

July 6, 1926.

1,591,893

A. B. TAPPEN

DAMPER FOR CLOSED SYSTEM AIR WASHERS

Filed July 26, 1923

Fig. 1.

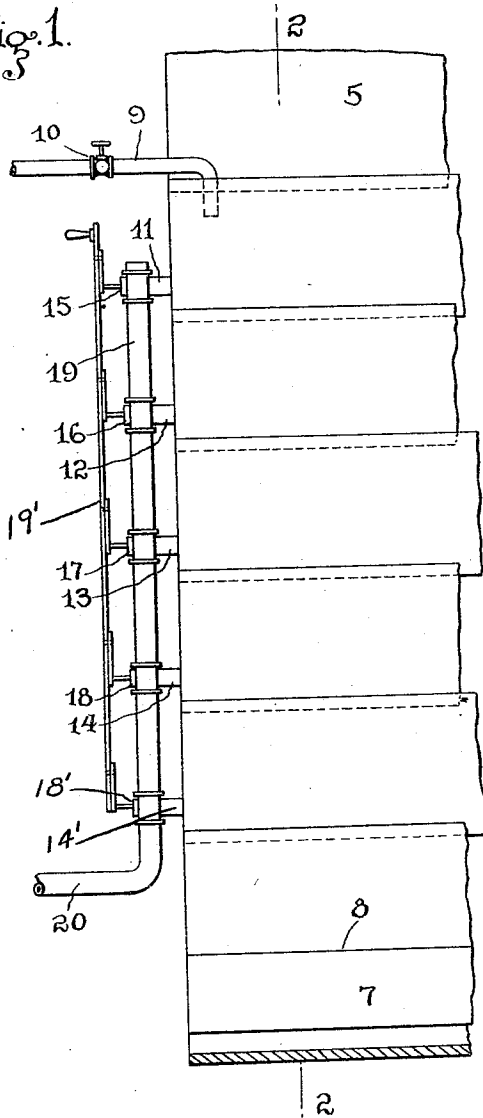
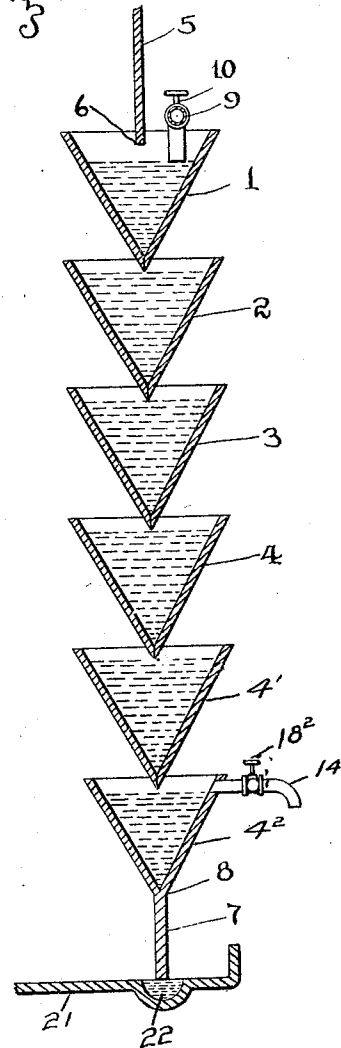


Fig. 2.



INVENTOR
Alexander Bonnell Tappen
 BY *Andrew F. Smith*
 ATTORNEY

UNITED STATES PATENT OFFICE.

ALEXANDER BONNELL TAPPEN, OF BRIARCLIFF MANOR, NEW YORK.

DAMPER FOR CLOSED-SYSTEM AIR WASHERS.

Application filed July 26, 1923. Serial No. 653,905.

This invention relates to dampers for use in closed system air washers, and the like, in which it is desirable to provide an air tight damper which may be readily opened. In devices of the above mentioned type, the outer air is normally excluded from the system and means are provided for the admission of the outer air in emergent conditions resulting from failure of some part of the system to properly function. The end sought is a continuous and uninterrupted supply of air. It is customary to provide a suitable device which will automatically open to admit air in such emergent conditions.

The objects of my invention are to provide a damper which may be, first, quickly opened, second, effectively sealed against all passage of air, third, easily and quickly operated, and, fourth, possessing within itself means of opening if emergent or other automatic devices fail.

I attain these objects by means of the device illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of the damper, and

Figure 2 is a vertical section taken on the line 2—2 of Figure 1.

Similar numerals refer to similar parts throughout the several views.

My improved damper is adapted to be placed in the wall of the air conduit of an air washer of the closed type or other similar device, whereby the wall will be normally sealed against the admission of air there-through. In the event of increased atmospheric pressure, however, air will be admitted as is hereinafter more particularly described.

The damper includes a series of vertically spaced containers or troughs 1, 2, 3, 4, 4¹ and 4² which are preferably V-shaped in cross section. The troughs have their vertical center lines common to the vertical plane of the wall 5.

The bottom of each trough or container is set slightly below the horizontal plane of the top edges of the trough next beneath it. The lower edge 6 of the wall 5 at the top of the damper comes below the plane of the top edges of the uppermost trough while the bottom of the bottom container 4² is joined with the top of the bottom wall 7 as

at 8 by any suitable means. The joint between the wall 7 and the floor 21 may be water sealed by the liquid filled trough 22 as shown.

A feed pipe 9 having a control valve 10 is disposed above the uppermost trough, so that the said trough may be filled with liquid, whereby the containers located beneath it may be filled by the overflow of the liquid from the container next above.

Each trough is provided with an outlet 11, 12, 13, 14, 14¹ and 14² respectively controlled by valves 15, 16, 17, 18, 18¹ and 18² respectively which may be manually or otherwise operated. The valves may be operated separately, but they are interconnected by the pipe 19 so that they may be adjusted simultaneously by means of a shaft 19¹. The outlets 11, 12, 13, 14 and 14¹ are each connected with a common waste pipe 20. The inlet valve 10 is also operated, preferably in conjunction with the opening of the waste valves 15, 16, 17, 18 and 18¹, so as to cut off the supply of liquid to the damper.

The operation of the device is as follows: After the troughs 1, 2, 3, 4, 4¹ and 4² have been filled with liquid from the feed pipe 9, which is of sufficient size for rapid filling of the troughs, the amount of water supplied to the top trough is regulated by means of a valve 10 to such an amount only as is necessary to keep each trough filled and to take care of evaporation. To open the damper, the waste valves 15, 16, 17, 18 and 18¹ are opened, which drains off the water from the troughs 1, 2, 3, 4 and 4¹ into the main waste pipe 20. The outlets of course are large enough to allow a very rapid lowering of the water level in each trough. Since the bottom of each of the troughs 1, 2, 3, 4 and 4¹ is set only the least distance practical below the line of the top edges of the trough beneath, it is obvious that the opening of the damper, due to the fall of water in the troughs as the valves 15, 16, 17, 18 and 18¹ are opened, will be almost instantaneous.

The size of the openings in the curtain increases as the volume of water released increases. In the event of failure of the air washer mechanism to function, a slight excess air pressure will blow out the water seals and give relief.

The outlet valve 18² of the trough 4² may

be regulated to take care of any excess water which might otherwise overflow trough 4², due to changes in evaporation.

I claim:

5 1. A series of liquid filled containers vertically disposed, forming a gas-tight damper, means for supplying water to the uppermost container and thence by overflowing the same, to the containers beneath the
10 said uppermost container and means for exhausting any of the containers.

2. In a damper, a series of vertically spaced open containers, the bottom of each container being set slightly below the horizontal plane of the top edges of the con-
15 tainer next beneath it, a feed pipe adapted to supply water to the uppermost container, the containers beneath being adapted to be

filled by overflow from the said uppermost container, outlet drains in the said contain- 20 ers, valves therein, and means for operating the said valves simultaneously.

3. In a damper, a series of vertically dis- posed open containers adapted to be filled with liquid, the bottom of each container 25 extending into the container next beneath it to be immersed in the liquid therein when said container next beneath is filled with liquid whereby an airtight seal is formed, a liquid supply pipe for the top container 30 from which the containers below will be filled by overflow therefrom.

In testimony whereof I affix my signature.

ALEXANDER BONNELL TAPPEN.