June 22 , 1926. 1,589,986

T. RUSSELL

METHOD OF CLEANING FURNACES

Filed August 24, 1925 2 Sheets-Sheet 1

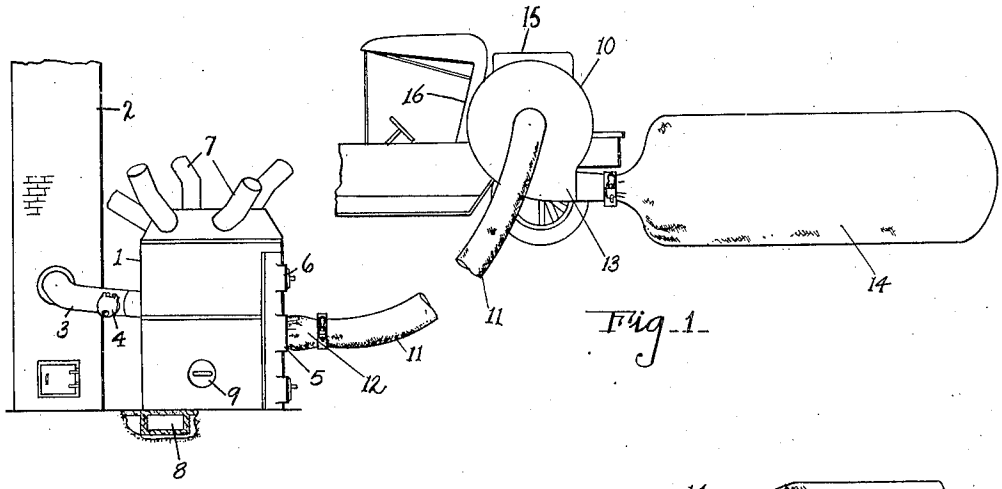


Fig. 1.

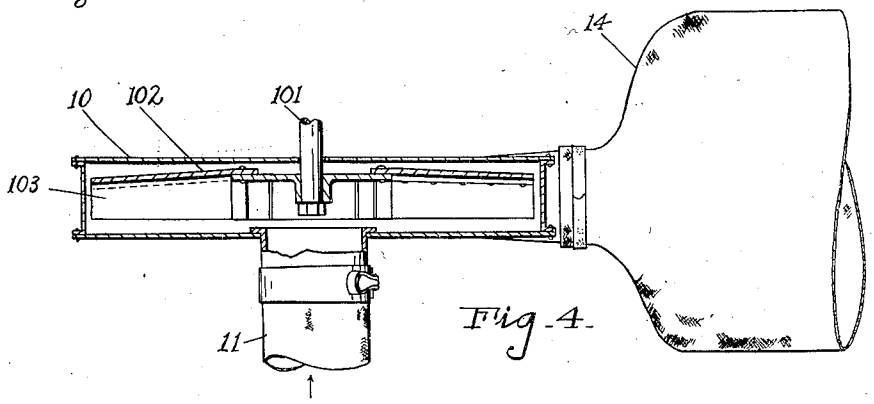


Fig. 4.

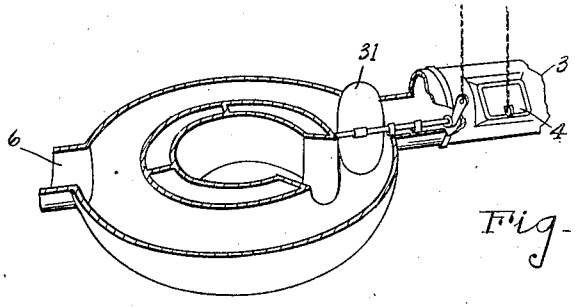


Fig. 5.

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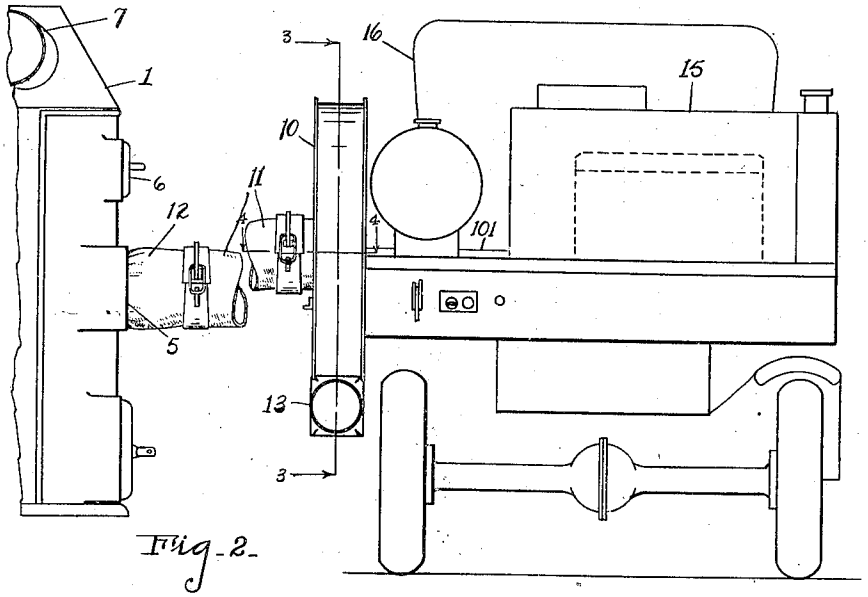


Fig. 2.

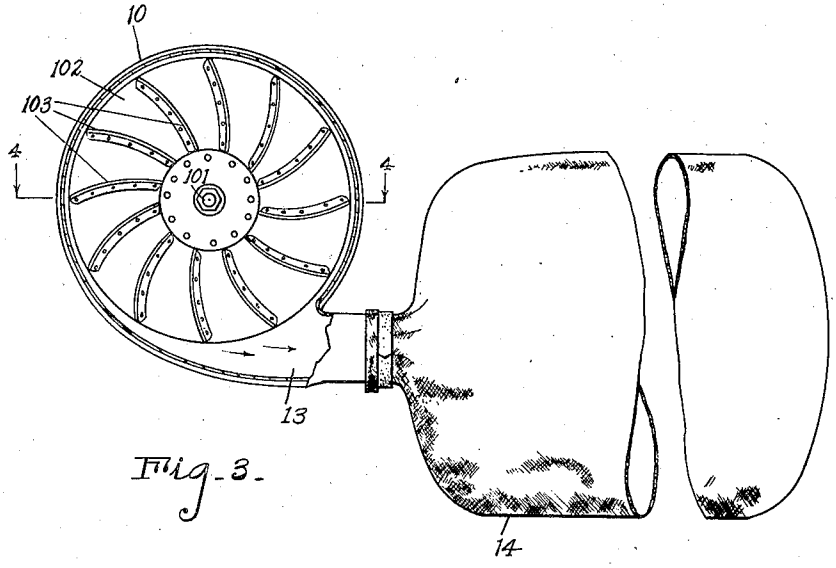


Fig. 3.

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UNITED STATES PATENT OFFICE.

TITUS RUSSELL, OF HOLLAND, MICHIGAN, ASSIGNOR TO HOLLAND FURNACE COMPANY, OF HOLLAND, MICHIGAN.

METHOD OF CLEANING FURNACES.

Application filed August 24, 1925. Serial No. 52,172.

This invention relates to an improved method of cleaning furnaces.

The object of the invention is to provide an effective, simple and inexpensive pneumatic means of cleaning furnaces of soot, ash and other accumulations.

Objects relating to details and economies of construction and operation of my invention will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

I carry out my improved method by means of the apparatus illustrated in the accompanying drawing forming a part of this application, in which:

Fig. 1 is a diagrammatic view of an assembly of my apparatus connected to a furnace and chimney for cleaning the same by my method.

Fig. 2 is an enlarged detail view of the portion of the furnace and the organization of the truck and fan for making my means portable.

Fig. 3 is a detail sectional view on line 3—3 of Fig. 2 showing construction of the suction fan and the dust bag.

Fig. 4 is an enlarged detail horizontal sectional view on line 4—4 of Figs. 2 and 3 showing details of construction of the fan and its organization with the suction pipe and dust bag.

Fig. 5 is an enlarged detail view of the internal structure of a "Holland" furnace indicating the method of applying my method of cleaning to the same.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

The parts of the drawing will be identified by their numbers. 1 is a furnace of the usual construction, the furnace here illustrated being one made by the Holland Furnace Company. 2 is the chimney. 3 is the smoke pipe connecting the furnace to the chimney. A direct control damper 31 is provided. 4 is the check damper therefor. 5 is the fuel feed door to the furnace. 6 is the clean-out door. 7 are the hot air pipes. 8 is the cold air intake. 9 is a clean-out door for the casing. 10 is a suction fan. 11 is the suction pipe leading to the intake of the fan and 12 is the nozzle connecting the pipe to the furnace door frame 5. 13 is the discharge of the fan and 14 is the dust bag to which it delivers. 15 is a diagrammatic indication of a gasoline engine and 16 is the truck which transports the apparatus from place to place, the gasoline engine 15 and fan being carried on the truck for that purpose. 101 is the fan shaft carrying the fan 102 provided with suitable blades 103 as indicated which create a strong suction. The suction pipe 11 is ordinarily about twelve inches in diameter permitting a comparatively large flow of air. The fan is about five feet in diameter with a circular intake twelve inches in diameter. The engine shown is an ordinary Ford automobile engine as now made rated at twenty-two horsepower but showing somewhat less in this relation, but sufficient to create a strong suction and maintain a vacuum indication on a U-water tube of from six to ten inches at the furnace door as an indication of the condition in the body of said furnace during the rapid displacement of the air by said fan. Greater effect would be obtained by a more powerful engine. The power should not be materially less than described to secure satisfactory results with present known fan structures.

My improved method of cleaning comprises inserting the nozzle of the suction pipe into the fuel door of the furnace, closing all dampers and openings into the furnace body and then opening the cut-off damper to the chimney so that there is a free circulation of air down the chimney.

In the first place I open the direct damper 31 so that the flow of air down the chimney and into the body of the furnace is free and unobstructed and all accumulations of soot and ashes in the chimney are consequently wiped out by the flow of air carried into the suction fan and discharged into the dust bag or any receptacle, or, for that matter, might be delivered to the atmosphere.

After the soot and accumulations have been cleaned out from the chimney so that there is a very free circulation of air and the accumulation of material inside the furnace has been taken out through the suction pipe, the direct damper 31 is closed and the free flow of air passes through the indirect

flue and heating chamber of the system, cleaning all soot out at this time. The clean-out door is merely opened to insure a complete cleaning at that point.

I desire to state that the kind of suction fan, the particular kind of nozzle, the particular connections, etc., can be greatly varied and still accomplish my improved method.

I have claimed the particular suction pipe in my copending application Serial No. 52,175 filed August 24, 1925, the nozzle in application Serial No. 52,177, filed August 24, 1925, and the coupling device in application Serial No. 52,176, filed August 24, 1925. I desire to claim here particularly the method of cleaning the furnace and chimney.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The method of cleaning a furnace and chimney by providing an exhaust connection to the furnace door, closing all openings to the said furnace and opening the direct smoke flue for free passage of air down the chimney to the said furnace body and out at the exhaust connection, thereafter closing the direct flue and connecting the indirect flue and cleaning out the said indirect flue within the furnace and then opening the clean-out door for the inrush of air at that point and creating a suction in the said exhaust connection that rapidly displaces the air from the said furnace body, creating a considerable degree of vacuum and causing a full flow of air down said chimney and flue and through the said furnace and its passages, as specified.

2. The method of cleaning a furnace and chimney by providing an exhaust connection to the furnace door, closing all openings to the said furnace and opening the direct smoke flue for free passage of air down the chimney to the said furnace body and out at the exhaust connection, thereafter closing the direct flue and connecting the indirect flue and cleaning out the said indirect flue within the furnace and then creating a suction in the said exhaust connection that rapidly displaces the air from the said furnace body, creating a considerable degree of vacuum and causing a full flow of air down said chimney and flue and through the said furnace and its passages, as specified.

3. The method of cleaning a furnace and chimney by providing an exhaust connection to a door of said furnace, closing all openings to the said furnace and opening the smoke pipe damper for free passage of air down the chimney to the said furnace body and out at the exhaust connection and creating a suction in the said exhaust connection that rapidly displaces the air from the said furnace body, creating a considerable degree of vacuum and causing a full flow of air down said chimney and flue and through the said furnace and its passages, as specified.

In witness whereof I have hereunto set my hand.

TITUS RUSSELL.