No. 651,044. Patented June 5, 1900.

W. D. KING.

TIME DAMPER OPERATING MECHANISM.

(Application filed Mar. 1, 1899.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 1.

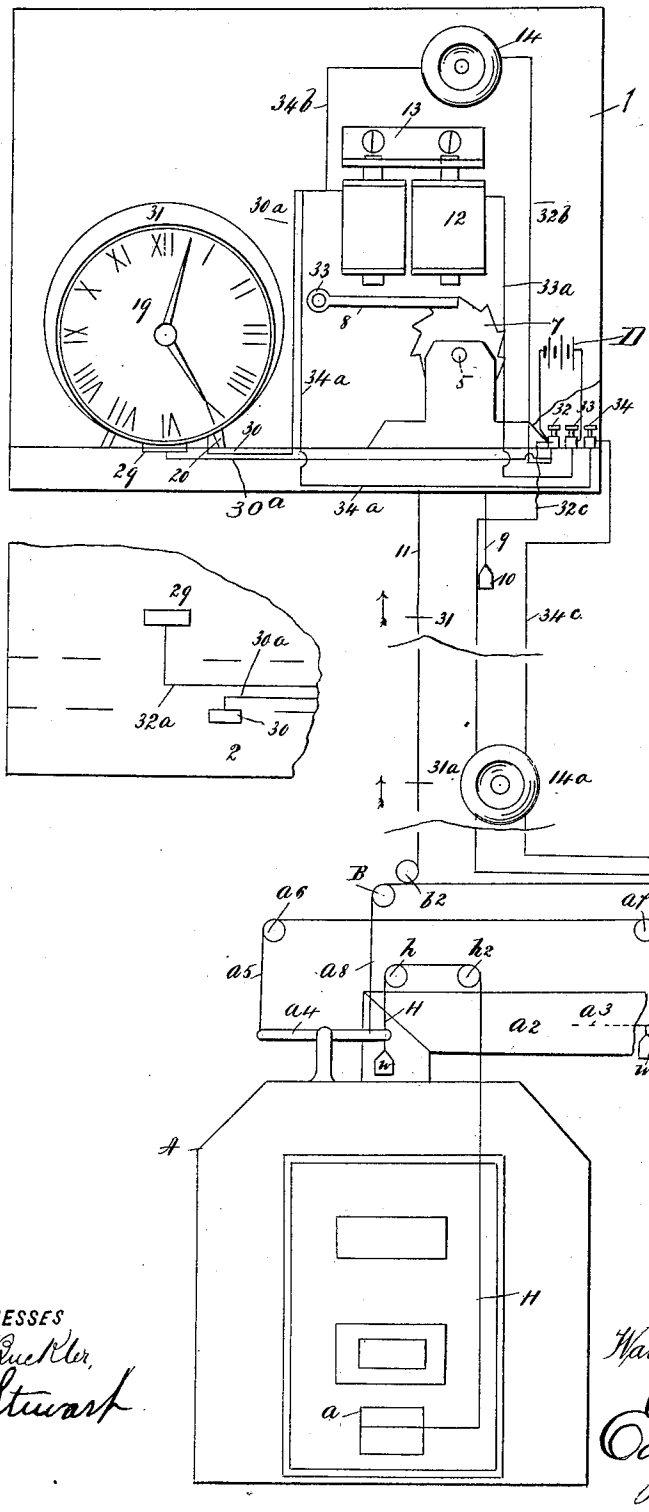

FIG. 2.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

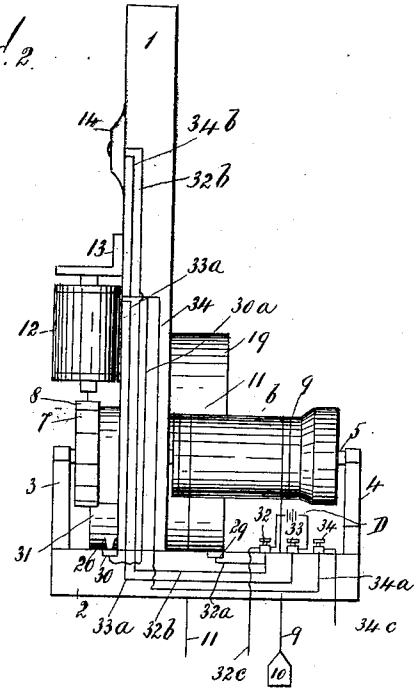


Fig. 3.

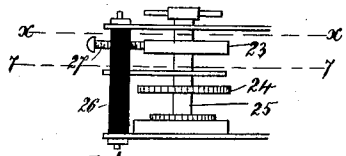


Fig. 4.

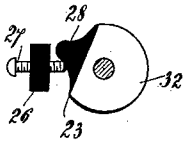


Fig. 5.

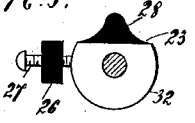


Fig. 6.

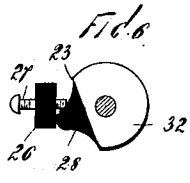
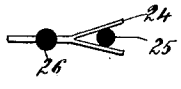


Fig. 7.



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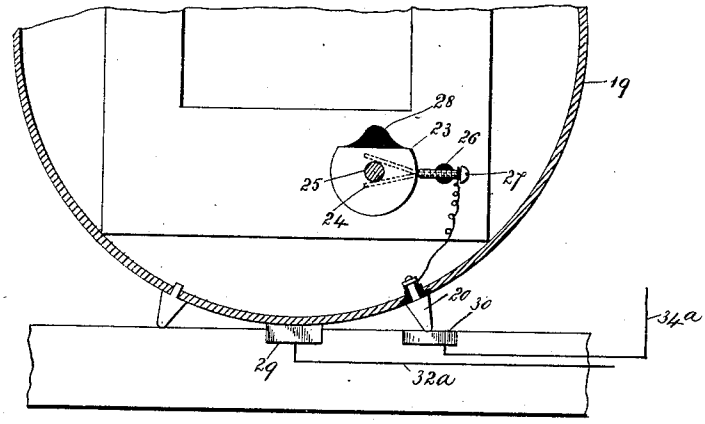
(No Model.) 3 Sheets—Sheet 3.

Fig. 9.



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UNITED STATES PATENT OFFICE.

WARREN D. KING, OF PEABODY, MASSACHUSETTS.

TIME-DAMPER-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 651,044, dated June 5, 1900.

Original application filed May 23, 1896, Serial No. 592,729. Divided and this application filed March 1, 1899. Serial No. 707,281. (No model.)

To all whom it may concern:

Be it known that I, WARREN D. KING, a citizen of the United States, residing at Peabody, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Circuit-Closing Devices, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This is a divisional application based on application Serial No. 592,729, filed by me May 23, 1896, and the invention to which this application relates is a primary and circuit closing device; and one object of the invention is to provide an improved circuit-closing mechanism which is operated by a clock, a further object being to provide a circuit-closing mechanism of the class specified which is particularly adapted for use in operating the dampers of furnaces, but which may also be employed for other purposes.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by the same letters and numerals of reference in each of the views, and in which—

Figure 1 is a diagrammatic view showing the various parts of my improved apparatus and the operation thereof, parts of the same being in elevation; Fig. 2, an end view of the damper-operating apparatus; Figs. 3 to 7, inclusive, detail views of an automatic circuit-closing device which I employ and which will be hereinafter described; Fig. 8, a plan view of a part of the base-plate of a frame or support with which the damper-operating apparatus is connected, and Fig. 9 a sectional detail of a part of the construction shown in Fig. 1 on an enlarged scale.

In the practice of my invention I provide a suitable frame or support consisting of an upright plate 1, which is secured to or formed on a bottom plate 2 and which is provided with two upright standards 3 and 4, connected by a shaft 5, on which is mounted a drum 6. The drum 6 passes through the upright plate 1 of the frame or support and is provided at its front end with a ratchet-wheel 7, adjacent to which is pivoted a soft-iron armature 8, which operates in connection therewith, said armature being pivoted at 33, and wound in opposite directions on the drum 6 are two chains or cords 9 and 11, and these chains or cords 9 and 11 pass downwardly through the bottom plate or board 2 of the frame or support, and the chain or cord 9 is provided with a weight 10.

Mounted above the front end of the drum and above the ratchet-wheel 7, secured thereto, and the armature 8 is an electric magnet 12, the cores of which are connected at their upper ends by an L-shaped piece or yoke of soft iron 13, secured to the plate 1, and said plate 1 is provided with a circular opening 31, in which is placed an alarm-clock-circuit-closing device 19. The plate 2 of the frame or support is provided with two contact-pieces 29 and 30, (shown more particularly in Fig. 8,) composed of brass or other conducting material and so located that when the clock 19 is placed in position the case thereof will rest on the contact-piece 29, and said clock-case is provided with an insulated leg 20, which rests on the contact-piece 30.

Fig. 1 of the drawings shows the apparatus which I employ as applied to a building containing different floors, and in practice a push-button 14 is secured to the plate 1 of the frame or support, and other push-buttons 14^a and 14^b are arranged on the other floors of the building. The bottom plate 2 of the frame or support is also provided, preferably at one corner thereof and arranged diagonally thereon, with three binding-posts 32, 33, and 34, and the binding-post 32 is in electrical connection with the contact-piece 29 by a wire or conductor 32^a, and said binding-post 32 is also in electrical connection with the push-buttons 14, 14^a, and 14^b by means of conductors 32^b and 32^c. The binding-post 33 is in electrical connection with the magnet 12 by a wire or conductor 33^a, and the binding-post 34 is in electrical connection with the magnet 12 by means of a wire or conductor 34^a, with which is connected a wire 34^b, which is connected with the push-button 14, and said contact-piece 30 is also in connection with the wire or conductor 34^a by means of a wire or conductor 30^a, and the binding-post 34 is also in electrical connection with the push-

button 14^a and 14^b by a wire or conductor 34^c. I have also shown in Fig. 1 a furnace A, provided with a damper *a* and an escape-flue a^2, having a pivoted damper a^3, and above the furnace A is pivoted a lever a^4, the outer end of which is provided with a cord a^5, which passes over pulleys a^6 and a^7 and is connected with the damper a^3, which is also provided adjacent to the connection of the cord a^5 with a weight *w*. A cord a^8 is connected with the lever a^4 adjacent to the inner end thereof and passes over pulleys B and *b* and is provided with a handle 31^b, and the cord a^8 is also passed around a pulley b^2 above and a little to the right of the pulleys B and is connected with the cord 11, which is wound on the drum 6 and is provided with handles 31 and 32^a, which are arranged, respectively, in the upper and intermediate or second compartment of the building. Connected with the inner end of the lever a^4 is a cord H, which is passed over pulleys *h* and h^2 and connected with the damper *a*, and a damper-weight *w* is also suspended from the inner end of the lever a^4.

I have also shown in Fig. 2 a battery D, which is in electrical connection with the binding-posts 32 and 33, and the operation of this apparatus is substantially as follows: The weight of the dampers or of the damper-weight is sufficient to open the dampers, and the chain or other flexible connection 11 between the dampers and the drum 6 tends to revolve the drum to the left, while the weight 10 operates to revolve said drum to the right; but the weight 10 is not sufficient to revolve said drum when opposed by the weight of the dampers and the damper-weights. To close the dampers, a pull is exerted on either of the handles 31, 31^a, or 31^b in the direction of the arrows shown in Fig. 1 when the drum 6, being relieved from the weight of the dampers and the damper-weights, will revolve to the right under the influence of the weight 10 and is retained in said position by the pivoted armature 8. The dampers can be either fully or partially closed by varying the distance through which the handles 31, 31^a, and 31^b are moved, and to open the dampers the circuit is closed through the magnet 12 by means of the push-buttons 14, 14^a, or 14^b, which operation attracts the armature 8, thus freeing the drum, which revolves to the left under the influence of the weight of the dampers and the damper-weights and allows said dampers to open.

Instead of employing the circuit-closing devices of which the buttons 14, 14^a, and 14^b form a part, I may employ an automatic circuit-closer which forms a part of the mechanism of the clock 19. This clock differs from an ordinary alarm-clock only as shown in Figs. 3 to 7, inclusive, and in Fig. 9, this difference being as follows: The leg 20 of the clock hereinbefore referred to is insulated from the case thereof and all other parts, except the screw 27, with which it is in electrical connection, and in place of the ordinary metallic frame-post I employ or substitute the insulating frame-post 26, composed of hard rubber or other suitable insulating material and through which the conducting-screw 27 passes, and said insulating-post 26 also carries a Y-shaped piece 24, which will be hereinafter described. The clock mechanism is also provided with an additional wheel 23, mounted on the alarm-spring shaft 25, and said wheel is made up of two parts 28 and 32, the part 32 being composed of metal and circular in form, except at one side, where the part 28, which is composed of rubber or other insulating material, is connected therewith. The part 28 consists simply of a lug or projection secured to one side of the body 32 of the wheel, and when the shaft 25 is wound up the contact-screw 27 is brought into contact with the lug or projection 28, as shown in Fig. 4, in which position it remains until time for putting on the draft or opening the dampers, at which time the wheel 23 will revolve, as shown in Fig. 5, and the screw 27 is so adjusted that during the revolution of said wheel the metal part 32 thereof will be in contact with said screw and the circuit will be closed, and at the end of the revolution of the wheel the screw and the lug 28 will again be in connection, as shown in Fig. 6, when the circuit will again be opened. The Y-piece 24 (shown more particularly in Figs. 7 and 9) is designed to prevent the post 26 from being turned by reason of the impact of the lug 28 with the screw 27, thus throwing the screw 27 out of adjustment.

When the clock mechanism is used to close the circuit, as herein described, it is only necessary to set the wheel 23 in the desired position, so that when the predetermined time arrives the circuit will be closed and the damper opened, the circuit being again opened as soon as the dampers are opened, and it is obvious that various changes in and modifications of the construction as herein described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automatic damper mechanism, a magnet, a battery in open circuit with said magnet, and means for closing said circuit, consisting of an alarm-clock the alarm-shaft of which is provided with a wheel in electrical connection with said magnet, said clock being also provided with an insulated leg in electrical connection with said battery and said magnet, and with a post or shaft of insulating material, said last-named post or shaft being provided with a threaded opening, and a metal screw which is inserted therein, said screw being adapted to operate in connection with said contact-wheel, and said contact-wheel being provided with a lug or projection composed of insulating material,

and said screw being in electrical connection with said leg of the clock, substantially as shown and described.

2. A circuit-closing device, comprising an alarm-clock, a magnet and a battery, said clock being provided with a contact-wheel mounted on the alarm-shaft thereof, and with a post or shaft composed of insulating material, said last-named post or shaft being provided with a screw-threaded opening, and a metal screw which is inserted therein, said screw being adapted to operate in connection with said contact-wheel, and said contact-wheel being provided with a lug or projection composed of insulating material, and said screw being in electrical connection with said leg of the clock, substantially as shown and described.

3. In an electric-circuit-closing device, an alarm-clock provided with a contact-wheel mounted on the alarm-shaft, and with a post or shaft composed of insulating material, said last-named post or shaft being provided with a screw-threaded opening, and a metal screw which is inserted therein, said screw being adapted to operate in connection with said contact-wheel, and said contact-wheel being provided with a lug or projection composed of insulating material, and said screw being in electrical connection with the said leg of the clock, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 20th day of February, 1899.

WARREN D. KING.

Witnesses:
FRED W. BUSHBY,
CHAS. J. EMMERTON.