

F. HARDINGE.  
 KEY FOR WATCHMEN'S CLOCKS.  
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Fig. 1.

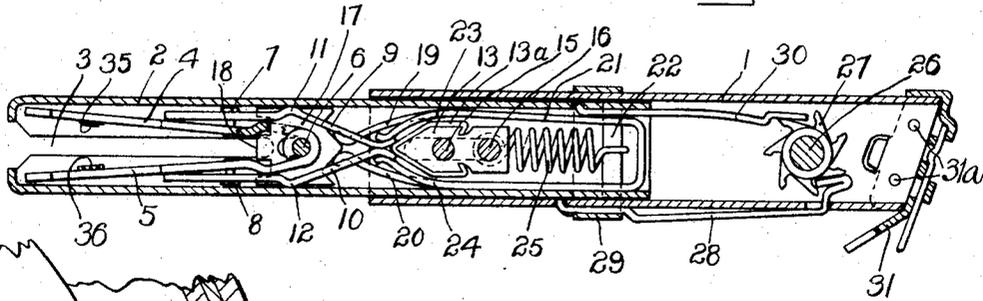


Fig. 2.

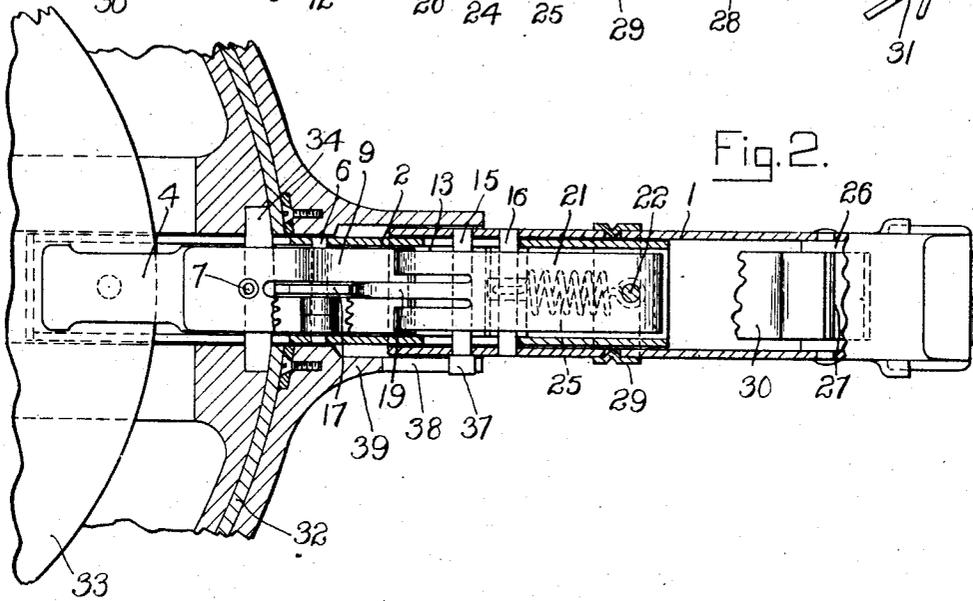
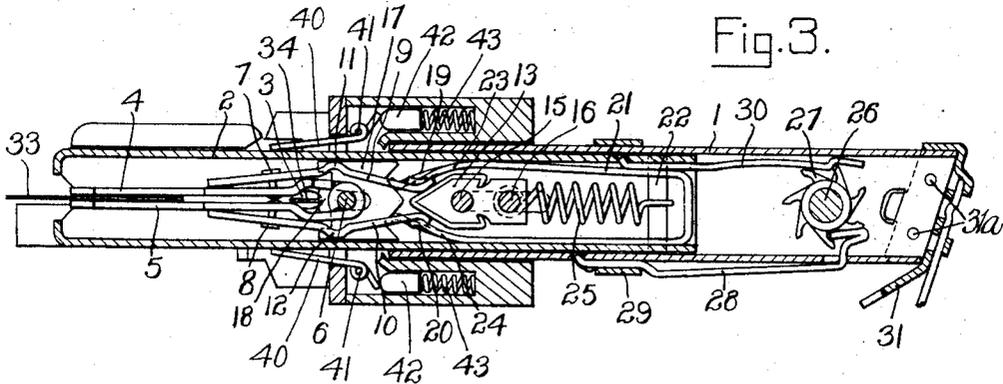


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## KEY FOR WATCHMEN'S CLOCKS.

1,188,349.

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Application filed November 25, 1910. Serial No. 594,014.

*To all whom it may concern:*

Be it known that I, FRANKLIN HARDINGE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Keys for Watchmen's Clocks, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved form of key mechanism adapted for use with watchmen's clocks, in which a record is made characteristic of the station visited by the watchman by means of inserting the key in the clock.

It is a special object of my invention to provide a construction such that the key as a whole shall be of as small size as possible to do the work, and also in the employment of mechanism for affording an indication to the watchman of the operation of the key. The indicating mechanism employed is of such a nature that in addition to sending an alarm upon the actuation of the key a blow is imparted to the recording mechanism which facilitates its operation.

The several drawings illustrating my invention are as follows:

Figure 1 is a longitudinal sectional view taken through the center of the key; Fig. 2 is a view of the key in place in the clock, showing the casing of the clock and the casing of the key partially in section; and Fig. 3 is a view similar to Fig. 1 of the key in its operated position in the clock.

Similar numerals refer to similar parts throughout the several views.

As shown in Fig. 1, the casing of the key consists of two tubes 1 and 2, the latter of which projects from and is adapted to slide into the other. The projecting end of the tube 2 is slotted, as shown at 3, and jaws 4 and 5 are disposed above and below the slot 3 and pivoted to the tube 2 at 6. The jaws have loosely secured to them at 7 and 8 operating levers 9 and 10, provided with fulcrums 11 and 12 bearing against the inside of the tube 2. The right-hand ends of the levers 9 and 10 are normally in contact and bent outward to be engaged by the point of the operating wedge 13, rigidly secured to the tube 1 by the supporting rods 15 and 16. A lock 17 is mounted upon the pivot rod 6, and so conformed that a tongue

18 formed thereon normally lies between the jaws 4 and 5 to prevent motion thereof from the position indicated in Fig. 1. The right-hand edge of the lock 17 is wedge-shaped to be engaged by the spring tongues 19 and 20 formed on the spring 21, secured in the tube 2 by the rod 22. The spring 21 has independent tongues 23 and 24 formed therefrom to engage the right hand ends of the levers 9 and 10 to maintain them normally in the position indicated in Fig. 1. A spring 25 is secured at one end to the rod 16 and at the other end to the rod 22 to maintain the tubes 1 and 2 normally in the position relatively to each other, as indicated in Fig. 1.

The wedge 13 is made preferably of cast metal, and provided at its left hand end with a facing of thin sheet steel to take the wear caused by the engagement of the wedge with the right hand ends of the levers 9 and 10. The right hand ends of the facing 13<sup>a</sup> are bent inward to engage notches in the upper and lower faces of the body portion of the wedge 13, and the facing is so made that it may be placed upon the body portion by sliding it sidewise thereon, in which position it is positively held in place by the walls of the tube 2 after the wedge is properly assembled in the key. The right hand end of the wedge 13 is slotted so that the left hand end of the spring 25 may engage the rod 16. Within the tube 1 at its right hand end there is rotatably mounted upon a rod 26 a ratchet wheel 27 normally held in the position indicated in Fig. 1 by a spring 28 located outside of the tube 1, and held in place by a band 29 encircling the tube and left hand end of the spring 28, by means of an indentation in the spring 28 and indentations formed in the band to enter suitable holes formed in the tube 1 to retain the band in place. The left-hand end of the spring 28 is bent to enter a slot formed therefor in the wall of the tube 1 which, in conjunction with a bend formed in the spring 28 immediately to the right of the band 29, serves to securely hold the spring 28 in place. The ratchet wheel 27 is rotated when the tube 2 is pushed into the tube 1 by means of a spring 30 secured to the right-hand end of the tube 2 by means of the rod 22 between the spring 21 and the inner wall of such tube. The left-hand end of the spring 30 is bent to enter a slot formed therefor in the wall of the tube 2, and at its right-hand end a

shoulder is formed in such spring to engage the teeth of the ratchet wheel 27, while the end portion of the spring normally rests over the point of one of the teeth. The right-hand end of the key is closed by means of a punching 31, to which a chain may be connected if desired for securing the key in any desired position upon a watchman's beat.

When it is desired to make a record by means of the key shown in Fig. 1, it is inserted into a clock 32 so constructed that the jaws 4 and 5 occupy positions above and below a record disk 33 contained in the clock 32, and driven at a uniform rate by suitable clockwork, not shown. A bar 34 extends across the keyway in the clock 32 in substantially the same plane as the disk 33, and thus the bar enters the slot 3 when the key is inserted in place and engages the tongue 18 of the lock 17, after which an inward thrust upon the tube 1 moves the lock 17 slightly to the right against the action of the spring tongues 19 and 20, thus leaving the thrust exerted upon the tube 1 free to move the wedge 13 between the right-hand ends of the levers 9 and 10, thus bringing the jaws 4 and 5 together, as indicated in Fig. 3, so that the cooperating dies 35 and 36 carried by the jaws may make their characteristic record upon the disk 33. The operation described stretches the spring 25 somewhat, and also, by means of the spring 30, rotates the ratchet wheel 27 against the resisting force of the spring 28 until the bent right-hand end of the latter spring slips over the end of the tooth with which it was in contact and springs against the long face of the next tooth. The snap thus produced is readily distinguished by the watchman, and indicates to him that the key has been properly operated. Clearances are provided in the short faces of the ratchet teeth so that when the end of the spring 28 comes opposite these clearances the force of the blow imparted to the ratchet wheel 27 by the spring 28 may cause the ratchet wheel to turn slightly to the left, as shown in the drawings, thus imparting a blow to the spring 30, which is communicated through the tube 2 to the jaws 4 and 5, and the resultant jar causes the dies 35 and 36 to operate more effectively than they otherwise would. When the thrust upon the tube 1 is released the spring 25 returns the parts to their normal position, thus moving the spring 30 to the left into engagement with the next tooth of the ratchet wheel 27.

The rod 15 is extended outside of the tube 1 at one end and provided with an enlarged head or roller 37 adapted to cooperate with a slot 38 formed in but one side of the outer key-guide 39 of the clock 32, thus necessitating the introduction of the key into the

clock in the proper position. Shutters 40 pivoted to the outer key-guide 39 at 41 are provided to normally close the keyway in the clock when the key is not in position, thus preventing tampering with the clock and also preventing the accidental entry of dirt into the clock. The shutters 40 are maintained in their normal position by plungers 42, actuated by springs 43 carried in suitable holes formed in the key-guide 39.

The punching 31 is so conformed that projecting points 31<sup>a</sup> formed thereon enter corresponding holes formed in the sides of the tube 1 at its right hand end when the punching is assembled, and thus it is securely held in place without the use of rivets, pins or solder.

An important result secured by placing the alarm spring 28 outside of the tube 1, is that a sufficiently long spring 28 may be employed to be durable under the usage it receives without correspondingly increasing the length of the key casing. It is very desirable to make the key casing as short as possible, and with the arrangement shown in the drawings, it is practically impossible to dispose a durable spring inside of the casing. It is to be understood of course that any arrangement of alarm spring is contemplated herein, which may be employed consistently with the design of key used.

While I have shown my invention in the particular embodiments herein described, I do not, however, limit myself to these exact constructions, but desire to claim any equivalents that may suggest themselves to those skilled in the art.

What I claim is:

1. A key for a watchman's clock comprising two members movable relatively to each other, and a ratchet wheel carried by one of such members arranged to be operated by the other one of said members, said ratchet wheel cooperating with a flexible member to indicate that the key has been properly operated.

2. A key for a watchman's clock comprising two members movable relatively to each other, a ratchet wheel carried by one of such members, and a pawl carried by the other member for operating the ratchet wheel.

3. A key for a watchman's clock comprising two members movable relatively to each other, a ratchet wheel carried by one of such members, a pawl carried by the other member for operating the ratchet wheel, and a spring carried by the first member to engage the ratchet wheel.

4. A key for a watchman's clock comprising two members movable relatively to each other, a ratchet wheel carried by one of such members, a pawl carried by the other member for operating the ratchet wheel, and a spring carried by the first member to engage the ratchet wheel, such ratchet wheel and

spring conformed to impart a blow to the pawl when the spring snaps from one tooth of the ratchet wheel to the next.

5 5. A recording key for a watchman's clock comprising two telescope tubes, a ratchet wheel alarm mechanism carried by one of said tubes and means carried by the other tube for operating said ratchet wheel alarm mechanism when said key is operated.

10 6. A recording key for a watchman's clock comprising a tube, a ratchet wheel carried by said tube and means carried by said tube cooperating with said ratchet wheel to indicate the operation of the key.

15 7. A recording key for a watchman's clock comprising two telescope tubes, a ratchet wheel carried by one of said tubes, and a pawl carried by the other tube for operating said ratchet wheel when the key is operated.

20 8. A recording key for a watchman's clock comprising two telescope tubes, a ratchet wheel carried by one of said tubes, an operating pawl for said ratchet wheel carried by the other tube, and an alarm spring carried by the first mentioned tube and cooperating with the ratchet wheel to indicate when the key is operated.

30 9. A recording key for a watchman's clock comprising two telescope tubes, a ratchet wheel carried by one of said tubes, an operating pawl for said ratchet wheel carried by the other tube, and an alarm spring engaging the ratchet wheel and carried by the first mentioned tube, such ratchet wheel and spring conformed to impart a blow to the pawl when the spring snaps from one tooth of the ratchet wheel to the next.

40 10. In a key for a watchman's clock, the combination of a casing, devices within the casing arranged when operated to impress

a record upon a record sheet, an impact member carried by said casing, an alarm spring carried by the casing, together with 45 means for causing the impact member and alarm spring to move with respect to each other when the recording devices are operated.

11. A recording key for a watchman's 50 clock comprising two telescope tubes and a ratchet wheel carried by one of said tubes, means for operating said ratchet wheel carried by the other of said tubes, said ratchet wheel cooperating with a spring to indicate 55 that the key has been properly operated, said spring being mounted upon the outside of said first-mentioned tube and being provided with a portion extending through an aperture therein to engage the ratchet 60 wheel.

12. A key for a watchman's clock comprising two members movable relatively to each other, a ratchet wheel carried by one of said members, and means for operating 65 said ratchet wheel carried by the other of said members, said ratchet wheel cooperating with a flexible member to indicate that the key has been properly operated.

13. A recording key for a watchman's 70 clock comprising a casing, means within the casing adapted when operated to impress a record upon a record sheet, an audible signal carried by the casing, and devices for effecting the operation of said 75 signal when the recording devices have been actuated.

In witness whereof, I hereunto subscribe my name this 16th day of November, A. D., 1910.

FRANKLIN HARDINGE.

Witnesses:

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ROBERT F. BRACKE.

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