

J. H. KINEALY.
AIR WASHING APPARATUS.
APPLICATION FILED DEC. 10, 1908.

969,287

Patented Sept. 6, 1910.

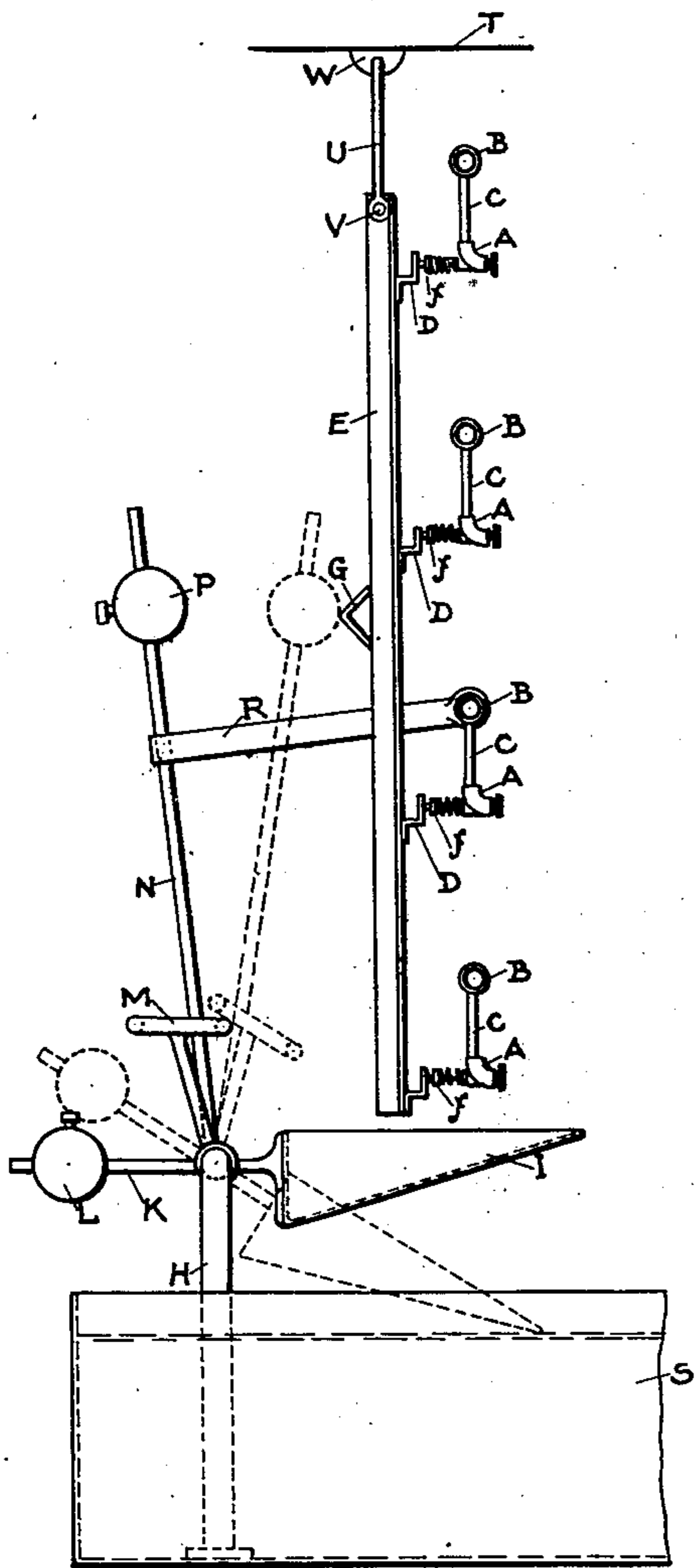


FIG. 1.

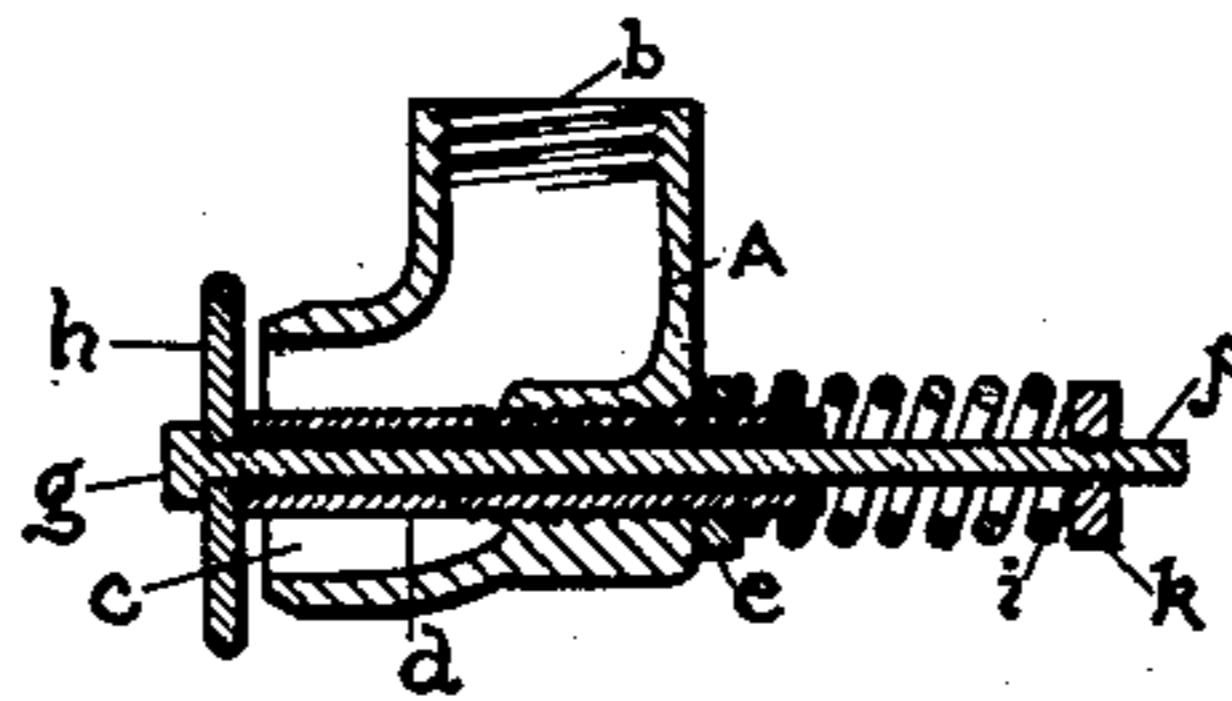


FIG. 3.

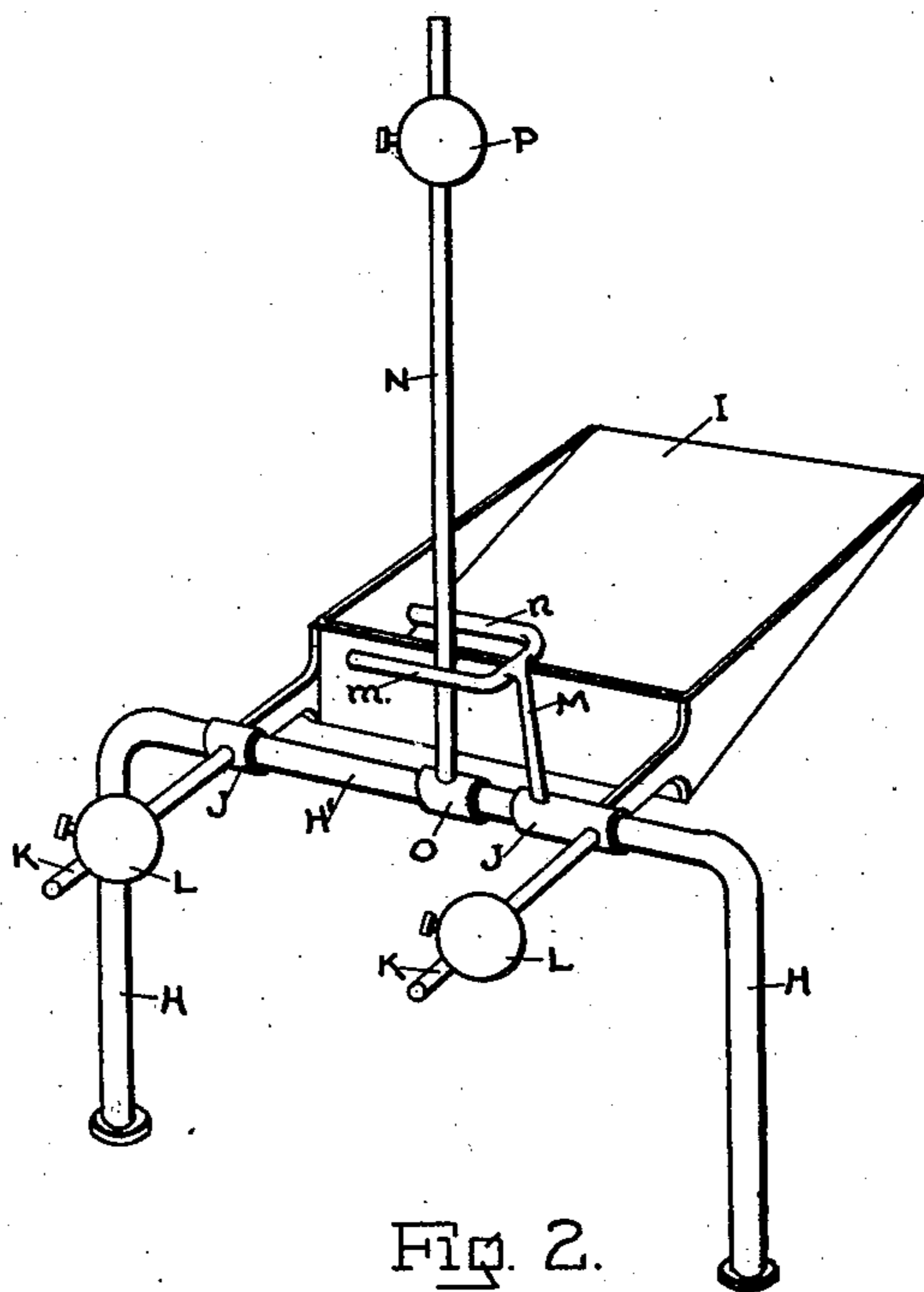


FIG. 2.

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AIR-WASHING APPARATUS.

969,287.

Specification of Letters Patent.

Patented Sept. 6, 1910.

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To all whom it may concern:

Be it known that I, JOHN H. KINEALY, a citizen of the United States, residing at Ferguson, in the county of St. Louis and State of Missouri, have invented a new and useful Improvement in Air-Washing Apparatus, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to those apparatus by means of which air supplied to buildings for ventilating purposes is washed by being made to pass through water in the form of thin sheets or finely divided spray. In these apparatus the water is made to pass from spray heads through small openings. The size of these openings depends upon the degree of fineness that it is desired shall be given to the spray, but in almost all cases the size of the openings is such that any dirt that may get into the water is likely to partially clog the openings so as to render the spray heads inefficient. It is also usual to use the same water over and over again, so that after a short time it becomes very dirty and then the spray heads usually become more or less clogged with dirt, and it becomes necessary to devise some means whereby the spray heads may be flushed at intervals so as to wash out the dirt that may accumulate in them.

The object of my invention is to provide an apparatus for washing air by means of water issuing from spray heads with means whereby the spray heads may be automatically flushed and freed of dirt; and a further object of my invention is to provide an air washing apparatus that will need little or no care on the part of an attendant to keep it in an efficient condition.

My invention is fully shown in the accompanying drawings where similar letters are used to designate similar parts.

Figure 1, shows a side view of the apparatus; Fig. 2, shows a view of that part of the apparatus by means of which the flushing of the spray heads is governed; and Fig. 3, shows a section of one form of spray head which may be used with the apparatus.

Referring to the figures, A is a spray head connected to the water pipe B by means of the short pipe C.

D is a piece attached to the member E and which is in contact with the rod *f* of the spray head A.

G is a strike-piece attached to the member E.

The piece D, the member E and the strike-piece G, constitute a frame which is suspended from the ceiling T of the place in which the apparatus is installed by means of the link U, the pin V and the piece W. The frame is so suspended that it is movable backward and forward in such a way that pressure may be brought to bear on the rod *f* at such times as may be desired.

H is a support carrying a shaft H'. A water pan I is connected to the journals J which move on the shaft H'. To the same journals are connected arms K which carry counterweights L.

M is a fork having the prongs *m* and *n*.

N is a rod which passes between the prongs of the fork M and is connected to the journal O which is free to move on the shaft H'. At the upper end of N there is a weight P. The rod N and the weight P constitute a hammer.

R is a guide which guides the rod N in its movement and also limits in one direction the extent of the movement of this rod.

S is a sump in which the water from the spray head A falls. The relative position of the water pan and its various parts with respect to the hammer is clearly shown in Figs. 1 and 2. It will be seen from these figures that the hammer is free to move through a limited angle determined by the guide R and the strike-piece G, and that by means of the prongs *m* and *n* of the fork M, the movement of the hammer is controlled by the movement of the water pan I.

The construction of the spray head A is clearly shown in Fig. 3, where *b* is the inlet, *c* the outlet, and *d* a tube screwed into the body of the head and provided with a lock-nut *e* by means of which it can be locked in any desired position. This tube projects through the outlet and has passing through it a rod *f* of smaller diameter than the inside of the tube. This rod *f* has at the end next to the outlet a head *g*. Between this head *g* and the end of the tube *d* there is held a spray plate *h* which is loosely mounted on the rod *f*. At the farther end of the rod *f* is a nut *k* which engages with threads cut on the rod. Between the nut *k* and the lock-nut *e* there is a spring *i* which having been compressed tends to expand and thus forces the rod *f* outward so as to hold the spray plate *h*

in place against the pressure of the water in the spray head A. The tube *d* is adjusted so that the spray plate is held at the desired distance from the end of the outlet *c*, and then the nut *k* is adjusted so that the spring *i* exerts sufficient pressure to hold the rod in place against the pressure exerted on the spray plate by the water. When the rod *f* is subjected to a pressure that will compress the spring *i*, the head of the rod *g* moves away from the outlet *c* and the water issuing from the spray head A forces the spray plate *h* to follow the head of the rod so that the opening between the spray plate and the end of the spray head is enlarged and the spray head is flushed so as to wash out any dirt that may have accumulated in the spray head or in the opening between the outlet *c* and the spray plate *h*. When the force exerted on *f* is removed, the spring *i* presses on the nut *k* and forces the rod *f* back to its original place and thus carries the spray plate *h* to its original position in front of the outlet. It is evident that the force brought to bear on the rod *f* whereby the spring *i* is compressed and the spray head flushed may be the result of a steady pressure or of a blow.

The operation of the apparatus is as follows: Water is forced through the pipes B and C into the spray head and from there it flows out through the opening between the end of the outlet and the spray plate and is thus converted into a sheet or spray of a greater or less degree of fineness, depending upon the adjustment of the spray plate *h* with respect to the outlet *c* and upon the pressure of the water in the pipes. The air passes through this water and the dirt in the air is washed out and is carried down with the water into the sump S. The frame consisting of the parts D, E, and G is so adjusted and suspended that the piece D is in contact with the end of the rod *f*. The water pan is empty and is in the position shown by the full lines in Fig. 1. The hammer is also as indicated by the full lines in Fig. 1. Some of the water issuing from the spray head A falls into the pan I and gradually this pan is filled. When it is filled, the weight of the water and the weight of the pan make the pan tilt downward, as indicated by the dotted lines in Fig. 1, and dump. When the pan begins to tilt the fork M moves with it and the prong *m* comes in contact with the rod N and moves it until the rod passes beyond the vertical, then the rod and the weight P falls over and the weight P strikes the strike-piece G and moves the member E and the piece D. Since the piece D is in contact with the rod *f* of the spray head, force is thus brought on the rod *f* and the spring *i* is compressed and the head is flushed. When the pan I has dumped and the water has run out of it

into the sump S, the counterweights L overbalance the pan and make it swing back to its original position shown by the full lines in Fig. 1. As it swings back the prong *n* of the fork M engages with the rod N and swings it back to the position shown by the full lines in Fig. 1. Water again accumulates into the pan I and when it is filled the operation just described is repeated, and thus the spray heads are automatically flushed as long as water is made to issue from them.

It is evident that the form and dimensions of the spray head A may be varied without departing from the spirit of the invention, and that the pan I with the shaft H' and the counterweights L constitute a motor which may be changed to suit the requirements of various conditions.

What I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus for washing air, a plurality of spray heads each provided with means whereby it may be flushed, means operated by a blow for simultaneously operating said flushing means, and a motor adapted to cause said blow, substantially as described.

2. In an apparatus for washing air, a spray head provided with means whereby it may be flushed, means operated by a blow for operating said means whereby the spray head may be flushed, a hammer adapted to revolve and strike said means for operating the means whereby the spray head may be flushed, and a motor whereby the movement of said hammer is controlled, substantially as described.

3. In an apparatus for washing air, a spray head provided with means whereby it may be flushed, a movable frame in contact with said means, a hammer mounted on a shaft so as to revolve and strike said frame, and a motor whereby the movement of said hammer is controlled, substantially as described.

4. In an apparatus for washing air, a spray head provided with means whereby it may be flushed, a movable frame in contact with said means, a hammer mounted on a shaft so as to revolve through a limited angle and strike said frame, and a water motor whereby the movement of said hammer is controlled, substantially as described.

5. In an apparatus for washing air, a spray head provided with means operated by pressure whereby it may be flushed, a movable frame in contact with said means, a hammer mounted on a shaft so as to revolve through a limited angle and strike the frame, a guide for the hammer, and a water motor operated by water from the spray head whereby the movement of the hammer is controlled, substantially as described.

6. In an apparatus for washing air, a

5 spray head provided with means operated
by pressure whereby it may be flushed, a
movable frame in contact with said means,
a horizontal shaft, a hammer mounted on
said shaft so that it can revolve through a
limited angle and strike the frame, a guide
for the hammer, a water pan mounted so
as to be movable on the shaft, said water
pan being so constructed that when full of
10 water it swings forward and dumps, a coun-
terweight for said water pan, and a fork
controlled by the pan to control the ham-
mer, substantially as described.

15 7. In an apparatus for washing air, a
spray head provided with means operated
by pressure whereby it may be flushed, a
movable frame in contact with said means,
a horizontal shaft, supports for the shaft, a

hammer mounted on said shaft so that it
can revolve through a limited angle and 20
strike the frame, a guide for the hammer, a
water pan movable on the shaft, said water
pan being adapted to catch water from the
spray head and so constructed that when
full of water it swings forward and dumps, 25
a counterweight for said water pan, a fork
controlled by the pan to control the hammer,
and a sump for water, substantially as de-
scribed.

In testimony whereof I have signed my 30
name to this specification in the presence of
two witnesses.

JOHN H. KINEALY.

Witnesses:

ELLA JUNE,
THERESA SUEME.