W. S. QUIGLEY.

CLOSURE FOR FURNACES.

APPLICATION FILED JAN. 22, 1914.

1,126,080.

Patented Jan. 26, 1915

2 SHEETS—SHEET 1.

Fig. 1.

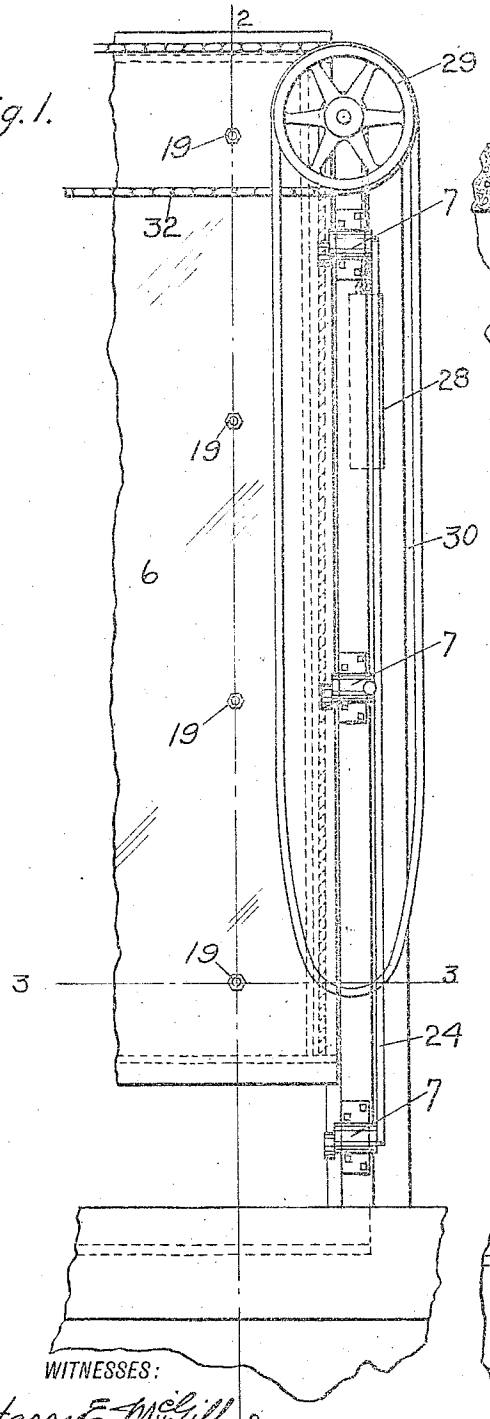
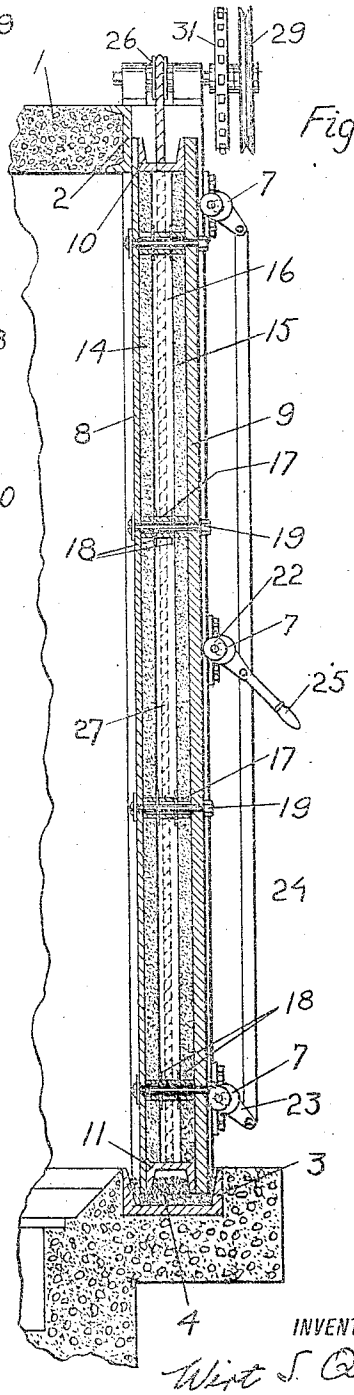


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

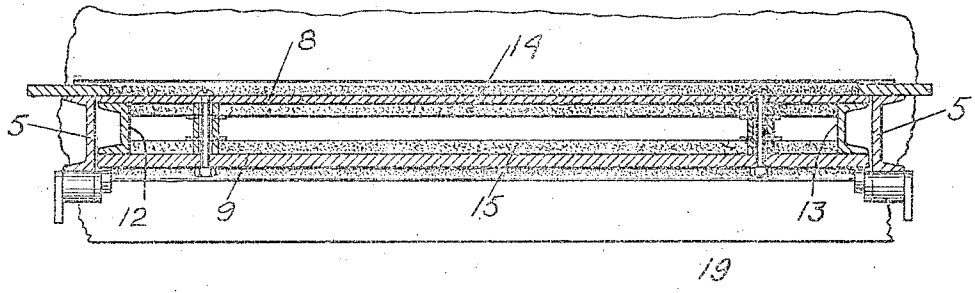


Fig. 4.

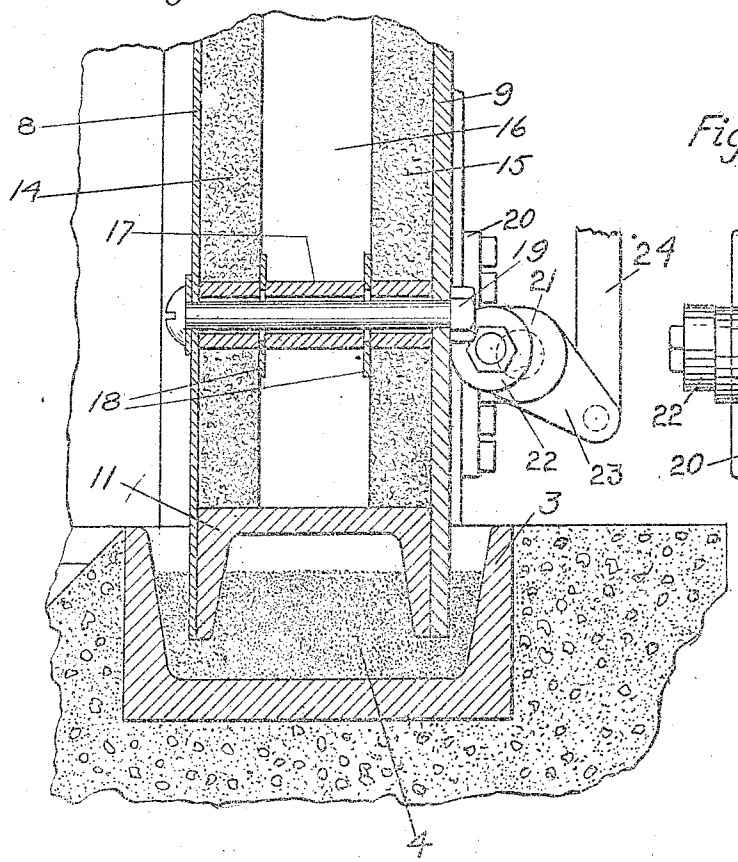
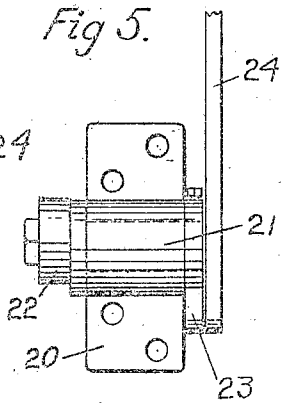


Fig 5.



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CLOSURE FOR FURNACES.

1,126,080. Specification of Letters Patent. Patented Jan. 26, 1915.

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To all whom it may concern:

Be it known that I, WIRT S. QUIGLEY, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Closures for Furnaces, of which the following is a specification.

The present invention relates to a closure for a furnace and has for its object the provision of means whereby the furnace may be effectually sealed with respect to the outside atmosphere, the said means being of such a character that they will not be unduly affected by the heat of the furnace, and to embody such means in a simple and convenient construction.

In carrying out the above objects I provide a vertically sliding door or closure whose lower end dips into a body of sand or the like, when in its closed position, suitable means being provided for confining said body of sand. In order to make the door tight against the body of the furnace, the guiding means for the door or closure will preferably include an abutment engaging with the face of the door, and means will preferably be provided for clamping said door against said abutment.

The door itself comprises inner and outer members of sheet material, such as iron or steel, between which is interposed suitable heat non-conducting material, such as asbestos, mineral wool or the like. Preferably the non-conducting material will be divided into two layers separated by an air space, and suitable means for securing the parts together are employed. I have found that by making the outer member of sheet material relatively thicker than the inner member that the said inner member will not have sufficient power to warp or twist the door when subjected to heat.

The inner and outer members are preferably spaced apart by means of channel members which extend along the side and upper and lower edges of the door, said channels being so arranged that they form vertically extended recesses in the door in the sides thereof, while the bottom channel conveniently forms a double projecting member which extends into the body of sand. In addition to the foregoing, spacing and confining means between the inner and outer members and extending through the non-conducting material may be employed at intervals throughout the entire length and breadth of the door, and the means for securing the parts together may conveniently pass through such spacing and confining means. Suitable side guides for the door are provided, in the present instance taking the form of channel irons so disposed that the channels extend away from the door and form vertical recesses outside the same. The means for elevating the door may take any suitable form but preferably a flexible connection extends down through the vertical recesses in the side edges of the door and is secured thereto, the other end of said flexible connection passing over a suitable pulley and extending down into the vertical recesses outside the door formed by the channel guide members, a suitable weight being attached to the flexible connection which extends down through the said outside channel guide members. The means for clamping the door against the face of the furnace body may consist of eccentrics or cams or the like, which are conveniently mounted on the side guide channels. These cams or eccentrics form a clamping means when in their locked position, and a part of the confining or guiding means for the closure when in their unlocked position.

The invention is embodied in the accompanying drawings in a concrete and preferred form, but changes of construction may be made without departing from the scope of the claims.

In the said drawings: Figure 1 is a front elevation of one side of the closure showing it in its partly raised position. Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1. Fig. 4 is a sectional view of the lower end of the door and the means for confining the body of sand on a large scale. Fig. 5 is a detail view of the clamping means.

Similar characters of reference indicate corresponding parts in the different views.

1 is the furnace body or construction which may be of any suitable character, and is provided with a face abutment 2 at the upper end thereof and at its lower end with the sand confining means 3, conveniently in the shape of a trough, and containing a body of sand 4. Extending from the furnace construction are further the two channel members 5 forming side guides for the door and having their channel extending

outwardly away from the side edges of the door. The door 6 is mounted to slide in the side guides 5 and between the face abutment 2 and the clamping means 7 more particularly hereinafter described.

The door itself comprises inner and outer members of sheet material respectively marked 8 and 9. The outer member 9 is of a greater thickness than the inner member 8 so that the inner member when affected by heat will not be sufficiently powerful to twist or warp the door as a whole. These inner and outer members are spaced apart by the upper and lower channel members 10 and 11, the said lower channel member conveniently forming a double ended extension which buries itself in the sand 4 when the door is closed. The said inner and outer members are further spaced apart by means of the channel members 12 and 13 which extend vertically adjacent to the side edges of the door and form channels or recesses within the door, as shown more particularly in Fig. 3. Interposed between the inner and outer members of the door is a body of non-conducting material, such as asbestos or mineral wool. In the present instance this body is shown as being divided into two layers 14 and 15, separated by an air space 16, and this body of non-conducting material may extend throughout the entire width and breadth of the door. Additional spacing and confining means for this material are found in the sleeves or tubular members 17 and washers 18, which serve to space the inner and outer members and the several layers of non-conducting material and to keep the latter in proper position within the door. If desired, suitable fastening means like the bolts 19, may pass through said spacing and confining means, whereby the parts comprising the door are secured together.

Mounted on suitable brackets 20 on the side guide channels 5 are the rotatable members 21 carrying the cams or eccentrics 22 and having connected thereto short arms 23 which are pivotally attached to a vertically extending connecting rod 24, which connecting rod may conveniently be operated by means of the handle 25 so that several of said clamping means may be operated in unison. It will be observed that by moving the rod 24 upward, the clamping member 7 may be disengaged from the front face of the door when the door may be elevated. The said clamping members, however, perform the very important additional function of serving as guides for the door, as will be readily apparent.

The door may be elevated by any suitable means but in the present instance I employ a rotatable member or pulley 26 which is mounted on a stationary portion of the furnace and over which passes a flexible connection 27 down into the recesses formed by the channel members 12 and 13, the other end of said flexible connection having a weight 28 attached thereto and passes down through the channels formed by the side guide channel members 5. The pulley 26 may be operated by means of a wheel 29 and a belt 30. In addition, another pulley 31 may be mounted to rotate with the member 29, and by means of a chain 32 may communicate motion to the other side of the furnace door, where a pulley similar to 26 and a flexible connection similar to 27, may be employed so as to lift both sides of the door in unison.

What is claimed, is:

1. A closure for a furnace comprising inner and outer members of sheet material, the outer member being of greater thickness than the inner member, non-conducting material interposed between the inner and outer members, and means for securing the parts together.

2. A closure for a furnace comprising inner and outer members of sheet material, the outer member being of greater thickness than the inner member, two layers of non-conducting material separated by an air space interposed between the inner and outer members, and means for securing the parts together.

3. A closure for a furnace comprising inner and outer members of sheet material, spacing members separating said inner and outer members, a body of non-conducting material interposed between said inner and outer members, and means for securing the parts together.

4. A closure for a furnace comprising inner and outer members of sheet material, spacing members located adjacent to the edges of said inner and outer members, a body of non-conducting material interposed between said inner and outer members, and means for securing the parts together.

5. A closure for a furnace comprising inner and outer members of sheet material, spacing members located adjacent to the edges of said inner and outer members, a body of non-conducting material interposed between said inner and outer members, spacing and confining members between the inner and outer members and extending through the non-conducting material, and means for securing the inner and outer members together.

6. A closure for a furnace comprising inner and outer members of sheet material, channel members extending vertically between said inner and outer members adjacent to the side edges thereof, said channel members forming a recess in the side edges of the closure, means for securing the parts together, channel members forming side guides for the closure and forming a recess

adjacent to the side edges of the closure, said recesses of the guides being separated from the recess in the closure by the main body of the channel iron aforesaid, flexible connections passing down through the recesses in the closure and secured thereto, a pulley mounted independently of the closure over which said flexible connection passes, and a weight connected to the other end of the said flexible connection and passing down through the recesses outside the closure.

7. A closure for furnaces comprising inner and outer members of sheet material, vertical and horizontal channel members disposed between said inner and outer members at their edges forming a recess in the side edges of the closure, spaced sheets of non-heat conducting material interposed between said members, means extending transversely through said inner and outer members for securing said parts together and holding said non-heat conducting material in spaced relation.

8. The combination with a furnace having an opening therein, of a vertically slidable closure for said opening, vertically disposed guide members arranged at opposite sides of the closure to guide the same in its vertical movement, abutments provided on the edges of the opening of the furnace to form back guide members for the closure, means for raising and lowering said closure, and means on the vertical guides for locking the closure in opened and closed position and to provide front guide members for the closure when unlocked.

9. A closure for furnaces comprising inner and outer members of sheet material, non-heat conducting material interposed between said members, channel members extending vertically and horizontally between said inner and outer members adjacent their side edges of the closure, means for securing said parts together, a body of sand in line with the lower end of the closure and into which the lower horizontal channel member will extend when the closure is in closed position, a roller disposed adjacent the closure, a flexible member extending over the roller and having one end weighted and the other end extended down the recess in the vertical channel members and secured to the lower end of the closure, means to actuate the roller, and means to lock the closure in closed or open position.

10. A closure for furnaces comprising inner and outer members of sheet material, vertical and horizontal channel members disposed between said inner and outer members at their edges and forming recesses in the side edges of the closure, spaced sheets of non-heat conducting material disposed between said inner and outer members, means extending transversely through said inner and outer members for securing said parts together and holding said non-heat conducting sheet in spaced relation, guide members for the closure, means secured to the closure and extending through the recesses of said vertical channel members for raising and lowering the closure, and means secured to the guide members to engage with the outer member of the closure to cause the inner member thereof to engage with the wall of the furnace whereby the closure may tightly seal the opening of the furnace and be supported in open or closed position.

11. A closure for furnaces comprising inner and outer members of sheet material, members disposed between said inner and outer members for holding the same in spaced and parallel relation, means connecting the inner and outer members for holding said parts together, guide members disposed adjacent the vertical sides of said closure, a pulley mounted upon the upper end of each of said guide members, a flexible member connected to the lower end of the closure and extended over said pulley for raising and lowering said closure, rotatable means mounted on the guide members and adapted to engage the outer member of the closure when said means are rotated so that the closure will frictionally engage the outer wall of the furnace.

12. A closure for furnaces comprising inner and outer members of sheet material, means disposed between said members to hold the same in spaced relation, means for securing said parts together, guide members vertically disposed adjacent the opposite sides of the closure, means for raising and lowering the closure, a plurality of rotatable members journaled on each of said guide members, roller members eccentrically secured to the inner end of said rotatable members and adapted to engage the outer member of the closure so as to force the closure into frictional engagement with the wall of the furnace, a lever rigid with one of the rotatable members on each of said guide members, and a rod connecting the remainder of the rotatable members of each respective guide with said lever thereof so that the rotatable members may be operated in unison.

Signed at New York city in the county of New York and State of New York this 20th day of January A. D. 1914.

WIRT S. QUIGLEY.

Witnesses:
AXEL V. BEEKEN,
EDWARD H. YOUNG.