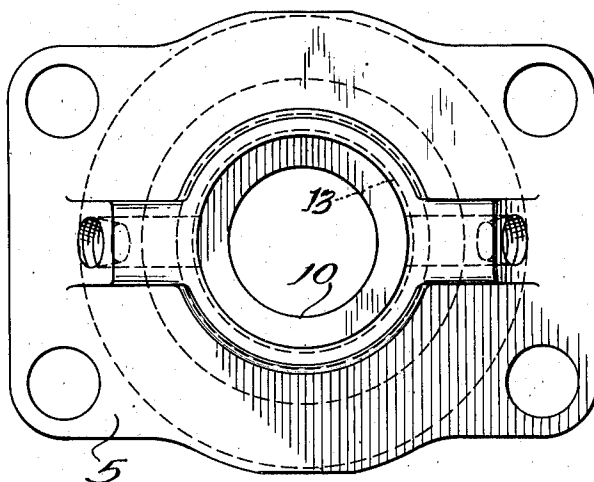
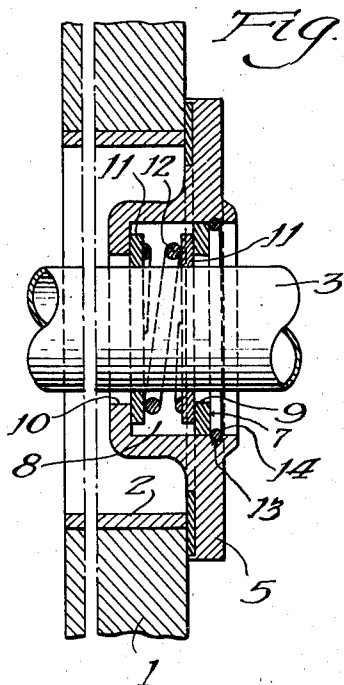
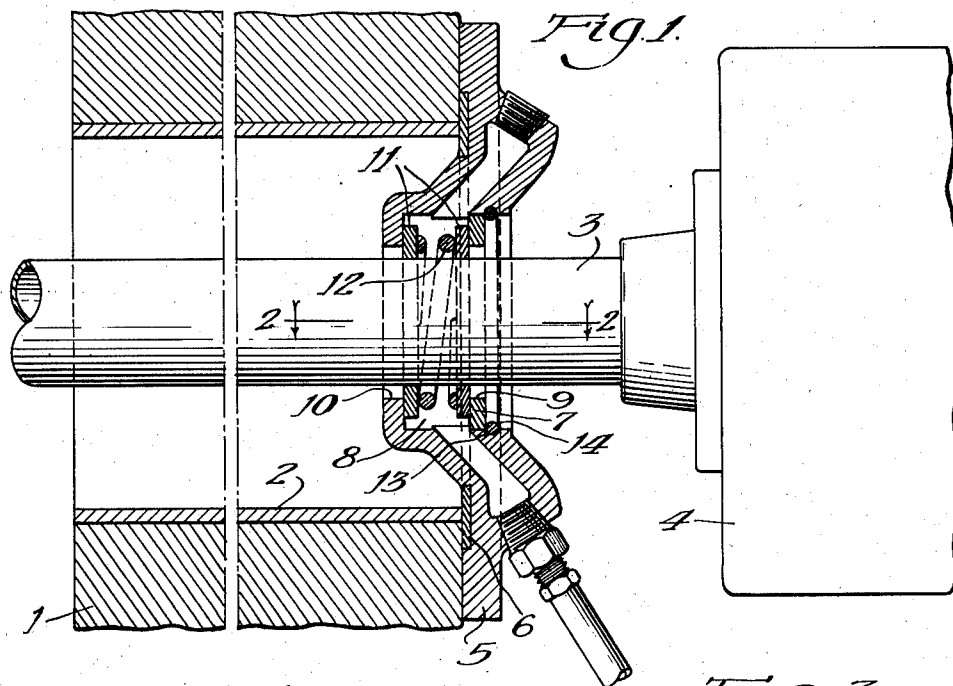


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SEAL AROUND A CLEANING ELEMENT
ENTERING A COMBUSTION CHAMBER
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SEAL AROUND A CLEANING ELEMENT
ENTERING A COMBUSTION CHAMBERDe Los E. Hibner and Fred C. Arey, Du Bois, Pa.,
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5 Claims. (Cl. 285-30)

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Usually, in installing a soot blower unit, the major portion thereof is mounted on the outer side of the wall of the boiler setting, while the tubular blowing or cleaning element is projected through the wall and into the combustion chamber. The opening through which the blowing element passes should be sealed to prevent the escape through the same of combustion gases. The problem of effecting such a seal is not simple, particularly when the blowing element must be allowed some play transversely of its axis and, consequently, the simpler expedients heretofore employed have not been satisfactory.

The object of the present invention is to produce a seal of the character just explained which shall be simple, durable and be capable of positively preventing leakage of combustion gases through the opening for the blowing element of a soot cleaning apparatus or the like.

The basis of our invention is that if there can be established at the opening through which the blowing element extends a counter pressure equal to or greater than the fluid pressure in the combustion chamber, no combustion gases will escape through that opening. Therefore, viewed in one of its aspects, the present invention may be said to have for its object to produce simple, novel and effective means for creating and maintaining such a counter pressure.

The various features of novelty whereby our invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is an axial section through a fitting embodying the present invention, with a tubular blowing element extending through the same and a fragment of a furnace wall through which the blowing element projects; Fig. 2 is a view similar to Fig. 1, the section being on a plane at right angles to the plane of Fig. 1; and Fig. 3 is a face view of the hollow closure member of the fitting.

In the drawings, 1 represents a furnace wall and 2 is a large sleeve or bushing that forms a lining for an opening through the wall. A tubular blowing element 3 extends through the sleeve, at the axis of the latter, from the outer side of the wall into the combustion chamber; the said element being rotatable about its axis.

The parts just described are old, the soot blower unit being of any usual or desired type, as long as it is provided with a movable blowing element. By way of example, a fragment of the casing 4

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to contain the gearing for turning the blowing element angularly about its axis, as in several well known soot blowers, is shown.

In the particular embodiment of our invention illustrated, a closure 5 is engaged with the outer end of the sleeve or bushing 2, the joint being sealed by a suitable gasket 6. Generally speaking, the closure may be said to comprise a cup-shaped element having at the open end a wide, annular flange, the cup-shaped part lying within the sleeve, while the flange part presses the gasket against the end face of the sleeve. A disk 7 is set in the open end of the cup to form the outer wall of a chamber 8 of which the bottom of the cup forms the inner wall. The disk is really a ring the opening 9 in which is considerably larger in diameter than the blowing element. The bottom of the cup contains an opening 10 which, like the opening 9, has its center at the axis of the sleeve or bushing. Within the chamber 8, and surrounding the blowing element, are two large washers or rings 11 that are an easy fit on the blowing element. Surrounding the blowing element, between the washers, is a strong compression spring 12 which presses one of the washers against the ring or disk 7 and the other against the bottom of the cup, namely against the face of the inner wall of chamber 8. The disk 7 is removable in order that the spring and the washers may easily be inserted or removed. In making the assembly, the disk is entered in the cavity in the cup portion of the cover plate, after the washers and the spring are in, until it engages the rear washer. It is then pushed back, against the resistance of the spring, until it passes beyond an annular groove 13 in the wall of the cup and just inwardly from the mouth thereof. The disk is then locked in place by a ring 14 that is snapped into groove 13 and overlaps the marginal portion of the outer face of the disk.

It will be seen that the construction just described provides a fairly tight joint between the movable blowing element and the closure plate 5 and, at the same time, permits some movement of said element transversely of its axis. However, some combustion gas may leak out, just as in many constructions now in common use. To forestall any such leakage we set up in chamber 8 a fluid pressure which is counter to that in the combustion chamber. If the counter pressure equals that in the combustion chamber the two will balance each other and no leakage should occur. The counter pressure is preferably somewhat higher than the pressure in the combustion chamber so that leakage, if there be any, will be

into the combustion chamber instead of away from it. Any suitable gaseous fluid may be used to create the counter pressure; but we prefer air, since that can do no harm if it leaks into the furnace chamber or into the boiler room, or both.

Air for our purpose may be supplied by the blowers which produce the forced draft in the furnace. This is entirely feasible, because the pressure in the furnace is less than that of the air discharged by the blower, friction in piping and chimney draft accounting for the difference. Thus no additional equipment is needed in the case of a furnace having forced draft to supply the air necessary to create and maintain the air seal.

While we have illustrated and described with particularity only a single preferred form of our invention, we do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements coming within the definitions of our invention constituting the appended claims.

We claim:

1. The combination with the wall of a boiler setting having a hole extending therethrough into the combustion chamber and a tubular blowing element passing through said hole, of a stationary dish-like closure for the hole that is hollow to provide an internal chamber through which said element extends, the openings for the element in the walls of the closure being somewhat larger in diameter than said element to allow said element limited transverse movements, two washer-like plates loose on and surrounding said element within the chamber in the closure, a spring between said plates yieldingly pressing them apart and against the inner sides of said walls of the closure, and means to deliver air under pressure into the chamber in the closure.

2. The combination with the wall of a boiler setting having a large hole extending therethrough into the combustion chamber and a tubular blowing element passing through said hole, of a dish-like closure for said hole that is hollow to provide a central chamber and having in the inner and outer walls thereof central openings somewhat larger in diameter than said element to allow said element limited transverse movements, two washer-like plates surrounding the said element within the chamber in the closure, a spring between the plates yieldingly pressing them apart and against the inner sides of said inner and outer walls, and means to deliver into the interior of closure air under a pressure at least as great as that in the combustion chamber.

3. The combination with the wall of a boiler setting having a large hole extending therethrough into the combustion chamber and a tubular blowing element passing through said hole,

of a dish-like closure for said hole that is hollow to provide a central internal chamber the inner and outer walls of which have central openings somewhat larger than the diameter of said element to allow said element limited transverse movements, two washer-like plates surrounding said element and fitting easily thereon, within the chamber in the closure, and a spring between said plates yieldingly pressing them against the inner sides of said inner and outer walls.

4. The combination with the wall of a boiler setting having a large hole extending therethrough into the combustion chamber and a tubular blowing element passing through said hole, of a dish-like closure for said hole that is hollow to provide a central internal chamber the inner and outer walls of which have central openings somewhat larger than the diameter of said element to allow the latter limited transverse movements, two washer-like plates surrounding said element and fitting easily thereon, within the chamber in the closure, and a spring between said plates yieldingly pressing them against the inner sides of said inner and outer walls; said outer wall of the closure being detachable; and a snap ring detachably fitting into a groove in the closure close to the outer side of the outer wall.

5. The combination with the wall of a boiler setting having a large hole extending therethrough into the combustion chamber and a tubular blowing element passing through said hole, of a dish-shaped closure for said hole provided with a detachable outer wall to form between it and the inner wall a central internal chamber, means to secure said outer wall in position, said inner and outer walls containing central openings somewhat larger than the diameter of said element to allow the latter limited transverse movements, two washer-like plates surrounding said element and fitting easily thereon, within the chamber in the closure, and spring means between said plates yieldingly pressing them, respectively, against said inner and outer walls.

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