May 2, 1939. C. O. BROWNFIELD 2,156,370

CLEANING APPARATUS

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Fig. 1.

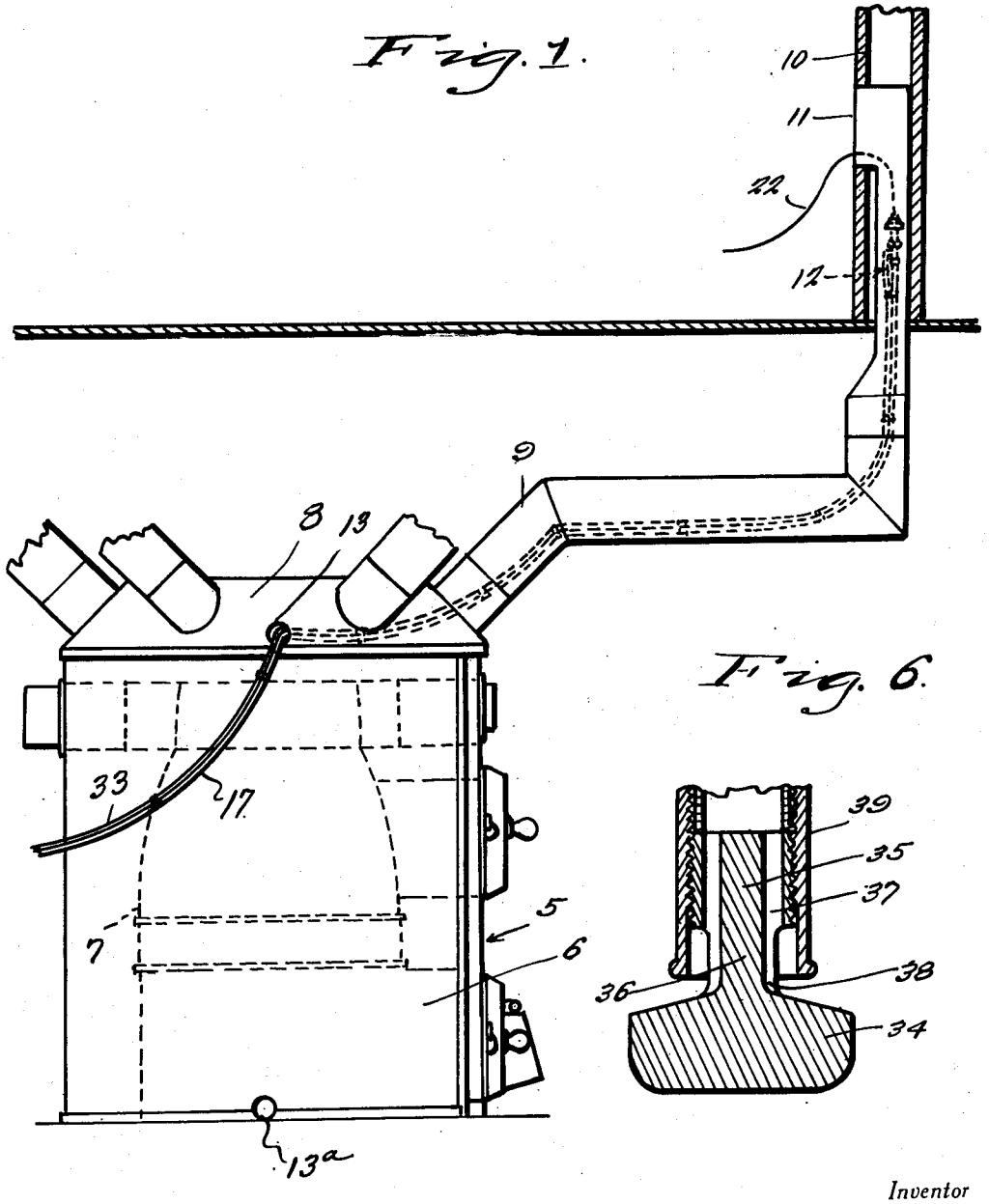


Fig. 6.

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Fig. 2.

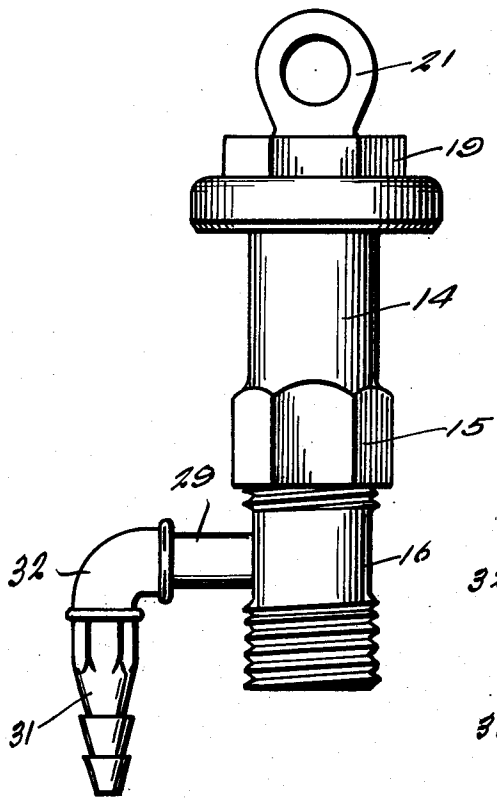


Fig. 3.

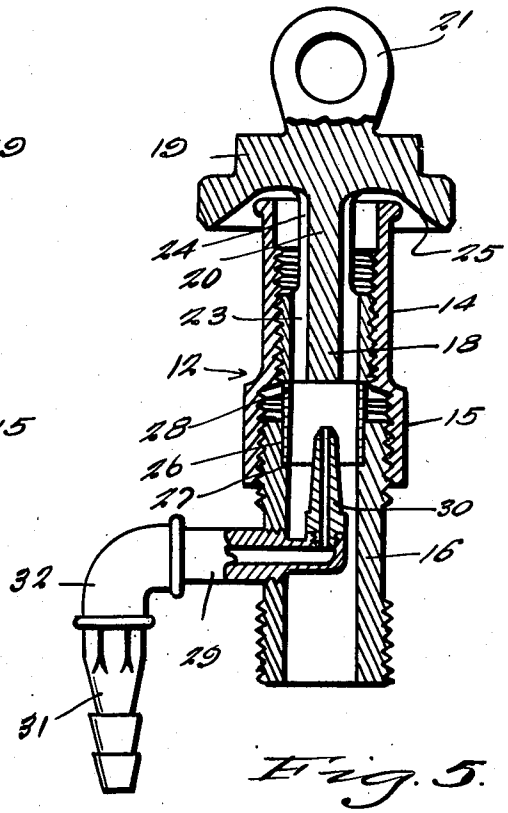


Fig. 5.

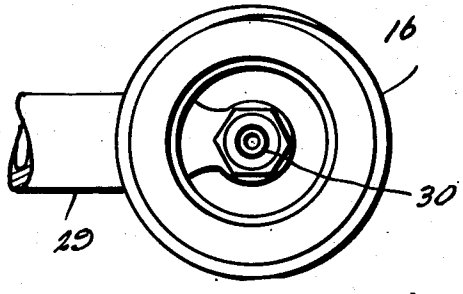
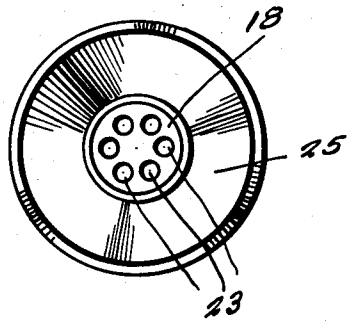


Fig. 4.



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CLEANING APPARATUS

Charles O. Brownfield, Covington, Ky.

Application June 24, 1937, Serial No. 150,202

1 Claim. (Cl. 141—1)

This invention appertains to new and useful improvements in cleaning apparatus and more particularly to means for cleaning air furnace ducts, air furnace shells, conduits, tanks and various other structures in which scum and other filth adheres to the walls thereof.

The principal object of the present invention is to provide an apparatus which can be fed along the inside of a duct or elsewhere and which in operation will serve to peel off the foreign matter in a manner which will efficiently serve to entirely clean the affected surfaces without leaving residue.

Another important object of the invention is to provide a cleaning device of the character stated which can be readily adjusted to meet various conditions.

These and various other important objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawings:

Figure 1 represents a side elevational view of a hot air furnace showing the cleaning device about to the started in operation.

Figure 2 is a side elevational view of the cleaning device.

Figure 3 is a longitudinal sectional view through the device.

Figure 4 is an end view of the detached upper part of the device looking toward the inner side of the deflector.

Figure 5 is an end view of the detached lower part of the device looking at the upper end of the tubular fitting which carries the air nozzle.

Figure 6 is a fragmentary longitudinal sectional view through a slightly modified form of cleaning device.

Referring to the drawings wherein like numerals designate like parts, it can be seen in Figure 1 that numeral 5 generally refers to the hot air furnace which consists of the shell 6, a bowl 7 and dome 8.

Extending from the dome 8 in the usual manner are the hot air ducts 9 which lead to various parts of the building to be heated. As shown in Figure 1, one of the ducts 9 extends upwardly into the wall 10 to the register 11.

The cleaning device is generally referred to by numeral 12 and to accommodate this device the dome 8 is provided with an opening 13 sufficiently large to permit the passage therethrough of the device 12.

The device consists of the elongated threaded barrel 14 which is provided with the enlarged extension 15 at one end internally threaded to receive the adjacent externally threaded end of the tubular fitting 16, the remaining end of this fitting being threaded for attachment to a water hose line 17.

The barrel 14 is internally threaded to receive the externally threaded head 18 of the deflector 19, said head being connected to the deflector 19 by the reduced neck portion or shank 20.

The deflector 19 is provided with the eye 21 to which a cable 22 can be connected for lowering the cleaning device into a duct.

The head 18 is provided with an annular arrangement of longitudinal bores 23 which merge at their upper ends with the longitudinally extending grooveways 24 in the neck 20. Each grooveway has its lower end in communication with a bore 23 and its upper end merges into the bottom side of the deflector 19, as shown in Figure 3. These grooves permit the neck 20 to be made of greater diameter without obstructing the bores 23 as it would if such grooves were not provided in the neck.

The bottom side of the deflector 19 is concaved as denoted by the numeral 25 and the beaded upper edge portion of the barrel 14 is to be in slightly spaced relation to this concave surface 25 when the deflector is properly adjusted with respect to the barrel 14. As water issues through the head 18 and grooves 24 and against the deflector 19, the concaved surface 25 will form the spray of water into a formation simulating an umbrella which in diverging downwardly will cut under foreign matter in a duct or the like as the device is lowered in the duct for substantially peeling the foreign matter from the affected surfaces, instead of simply taking off a small amount of the foreign matter as in the case of other cleaning devices and more specially suction apparatus now generally employed.

It can be seen in Figure 3, that the upper end of the fitting 16 is counterbored as at 26 to define a shoulder 27 against which one end of the tube 28 can engage while the opposite end bears against the head 18. Thus it can be seen, that first the relationship of the deflector 19 can be fixed with respect to the adjacent end of the barrel 14 for fixing the spray and then subsequently the extension 15 can be fed onto the adjacent end of the fitting 16, thus bringing the tube 28 into snug abutting relation with the head 18 to prevent any self adjusting of the deflector 19. This serves as detent means for the deflector.

A compressed air inlet nipple 29 is provided on

the fitting 16 and extends into the fitting 16. The inner end of this nipple is equipped with the jet 30 directed into the tube 28.

A compressed air hose line entering nipple 31 is connected to the nipple 29 by the elbow 32, the air hose being denoted by the numeral 33.

In manipulating the cleaning device, the cable 22 is first dropped through the duct and pulled through the opening 13. The cable is then attached to the eye 21 of the device 12 after the hose lines 17—33 have been connected to the device. The device is now fished upwardly to the top of the duct as shown in Figure 1 and is ready for operation. A person at the supply ends of the hose lines 17—33 now turns on the compressed air and water. Both of these enter the fitting 16, the compressed air driving the water through the head 18 in streams formed by the bores 23 and channels 24. The deflector 25 spreads the water and compressed air out into an umbrella form and as the device is lowered in the duct this umbrella form of compressed air and water impinging against the affected surfaces of the duct will cause peeling off of the foreign matter.

Where it is desired to clean the inside of the shell 6 or other structures where the device must be lowered in with the deflector first, the deflector is of a slightly different form as shown in Figure 6. In this form of the invention the deflector body is denoted by numeral 34, with its head 35 connected thereto by the reduced neck 36. The head 35 is provided with the longitudinal bores 37 merging with the longitudinal channels 38 of the neck 36. However, instead of the head 34 at its side opposed to the shell 39 being concaved, it is convexed so as to form a downwardly disposed umbrella form of spray. Obviously in this form the device is lowered by its hose line through the opening 13 and can be worked around on the inside of the shell 6 for adequately cleaning the walls of the sell and fire bowl.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention what is claimed as new is:

A cleaner of the class described comprising a barrel having an enlargement at one end thereof, said barrel and the enlargement being internally threaded, a shank, a head at one end thereof externally threaded to engage the threads of the barrel, said head having longitudinally extending ports therein, an enlarged deflector member connected with that end of the shank opposite the end which is connected with the head, said deflector member having its inner face shaped to deflect fluid passing through the barrel into conical form, a tubular member threaded into the enlargement of the barrel, a sleeve bearing against the head and a part of the inner end of the tubular member, means for connecting the outer end of the tubular member to a supply of fluid, a tube arranged at right angles to the tubular member and entering the same at one side thereof, means for connecting the tube with a source of fluid, and a nozzle connected to the inner end of the tube and located in the tubular member for directing the fluid from the tube into the ports of the head of the shank.

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