April 18, 1933. W. A. SMITH 1,904,667

AIR WASHING AND THE LIKE

Filed Nov. 30, 1929 2 Sheets-Sheet 1

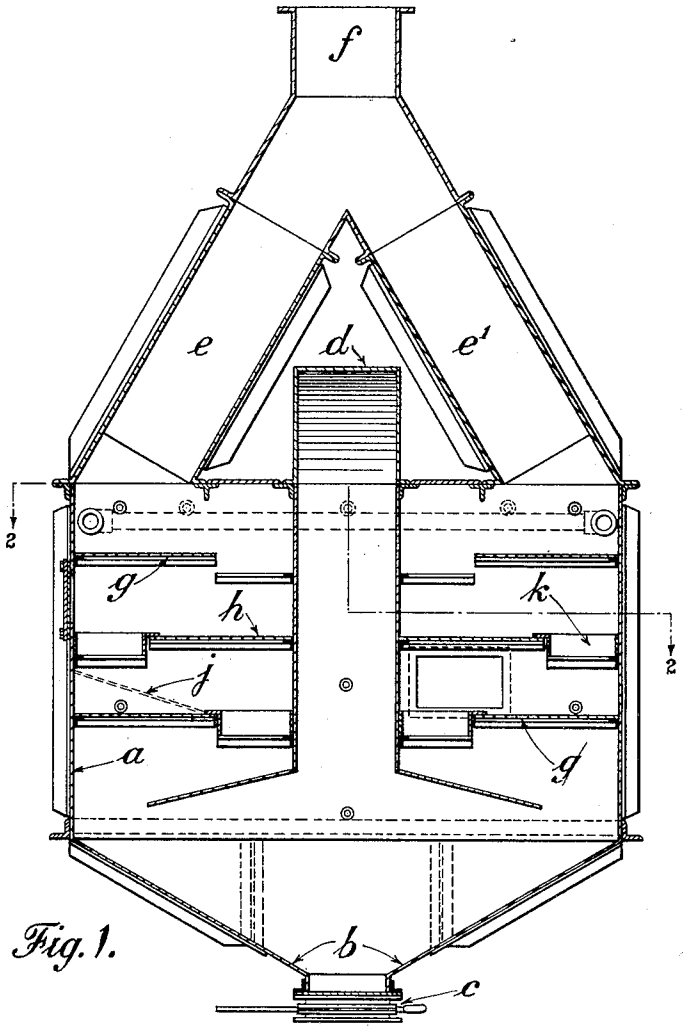


Fig. 1.

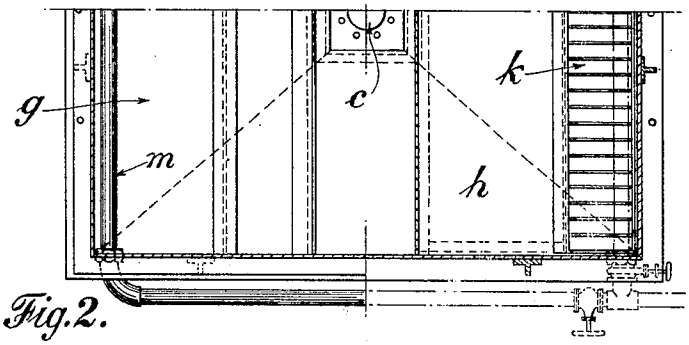


Fig. 2.

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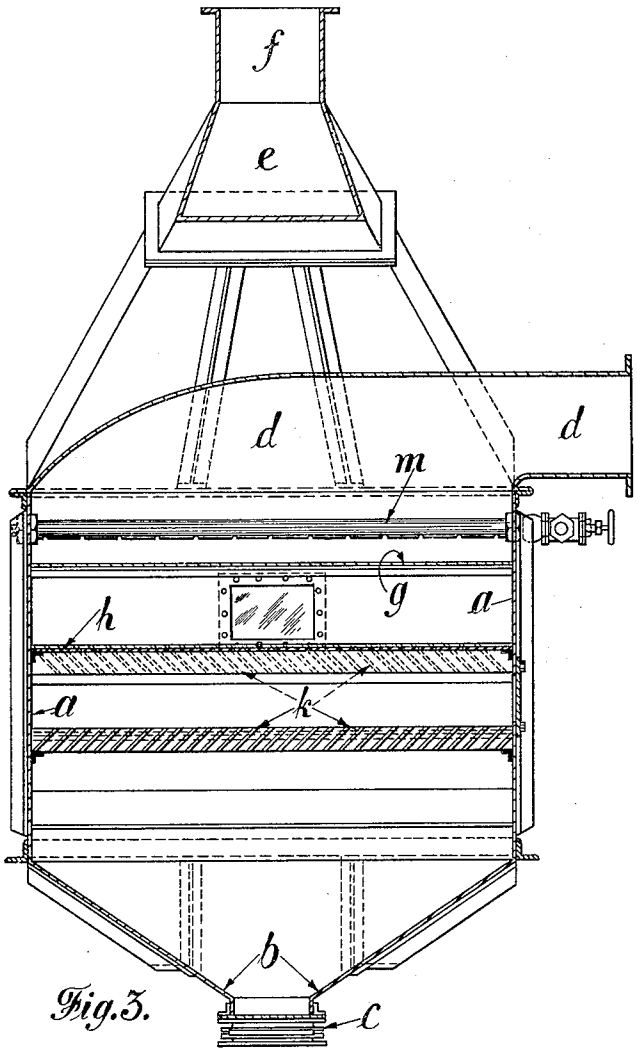


Fig. 3.

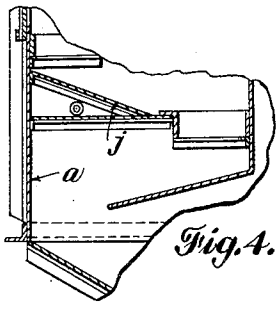


Fig. 4.

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Patented Apr. 18, 1933 1,904,667

UNITED STATES PATENT OFFICE

WILLIAM ALLEN SMITH, OF LONDON, ENGLAND

AIR WASHING AND THE LIKE

Application filed November 30, 1929, Serial No. 410,852, and in Great Britain December 3, 1928.

This invention relates to air washing apparatus and the like and in particular to such apparatus as may be employed for the cleaning of air which has been used for the removal or conveyance of granular, powdered and like materials.

The object of the invention is an improved apparatus which will more effectively break up the air in the process of washing so as to cause better deposition of the suspended matter therein.

According to the invention the air is admitted below the water through which it rises in a tortuous path striking against baffles as it rises which direct it and break it up.

Upon the accompanying drawings:

Fig. 1 is a sectional elevation of one example of the improved air washer.

Fig. 2 is a sectional plan on line 2—2, Fig. 1.

Fig. 3 is a cross sectional elevation of Fig. 1.

Fig. 4 is a sectional elevation of a part of the washer showing a modification of the baffles.

As illustrated, the washer comprises a closed rectangular tank *a*. The bottom *b* of the tank is inclined, as in a hopper, and provided at its apex with a sludge valve *c*. The top of the tank carries a depending central inlet *d* extending the full length of the tank as well as two outlets *e*, e^1 at the sides of the tank, which unite or join together, immediately above the inlet, for a single pipe connection *f*.

The lower end of the inlet *d* is bell-shaped to facilitate the exit of the air and to direct it outwardly towards the sides of the tank. Within the tank at each side and above such inlet are longitudinal baffles, spaced alternately and overlapping, comprising baffles *g* secured on the sides of the tank and baffles *h* secured on each side of the inlet *d*. All the baffles are below water level, and are preferably horizontal so that while they present an even surface at right angles to the main direction of the air, they do not produce air pockets, or are slightly inclined as illustrated to facilitate washing to remove the sludge. As shown in Fig. 4 and in order to prevent the sludge formed of the wetted suspended matter from settling or lodging on the upper side of the baffles, the baffles *g* or some of them may be formed with an inclined upper surface *j* from which the sludge will fall or may be easily washed.

At the overlapping edges of the baffles, further louvered baffles *k* are provided so as to break up the stream of air as it passes up around the end of the baffles. The louvered baffles *k* are arranged so that alternate sets give the air opposite directions of movement longitudinally of the tank, thus further breaking the direct passage of the air. The wet surface of the louvers also provides additional area on to which the dust will be deposited from the air bubbles in their passage. A single water spray pipe *m* is arranged at each side of the tank immediately over each of the top baffles, and these serve both for filling the tank and for washing the baffles, the water as it falls down in the tank being directed from one baffle to the other, effectively washing the whole upper inclined surface of each in its descent.

In a modification the baffles, instead of being inclined so as to prevent collection of deposit, may be pivoted or hinged so that they may be tilted, turned over and/or agitated to shake off any collected sludge so that it will fall to the bottom of the tank.

By avoiding a construction in which pockets of air will be formed, the maximum duration of effective washing is obtained and the least possible resistance consistent with efficient washing is offered to the passage of the air.

The invention is open to modification of construction as for example, in the number and arrangement of the baffles, in the shape of the tank and in the shape of the baffles, which may be formed with an uneven edge to assist the breaking up of the air. Also the apparatus may be made so as to enable continuous operation, the sludge removal being arranged so that it may be effected during operation of the washer, and automatic means provided for maintaining the required level of water.

What I claim is:—

1. An improved air washer comprising a

closed rectangular tank, a depending inlet, for admitting the air, extending the full width of the tank and to the bottom thereof, a series of overlapping longitudinal baffles on each side of and above the inlet, louvered baffles providing relatively close parallel submerged upwardly directed surfaces, each larger in area than the space between them in a transverse plane at the overlapping edges of the longitudinal baffles, an outlet for the air at the top of the tank and a collecting place and sludge outlet at the bottom of the tank, as set forth.

2. An improved air washer comprising a closed rectangular tank, a depending inlet, for admitting the air, extending the full width of the tank and to the bottom thereof, a series of overlapping longitudinal baffles on each side of and above the inlet, inclined louvered baffles providing relatively close parallel submerged surfaces, each larger in area than the space between them in a transverse plane, inclined to give lateral movement to the rising air and positioned at the overlapping edges of the longitudinal baffles, an outlet for the air at the top of the tank and a collecting place and sludge outlet at the bottom of the tank, as set forth.

3. An improved air washer according to claim 2, the louvered baffles at adjacent levels being oppositely inclined to give lateral movement in opposite directions to the rising air at such adjacent levels, as set forth.

In testimony whereof I have signed my name to this specification.

WILLIAM ALLEN SMITH.