

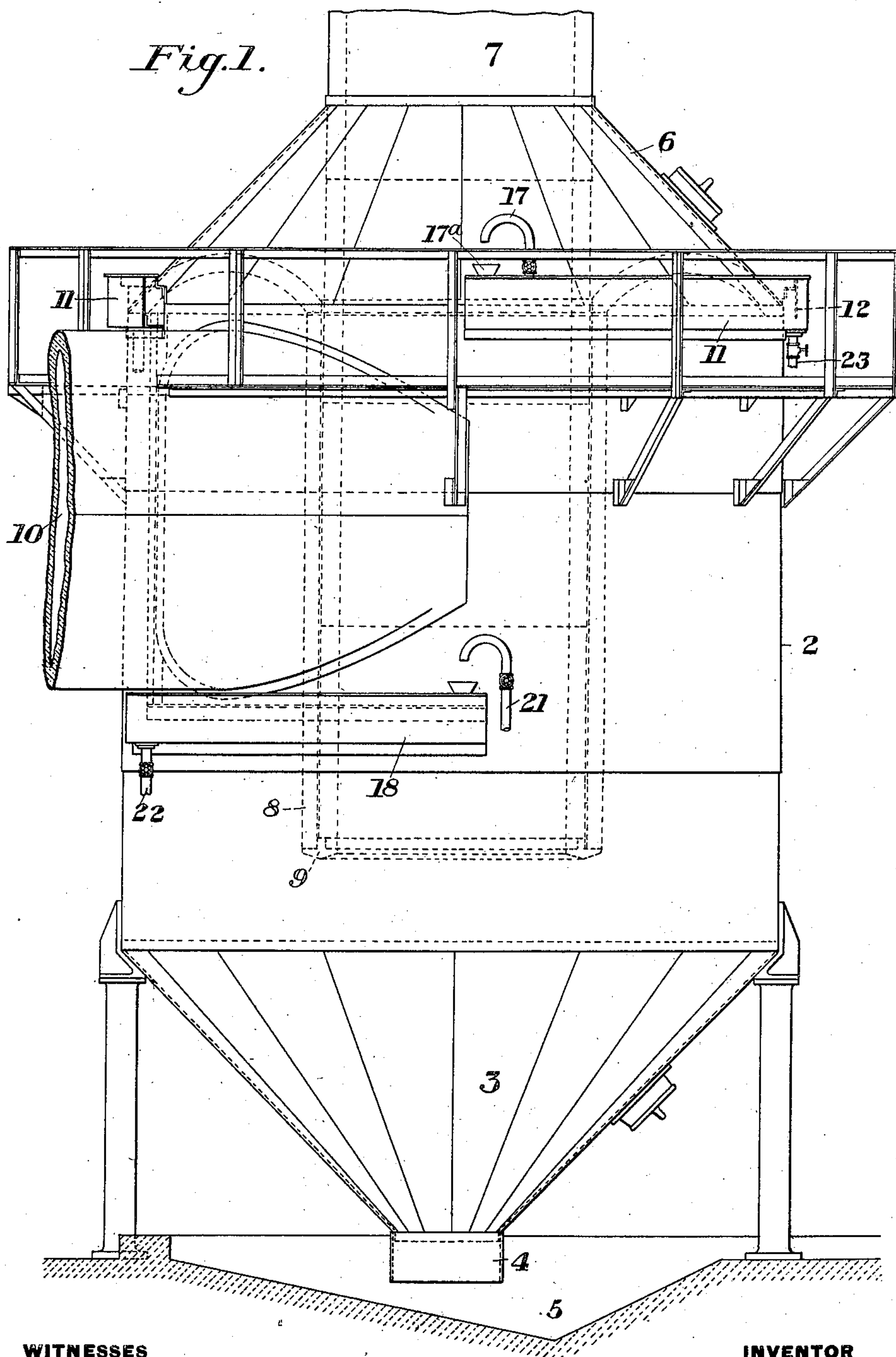
No. 844,813.

PATENTED FEB. 19, 1907.

F. E. BACHMAN.
GAS WASHER.

APPLICATION FILED JULY 11, 1906.

3 SHEETS—SHEET 1.



WITNESSES

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W. W. Swartz

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No. 844,313.

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3 SHEETS—SHEET 2.

Fig. 2.

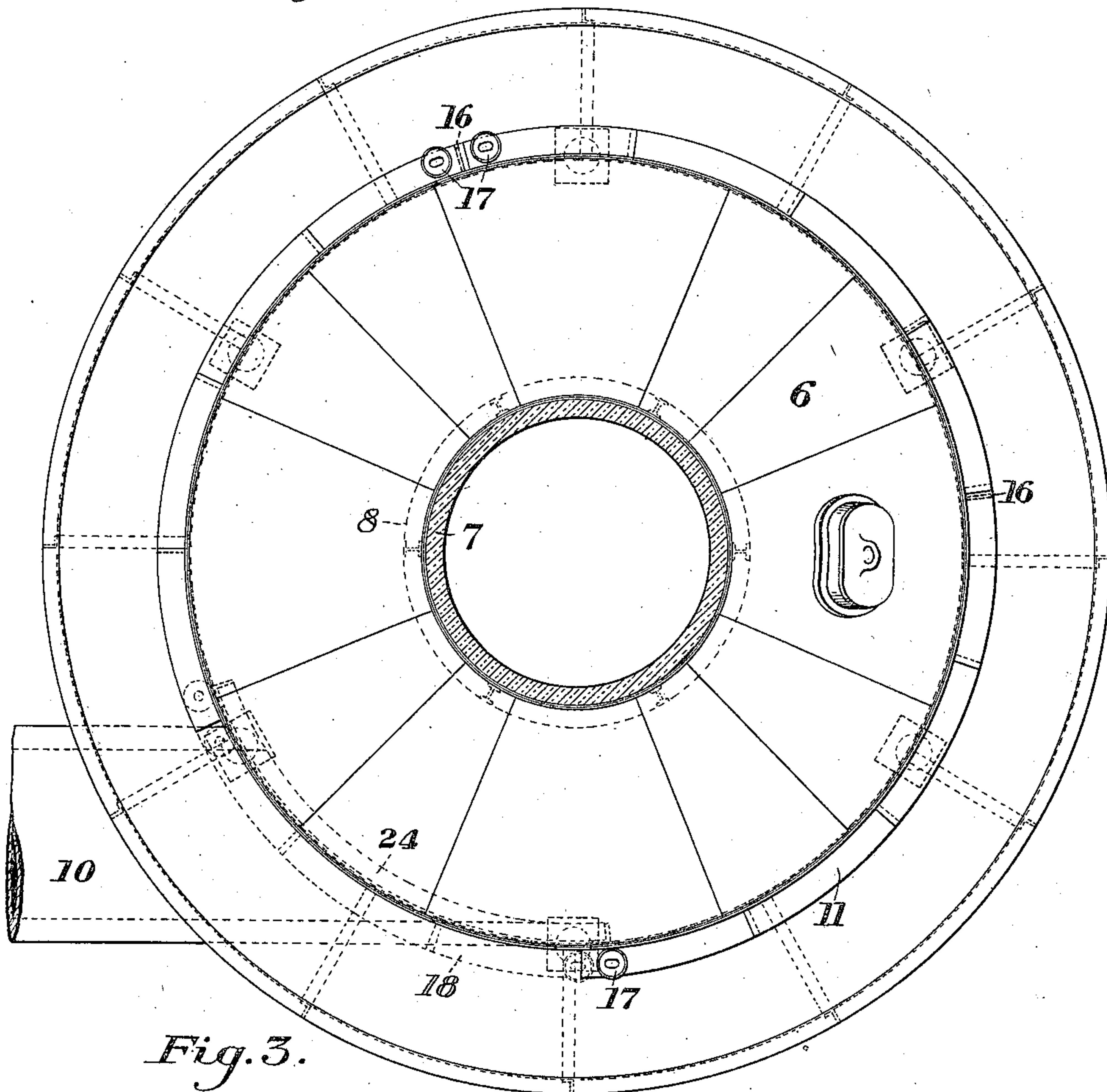
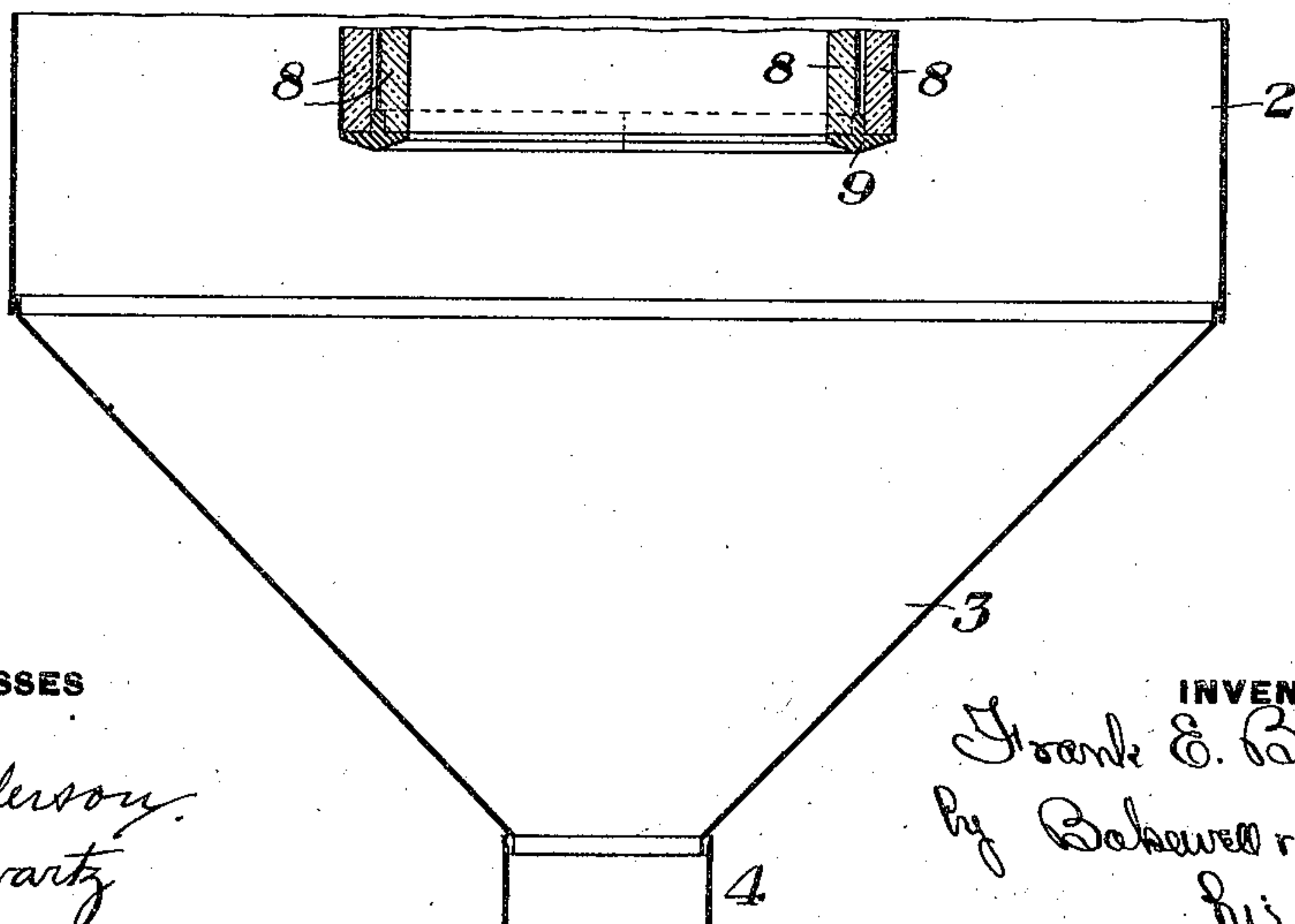


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

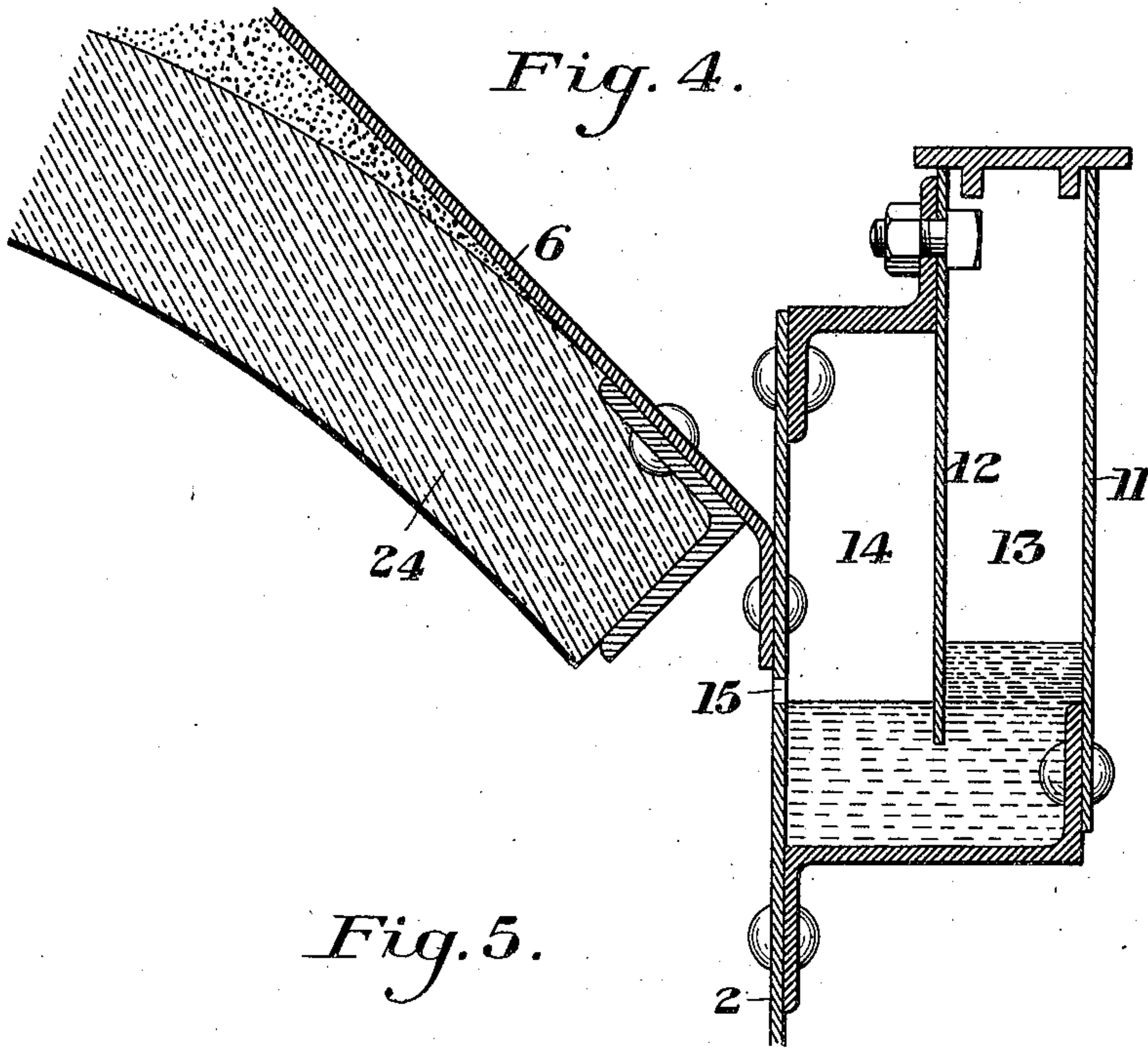
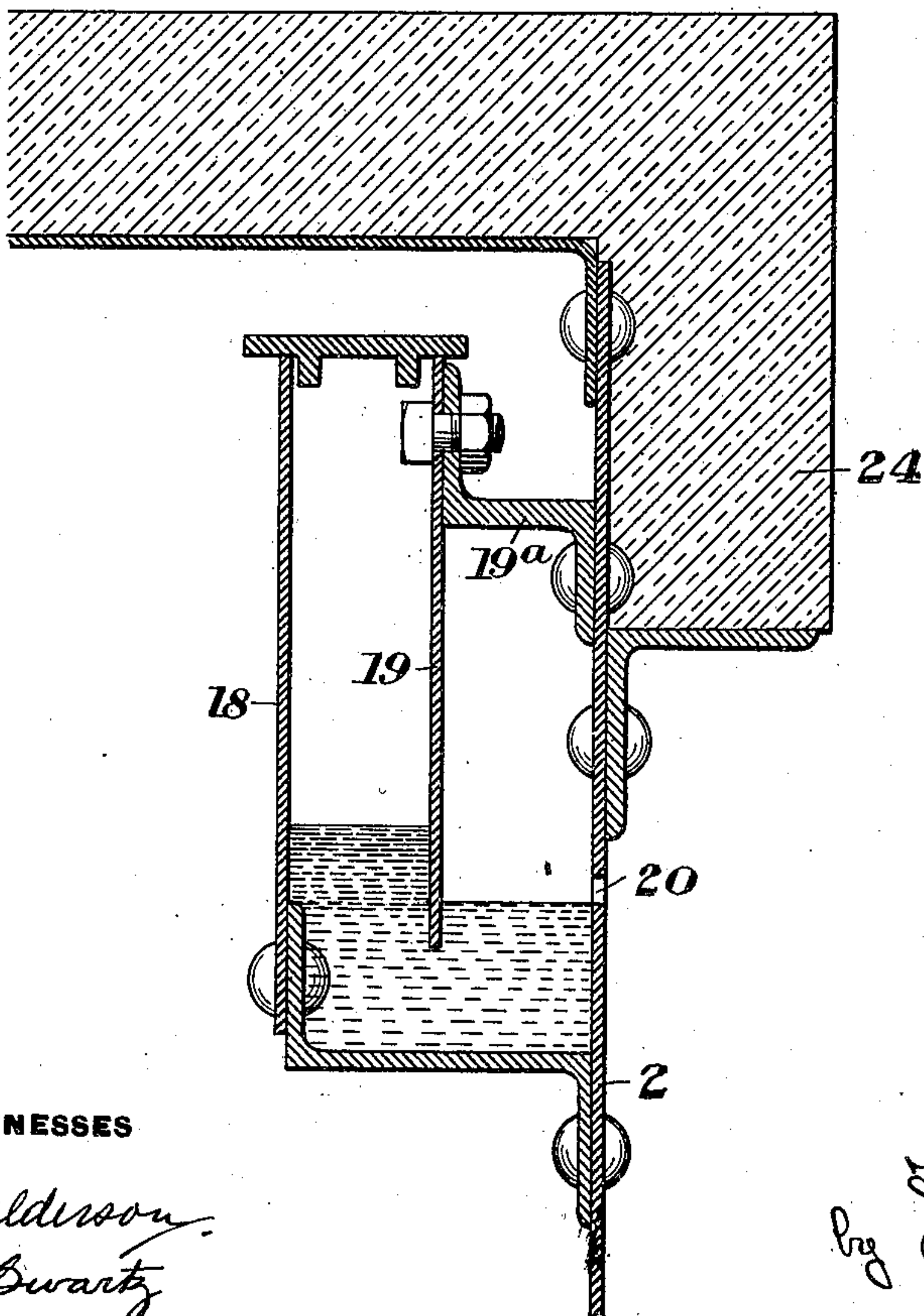


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK E. BACHMAN, OF PORT HENRY, NEW YORK.

GAS-WASHER.

No. 844,313.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed July 11, 1906. Serial No. 325,632.

To all whom it may concern:

Be it known that I, FRANK E. BACHMAN, of Port Henry, Essex county, New York, have invented a new and useful Gas-Washer, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation showing one form of apparatus constructed in accordance with my invention. Fig. 2 is a sectional plan view. Fig. 3 is a partial vertical section of the bottom portion of the washer, and Figs. 4 and 5 are enlarged detail sections of the two water-distributing troughs and adjacent parts.

My invention relates to apparatus for separating dust from gases, and is designed to provide a simple and efficient apparatus of this character in which the inner surface of the casing-wall is bathed with water against which the dust particles are thrown from the gas by centrifugal force. The gas is given a rotary or spiral path, preferably by arranging the inlet in a tangential or non-radial direction.

The invention further consists in providing a protecting-covering for the metal surfaces which are not bathed with water, in arranging the water-distributing troughs in different sections, partly below the inlet and partly above such level, and, further, in the construction and arrangement of parts, as hereinafter more fully described and claimed.

In the drawings, 2 represents a casing, which I have shown as cylindrical in form, having a bottom hopper portion 3, terminating in a tube or outlet 4, which preferably enters a water-sealing trough 5. The upper portion or top 6 of the casing is preferably of frusto-conical shape, and through it extends the cylindrical outlet flue or pipe 7. This pipe extends down within the lower portion of the washer and is preferably protected on both sides by layers of brick or refractory material 8 8. I have shown such layers as being supported upon a ring 9, secured to the lower portion of the metal pipe.

The inlet-pipe 10 enters the upper portion of the casing in a tangential or non-radial direction, thus causing the gas to take a spiral path as it flows around within the casing and down to enter the outlet.

In order to bathe the interior of the outer shell or casing with water without substan-

tially spraying the water through the gas, I preferably employ an external water box or boxes. In the form shown the upper water-box 11 extends around the upper part of the casing for about three-fourths of its circumference, terminating at the sides of the inlet-flue. In the form shown this box is divided into two compartments by a longitudinal partition 12, which extends down for a part of the height of the chamber to allow the water to flow from the outer chamber into the inner chamber 14. The inner chamber 14 is provided with a slot or series of holes 15, cut through the shell of the washer and allowing the water to flow down over the inner surface. In order to obtain a substantially even flow throughout the length of the trough, I preferably provide cross-partitions at intervals to separate it into chambers, each of which has its own supply-pipe. In the form shown there are three partitions 16 and three water-inlet pipes 17, which discharge into funnels 17^a, set in the cover of the box.

The head of the water in the distributing-box is preferably such as to just overbalance the pressure of gas on the inside, so that the water flows through the openings without having sufficient head or pressure to spray it into the body of the washer. It therefore trickles down over the inside of the wall or casing and is distributed over the whole surface by the circular movement of the gas-current. The remaining one-fourth of the circumference of the casing is provided with a separate external water trough or box 18, located immediately below the gas-inlet. This box is preferably similar to the upper box, having the longitudinal baffle 19 and communicating through holes 20, leading through the casing. 21 is the supply-pipe for this trough, and 22 is a valved washout-pipe, the same as the pipes 23 for the upper trough. As the gas flows inwardly and downwardly through the casing it takes a spiral path, and its centrifugal action causes the dust particles to strike the cylindrical sheet of water, and thus to be washed down into the seal at the bottom.

Those parts of the inner surface of the shell or casing which are not protected by the water are preferably supplied with a protecting layer 24, of brick or refractory material, as shown in Figs. 4 and 5. When gas is passing through the washer, it is generally under

some pressure. The openings have a larger area than is necessary to take away the volume of water fed into the outer portion 13 of the box. The openings 15, therefore, are not
 5 entirely closed by water, and gas can pass into the section 14 above the level of the water, the gas in this section being at the same pressure as the gas in the washer. When
 10 water is poured into the box 13, the pressure of the gas in the washer and in the space above the water in the part 14 counterbalances it and prevents water from entering the washer until the level 13 is high enough to counterbalance the gas-pressure. Water
 15 then flows through the openings 15 into the washer. If the pressure increases, the difference in level in the parts 13 and 14 increases, while if the pressure of the gas decreases the difference in level also decreases until at the
 20 point of no pressure the water is at the same level in both compartments. The flow of water through the openings is thus automatically regulated, the water at the same time acting as a gas seal to prevent the gas from
 25 passing through the openings 15 out into the air.

The baffle or apron 19 makes an air-tight joint with the Z-bar 19^a, to which it is secured, and the Z-bar also makes an air-tight
 30 joint with the extension of the shell to which it is secured.

The advantages of my invention result
 35 from the external arrangement of the trough, from the use of the trough-section below the inlet, and the use of sufficient head to overcome the gas-pressure and yet prevent substantial spraying of the water into the gas-current. The refractory lining for parts not
 40 water-cooled is also of advantage in prolonging the life of the device.

Many changes may be made in the form and arrangement of the washer and its parts without departing from my invention.

I claim—

45 1. In a gas-washer, a casing having a non-radial inlet and water-box located entirely outside of the gas-chamber of the washer, and having openings arranged to discharge

water along the inner surface of the shell or casing; substantially as described. 50

2. In a gas-washer, a stationary vertically-extending cylindrical casing having a gas-outlet, a gas-inlet extending in a non-radial direction, and a water-distributing device exterior to the gas-chamber of the washer, and
 55 arranged to flow water over the inner surface of the casing without spraying the gas; substantially as described.

3. In a gas-washer, a substantially cylindrical casing having a lateral, tangentially-directed non-radial inlet and a central outlet at a different level, and means for directing water along the inner surface of the casing or shell without substantially spraying of the gas; substantially as described. 60

4. In a gas-washer, a chamber having a side inlet, a water-box below the inlet and extending for a part of the circumference, and another water-box above the level of said lower water-box; substantially as described. 65

5. In a gas-washer, a chamber having a side inlet, a water-box below the inlet and extending for a part of the circumference, and another water-box above the level of said lower water-box, and extending through the
 70 major part of the circumference; substantially as described.

6. In a gas-washer, a casing, a water-box extending around the casing, partitions dividing same into compartments and a supply-pipe for each compartment; substantially as described. 75

7. In a gas-washer, a casing having an external water-box, and means for maintaining a substantially constant head of water therein, just sufficient to overcome the gas-pressure, and causing the water to flow down over the interior wall of the casing; substantially as described. 80

In testimony whereof I have hereunto set
 85 my hand.

FRANK E. BACHMAN.

Witnesses:

H. E. KIDDER,
 R. J. BIGBY.