July 24, 1934. F. H. TREGO 1,967,273

PRINTING MECHANISM FOR TYPEWRITING MACHINES

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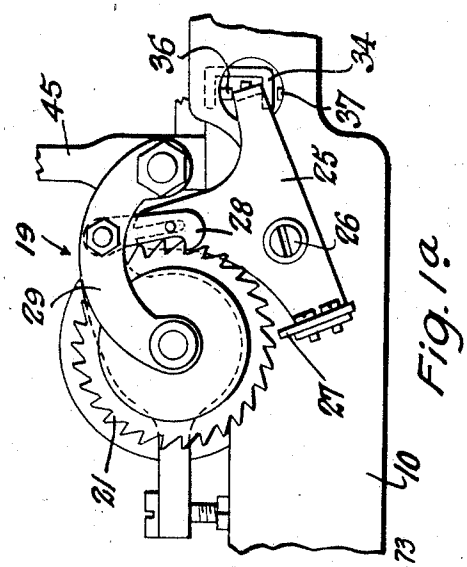


Fig. 1a.

Fig. 1.

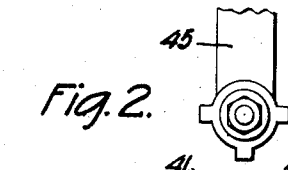
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Fig. 2.



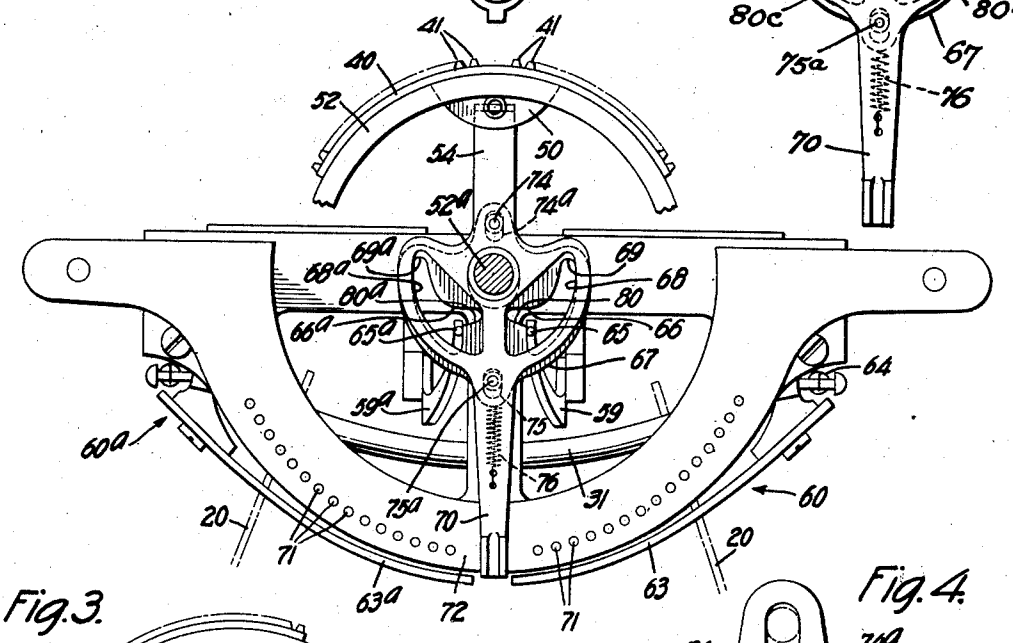


Fig. 7.

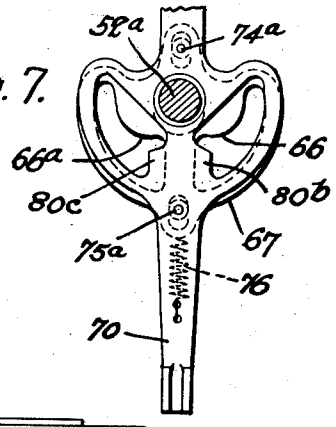


Fig. 3.

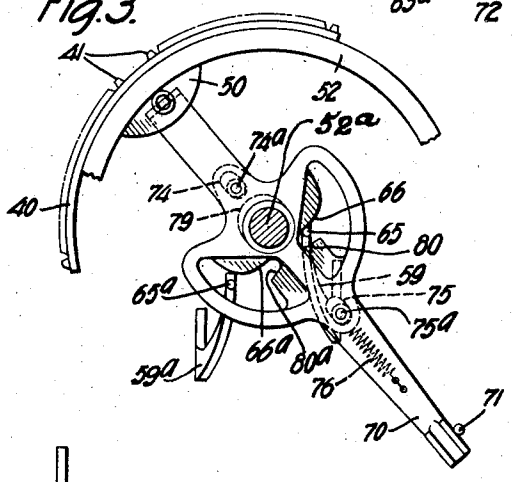
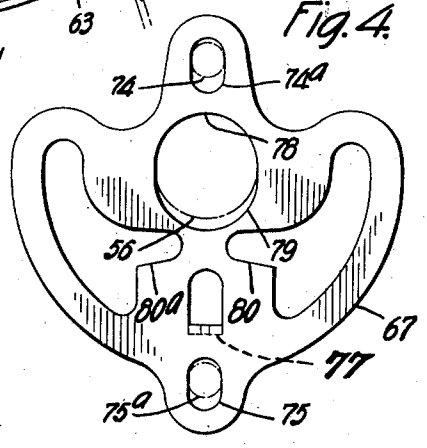


Fig. 4.



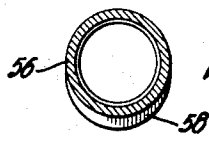


Fig. 6.

Fig. 5.

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PRINTING MECHANISM FOR TYPEWRITING MACHINES

Frank H. Trego, New York, N. Y., assignor, by mesne assignments, to Ralph C. Coxhead Corporation, New York, N. Y., a corporation of Delaware

Application December 9, 1929, Serial No. 412,651

20 Claims. (Cl. 197—49)

This invention relates to improvements in printing mechanism for typewriting machines and is in the nature of an improvement on my application, Serial No. 405,878 filed November 9, 1929.

An object of the present invention is to provide a resilient connection between the actuating lever, for the type carrier, and its operating means so that after said lever has been arrested to position the selected type at the printing point, a further movement of the active key-lever is facilitated, with a minimum of pressure on the key, to effect the actuation of the carriage escapement mechanism and the printing hammer.

In carrying out the invention there is provided on the actuating lever a resilient device engageable by the arms which extend from universal bars operable by the key levers, which device may yield to permit a further actuation of either universal bar by the active key-lever, after the actuating lever has been arrested, to thus effect the actuation of the carriage escapement and printing operation of the hammer.

Other features and advantages will hereinafter appear.

In the accompanying drawings.

Fig. 1 is a sectional side view of the machine showing the invention applied thereto;

Fig. 1ª is a fragmentary rear view illustrating the escapement mechanism;

Fig. 2 is a fragmentary top plan view showing the shuttle actuating mechanism and the arresting means therefor;

Fig. 3 is a detail top plan view showing the type carrier operated;

Fig. 4 is a detail top plan view of the slide forming part of the resilient means carried by the shuttle actuating lever;

Fig. 5 is a central section through the shuttle actuating lever;

Fig. 6 is a detail section taken on the line 6—6 of Fig. 5; and

Fig. 7 is a view illustrating a modified form of the invention.

Similar reference characters represent similar parts throughout the several views.

The invention is shown as applied to the Varityper writing machine which includes a main frame 10, having a track 11 upon which is arranged a carriage 12 to travel back and forth through the medium of anti-friction rollers or balls 13 co-operating with a bar 14 of said carriage. The carriage 12 may be guided at its upper end by means including a roller 15 and a guard 16 engaging a bar 17 on the carriage.

The carriage is urged in a letter space direction by means including a spring drum, not shown, connected to said carriage by a strap 18. The letter-space movements of the carriage are effected by escapement mechanism, indicated generally by the numeral 19, which is actuated at each operation of the key-levers 20.

The escapement mechanism 19 includes an escapement wheel 21 secured to a shaft 22 supported on the main frame 10. A rack 23 on the carriage 12 engages a pinion 24 connected to the escapement wheel 21 to rotate the latter upon each actuation of the dog rocker 25. The dog rocker is pivoted at 26 on the machine frame 10 and is effective to actuate a dog 27 thereon and a dog 28 supported on a pivoted frame 29, said dogs engaging alternately with the escapement wheel 21 in the usual manner to effect the feed of the carriage.

To actuate the escapement mechanism 19 and thus feed the carriage at each type stroke, the key-levers 20, when actuated about a fulcrum 30, engage a universal bar 31 of a frame 32 to swing the latter about a fulcrum 33. An arm 34 of the frame 32, when the latter is actuated, swings downwardly to actuate the dog rocker 25, through the medium of a set screw 32ª, engaging a tail 25ª of the dog rocker, to carry the dog 27 into engagement with the escapement wheel 21, the dog rocker being connected to the dog 28 in the usual way to swing it about its pivot 35 out of engagement with the escapement wheel.

Upon the return of the actuated key-lever 20 the escapement devices are returned to normal in the usual manner, thus effecting a letter space movement of the carriage, the motion of the dog rocker being limited in both directions by adjustable stops 36 and 37.

The printing instrumentalities include a type carrier or shuttle 40, operable in a manner hereinafter described, to select any desired type 41 to be printed on a work sheet 42 supported by feed rollers 43 and 44 of a carriage 12. A hammer 45, at the opposite face of the work sheet, co-operates with the types 41 to print on said work sheet through the usual ribbon, not shown. Said hammer may be swung about a pivot 46 by the action of a spring 47, but is normally held in its ineffective position by the frame 29 of the escapement mechanism, to which frame the hammer is connected by a stud 48.

The type shuttle 40 is supported through the medium of a fin-like member 50 thereon, extend-

ing through a slot 51 of an anvil 52 supported in the usual manner by means including a vertical shaft 52ª; said shaft being supported in a bar 53 and a plate 55 secured to the main frame 10.

To actuate the type shuttle 40 the fin 50 has connected thereto a lever 54 secured to a sleeve 56 to rotate about the shaft 52ª; the sleeve being supported on the bar 53 on which it is maintained by a screw 57 engaging a flange 58 at the lower end of the said sleeve.

The shuttle actuating lever 54 or actuator may be operated in opposite directions (Fig. 2) by arms 59 and 59ª, about the shaft 52ª; the arms being actuated, one at a time, in a manner hereinafter described to carry the selected type of the shuttle 40 to the printing point. Subsequently the hammer is actuated as above described to co-operate with the selected type to print on the interposed work sheet.

The arms 59 and 59ª which operate the shuttle actuating lever 54 form parts of universal bar frames or driving devices 60 and 60ª, each frame being supported to swing about a pivot 61 on a fixed bracket 62. The key levers are divided into two groups, one group at each side of the middle of the machine, and the frames or intermediate means 60 and 60ª include universal bars 63 and 63ª extending towards the middle of the machine one over each group of key-levers 20 (Figs. 1 and 2) so that if any one of the key-levers is operated the associated one of the frames 60 and 60ª is operated thereby against the action of a return spring 64. If the frame 60 is operated the upper end of the arm 59 is swung rearwardly in Fig. 1 and to actuate the lever 54 and shuttle 40 in a counterclockwise direction (Fig. 2). Similarly the arm 59ª may be actuated by any one of the key-levers associated with the frame 60ª to actuate the type shuttle in the opposite direction.

The arms 59 and 59ª are provided at their upper ends with pin-like extensions 65 and 65ª respectively, which engage shoulders 66 and 66ª, respectively, of a member or engageable device 67 resiliently supported on the lever 54 for a purpose hereinafter stated, to operate the shuttle actuating lever 54 in opposite directions. Clearance slots 68 and 68ª are provided in the lever 54 to prevent obstruction thereof by any of the pins 65 and 65ª while said lever is being actuated by the other pin. For the same reason the member 67 is provided with clearance slots 69 and 69ª.

To accurately position the selected type at the printing point the shuttle actuating lever 54 is provided with an arm 70 which may engage the upper end of any one of a plurality of stop pins 71 supported in an upper guide plate 72 and the lower guide plate 55. There is one stop rod 71 disposed above each key-lever 20 so that when one of the key-levers is depressed the corresponding stop rod is moved upwardly, against the action of a spring 73, to project its upper end into the path of the arm 70 so as to arrest said arm, to position the selected type at the printing point.

To facilitate a further actuation of the key-levers, after the shuttle actuating lever 54 has been arrested by one of the pins 71, so that the escapement 19 may be actuated with a minimum of effort, I provide the resilient member 67 which is in the form of a slide supported on headed studs 74ª and 75ª extending through slots 74 and 75 and secured to the lever 54. A spring 76 connected at one end to an ear 77 on the member 67 and at its other end to the lever 54, draws the slide member 67 forwardly on the lever 54; said member being arrested by the rear end 78 of a slot 79 engaging the sleeve 56.

For convenience in assembling the member 67 on the lever 54, after the sleeve 56 has been secured to said lever, the flange 58 of the sleeve 56 extends only partially around said sleeve, as in Fig. 6, and the slot 79 is slightly elongated to permit the member 67 to be slipped over the lower end of the sleeve. The studs 74ª and 75ª are then inserted through the holes 74 and 75 and riveted to the lever 54.

Thus it will be understood the shuttle operating lever 54 may be operated by either arm 59 or 59ª, the pins 65 and 65ª thereof engaging the shoulders 66 and 66ª of the element 67, and through the medium of the spring 73; said spring being strong enough to prevent any shifting movement of the member 67 relatively to the lever 54 while the type shuttle is being actuated. After the lever 54 is arrested, however, by engagement of its arm 70 with the operated stop pin 71, the member 67 may be moved against the action of the spring 76 by the operated arm 59 or 59ª, thus facilitating further movement of the active key lever to effect the operation of the printing hammer which, it will be remembered, is controlled by the escapement mechanism.

To return the shuttle operating lever 54 to normal the pins 65 and 65ª are adapted to engage shoulders 80 and 80ª, formed on the slide 67. It will be understood that, if desired, the shoulders 80 and 80ª may be substituted by shoulders 80ᵇ and 80ᶜ formed on the lever 70 as indicated in Fig. 7. It will also be understood that the shuttle operating lever 54 of my invention may readily be substituted for the one now used in any Varityper machine.

Having thus described the invention it should be understood that it is not to be limited to the specific embodiment illustrated herein, there being variations of the invention which fall within the scope of the appended claims.

I claim:—

1. In a typewriting machine, the combination of a type carrier, a printing hammer to co-operate therewith, two groups of key-levers, a lever associated with the type carrier whereby the latter may be operated in opposite directions, means operable by the key-levers of one group to actuate said lever in one direction from a normal position, means operable by the key-levers of the other group to actuate said lever in the opposite direction from the normal position, means to arrest said lever to position the selected type at the printing point, and means including a resilient device on said lever to facilitate a further actuation of any one of the key-levers to effect the actuation of the printing hammer after said lever has been arrested, said resilient devices being effective irrespective of the direction in which the lever is moved from a central position.

2. In a typewriting machine, the combination of a type carrier having a row of types registering with the printing line, a printing hammer to co-operate therewith, key-levers, a lever connected to the type carrier to operate the latter, a pivot about the axis of which the lever is operable, a spring controlled member supported bodily on said lever, means to engage said member and operable by said key-levers to actuate said lever, and means to arrest said lever to accurately position the selected type at the print-

ing point, said element being movable on said lever against the action of the spring to permit a further actuation of the key lever to effect the actuation of the printing hammer after the lever has been arrested.

3. In a typewriting machine, the combination of a type carrier, a hammer to co-operate therewith, key-levers, an actuator for the type carrier, said actuator being operable in opposite directions from a normal position, intermediate means by which the actuator may be operated by the key-levers, devices at both sides of the actuator to be engaged thereby to locate the selected type at the printing point, means operable by the key levers to effect the operation of the printing hammer, and resilient means supported entirely on said actuator and effective when the actuator is moved in either direction to facilitate a further actuation of the key-levers to effect the actuation of the printing hammer after the actuator has been arrested.

4. In a typewriting machine, the combination of printing means, key-levers, an indexing lever for the printing means operable by the key-levers, means to arrest the indexing lever, a universal bar operable by the key-levers, an arm on said universal bar to actuate the indexing lever, means to arrest the indexing lever, a slide on said indexing lever, a spring connected to said slide, said arm engaging said slide to actuate the indexing lever, said slide being actuable by said arm after the indexing lever has been arrested to permit the actuation of the printing means by said universal bar.

5. In a typewriting machine, the combination of a type shuttle, a printing hammer to co-operate therewith, an actuating element for said type shuttle, a pivot about which said actuating element may be swung in opposite directions to set the shuttle, two groups of key-levers, two universal bar frames, one for each group of key-levers to be operated thereby, an arm on each universal bar frame, a resilient device on said actuating element, the arms of the universal bar frames engaging the resilient device one at a time to operate the actuating element to position the shuttle with the selected type at the printing point, and means to arrest the actuating element to position the selected type at the printing point, the active arm being operable against the action of the resilient device to permit a movement of the universal bar and consequently a further movement of the active key-lever after the shuttle actuator has been arrested to effect the actuation of the printing hammer.

6. In a typewriting machine, the combination of a reciprocating type carrier, an oscillating lever therefor, an engageable device, means to slidingly support said device on said lever, a spring to urge the device in one direction on said lever, means to arrest said device against the action of said spring, and two actuating elements to engage said device to actuate said lever in opposite directions from a normal position through the medium of said spring.

7. In a typewriting machine, the combination of a reciprocating type carrier, a flat oscillating lever therefor, a slide, means to support said slide on said lever, a spring to urge the slide in one direction on said lever, means to arrest said slide against the action of said spring, actuating means including two elements to engage said slide to actuate said lever in opposite directions from a normal position through the medium of said spring, and means to arrest said lever to position the selected type at the printing point, the spring controlled slide being movable lengthwise of said lever against the action of said spring to permit a further movement of the active one of said elements after said lever is arrested.

8. In a typewriting machine, the combination of a type carrier, an oscillating lever operable in opposite directions from its home position to actuate said type carrier, operating means including two arms to actuate said lever, means to arrest said lever to position the selected type at the printing point, a resilient contact portion on said lever engageable by both arms one at a time to operate said lever in opposite directions, said contact portion yielding after said lever is arrested to permit a further movement of active arm of the operating means, and two shoulders on said lever to be engaged by said arms to return said lever to normal.

9. In a typewriting machine, the combination of a type carrier, an oscillating lever to actuate said type carrier, operating means including two arms one at each side of a plane extending parallel to and through the axis about which said lever oscillates, a slide, means to support said slide on said lever, a spring to urge the slide towards said arms, said arms being operable one at a time to effect the actuation of said lever in opposite directions, shoulders on said slide, each shoulder to be engaged by one of said arms to actuate said lever through the medium of said slide and spring, said lever and said slide having clearance slots through which the arms extend, and shoulders on said slide to be engaged by said arms to return said lever to normal.

10. In a typewriting machine, the combination of a type carrier, an oscillating lever therefor, a shaft about which said lever may be oscillated, a sleeve secured to said lever through which said shaft extends, a slide carried by said lever, a spring forming a connection between said lever and said slide, means including an arm to engage said slide to actuate the lever through the medium of said spring, a flange on said sleeve, and means to engage said flange to hold said lever against upward movement on said shaft, said flange extending only part way around said sleeve and said slide having a slot which enables it to be assembled on said lever after the sleeve has been secured thereto, one end of the slot bearing against said sleeve against the action of said spring.

11. In a typewriting machine, the combination of a curved type shuttle, a cylindrical anvil to support said shuttle, a lever to actuate said shuttle about said anvil, key levers, a frame including a universal bar operable by the key levers, the actuator lever including two members, namely a shuttle engaging member, and a member to be acted upon by said frame, a shoulder on the last named member to be engaged by the frame to actuate said lever, a spring tending to hold the engageable member in a definite relation with respect to the shuttle engaging member, a hammer to co-operate with the shuttle, hammer operating means under the control of the key-levers, and means to arrest the shuttle engaging member to register the selected type with the printing point, said engageable member being operable on the shuttle engaging member against the action of said spring to permit a further actuation of the operated key-lever after the type shuttle has been registered to effect the actuation of the hammer actuating means.

12. In a typewriting machine, the combination of a type carrier, an actuator therefor, two driving devices to operate said actuator in opposite directions from a normal position, means to arrest said actuator to register the selected type at the printing point, and means including a single spring between the actuator and said driving devices against the action of which the active driving device may be operated after the actuator is arrested.

13. In a typewriting machine, the combination of an arcuate type carrier, a hammer to co-operate therewith, an actuator, a vertical pivot for said actuator about which the latter may be operated in a horizontal plane, two groups of key-levers, two universal bar frames, one associated with each group of key-levers, each universal bar frame including a vertically disposed arm, a slide supported for radial movement on the actuator and with respect to said pivot, shoulders on said slide at opposite sides of said pivot, said shoulders to be engaged by the upper ends of said arms one at a time to operate the actuator in opposite directions from a central position, means to arrest the actuator when the selected type is at the printing point, and a spring against the action of which the slide may move after the actuator has been arrested.

14. In a typewriting machine, the combination of a curved type shuttle, an actuating lever therefor, a pivot for said lever, a slide supported for movement on said lever, a spring to control said slide and tending to prevent movement of said slide on said lever, said slide having two shoulders thereon at opposite sides of the pivot, two drivers one for each shoulder to operate the lever, means to arrest the lever to register the selected type at the printing point, the slide being actuable against the action of said spring after the lever has been arrested and shoulders associated with said lever to be engaged by said drivers to return the lever to its normal position.

15. In a typewriting machine, the combination of printing instrumentalities including a shuttle, an actuator therefor which is operable in opposite directions from a home position, key operated means including two arms actuable one at a time to operate said actuator, and means to arrest the actuator to properly position said shuttle, said actuator comprising a pivoted body part to engage the shuttle, a slide, members to support the slide completely on said body part for movement lengthwise thereof, said slide to be engaged by the arms of the key operated means, and a spring connected between the slide and said body part to cause the actuator to act as an integral part until it is arrested by the arresting means after which the slide may move on said body part against the action of said spring.

16. In a typewriting machine, the combination of a carriage, escapement mechanism therefor, a type carrier, a pivoted actuator therefor, key-levers, two driving devices operable by the key-levers to operate said actuator in opposite directions, means to arrest said actuator to register the selected type at the printing point, a resilient device supported on said actuator and engageable by both of said driving devices one at a time to operate the actuator in opposite directions and against the action of which the active driving device may be operated after the actuator is arrested to permit a further actuation of the active key-lever, and means operable during such further actuation of the key-lever to effect the actuation of the escapement mechanism.

17. In a typewriting machine, the combination of a type shuttle, a hammer to co-operate therewith, a pivoted actuator for said shuttle, key-levers, two driving devices operable by said key-levers to operate said actuator in opposite directions, means to arrest said actuator to register the selected type at the printing point, a resilient device supported on said actuator and engageable by both of said driving devices one at a time to operate the actuator in opposite directions and against the action of which the active driving device may be operated after the actuator is arrested to permit a further actuation of the active key-lever, and means operable during such further actuation of the active key-lever to effect the actuation of the hammer.

18. In a typewriting machine, the combination of a carriage, escapement mechanism therefor, a type shuttle, a hammer to co-operate therewith, a pivoted actuator for said shuttle, key-levers, two driving devices operable by said key-levers to operate said actuator in opposite directions, means to arrest said actuator to register the selected type at the printing point, a resilient device supported on said actuator and engageable by both of said driving devices one at a time to operate the actuator in opposite directions and against the action of which the active driving device may be operated after the actuator is arrested to permit a further actuation of the active key-lever, said hammer being associated with the escapement, and means operable during such further actuation of the active key-lever to effect the actuation of the escapement and the hammer.

19. In a typewriting machine, the combination of a type carrier operable in opposite directions from a home position, two sets of key-levers, two universal bar frames, one associated with each set of key levers, and a single resilient device operable by both universal bar frames one at a time to operate the type carrier in opposite directions, and means to arrest the type carrier in its selected position, the resilient device being effective to yield after the type carrier has been arrested to permit a further actuation of the active universal bar frame and the active key-lever.

20. In a typewriting machine, the combination of a type shuttle, a pivoted shuttle actuating lever, arresting means for the actuating lever, key-levers, a universal bar frame operable by the key-levers and having an arm thereon to operate the shuttle actuating lever, said shuttle actuating lever comprising a flat sheet metal main member, a flat sheet metal member movably supported on the main member and engageable by said arm to operate the actuating lever, and a spring connected between said main member and said movable member tending to hold the movable member in a definite position on the main member so that the actuating lever acts as an integral part during the actuation prior to its engagement with the arresting means, said movable member being subsequently operable against the action of said spring to permit a further actuation of the active key-lever after the main member of said lever is arrested each one of said members having apertures through which said arm extends.

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