

C. JOHNSON.
DUST REMOVING APPARATUS.
APPLICATION FILED SEPT. 15, 1908.

946,047.

Patented Jan. 11, 1910.

Fig. 1.

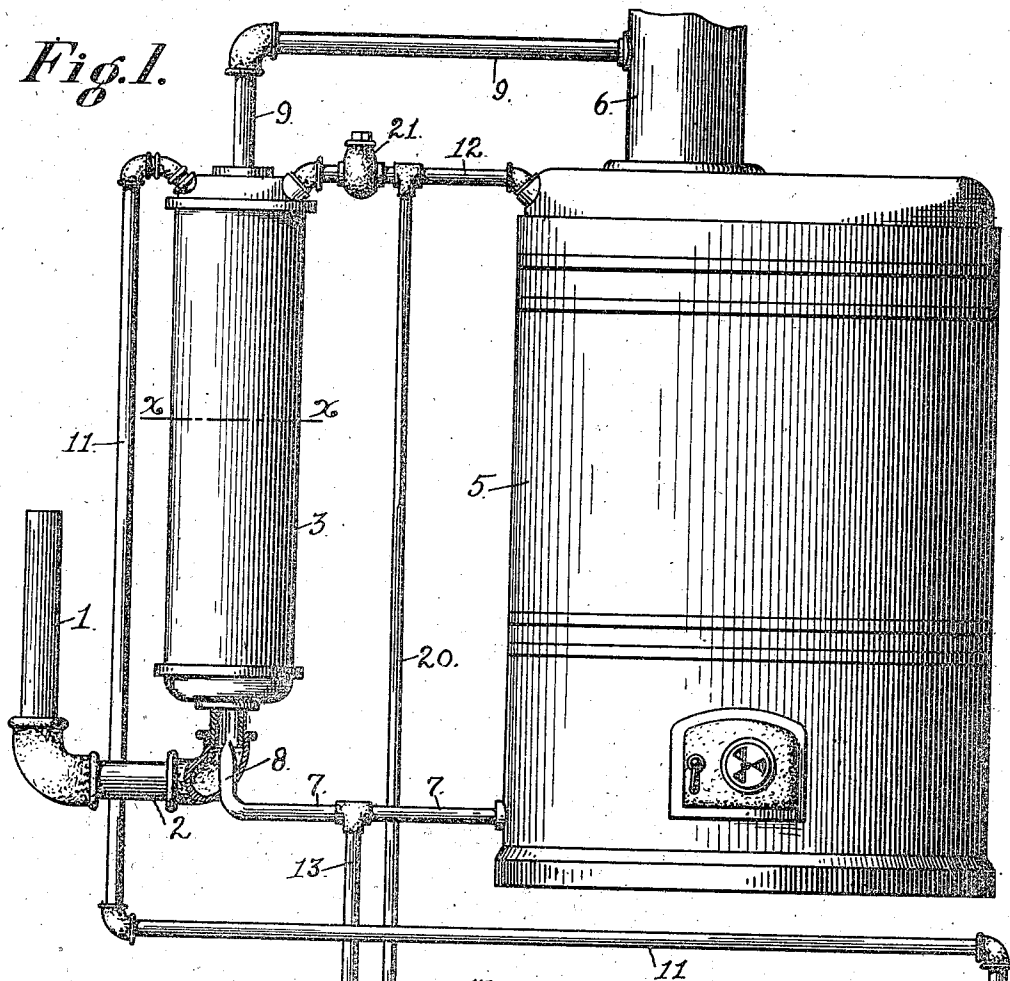
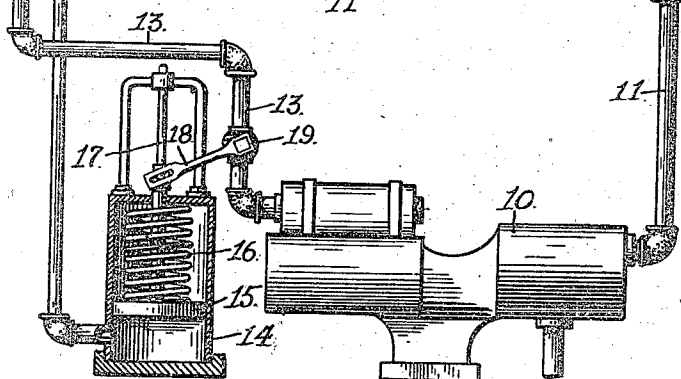
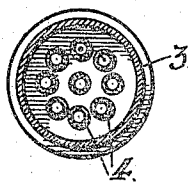


Fig. 2.



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UNITED STATES PATENT OFFICE.

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DUST-REMOVING APPARATUS.

946,047.

Specification of Letters Patent.

Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, CAREL JOHNSON, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Dust-Removing Apparatus, of which the following is a specification.

My invention relates to that class of apparatus for removing the dust from carpets, rugs, furniture, floors and walls of rooms, etc., in which a suction is created by suitable means; and, more especially, to those devices of this type in which said suction is induced by the injection of steam into the passage through which the dust-laden air is carried.

The main objects of my invention are, to economically utilize the steam employed in inducing the suction, by causing it to interchange its heat with the feed-water to the steam generator; also, to use said steam and the accompanying dust-laden air, by their disposition to the best advantage in the stack of the generator, thereby, not only getting rid of the dust, but also increasing the draft through the generator, and the consequent thorough combustion of the fuel; and, finally, to provide for the automatic regulation of the feed-water supplied to the generator.

With these objects in view, my invention consists in the novel construction and arrangement of the apparatus which I shall now fully describe, by reference to the accompanying drawings in which—

Figure 1 is an elevation of my apparatus, partly in section. Fig. 2 is a cross section on the line $x-x$ of Fig. 1.

1 is a pipe which must be supposed to lead from any suitable source of dust-collection, and to be connected with any of the ordinary or well known suction nozzles, renovators, or like devices, which are moved over the surface to be cleaned. An extension 2 of this pipe leads to and opens into the base of a heat-interchanger 3 of some suitable character, as, for example, one which comprises an external shell and inclosed pipe-system 4, Fig. 2. Around this pipe-system 4, the dust-laden-air from pipe 1, and the steam which induces the suction, flow.

5 is a steam-generator of any suitable character, and 6 is its stack. From the steam-space of the generator leads a pipe 7, the end of which has an injector 8 which is

let into the pipe 2 in such position as to induce a current of dust-laden air to flow through pipe 1, and to force said air forwardly into and through the heat-interchanger. From the top of the heat-interchanger 3 leads a pipe 9 to the stack 6 of the generator.

10 is a feed-water pump. A pipe 11 leads from this pump to the top of the heat-interchanger, where it communicates with its pipe-system 4. From this pipe-system a pipe 12 leads to and supplies water to the generator.

13 is a pipe connection from the steam-pipe 7 for operating the feed-water pump.

14 is a cylinder containing a piston 15 controlled by a spring 16 adapted to yield to a predetermined pressure. With the rod 17 of the piston a lever 18 is suitably connected, said lever operating a valve 19 in the pipe connection 13 which supplies steam to operate the pump.

20 is a pipe leading from the water connection 12 of the generator to the cylinder 14 under its piston 15. In the water connection 12, between the heat-interchanger and the pipe 20, is a check valve 21.

The operation of the apparatus is as follows:—Steam from the generator, passing from the injector 8, induces suction in the dust-pipe 1 and its extension 2, and forces the dust-laden air up into and through the heat-interchanger; and the air and steam thence pass to the stack 6, by which means the dust is disposed of, and an increased draft created in the generator. The steam in passing through the heat-interchanger gives up its heat, or a portion thereof, to raise the temperature of the water flowing through the pipe-system of the interchanger, whereby said water is economically supplied to the generator with a preliminary heat. The steam pressure in the generator, acting on the water, will cause the latter, through the pipe 20, to lift the spring-controlled piston 15, when said pressure is in excess of that for which it is set, and thereby, through the lever 18 and steam valve 19, automatically regulate the supply of steam to operate the pump, thus regulating the supply of water to the needs of the generator, whereby the steam is kept constant to supply the injector and effect a constant suction for the work to be accomplished through the dust-pipe 1.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent is:—

1. A dust-removing apparatus comprising a pipe leading from a source of dust-collection; a heat-interchanger comprising a tubular chamber to which said pipe delivers its contents; a steam generator; a steam-pipe therefrom having its outer end provided with an injector disposed within the communication between the dust-pipe and the heat-interchanger in such manner as to induce a suction in said dust-pipe and to force its contents through said heat-interchanger; an outlet for the dust and steam from said heat-interchanger; a source of feed-water for the generator; a water conduit within the tubular chamber; a water-pipe connection between said feed-water source and the water conduit; and a pipe-connection for the water from said conduit to the steam generator.

2. A dust-removing apparatus comprising a pipe leading from a source of dust-collection; a heat-interchanger to which said pipe delivers its contents; comprising a closed chamber; a steam generator; a steam pipe therefrom having its outer end provided with an injector disposed within the communication between the dust-pipe and the heat-interchanger in such manner as to induce a suction in said dust-pipe and to force its contents through said heat-interchanger; an outlet pipe for the dust and steam from said heat-interchanger communicating with the stack of the steam generator; a source of feed-water for the generator; a pipe within the heat interchanger chamber in the path of and adapted to be traversed by the material forced through said chamber, a water-pipe connection between said feed-water source and the said pipe; and a pipe-connection for the water from said pipe to the steam generator.

3. A dust removing apparatus comprising a steam generator having a suitable stack projecting therefrom, a heat interchanger

comprising a closed tubular chamber, a dust receiving pipe having connection with the heat interchanger, a steam pipe having a connection at one end with the generator and terminating at its opposite end in a jet nozzle disposed within the connection between the dust receiving pipe and tubular chamber, an outlet for the contents of the chamber connecting directly with the said generator stack, a water pipe system mounted within the closed chamber and constructed and arranged to be enveloped by the passing contents of the chamber, an inlet for the pipe system, and an outlet therefor communicating directly with said generator.

4. A dust removing apparatus comprising a steam generator, a heat interchanger spaced therefrom and comprising a hollow chamber closed throughout, a water pipe within the said chamber and closed throughout, a water supply connecting with one end of said pipe, an outlet connection leading from the other end of said pipe to the generator, a dust inlet pipe, a steam pipe leading from the generator connecting with the dust inlet pipe at its point of connection with said chamber, and governing mechanism for regulating said water supply including pumping instrumentalities, a steam connection comprising a pipe connected with said first mentioned steam pipe intermediate its ends and with the pump, and a valve controlled device for said steam connection including a pipe connected with the outlet connection of the water pipe at a point between its connection with the generator and the water pipe.

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

CAREL JOHNSON.

Witnesses:

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