C. H. BICALKY.

AIR WASHING APPARATUS.

APPLICATION FILED MAY 31, 1913.

1,225,696. Patented May 8, 1917.

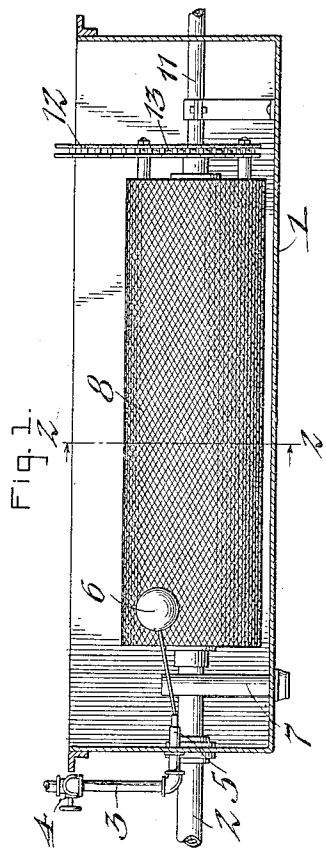


Fig. 1.

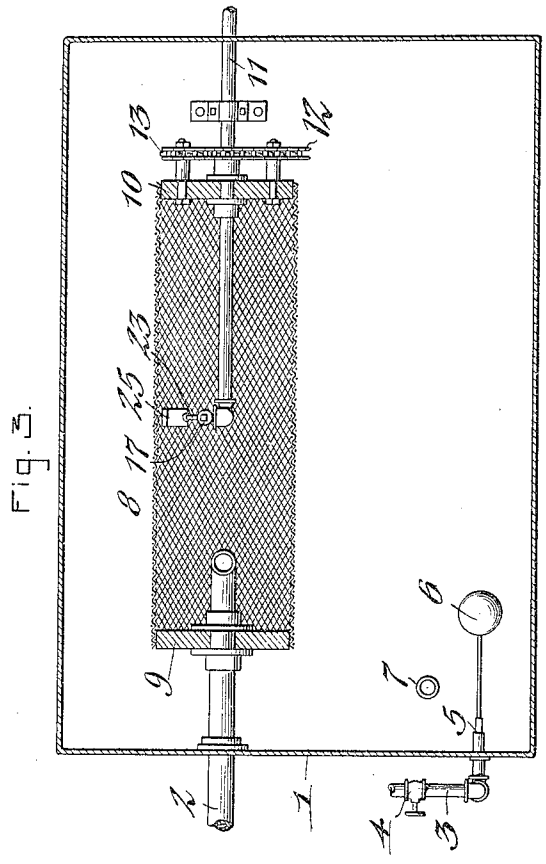


Fig. 3.

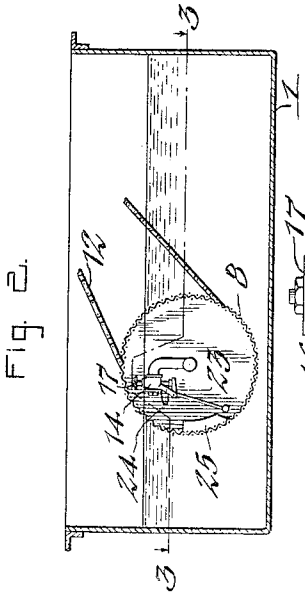


Fig. 2.

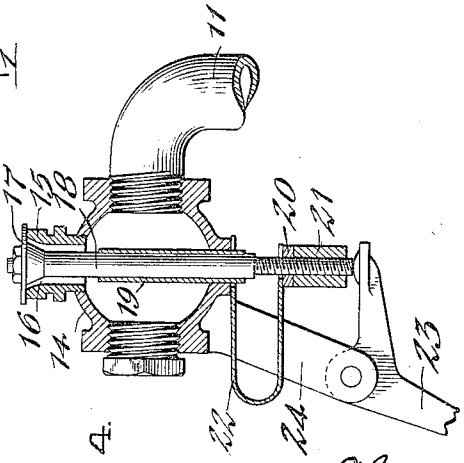


Fig. 4.

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AIR-WASHING APPARATUS.

1,225,696. Specification of Letters Patent. Patented May 8, 1917.

Application filed May 31, 1913. Serial No. 770,844.

To all whom it may concern:

Be it known that I, CHARLES H. BICALKY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Air-Washing Apparatus, of which the following is a specification.

This invention relates to means for automatically cleaning the rotary sieve or screen of an air-washing apparatus although the same may also be used for other purposes.

The object of this invention is the production of a sieve or screen cleaner for this purpose which is simple and efficient in construction, reliable in operation and not liable to become clogged when used continuously.

In the accompanying drawings: Figure 1 is a fragmentary vertical longitudinal section of an air washer equipped with my improvements. Fig. 2 is a vertical transverse section of the same taken on line 2—2, Fig. 1. Fig. 3 is a horizontal section taken in line 3—3, Fig. 2. Fig. 4 is a vertical section, on an enlarged scale, of the cleaning sprayer. Similar characters of reference indicate corresponding parts throughout the several views.

1 represents a sump or catch basin which may form the lower part of an air washing apparatus and which is adapted to catch the water after the same has dropped through the air passage of this apparatus.

The water is withdrawn from this sump through a discharge pipe 2 which preferably extends horizontally through one of the end walls thereof and is arranged with its inlet end below the level of the water in the sump while its outlet end is connected with means which discharge the water in the form of a spray or vapor across the path of the air to be washed.

Fresh water may be supplied to the sump from any suitable source for instance by means of a supply pipe 3 leading into the lower part of the sump and provided with a hand controlling valve 4. The outlet of this pipe may be provided with a float operated valve 5 which is so constructed that when the level of the water in the sump reaches a predetermined height the float 6 of this valve will operate to automatically close the same and prevent the further admission of water. If desired, an overflow pipe 7 may also be employed the upper inlet end of which is arranged within the sump in line with the level of the water which is to be maintained therein while the other end may be connected with a sewer or drain for carrying away the excess water.

Before withdrawing the water from the sump and delivering the same to the spraying apparatus it is necessary to remove from the water all dirt, sediment or other large impurities which may be contained therein so as to prevent the spray nozzles from becoming clogged and thus impairing their efficiency. For the purpose of preventing this possibility a filtering or screening apparatus is provided which removes any large particles or impurities from the water before being carried away from the sump. In its preferred form this screening or filtering device is constructed as follows:

Arranged within the sump is a screen which rotates about a horizontal axis which is provided with a cylindrical foraminous body 8 which is preferably constructed of woven fabric and two imperforate heads 9, 10 which are preferably constructed of wood and secured to the opposite ends of the cylindrical body. This screen may be mounted so as to rotate about a horizontal axis in any suitable manner but as shown in the drawings its head 9 is journaled centrally on the horizontal discharge pipe 2 which connects with the spray nozzles above referred to, while the other head of the screen is journaled centrally on a pipe 11 which is adapted to supply water for cleaning the meshes of this sieve or screen. This rotatable screen is submerged in the water of the sump to a line above the center thereof and preferably about midway between its axis and the top thereof so that the upper part of the screen is unsubmerged and exposed above the water level while the supply and discharge pipes 11, 2 are submerged in the water within the screen. It follows from this that any water of the sump before reaching the outlet pipe 2 must first pass inwardly through the screen and in doing so any large impurities contained in the water are separated therefrom and remain attached to the outer side of the screen.

In order to prevent the screen from becoming clogged and rendered inoperative the same is rotated so that all of its parts are successively brought from the submerged underside of the screen to the unsubmerged upper part thereof, and a spray of cleaning water is delivered from the interior of the screen against the inner side thereof so as to

dislodge any sediment or large particles which may adhere thereto on its unsubmerged part, thereby clearing the latter and maintaining the same in fit condition for continuing the filtration or cleaning of the water supply before the same is delivered to the air washing spray nozzles. The rotary motion may be imparted to the screen by any suitable means, for instance by means of a chain belt 12 which derives its motion from any suitable source and passes around a sprocket wheel 13 on one of the heads of the screen, as shown in Figs. 1 and 3.

The delivery of the cleaning water against the inner side of the screen is preferably effected continuously in the form of a spray by the following means:

14 represents the body of a cleaning sprayer which is arranged within the upper part of the space within the cylindrical screen and connected with the cleaning water supply pipe 11 and has its discharge nozzle 15 arranged above the water level and projecting upwardly. The outlet or mouth 16 of the cleaning nozzle is preferably flared outwardly, as shown in Fig. 4 and the discharge of water from the same is controlled by means of a disk-shaped head 17 having a flat rear or inner side arranged at right angles to the axis of this nozzle and adapted to engage with the front or outlet end thereof. This sprayer head is mounted on the front end of a shifting rod or stem 18 which is arranged axially in the sprayer nozzle and extends diametrically across the body thereof and passes through a guide tube 19 mounted on the underside of the sprayer body. The rear or outer end of the sprayer stem is screw threaded externally and provided with two adjusting screw nuts 20, 21. 22 represents a spring which operates constantly to shift the stem rearwardly and move the head 17 toward the outlet end of the nozzle. In its preferred form this spring is made U-shaped and bears with one end against the outer side of the nozzle body while its other end bears against the inner screw nut 20.

When the apparatus is at rest the spring by pulling rearwardly on the stem causes the head to engage the outlet of the nozzle and close the same. When, however, water under pressure is supplied to the interior of the cleaning sprayer this pressure forces the sprayer head slightly away from the mouth of the nozzle and permits the water to issue radially in all directions from the cleaning sprayer in the form of a thin sheet of finely divided water spray or mist.

Inasmuch as the water contains impurities, particularly when the same is constantly circulated by taking the water which is discharged from the air washing or humidifying apparatus into the sump the outlet of the cleaning sprayer is liable to become clogged with these impurities and interfere with the proper spraying action of the same against the interior of the screen. In order therefore to maintain this cleaning sprayer in any efficient and proper working condition the sprayer head is fully opened momentarily at intervals so as to permit a large volume of water to flow periodically through the cleaning nozzle and thereby flush out any dirt or impurities which may have accumulated therein.

The means whereby this cleaning sprayer is automatically flushed at intervals in this manner may be variously constructed and operated but in the preferred form shown in the drawings the same are preferably constructed and operated as follows:

23 represents a lever which is pivoted on a bracket 24 projecting from the body of the cleaning sprayer and having an upper arm which bears against the rear end of the sprayer stem and a lower arm which is adapted to be engaged intermittently by a trip cam 25 mounted on the inner side of the body of the screen, as shown in Figs. 2 and 3. As the trip cam engages the lower arm of this lever the latter is so shifted that its upper arm pushes the stem of the cleaning sprayer forwardly and moves the sprayer head away from the outlet or mouth of the discharge nozzle, thereby permitting a large volume of water to pass suddenly out through the cleaning sprayer and flush out or clear the same of any sediment. After the trip cam clears the lever the spring again returns the head to its normal position, so that the delivery of the water from this nozzle in the form of a fine spray is again resumed until the trip cam again comes into its operative position relative to the lever.

By this means the screen is not only cleaned continuously and maintained in an efficient condition but the cleaning sprayer is also periodically flushed out and maintained in proper working condition, thereby assuring a continuous supply of filtered or clean water to the devices or apparatus which are fed from the sump.

I claim as my invention:

1. The combination of a sump which is adapted to contain water, a movable screen having a part submerged in said water and a part arranged above the level of the water, a spray nozzle adapted to deliver a spray of water against the unsubmerged part of said screen, and means for intermittently flushing said nozzle.

2. The combination of a sump which is adapted to contain water, a movable screen having a part submerged in said water and a part arranged above the level of the water, a spray nozzle adapted to deliver a spray of water against the unsubmerged part of said screen and having an outlet

and a head movable toward and from said outlet, and means for automatically actuating said nozzle at intervals.

3. The combination of a sump which receives water, a rotatable screen having one part submerged in the water of said sump and another part arranged above the level of the water in the sump, means for withdrawing water from the interior of said screen and means for clearing the meshes of said screen comprising a sprayer arranged within the screen and adapted to deliver a spray of water outwardly against the unsubmerged part of the screen and having a water delivery nozzle, a head movable toward and from the outlet of the nozzle, and means for opening said head by movement derived from said screen.

4. The combination of a sump which receives water, a rotatable screen having one part submerged in the water of said sump and another part arranged above the level of the water in the sump, means for withdrawing water from the interior of said screen and means for clearing the meshes of said screen comprising a sprayer arranged within the screen and adapted to deliver a spray of water outwardly against the unsubmerged part of the screen and having a water delivery nozzle, a head movable toward and from the outlet of the nozzle, a spring operating to close said head, a lever operating to open said head, and a cam arranged on the inner side of said screen and adapted to shift said lever.

Witness my hand this 27th day of May, 1913.

CHARLES H. BICALKY.

Witnesses:
THEO. L. POPP,
ANNA HEIGIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."