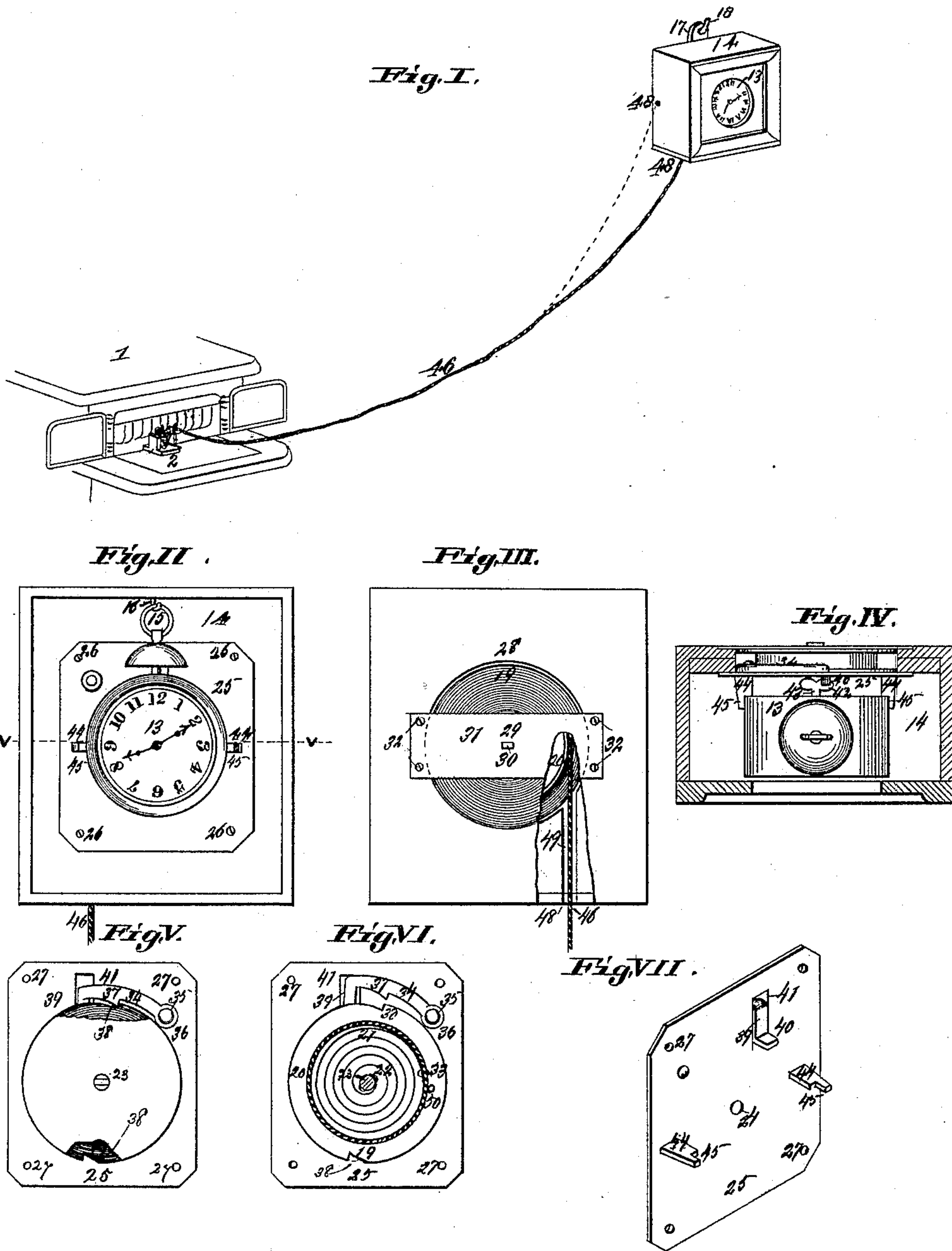


(No Model.)

W. HARLES.
FIRE LIGHTER.

No. 411,335.

Patented Sept. 17, 1889.



UNITED STATES PATENT OFFICE.

WILLIAM HARLES, OF ST. LOUIS, MISSOURI.

FIRE-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 411,335, dated September 17, 1889.

Application filed September 4, 1888. Serial No. 284,557. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HARLES, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Fire-Lighters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention is an improvement on my invention patented June 19, 1888, No. 384,842, and relates to a device for lighting a fire automatically at any predetermined time; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a perspective view of the device, showing its relation to a stove. Fig. II is a front view of an alarm-clock and its case, forming part of the apparatus. Fig. III is a rear view of the case, and shows the spring-drum that carries the operating-cord, with part broken away to show the seating of the cord and the boxing of the spring that actuates the drum. Fig. IV is a horizontal section on line V V, Fig. II, and shows the means of actuating the trigger-pawl to release the spring. Fig. V is a rear view of the drum with part of the back plate broken away to show the trigger-pawl in engagement with the spring-drum. Fig. VI is a like view with the trigger tripped and the back plate of the spring-drum removed to show the spring. Fig. VII is a view of the plate that carries the spring-drum, and shows the trip-lug of the trigger.

Referring to the drawings, in which similar figures of reference indicate like parts in all the views, 1 represents a stove, and 2 is any suitable match-striker to which my invention is connected.

13 represents an alarm-clock, and 14 the case in which it is hung on the hook 15, with which its ring 16 engages. The case itself is preferably hung on the wall by an eyelet-catch 17 on a hook 18, but may, if preferred, be secured on a shelf, or in any other suitable way.

19 represents the disks, and 20 the hoop, of a metal drum, and 21 is a coil-spring, which is secured at its inner end by a rivet 22 to an axle 23, that passes through perforations in

the center of the drum-disks and whose inner projecting end has a bearing 24 in the iron plate 25. The said plate is secured inside the case in which the clock is hung, to the back of which case it is attached by screws 26, that pass through the holes 27 in the plate and are screwed into the back of said case. The spring-drum has rotary movement on the axle 23, and the flattened outer end 29 of the axle 23 of the drum is tight-seated in the slot 30 in the center of the iron plate 31, that spans the circular hole 28 in the back of the case, to which it is secured by screws 32. The outer end of the coil-spring is secured to the hoop of the drum that incases it by the rivet 33.

34 represents the ratchet-pawl that surmounts the spring-drum, and which has loose bearings 35 on the pivot-bolt 36, whose fast end is riveted or otherwise secured to the iron plate 25. The ratchet-pawl has a projecting ratchet-tooth 37, which, as the spring-drum is being rotated to screw up the spring-coil, runs freely over the periphery of the inner disk of the drum, dropping into the two ratchet-recesses 38 in said periphery and passing on by the curvilinear outlets from the same, so as to offer no obstruction to the winding up of said spring, but prevents its reactionary movement, as the spring in its drum-case is arrested from unwinding until the ratchet-pawl is elevated.

39 represents a trip-trigger that hangs pendent from the loose end of the ratchet-pawl and is integral therewith, and 40 is a spur-lug on the lower end of the same. This trip-trigger works within an elongated slot 41, that passes through the iron plate 25, and the spur-lug 40 projects above the rising wing 42 of the alarm-winding key 43, so that when the alarm-clock has been wound and the alarm set to the time it is desired that it should start to run down and that the fire should be lighted the rising wing 42 of the alarm-key trips or elevates the trigger of the ratchet-pawl 34, so that it releases its ratchet hold of the spring-drum, which, under the actuation of its spring, immediately revolves, and in so doing rewinds the operating cord, and thereby striking and igniting the matches that light the fire.

44 represent two lugs which project in-

wardly from the iron plate 25 and may be cast integral therewith, and which lugs have recessed notches 45, that embrace the alarm-clock near the middle of its case and hold it steady in position.

46 represents the operating-cord, which is secured to the match-striker. The other end of said cord is passed through a hole 48 in the bottom or side of the back of the case 14, in which the alarm-clock is hung, and passes through a channel-groove 49 in said back, and, entering between the twin disks of the spring-drum, the end is secured by passing it through the hole 50 in the inner disk, close outside the hoop 20, that incases the spring-chamber. After passing the end of the cord through said hole it may be knotted or otherwise secured.

The operation of the invention is as follows: The operating-cord, which has been secured to the inner disk of the spring-drum, as stated, is wound around the drum within the flanges of the twin-disks, leaving the friction-tab outside the clock-case. The incased clock is then hung up, as shown in Fig. I, or it may be secured on a clock-shelf or in any other suitable position. The distance from the stove or grate in which the fire is to be lighted is not material, for the operating-cord can be lengthened to any reasonable extent or reduced in length. Now it will be seen that when the cord is drawn on it will rotate the spring-drum, from which it is being withdrawn, and at the same time wind up the coil-spring within it, which cannot unwind, for the ratchet-pawl engages in one of the recessed ratchet-seats in the inner disk of the spring-drum and prevents the reaction of the spring. The match-striker 2 is then placed in position in contact with the paper that protrudes from the grate. The clock having been wound and set and the alarm set to start to run down at the time it is desired that the fire should be lighted, at said time the rising wing 42 of the winder-key of the alarm elevates the spur-lug 40 of the trigger 39, which trips the ratchet-pawl 34, so that it releases its ratchet hold of the spring-drum, which then, under the actuation of its spring, immediately revolves, and in so doing rewinds the operating-cord around the drum, which in its first movement operates the match-striker, thereby striking or igniting the matches and through them the paper, portions of which protrude from between the bars of the grate of the stove or fire-place, thus lighting the fire which has been laid over night.

In the winter especially the use of this invention is a great convenience, and in invalid households it is very useful the year round, where at a stated time in the night a fire may be automatically kindled.

I have shown the operating-cord descending from the bottom of the back of the clock-case in Figs. I, II, and III, as it is the most favorable outlet for the cord when the clock-

case is suspended, as shown in Fig. I, from a hook; but when the clock-case is placed on a shelf, or from any other cause it is not convenient to have the exit for the cord through the bottom, it can be made in the side, as also shown in Fig. I, in which case the cord will ascend to the hole in the side of the case, as shown in broken line in said figure.

It will be seen that I have avoided the difficulties experienced in my former invention, on which, as stated, this is an improvement, and also in overcoming like difficulties in other inventions of the same class, by avoiding the use of weights as being unsatisfactory in their accumulative impetus, that causes a concussion at the terminal of their descent, whereas that of the spring exhausts itself without violence. It will also be seen that no part of the device is left near the heat of the fire after the lighting of the same, for all parts of the device are remote from the fire except the cord, and it is withdrawn also at the time of striking the matches; also, the cord being automatically withdrawn to the clock-case when not set and immediately after use, the whole apparatus is out of the way. It will also be seen that the wings of the winder-key, after tripping the trigger of the ratchet-pawl, and so having effected the lighting of the fire and given a short and sufficient alarm, are then stayed from a continuous rotation and ringing of the alarm by the engagement of the trigger of the ratchet-pawl with the top of the slot 41 while pressed upward from beneath by the wing of the alarm-key. If, on the other hand, it is desired that the alarm should run during the whole of its usual course, all that is necessary is to lower the hook 15, by which the clock is suspended, so that the top of the trip-trigger will not come into contact with the top of the slot 41, and in this way the wings of the key are allowed to pass freely around during the whole course of the alarm, as the trip-trigger of the ratchet-pawl has then full vertical play in said slot to rise out of contact with the wings of the alarm-key.

I claim as my invention—

1. In a fire-lighter, the combination of the cord for attachment to a match-striker, the spring-drum upon which said cord is adapted to be wound, having ratchet-teeth, the coiled spring within and attached to said drum, the ratchet-pawl 34, adapted to engage said ratchet-teeth, the pendent trigger integral with said pawl, having the trip-lug, and the alarm-clock having a winged winding-key arranged to engage said trip-lug and raise said pawl, substantially as set forth.

2. The combination, with the alarm-clock having the winged winding-key, of a spring-actuated drum having ratchet-teeth, the plate 25, arranged between said clock and drum, a pawl adapted to engage said ratchet-teeth and having a trigger projecting through the slot 41 within reach of said winged key, and

the cord 46 attached to said drum and adapted to be wound thereon, substantially as set forth.

3. In a fire-lighter, the combination of the
5 cord 46, for attachment to a match-striker, the spring-actuated drum on which said cord winds, having ratchet-teeth, the alarm-clock
13, arranged with its back to said drum and having a winged winding-key, the case 14, in
10 which said clock and drum are hung, having in its back the channel or groove 49, through

which said cord passes, and the pawl 34, adapted to engage said ratchet-teeth and having a trip-trigger provided with a spur-lug arranged to be struck by the wings of said key 15 to disengage said pawl, substantially as set forth.

WILLIAM HARLES.

In presence of—
BENJN. A. KNIGHT,
EDW. S. KNIGHT.