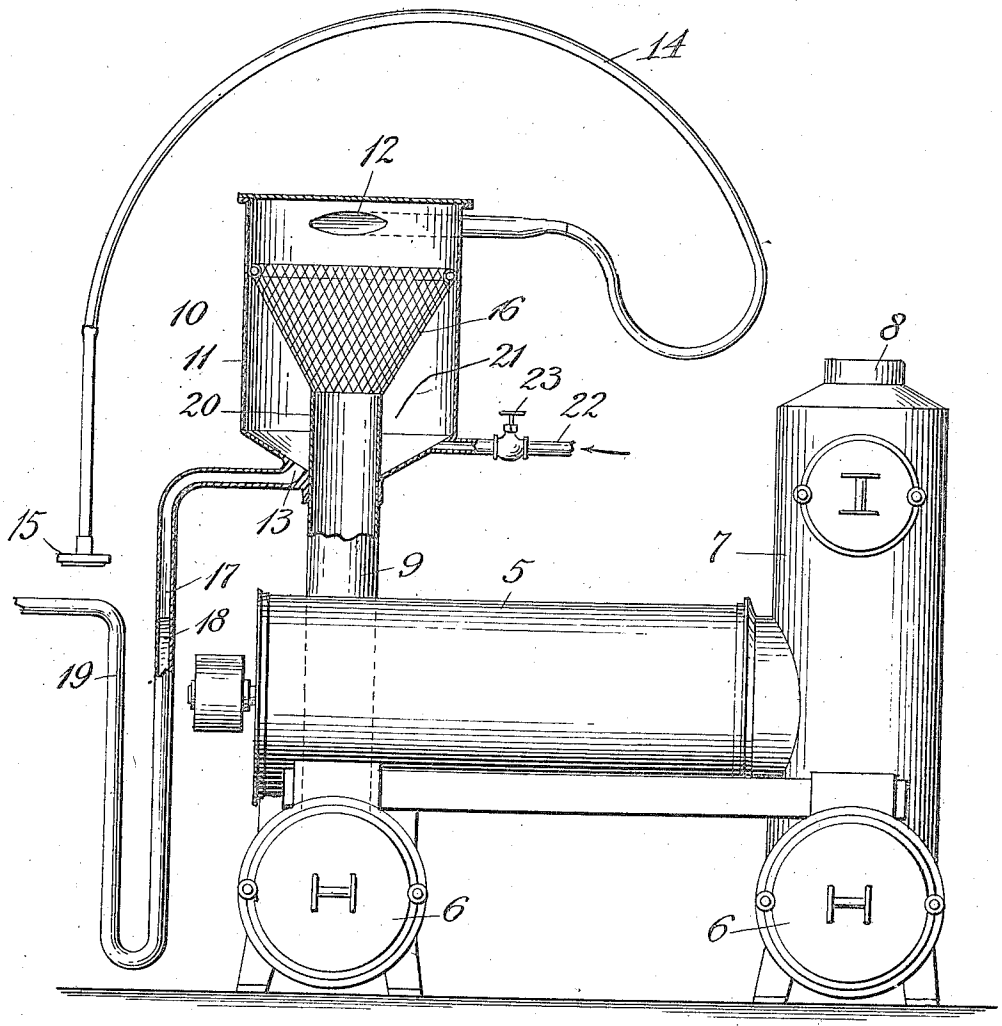
I. H. SPENCER.

CLEANING APPARATUS.

APPLICATION FILED JUNE 9, 1908.

1,103,628. Patented July 14, 1914.



WITNESSES:

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CLEANING APPARATUS.

1,103,628. Specification of Letters Patent. Patented July 14, 1914.

Application filed June 9, 1908. Serial No. 437,528.

To all whom it may concern:

Be it known that I, IRA H. SPENCER, a citizen of the United States, and a resident of West Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Cleaning Apparatus, of which the following is a specification.

My invention relates to the class of devices specified, and an object of the invention, among others, is to provide a device of this class having numerous novel features of advantage and utility.

A form of device in the construction and use of which the objects herein set out, as well as others, may be attained is illustrated in the accompanying drawings, in which—

The figure is a view in elevation of a device embodying my invention with parts broken away to show construction.

My apparatus contemplates the flow of a current of air that by the force of such flow shall remove dirt, and other impurities which are carried along with the current, the device contemplating a suitable apparatus for creating flow of a current of air sufficient for the required purpose.

In the operation of such devices it is desirable in many cases to use water as a means for loosening dirt, this being in the nature of a scrubbing process, the tools embodying brushes and like devices for facilitating the scrubbing. The air and commingled dirt and water are carried through the tools and along the tubing. In order to separate the water, dirt and other impurities from the air, or at least a considerable portion thereof, before the latter reaches the device for creating the flow, I have so arranged my apparatus that it is especially applicable in effecting the separation in which water is a considerable factor.

In the accompanying drawings the numeral 5 denotes a device for creating a flow of air and this may be of any approved pattern, preferably one that is known as a turbine exhauster. This exhauster is provided with receptacles 6 which may accumulate any of the minor parts of the impurities, and a stack 7 having an outlet 8 which may lead to any suitable source of exhaust for the air.

A tubular support 9 rises from the shell of the exhauster (the device for creating a flow of air), this support being connected with the inlet side of said device. Upon this tube a separator 10 is mounted, that, in its preferred form, consists of a case 11 having an inlet 12 and an impurities outlet 13. The inlet 12 is preferably tangentially arranged with respect to the case and has a tube 14 of proper length and size to conduct the current of dirt-laden air, this tube terminating in a tool 15 by means of which the dirt and air are removed.

Within the separating chamber in the case 11 a screen 16 is arranged, preferably tapered or of frusto conical form with the smaller end downward and communicating with the tubular support 9.

A flange 20 is located within the case 11 at the bottom providing an annular space 21. The size as to diameter of this flange may vary within the limits of the dimensions of the chamber within the case, and I consider a satisfactory construction to reside in making this flange of a size approximately that of the tubular support 9, and if desired, this support may be projected within the case to a sufficient extent to provide this flange. The lower end of the screen 16 rests upon the flange 20.

An inlet pipe 22 may be extended into the case 11 and provided with a valve or other suitable means 23 for controlling flow of water, this for the purpose of flushing the case when desired.

The flange 20 may be of any desired height or length to suit any special requirement, in some instances it may be found of advantage to have a construction in which the screen 16 is absent, the flange 20 extending sufficiently within the case to serve all purposes.

In the operation of the device the cleaning tool being applied to a surface, as a floor having water thereon and the device for creating a flow of air being in operation, the commingled dirt, water and air are drawn into the case 11 through the pipe 14 and inlet 12. The centrifugal motion imparted to this current by the action of the device 5 causes the heavier parts of the material, and especially the water, to be thrown outward against the walls of the case from which it flows downward to the bottom thereof into the annular space 21 and from thence through the outlet 13. Any coarser particles of the material are intercepted by the screen 16, and passing along the same and through the tube 9 are deposited in one

of the receptacles 6. This prevents any danger of obstruction in the outlet from the case.

It will be understood that it is essential to maintain a water seal within the trap in order to prevent the flow of impurities and obnoxious gases past said trap into the apparatus, and thence into the room in which the apparatus may be located. In a trap of common and ordinary construction the suction of the apparatus would be such as to draw the limited amount of water from the trap into the apparatus, and to prevent this applicant constructs his trap to contain, when the apparatus is not in use, sufficient water to resist the suction of the apparatus, the trap or connections also being constructed to contain this amount of water when the apparatus is in operation and without backflow into such apparatus.

In the trap herein shown for accomplishing this purpose the shorter arm 19 is of such length that sufficient water will be contained in both arms of the trap, before outflow from the outlet from the arm 19, to resist the suction of the apparatus, and the longer arm 18 of the trap is of a length to contain enough water to resist the suction of the apparatus and prevent back-flow of the water into such apparatus.

When the apparatus is started water will be drawn upward in the long arm to a certain extent, and will, of course, be lowered in the shorter arm 19 to same extent. The water now collected in the cleaning tool flowing out through the outlet 13 and pipe 17 will further raise the water an equal distance in both the longer and shorter arms, this distance being sufficient to permit the water to flow from the short arm through the outlet, this raise in both arms however not being sufficient to carry the water up into the apparatus.

I claim:—

1. A cleaning apparatus including means for creating flow of a current of fluid, a receptacle, a flange projecting from the bottom of the receptacle providing a space between said flange and the wall of the receptacle, an outlet from said receptacle, said outlet being connected with the device for creating a flow of fluid, a screen of conical shape open at its upper end located within said receptacle and with its smaller end opening into said outlet within said flange, and means for delivering matter to be separated into said receptacle.

2. A device for creating flow of a current of air, a receptacle, a flange projecting upward from the bottom of the receptacle and providing a space between said flange and the wall of the receptacle, a connection communicating between the space within the flange and said device for creating flow of a current of air, a screen of frusto-conical form open at its upper end and with its lower end resting upon said flange, said receptacle having an inlet thereto above the screen, and means connected with the inlet for delivering the mixture to be separated into said receptacle.

3. A device for creating flow of a current of air, a receptacle, a flange projecting upward from the bottom of the receptacle providing a space between the wall of the latter and said flange, a connection opening from the space within the flange and connected to the device for creating flow of a current of air, an outlet from the space outside of the flange, and on one side thereof the said outlet including a trap having a longer and shorter arm, whereby removal of fluid from said trap by the operation of the device for creating flow of a current of air is prevented, and an inlet for delivering a mixture to be separated into said receptacle.

4. A device for creating flow of a current of fluid, a receptacle having a communicating passage with said flow creating device and also having an outlet including a trap having a longer and a shorter arm whereby the removal of fluid from said trap by the action of the device for creating flow of air is prevented, means connected with the receptacle for delivering matter to be separated thereinto, and means for separating the water and the dirt carried by it from the air entering the casing of the device for creating said flow.

5. A device for creating flow of a current of fluid, a receptacle having a communicating passage with said flow creating device and also having an outlet including a trap having a longer and a shorter arm whereby removal of fluid from said trap by the action of the devices for creating a flow of air is prevented, means connected with the receptacle for delivering thereto matter to be separated therein, and means within the receptacle for separating the water and coarser material carried thereby.

6. An apparatus including a device for creating flow of a current of air, a separating chamber for collected material, said apparatus having a communicating passage between said device and said separating chamber, and an outlet from said chamber including a liquid trap constructed to prevent emptying thereof by the action of said flow creating device while permitting flow of water through said trap.

7. An apparatus including a device for creating flow of a current of air, a separating chamber for collected material, said apparatus having a communicating passage between said device and said separating chamber, and an outlet from said chamber including a liquid trap constructed to contain liquid enough to resist the suction force of

said flow creating device to an extent to prevent emptying of the trap or back-flow of liquid to said separating chamber.

8. An apparatus including a device for creating flow of a current of air, a separating chamber for collected material, said apparatus having a communicating passage between said device and said separating chamber, and an outlet from said chamber including a trap having a longer and a shorter arm of a capacity to prevent emptying of the trap, the longer arm having a capacity to contain liquid enough to resist the suction of the flow creating device and prevent back-flow of liquid to said apparatus.

9. An apparatus including a device for producing flow of a current of air, a separator into which material is discharged by the air currents, means connected with said separator for delivering thereto material to be separated, said apparatus having a communicating passage between the separator and said device, and a liquid trap connected with the separator and having a longer and shorter arm of a capacity to prevent emptying of the trap whereby the removal of liquid from said trap by the action of said device is prevented.

10. A suction apparatus, a separator into which material is discharged by the air currents produced by said apparatus, means connected with said separator for delivering thereto material to be separated, a tubular connection between said separator and apparatus and a trap connected with the separator and having a longer and a shorter arm of a capacity to prevent emptying of the trap, said longer arm being located on that side of the trap toward the separator and the shorter arm being located at the other side of the trap, whereby the removal of fluid from the trap by the action of the suction device is prevented and an outflow from the trap is permitted without flooding the separator.

11. A suction apparatus for creating flow of a current of air, a separator into which material is discharged by the action of the air currents, means connected with said separator for delivering thereto material to be separated, a tubular connection between said separator and apparatus and a liquid trap connected with the separator and of a capacity to prevent emptying of the trap and including a longer arm or riser proportioned in length to the force to be exerted by said apparatus to maintain a column of liquid in the riser, said trap also including a short arm connected with the waste.

12. An apparatus for creating flow of a current of air, a separator into which material is discharged by the air currents, means connected with said separator for delivering thereto material to be separted, a tubular connection between said apparatus and separator and a liquid trap connected with the separator and having an unobstructed outlet for the discharge of liquid delivered to the separator, said outlet being arranged to maintain a water seal against the force exerted by said apparatus and without back-flow into said separator.

13. An apparatus including a device for creating flow of a current of air, a separator into which material is discharged, said apparatus having a communicating passage between said device and separator, a passage leading to said separator for delivering matter thereto, said passage having an enlarged section in which the moving material may settle, and a liquid trap connected with said separator and having legs of unequal length.

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