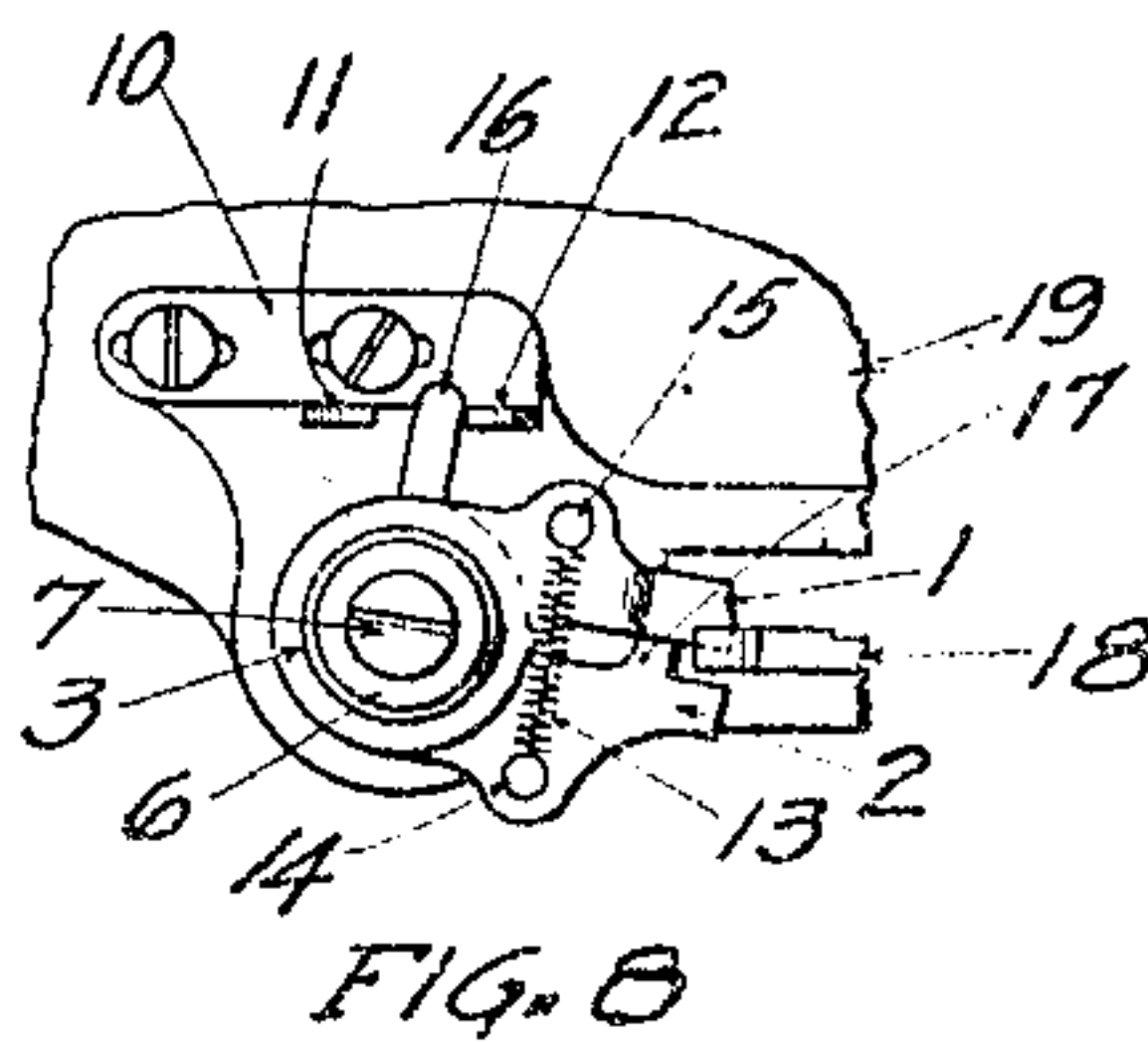
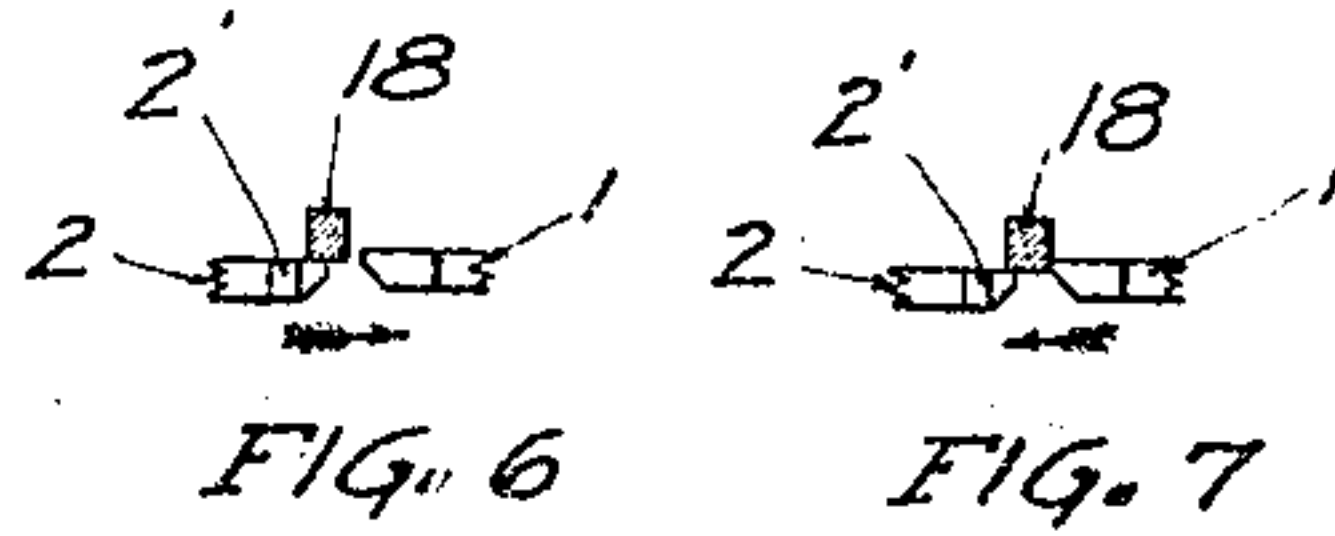
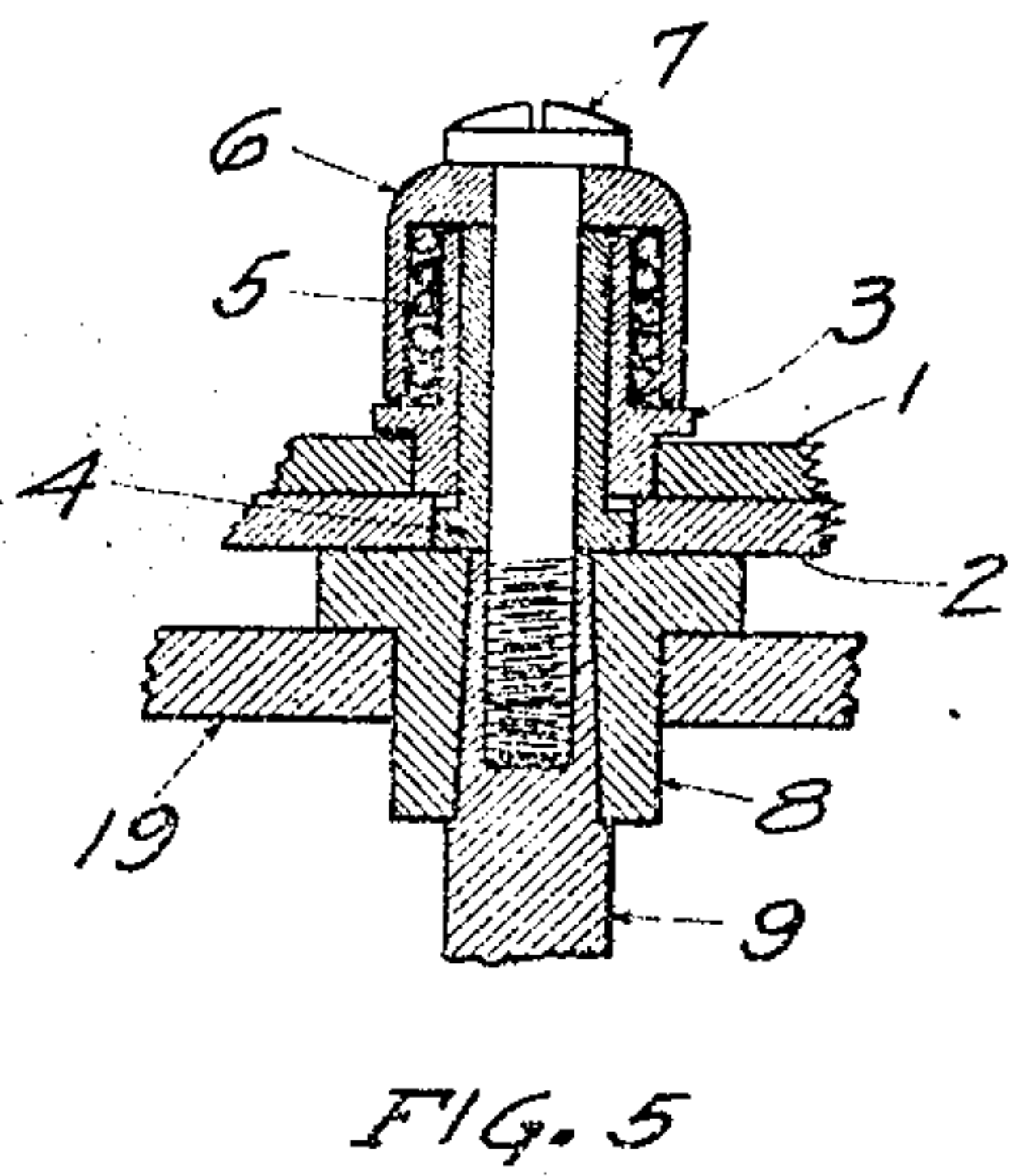
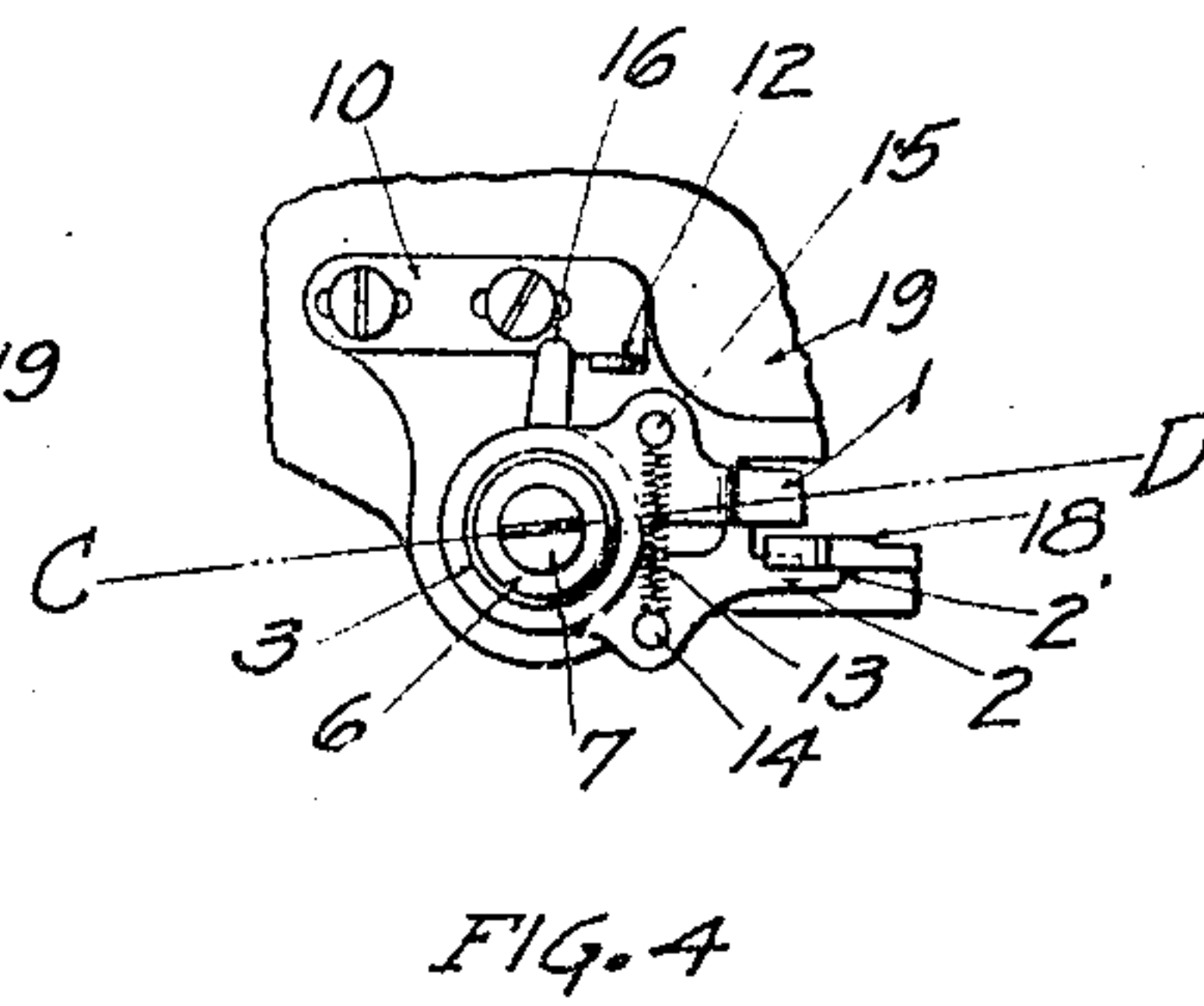
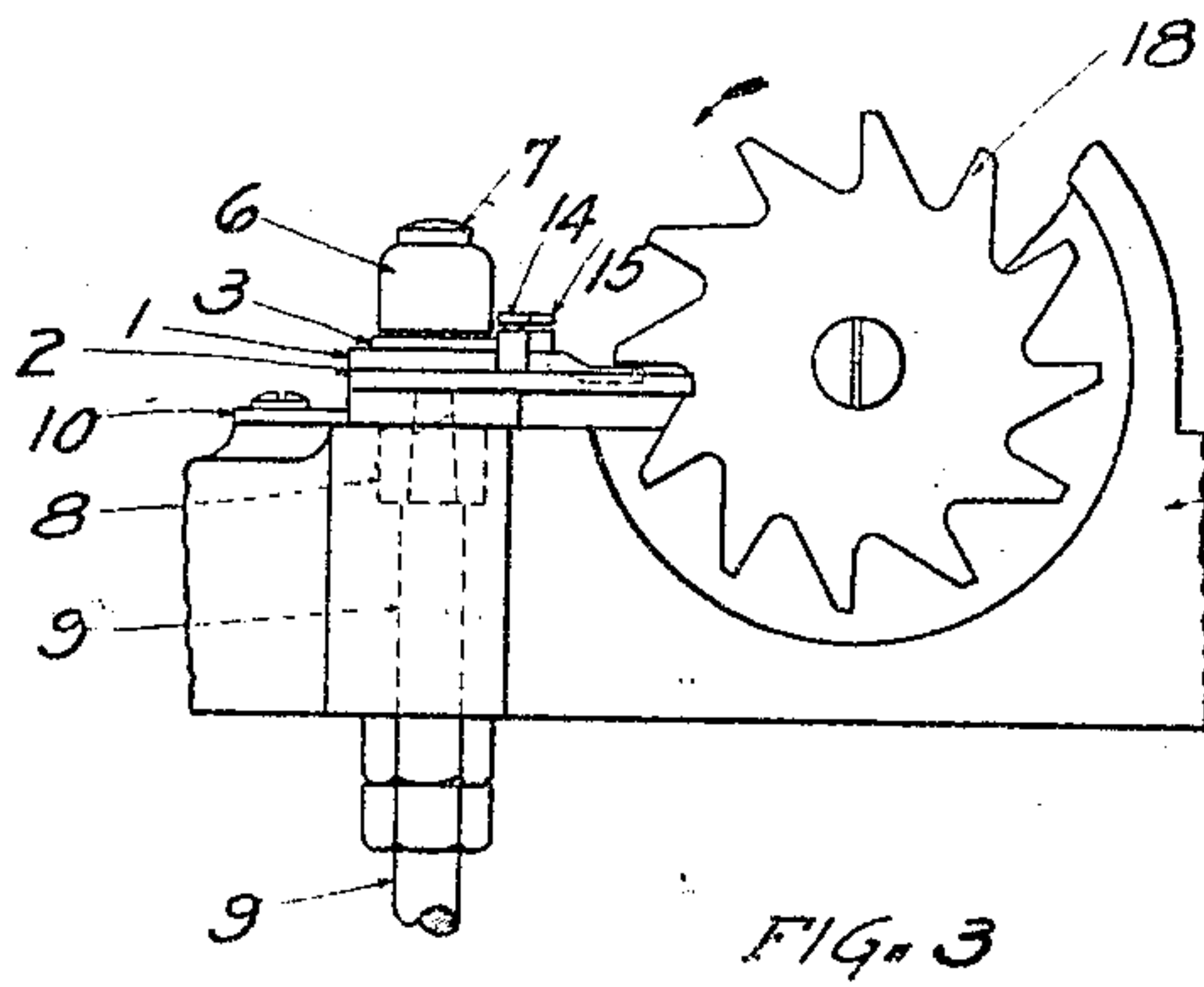
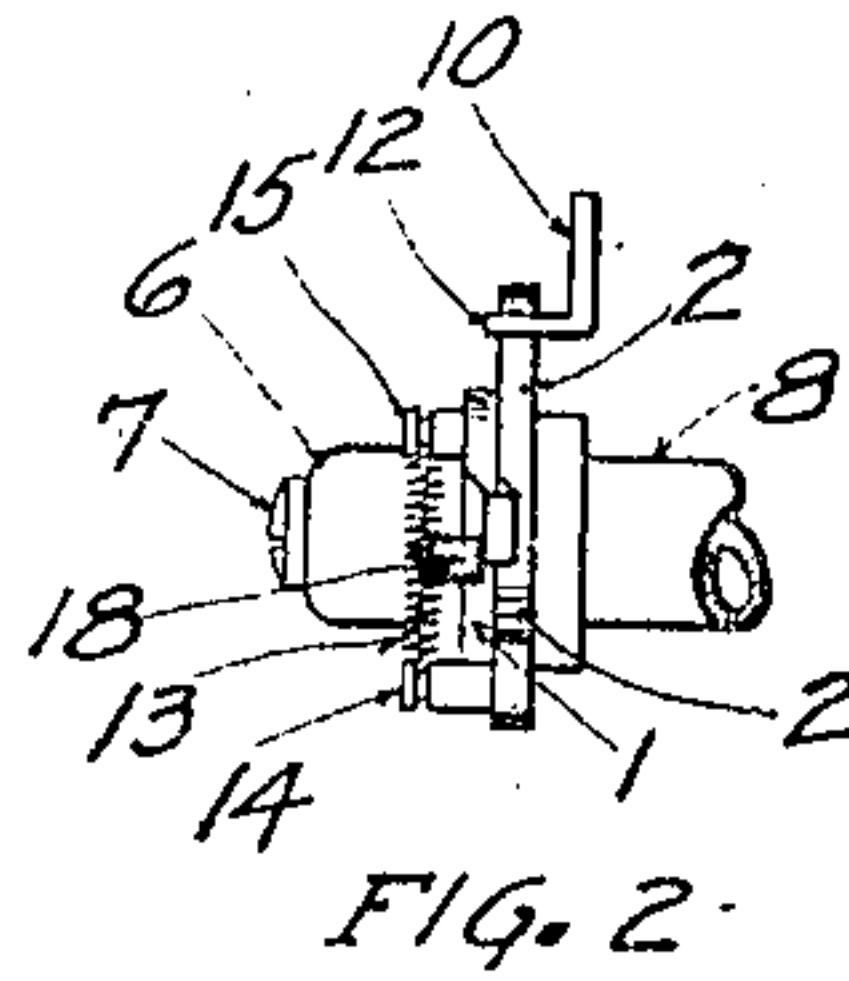
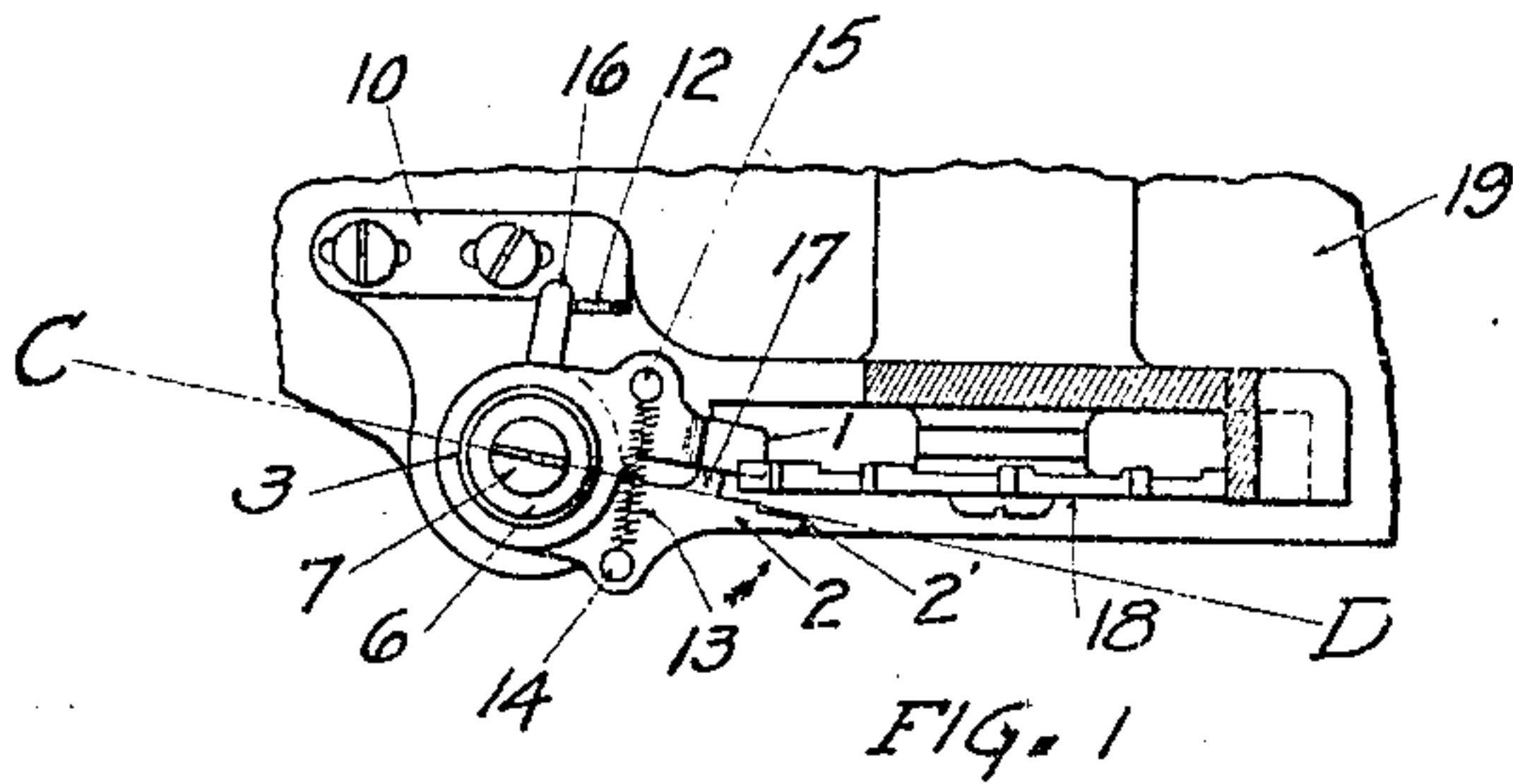


J. H. BARR.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 7, 1908.

925,796.

Patented June 22, 1909.



WITNESSES:

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JOHN H. BARR, OF SYRACUSE, NEW YORK, ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 925,796.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed April 7, 1908. Serial No. 425,687.

To all whom it may concern:

Be it known that I, JOHN H. BARR, citizen of the United States, and resident of Syracuse, in the county of Onondaga 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 typewriting machines and more particularly to the carriage feed mechanism of such machines.

My invention has for its principal object to provide an improved escapement which is simple in construction and rapid in operation.

To the above and other ends, my invention consists in certain features of construction and combinations and arrangements of parts, all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top view of an escapement embodying my invention, the same being shown applied to the Smith Premier typewriter, the parts being shown in normal position. Fig. 2 is a right-hand elevation of the escapement dogs and connected parts, a tooth of the escapement wheel being shown in section and all of the parts being shown in normal position. Fig. 3 is a rear elevation of the parts shown in Fig. 1. Fig. 4 is a top view showing the parts in the positions they occupy when a key is fully depressed. Fig. 5 is a fragmentary vertical section on an enlarged scale through the center of the dog-carrying shaft. Fig. 6 is a diagrammatic right hand end view of the feed dogs and a tooth of the escapement rack, the parts being in the position indicated in Fig. 4. Fig. 7 is a view similar to Fig. 6 but showing the position of the parts just prior to or at the instant of let-off. Fig. 8 is a fragmentary top plan view of a modification.

Similar numerals of reference refer to like parts throughout the several views.

The speed of a typewriter is largely limited by the speed limitations of its escapement mechanism. Theoretically, the carriage should begin to move in its step by step feed across the machine just after the type has impinged upon the platen. In most forms of escapements which employ the "ordinary" feed it has been found necessary or desirable, owing to lost motion, springing of parts, etc., to so set the parts

that the actual let-off does not take place until the type has been brought back about half way toward its normal position of rest, and the holding dog, or dog not normally in engagement with the wheel, is obliged to slip through the teeth of the wheel, or rack, as the case may be, much farther than is necessary, causing wear upon the parts.

It is one of my purposes to provide such a mechanism as will admit of no farther motion of the dogs through the escapement wheel, or rack, than is necessary. By reason of the mechanism hereinafter described, no matter whether the finger key be jammed down to its limit, or gently depressed, the holding dog will be freed immediately when the type starts upon its return toward the type basket. By reason of this structure it does not matter whether or not all of the type bar levers cause an equal movement of the dog carrier mechanism, as will be hereinafter explained.

I have shown my invention applied to the well known Smith Premier typewriter, but the same may be applied to any form of standard typewriting machine by merely varying the details to meet the mechanical conditions without departing from the mechanical principles herein set forth.

I have shown only so much of a Smith Premier typewriter as is essential to an understanding of my invention. 19 designates a part of the top plate of the machine across which the usual paper carriage (not shown) is adapted to move in a right and left-hand direction. Said paper carriage has a feed rack which is geared to a shaft, on the rear end of which is mounted an escapement wheel or rack 18. The carriage is drawn from right to left across the machine by a spring in a manner that is well known in the art. The machine also comprises a series of printing keys and a gate or universal bar which is operated by any of said keys and also by a space key, and said universal bar is arranged to rock a vertical shaft 9 which constitutes a dog carrier or actuator and the upper end of which is shown in Figs. 3 and 5. The construction of these parts is so well known that I have not thought it necessary to illustrate them except those parts which are immediately associated with the escapement.

I have connected the feed dogs with the carrier 9 in such a way that they move with

said carrier during the first part of its stroke in either direction, but said carrier may be moved farther than the dogs. In the present instance, the dogs have a frictional connection with the carrier. The upper end of the shaft 9 is formed with a taper, as shown in Fig. 5, and on this taper there is mounted a spool or thimble 8 having a broad flat top or flange arranged above the top plate. The thimble 8 is forced to turn with the shaft 9 by reason of its taper fit on said shaft. A sleeve 4 having an annular flange at its lower end, rests on the upper surface of the thimble 8 and a cap 6 rests on the top of said sleeve 4, a long screw 7 passing through the cap 6 and sleeve 4 and threaded into the shaft 9, clamps these parts to the shaft and the thimble 8 so that all of said parts turn together. My escapement comprises two feed dogs, *i. e.* a stepping dog 1 and a holding dog 2, the latter of which lies on the flat upper surface of the thimble 8 and is pivoted to turn in a horizontal plane about the flanged lower part of the sleeve 4. A friction sleeve or member 3 surrounds said sleeve 4 and is loosely mounted thereon and said sleeve 3 bears at its lower end on the upper surface of the dog 2 and presses the same axially. The sleeve 3 is pressed downward against dog 2 by a spring 5 coiled about said sleeve and compressed between the cap 6 which surrounds the spring and the flange on the lower part of the sleeve 3. Since the dog 2 is thus held by spring pressure against the upper flat surface of the thimble 8, said dog is frictionally connected with said thimble and through it with the shaft 9 so that when said shaft 9 is rocked by the operation of the keys the dog 2 tends to rock with it; but if said dog be positively held against movement the thimble 8 can turn under the dog, leaving said dog stationary.

The stepping dog 1 at its pivotal end lies on the upper surface of the dog 2 and is loosely pivoted on the lower part of the sleeve 3. The annular flange on the sleeve 3 against which the spring 5 bears overlies the dog 1 and prevents it from being lifted out of place. The spring 5, however, does not exert any pressure through this flange on the dog 1 so that as above stated said dog 1 is mounted loosely so that it can turn freely about its pivot. The cap 6 is extended downward as shown in Fig. 5 so as to cover up the spring 5.

The dogs 1 and 2 are situated at one side of the escapement wheel 18 and about on a level with the axis of the shaft of said wheel, and said dogs extend from the shaft 9 toward the wheel 18 and engage the teeth of said wheel, the dog 1 being normally in engagement. The dog 1 at its operative end is bent downward nearly into the plane of the dog 2 but not quite into the plane of said

dog 2 so that there is a slight "drop" from one dog to the other as indicated in Figs. 6 and 7. The two dogs are connected by a contractile spring 13 secured at its ends to pins 14 and 15 projecting from the dogs 2 and 1 respectively, the spring tending to draw the two dogs together. The relative motion of the dogs toward each other under the impulse of said spring is limited by a stop lug 17 (Fig. 1) projecting from the dog 2 in position to be struck by the dog 1 and said stop lug is of such length that the free ends of the dogs are normally held by the spring 13 spaced apart a distance a little less than the thickness of the escapement wheel 18.

The dog 2 is formed with an elongation that forms a stop projection 2' (Fig. 1) which, when a key is depressed strikes the rear face of the wheel 18 at the untoothed portion thereof and arrests the dog 2 when said dog has moved to a slight extent into engagement with the escapement wheel. Motion of the dog 2 in the opposite direction is limited by an arm 16 (Fig. 1) which projects from said dog and engages a stop 12 consisting of an ear bent up from a plate 10 of sheet metal adjustably secured to the stationary framework of the machine by means of screws which pass through slots in said plate.

The operation is as follows:—The parts are normally in the position shown in Figs. 1 and 2 with the arm 16 in contact with the stop 12 and the dog 1 slightly in engagement with a tooth of the escapement wheel. When a key is depressed the shaft 9 is rocked in the direction of the arrow in Fig. 1, the dog 2 being carried with the shaft by the frictional connection which has been described and the dog 1 being carried with the shaft through the lug 17. The dog 2 rocks with the shaft until it is arrested by the stop projection 2' engaging the wheel after which the shaft moves on as far as its connection with the key is adapted to move it. The shaft 9 may rock to some such extent as I have indicated by the line C—D in Figs. 1 and 4, which line is drawn through the slot in the head of the screw 7. It will be seen that in normal position the line C—D is coincident with the forward edge of the dog 2 but in the operated position shown in Fig. 4 said line has moved farther than said dog 2, this motion of course being rendered possible by the frictional connection between the dog and shaft. If a key is pressed down hard the shaft 9 will rock through a greater distance than if the key were struck more gently and some of the keys may move the universal bar farther than others and consequently rock the shaft 9 farther than other keys, but such difference in the extent of motion imparted to the shaft 9 makes no difference in the operation of the escapement

because the instant the shaft begins its return motion the dog 2 is carried with it through the frictional connections of said dog and immediately returns to the position shown in Fig. 1 where it is arrested by the arm 16 and stop 12, the shaft moving on to its normal position independently of the dog. In some of the claims, the motion of the dogs and their carrier which takes place on the down stroke of a key, has been referred to as the forward stroke of the parts, as distinguished from the return stroke.

As was said above, there is a slight drop between the stepping dog 1 and the holding dog 2 so that when a tooth of the wheel 18 rests on the holding dog 2, as indicated in Fig. 6 and the dog carrier begins its return motion, the dog 1 strikes against the side of the engaged tooth of the escapement wheel and is arrested by said tooth as shown in Fig. 7, so that the dog 2 moves on ahead of the dog 1 until it passes out from in front of the tooth. The wheel is then free to turn, the previously engaged rack tooth moves downward and the dog 1 instantly snaps in behind it, being drawn toward the back of the machine by its spring 13 into position to arrest the next succeeding tooth of the escapement wheel. The stop projection 2' is arranged to allow the tooth 2 to move into engagement with the escapement wheel only far enough to insure the holding of said wheel and only a very slight motion of said dog is necessary therefore to release the escapement wheel. Furthermore, the return motion of the dog begins instantly as soon as the key is released and the universal bar begins its return motion. It will be seen that this escapement affords a let-off of the carriage very early in the return stroke of the type bar and that the let-off is uniform under all conditions; that is to say, without reference to any fine adjustment between each individual key and the universal bar and without reference to whether the blow on the key is a light one or a hard one.

In Fig. 6 I have shown a modification of the invention in which the stop projection 2' has been omitted and other means provided for arresting the holding dog on the downstroke of the key. The means shown in said figure for this purpose consists of a second stop lug 11 projecting upward from the plate 10 so that the arm 16 has a limited motion between the two stops 11 and 12.

Various other changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine and in carriage feed mechanism, the combination with an escapement rack, of a dog carrier, a feed dog mounted on and frictionally connected with said dog carrier, the frictional connection

operating to move the dog on its return stroke, a second dog loosely connected with said carrier, and a spring connecting said dogs.

2. In a typewriting machine and in carriage feed mechanism, the combination with an escapement rack, of two feed dogs for co-operation with said rack, a spring connecting one of said dogs with the other, and actuating means having frictional connection with one of said dogs adapted to move said dog on its return stroke.

3. In a typewriting machine and in carriage feed mechanism, the combination with an escapement rack, of a feed dog, an actuator having frictional connection with said dog adapted to move said dog on its return stroke, means for limiting the motion of said dog in both directions, a second dog loosely mounted and having its arresting face a little in advance of that of the frictionally mounted dog to provide a drop, and a spring for moving said loosely mounted dog toward its position of engagement with said rack.

4. In a typewriting machine and in carriage feed mechanism, the combination with an escapement rack, of an oscillatory dog carrier, a feed dog pivoted on said dog carrier, a spring pressing said feed dog axially into frictional contact with said dog carrier, means for limiting the motion of said dog, and a second dog cooperating with said rack.

5. In a typewriting machine and in carriage feed mechanism, the combination of a dog rocker, a holding dog, means whereby said holding dog is moved with said dog rocker during the first part of the forward stroke of said dog rocker and during the first part of the return stroke of the dog rocker, means for arresting said dog before the dog rocker has completed its stroke in each direction, a stepping dog, means whereby said stepping dog is positively moved by said holding dog on its forward stroke, a spring for returning said stepping dog, and a feed rack cooperating with said dogs.

6. In a typewriting machine and in carriage feed mechanism, the combination of a dog rocker, a holding dog, means whereby said holding dog is moved with said dog rocker during the first part of the forward stroke and also during the first part of the return stroke of said dog rocker, means for arresting said holding dog before said dog rocker completes its stroke in either direction, a stepping dog, means whereby said holding dog positively moves said stepping dog on its forward stroke, a spring for returning said holding dog, and a feed rack cooperating with said dogs and arranged temporarily to arrest said stepping dog in its return stroke.

7. In a typewriting machine and in carriage feed mechanism, the combination of

an escapement wheel, a vertical rock shaft, two dogs mounted on the upper end of said shaft, means for moving one of said dogs with said shaft during the first part of the motion of said shaft in each direction, means for arresting said dog before said shaft has completed its motion in either direction, means for positively moving the other of said dogs in one direction, and a spring for moving it in the opposite direction.

8. In a typewriting machine and in carriage feeding mechanism, the combination of an oscillatory dog carrier, a stepping dog and a holding dog mounted on said dog carrier and capable of motion with and independently of said dog carrier and of each other, means for moving said holding dog with the dog carrier during the first part of the stroke of said dog carrier in each direction, means for arresting said holding dog before the dog carrier completes its stroke in either direction, means for arresting said stepping dog to let a tooth of the rack pass it, and means for moving said stepping dog into the path of the next succeeding tooth.

9. In a typewriting machine, the combination of an escapement wheel 18, and an oscillating dog carrier 8, the dogs 1 and 2, the spring 13, the clamping bushing 4, the friction collar 3, the friction spring 5, the tension spring barrel 6, the clamping screw 7, and the adjusting stop plate 10 having the ear 12.

10. In a typewriting machine, the combination of an oscillating dog carrier, a pair of escapement dogs concentrically and pivotally mounted upon said carrier, a friction means between one of said dogs and said carrier, comprising a friction collar, a pressure spring, a spring for holding said dogs in normal relation to each other, and means for limiting the oscillation of said dogs, consisting of a fixed stop and an adjustable stop adapted to alternately abut said dog under said frictional contact with said carrier, for the purpose specified.

11. In a typewriting machine, the combination of an oscillating dog carrier, a pair of escapement dogs concentrically and pivotally mounted upon said carrier, a friction means between one of said dogs and said carrier, comprising a friction collar, a pressure spring, a spring for holding said dogs in normal relation to each other, and means for limiting the oscillation of said dogs, consisting of suitable stops adapted to alternately abut said dog under said frictional contact with said carrier.

12. In a typewriting machine, the combination of an oscillating dog carrier, a pair of escapement dogs concentrically and pivotally mounted upon said carrier, one of said dogs having a projecting ear, a friction means between said dog with said projecting

ear and said dog carrier comprising a friction collar, a pressure spring, a spring for holding said dogs in normal relation to each other, and a pair of stops adapted to be alternately engaged by said dog with said projecting ear and limit the movement thereof for the purpose specified.

13. In a typewriting machine, the combination of an oscillating dog carrier, escapement dogs concentrically and pivotally mounted upon said carrier, friction means between one of said dogs and said carrier comprising a friction collar and a pressure spring; a spring for holding said dogs in normal relation to each other, and a pair of stops adapted to alternately engage said dog under frictional contact with said carrier and limit the movement thereof.

14. In a typewriting machine, the combination of an oscillating dog carrier, escapement dogs concentrically and pivotally mounted upon said carrier, a friction means between one of said dogs and said carrier, a spring for holding said dogs in normal relation to each other, and a pair of stops adapted to alternately engage said dog under frictional contact with said carrier and limit the movement thereof.

15. In a typewriting machine, the combination of an oscillating dog carrier, escapement dogs concentrically and pivotally mounted upon said carrier, friction means between one of said dogs and said carrier, a spring for holding said dogs in normal relation to each other, and means for limiting the oscillation of said dogs independently of the oscillation of said carrier.

16. In a typewriting machine, the combination of an oscillating dog carrier, escapement dogs mounted upon said carrier, a friction means between one of said dogs and said carrier for moving said dog with said carrier but allowing motion of said carrier independent of said dog, a spring for holding said dogs in normal relation to each other, and means for limiting the oscillation of said dogs.

17. In a typewriting machine, the combination of an oscillating dog carrier and a toothed escapement member having a movement synchronous to that of the typewriter carriage, escapement dogs adapted to cooperate with said toothed escapement member, the cooperating point of one of said dogs being in a slightly different plane from the corresponding cooperative point of the other dog, means tending to hold said dogs in normal relation to each other, a friction means between one of said dogs and said carrier for moving said dog with said carrier but allowing motion of said carrier independent of said dog, and means for limiting the oscillation of said dogs without limiting the oscillation of said carrier.

18. In a typewriting machine, the combination of an oscillating dog carrier, dogs movably mounted upon said carrier, one of said dogs being adapted to move freely upon the said carrier, a friction means between the other of said dogs and said carrier for moving said dog with said carrier but allowing motion of said carrier independent of said dog, spring means for holding said dogs in normal relation to each other, and stops for limiting the oscillation of said dogs without limiting the oscillation of said carrier.

19. In a typewriting machine, the combination of an oscillating dog carrier, escapement dogs movably mounted upon said carrier, one of said dogs being adapted to move freely upon said carrier, means tending to move the other of said dogs with said carrier, means for holding said dogs in normal relation to each other, and means for arresting both of said dogs together without limiting the oscillation of said carrier.

20. In a typewriting machine, the combination of a toothed escapement member, a dog carrier, dogs movably mounted upon said carrier and adapted to cooperate with said toothed escapement member, one of said dogs being adapted to move freely upon said carrier, and a friction means between the other of said dogs and said carrier for moving said dog with said carrier but allowing motion of said carrier independent of said dog, means for holding said dogs in normal relation to each other, and means for changing the position of said dogs relative to said carrier without disturbing the cooperative relation between said dogs and said toothed escapement member.

21. In a typewriting machine, the combination of a toothed escapement member, a dog carrier, dogs movably mounted upon said carrier and adapted to cooperate with said toothed escapement member, one of said dogs being adapted to move freely upon said carrier, means for holding said dogs in normal relation to each other, and means for changing the position of both of said dogs together relative to said carrier without disturbing the cooperative relations between

said dogs and said toothed escapement member.

22. In a typewriting machine, the combination of a toothed escapement member, a dog carrier, dogs movably mounted upon said carrier and adapted to cooperate with said toothed escapement member, means for holding said dogs in normal relation to each other, means for changing the relation of both of said dogs together relative to said carrier during the down stroke of a key, and means for changing the position of said dogs relative to said carrier and relative to each other during the up stroke of a key.

23. In a typewriting machine, an escapement comprising two escapement members movable toward and away from each other in a direction transverse to the travel of the carriage, actuating means for moving said escapement members, and means for frictionally connecting one of said escapement members with said actuating members, said frictional connecting means operating to move the escapement members with said actuating member.

24. In a typewriting machine, the combination of a feed rack, a dog rocker, a pair of feed dogs pivoted on said dog rocker, the movement of one of said dogs on its pivot in one direction being limited by the other dog, and friction means between said other dog and the dog rocker.

25. In a typewriting machine, the combination of a feed rack, a dog rocker, a pair of feed dogs pivoted on said dog rocker, the movement of one of said dogs on its pivot in one direction being limited by the other dog, friction means between said other dog and the dog rocker, and means for positively limiting the movement of said last mentioned dog in opposite directions.

Signed at Syracuse, in the county of Onondaga and State of New York this 4th day of April A. D. 1908.

JOHN H. BARR.

Witnesses:

E. E. CORY,
E. M. STORMS.