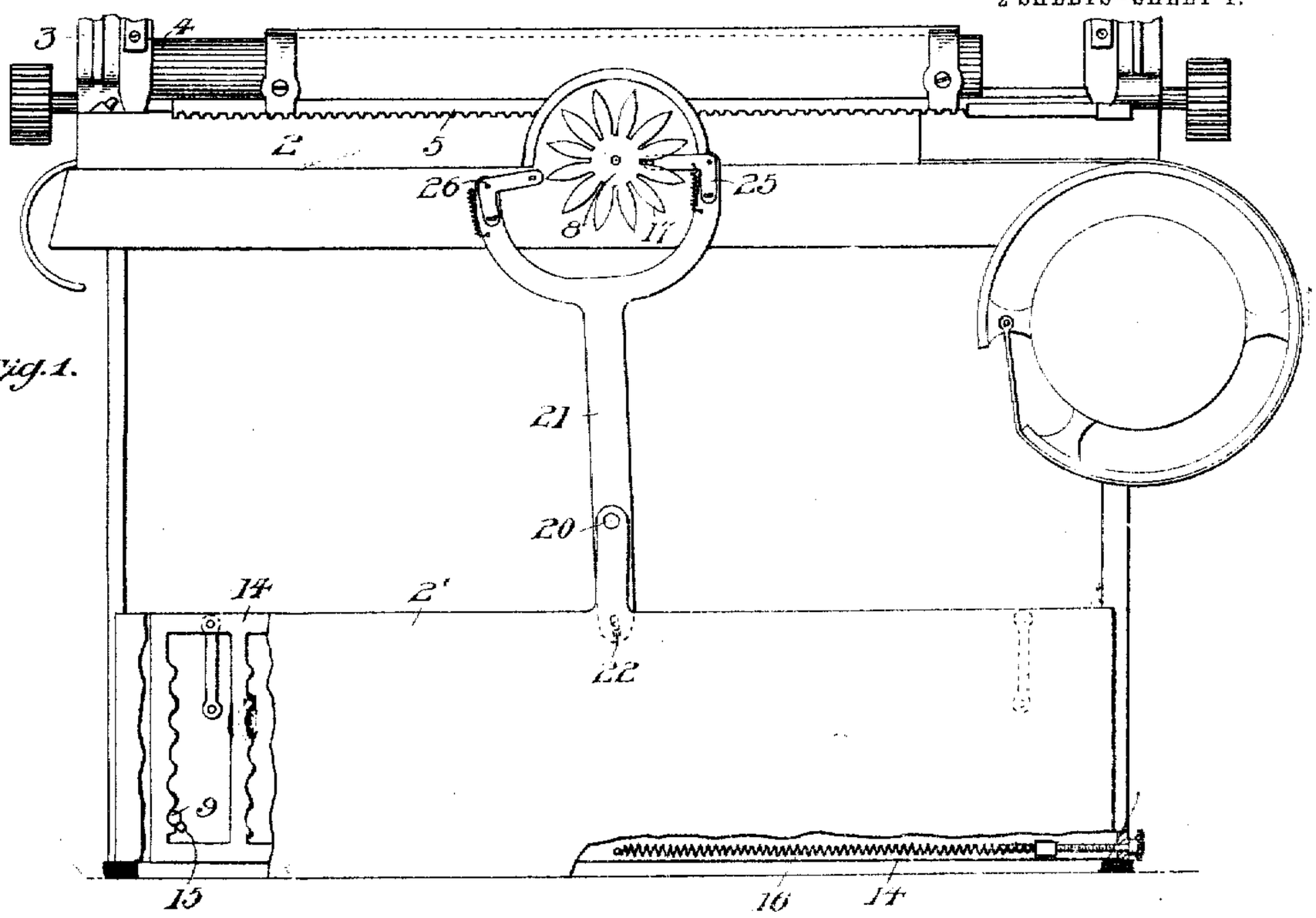

Fig. 1.

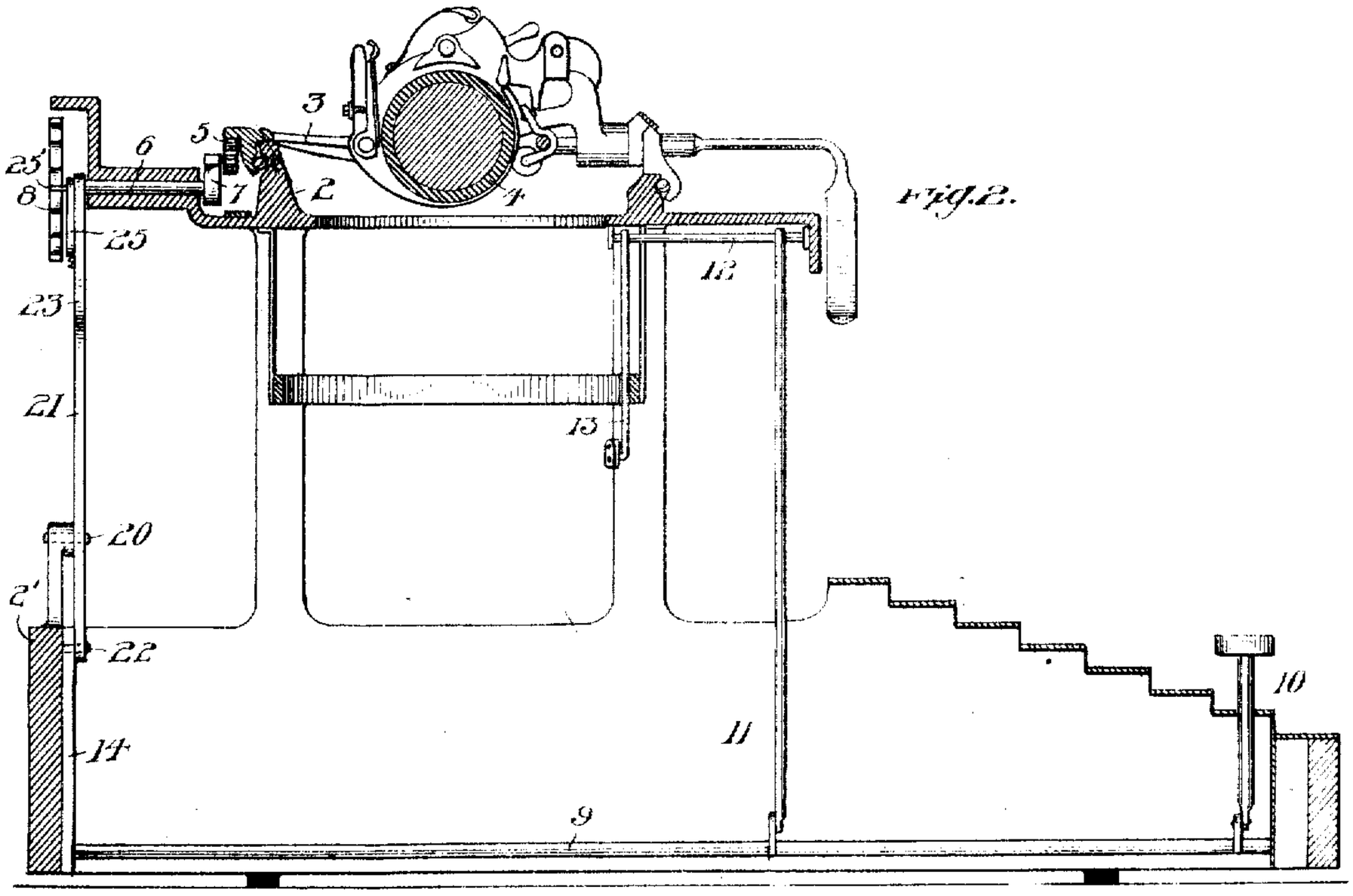

Fig. 2.

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Fig. 3.

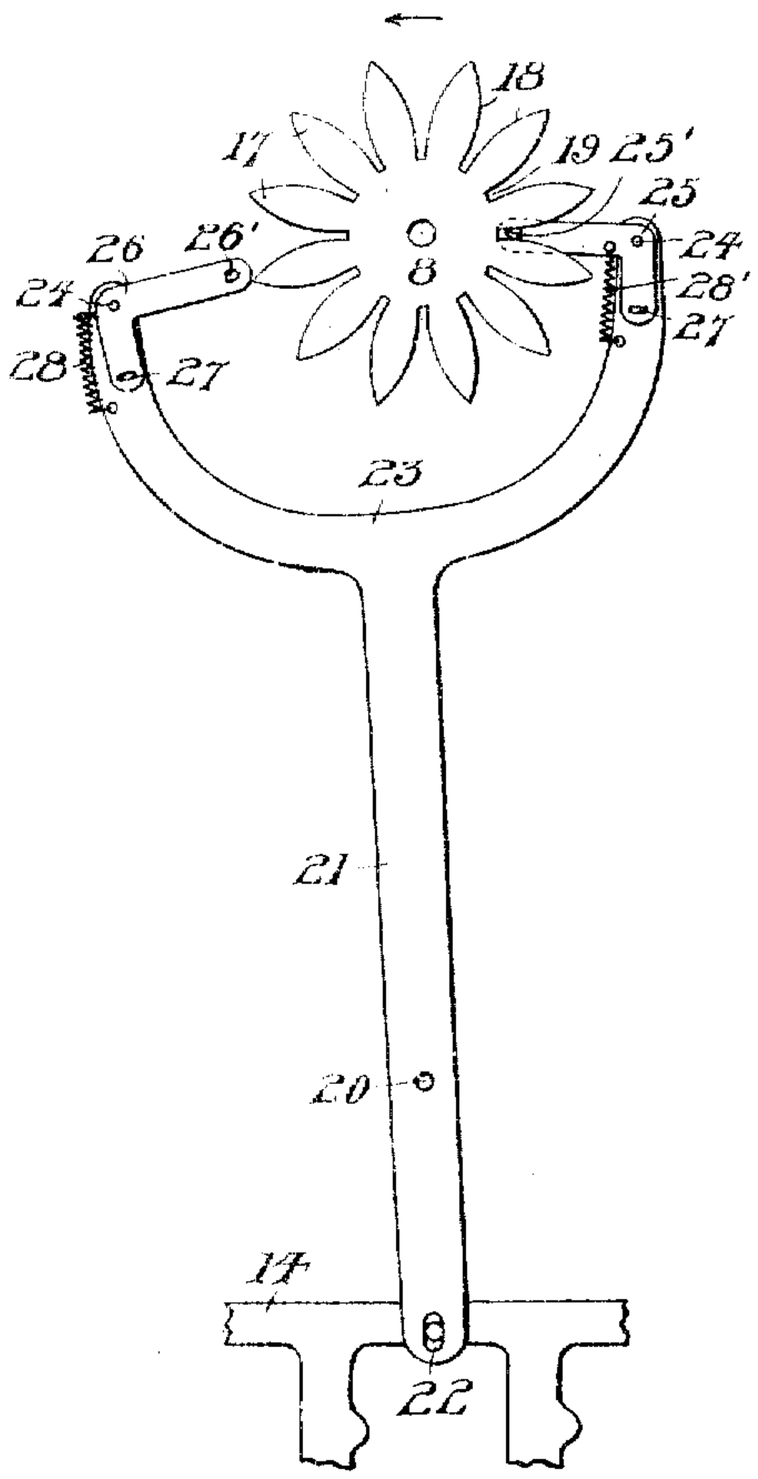


Fig. 4.

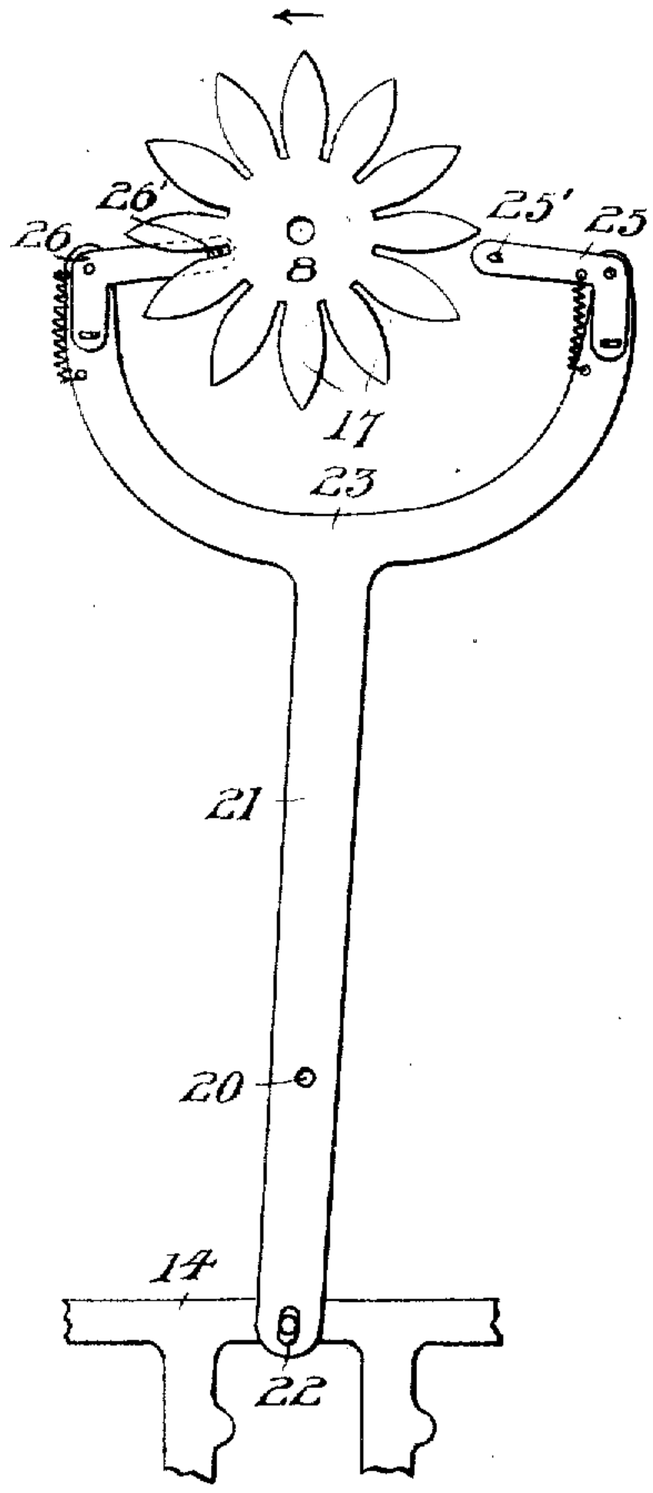
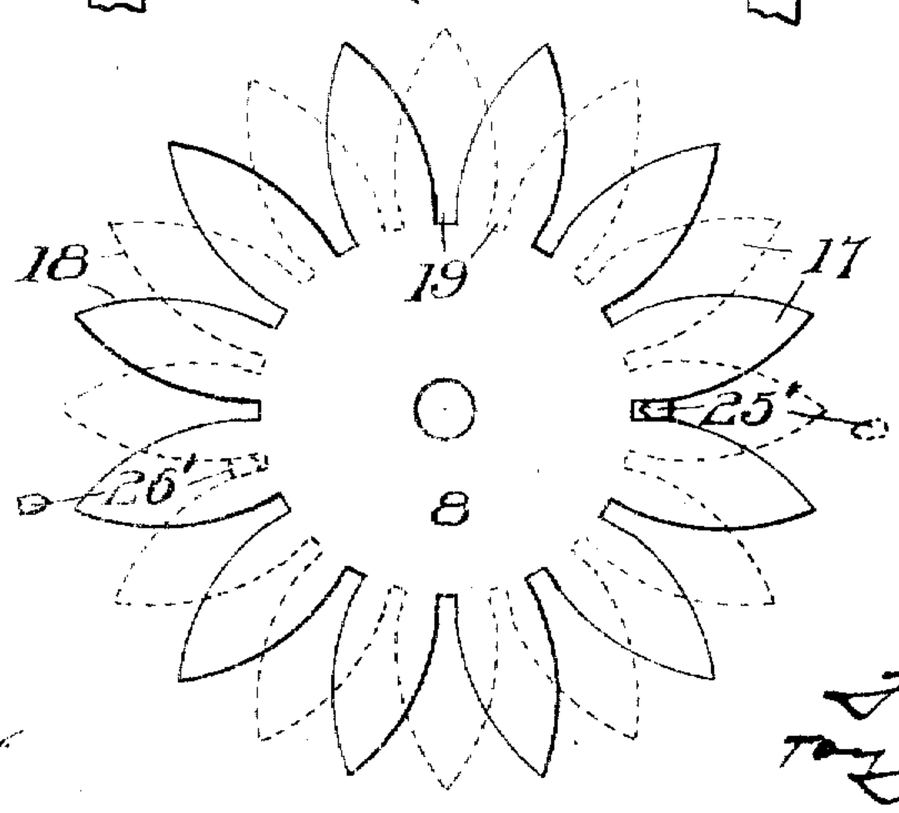


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES DENNY DAUGHERTY, OF KITTANNING, PENNSYLVANIA, ASSIGNOR TO UNION TYPE-WRITER COMPANY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 915,662. Specification of Letters Patent. Patented March 16, 1909.

Application filed May 11, 1906. Serial No. 316,284.

To all whom it may concern:

Be it known that I, JAMES DENNY DAUGHERTY, a citizen of the United States, residing at Kittanning, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to escapement mechanism, designed especially for the carriage of a writing machine, and the primary object thereof is to obviate the uncontrolled jumping or jerking advancing movements of the carriage between impressions, and the noise occasioned thereby, objections incident to many writing machine escapements of prior design. I accomplish this by having the escapement under constant and positive speed control. With the escapement under positive control of the impression mechanism their movements are synchronous, and mechanically accurate spacing is attained, it being impossible for the carriage to move faster or slower than the impression mechanism.

The invention is preferably so embodied that the carriage is held rigid when the impression mechanism is at the limits of its movement, and is under controlled movement while the impression mechanism is in motion, with the result that the feed movement is divided, part occurring before and part after each impression. These movements may be of equal extent, or the movement preceding the impression may be greater or less than the other, it being only essential that the movements intervening between successive impressions shall total a full space.

While the improved escapement may be adapted to machines of various makes, I have in the accompanying drawings shown the same applied to a Smith Premier machine, Figure 1 being the rear elevation thereof and Fig. 2 a vertical sectional view, portions only of the organized machine being shown. Figs. 3 and 4 are detail views of the escapement mechanism, the views showing the releasing dogs in reverse position. Fig. 5 is a diagrammatic view of the escapement wheel and dogs.

Referring to the drawings, 2 designates the upper portion of the machine-frame, 3 the carriage, and 4 the platen.

5 is the rack-bar extending longitudinally of the carriage and with which the escapement mechanism coöperates.

Journaled in the rear portion of the frame is shaft 6 having at its inner end ratchet gearing 7 such as that ordinarily employed in the Smith Premier machine #4 and which is shown and described in the patent to Brown No. 615,343, dated Dec. 6th, 1898. This so-called ratchet gearing meshes with the rack 5. An escapement wheel 8 is secured to the rear end of the shaft 6 and the ratchet gearing 7 constitutes an operative connection between the rack 5 and the shaft 6, whereby the carriage may be moved to the right independently of the shaft and escapement wheel but cannot move to the left independently of said parts without affecting a release through the usual release key (not shown).

9 designates the rock-shaft to which key-stem 10 is connected, and 11 is the link which transmits motion from said shaft to rock-shaft 12, carrying type-bar 13 which strikes upwardly against platen 4 when making an impression.

14 is the oscillating gate in the rear of the machine which has universal connection with all of shafts 9 by means of a lug 15 carried by each shaft and engaging a suitable surface of the gate.

16 is the spring against which the gate pulls when a key is depressed and which operates to return the gate and key to normal position.

The parts thus far referred to, with the exception of wheel 8, appear in the Smith Premier machine, and are well known in the art.

The outwardly tapered or pointed teeth 17 of escapement wheel 8 are preferably of cycloidal form. The curved edges 18 of adjacent teeth converge inwardly, with their inner or lower portions near the bases of the teeth straight or parallel to form the dog-spaces 19.

Fulcrumed at 20 to the rear part 2′ of the frame is lever 21 having at its lower end slot-and-pin connection 22 with gate 14, and at its upper end fork or yoke 23, the arms of which extend upwardly at opposite sides of escapement wheel 8. Pivoted at 24 to these arms are dogs 25 and 26, here shown in the form of bell-crank levers, each pro-

vided with a tooth 25′ 26′ respectively, which play in and out between teeth 17. A slot-and-pin connection 27 affords each of the dogs limited independent movement on its pivot 24. Spring 28 is arranged to hold dog 26 with tooth 26′ normally elevated and resists depression thereof, while a similar spring 28′ holds dog 25 with tooth 25′ normally depressed and resisting elevation thereof. Teeth 25′ and 26′ are of approximately the same size as dog-spaces 19 so that when in the latter escapement wheel 8 is held rigid.

The normal position of the escapement mechanism is as shown in Fig. 3, with dog 25 in inward position and tooth 25′ thereof within space 19 and positively holding and locking wheel 8, the dog having been turned to the limit of its movement against the pull of spring 28′. While a key is being depressed, the dog-carrier and dogs are moving simultaneously therewith, the position of the carrier and dogs being as shown in Fig. 4 at the completion of the key depression, and when the key is released the mechanism returns to the position shown in Fig. 3.

Referring now to Fig. 3, as dog 25 moves outward, the curved edge of the active tooth 17 bears upwardly against dog-tooth 25′, the teeth disengaging just before dog 25 reaches the outward limit of its movement. Meanwhile, dog 26 is moving inward between two of teeth 17 at the opposite side of wheel 8, and tooth 26′ thereof is brought into engagement with the curved under edge of the tooth 17 descending toward it. This engagement takes place and dog 26 is oscillated downwardly through its limited independent movement before dog 25 has become entirely disengaged, so that for an appreciable time both of dogs 25 and 26 are in positive engagement with the teeth of the escapement wheel, thus making independent movement of the latter absolutely impossible, the wheel being under positive control of one or the other or both dogs at all times. By the time dog 25 and its tooth 25′ have moved outside the radius of teeth 17, dog 26 and its tooth 26′ are in inward position within space 19, and holding the escapement wheel rigid and locked, it being at that instant that the impression takes place. As soon as dog 25 has in its outward movement cleared tooth 17, it is retracted by spring 28′ into alinement with a fresh teeth-separating or interdental space and in position to coöperate in effecting the next advance of the escapement wheel. In like manner, when in moving outward dog 26 has cleared its engaged tooth 17, it is oscillated by spring 28 into alinement with a fresh space. The active engagement of each dog with wheel 8 begins during the latter part of the inward movement of the dog and continues throughout the entire outward movement thereof. While this outward movement, combined with the curved edges of teeth 17, affords wheel 8 controlled movement in response to the pull or tension of the carriage, said pull or tension, transmitted through the curved edge of tooth 17, accelerates the movement of the dog. Thus, instead of the pull of the carriage being directly opposed to the movement of the escapement mechanism, as heretofore, it assists the same, and thereby very appreciably lightens the touch.

From the foregoing description it will be understood that the carriage is a power driven carriage propelled by the usual spring drum shown in Fig. 1; that each tooth 17 of the feed rack, which is shown in the present instance as an escapement wheel, has a front working face which is inclined or beveled and allows an advance of the escapement wheel and carriage during a disengaging movement of each dog, and that each dog engages alternately on one side and then on the other of each tooth of the escapement wheel.

While I have shown and described a preferred embodiment of the escapement mechanism with the same applied to a machine of particular type, it will be understood that the invention may be variously embodied, and adapted to various makes of machines, without departing from the invention. And while designed primarily for use in writing machines, the improved escapement may be employed in other connections or wherever such mechanism is required.

I claim:—

1. In a writing machine, a carriage escapement member having teeth, and inversely operating dogs adapted to play in and out between the teeth and mounted to move therewith, one or other of said dogs at all times engaged with and positively controlling the escapement member.

2. An escapement device having an advancing movement and provided with teeth, the edges of adjacent teeth converging inwardly and forming inclined working faces and forming a dog receiving space near the bases of the teeth, and inversely operating dogs of the same width as said spaces near the bases of the teeth and adapted to play in and out between the teeth and in and out of said spaces.

3. An escapement device having an advancing movement and provided with teeth, the edges of the adjacent teeth being rounded to form rounded working faces and converging inwardly and forming a dog-space near the bases of the teeth, and inversely operating dogs of the same width as said spaces near the bases of the teeth and adapted to play in and out between the teeth and in and out of said spaces.

4. An escapement device having an advancing movement and provided with teeth of cycloidal form to provide inclined work-

ing faces, the edges of adjacent teeth forming at their inner ends a dog-space, and inversely operating dogs each of the same width as a space thus formed at the inner ends of the teeth and adapted to play in and out between the teeth and in and out of said spaces.

5. In a writing machine, an escapement device having teeth of cycloidal form to provide inclined working faces and having dog-spaces between adjacent teeth near the bases thereof, and inversely operating dogs adapted to fit said spaces near the bases of the teeth and play in and out between the teeth and in and out of said dog-spaces.

6. In a writing machine, an escapement device having teeth with dog-spaces between the bases of adjacent teeth, inversely operating dogs adapted to fit said spaces and play in and out between the teeth and in and out of said spaces and when in the latter operating to hold the escapement device rigid, and means operating when each dog is in outward position to aline that dog with a fresh teeth-separating space.

7. A carriage escapement comprising a tensioned toothed wheel, inversely operating dogs adapted to engage the wheel, each dog having spring-opposed limited movement in the direction of rotation of the wheel, and means for so moving the dogs toward and from the wheel that one dog is at the limit of its independent movement and in positive engagement with a tooth thereof before the other dog is disengaged.

8. A carriage escapement comprising a tensioned wheel having teeth of cycloidal form, the edges of adjacent teeth forming at their inner ends a dog-space, inversely operating dogs adapted to enter between the teeth and fit said spaces, each dog having spring-opposed limited movement in the direction of rotation of the wheel, and means for so moving the dogs toward and from the wheel that one dog is at the limit of its independent movement and in positive engagement with a tooth thereof before the other dog is disengaged.

9. A carriage escapement comprising a tensioned toothed wheel, an oscillating carrier extending to opposite sides of the wheel, a dog pivoted to the carrier at each side of the wheel and adapted to be moved by the oscillating carrier in and out between the wheel teeth, each dog having limited spring-opposed movement on its pivot in the direction of rotation of the wheel.

10. A carriage escapement comprising a tensioned toothed wheel, an oscillating frame extending to opposite sides of the wheel, a dog of bell-crank form pivoted to the carrier at each side of the wheel, the pivoted dogs having limited turning movement in the direction of rotation of the wheel, and a spring for each dog connected to an arm thereof for opposing said limited movement.

11. An escapement device having an advancing movement and provided with teeth, the edges of adjacent teeth converging inwardly and forming a dog-space near the bases of the teeth, said space having parallel side walls, and inversely operating dogs adapted to play in and out between the teeth and said dog-spaces, the engaging portion of each dog being of the same width as the dog-spaces and having parallel side faces.

12. In a writing machine, a carriage escapement member having teeth, and inversely operating dogs adapted to play in and out between the teeth, one or other of said dogs at all times engaged with and positively controlling the escapement member.

13. In a typewriting machine, the combination of a carriage, an escapement rack having teeth with inclined working faces, and a pair of feed dogs that co-act with said inclined working faces and enable an advance of the rack to take place during the disengagement of each dog from the rack.

14. In a typewriting machine the combination of a power driven carriage, an escapement wheel having teeth with inclined working faces and a pair of feed dogs that engaging portions of which move in the plane of the escapement wheel and coact with said working faces and enable an advance of the escapement wheel to take place during the disengagement of each dog from the escapement wheel.

15. In a typewriting machine, the combination of a power driven carriage, an escapement wheel having teeth with inclined working faces, and a pair of independently pivoted spring pressed feed dogs, the engaging portions of which move in the planes of the escapement wheel and co-act with said working faces and enable an advance of the escapement wheel to take place during the disengagement of each dog from the escapement wheel.

16. In a typewriting machine, the combination of a feed rack each tooth of which has inclined working faces on opposite sides thereof, and a pair of independently pivoted spring pressed feed dogs that co-act with said inclined working faces during the movement of said dogs toward and away from the feed rack.

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

JAMES DENNY DAUGHERTY.

Witnesses:

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ROLAND B. SIMPSON.