Nov. 18, 1930. F. H. WILLCOX ET AL 1,781,796

BURNER

Filed April 14, 1928 3 Sheets-Sheet 1

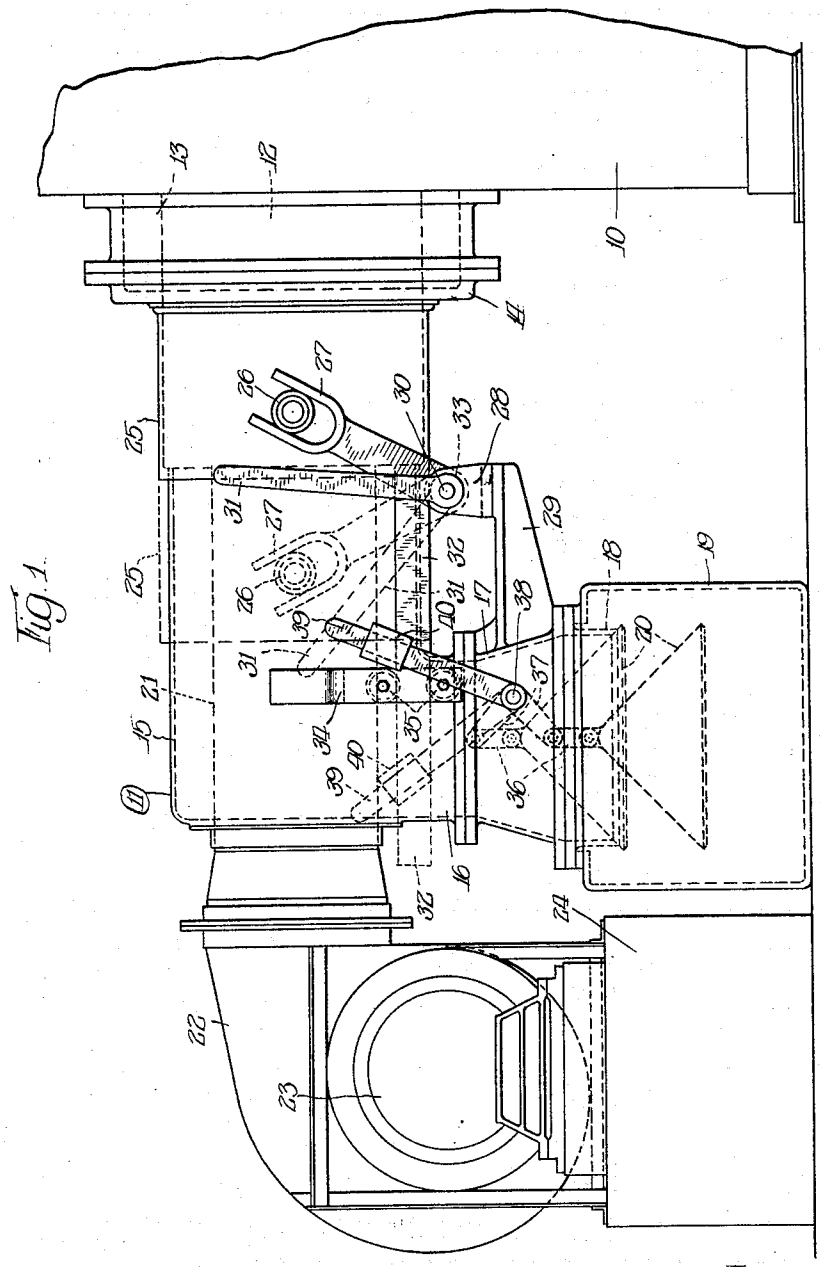


Fig. 1.

Inventors:
Frederich H. Willcox,
Edgar P. Everhard,

Witness:
R. Burkhardt.

By Wilkinson, Huxley, Byron & Knight
attys.

Nov. 18, 1930. F. H. WILLCOX ET AL 1,781,796

BURNER

Filed April 14, 1928 3 Sheets-Sheet 2

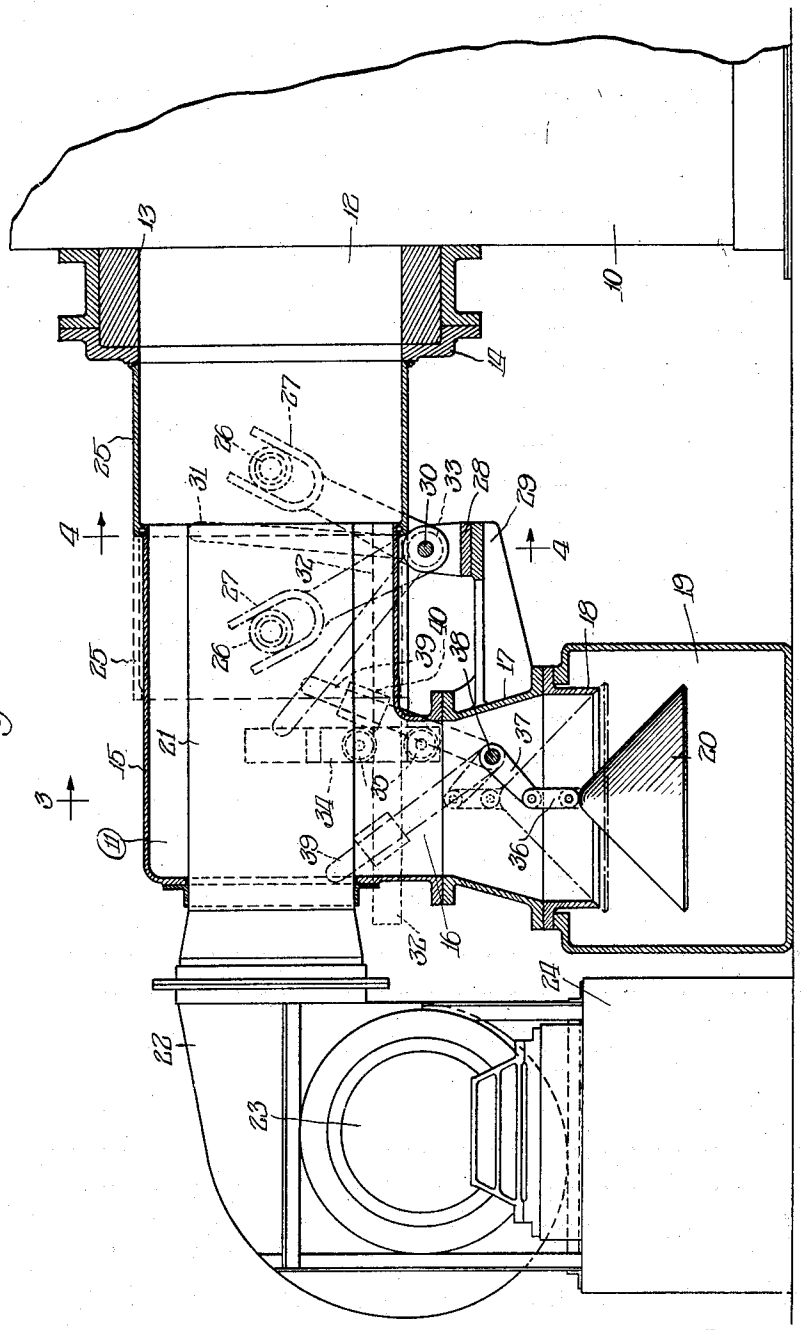


Fig. 2.

Witness:
R. Burkhardt.

Inventors:
Frederick H. Willcox,
Edgar P. Everhard,
By Williamson, Hopkins, Bryant & Knight
Attys.

Nov. 18, 1930. F. H. WILLCOX ET AL 1,781,796

BURNER

Filed April 14, 1928 3 Sheets-Sheet 3

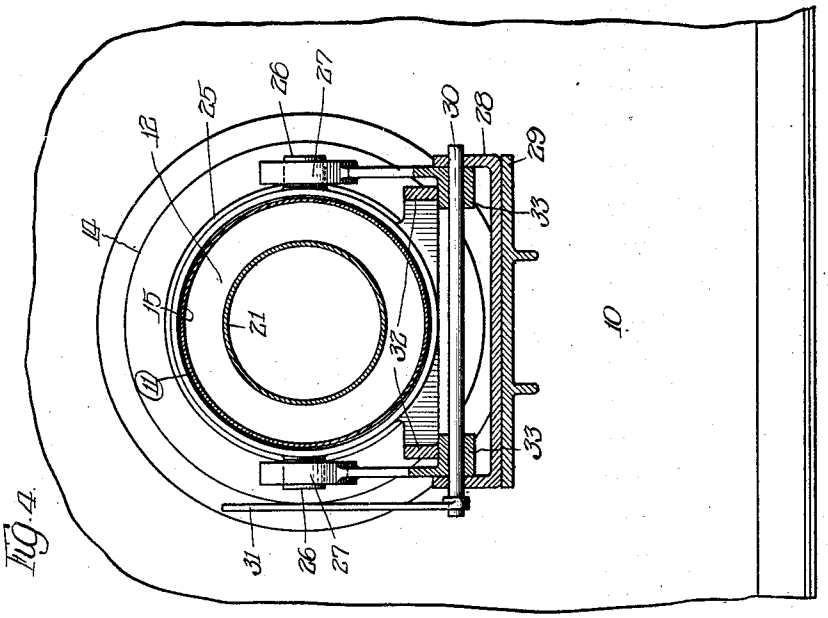


Fig. 4.

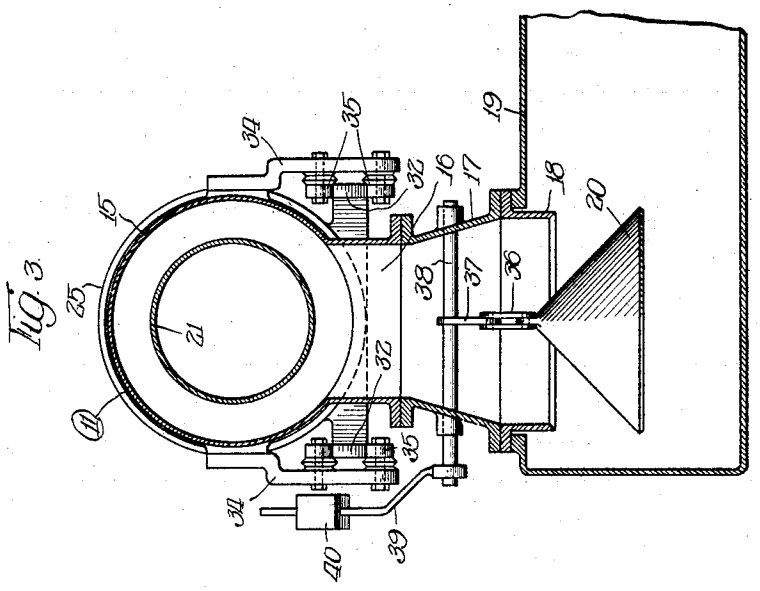


Fig. 3.

Witness:
R. Burkhardt

Inventors:
Frederick H. Willcox,
Edgar P. Everhard,
By Williamson, Hafley, Byrne & Knight Attys.

Patented Nov. 18, 1930 1,781,796

UNITED STATES PATENT OFFICE

FREDERICK H. WILLCOX AND EDGAR P. EVERHARD, OF CHICAGO, ILLINOIS, ASSIGNORS TO FREYN ENGINEERING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE

BURNER

Application filed April 14, 1928. Serial No. 269,926.

The present invention relates to burners.

More particularly the present invention relates to burners applicable to hot blast stoves and blast furnaces. In blast furnace practice, when the hot blast stove is on gas, the burner is connected to the furnace to direct air and gas into said stove, a port being provided for the ingress of said air and gas. When the hot blast stove is on blast, said port is closed by means of a door commonly disposed upon the outside of the hot blast stove or its equivalent. It has been common practice to move the entire gas and air directing mechanism when said door is to be operated. In large installations said gas and air directing mechanism is quite heavy and the job of moving same is an arduous one.

An object of the present invention is to provide a burner for a stove or the like which has the advantage that the connection to or the disconnection from said stove may be readily accomplished.

A further object is to provide a burner applicable to stove practice which involves the movement of only relatively light weight parts when said burner is being connected to or disconnected from its stove.

A further object is to provide a burner applicable to stove practice which is convenient to operate and not likely to get out of order.

Further objects will appear as the description proceeds.

Refering to the drawings—

Figure 1 is a view in side elevation of structure embodying the principles of the present invention;

Figure 2 is a longitudinal sectional view of the structure shown in Figure 1;

Figure 3 is a sectional view taken along the plane indicated by the arrows 3—3 of Figure 2; and

Figure 4 is a sectional view taken along the plane indicated by the arrows 4—4 of Figure 2.

The numeral 10 indicates a blast furnace stove, and the numeral 11 indicates as a whole a burner adapted to cooperate with the stove 10. The stove 10 is provided with the port 12, bounded by the wall 13, which wall 13 may comprise refractory material disposed within the metallic casing 14.

The burner 11 includes the conduit 15, which is provided with the opening 16, which communicates with the casting 17. Said casting 17 is operatively connected to the valve seat 18, which valve seat is connected to the gas conduit 19. As will be noted from Figure 2, communication is had from the gas conduit 19, through the valve seat 18, casting 17 and opening 16, to the conduit 15. Cooperating with the valve seat 18 is the valve 20, which in a certain physical embodiment of the present invention is cone-shaped in outline. The valve closes with the gas stream, and the gas pressure aids in a tight closure. Means are provided for moving the valve 20 selectably to open or closed position, which means will be referred to further presently.

Enclosed within the conduit 15 is the conduit 21, which has communication with the blower 22, which blower is provided with the motor 23. The blower 22 with its motor 23 may be mounted as a unit with relation to the conduits 21 and 15, or, in larger installations said blower 22 with its motor 23 may be mounted upon the foundation 24.

The conduits 15 and 21 stop short of the casing 14 a sufficient distance to permit the manipulation of a door (not shown) in connection with the port 12 of the casing 14. Disposed in sliding relationship with the conduit 15 is the sleeve 25 adapted when in closed position to complete the connection of conduit 15 with the casing 14.

Said sleeve 25 may be moved rearwardly to the position shown in dotted lines in Figure 2 to permit the insertion of the door in closing relationship with the port 12. The sleeve 25 is provided at diametrically opposed

regions with the trunnions 26—26, adapted to be disposed within the yokes 27—27 upon the two sides of the sleeve 25, which yokes are swingingly mounted upon a bracket 28 carried by an extension 29 of the casting 17. The yokes 27—27 are secured to the rotatable shaft 30, which shaft has secured thereto outwardly of the conduit 15 the lever 31, by means of which said yokes may be manually swung about the axis of the shaft 30. Swinging movement of the lever 31 will, by reason of the engagement of the yokes 27—27 with the trunnions 26—26, result in a reciprocating movement of the sleeve 25. Figure 2 shows two alternative positions of one of the yokes 27. One of said positions is shown in lines constituting short dashes, which position is the position in which the sleeve 25 is held closed. The dash and dot line representation of the yoke 27 represents conditions when the sleeve 25 is in open position. In order to guide the sleeve member 25 in a right line movement, said sleeve member has rigidly secured thereto a pair of longitudinally extending bars 32—32. Mounted upon the shaft 30 are rollers 33—33, which support said bars 32—32. Disposed rearwardly of the shaft 30 are a pair of brackets 34—34, each of which carries spaced rollers 35—35 adapted to engage the upper and lower edges of the bars 32—32. The parts are so disposed relative to one another that when the sleeve 25 is in its withdrawn position the forward extremities of the bars 32—32 rest upon the rollers 33—33. At this time the rollers 35—35 are disposed substantially midway of the length of the bars 32—32.

When the sleeve 25 is in its right-hand position as the parts are shown in Figures 1 and 2, the rear end portions of the bars 32—32 are in position to engage the rollers 35—35 and the mid portions of said bars 32—32 are in position to rest upon the rollers 33—33. The sleeve 25 and the casing 14 may, if preferred, have cooperating seats. The sleeve 25 will be prevented at all times from getting out of its proper axial alignment with the port 12 by reason of the cooperation of the rollers 35—35 and rollers 33—33 with the bars 32—32 and by a sliding engagement with conduit 15.

The valve 20 in the illustrated embodiment of the present invention is supported by the link 36, which in turn is carried by the crank 37 fast to the transversely extending rotatable shaft 38. Said shaft 38 has secured thereto the lever 39, which may be weighted by the weight 40. The lever 39 and the lever 31 are preferably upon the same side of the conduit 15, whereby the operator may conveniently control both of said levers. The lever 39 and the parts associated therewith are so weighted that the valve 29 will remain in either its closed or its open position when the lever 39 is correspondingly moved to one side or the other of the vertical plane including the axis of the shaft 38.

In the operation of the device, the operator may control the supply of gas by operating the valve 39, opening the valve 20 by swinging the lever 39 to the left as the parts are viewed in Figures 1 and 2, and closing said valve by swinging the lever 39 to the right as the parts are viewed in said figures. During operation, gas from the gas conduit 19 will mingle with the air delivered by the conduit 21, forming a combustible mixture entering the port 12.

The relative supplies of air and gas may be controlled by any of the well known means upon the market for that purpose. When gas and air are being supplied to the hot blast stove, the sleeve 25 will, of course, be in its closed position, as indicated in full lines in Figures 1 and 2. When it is desired to disconnect the burner 11 from the hot blast stove 10, the supply of gas and air will be shut off and the lever 31 will be swung to the left as the parts are viewed in Figures 1 and 2, whereby the sleeve 25 will be moved away from the blast furnace 10, being guided in a straight line movement by reason of the engagement of the bars 32—32 with the rollers 33—33 and the rollers 35—35. When the sleeve 25 is moved to the left, as shown in dotted lines in Figure 2, ample room will be provided for manipulating the door (not shown) for closing the port 12.

Though a preferred embodiment of the present invention has been described in detail, many modifications will occur to those skilled in the art. It is intended to cover all such modifications that fall within the scope of the appended claims.

What is claimed is—

1. In combination, a stove, a conduit for directing gas to said stove and a conduit for directing air to said stove, one of said conduits being in encircling relationship with the other of said conduits, said conduits stopping short of said stove, and a sleeve slidable along the outermost of said conduits, said sleeve being adapted to complete the connection between said outermost conduit and said stove.

2. In combination, a gas supply conduit, an air supply conduit communicating with said gas supply conduit, one of said conduits being enclosed within the other of said conduits, a valve controlling said gas supply conduit, a hot blast stove, said conduits being disposed in position to direct gas and air to said hot blast stove but stopping short of said hot blast stove, a sleeve cooperatively associated with said conduits and adapted to complete the connection of said conduits with said hot blast stove, and manually operable means for controlling said gas conduit valve and for controlling the position of said sleeve, said manually operable means being

disposed adjacent to one another upon the same side of said conduits.

3. In combination, a hot blast stove, means for directing air and gas to said stove, said means stopping short of said stove, and a sleeve slidable along said means for conducting a mixture of gas and air delivered by said means to said stove, said sleeve being adapted to complete the connection between said means and said stove.

Signed at Chicago, Illinois, this 9th day of April, 1928.

FREDERICK H. WILLCOX.
EDGAR P. EVERHARD.