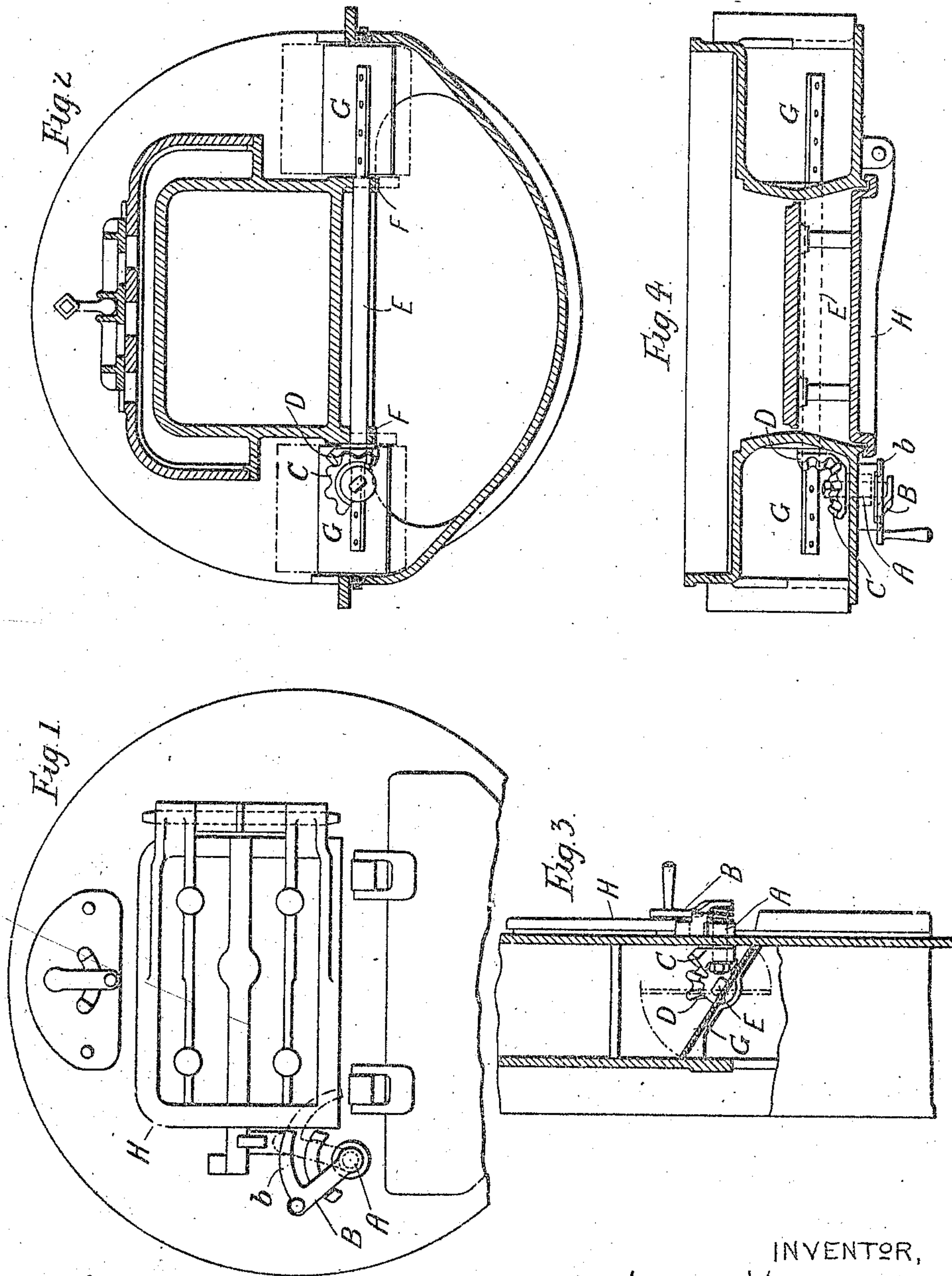


J. HOWDEN.  
FURNACE FRONT.  
APPLICATION FILED FEB. 26, 1909.

923,178.

Patented June 1, 1909.



WITNESSES,  
*W. H. Berrigan*  
*John H. Howden*

INVENTOR,  
JAMES HOWDEN,  
by *Wm. O'Connell*  
Attorney.



# UNITED STATES PATENT OFFICE.

JAMES HOWDEN, OF GLASGOW, SCOTLAND, ASSIGNOR TO JAMES HOWDEN & COMPANY, LIMITED, OF GLASGOW, SCOTLAND.

## FURNACE-FRONT.

No. 923,178.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed February 25, 1909. Serial No. 479,948.

*To all whom it may concern:*

Be it known that I, JAMES HOWDEN, a subject of the King of the United Kingdom of Great Britain and Ireland, and residing at Glasgow, Scotland, have invented a certain new and useful Improvement in Furnace-Fronts, of which the following is a specification.

This invention relates to fronts of boiler and other furnaces of the kind arranged to work under forced draft and in which the furnace door is secured against opening, while the air supply valves are open, by a locking lever pivoted on the furnace front and adapted to stand in front of the door, said lever serving to close the air supply valves when withdrawn to permit of the furnace door being opened.

The object of the present invention is to provide an improved arrangement wherein the air supply valves are arranged to rock on an axis parallel to the furnace front and are operated through gearing from the furnace door locking lever pivoted on the furnace front.

According to the invention, the spindle of the furnace door locking lever has attached to its inner end a toothed member, for instance, a wheel having bevel teeth on part of its periphery adapted to gear with a like toothed member on a shaft carried in bearings within the furnace front and disposed parallel thereto, said shaft having attached to it at each end a valve for controlling the supply of air to the furnace.

In the accompanying drawings Figure 1 is a front elevation, Figs. 2 and 3 are vertical sections at right angles to each other, and Fig. 4 is a horizontal section, of a Howden's forced draft furnace front fitted with the improvements.

As shown in the drawings, the spindle A of the furnace door locking lever B, which in part is of bent or horn-like formation, has attached to its inner end a wheel or segment C having bevel teeth on part of its periphery

adapted to gear with a like wheel or segment D secured to a shaft E carried in bearings F and disposed parallel to the furnace front, the said shaft E having attached to it at each end a valve G for controlling the supply of air to the furnace.

When the lever B is turned to withdraw the bent or horn-like arm b from its position in front of the furnace door H, (see Fig. 1), the wheel C receives a partial rotation and imparts movement to the wheel D, whereby the valves G are brought to their closed position, indicated by full lines at Figs. 2 and 3, and the furnace door H can then be opened without risk of flame entering the stokehole; but when the furnace door H is closed and the arm b restored to locking position (indicated by dotted lines at Fig. 1), the wheel D is turned in the reverse direction so that the valves G are brought to their open position, indicated by dotted lines at Figs. 2 and 3.

Having now described my invention what I claim and desire to secure by Letters Patent of the United States is:—

In forced draft installations, in combination, a furnace front, a furnace door therefor, a lever having a spindle mounted on said furnace front, said lever adapted to be swung out of or into position in front of the furnace door, a toothed member on the spindle of said lever, air supply conduits in said furnace front, a shaft disposed parallel to the furnace front, a second toothed member on said shaft adapted to gear with the first mentioned toothed member, and a valve at each end of said shaft for controlling the supply of air through the aforesaid conduits to the furnace, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES HOWDEN.

Witnesses:

WALLACE CRANSTON FAIRWEATHER,  
JOHN McCLEARY, Jr.