H. F. WAITE.

TIME SWITCH FOR X-RAY AND OTHER MACHINES.

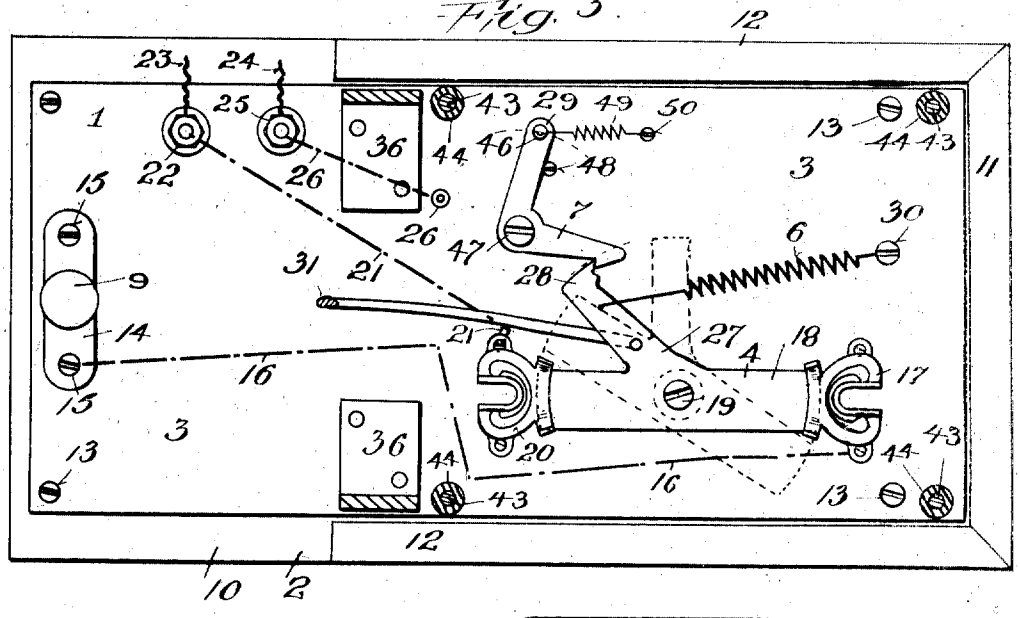
APPLICATION FILED AUG. 21, 1916.

1,250,729.

Patented Dec. 18, 1917.

2 SHEETS—SHEET 1.

Fig. 3.



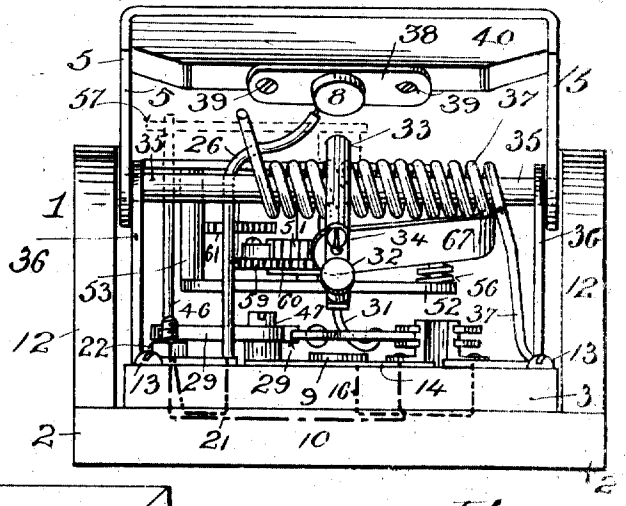


Fig. 2.

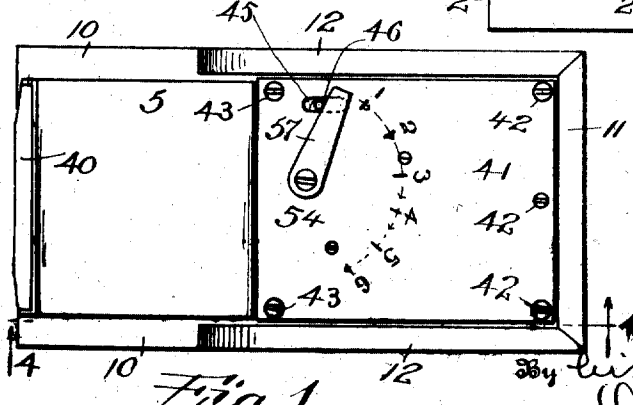


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

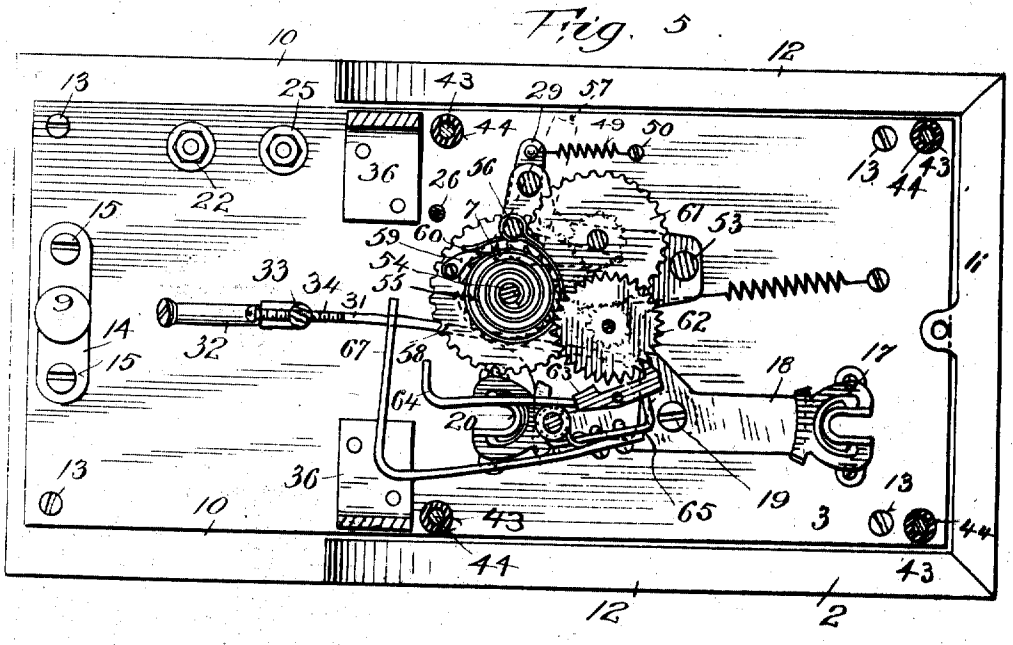
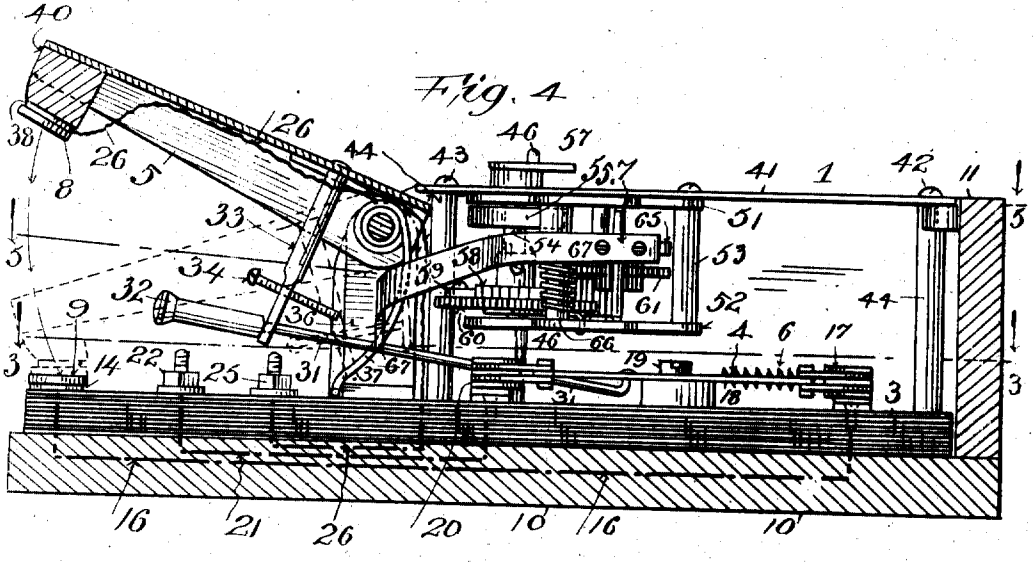


Fig. 4.



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TIME-SWITCH FOR X-RAY AND OTHER MACHINES.

1,250,729. Specification of Letters Patent. Patented Dec. 18, 1917.

Application filed August 21, 1916. Serial No. 115,991.

To all whom it may concern:

Be it known that I, HARRY F. WAITE, a citizen of the United States, and a resident of Whitestone Landing, county of Queens, city and State of New York, have invented a new and useful Improvement in Time-Switches for X-Ray and other Machines, of which the following is a specification.

The object of my invention is to provide a switch of this class which may be used so as to give a number of exposures aggregating a predetermined amount and no more, so that the right exposure may always be had with the apparatus where my switch is employed, and yet the apparatus may never be overtaxed, as it is much less hard upon the apparatus to have a number of short exposures instead of one long one. These, and other objects are accomplished by my invention, one embodiment of which is hereinafter more particularly set forth.

For a more particular description of my invention, reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a plan view of my improved time switch.

Fig. 2 is an end elevation of the same.

Fig. 3 is a sectional view, taken on the line 3—3 of Fig. 4, looking in the direction of the arrows.

Fig. 4 is a sectional view, taken on the line 4—4 of Fig. 1, looking in the direction of the arrows.

Fig. 5 is a sectional view, taken on the line 5—5 of Fig. 4, looking in the direction of the arrows.

Throughout the various views of the drawings, similar reference characters designate similar parts.

My improved switch 1 consists of a casing 2 on which is placed a base 3 of insulating material, as slate, and on this is mounted a switch 4, together with its connections, which cause it to be thrown in one direction by a foot-pedal 5, and in another direction by a coil spring 6 which acts to open the circuit when a time-controlled mechanism 7 permits. The base 3 and the pedal 5 are connected at one end of each by a suitable pair of contacts 8 and 9 which are adapted to come together as shown in Fig. 4, so that the circuit is closed through two switches or contacts, one at the switch 4 and one between the parts 8 and 9, and it may be opened at either or both, as will appear below, so as to permit a definite closing for a definite time, always subject to the foot control of the operator.

The casing 2 consists of a bottom 10, an end 11 and sides 12, which preferably terminate short of the bottom, as shown. The casing may be made of any suitable material, as wood or metal, or anything else, as desired.

The insulated base 3 is secured to the casing 2 by means of suitable screws 13, or any other suitable means, and these screws are preferably placed at the four corners, as indicated. The forward end of this base 3 carries a small pedestal 14 secured by suitable screws 15, and this pedestal carries the contact 9, as indicated. A suitable wire 16 connects this pedestal, which is made of metal, with the rearward jaw 17 of the switch 4. The switch 4 has a suitable blade 18 pivoted at 19, in the conventional manner, and adapted to engage a second jaw 20, which is also mounted on the base 3, and this second jaw is connected by a wire 21 to a binding post 22 from which runs a lead 23, as indicated in Fig. 3. Another lead 24 runs to a binding post 25 which is connected by a wire 26 with the contact 8 of the foot-pedal 5, as is clear from Fig. 4. The switch 4 has its blade 18 provided with a diagonally extending arm 27 which arm is connected with the spring 6 at one end, and provided with a part 28 adapted to engage a catch 29 of the time controlled mechanism 7, as will appear below. The spring 6 is also connected to a suitable screw or other device 30 which rises from the base 3 so that this spring may act to draw the blade 18 clear of the jaws 17 and 20, in a manner to be described below.

The arm 27 is connected to the foot pedal 5 by means of a connecting link 31, provided with a nut 32 at its free end, and the pedal 5 is provided with a downwardly projecting stud 33 which is fixed thereto, and provided with a perforation at one end which passes over the link 31, and with another perforation which is screw-threaded to receive the set-screw 34, which is connected at times with the time-controlled mechanism 7, as will appear below. From the foregoing it is obvious that the projection 33 can pull the link 31 but cannot shove the same, this pull being exerted through the adjustable nut 32,

as shown in Fig. 4. On the other hand, the time-controlled mechanism cannot be pulled by the set-screw 34 but may be shoved in a manner which will be described below. The foot-pedal 5 is pivotally mounted on a suitable pivot 35 which is in turn pivotally mounted near each end in suitable brackets 36 which rise from the base 3, and a coil spring 37 has one end against the lower surface of the foot-pedal 5, and another end against one of the brackets 36, and this coil spring is mounted about the shaft 35, and is so arranged and disposed that it normally keeps the foot-pedal 5 in its elevated position, so that the contacts 8 and 9 are normally separated. The contact 8 is mounted on a suitable pedestal 38, which is secured by screws 39 to insulating material 40, which is secured to the lower surface and outer end of the foot-pedal 5.

The time-controlled mechanism 7 is suspended from a plate 41 which is secured to the casing 2 by means of a suitable screw 42 and to the base 3 by means of screws 43 which pass through suitable insulating washers 44. It is apparent from Fig. 1 that the plate 41 has a slot 45 through which protrudes a pin 46 which rises upwardly from the catch 29 and extends well above the upper surface of the plate 41. The catch 29 is pivoted, as shown in Fig. 3, at 47 on any suitable pivot, and is normally held against a stop 48 by means of a coil spring 49 connecting this catch 29 with a pin 50, in the conventional manner. The pin 50 rises from the base 3. As long as the catch 29 is in the position shown in Fig. 3, that is against the stop 48, it will engage the part 28 of the projection 27 of the blade 18, and these parts 28 and 29 will be held together as long as the spring 50 can perform this function. It cannot perform this function when the catch 29 is thrown out of the path of the projection 27, or when this projection is drawn by the link 31 away from the catch 29 as occurs when the spring 37 raises the foot-pedal 5, as the spring 37 is much stronger than the spring 6. The time controlled mechanism for throwing the catch 29 clear of the projection 27, at a predetermined time, will now be described in detail.

The time controlled mechanism 7, in addition to the catch 29 and the parts connected therewith, which have been described above, has two parallel plates, an upper 51 and a lower 52, connected by the usual studs 53 which hold these plates in parallel relation at all times to receive the usual clock-mechanism which will be described more in detail. This clock mechanism has a main arbor 55 on which is mounted, a coil spring 54, in the usual manner, with its inner end secured thereto, and its outer end secured to a stud 56 which projects from the upper plate 51. The spring 55 is under tension at all times. This main arbor 54 has an arm 57 fixed thereon by means of which it may be wound against the tension of the spring 55, or by which it may be forced through the tension of this spring against the pin 46 to throw the catch 29 clear of the projection 27. The time controlled mechanism 7 is so arranged and disposed that for a given time, say one second, the arm 57 travels a certain distance, which is indicated by numerals on the plate 41, as shown in Fig. 1. This main arbor 54 carries a ratchet 58 which is fixed thereto in the usual way and adapted to engage a pawl 59, mounted on a gear 60, as is usual in such structures, and this gear meshes with a clock train 61 of the conventional kind, which is provided with an escapement wheel 62 which meshes with an escapement 63 to which is secured a pendulum bar 64 which is oscillated and driven by the escapement wheel 62. This escapement wheel 62 also forms a part of the mechanism for preventing the clock-work from operating, as it has back of the pawl 63 a suitable pivoted detent 65 which is held by spring pressure exerted through a suitable coil spring 66 about a stud 53 so that the escapement wheel 62 cannot drive the escapement dog or ratchet 63, unless the tension of this spring 66 is overcome. This tension is overcome by means of a bent shank 67 fixed to the detent 65 which extends into the path of the set screw 34 so that when this set screw 34 is projected against the shank 67 the tension of the spring 66 is overcome and the escapement wheel 62 is allowed to operate in the conventional manner.

Operation.

In view of the foregoing, the operation of my improved device will be readily understood. Assuming that the leads 23 and 24 run to any suitable device, as an X-ray apparatus, where it is desirable to give a time and intermittent or just a time action, the arm 57 is turned on the main arbor 54 and turns this arbor with it to the extent desired, say enough for four seconds, that is beyond the point indicated by the numeral 4 on the plate 41. Thereafter the operator depresses the foot-pedal 5 by placing his foot thereon. As soon as he does so, the parts being connected as above indicated, all tension is taken off the link 31 and the set screw 34 engages the shank 67 and forces the bent end of the same toward the rear, and thereby releases the time-controlled mechanism so that the spring 55 can drive the arbor 54 anti-clockwise. As soon as the foot pedal 5 is raised the set-screw 34 is taken away from the shank 67 and the clock mechanism is stopped, and at the same time tension is put through the nut 32 on the rod 31 so as to keep the switch-blade of the switch 4 closed in the contacts 17 and 20. When

the foot-pedal is again depressed the clock mechanism again starts and again throws the arm 57 toward the left, that is anti-clockwise. When the pedal 5 is lowered a contact is made between the parts 8 and 9 and the circuit is complete. When the foot-pedal is raised under the tension of the spring 37 this circuit is opened. This opening and closing is continued as often as desired by the operator until the arm 57 reaches the pin 46, at which time the catch 29 gets clear of the projection 27 on the blade 18, and then the spring 6 acts to open the circuit between the blade 18 and the contacts 17 and 20, and thereafter it is impossible to close the circuit through the switch until the arm 57 is again set, after which the above mentioned operations may be repeated, and this cycle of operations may be repeated as often as desired.

From the foregoing it is apparent that my improved switch is not restricted to the precise embodiment herein shown and described, but is broad enough to cover all structures which come within the scope of the annexed claims.

Having thus described my invention, what I claim is:

1. In a device of the class described, time controlled means for opening a circuit, a foot pedal with means for opening a circuit and connections between the two so that a circuit may be opened as often as desired by the operator, and closed for a time aggregating what the apparatus has been set for, said connections being arranged so that the time controlled means for opening the circuit cannot operate except when the foot pedal means is closed.

2. In a device of the class described, a switch and time controlled means for opening the same, a foot pedal with a second switch and connections between the foot pedal and the time controlled switch so that no circuit is closed unless both switches are closed, and the time controlled switch may be opened only when the foot controlled switch is closed, and the time controlled mechanism cannot operate unless the foot controlled switch is closed.

3. In a device of the class described, a base, two switches supported thereby, a clock mechanism supported by said base, a connection between one of said switches and the said clock mechanism whereby the clock mechanism permits the opening of one of the said switches, a foot pedal mechanism for closing the other of said switches, and connections between the foot pedal and the time controlled switch so that it can be opened only when the foot pedal switch is closed.

4. In a device of the class described, a base, a contact on said base, ears rising from said base and a foot-pedal pivotally connected to said ears, a contact carried by said pedal and adapted to engage the contact on said base to close the circuit, a projection extending from said foot-pedal, a spring for normally keeping said foot-pedal in its raised position, a pivoted switch and connections between said pivoted switch and said projection whereby said pivoted switch may be closed by said projection when the foot-pedal is raised, a spring for opening pivoted switch, a catch connected to said pivoted switch and adapted to keep the same from opening unless swung clear of said pivoted switch, a time controlled mechanism, a connection between said time controlled mechanism and said projection whereby the projection may release the time controlled mechanism and put it in operation, means for determining time the pivoted switch can remain closed, and suitable wiring connections so that the circuit may be opened either by the foot-pedal or by the pivoted switch when the time controlled mechanism permits.

HARRY F. WAITE.