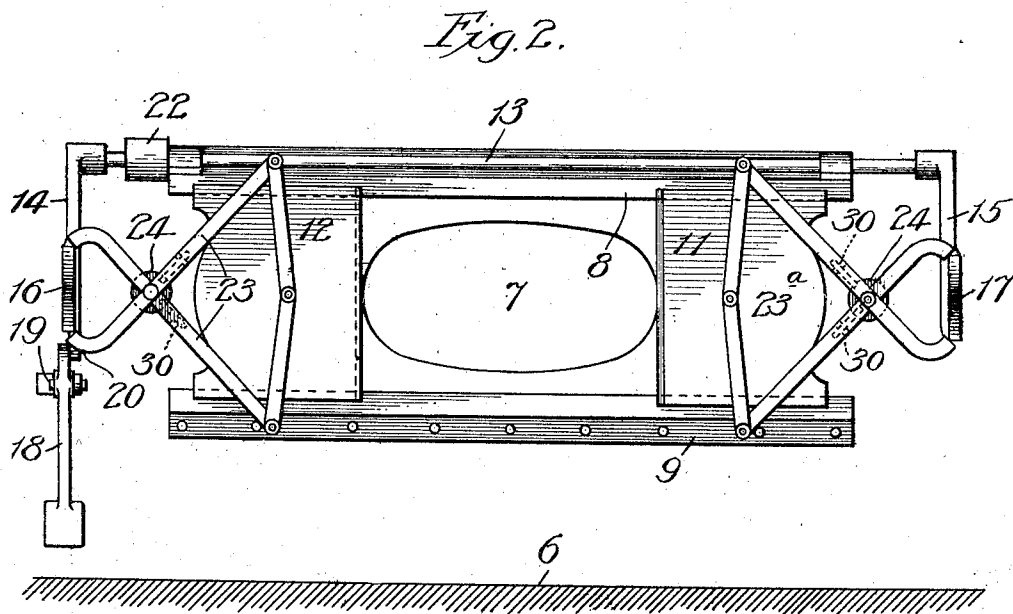
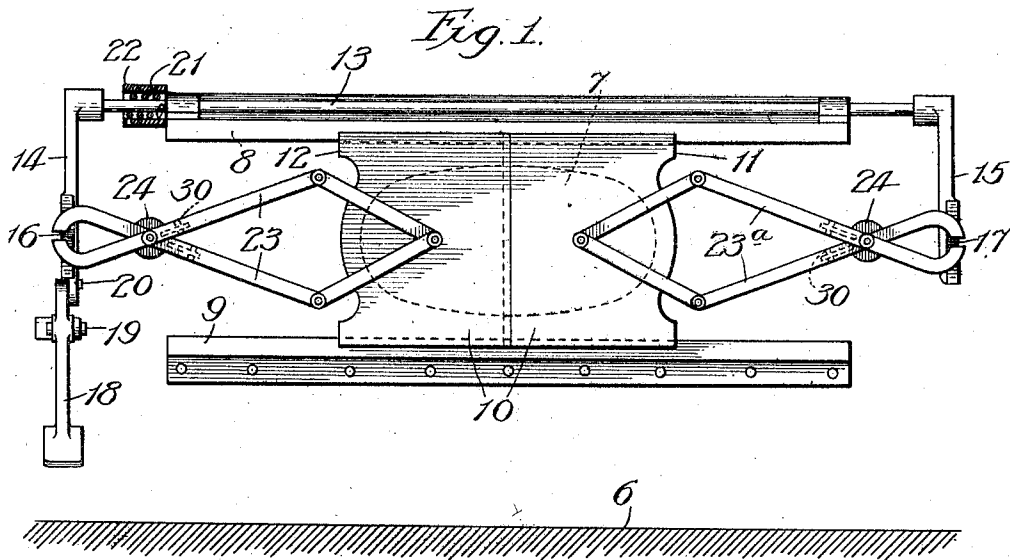


E. M. MATTHEWS.
DOOR OPERATING MEANS.
APPLICATION FILED NOV. 5, 1909.

952,829.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.



Witnesses:

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Chas. A. Bull

Inventor:

Edgar M. Matthews
By Sympson, Lee, Chittenden & Miles,
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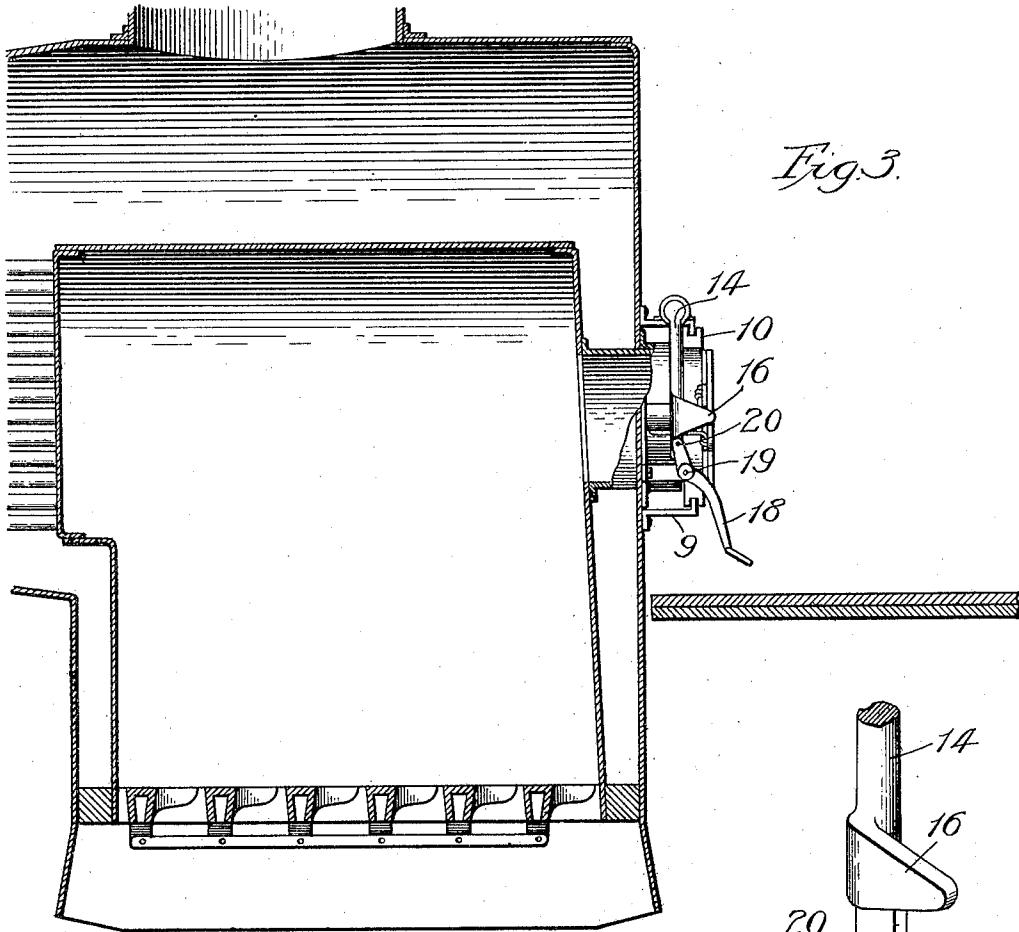


Fig. 3.

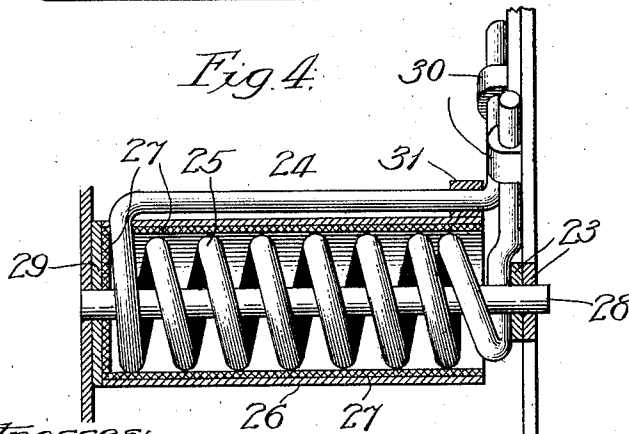


Fig. 4.

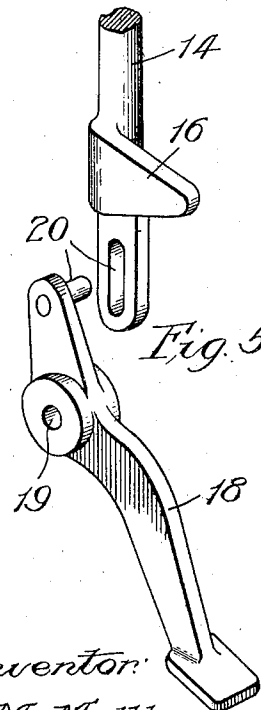


Fig. 5.

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UNITED STATES PATENT OFFICE.

EDGAR M. MATTHEWS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO W. E. ROTHERMEL, OF CHICAGO, ILLINOIS.

DOOR-OPERATING MEANS.

952,829.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed November 5, 1909. Serial No. 526,361.

To all whom it may concern:

Be it known that I, EDGAR M. MATTHEWS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Door-Operating Means, of which the following is a specification.

My invention relates to an improvement in the class of sliding doors which require, in their use, to be readily opened and held open for a time, as by hand or foot power, and to be closed automatically and more or less quickly upon releasing them from the open condition. Furnace-doors and car-doors are among the varieties included in this class, the former requiring to be held open while throwing a shovelful of coal into the furnace and closed as expeditiously as possible to reduce to the minimum the period of exposing the fire to the outer air, and the latter requiring to be held open long enough to permit passengers to pass and to close thereafter with the least possible waste of time.

My invention relates, more particularly stated, to improved means for operating, in the manner thus suggested, a sliding door of any kind; but I illustrate it in the drawing, forming a part hereof, as applied to a locomotive furnace for the sake of convenience and because I have immediately devised it for that particular application.

In the accompanying drawing, Figure 1 is a view in front elevation showing a locomotive-furnace door equipped with my improvement, with the door in its normally-closed condition; Fig. 2 is a view like that presented in Fig. 1, but showing the door open; Fig. 3 is a broken sectional view showing the furnace-portion of a locomotive in side elevation equipped with my improvement; Fig. 4 is an enlarged sectional view of the housed helical-spring device which is applied to the lazy-tongs, at their junctions, for unfolding or distending them to effect the door-closure. Fig. 5 is a broken perspective view of the actuating treadle-lever and a rock-shaft arm adapted to be connected therewith, but showing them in unassembled relation.

In Figs 1 and 2 the floor-line of a locomotive-furnace is indicated at 6. The door-opening 7 leading to the fire-box is faced, above and below, with similar metal Z-bars 8 and 9. The furnace-door 10 is formed of two similar members or sections 11 and 12,

each grooved along its upper and lower edges there to embrace the vertical sections of the Z-bars to enable them to slide thereon toward and from each other in closing the door by meeting at the vertical center of the opening 7 and to open it by separating the sections. A rock-shaft 13 is journaled above the door to extend lengthwise of the bar 8 and carries on its opposite projecting ends similar depending arms 14 and 15, terminating at their lower ends, respectively, in forwardly-projecting wedge-shaped fingers 16 and 17. A lever for turning the rock-shaft is shown in its preferred form of a bell-crank treadle 18 fulcrumed, at 19, to extend its lower end downwardly and forwardly, at the left-hand side of the furnace-door, into position conveniently accessible to the left foot of the fireman, the opposite bent and shorter arm of the treadle being pivotally connected, at 20, with the lower slotted end of the arm 14. On the shaft 13 is provided a torsion-spring 21, confined in a suitable casing 22 and performing the function hereinafter explained. One end of a lazy-tongs 23 is pivotally fastened to the face of the door-member 12, and a similar lazy-tongs 23^a is fastened in like manner to the face of the door-member 11, whereby distending or unfolding the lazy-tongs into the condition represented in Fig. 1 runs the door-members toward each other to close the door, and spreading the members apart to open the door results from folding or retracting the lazy-tongs into the condition represented in Fig. 2. The first-named, or normal, condition is superinduced by the action of a torsion-spring device 24 at the fulcrum of each lazy-tongs and involving, as its preferred construction, that shown in Fig. 4. The helical spring 25 is housed in a tubular metal shield 26 lined with heat-insulating material 27, such as asbestos covering, to protect the spring against injury from the furnace-heat; and a rod 28, fastened at its opposite ends, as to the forward boiler-head and the front furnace-wall, extends horizontally and centrally lengthwise through the shield and through the spring 25 therein, the end of the shield nearest the boiler being preferably closed by a metal head 29, protected on its inner face with insulating material 27, the head, however, not being necessarily fastened to the shield. The rods 28 form fulcrums for the lazy-tongs, along op-

posite ends of which the springs 25 extend through loops 30 thereon, one end of each spring passing out through the wall of its shield 26 and along the latter through a bearing 31 on its forward end, as shown in Fig. 4. The outer curved ends of the lazy-tongs register, at their meeting-extremities, respectively with the wedges 16 and 17, the pointed ends of which normally extend between those extremities in the normal forwardly-inclined condition of the arms 14 and 15 and treadle 18 maintained by the normal tension of the spring 21, in which condition of the parts the door-members abut to close the door with the lazy-tongs in their condition represented in Fig. 1. Pressure on the treadle turns the rock-shaft 13 against the resistance of the spring 21 to advance the arms 14 and 15 and force the wedges between the lazy-tongs to spread them apart at their adjacent ends, thereby bringing them, against the tension of their controlling springs 25, to the condition represented in Fig. 2, whereby they retract the door-members and open the door, which is held open while the treadle remains depressed by the foot of the fireman during the time he is throwing a shovelful of coal into the furnace. The moment he releases the treadle, the spring 21 turns the shaft 13 to retract the arms 14, 15 and withdraw the wedges to normal position; and the springs 25 being thus freed, their recoil-force distends the lazy-tongs to slide the members 11 and 12 toward each other and thus quickly close the door.

While the door is shown to be of the folding variety, comprising two members, it may be a single sliding door, when, of course, only one of the lazy-tongs and the means connected with the rock-shaft for operating it would be required.

What I claim as new and desire to secure by Letters Patent is—

1. In combination with a sliding door, a spring-pressed lazy-tongs pivotally connected at its inner end with the door, a spring-pressed rock-shaft having an arm extending from it and provided with a wedge registering with the separable outer end of the lazy-tongs, and means for turning said shaft against the resistance of its controlling-spring to force the wedge between the extremities of said separable end of the lazy-tongs, for the purpose set forth.

2. In combination with a sliding door, a lazy-tongs pivotally connected at its inner end with the door, a rod forming the lazy-tongs fulcrum, a spring confined about said rod with its free ends engaging opposite arms of the lazy-tongs, a spring-pressed rock-shaft having an arm extending from it and provided with a wedge registering with the separable outer end of the lazy-

tongs, and means for turning said shaft against the resistance of its controlling spring to force the wedge between the extremities of said separable end of the lazy-tongs, for the purpose set forth.

3. In combination with a sliding-door, a lazy-tongs pivotally connected at its inner end with the door, a rod forming the lazy-tongs fulcrum, a metal shield surrounding said rod, a spring confined in the shield about the rod therein with its free ends engaging opposite arms of the lazy-tongs, a spring-pressed rock-shaft having an arm extending from it and provided with a wedge registering with the separable outer end of the lazy-tongs, and means for turning said shaft against the resistance of its controlling spring to force the wedge between the extremities of said separable end of the lazy-tongs, for the purpose set forth.

4. In combination with a sliding door, a spring-pressed lazy-tongs pivotally connected at its inner end with the door, a spring-pressed rock-shaft having an arm extending from it and provided with a wedge registering with the separable outer end of the lazy-tongs, and a lever fulcrumed near one end adjacent to said arm and connected therewith, for the purpose set forth.

5. In combination, a door formed of two sliding sections adapted to be separated to open the door and brought into meeting relation to close it, and means for operating said sections, comprising spring-pressed lazy-tongs each connected at its inner end with one of the door-sections and separable at its outer end, a spring-pressed rock-shaft having arms extending from it and provided with wedges registering with said separable ends of the lazy-tongs, and a lever connected with said shaft for turning it against the resistance of its controlling-spring to force the wedges between the extremities of the separable ends of the respective lazy-tongs, for the purpose set forth.

6. In combination, a door formed of two sliding sections adapted to be separated to open the door and brought into meeting relation to close it, and means for operating said sections, comprising spring-pressed lazy-tongs each connected at its inner end with one of the door-sections and separable at its outer end, a spring-pressed rock-shaft having arms extending from it and provided with wedges registering with said separable ends of the lazy-tongs, and a treadle fulcrumed near one end adjacent to the free end of one of said arms and pivotally connected therewith, for the purpose set forth.

EDGAR M. MATTHEWS.

In presence of—

R. A. WILSON,
J. SCHAEFER.