

AIR WASHER.

**1,062,124.**

FIG. 2.

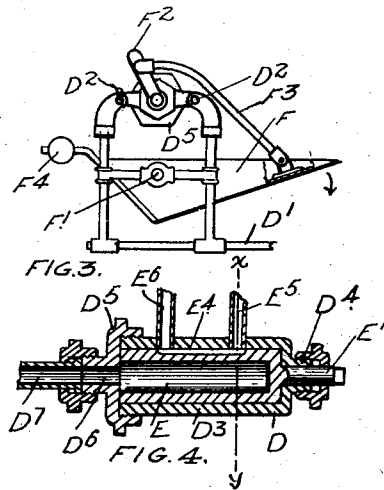


FIG. 3.

FIG. 4

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# UNITED STATES PATENT OFFICE.

SIDNEY RANDOLPH SHELDON, OF GALT, ONTARIO, CANADA.

## AIR-WASHER.

1,062,124.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed July 30, 1912. Serial No. 712,346.

*To all whom it may concern:*

Be it known that I, SIDNEY RANDOLPH SHELDON, of the town of Galt, in the county of Waterloo, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Air-Washers, of which the following is the specification.

My invention relates to improvements in air washers and the object of the invention is to use the head or pressure created by the circulating pump of the air washer for operating the flushing mechanism of the spray heads and it consists essentially of a series of spray heads arranged in a vertical plane so that the spray therefrom forms a vertical sheet of water, a centrifugal pump and pipes leading to the spray heads for supplying the same with water, a valve and operating mechanism therefor operated by the falling water, a pipe connecting the valve to the pump and pipes connecting the valve with the spray heads to operate the flush mechanism thereof at predetermined intervals as hereinafter more particularly explained by the following specification.

Figure 1, is a face elevation of an air washer. Fig. 2, is a side elevation with the side wall partially removed. Fig. 3, is a detail elevation of the valve and the operating mechanism therefor. Fig. 4, is a longitudinal section through the valve. Fig. 5, is a cross section on line *x-y* Fig. 4. Fig. 6, is a sectional detail of a spray head.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the frame of the air washer provided with the usual screens A' and water tank A<sup>2</sup>.

B is a centrifugal pump designed to force water from the tank A<sup>2</sup> through the pipes B' and B<sup>2</sup> to the feed pipes B<sup>3</sup> leading to the spray heads.

C are the spray heads which comprise the tubular portion C' and a central chamber C<sup>2</sup> into which the feed pipes B<sup>3</sup> lead.

C<sup>3</sup> is the central operating spindle of the spray head provided at one end with a spray nut C<sup>4</sup> and operating diaphragms C<sup>6</sup> and C<sup>7</sup> at the other end. The diaphragms are secured at their edge in the enlargement C<sup>8</sup> of the spray head. The spindle C<sup>3</sup> is journaled in a longitudinal bearing C<sup>9</sup> forming part of the main casting of the spray head.

It will be seen that when water is supplied through the feed pipes B<sup>3</sup> that such water is forced through the annular open-

ing C<sup>10</sup> between the spray nut C<sup>4</sup> and the tubular portion C' of the main casting of the spray head. As such water is driven through the opening C<sup>10</sup> it is formed into a thin sheet of water through which air is forced for the purpose of cleaning it.

D is a valve for operating the flushing mechanism of the spray head, such flushing mechanism comprising the longitudinal spindle C<sup>3</sup> and diaphragm C<sup>7</sup> hereinbefore described.

D' is the supporting frame for the valve provided with longitudinal bars D<sup>2</sup> to which the valve is secured.

D<sup>3</sup> is the outer casing of the valve provided at one end with an end bearing D<sup>4</sup> (see Fig. 4) and at the opposite end with a covering cap D<sup>5</sup> having a central orifice D<sup>6</sup>.

D<sup>7</sup> is a feed pipe designed to convey water from the pipe B<sup>2</sup> of the centrifugal pump to the valve D.

E is the inner turnable member of the valve (see Fig. 4). The turnable member E is tubular and is provided at one end with an operating spindle E'. The opposite end of the turnable member E is open so that the water passing from the feed pipe D<sup>7</sup> is fed into the center of the turnable member.

E<sup>3</sup> is an opening (see Fig. 5) leading through the wall of the turnable member.

E<sup>4</sup> is a channel formed longitudinally in the periphery of the turnable member.

E<sup>5</sup> and E<sup>6</sup> are vertical pipes leading from the outer casing D' of the valve D.

E<sup>7</sup> are branch pipes extending from the pipe E<sup>5</sup> and provided with supplemental branch pipes E<sup>8</sup> leading into the enlargement C<sup>8</sup> of the spray head behind the diaphragm C<sup>7</sup>. The pipes E<sup>6</sup> extend vertically upwardly above the uppermost row of spray heads C.

F is a tiltable pan journaled on trunnions F'.

F<sup>2</sup> is an arm secured on the end of the spindle E'.

F<sup>3</sup> is a link connecting the arm F<sup>2</sup> with the forward end of the pan F.

F<sup>4</sup> is a counterweight secured to the opposite end of the pan.

It will be understood that the valve is normally in the position shown in the drawing. The water supplied by the centrifugal pump passes into the portion C<sup>2</sup> of the spray head so as to exert pressure against a smaller diaphragm C<sup>6</sup>. The pan F is gradually filled with water falling from the spray

heads until the weight of the water in the forward end of the pan overbalances the counterweight F<sup>4</sup>. The pan then tips down in the direction of arrow (see Fig. 3) turning the spindle E' and inner turnable valve member E until the opening E<sup>3</sup> is brought opposite the pipe E<sup>5</sup>. The water pressure then passes from the pipe D<sup>7</sup> through the center of the turnable member E and pipe E<sup>5</sup> to the back of the large diaphragm C<sup>7</sup>. It will be readily understood that the pressure against the large diaphragm C<sup>7</sup> will overcome the pressure against the smaller diaphragm C<sup>6</sup> and will, therefore, carry the spindle C<sup>3</sup> in the direction of arrow to flush the spray head. As soon as the pan F becomes empty, of course, it will return to its normal position by means of the counterweight F<sup>4</sup>. When in such position the longitudinal passage E<sup>4</sup> of the turnable member E of the valve will connect the pipe E<sup>5</sup> with the pipe E<sup>6</sup> allowing the water pressure on the diaphragm C<sup>7</sup> to be relieved to the atmosphere through the pipe E<sup>6</sup>. It will thus be seen that when the valve is turned to the flushing position, the pipe E<sup>5</sup> is always full of water, and therefore, water pressure is immediately conveyed to the diaphragm C<sup>7</sup>.

It will, of course, be understood that the operation has to be repeated a few times when starting the machine to fill the pipes E<sup>6</sup>. The pipe E<sup>5</sup> will then always be maintained full of water and also the space at the back of the diaphragm C<sup>7</sup> will be full of water when the diaphragm is in its released position.

From this description it will be seen that I have devised a simple form of air washer which will be operated only by water pressure and that there will be practically no consumption water in the volume to operate the machine.

What I claim as my invention is—

1. An air washer comprising a series of spray heads having spray openings, and a flush mechanism whereby such openings are enlarged, a valve, and means for operating the valve at predetermined intervals to supply water pressure to the spray heads for operating the flush mechanism thereof, as and for the purpose specified.

2. An air washer comprising a series of spray heads having spray openings, and a flush mechanism whereby such openings are enlarged, a valve, means for operating the valve at predetermined intervals to supply water pressure to the spray heads for operating the flush mechanism thereof, and means for automatically releasing such water pressure to the atmosphere when the valve is carried to its normal position, as and for the purpose specified.

3. In an air washer, the combination with a spray head having a spray opening, a

central spindle, and means for moving the spindle longitudinally operated by water pressure, of a valve, and means controlled thereby for conveying water pressure to the spray head to carry the central spindle of the spray head longitudinally, as and for the purpose specified.

4. In an air washer, the combination with the spray head provided with a central operating spindle, a major and a minor operating member connected to the spindle, means for conveying water pressure into the spray head to form the spray, and exert pressure against the minor member, of a valve, and means controlled by the valve for conveying water pressure to one side of the major member to oppose the pressure against the minor member and carry the spindle longitudinally, and means for relieving the pressure against the major member to the atmosphere when the valve is in its normal position, as and for the purpose specified.

5. In an air washer, the combination with a spray head having a major and a minor diaphragm, of means for conveying water to the spray head to form the spray and exert pressure against the minor diaphragm, of a valve designed to convey water pressure against the major diaphragm to oppose the pressure against the minor diaphragm, means for relieving the pressure against the major diaphragm to the atmosphere when the valve is in its normal position, and means for operating the valve by the water falling from the spray head, as and for the purpose specified.

6. In an air washer, the combination with a series of spray heads provided with spray openings, each having a major and a minor diaphragm, means for delivering water to said spray heads in contact with the minor diaphragm constantly, and means for intermittently delivering water to said heads in contact with the major diaphragm to automatically flush said heads periodically.

7. In an air moistener, the combination with spray heads, of a valve casing having an inlet opening, a pipe leading from the valve casing to the spray heads, a pipe leading from the valve casing to the atmosphere above the spray heads, and an inner valve member designed to alternately connect the inlet to the pipe leading to the spray heads, and to cut off the inlet from the pipe leading to the spray head and simultaneously connect the pipe leading to the spray heads to the pipe leading to the atmosphere above the spray heads, as and for the purpose specified.

8. In a control device for spray heads for air washers, a series of spray heads, a valve casing having an inlet opening, a pipe leading from the valve casing to the spray heads, a pipe leading from the valve casing to the

atmosphere above the spray heads, and an inner valve member designed to alternately connect the inlet to the pipe leading to the spray heads and to cut off the inlet from the pipe leading to the spray heads and simultaneously connect the pipe leading to the spray head to the pipe leading to the atmosphere, and means for reciprocating the inner valve member, as and for the purpose specified.

9. In a control device for spray heads for air washers, a series of spray heads, a valve casing having an inlet opening, a pipe leading from the valve casing to the spray heads, a pipe leading from the valve casing to the atmosphere above the spray heads, a tiltable pan designed to receive water and tilt when full, means for holding the pan normally

level when empty, a turnable valve member, a suitable connection between the pan and the turnable valve member, and means in the turnable member for alternately connecting the inlet with the spray pipe, and the spray pipe with the pipe leading to the atmosphere, and simultaneously cut off the valve inlet from the spray pipe when operated by the pan, as and for the purpose specified.

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

SIDNEY RANDOLPH SHELDON.

Witnesses:

ROBERT DONALDSON,  
J. A. STEPHENSON.

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