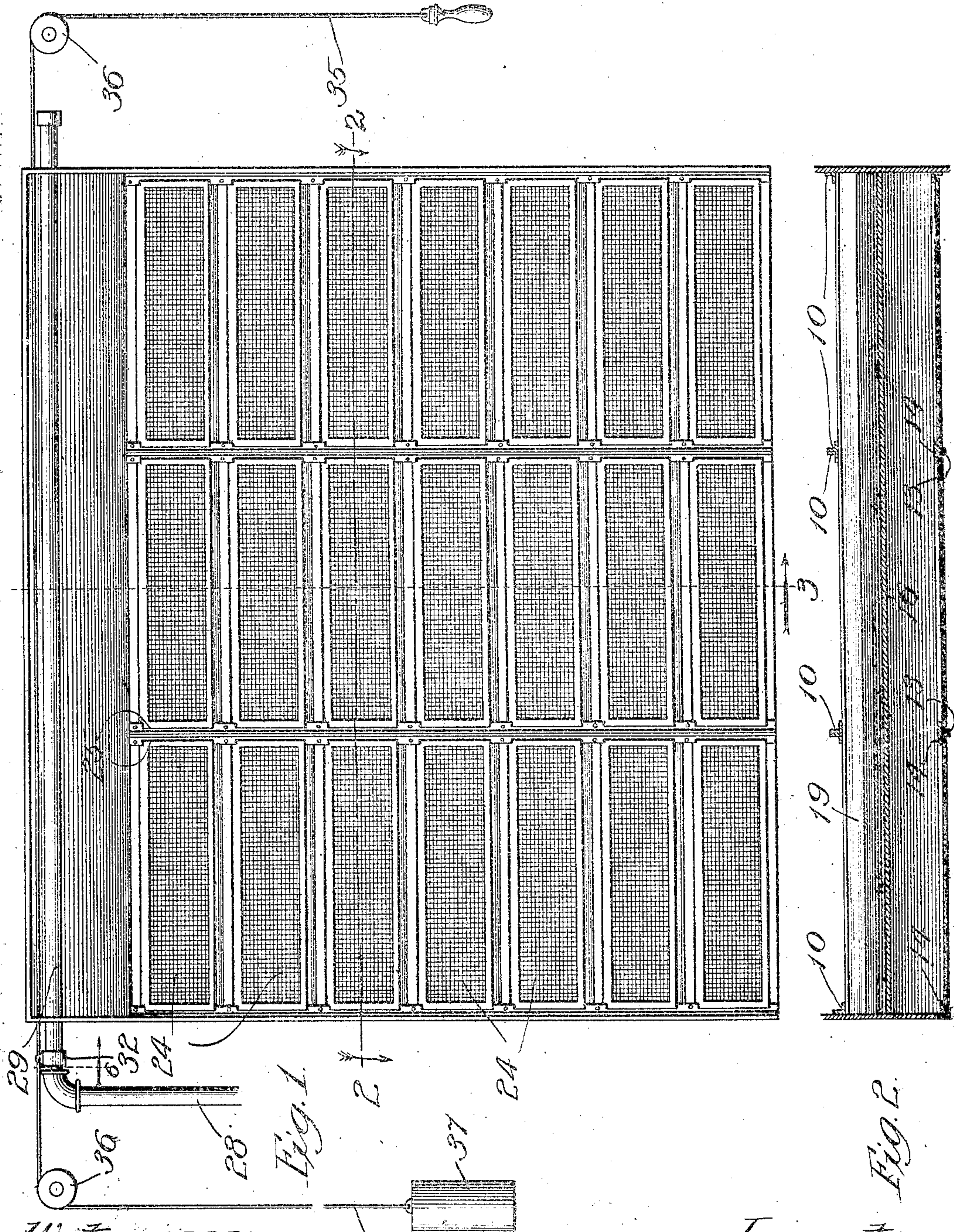


L. NAROWETZ.
AIR WASHING APPARATUS.
APPLICATION FILED APR. 20, 1908.

907,633.

Patented Dec. 22, 1908.

2 SHEETS—SHEET 1.



Witnesses:
Edw. B. Gaylord.
Chas. H. Buell.

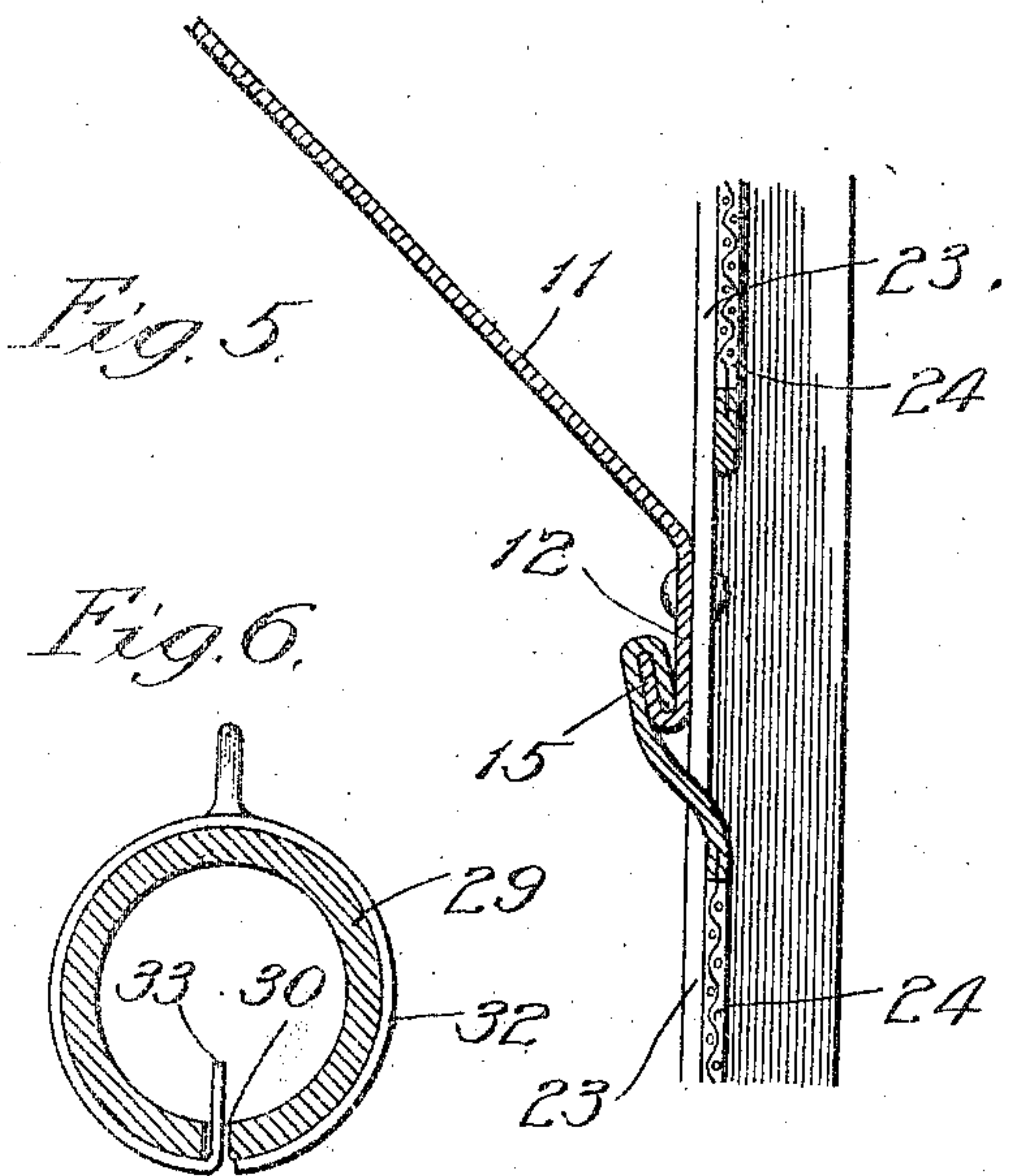
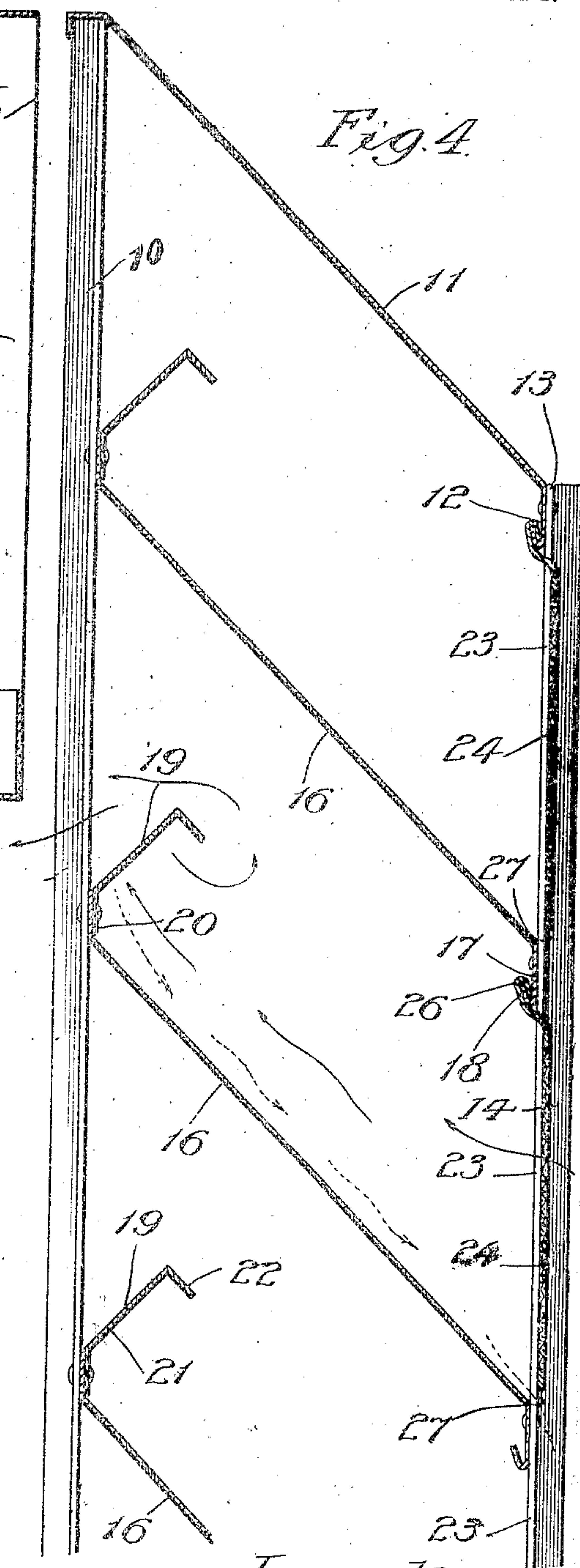
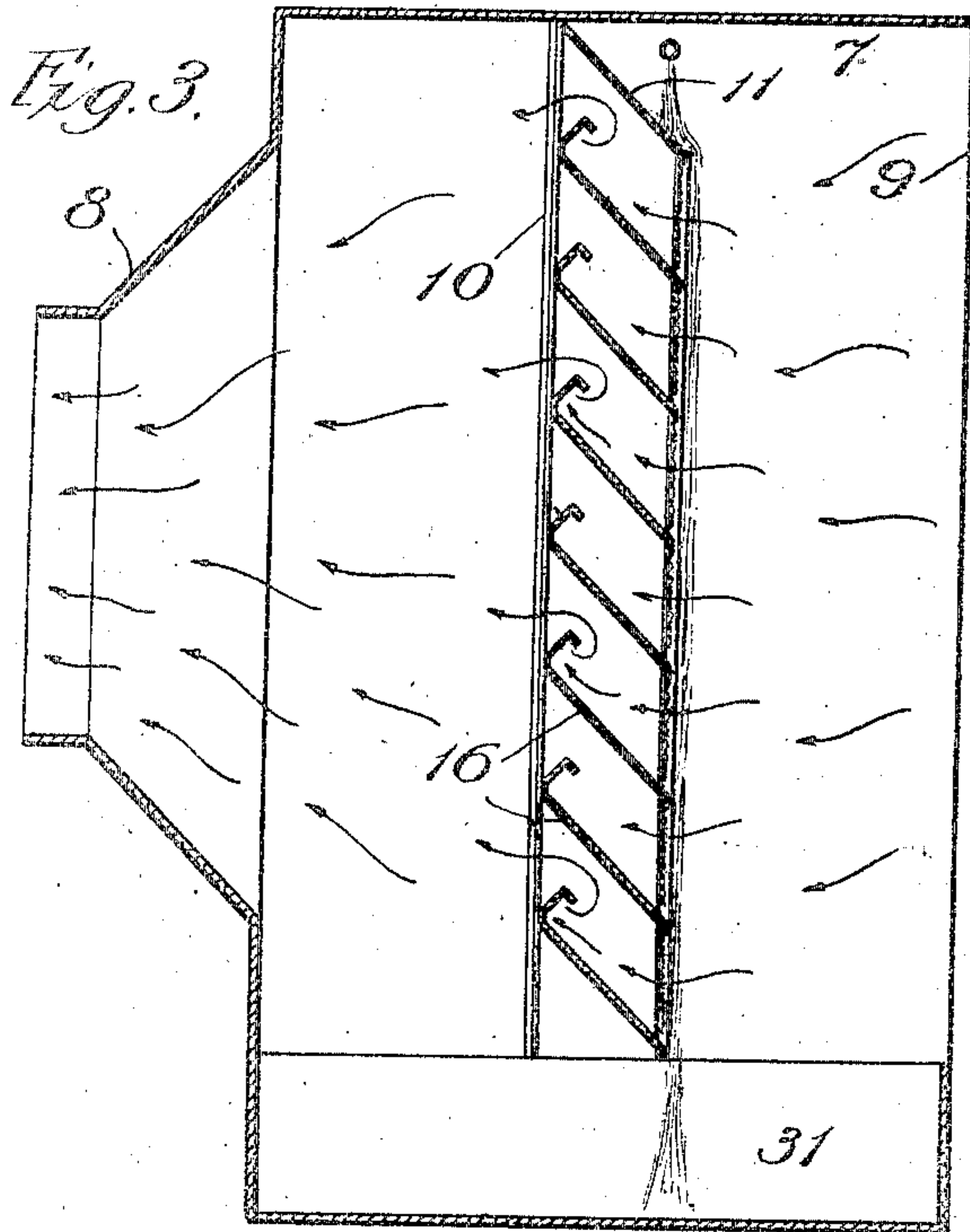
Inventor:
Louis Narowetz.
By D. D. Dymforth, L. C. Chittenden & Wiles,
Attys.

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UNITED STATES PATENT OFFICE.

LOUIS NAROWETZ, OF CHICAGO, ILLINOIS.

AIR-WASHING APPARATUS.

No. 907,633.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed April 20, 1908. Serial No. 428,262.

To all whom it may concern:

Be it known that I, LOUIS NAROWETZ, a citizen of the United States, residing at 203 East Kinzie street, Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Air-Washing Apparatus, of which the following is a specification.

My invention relates to the class of air-washing apparatus for use in cleansing air of dust and dirt preliminary to its use in connection with heating and ventilating systems by passing the air through water; and my primary objects, generally stated, are first, to afford a construction by which all of the air drawn into the apparatus shall be subjected to the washing action of the water; and second, to reduce to the minimum the number of baffles required for precipitating the moisture taken up by the air in passing through the water, and thus reduce to the minimum the amount of power required for inducing the desired suction action upon the air to be cleansed, and the amount of moisture in the air after it leaves the cleansing apparatus for distribution in the system to which it is supplied.

Referring to the accompanying drawings: Figure 1 is a front view of an air-washing apparatus constructed in accordance with my invention, this view showing the screened end of the apparatus through which the air is drawn into the latter. Fig. 2 is a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow. Fig. 3 is a section taken at the line 3 on Fig. 1, and viewed in the direction of the arrow. Fig. 4 is an enlarged view in sectional elevation of the upper end of the screen-and-baffle-construction illustrated in Fig. 3. Fig. 5 is an enlarged view in sectional elevation of a detail; and Fig. 6 is a section taken at the line 6 on Fig. 1 and viewed in the direction of the arrow.

The casing for housing the parts of the apparatus is represented at 7, and has its opposite ends 8 and 9 open for the passage of air through it. Its inner end 8 is restricted as illustrated and is adapted to be connected with a conduit containing a suction-fan (not shown) as is commonly provided in structures of this kind for drawing the air to be cleansed through the apparatus.

A frame-work preferably composed of parallel vertical angle-irons 10 spaced apart, as represented in Fig. 2, are riveted to the inner

surfaces of the casing 7. Fixed to this frame-work at its upper end to extend completely across the interior of the casing 7 and inclined forwardly and downwardly is a shelf 11 joined at its lower forward depending flange 12 to the rear flanges 13 of a vertical series of parallel angle-irons 14 which form a frame between the irons 10 and the outer air-inlet end 9 of the casing. The lower edge of the depending flange 12 of the shelf 11 is rearwardly and upwardly turned to afford an upwardly extending flange 15, for a purpose hereinafter explained.

Below the shelf 11 is a vertical series of shelves 16 extending entirely across the interior of the casing, each vertically spaced apart from the other as represented, and inclining downwardly and forwardly from their rear upper edge-portions, at which they are riveted to the irons 10, to the irons 14 to which they are fastened by depending flanges 17 thereon. The flanges 17 are formed with rear upwardly extending flanges 18, as described of the shelf 11, for a purpose hereinafter set forth. The shelves 16 are preferably so inclined as to cause their upper inclined portions to extend in a horizontal plane above that occupied by the opposed flanges 18 as represented, for the purpose hereinafter explained.

Extending across the interior of the casing, at the upper extremities of the shelves 16, are baffles 19, each of which is preferably formed with a depending flange 20 at which it is riveted to the irons 10, a central section 21 extending at right-angles to the shelves 16 and a lip 22 at right-angles to the section 21, each baffle, by reason of the inclination of the shelves, as described, extending in a plane above that occupied by the lower edge-portions of the shelf immediately above it.

In each of the openings 23 afforded by the intersection of the outer edge-portions of the shelves 16 and the vertical irons 14, a screen 24 is removably suspended. Each of these screens fits flatwise against the adjacent rear flanges 13 of the irons 14, and the ends of the upper edge-portion are cut away as indicated at 25, and bent rearwardly and upwardly to form a hook-edge 26 which extends rearwardly beyond the irons 14 and hooks over the adjacent flange 18, as most clearly illustrated in Fig. 5, the heights of the screens being such as to cause each of them to reach short of the plane in which the shelf 16 immediately below it terminates,

and thus a series of spaces 27, as illustrated in Figs. 3, 4 and 5, is afforded between the bottom of each screen and the shelf immediately below it. The washing water is supplied through a pipe 28 which terminates in a pipe 29 located above the upper shelf 11, the pipe 29 being provided with a slot 30 through which the water is caused to discharge onto the shelf 11.

The operation of the apparatus is as follows: The washing water flows from the pipe 29 in a thin sheet on to the shelf 11 from which it pours over the lower end of this shelf, passing over the screens 24 in the form of a continuous curtain. The air to be washed, entering the casing at the end 9, under the action of the usual suction-fan placed beyond the restricted end 8 of the casing 7, is drawn through the water-curtain and screen 24, and the air, and the water taken up by the air, is caused to impinge against the shelves 16 and baffles 19, the water being thus precipitated on the baffles and shelves from which it pours down in the course as indicated by the dotted arrows in Fig. 4, falling from these shelves at the openings 27. The spent water runs into a tank 31 from which it may be drained in any suitable manner to separate it from the dirt washed from the air.

It will be noted that the water in flowing down the screens is caused in part to be carried through each screen and that the water carried through the screens and precipitated onto the shelves 16 is caused to run off therefrom and in falling over the respective screens below again is subjected to the suction action and portions of it are again drawn through the screens to again be precipitated and flow to the next screens below, this action continuing until the water reaches the tank. It will be understood that the amount of water drawn through the screens depends on the strength of the suction-action produced. A decided advantage afforded by this construction is that of causing a water-curtain of the desired density to be provided at all of the screens independent of their position relative to the water-supply pipe. As a means for removing clogging dirt from the slot 30 in the pipe 29, I provide a sliding sleeve 32 which carries an upwardly-extending tongue 33 projecting through the slot 30, as illustrated in Fig. 6, this sleeve being secured to cables 34 and 35 which pass over pulleys 36, the cable 34 carrying a weight 37 which holds the sleeve normally at one end of the pipe 29 and the cable 35 having a handle by which the sleeve may be drawn lengthwise of the pipe to cause its tongue to move through the slot 30 and remove therefrom any clogging dirt.

By locating the shelves and baffles as described the air charged with water, in moving

in the direction indicated by arrows in Fig. 3 after leaving the screens strikes the baffles, precipitating the water as described. Thus but one baffle for each screen-section is required, thereby not only permitting the air to be sucked through the apparatus with the minimum power, but also reducing to the minimum the amount of moisture produced by evaporation of the usually heated water on the baffles.

The feature of supporting the screen-sections in a manner to permit of their removal and replacing, enables the sections to be readily removed independently of each other for purposes of repair, or the like.

It is manifest that where conditions require it, as for instance where the air to be cleansed is especially dirty, the casing may be lengthened over that shown in the drawings, and any number of sets of shelves and baffles with a water-curtain for each, such as that described, may be used.

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

1. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a series of shelves in the rear of said screen, and means for producing a water-curtain between the screens and air-inlet, the whole being constructed and arranged to cause the water precipitated onto the shelves to discharge into the water curtain, for the purpose set forth.

2. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a series of shelves in the rear of said screen, a baffle near the rear edge of each of said shelves, and means for producing a water-curtain between the screens and said air-inlet, the whole being constructed and arranged to cause the water precipitated onto the shelves to discharge into the water curtain.

3. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a shelf in the rear of said screen, baffle-means operating in conjunction with said shelf, and means for producing a water-curtain between said screen and the air-inlet.

4. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a shelf in the rear of said screen, a baffle at the rear of said shelf, and means for producing a water-curtain between the screen and said air-inlet.

5. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, an inclined shelf in the rear of said screen, a baffle at the rear edge portion of said shelf, and means for producing a water-curtain between said screen and air-inlet.

6. In an air-washing apparatus, the combination of a casing provided with an air-inlet and air-discharge, a partition in the casing containing a screen, a shelf in the rear of said screen, a baffle above the shelf in a plane above that occupied by the upper portion of the screen, and means for producing a water-curtain between the screen and the air-inlet.

7. In an air-washing apparatus, the combination of a casing provided with an air-inlet and air-discharge, a partition in the casing containing a screen, a shelf and a baffle connected with the shelf, the said partition containing an opening registering with the shelf for draining the latter, and means for producing a water-curtain between the screen and air-inlet.

8. In an air-washing apparatus, the combination of a casing provided with an air-inlet and air-discharge, a screen-partition in the casing, a vertical series of inclined shelves in the rear of said screen, baffles on the shelves, each baffle in a plane above that occupied by the lower portion of the shelf immediately above it, and means for producing a water-curtain between the screen and the air-inlet.

9. In an air-washing apparatus, the combination with a casing provided with an air-inlet and air-discharge, a partition in the casing containing a plurality of screen-sections each independently removably supported, a vertical series of shelves in the rear of the screens, baffles for said shelves, and means for producing a water-curtain between the screen and the air-inlet.

10. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a series of screen-sections removably secured in the casing, a series of shelves in the rear of said screens, and means for producing a water-curtain between the screens and said air-inlet.

11. In an air-washing apparatus, the combination of a casing provided with an air-

inlet and air-discharge, inclined shelves supported in the casing, baffles on the shelves, screen-sections removably secured to the shelves to depend therefrom between the shelves and the air-inlet, and means for producing a water-curtain between the screens and the air-inlet.

12. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a water-shelf in the casing, and means for discharging water upon said shelf to cause it to run therefrom to form a water-curtain between the screen and air-inlet.

13. In an air-washing apparatus, the combination of a casing provided with an air-inlet and an air-outlet, a screen in the casing, a series of shelves in the rear of said screens, baffles on the shelves, a water-shelf above said first-named shelves, and a water-pipe adapted to discharge upon said water-shelf, for the purpose set forth.

14. In an air-washing apparatus, the combination with a casing provided with an air-inlet and air-discharge, a vertical series of shelves, baffles on the shelves, a water-shelf above said shelves, a screen between said shelves and air-inlet and a water-pipe having a slotted discharge adapted to discharge water upon said water-shelf, for the purpose set forth.

15. In an air-washing apparatus, the combination of a casing provided with an air-inlet and air-discharge, a screen partition, a pipe containing a longitudinal slot at which it is adapted to discharge water upon said screen, means operating in said slot for removal therefrom of clogging dirt, and means for separating the water from the air after it passes through said screen.

LOUIS NAROWETZ.

In presence of—

RALPH SCHAEFER,
W. T. JONES.