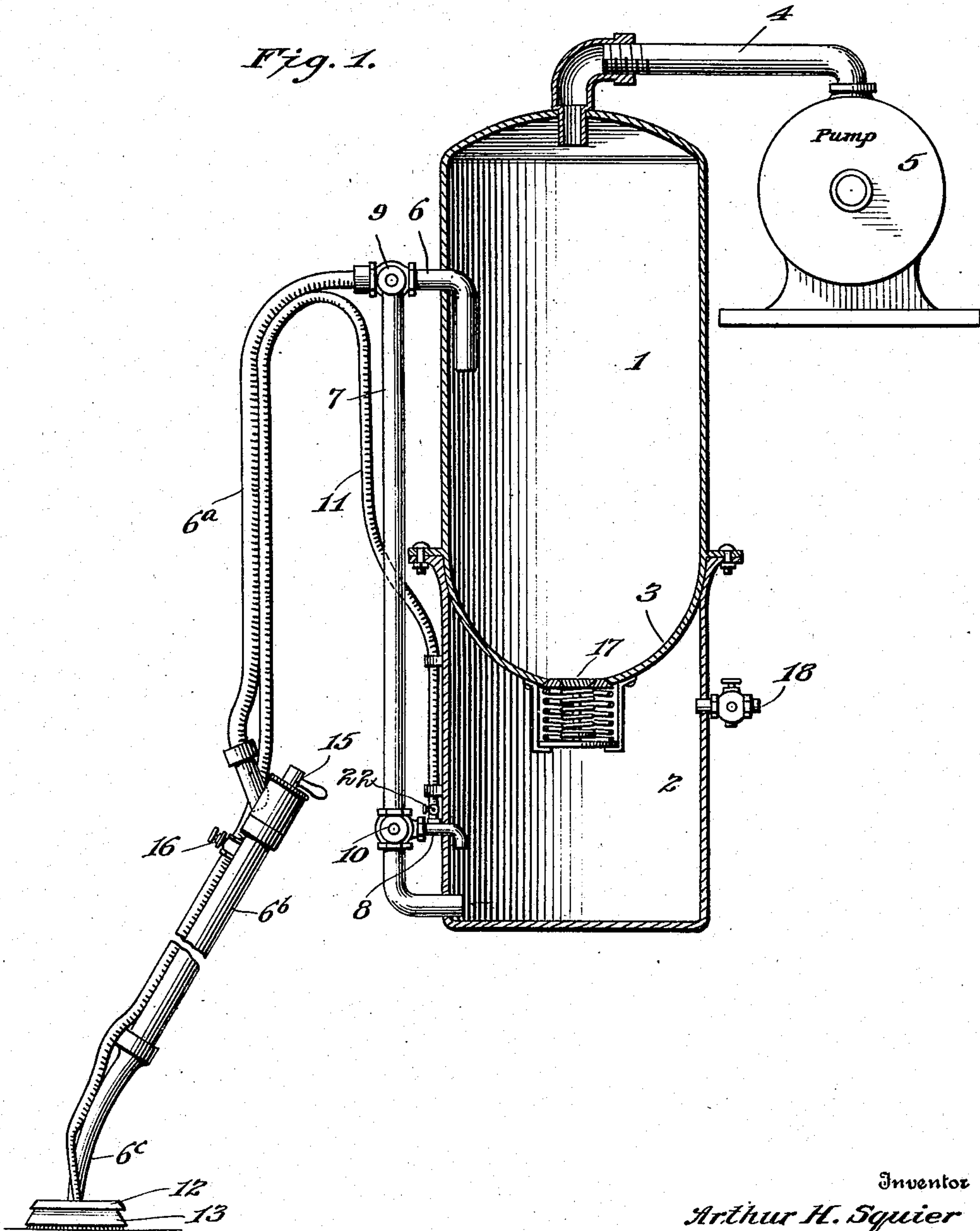


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AIR SUCTION CLEANING APPARATUS.
APPLICATION FILED OCT. 3, 1908.

930,628.

Patented Aug. 10, 1909.
2 SHEETS—SHEET 1.

Fig. 1.



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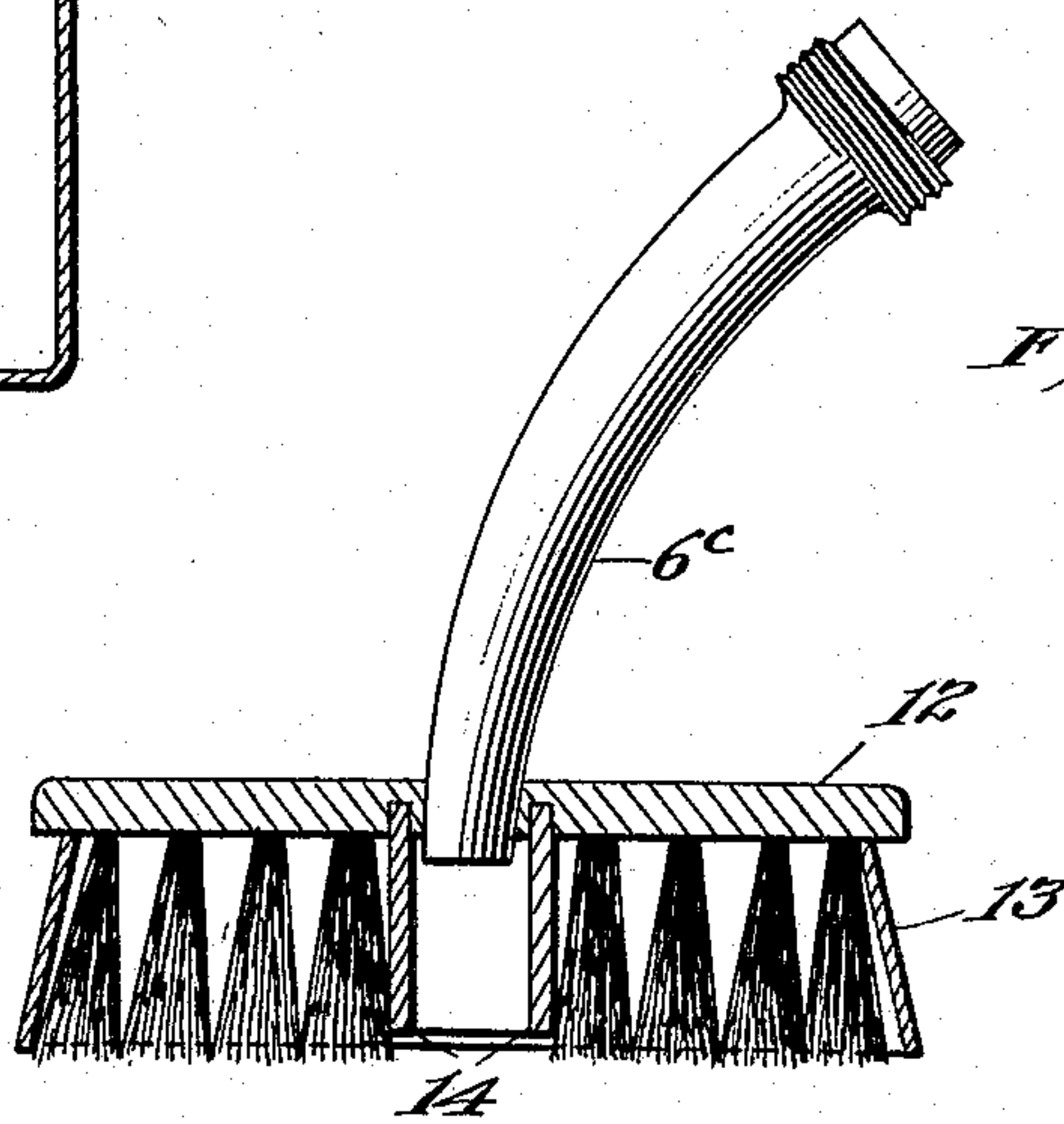
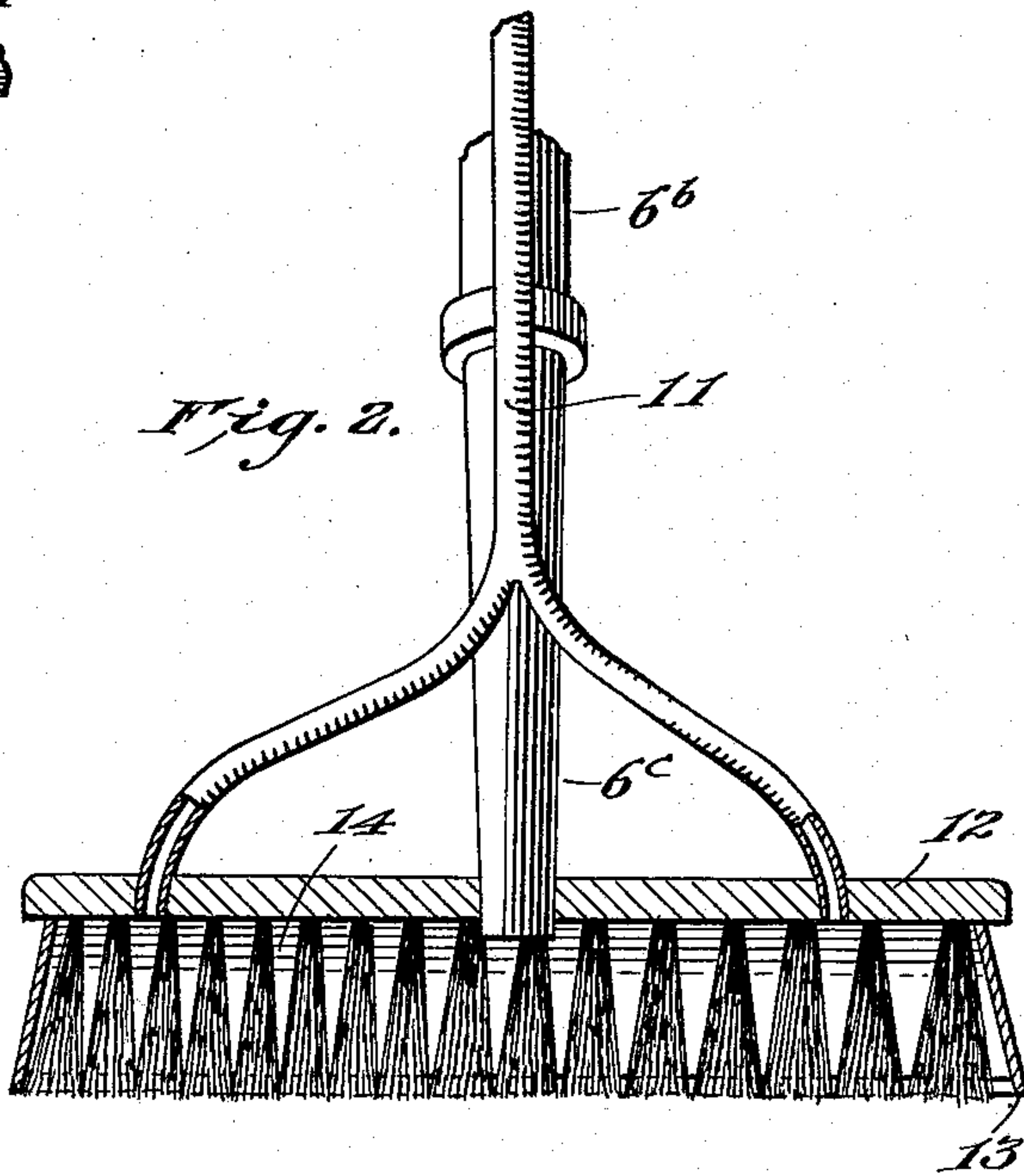
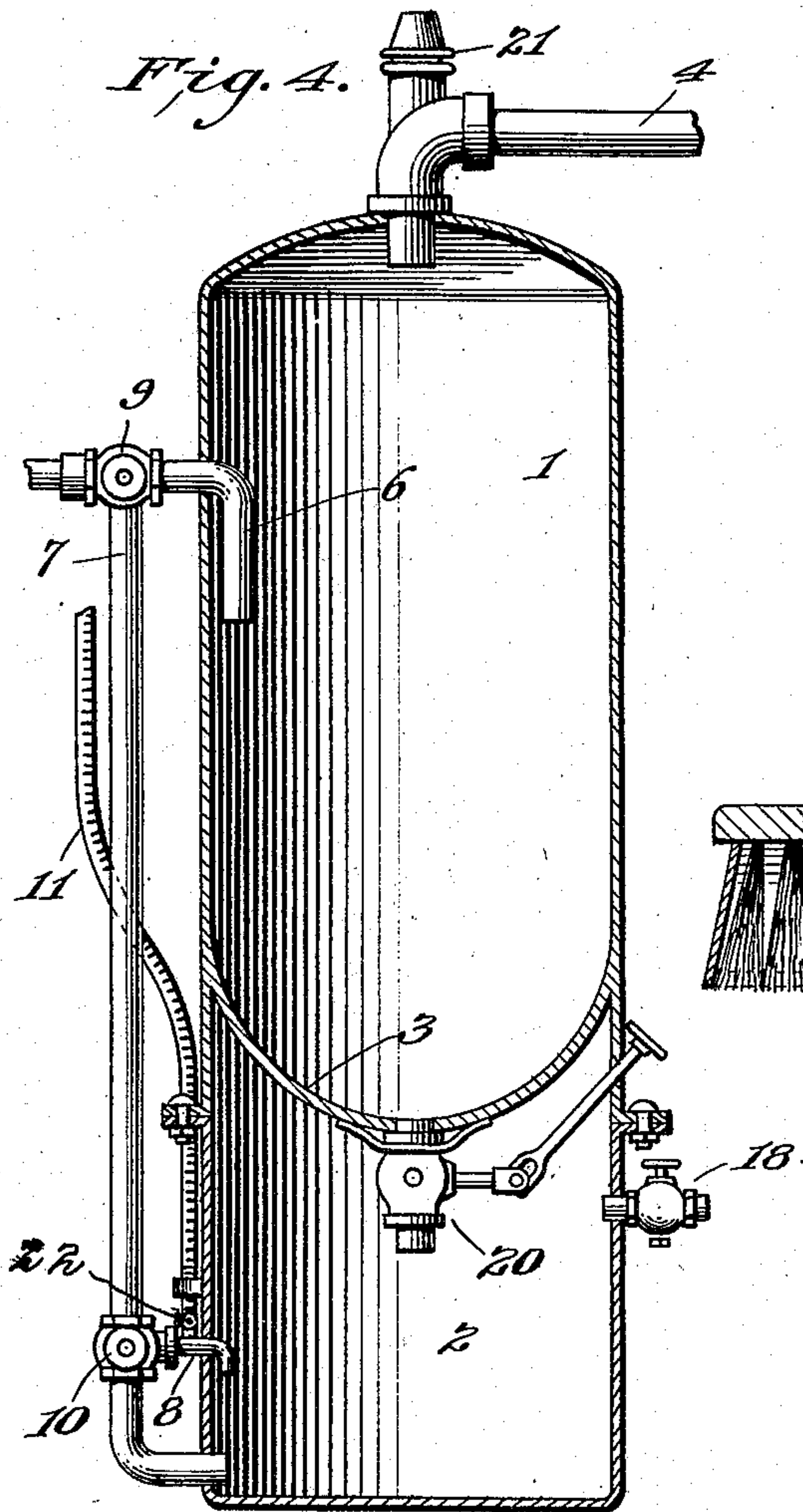
By

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Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR H. SQUIER, OF PHILADELPHIA, PENNSYLVANIA.

AIR-SUCTION CLEANING APPARATUS.

No. 930,628.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed October 3, 1908. Serial No. 455,975.

To all whom it may concern:

Be it known that I, ARTHUR H. SQUIER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Air-Suction Cleaning Apparatus, of which the following is a specification.

My invention relates to improvements in air suction cleaning apparatus, and more particularly to an improved portable mechanism designed particularly for wet cleaning, such as scrubbing floors and the like, but it may also be used for dry cleaning as well.

An object of the invention is to provide improvements of this character which will, in wet cleaning, supply just the proper amount of water to the scrubbing device, and which can be operated to remove all the water from the floor at the proper time.

A further object is to so construct an apparatus that in dry cleaning, water will be commingled with the dust laden air, allaying all dust and precipitating it to the bottom of the receiving or suction tank, and preventing the dust passing to the pump.

A further object is to so construct the several parts, that the water accumulated in the receiving tank can be readily returned to the water chamber, and when the water therein becomes dirty can be ejected and clean water drawn in its place without undue loss of time.

With these and other objects in view the invention consists in certain novel features of construction, combinations and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings Figure 1, is a view partly in section illustrating my improvements. Fig. 2, is an enlarged view in longitudinal section of the scrubbing device on the line *x—x* of Fig. 2. Fig. 3, is a view in section at right angles to Fig. 2, and Fig. 4, is a view of a modified construction of tank.

1 represents a receiving or suction tank or chamber secured upon the open upper end of a water chamber 2. The bottom 3 of tank 1 effectually closes tank 2, forming in effect, a single tank divided by a horizontal partition into upper and lower chambers. A pipe 4 connects the upper portion

of chamber 1 with a suitable pump 5 shown in Fig. 1.

6 represents the suction pipe discharging into tank 1 and connected near the tank with a water pipe 7, the latter communicating with chamber 2 below the water level therein. A small pipe 8 connects pipe 7 with chamber 2 and three-way valves 9 and 10 respectively are provided at the juncture of pipes 6 and 7 and pipes 7 and 8. A cock or valve 22 is provided on pipe 8, and a small pipe or hose 11 connects with the cock or valve 22, and extends to the scrubbing device, as will more fully hereinafter appear. This cock or valve 22 is normally open and is only closed when pipe or hose 11 is to be disconnected.

A hose 6^a connects pipe 6 with a metal pipe 6^b having a nozzle 6^c at its end and the latter projects into the center of a brush 12. An apron 13 is provided around the brush and another apron 14 about the nozzle 6^c, the apron 14 being shorter than the bristles of the brush so as not to touch the floor until unusual pressure is put upon the brush.

The hose or pipe 11 as above stated, extends to the brush and preferably divides at the brush to discharge the water in the opposite ends thereof and more evenly distribute the same. A preferred and economical structure is to provide a double woven hose such as illustrated connecting the tank and handle which is formed by pipe 6^b. The larger hose 6^a serves as a suction pipe and the smaller hose 11 conveys water to the brush.

Valves 15 and 16 respectively are provided in the pipes or passages 6^b and 11 in convenient reach of the operator during the scrubbing operation, so that he can control the passage of water from and to the tanks as will be explained.

A spring pressed double acting valve 17 normally closes an opening in the bottom of the tank 1, and hence normally prevents any water in tank 1 from passing to tank 2, and a vent 18 of any preferred construction is located at the upper portion of tank or chamber 2 to compensate for water drawn therefrom and prevent a vacuum in the chamber 2.

In the modification illustrated in Fig. 4, I show an ordinary globe valve 20 normally closing the passage between tanks 1 and 2,

this valve being hand operated from the outside of the tank, and in this modified construction I may employ a safety valve 21 in pipe 4 leading to the pump.

The operation of my improvements is as follows: In the scrubbing operation, the valve 9 is turned to close communication between the pipes 6 and 7, but permit a free passage through 6^a and 6 into tank 1, the valve 22 is open and valve 10 preferably closed. The valve 18 is open, and when the pump 5 begins to create a suction or partial vacuum in tank 1, as the valves 15 and 16 will also be open, the air will be drawn from the scrubbing device 12, which latter will be in position on the floor, and when the scrubbing device is pressed down by the operator, so that the apron 13 will touch the floor, a partial vacuum will be created in the space inside of this apron 13, which will cause the water to be drawn through pipe 11 to the scrubbing device. The proper suction can be controlled by turning the valve 15 so as to draw just the proper amount of water to the scrubbing device. When the floor is thoroughly scrubbed by manipulating the scrubbing device over the same, the operator closes valve 16 to shut off the water, and then while moving the scrubbing device over the floor, he presses down upon the same until the apron 14 rubs on the floor, and the suction of air under the apron 14, and through the space inclosed by the apron 14, will be so great that the dirty water will be sucked through the pipes 6^c, 6^b, 6^a, and 6 into tank 1. When the water accumulates in tank 1 and it is desired to transfer the same to tank 2, the valve 15 will be closed, and valve 9 will remain in a position to prevent communication between pipes 6 and 7. The pump 5 then exerts such a suction in tank 1, that valve 17 will be drawn upward to permit the water to pass into tank 2. To blow the dirty water out of tank 2, valves 18 and 22 are closed and valve 10 turned so as to allow free passage through pipe 7. Valve 9 is turned so as to allow a free passage between pipes 7 and 6^a, but to close pipe 6, and valve 15 is also opened. When the pump is reversed to exert pressure in tank 1, it will open valve 17 and allow the air to exert a pressure on the dirty water in tank 2, to force the water through the pipes 7, 6^a, 6^b, and 6^c into the sewer, or elsewhere, over which the scrubbing device is placed. When the dirty water is forced out, the operator leaves the valves exactly as they are, and places the scrubbing device in clear water. The pump is reversed and sucks the clear water through pipes 6^c, 6^b and 6^a, into tank 2, the valve 9 being turned so as to prevent the water being drawn directly into tank 1, but compelling it to be drawn down pipe 7 into tank 2.

During the dry cleaning operation in

which the water is utilized only as a cleaning medium for the air, valve 18 is opened, valve 10 is positioned to close pipe 8, but leave the pipe 7 open, the valve 9 is turned so as to open communication between the pipes 6, 6^a and 7, and a suitable cleansing nozzle of any character is connected with the pipe 6^a. When the pump is operated to exert a suction in tank 1, the dust-laden air will be drawn through pipes 6^a and 6 and across the upper end of pipe 7, causing the water to be drawn up pipe 7 and commingle with the dust-laden air and pass with it into the tank 1, where the particles of water which have taken up the dust in the air, will be precipitated into the bottom of tank 1 and the cleansed air will pass to the pump.

Slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not restrict myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. In an apparatus of the character described, the combination with a suction chamber, of a water chamber, a valve normally closing a passage between said chambers, a suction pipe communicating with said first mentioned chamber, a pipe connecting said first mentioned pipe with the water chamber below the water level in the latter, and a pump communicating with said first mentioned chamber.

2. In an apparatus of the character described, the combination with a suction chamber, of a water chamber, a pressure valve normally closing the passage between said chambers, a suction pipe communicating with said suction chamber, a water pipe connecting the suction pipe with the water chamber below the water level of the latter, a pipe connecting the water pipe with the water chamber, and three-way valves located at the junctures of said pipes.

3. In an apparatus of the character described, the combination with a suction chamber, of a water chamber communicating with said suction chamber, a pressure valve normally closing the passage between said chambers, a suction pipe communicating with said suction chamber, a water pipe communicating with the water chamber, a scrubbing device, pipes or hose connecting the scrubbing device with the ends of said water and suction pipes, and valves in said pipes controlling the flow of water and air through said pipes.

4. In an apparatus of the character described, the combination with a suction chamber, of a water chamber below the same, a

partition between said chambers having an opening therein, a spring-pressed double-acting valve normally closing said opening, a suction pipe communicating with said suction chamber, a water pipe connecting the suction pipe with the water chamber below the water level in the latter, a small pipe connecting the water pipe with the water chamber, and a valve in said water pipe.

5. In an apparatus of the character described, the combination with a water chamber having an open top, of a suction chamber secured on top of the water chamber and closing the latter, a spring-pressed valve normally closing an opening in the bottom of said suction chamber and closing communication with the water chamber, a suction pipe communicating with the suction chamber, a water pipe connecting said suction pipe with the water chamber below the water level in the latter, a small pipe connecting the water pipe and water chamber, a pipe communicating with said small pipe, a scrubbing device, flexible pipes or hose connecting the scrubbing device with said last mentioned pipe and the suction pipe.

6. In an apparatus of the character described, the combination with a suction tank or chamber, of a water chamber, a valve normally closing communication between said chambers, a pump communicating with the suction chamber, a suction pipe communicating with the suction chamber, a scrubbing device, a flexible pipe or hose connected to

the scrubbing device and to which said suction pipe is connected, a water pipe communicating with the water chamber, a flexible pipe or hose connecting said water pipe with the scrubbing device, and valves controlling the suction of water to the scrubbing device and the passage of water from the latter to the suction tank.

7. In an apparatus of the character described, the combination with a suction tank or chamber, of a water chamber, a valve normally closing communication between said chambers, a pump communicating with the suction chamber, a suction pipe communicating with said suction chamber, a scrubbing brush, a suction nozzle projecting through the center of said brush, a flexible pipe or hose connecting said nozzle with the suction pipe, a water pipe communicating with the water chamber, water discharge pipes projecting through the brush, a flexible pipe or hose connecting said water discharge pipes with the first mentioned water pipe, a depending apron around the outside of the brush, and a second depending apron around that portion of the brush through which the suction nozzle projects.

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

ARTHUR H. SQUIER.

Witnesses:

R. H. KRENKEL,
S. W. FOSTER.