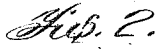


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RICHARD A. PHILBRICK, OF COFFEYVILLE, KANSAS, ASSIGNOR OF ONE-HALF TO JOEL D. MADDEN, OF PARSONS, KANSAS.

FIRE-BOX-DOOR CLOSER.

965,009.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RICHARD A. PHILBRICK, a citizen of the United States, residing at Coffeyville, in the county of Montgomery and State of Kansas, have invented a new and useful Improvement in Fire-Box-Door Closers, of which the following is a specification.

This invention relates to mechanism operated by compressed air for closing and opening furnace doors and is especially adapted for use in connection with the doors of locomotive furnaces, where the compressed air necessary to operate the device can be readily obtained by tapping the train pipe.

The invention consists of the novel features of construction hereinafter set forth, pointed out in the claim and shown in the accompanying drawings, in which,

Figure 1 is a detail sectional view showing the invention applied to a furnace door, the door and an end of the furnace being shown in outline, and the floor of an engine cab being shown partly in section. Fig. 2 is a section on the line 2—2 of Fig. 1, looking downwardly.

In these drawings, 1 represents the furnace and 2 the door and the door is provided with hinge leaves 3 which are fixed to a rotatable pintle 4 journaled in suitable bearings which bearings may consist of the stationary sleeves which now form a part of the usual hinge. The device can therefore be applied to doors already in use by simply substituting the pintle 4 for the present pintle, and this pintle extends downwardly and at its lower end carries a drum 6 provided with intersecting cam grooves 7 which extend spirally about the drum. Upon either side of the drum are placed guides 8. Below the cab floor is arranged vertically an air cylinder 9 provided with a piston 10 having a piston rod 11. At its upper end the piston rod is forked providing two upwardly extending parallel arms 12 which slide upon the guides 8, and between said guides and the drum 6. These arms at their free ends carry inwardly extending cam arms 12^a, which may be either in the form of pins or rollers, and which engage the cam grooves 7 of the drum. I also place beneath the cab floor a valve casing

13 in which works a slide valve 14 of the D type, and a compressed air pipe 15 leads to the casing 13. From the said casing an air pipe 16 leads to the upper end of the cylinder 9 and a pipe 17 leads to the lower end of the cylinder 9, and an exhaust pipe 18 leads from the valve casing 13, and communicating with said casing at a point midway the pipes 16 and 17. The valve 14 is of a sufficient length to bridge two of the three pipes and when in one position connects the pipes 17 and 18, as shown in the drawings, and when moved into the other position connects pipes 16 and 18, so that one of the air pipes leading to the cylinder 9 is always in communication with the exhaust pipe 18 while the other pipe is in communication with the air pipe 15.

Any desired means may be provided for sliding the valve 14, and I have shown a simple construction consisting of a foot operated rod 19 normally held in elevated position by a spring 20, and which when depressed rocks a bell crank 21, pivotally connected to a valve stem 22.

The spring 20 normally holds the valve 14 in such position that the air pipe 16 is normally in communication with the train pipe 15, so that the air pressure holds the piston 10 at the lower end of the cylinder 9, thus holding the furnace door closed. Upon depressing the rod 19 the valve 14 is shifted so that pipe 16 is brought into communication with the exhaust pipe 18 and air is exhausted from the cylinder through the pipe 16 and admitted to the cylinder at the lower end through the pipe 17. This forces the piston to the upper end of the cylinder and the upward movement of the piston rod 11 and arms 12 causes the cam arms 12^a to travel along the cam grooves 7, thus rotating the drum 6 and pintle 4 and swinging the furnace door into open position. Upon release of the pressure upon the pin 19 a reversal of the above operation will take place and the door will be automatically closed.

What I claim is:—

A device of the kind described consisting of a vertically arranged compressed air cylinder, a piston therein, a piston rod extending upwardly, the upper end of the piston rod being forked providing upwardly ex-

tending parallel arms, guides upon which said arms slide, inwardly extending cam arms carried by the free ends of the first mentioned arms, a rotatable spirally grooved drum arranged between the arms first mentioned and engaged by the cam arms, a door, a pintle carried by the door, said pintle be-

ing upon the axial line of the drum and connected thereto, and means for admitting compressed air to the ends of said cylinder. 10

RICHARD A. PHILBRICK.

Witnesses:

H. G. MEGINN,

A. G. HUGHES.