No. 687,764. Patented Dec. 3, 1901.

C. E. LUNDBLAD.

TIME DAMPER FOR FURNACES.

(Application filed July 18, 1901.)

(No Model.)

FIG. 2

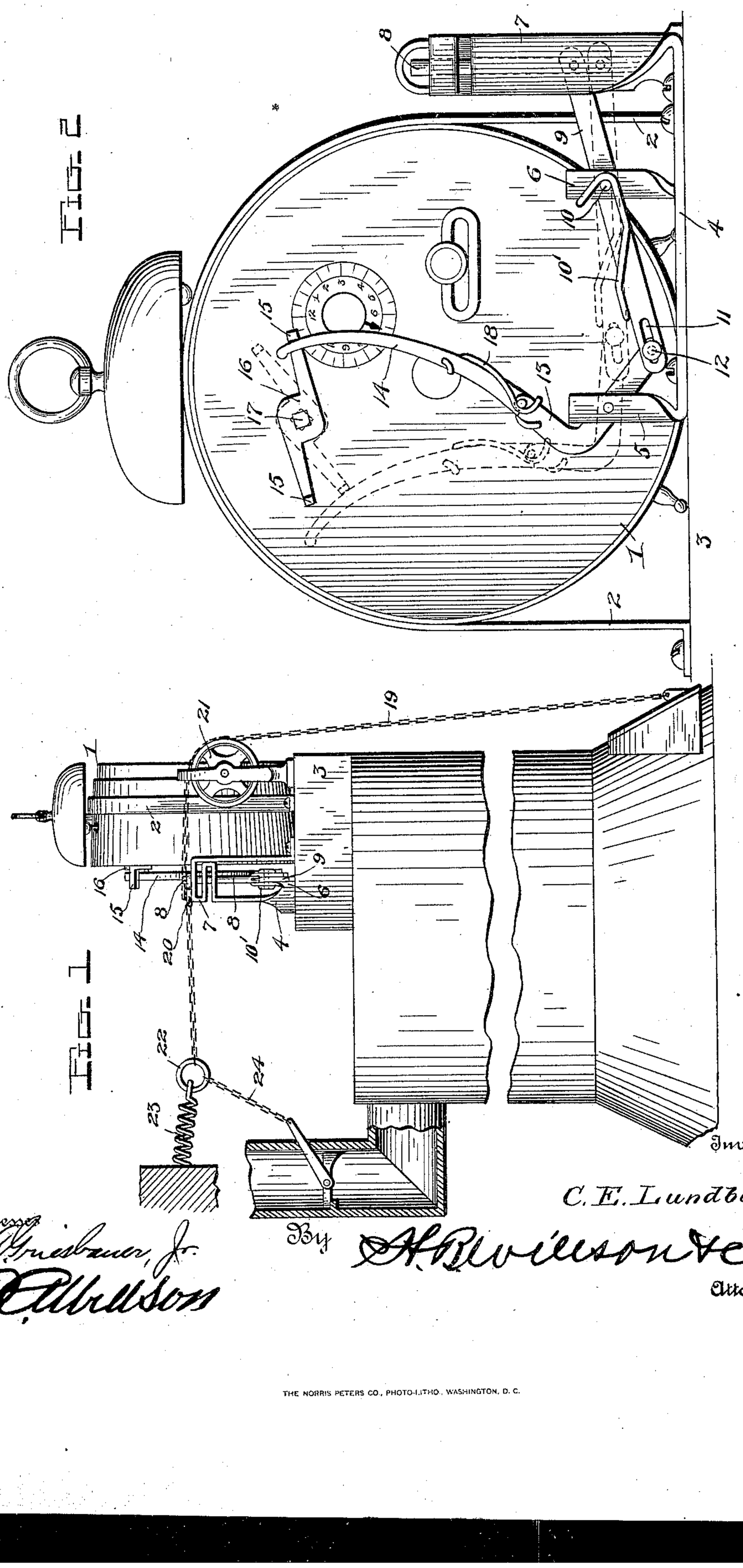

FIG. 1

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UNITED STATES PATENT OFFICE.

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TIME-DAMPER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 687,764, dated December 3, 1901.

Application filed July 18, 1901. Serial No. 68,770. (No model.)

To all whom it may concern:

Be it known that I, CARL E. LUNDBLAD, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Automatic Draft-Openers for Furnaces; and I do 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.

This invention relates to improvements in automatic draft-openers for furnaces, designed to open the dampers at a predetermined time to promote combustion.

The object of the invention is to provide automatic mechanism of this character which shall be simple, durable, and effective in construction and operation and to be operated through the medium of an ordinary alarm-clock, whereby said mechanism may be set to close the dampers to keep up the fire over night and to operate to open the dampers at any desired hour in the morning.

The invention consists in certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claim.

In the accompanying drawings, Figure 1 is a side elevation showing the parts of the automatic mechanism as arranged in use for holding the dampers closed; and Fig. 2 is a rear elevation of the clock and coöperating parts of the damper-controlling mechanism, showing the operation of the latter in full and broken lines.

Like reference characters designate corresponding parts throughout the views.

The numeral 1 in the drawings represents an alarm-clock of ordinary construction, which is secured by means of a band 2 or any other preferred kind of fastening to a base 3, which is secured in practice to the top of the boiler or furnace in connection with which the improved damper-controlling mechanism is used.

Upon the base 3, in rear of the clock, is mounted a supporting-bracket 4, which projects at one end beyond the clock and is provided with supporting-arms 5 and 6 and a guide-frame 7, the latter being located at said projecting end. In this frame slides a vertically-reciprocating bolt or retaining member 8, which is pivoted at its lower end to one end of a vibrating lever 9, fulcrumed at an intermediate point to a pin 10, fixed upon or journaled in the supporting-arm 6. The opposite end of this lever is normally held downward by a spring 10′ and is slotted, as at 11, to receive a pin or stud 12 upon one arm of a bell-crank lever 13, pivoted to the supporting-arm 5. The opposite arm of the bell-crank lever has pivoted thereto the lower end of a curved trip-lever 14, the free end of which is adapted to be engaged by a lug 15 upon either one of the arms of a rotary tripping device 16, fixed upon the winding-shaft 17 of the alarm mechanism of the clock 1. A spring 18 holds the said trip-lever 14 in operative position relatively to the bell-crank lever 13 and yields to the right in the act of winding up the trip device 16.

A chain or analogous flexible connection 19 extends past that side of the clock on which the guide-frame 7 is mounted and has attached thereto a ring or eye 20 to engage the upper end of the bolt or retaining member 8. One end of this chain passes forwardly over a pulley 21 on the base 3 and is adapted to be connected to the draft-door of the furnace, while the other end of said chain projects rearwardly and carries a ring 22, to which are connected a retracting-spring 23 and a chain 24. The spring 23 is secured to a block or other stationary object on or adjacent to the furnace, while the chain 24 is adapted to connect the chain 19 with the damper in the smoke-pipe of the furnace or in the chimney into which said pipe discharges.

The operation is as follows: When it is desired to set the mechanism, hold the draft-door and damper closed, and to release them at a predetermined time the alarm mechanism of the clock is set to operate at the time it is desired to have the dampers open, the trip-lever 14 engaged with the trip device 16, and the ring or eye 20 engaged with the upper projecting end of the bolt or retaining member 8. To engage said ring or eye with the bolt necessitates the stretching of the spring 23, whereby said spring is placed under tension, the chain 24 drawn taut to close the damper in the chimney or smoke-pipe,

and the forward end of the chain 19 slackened to allow the draft-door of the furnace to close. At the time set for the alarm mechanism to operate the movement of the trip device 16 will force the parts of the trip mechanism to the dotted-line position shown in Fig. 2, whereby the bolt 8 is retracted and releases the ring or eye 20. The spring 23 thereupon pulls upon and draws the chain 19 rearwardly, whereby the draft-door of the furnace is opened, and at the same time the chain 24 is slackened, so as to allow the damper in the smoke-pipe or chimney to open. The action of the spring immediately upon the release of the ring or eye 20 restores the parts of the trip mechanism to their normal positions, (shown in full lines in Fig. 2,) as will be readily understood.

The construction, mode of operation, and advantages of the invention will be fully understood from the foregoing description, and it will be seen that simple and effective automatic draft-controlling mechanism is provided.

Changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

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

In automatic draft-openers for furnaces, the combination with clockwork mechanism adapted to be set to operate at a predetermined time and provided with a trip, of a bolt, damper connections adapted to be engaged with the bolt when the latter is projected to hold the dampers closed, a spring set under tension by the engagement of said connections with the bolt and adapted when said bolt is withdrawn to retract the damper connections to open the dampers, a vibrating lever connected with the bolt, a spring acting on said lever to project the bolt, a bell-crank lever connected to said vibrating lever, and a yielding trip-lever connected to said bell-crank lever and coöperating with the trip device of the clockwork mechanism, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL E. LUNDBLAD.

Witnesses:
P. GEO. HANSON,
OLE PETERSON.