

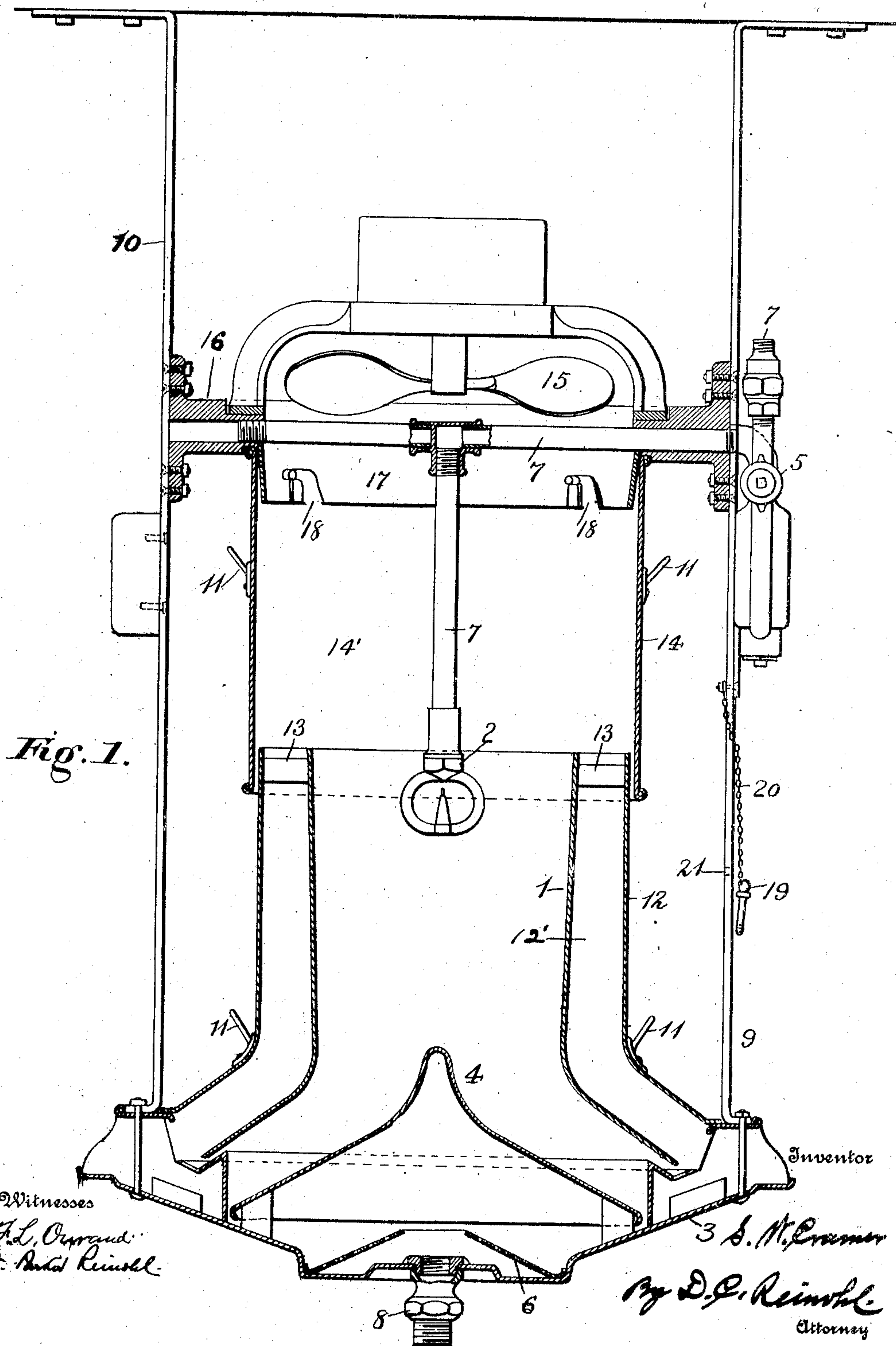
S. W. CRAMER.
HUMIDIFIER AND AIR MOISTENING APPARATUS.

APPLICATION FILED JULY 2, 1908. -

908,964.

Patented Jan. 5, 1909.

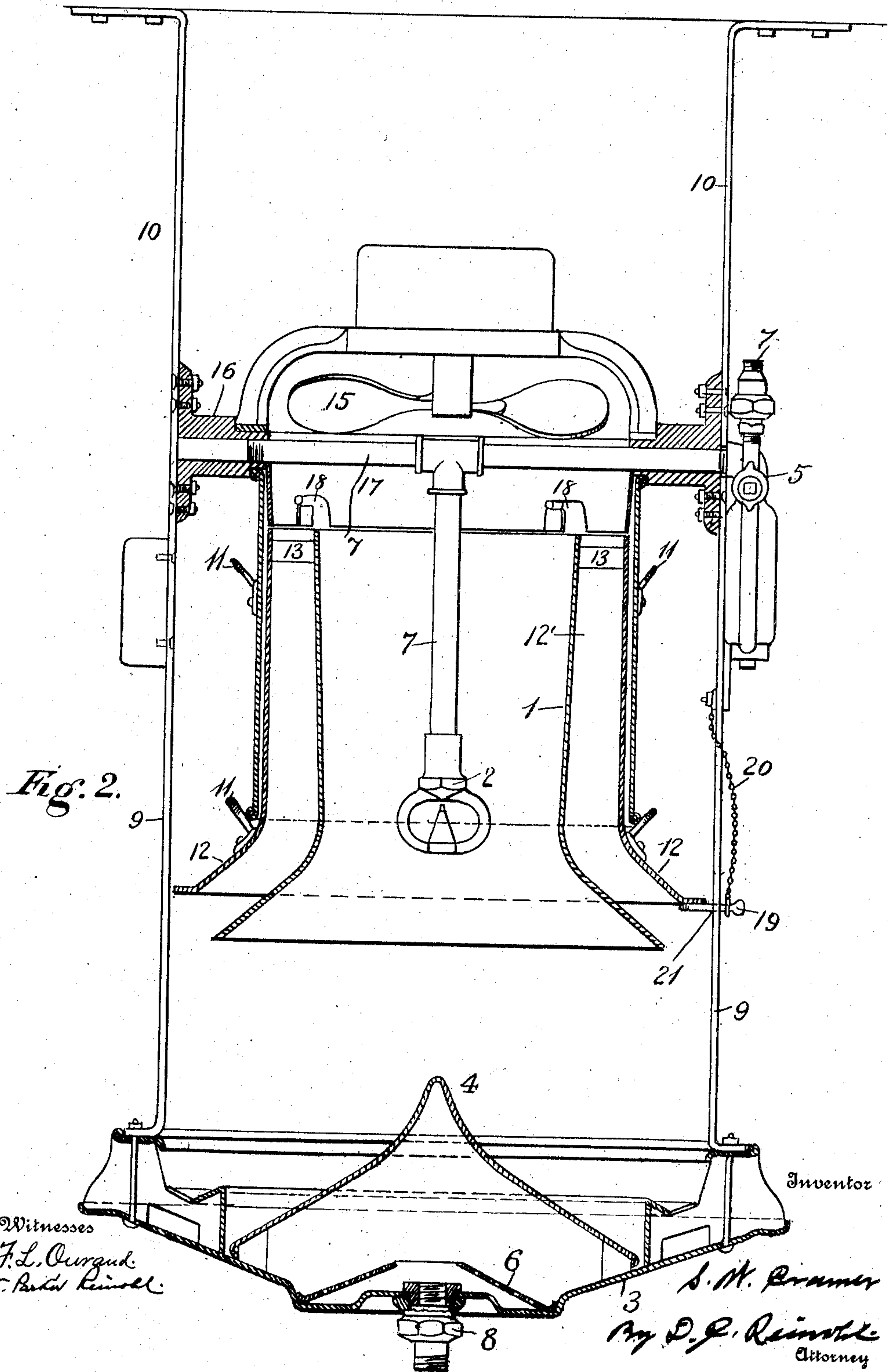
8 SHEETS—SHEET 1.



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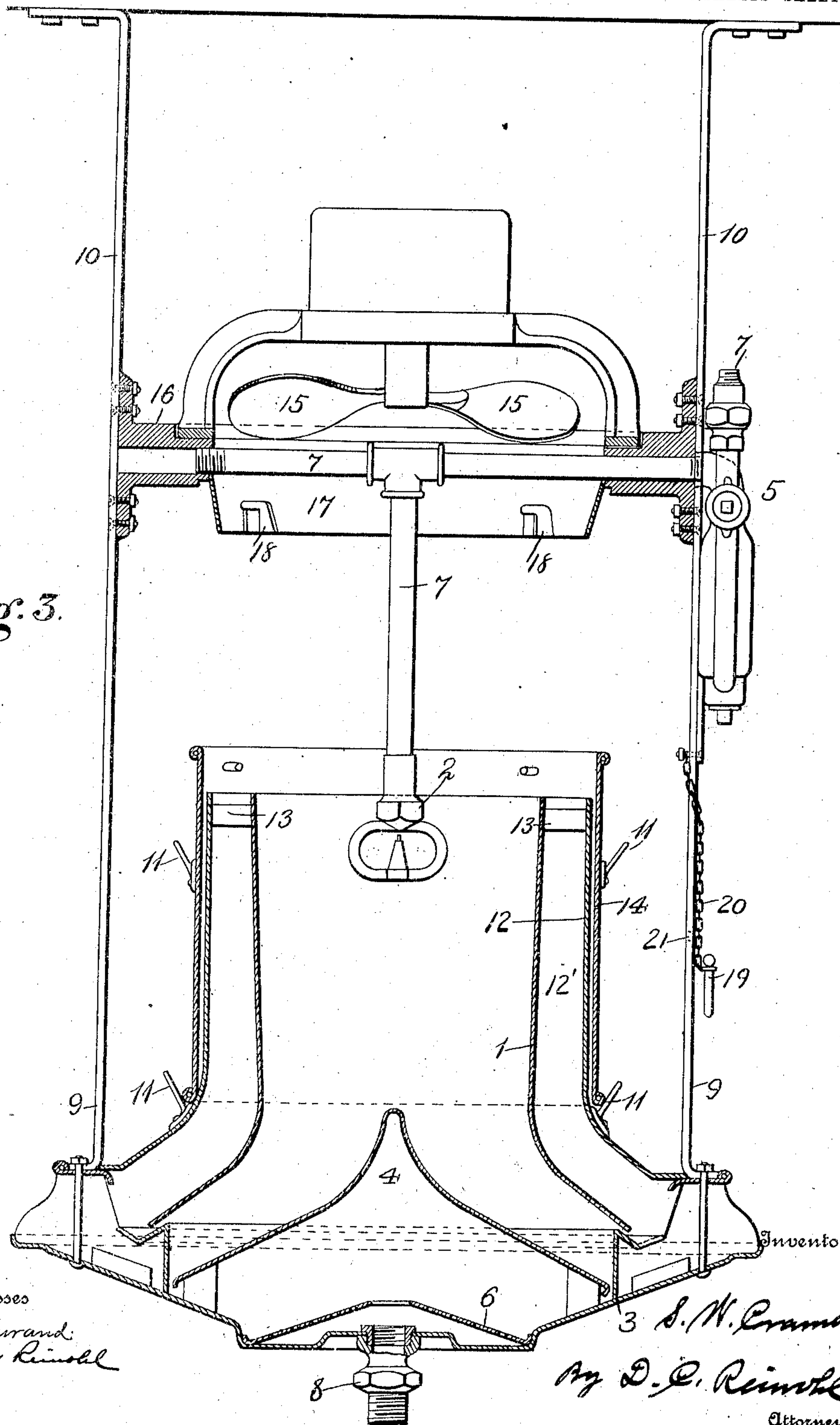
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8 SHEETS—SHEET 3.

Fig. 3.



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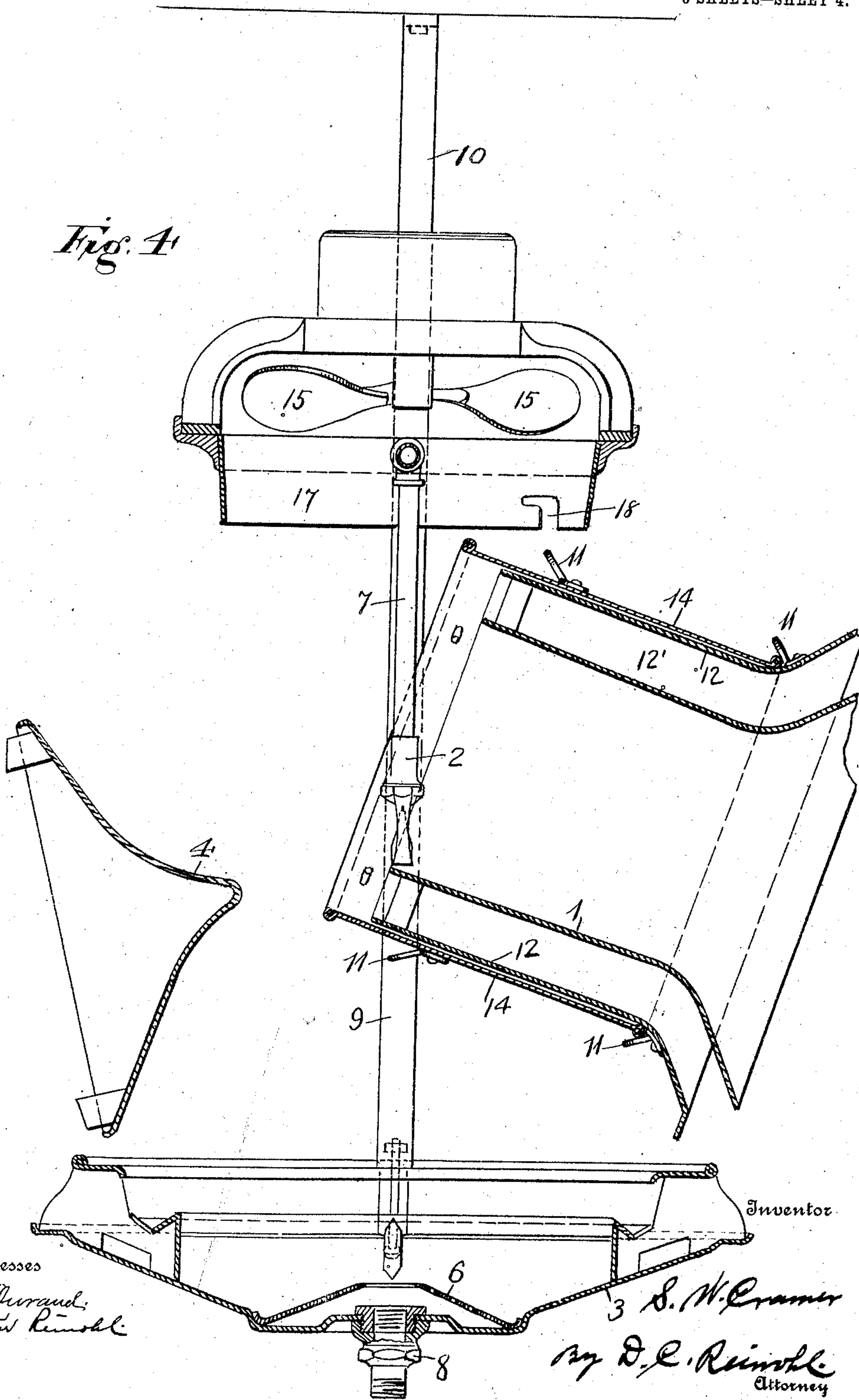
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Fig. 4.



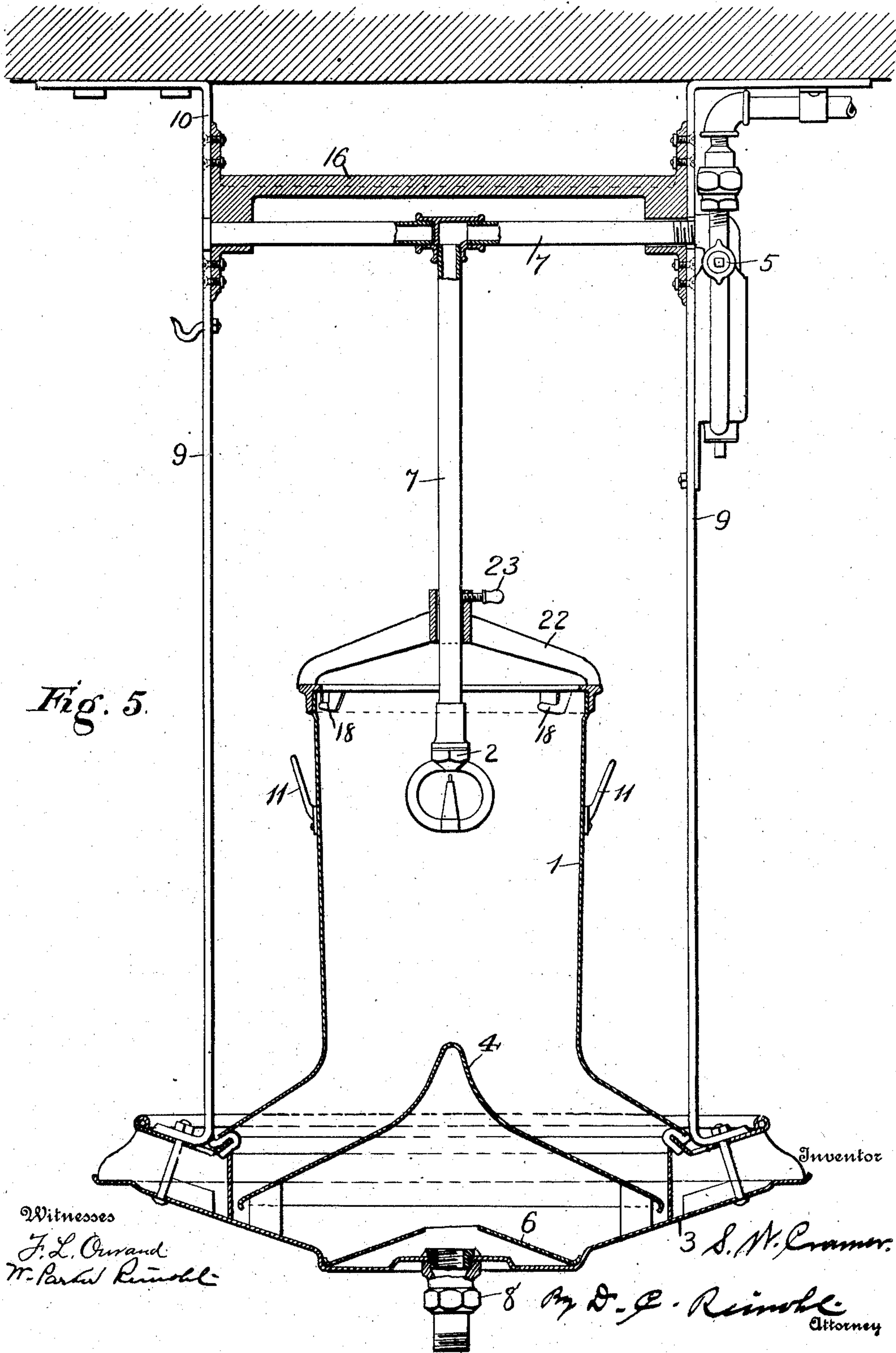
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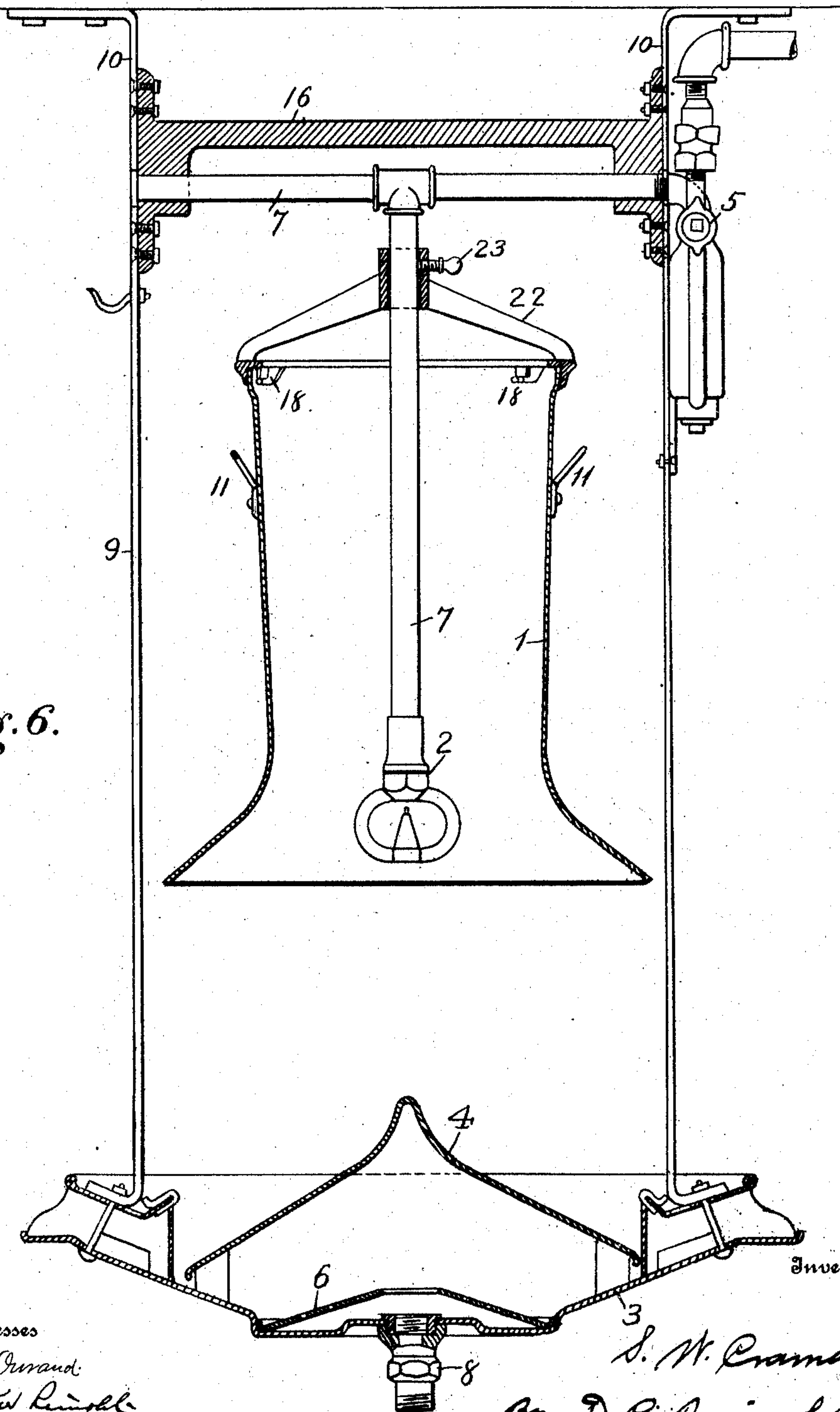
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8 SHEETS—SHEET 5.



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Fig. 6.



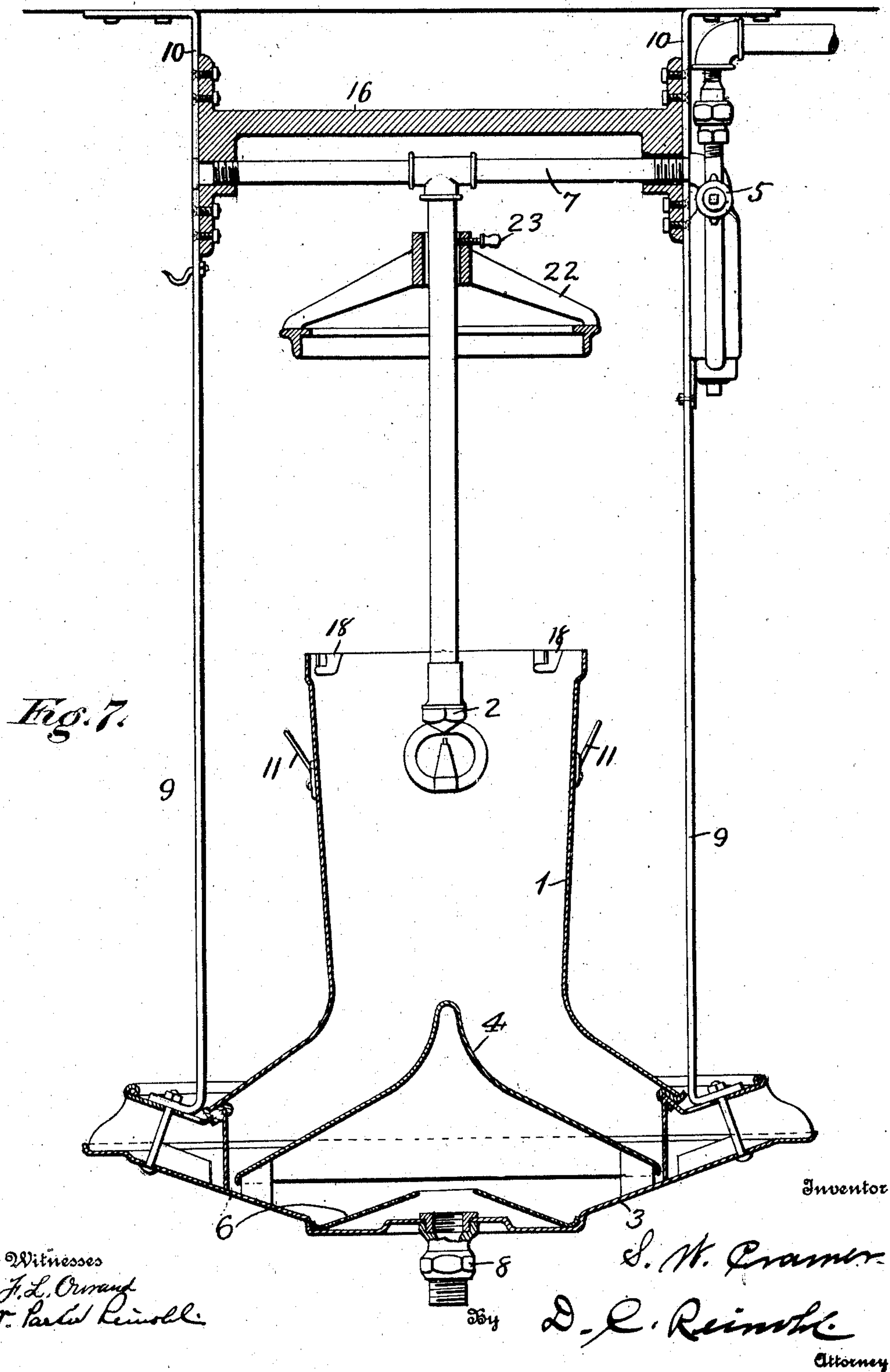
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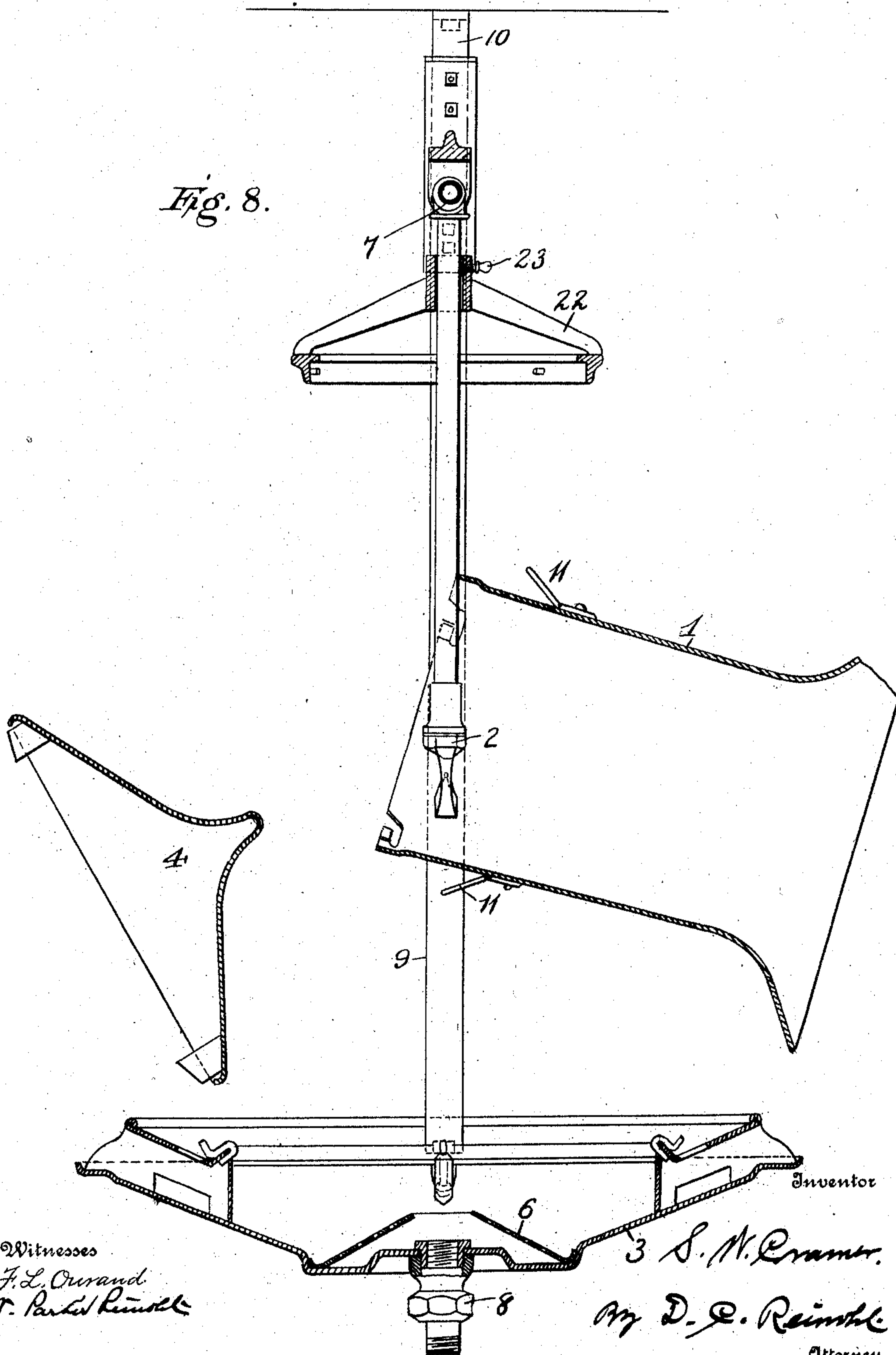
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8 SHEETS—SHEET 7.



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908,964.

Patented Jan. 5, 1909.
8 SHEETS—SHEET 8.



UNITED STATES PATENT OFFICE.

STUART W. CRAMER, OF CHARLOTTE, NORTH CAROLINA.

HUMIDIFIER AND AIR-MOISTENING APPARATUS.

No. 908,964.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed July 2, 1908. Serial No. 441,551.

To all whom it may concern:

Be it known that I, STUART W. CRAMER, a citizen of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Humidifiers and Air-Moistening Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to means for moistening the air in rooms or factories, and has for its object to provide an apparatus which will not only keep the air constantly supplied with any preferred amount of moisture, and diffuse such moisture throughout the room, but also an apparatus that will perform the additional function of cleansing the air.

The invention consists in certain improvements in construction as will be fully disclosed in the following specification and claims.

In all departments of textile factories, but particularly card rooms and the like, the atmosphere is heavily charged with lint, dust and other impurities. An efficient system of humidifiers should provide not only for the proper humidification of the air but for the proper cleansing of the air, for it is only by such an apparatus that the air can be cleansed in a commercial practical way, other than by completely removing the foul and substituting new and fresh air therefor. The latter method would obviously be the preferred method theoretically, but practically it would be too expensive to be commercial; it is possible, however, to so combine the two systems, that fresh air can be brought in from the outside and passed through ventilating types of humidifiers in sufficient quantity to maintain a healthy standard, which is ordinarily considered to be such that it does not contain over nine parts of carbonic acid gas in ten thousand parts of air; and the remainder of the atmosphere in the room can be cleansed if it be passed through inside humidifiers often enough for the dust, lint and other impurities to be condensed and separated by the water. There are several different types of apparatus which accomplish this result to a greater or less degree. In all of them there collects on the inside of the casings

layer after layer of these impurities which not only impede the draft, but also furnish breeding ground for bacteria. These bacteria which are in many cases the products of disease and thrown off from the operatives by respiration, perspiration, or otherwise, are carried about in suspension in the atmosphere, and deposited on the layers of lint and other impurities that line the casings of the humidifiers, where they multiply in great number, to be again picked up and disseminated throughout the rooms by the air issuing from the humidifiers. The superiority of the spray type of humidifier with its draft of air through the casing has never been questioned as compared to any other system as regards efficiency, economy in the use of power, and distribution; the principal objection to it, in the minds of many thoughtful manufacturers has been that it is unsanitary for the reasons above given. In other patents that have been issued to me and some applications for patents that are still pending, I have endeavored to provide an apparatus that would lessen this objection and to devise a construction that would permit of the different parts being readily accessible. I have already provided means by which the basin and cones can be cleaned. The present improvement contemplates a still further development of construction by which the casings can be readily detached and removed, whereby they can be taken out in the mill yard and scrubbed and washed perfectly clean. It is not enough to say that any type of humidifier can be taken down by breaking its pipe connections and loosening some bolts and performing a few other mechanical operations; the employees will not take the trouble to do these things as has been proven by many years' experience.

The purpose of my improvement is therefore to provide a construction so exceedingly simple and so readily detachable that it is practically no more trouble to remove a casing to be washed, than it would be to pick up a water pail or perform some other comparatively simple manual operation.

In the accompanying drawings, which form part of this specification:—Figure 1 represents a vertical section partly in elevation, of my improved double casing type of humidifier in its normal or working position. Fig. 2 a like view, showing the casings raised for cleaning the basin. Fig. 3 a like

view, showing the upper and supplemental casing lowered for access to the nozzle, and also in position for removing it and the double casings from the apparatus. Fig. 4
 5 a like view, but at a right angle to the position shown in Fig. 1, showing the casings being removed at one side, and the cone removed at the opposite side. Fig. 5 represents a vertical section partly in elevation, of
 10 my improved type of single casing spray humidifier in its working position. Fig. 6 a like view, showing the casing raised for the purpose of cleaning the basin. Fig. 7 a like view, showing the centering spider
 15 raised to permit ready access to the nozzle, and Fig. 8 a like view, but at a right angle to the position shown in Fig. 5, showing the casing being removed at one side, and the cone removed at the other side.

20 Reference being had to the drawings and the designating characters thereon, the numeral 1 indicates the inner or spray casing, within which is the spray nozzle 2.

25 3 is a collecting basin and 4 is a deflecting cone.

5 is a combined stop cock and strainer for the water supply and 6 is the waste water strainer.

30 7 is the water supply pipe and 8 is the waste water pipe.

9, 9 are supporting hangers for the basin and 10, 10 supporting hangers for the whole apparatus.

35 11 are handles for the convenient handling of the casings.

12 is an outer casing inclosing the air space 12' between the inner or spray casing 1, and the outer casing 12.

40 13 are centering and carrying porters definitely and relatively fixing the position of the inner and outer casings with reference to each other and to the other parts of the apparatus.

45 14 is a movable supplemental casing inclosing a plenum space 14' between the inner spray casing 1 and the fan 15.

16 is a support by which the fan is suspended in fixed position by the supporting straps 10.

50 17 is a carrying ring firmly fixed to the fan supporting member 16, and to which the supplemental casing 14 is detachably secured with a bayonet joint 18.

55 19, is a pin attached to a hanger by a chain 20, and is used as a support for the casings in raised position by being thrust through a hole 21 in the hanger and upon which the lower end of the casing 12 rests.

60 In Fig. 3, the supplemental casing 14 has been loosened from the bayonet joint 18 in the usual manner for such fastenings and has been allowed to slip down on the outer casing 12 resting against the handles 11 thereon.

65 In Fig. 4, the cone 4 is shown removed

laterally to the left and the inner and outer casings 1 and 12 with the supplemental casing 14 removed laterally to the right. It is obvious that this operation is both simple and expeditious, all three casings being
 70 simply lifted together enough for their lower ends to clear the lower part of the apparatus, the lower ends being then lifted outward and the upper ends lowered until they clear the spray head 2.

75 In Fig. 5, the same numbers designate corresponding parts in the preceding figures. 22 indicates a centering and positioning spider for positioning the spray casing 1 with reference to the spray head 2. 23 is
 80 a thumb set screw for supporting the spider in elevated position, with or without the casing 1 attached thereto.

In Figs. 6, 7, and 8 operations analogous to those in Figs. 2, 3 and 4 are illustrated
 85 and the same numerals indicate similar parts.

In the several figures the parts of the construction shown which are not included in the present invention and which are fully
 90 disclosed in my prior patents and applications for patents are not herein described.

It is obvious that changes in details of construction and the arrangement of the
 95 several parts of the devices may be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim is—

1. A humidifier having a movable supplemental casing, a casing vertically movable
 100 in the supplemental casing, a spray head within the casing, a fan for supplying air, means for supplying water, and means for collecting surplus water.

2. A humidifier having a movable supplemental casing, a casing vertically movable
 105 in the supplemental casing, a fan above the supplemental casing, a spray head below the fan and within the movable casing, means for supplying water, and means for collecting surplus water.

3. A humidifier having a movable supplemental casing, a casing vertically movable
 110 in the supplemental casing, said casing and said supplemental casing being also removable, a spray head within the casing, a fan for supplying air, means for supplying water, and means for collecting surplus water.

4. A humidifier having a movable supplemental casing, inner and outer vertically
 115 movable casings, a spray head within the inner casing, a fan for supplying air to the casings, means for supplying water, and means for collecting surplus water.

5. A humidifier having a movable supplemental casing, inner and outer vertically
 120 movable casings, said casings being also removable, a spray head within the inner cas- 130

ing, a fan for supplying air to the casings, means for supplying water, and means for collecting surplus water.

6. A humidifier having a movable supplemental casing, a spray casing, a spray head within the latter casing, a fan for supplying air, means for supplying water, and means for collecting surplus water.

7. A humidifier having a movable and removable supplemental casing, a spray casing, a spray head within the latter casing, a fan for supplying air, means for supplying water, and means for collecting surplus water.

8. A humidifier having a supplemental casing, a spray casing, a spray head within the latter casing, a fan for supplying air, means for supplying water, means for collecting surplus water, and means for affording access to the space inclosed by said supplemental casing.

9. In a humidifier, a vertically movable and removable casing, a spray head normally within the casing, means for supplying water, and means for collecting surplus water.

10. In a humidifier, a vertically movable

casing, said casing being also removable, a centering and supporting member to which said casing is detachably secured, a spray head, means for supplying water, and means for collecting surplus water.

11. In a humidifier, a casing, a spray-head, means for supplying water, means for collecting surplus water, and a centering and supporting member to which the casing is detachably secured for positioning the casing with reference to the spray-head.

12. A humidifier provided with a vertically movable and laterally removable casing, and means for supporting the casing at its upper end in operative position.

13. A humidifier provided with a detachable and laterally removable casing, means for supporting the casing at its upper end in operative position, a spray-head, means for supplying water, and means for collecting surplus water.

In testimony whereof I affix my signature, in presence of two witnesses.

STUART W. CRAMER.

Witnesses:

WM. B. HODGE,

JNO. C. WATSON.