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J. C. CALHOUN.

TIME SWITCH FOR PHOTOGRAPH PRINTING MACHINES.

APPLICATION FILED MAY 21, 1906.

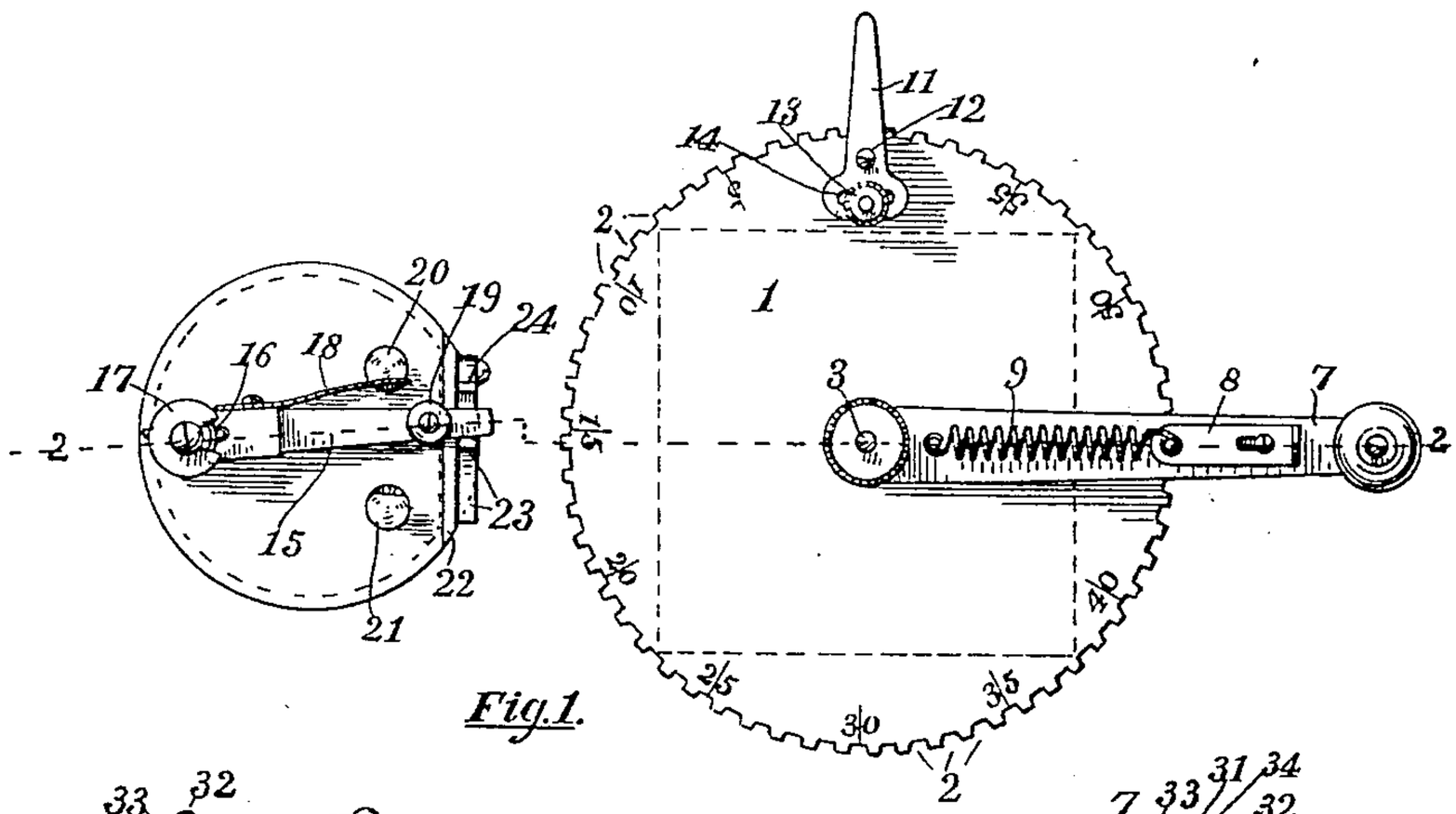

Fig. 1.

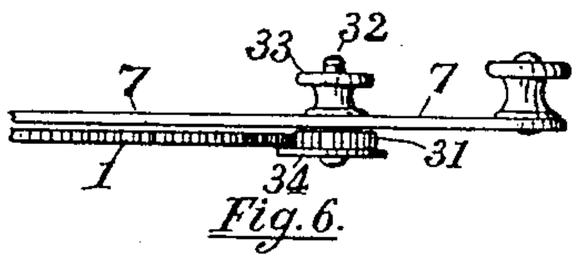

Fig. 6.

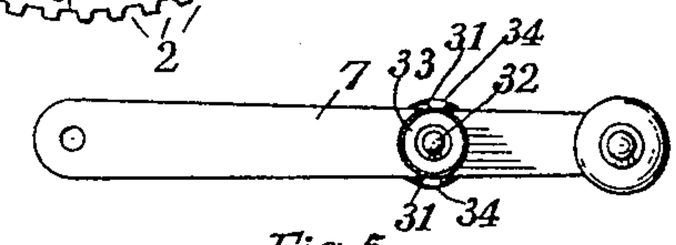

Fig. 5.

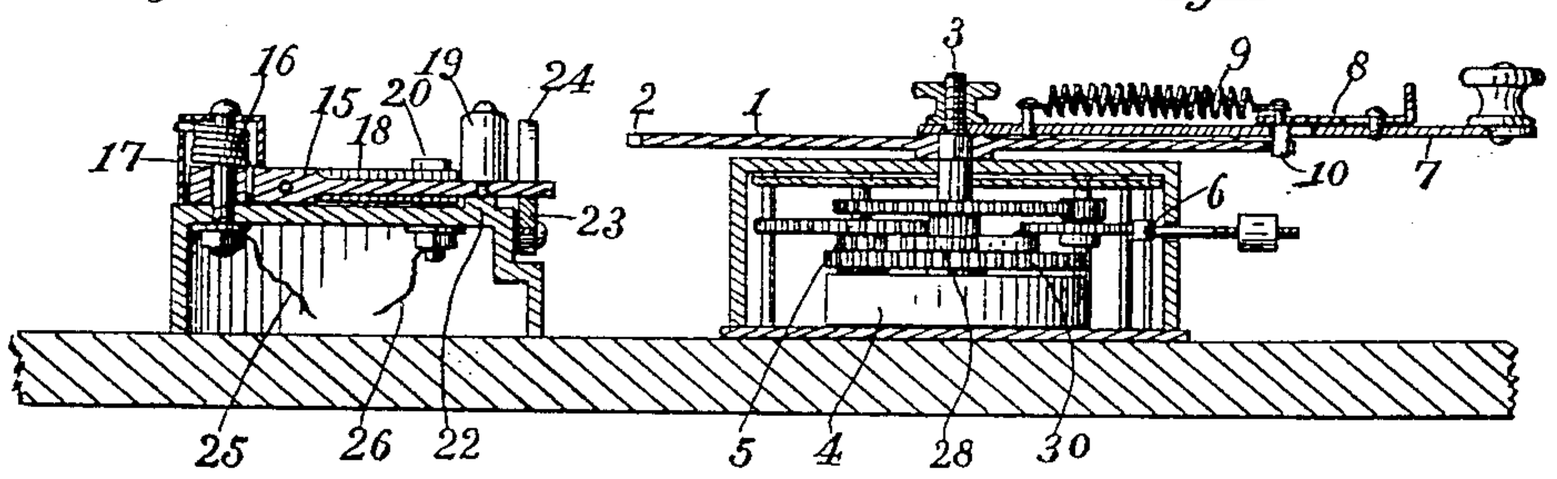

Fig. 2.

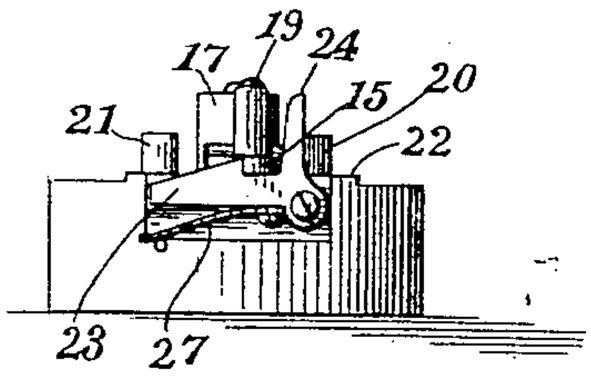

Fig. 3.

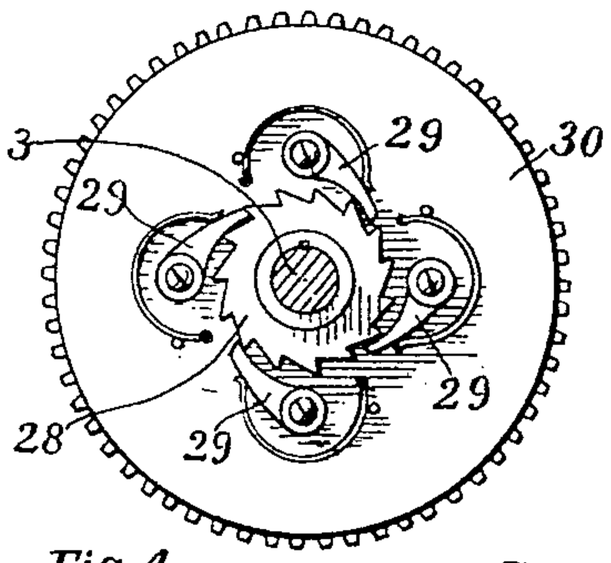

Fig. 4.

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TIME-SWITCH FOR PHOTOGRAPH-PRINTING MACHINES.

No. 864,883. Specification of Letters Patent. Patented Sept. 3, 1907.

Application filed May 21, 1906. Serial No. 317,974.

To all whom it may concern:

Be it known that I, JOSEPH C. CALHOUN, a citizen of the United States, residing at Holland, in the county of Ottawa and State of Michigan, have invented certain new and useful Improvements in Time-Switches for Photograph-Printing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in time switches for photograph printing machines, and its object is to provide a device that will automatically turn off the light after the print has been exposed for a predetermined length of time; and to provide the device with various new and useful features hereinafter more fully described and particularly pointed out in the claims.

My invention consists essentially of a switch comprising a spring actuated lever, a latch to hold the lever in position to close the circuit, a clock mechanism, a dial operated by the same, and two relatively adjustable arms mounted on the dial and adapted to set and release the switch, together with various minor details of construction and arrangement, as hereinafter more fully described, reference being had to the accompanying drawings, in which;

Figure 1. is a plan view of a device embodying my invention; Fig. 2. a vertical section of the same on the line 2—2 of Fig. 1.; Fig. 3. an elevation of the switch showing the side toward the clock mechanism; Fig. 4. an enlarged detail of the pawl and ratchet of the clock mechanism; Fig. 5. a detail in plan view of a modified fastener for the lever; and, Fig. 6. the same in side elevation.

Like numbers refer to like parts in all of the figures.

1 is a horizontally arranged rotative disk provided with recesses 2 in its margin, preferably sixty in number to correspond to the seconds of a minute of time. Said disk is fixed on a vertical shaft 3 rotated by a spring 4, and the time of rotation determined by a train of gearing 5 and escapements 6 preferably adjusted to rotate the disk one revolution per minute.

7 is a lever rotative about the axis of the shaft 3 on which is mounted a slide 8 yieldingly moved toward the disk by a spring 9 and provided with a lug 10 adapted to engage any one of the recesses 2 in the disk and thus hold the lever 7 in relative adjustment thereon. By moving this slide radially, the lug is detached from the disk and the lever can be turned and adjusted relative to the same.

11 is an arm pivotally attached to the disk at 12 and adjustable about said pivot by a thumb screw 13 through a slot 14 in the arm, to determine accurately the time of release of the switch as hereafter described.

15 is a switch lever pivoted at one end and provided with a spring 16 adapted to move the lever toward the stop 21.

17 is a case inclosing the spring.

18 is a spring electrode attached to the lever and adapted to engage the terminal 20 to close the light circuit.

19 is a projection on the switch lever engaged by the lever 7 to move the switch lever and close the circuit.

22 is a rib on the case on which the movable end of the switch lever slides.

23 is a pivoted latch engaging the lever 15 to hold the same in position and close the circuit. This latch is yieldingly held in engagement by a spring 27 and is provided with an upwardly extending arm 24, which arm is engaged by the arm 11 to depress the latch and release the switch lever.

25 and 26 are the wires forming the electric circuit, one being connected to the switch lever 15 and the other connected to the terminal 20. The stop 21 may also be connected in a second circuit so that when the switch is released, this second circuit will turn on a different light, the terminal 20 being for the white light to effect the exposure and print the paper, and the terminal 21 preferably arranged to turn on a red light to illuminate the paper without printing the same when adjusting it on the negative.

Fig. 4. illustrates my improved pawl and ratchet for this clock mechanism, whereby the same is adapted to hold the winding mechanism step by step corresponding to the sixty subdivisions of the disk 1. For this purpose I provide a ratchet 28 having fifteen teeth and keyed to the shaft 3, and on the first wheel of the train of gears I provide four pawls 29 adapted to successively engage with the various teeth, whereby one pawl after another in succession will engage the ratchet at each one-sixtieth of the revolution of the ratchet as the same is turned to set the switch.

In the modification shown in Figs. 5 and 6, 31 is a pinion journaled on a binding screw 32 extending through the lever 7 and provided with a milled nut 33 to bind the pinion against the lever 7 and prevent the pinion from turning. This pinion engages the teeth of the disk 1 and thus holds the lever adjusted when the nut is tight and rotates on the screw to permit the lever to be adjusted when the nut is loose. Below the pinion 31 is a disk 34 which engages the under side of the disk 1 and holds the pinion in engagement therewith.

The device is shown with the switch set for the actinic or white light, the lever 7 being adjusted relative to the arm 11 for 45 seconds exposure. The disk in rotating will bring the arm 11 in contact with the projection 24 and release the latch 23 and thus permit the spring 16 to turn the switch lever against the stop 21, thus breaking the circuit of the white light and closing

the circuit of the red light in the event one is used. To reset the device, the lever 7 is turned around against the projection 19 and the switch lever 15 is moved to the position shown, when the spring 27 will reëngage the latch with the lever and hold the circuit closed until again released as before described. Each setting of the device winds the spring, which runs down as the escapement permits the disk to rotate. To set initial tension on the spring the lever 7 and arm 11 are detached from the disk and the spring wound to the proper tension by turning the disk 1, shaft 3 and ratchet 28.

What I claim is:

1. A time switch, comprising a switch lever, a spring to move the lever, a latch to hold the lever, an arm to engage the latch and release the same, a lever to move the switch lever into engagement with the latch, means for relatively adjusting the arm and lever, and means for simultaneously moving the arm and lever at a predetermined rate per minute.

2. A time switch, comprising a pivoted lever, a spring electrode on the lever, a terminal and stop spaced apart at the respective sides of the lever, a spring to move the lever against the stop, a latch to hold the electrode in contact with the terminal, and clock mechanism to automatically release the latch after a predetermined interval of time.

3. In a time switch, the combination of a disk, an arm and a lever relatively adjustable on the disk, clock mechanism to rotate the disk, a switch lever and a terminal arranged in circuit, a spring to move the switch lever and break the circuit, a latch to hold the lever and having a projection engaged by the arm on the disk.

4. In a time switch, in combination with a switch lever arranged to open and close a circuit, a rotative disk having recesses in its periphery, clock mechanism to rotate the disk at a predetermined rate per minute, an arm on the disk to open the switch, a lever near the disk and rotative about the axis thereof, a slide on the lever, and a lug on the slide adapted to engage any one of the recesses in the disk.

5. In a time switch, a pivoted switch lever, a spring to move the lever and open the circuit, a spring electrode on the lever, a terminal engaged by said electrode, a stop engaged by the lever when the lever is moved by the spring, a latch to hold the lever, a rotative disk having recesses in its edge, an arm on the disk to engage and release the latch, a lever adjustable on the disk and adapted to move the switch lever, a slide on the disk lever, a lug on the slide engaging any one of the recesses in the disk, and clock mechanism to rotate the disk at a predetermined rate per minute.

6. In a time switch, the combination of a rotative shaft, a spring to rotate the shaft, a ratchet fixed on the shaft, a gear wheel rotative on the shaft, a series of pawls successively engaging the ratchet at regular intervals, a disk also fixed on the shaft and having recesses, which recesses are in number as many even multiples of the ratchet teeth as there are pawls, and two relatively adjustable members attached to the disk and adapted to operate a switch.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH C. CALHOUN.

Witnesses:
ELLA BALGOOYEN,
M. J. SCHOON.