A. E. VEZINA.

ATTACHMENT TO FURNACE DOORS.

APPLICATION FILED NOV. 13, 1911.

1,068,715. Patented July 29, 1913.

FIG. 1

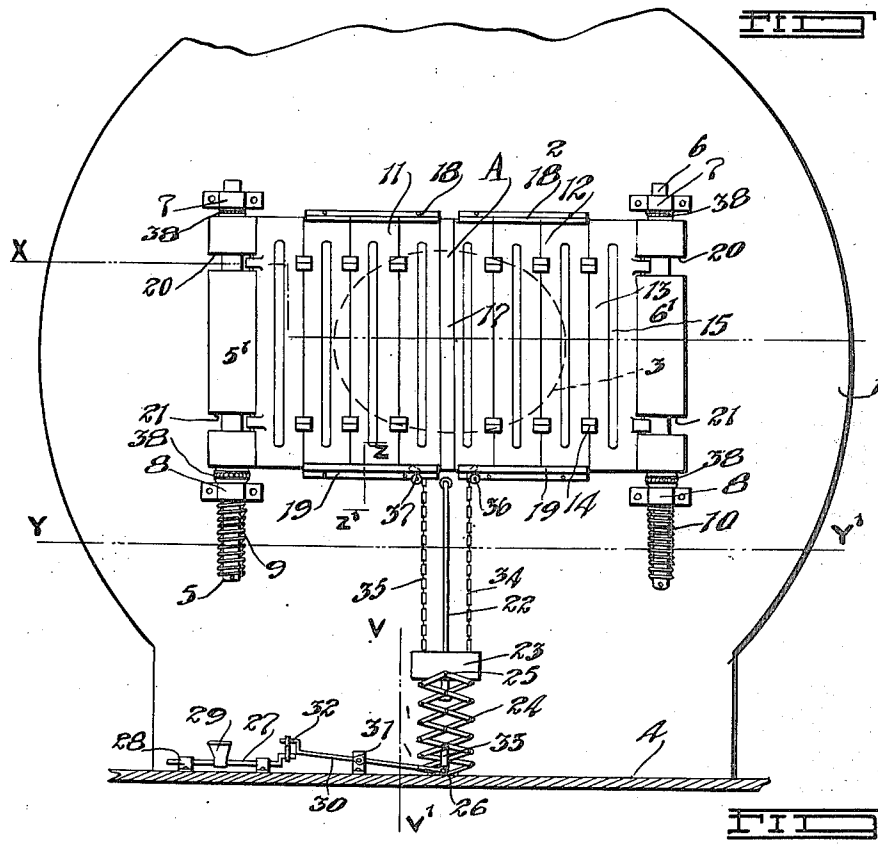


FIG. 2

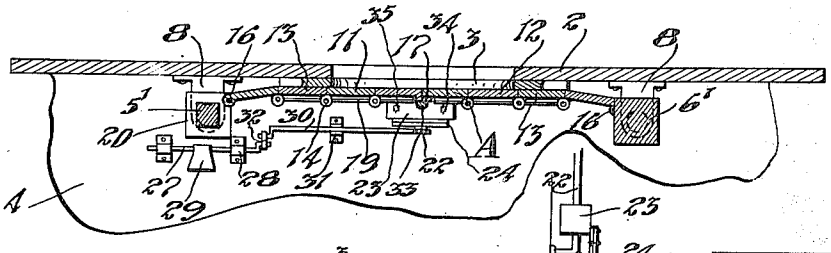


FIG. 3

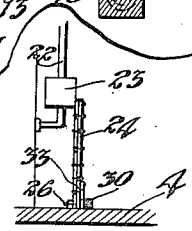
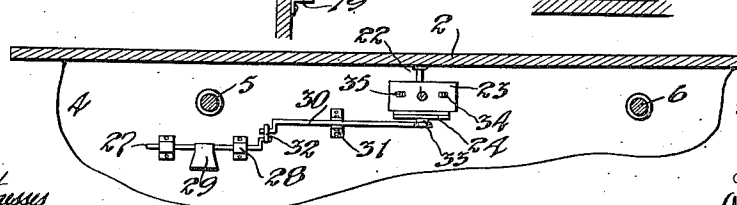


FIG. 4



FIG. 5



Witnesses
G. Thomson
G. S. Boxburgh

Inventor
A. E. Vezina

By Fred B. Fahrenbach
Attys

UNITED STATES PATENT OFFICE.

ANTOINE EMILE VEZINA, OF BRANDON, MANITOBA, CANADA.

ATTACHMENT TO FURNACE-DOORS.

1,068,715. Specification of Letters Patent. Patented July 29, 1913.

Application filed November 13, 1911. Serial No. 659,917.

To all whom it may concern:

Be it known that I, ANTOINE EMILE VEZINA, a subject of the King of Great Britain, of the city of Brandon, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Attachments to Furnace-Doors, of which the following is the specification.

My invention relates to mechanism for mechanically opening and closing the fire doors of a furnace, and more specifically to such as are designed particularly to use in conjunction with the fire doors of a locomotive.

The object of the invention is to provide a furnace door which can be easily and quickly opened and closed without requiring the fireman to use his hands, and my invention consists of a furnace door which the fireman can open with his foot by stepping on a lever or other suitable appliance, and which will close itself when the fireman removes his foot from the lever.

A further object of the invention is to provide a simply constructed, durable, and efficient door which will operate quickly and so prevent any prolonged inrush of air to the furnace during the time that it is being fired.

With the above objects in view the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described and later pointed out in the appended claims.

Figure 1 represents an end view of a boiler with my attachment applied, and in the closed position. Fig. 2 represents a horizontal sectional view through the end of the boiler and door, the section being taken in the plane denoted by the line X X′, Fig. 1. Fig. 3 is a horizontal sectional view through the end of the boiler and parts of the door operating mechanism, the section being taken in the plane denoted by the line Y Y′, Fig. 1. Fig. 4 is a vertical sectional view through a portion of one of the door sections, the sections being taken in the plane denoted by the line Z Z′, Fig. 1. Fig. 5 is a vertical sectional view through the platform and under plate of the boiler, the section being taken in the plane denoted by the line V V′, Fig. 1.

In the drawing like characters of reference indicate corresponding parts in each figure.

In the present instance I have shown the attachment as applied to the boiler of a railroad engine, but it is to be understood of course that it can be placed upon any boiler with equal advantage.

1 represents an engine boiler of which 2 is the front end plate, and 3 the furnace door opening.

4 represents the customary platform adjoining the boiler.

5 and 6 represent two upright and parallel shafts located to the sides of the doorway opening and rotatably mounted in upper and lower horizontally disposed bearing pieces 7 and 8 permanently fixed to the end 2 of the boiler. The lower ends of the shafts extend beyond the bearing pieces 8 and receive oppositely wound spiral springs 9 and 10, which springs have their lower ends fastened to the extremities of the shafts, and their upper ends secured to the bearing pieces 8.

"A" represents the furnace door which is formed from two similar sections 11 and 12 secured to the shafts 5 and 6, respectively. Each section is formed from a number of similar plates 13 connected together by hinges 14 and reinforced by longitudinally disposed ribs 15. The outer plates of each section are pivotally secured to the shafts by pivot pins 16, while the inner plates are designed to overlap as shown at 17.

18 and 19 are upper and lower sets of horizontally disposed guide bars firmly secured to the end 2 of the boiler and receiving the door sections slidably.

It is here to be noticed that the shafts 5 and 6 have the body portions 5′ and 6′ thereof square in cross section and of such dimension that the plates can be rolled on to them upon the shafts being turned. Each shaft is provided with grooves 20 and 21 which receive the hinges connecting the plates. The reason for this will be readily understood.

22 is a guide rod connected at its upper and lower ends permanently to the end of the boiler. The rod receives slidably a weight 23 connected to lazy tongs 24 pivotally secured to the weight at 25 and to the floor at 26.

27 is a crank shaft rotatably mounted in suitable bearings 28 fixed to the car platform.

29 is a foot trip pedal extending from the shaft 27.

30 is a lever pivotally secured within a bracket 31 extending upwardly from the

car floor, and 32 is a link connecting one end of the crank arm of the lever 30 with the crank of the shaft 27. By this construction the end of lever 30 is elevated above the adjacent end of the crank shaft 27 and a rotary movement imparted to the crank shaft causes a corresponding rocking movement of the lever 30. The opposite end of the lever is fastened by means of a link 33 to the lazy tongs, so that upon the foot trip being pressed downwardly, the lazy tongs are extended and the weight forced upwardly on the rod.

34 and 35 are chains connecting the weight with the inner plates of the reflective doors. The chains operate over rollers 36 and 37 inserted within the inner ends of the guide bars 19.

In the actual construction of the device the weight 23 has to be heavy enough to overcome the turning effect of the springs on the shafts, otherwise the door sections would be held normally open and this of course is not permitted.

The operation of the device is now described. Upon the fireman placing his foot on the trip 29 and pressing it downwardly, the crank shaft pulls on the lever through the agency of the link 32 and causes the lazy tongs to extend. The weight is accordingly raised on the guide rod and the springs operate to turn the shafts 5 and 6 and consequently roll up the door sections. This exposes the doorway opening for firing purposes. Upon the foot being removed from the trip the weight falls and draws the door sections closed. For convenience in operating I have fitted the shafts with ball bearings 38 which allow them to turn very easily.

What I claim as my invention is:

1. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed shafts carried by the end of the boiler and located at the sides of the doorway opening, said shaft being square throughout substantially its entire length and provided with grooves, hinged door sections secured to the grooved portions of said shafts and adapted to wind thereon, guide bars receiving the sections in their closed position, a guided weight connected to the door sections and holding them normally closed, means for raising the weight, and means for winding the sections on the shafts upon the weight being raised, as and for the purpose specified.

2. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed rotatable shafts located at the sides of the doorway opening, flexible door sections hingedly secured to the shafts and adapted to be wound thereon, said sections normally closing the doorway opening, guide bars receiving the sections and supporting the same slidably, a weight suspended from the door sections and holding the same normally closed, a lazy tongs connected to said weight at one end and to the boiler platform at the other end, a lever connected to said lazy tongs, and a foot actuated lever for rotating said first named lever for raising the weight, and spring means for winding the sections on the shafts upon the raising of the weight.

3. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed shafts carried by the end of the boiler and located at the sides of the doorway opening, hinged door sections secured to the shafts and adapted to wind thereon, guide bars receiving the sections in their closed position, a guided weight connected to the door sections and holding them normally closed, means for raising the weight, and means for winding the sections on the shafts upon the weight being raised, as and for the purpose specified.

4. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed rotatable shafts located at the sides of the doorway opening, flexible door sections hingedly secured to the shafts and adapted to be wound thereon, said sections normally closing the doorway opening, guide bars receiving the sections and supporting the same slidably, a weight suspended from the door sections and holding the same normally closed, means actuated by a foot trip for raising the weight, and spring means for winding the sections on the shafts upon the weight being raised, as and for the purpose specified.

5. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed and rotatably mounted shafts located at the sides of the doorway opening, door sections formed from hinged plates pivotally connected to the shafts and adapted to wind thereon, guide bars receiving the edges of the sections slidably, a vertically slidable weight located beneath the doorway sections and connected thereto whereby the sections are held normally closed, a foot trip adapted to raise the weight, and springs connected to the shafts and designed to rotate them and wind the door sections thereon upon the weight being raised, as and for the purpose specified.

6. The combination with a boiler having an end thereof provided with the usual doorway opening, of a set of vertically disposed and rotatably mounted shafts located at the sides of the doorway opening and having the body portion thereof square in cross section, similar door sections formed from hinged plates and having their outer edges

pivotally secured to the body portions of the shafts, upper and lower sets of guide bars located at the top and bottom of the doorway opening and receiving the door sections slidably, a vertically disposed guide rod beneath the doorway opening, a weight slidable on the guide rod, chains connecting the weight with the door sections, said weight being designed to hold the sections closed, a foot trip, means actuated by the foot trip and connected to the weight for raising the weight a considerable distance for a small depression of the trip, and springs for rotating the shafts and winding the door sections thereon upon the weight being raised, as and for the purpose specified.

Signed at Brandon in the Province of Manitoba this 27th day of May 1911.

ANTOINE ÉMILE VEZINA.

In the presence of—

FRANK PRIMEAU,

WM. DE MANBEY.