

No. 672,000.

Patented Apr. 16, 1901.

L. HARTEL.
FURNACE DOOR OPERATING DEVICE.

(Application filed Feb. 7, 1901.)

(No Model.)

Fig. 1.

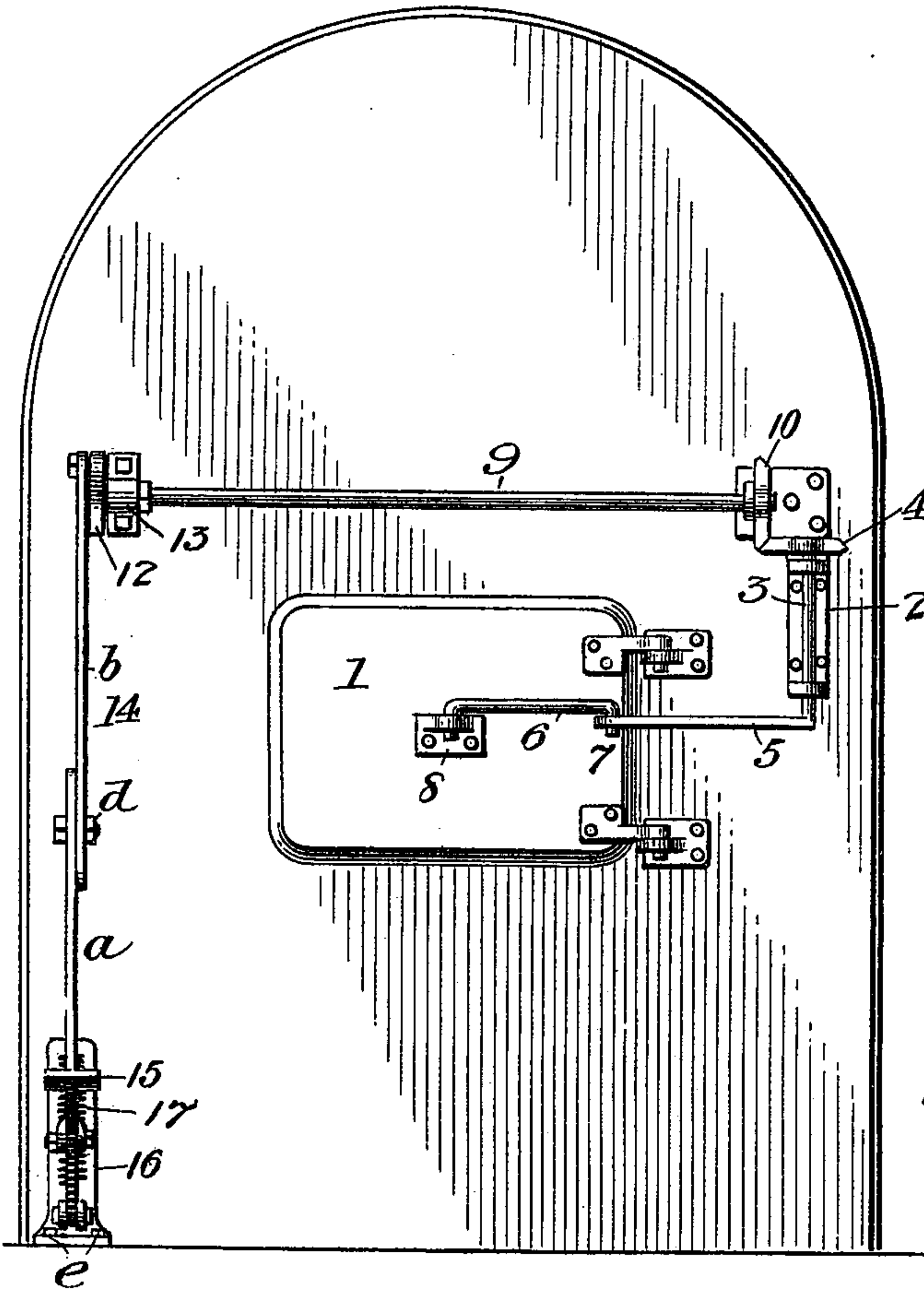


Fig. 2.

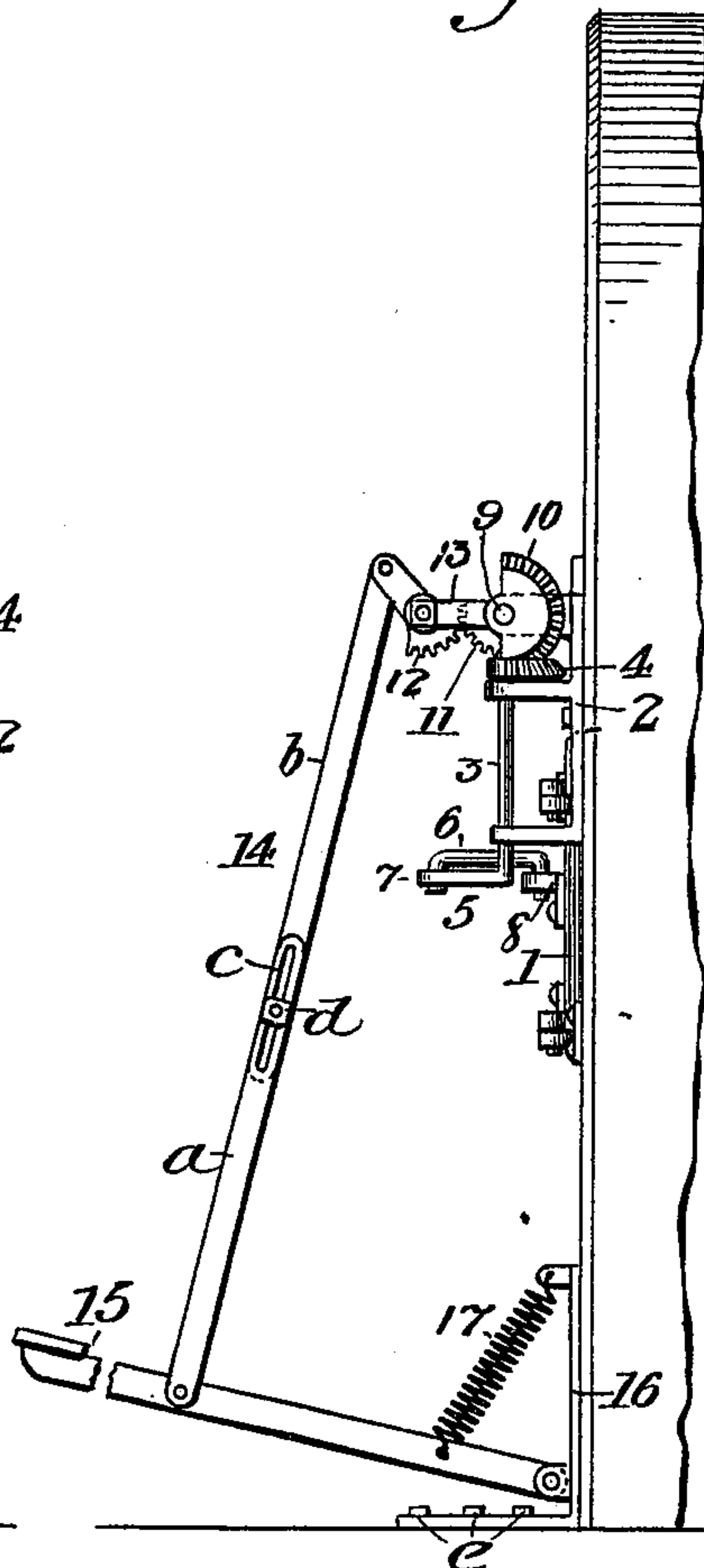


Fig. 3.

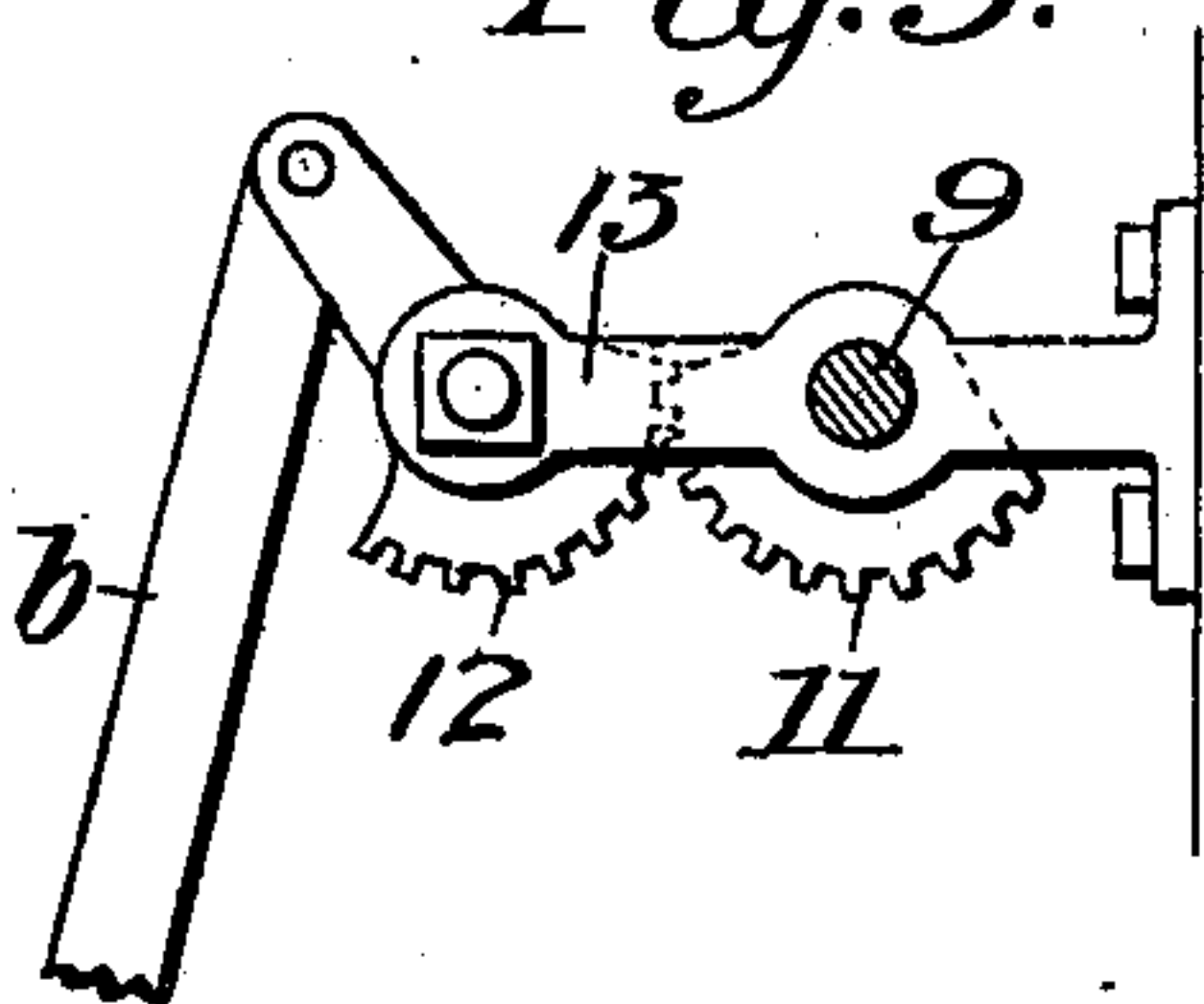
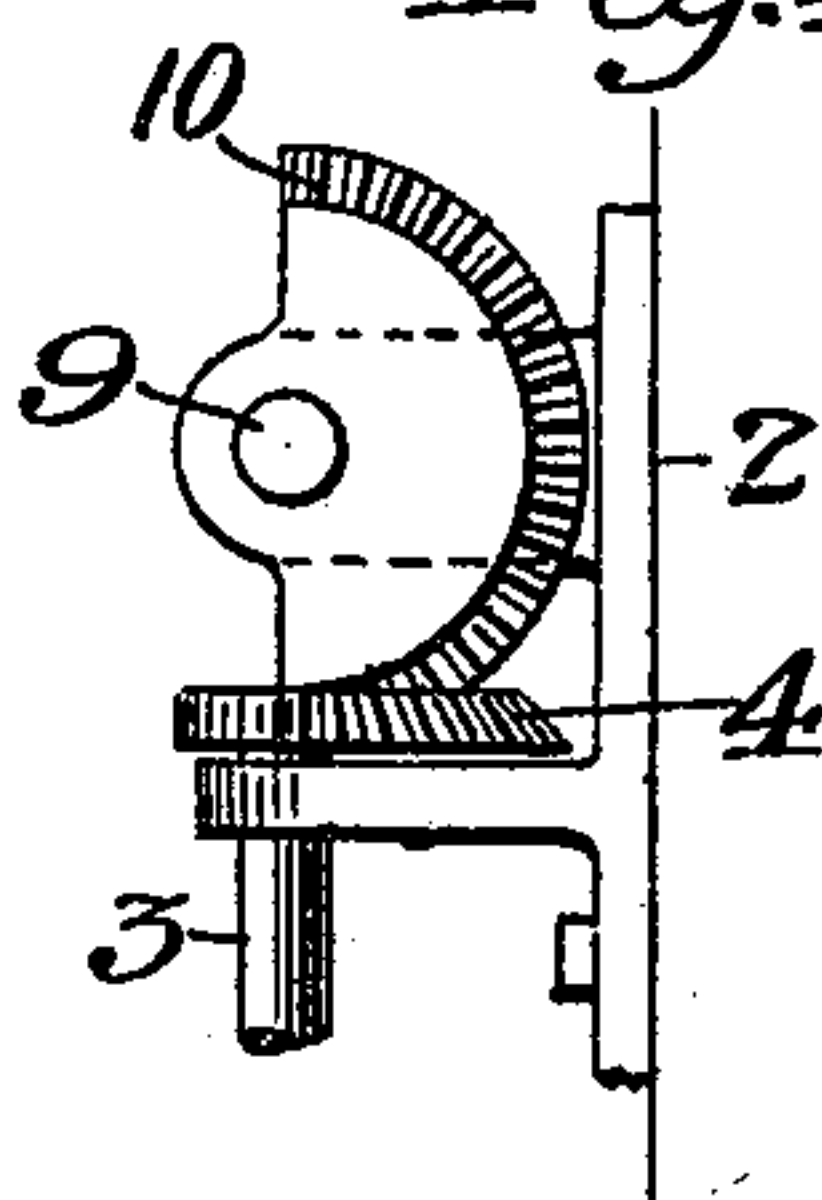


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

LEWIS HARTEL, OF LODI, OHIO.

FURNACE-DOOR-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 672,000, dated April 16, 1901.

Application filed February 7, 1901. Serial No. 46,420. (No model.)

To all whom it may concern:

Be it known that I, LEWIS HARTEL, a citizen of the United States, residing at Lodi, in the county of Medina and State of Ohio, have invented new and useful Improvements in Furnace-Door-Operating Devices, of which the following is a specification.

My invention relates to improvements in devices for opening and closing doors for steam-boilers and furnaces; and it consists of the novel construction, arrangement, and combination of parts hereinafter described, and pointed out in the appended claims.

In firing a locomotive-engine it is of importance to keep the furnace-door closed as much as possible in order to keep the draft from entering the fire-box through the door; and the object of the present invention is to produce an efficient and practical device for opening and closing furnace-doors without using the hands of the operator.

In the accompanying drawings, Figure 1 is a rear elevation of the device as it would appear applied to the front of an ordinary furnace with the door closed. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation showing a more detailed view of the rearwardly-extending bracket and spur-gear sectors. Fig. 4 is a detail view of the half-gears, &c.

Similar characters of reference indicate corresponding parts throughout all the figures of the drawings.

1 denotes the furnace-door of the usual construction, to the right of which there is secured, by means of a downwardly-extending bracket 2, a vertical shaft or pintle 3, having at its upper end a beveled half-gear 4 and provided at its lower end with a crank-arm 5, to the outer end of which there is pivoted at 7 one end of the rod 6. At the other end of this rod 6 it is attached to the furnace-door 1 by means of a bracket 8.

9 designates a horizontal rock-shaft journaled in suitable bearings of the brackets 2 and 13 and provided at one end with a half-gear 10 and at the other with a spur-gear sector 11, which mesh and turn with the half-gear 4 and the spur-gear sector 12, respectively. This spur-gear sector 12 is attached to the rearwardly-extending bracket 13, as shown, and to the arms of the spur-gear sec-

tor 12 there is attached the upper end of a two-part rod 14, secured at its lower end to a foot-lever 15. This rod 14 is made in two parts *a* and *b*, having their contiguous ends overlapping each other and provided with a slot *c* and an adjustable bolt *d* for regulating the length of the same. This foot-lever 15 is pivotally attached at its inner end to a bracket 16, the lower arm of which is attached to the cab-floor by means of the bolts *e*. The upper arm of this bracket simply abuts against the front wall of the furnace, and at the upper end of this arm there is formed an eye, as shown, to which there is attached a stiff spiral spring 17, secured at its lower end to the foot-lever 15. It will be observed that this spring in its normal position will hold the parts in the position shown in the drawings, thus securely holding the door shut and rendering the use of a door-latch unnecessary.

The end of the rod 6 may be readily disengaged from the bracket 8 of the door when in case of breakage of some part of the device or for some other cause it is not desired to use the same or when it is desired to leave the furnace-door open to allow the furnace to cool.

From the foregoing description, taken in connection with the drawings, the operation of my invention will be readily understood. The fireman, holding the shovelful of coal in both hands as he approaches the door, places his foot upon the lever, depressing the same and swinging the door open, and after discharging the shovel into the furnace the door is immediately closed by the operation of the coiled spring and held securely closed until again purposely opened. In this manner no time is lost in opening and closing the door, which remains open at each firing only long enough to enable the fireman to discharge his shovelful of coal into the furnace, thus saving fuel as well as time and labor.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principles or sacrificing any of the advantages of this invention.

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

1. A furnace-door-operating device, the

same consisting of a shaft attached to the wall of the fire-box and provided at one end with a beveled half-gear and at the other with a crank-arm, an arm connecting said crank-arm with the furnace-door, a rock-shaft arranged in suitable bearings attached to the wall of the fire-box and having at one end a beveled half-gear and at the other a spur-gear sector, a spur-gear sector mounted adjacent to the said spur-gear sector and meshing therewith, and a pivotally-mounted spring-actuated foot-lever connected with the said spur-gear sector by means of a rod whereby a rocking motion is given to the same when the lever is oscillated, substantially as shown, and for the purpose set forth.

2. In a furnace-door-operating device, the combination with the furnace-door, of a vertical shaft attached to the front wall of the fire-box and having at its top a beveled half-gear and provided at its lower end with a crank-arm, an arm pivotally connecting said

crank-arm with the furnace-door, a horizontal rock-shaft arranged in suitable bearings above the said furnace-door and having at one end a beveled half-gear and at the other a spur-gear sector, a spur-gear sector pivotally mounted adjacent to the said spur-gear sector and meshing therewith, an oscillating foot-lever pivotally mounted beneath the said spur-gear sector and connected therewith by means of a rod whereby a rocking motion is given to the same when the lever is oscillated, and a spring attached to the foot-lever whereby the same is normally held in an elevated position, substantially as described and for the purpose set forth.

In testimony whereof I have hereunto affixed my signature to this specification in the presence of two subscribing witnesses.

LEWIS HARTEL.

Witnesses:

O. C. BILLMAN,
E. E. ANDREWS.