

1,033,481.

C. H. SHEPARD.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 27, 1911.

Patented July 23, 1912.
3 SHEETS—SHEET 1.

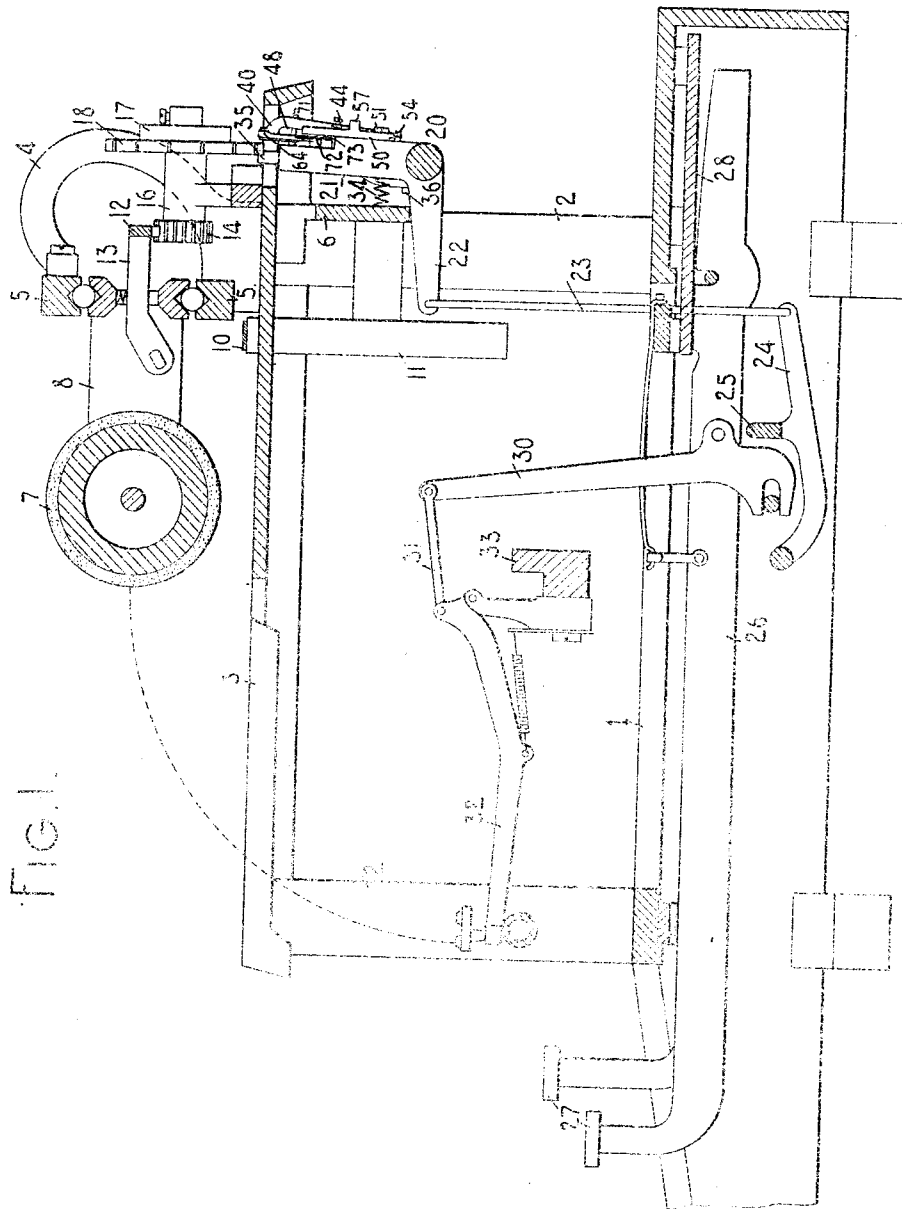


FIG. 1.

WITNESSES:

E. M. Mills

R. H. H. H. H.

INVENTOR:

Charles H. Shepard

By Jacob Feller

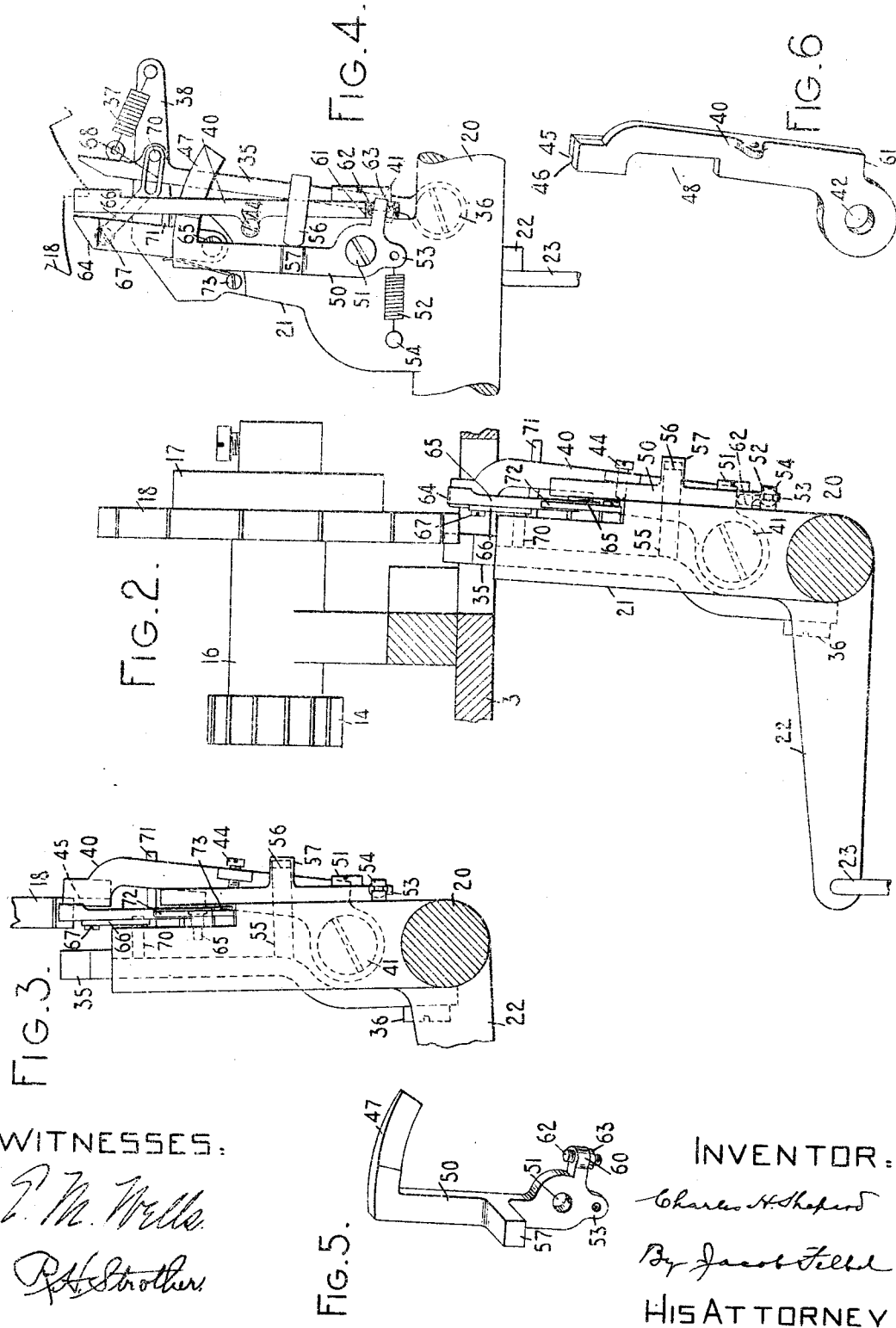
HIS ATTORNEY

1,033,481.

C. H. SHEPARD.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 27, 1911.

Patented July 23, 1912.

3 SHEETS-SHEET 2.



WITNESSES:

J. M. Wells
R. H. Strother

FIG. 5.

INVENTOR:

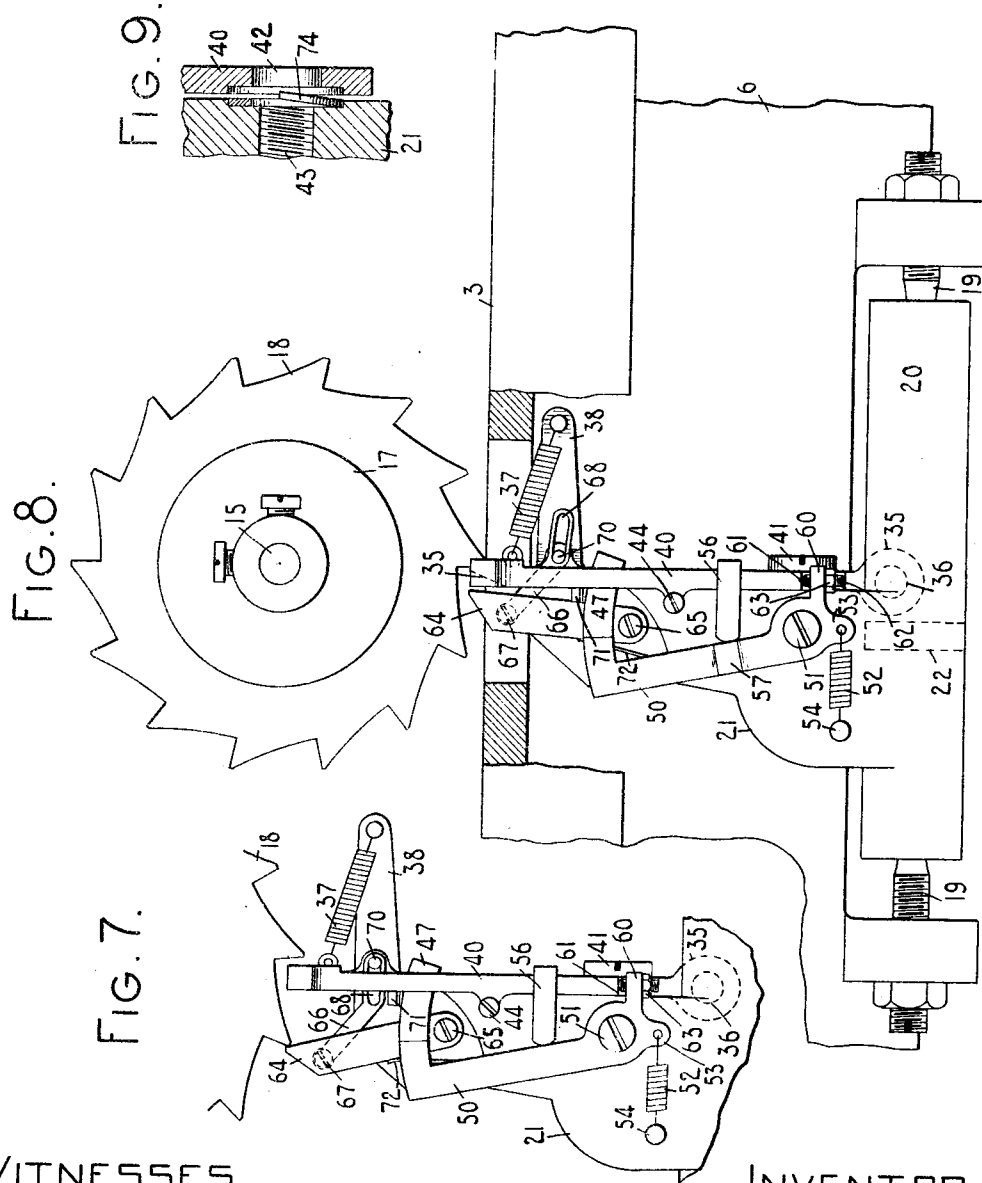
Charles H. Shepard
By *Jacob Felch*
HIS ATTORNEY

1,033,481.

C. H. SHEPARD.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 27, 1911.

Patented July 23, 1912.

3 SHEETS-SHEET 3.



WITNESSES:

J. M. Wells.

R. H. H. H. H.

INVENTOR.

Charles H. Shepard

By Jacob F. F.

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION
OF NEW JERSEY.

TYPE-WRITING MACHINE.

1,033,481.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed June 27, 1911. Serial No. 635,537.

To all whom it may concern:

Be it known that I, CHARLES H. SHEPARD, 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 typewriting machines and more particularly to the carriage escapement mechanism of such machines.

My invention is in the nature of an improvement on that shown in my prior Patent No. 953,440, dated March 29th, 1910.

The principal object of the present invention is to render certain parts of the escapement more positive in their action so that there is less liability of any failure of the parts to act and to act as quickly as is required in mechanism of this character.

To the above and other ends which will appear hereinafter, 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.

My present invention is capable of considerable modification.

One embodiment of said invention is illustrated in the accompanying drawings in which—

Figure 1 is a front-to-rear vertical sectional view of so much of a typewriting machine as is necessary to illustrate the embodiment of my invention therein. Fig. 2 is a side elevation of the escapement mechanism in normal position and with parts in section. Fig. 3 is a similar view but with the parts in the positions they occupy when the key is deeply depressed. Fig. 4 is a rear elevation of Fig. 3 and with the parts in the same position as in Fig. 3. Fig. 5 is an isometric view of the automatically adjusting wedge. Fig. 6 is an isometric view of the holding dog. Fig. 7 is a rear elevation of the principal parts of the escapement, showing their positions when the escapement wheel is momentarily arrested by the safety dog. Fig. 8 is a rear elevation of the escapement mechanism in normal position. Fig. 9 is a fragmentary sectional view of a detail. Fig. 1 is on a reduced scale, Figs. 2-8 are on an enlarged scale and Fig. 9 is on a still larger scale.

My invention is applicable or readily adaptable to typewriting machines generally. It is here shown applied to a Monarch typewriter. The stationary frame work of this machine comprises a base 1, corner posts 2, top plate 3, standards 4, carriage rails 5 supported by said standards, and a bracket 6 depending from the top plate. A platen 7 is mounted in a paper carriage 8 supported by the rails 5 in the usual manner. Said carriage is fed toward the left by a strap 10 running over a spring drum 11 supported by the bracket 6 and the feed of said carriage is controlled by means which include a feed rack 12 mounted on arms 13 which are pivotally mounted in the carriage 8, said rack engaging a feed pinion 14 rigid with a shaft 15 which is journaled in a bracket 16 secured to the top plate 3. At its rear end the shaft 15 has mounted thereon the usual housing 17 that contains pawl and ratchet connection with the escapement wheel 18, which escapement wheel is loosely mounted on the shaft. Pivoted at 19 to the bracket 6, is a dog rocker 20 which has an upstanding arm 21 and a horizontal arm 22, the latter connected by means of a link 23 with an arm 24 forming part of the frame of the universal bar 25 which is pivoted in the base 1 of the machine. Said universal bar lies beneath a series of printing key levers 26 having printing keys 27 on their forward ends and fulcrumed at their rear ends on a fulcrum plate 28. The key levers operate sub-levers 30 which are connected by links 31 with type bars 32 mounted on a segment 33. Except that the vertical arm 21 of the dog rocker has been somewhat modified, the parts thus far referred to are here shown as of substantially the ordinary Monarch construction; and as far as my invention is concerned they may be of any suitable construction. Said dog rocker is provided with the usual returning spring 34 and motion under the impulse of said spring is limited by the arm 22 striking against the lower edge of the bracket 6. The universal bar and the escapement are also operated by the usual space key, not shown.

As shown in Figs. 2 and 8, the escapement wheel 18 is normally engaged by a stepping dog 35 which is pivoted to the dog rocker on a pivot screw 36 for a limited motion transversely of the machine. When in normal position, the said dog is pressed toward

the right, or toward the left as viewed in Fig. 8, by the tooth of the escapement wheel against an arresting portion of the arm 21 of the dog rocker. When a key is depressed and the said arm is drawn toward the front of the machine to the position shown in Fig. 3, said stepping dog is drawn toward the left to the position shown in Fig. 4, by a spring 37 which is connected at one end to the stepping dog and at the other end to an arm 38 projecting leftward from the dog rocker arm 21. The motion of the stepping dog under the impulse of the spring 37 is limited by means that will be described hereinafter.

The holding dog 40 is pivoted to the dog rocker on a pivot screw 41 that passes through a hole 42, Fig. 9, in said dog and is threaded into a hole 43 in the arm 21. The pivot screw 41 extends horizontally and transversely of the machine, allowing the upper end of the dog 40 to move about said pivot toward the front or back of the machine relatively to the dog rocker. The motion of this dog toward the arm 21, is limited by an adjustable stop screw 44 threaded through the dog and adapted to strike the rear face of said arm. The rearward motion of said dog is limited by means that will be understood from the description of other parts of the escapement. As shown in Fig. 6, the upper end of the dog 40 is formed with a notch having a wall 45 that faces toward the front of the machine and a wall 46 that faces toward the right. When the dog rocker arm 21 is moved toward the front of the machine by the depression of a key, the tooth of the escapement wheel that was held by the stepping dog 35, enters the notch 45-46. Motion of the escapement wheel is then prevented by the wall 46 of said notch and further forward motion of the upper end of the dog 40, is prevented by the wall 45 of said notch engaging the rear surface of the tooth of the escapement wheel. Any further depression of the key therefore causes the arm 21 to move forward independently of the dog 40. The dog 35, however, moves on with the dog rocker and the result of the further depression of the key is therefore to widen the gap between the two dogs 35 and 40. In the normal position of the parts shown in Fig. 2 this gap is of less width than the thickness of the escapement wheel but upon a deep depression of a key the gap may acquire a width greater than the thickness of the escapement wheel.

Means are provided for causing the dog 40 to move out of the escapement wheel in the very first part of the upstroke of the key regardless of the extent of the down stroke. Said means consists in means for taking up the lost motion between the dog rocker and the dog 40 due to the arrest of said dog 40

before the completion of the forward stroke of the dog rocker. Said means, as shown in the present instance, consists of a wedge 47 that is adapted to enter a cut-out 48, Fig. 6, in the forward edge of the dog 40, the construction being such that said wedge can thus pass between said dog and the rear face of the arm 21 and fill up the space between these two parts whether that space be comparatively much or comparatively little depending on the extent of operation imparted to the dog rocker.

The mounting of the wedge 47 is best shown in Fig. 5 where it will be seen that said wedge consists of a tapering curved arm projecting from a lever 50 which at 51, Figs. 2, 4 and 5, is pivoted to the rear face of the arm 21. In the normal position of the parts shown in Fig. 8, the thin part of the wedge is in front of the dog 40; but when said dog is held away from the arm 21 by the depression of a key, the wedge is drawn farther in into engagement with the dog as shown in Fig. 4 by means of a spring 52 connected at one end to an arm 53 of the lever 50 and at the other end to a pin 54 projecting from the dog rocker. As in my prior patent above referred to, the extent to which the wedge is drawn in depends upon the extent of separation of the two dogs 35 and 40, which, in turn depends upon the extent of key depression or rather upon the extent to which the dog rocker is operated. Said dog rocker may be moved farther by one key than by another owing to some difference in the proportions of the parts, and it will be operated further by a long depression of a key than it will by a short, quick stroke. Whatever the degree of separation between the two dogs, said degree of separation will be maintained by the wedge so that the rear dog 40 moves out of the wheel immediately in the first part of the upstroke of the key.

When the dog rocker has moved back so far toward normal position that the escapement wheel again engages the dog 35, said dog is moved back by said wheel from the position shown in Fig. 4 to that shown in Fig. 1 and this motion of the stepping dog withdraws the wedge from in front of the dog 40. To this end the dog 35 has projecting therefrom an arm 55 having an offset part 56 which engages an arm 57 projecting from the lever arm 50. The offset 56 engaging said arm 57, forces the wedge back to its normal position as will be understood.

Means are provided whereby the restoration of the wedge to normal position positively forces the dog 40 back to its normal forward position. Said means may be constructed in a variety of forms. As here shown the lever 50 has an arm 60 projecting therefrom beneath a shoulder 61, Fig. 130

6, of the dog 40, and said arm 60 preferably has an adjusting screw 62 threaded therethrough and secured in its adjusted position by a lock-nut 63, the upper end of the screw 62 directly engaging the shoulder 61. When the lever 50 is forced toward the left in Fig. 8 the screw 61 moves upward and forces the dog 40 back to its normal position.

I contemplate adjusting the connections from the dog rocker to the universal bar so that ordinarily the space between the dog 40 and the dog 35 will not exceed the width or thickness of the escapement wheel. In case of any inaccuracy of adjustment, however, and also in case a key is pushed down hard, this space may exceed the thickness of the wheel. To insure the proper operation of the escapement under these conditions I have provided a safety dog 64 which is pivoted at 65 to the rear face of the arm 21 and between said arm and the wedge 47, the arm 21 being suitably cut out for the purpose, as shown in Fig. 2.

A link 66 is pivoted to the dog 64 at 67 near the upper end of said dog. Said link is formed at its other end with a slot 68 in which plays a pin 70 projecting from the side of the dog 35. The motion of the safety dog 64 toward the left is limited by a pin 71 projecting from the arm 21, said pin also serving as an abutment or guide for the upper end of the dog 40. The dog 64 is pressed toward the left by a spring 72 secured to the arm 21 by a screw 73. The slot 68 is of such length as to permit of the ordinary vibration of the dog 35 without disturbing the dog 64. It is the end of this slot that limits the motion of said dog 35 under the impulse of its spring 37 so that when the escapement wheel is held by the dog 40, as shown in Fig. 4, the pin 70 is in the end of the slot. If now the space between the two dogs exceeds the thickness of the escapement wheel, then upon the upstroke of the key the tooth of said wheel will escape from the dog 40 and will strike the dog 64, moving said dog 64 to the position shown in Fig. 7 where the wheel will be temporarily arrested. Said dog 64, acting through the link 66, pulls the dog 35 up to its normal position as shown in Fig. 7, and said dog 35 forces the wedge back to its normal position and the lever 50 of which said wedge forms a part, forces the dog 40 back to normal position. When the dog rocker completes its stroke to normal position, the tooth of the escapement wheel escapes from the dog 64 and the next succeeding tooth is caught by the dog 35, the dog 64 being restored to normal position by the spring 72. The positive connection between the dog 40 and the lever 50 not only results in a positive restoration of the dog 40 to normal position but the motion of said

dog 40 away from normal position also positively forces the wedge into its engaging position, at least to a certain extent and to a sufficient extent to start the wedge on its engaging motion. Preferably, when the wedge is in deep engagement with the dog 40 as shown in Fig. 4, there is a slight lost motion between the screw 62 and the shoulder 61.

I prefer to put a slight frictional restraint on the dog 40. This is accomplished by means shown in Fig. 9 where it will be seen that the contiguous faces of said dog and of the arm 21 are formed with registering annular cut-outs surrounding the holes 42 and 43, and in said cut-outs is placed a split washer 74 which is sprung into a spiral form so that it is compressed by the screw 41 and presses the dog into frictional engagement with the broad flat head of the screw.

The connection between the safety dog and stepping dog insures positively that the stepping dog gets in the path of the right tooth of the wheel. In my prior patent the safety dog was fixed and in order to insure proper engagement of the stepping dog this safety dog had to be set so as to allow only about a half drop to the wheel. By pivoting the safety dog in the present case and causing said safety dog when operated to pull the stepping dog up to its normal position, I am enabled to allow to the escapement wheel nearly its full stepping motion before it is arrested by the safety dog and at the same time to insure that the stepping dog engages the right tooth. The positive connections between the wedge and the holding dog 40 greatly increase the certainty of operation of the device.

It will be perceived that it is the power employed to move the carriage that restores the wedge and the dog 40 to normal positions.

Various changes can 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. The combination with an escapement rack, of a stepping dog, and a holding dog, one movable toward and from the other in a direction transverse to said rack, and a safety dog adapted to arrest said rack if it escapes from both of the first mentioned dogs, said safety dog being movable and operatively connected with the stepping dog.

2. The combination with an escapement rack, a stepping dog and a holding dog, one movable front and toward the other in a direction transverse to said rack, a movably mounted safety dog adapted to arrest said rack if it escapes from both of the first mentioned dogs, and a lost motion connec-

tion between said stepping dog and said safety dog adapted to allow to said stepping dog its ordinary stepping motion independently of the safety dog but to move said stepping dog to normal position when the safety dog is operated.

3. The combination with an escapement rack, of a dog rocker arranged to vibrate transversely of said rack, a stepping dog mounted on said dog rocker for vibration to and fro in the direction of motion of said rack, a holding dog mounted on said dog rocker for motion relative to the dog rocker in a direction transverse to said rack, means for arresting said holding dog when it has moved a short distance into engagement with the rack, a wedge for taking up the lost motion between the holding dog and the dog rocker due to further motion of said dog rocker after the holding dog has been arrested, a positive operative connection between said wedge and said holding dog for restoring the holding dog to normal position, and means for restoring said wedge to normal position.

4. The combination with an escapement rack, of a holding dog, a dog rocker, means for arresting said holding dog during the forward stroke of the dog rocker, a wedge for taking up the lost motion between the holding dog and the dog rocker, means for restoring said wedge to normal position, and means whereby said wedge restores said holding dog to normal position.

5. The combination with an escapement rack, of a stepping dog arranged to step back when freed from the rack to engage a new tooth and to be restored by the rack to normal position, a holding dog arranged to be arrested when it has moved a short distance into engagement with the rack, a wedge for taking up the lost motion between the stepping dog and the holding dog, means whereby said stepping dog when moved to normal position withdraws said wedge, and means whereby said wedge restores said holding dog to normal position.

6. The combination with an escapement rack, of a stepping dog, a holding dog arranged to be arrested when it is moved a short distance into engagement with the rack, means for taking up the lost motion due to the arrest of the holding dog, and means operated by the stepping of the rack for positively restoring said holding dog to normal position.

7. The combination with an escapement rack, of a dog rocker having a normally engaged dog and a holding dog, said holding dog arranged to be arrested during the forward stroke of said dog rocker, a wedge pivoted to said dog rocker for taking up the lost motion due to the arrest of the holding dog, and a lever arm integral with said

wedge and having an adjustable connection with said holding dog, and means for restoring said wedge to normal position.

8. The combination with an escapement rack, of a stepping dog having a stepping motion parallel with the plane of said rack and restored to normal position by the stepping of said rack, a holding dog arranged to be arrested when it has moved a short distance into engagement with said rack, and positive operating connections between said stepping dog and said holding dog.

9. The combination with an escapement rack, of a stepping dog normally engaged with said rack, a second dog mounted to move into the path of said rack when said stepping dog is moved out of engagement, said second dog being mounted for limited movement with and by said rack, and a loose connection between said dogs arranged to allow said stepping dog to move back into position to engage an on-coming tooth of the rack without moving the second dog but to draw said stepping dog to its normal position when the second dog is moved by the rack.

10. The combination with an escapement rack, of a dog rocker, a stepping dog movably mounted on said dog rocker and normally engaged by said rack, a spring for moving said stepping dog when said dog is out of the rack back into position to engage an on-coming tooth of said rack, a second dog movably mounted on said dog rocker in position to engage the rack when the stepping dog is withdrawn, and a loose connection between said dogs for drawing said stepping dog back to its normal relation to the dog rocker when said second dog is moved on the dog rocker by said rack, said connection being loose to allow the stepping dog to make its stepping motion independently of the second dog.

11. The combination with keys, a power driven carriage and an escapement rack, of a normally engaged dog, a holding dog, means for arresting the forward motion of said holding dog on the down stroke of a key before said normally engaged dog completes its forward stroke, means for causing said holding dog to begin its backward motion immediately on the beginning of the up-stroke of a key, and means operated by the power employed to move the carriage for positively restoring said holding dog to normal position with relation to said stepping dog.

12. The combination with keys, a power driven carriage and an escapement rack, of means for controlling the step-by-step feed of said rack comprising a dog rocker operated by said keys, a dog normally out of engagement with said rack but moved into engagement by the forward motion of said dog

rocker due to the down stroke of a key,
means for arresting said dog before the dog
rocker completes its forward stroke, and
means operated by the power employed to
5 move the carriage for restoring said dog to
its normal relation to said dog rocker.
Signed at the borough of Manhattan, city

of New York, in the county of New York,
and State of New York this 26th day of
June, A. D. 1911.

CHARLES H. SHEPARD.

Witnesses:

CHARLES E. SMITH,

M. F. HANNWEBER.

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