

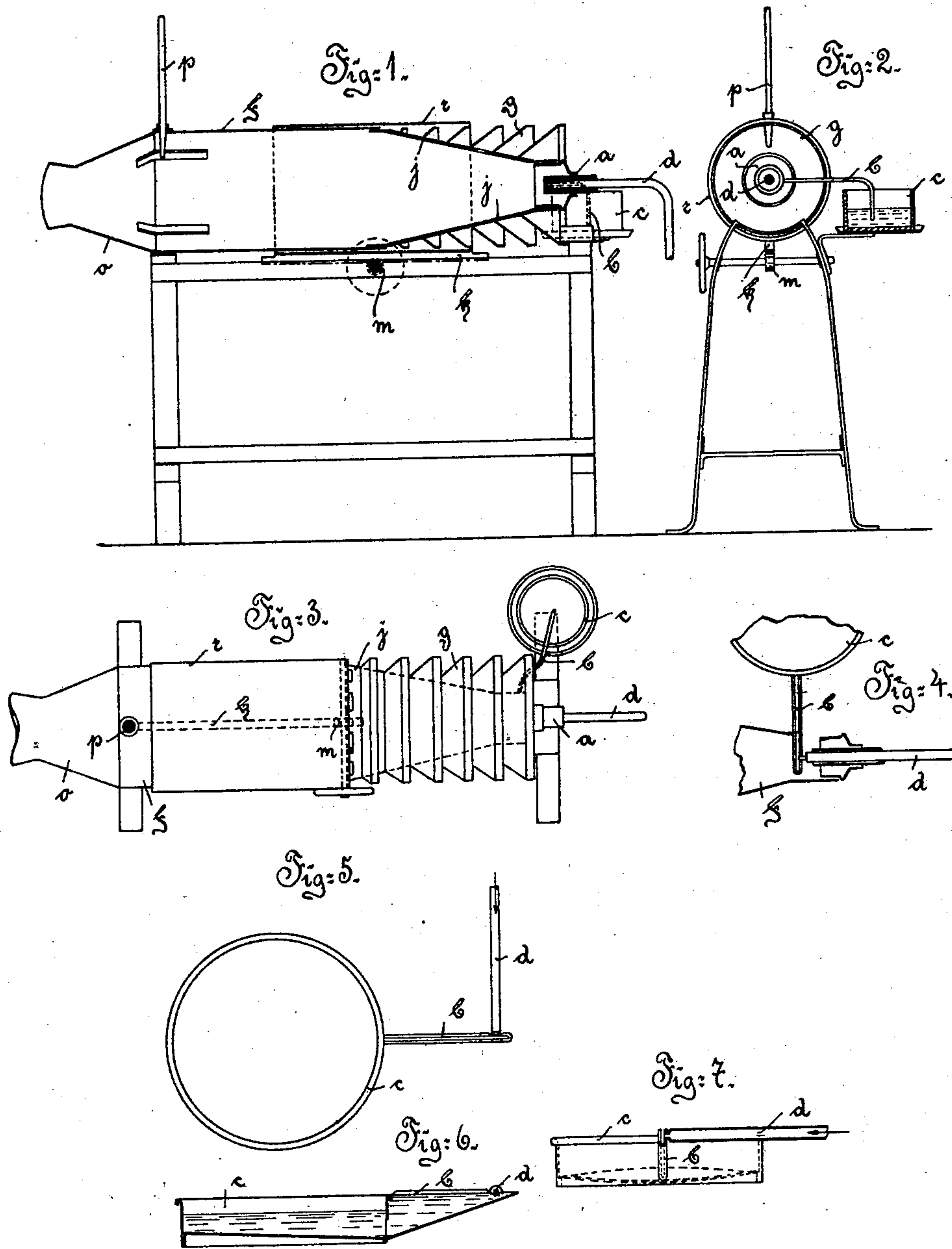
No. 725,928.

PATENTED APR. 21, 1903.

A. BULLING.
INHALER.

APPLICATION FILED MAY 13, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

ANTON BULLING, OF MUNICH, GERMANY.

INHALER.

SPECIFICATION forming part of Letters Patent No. 725,928, dated April 21, 1903.

Application filed May 13, 1902. Serial No. 107,155. (No model.)

To all whom it may concern:

Be it known that I, ANTON BULLING, a citizen of the Empire of Germany, residing at Munich, Germany, have invented certain
5 new and useful Improvements in Inhalers; 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
10 the same.

My invention relates to an improvement in inhalers. In the inhaling devices hitherto known to me the construction was such that the temperature of the vapor could not readily
15 be regulated.

The object of the present invention is to provide an apparatus whereby the exact regulation of the temperature of the spray or medicated vapor may be accomplished.

20 A further object of my invention is to provide a sprayer of such construction that the atomizer will not readily become clogged and in case it does may readily be cleaned.

With these objects in view my invention
25 consists in the features, details of construction, and combination of parts, which will first be described in connection with the accompanying drawings and then particularly pointed out in the claims.

30 In the drawings, Figure 1 is a longitudinal section of an apparatus embodying my invention; Fig. 2, a front view of the same; Fig. 3, a plan view; Fig. 4, a detail view, partially in section, of the atomizing device; Fig. 5, a
35 plan view showing said atomizer on a larger scale; Fig. 6, a sectional view, and Fig. 7 end view, of the same, the latter view being partly in section.

Referring to the drawings, and in particular to Figs. 1 to 3, inclusive, *f* is a spray-conducting tube, in the present instance arranged horizontally and provided at its forward end with a mouthpiece *o*, the atomizing device or
40 sprayer *a* being located at the rear. The said atomizing device leads the medicated fluid from a laterally-arranged vessel *c* through a small suction-tube *b*, while the steam or other agent which serves to produce the spray effect is conducted through a supply-tube *d*.

50 In order to avoid the accidental stopping or clogging of the suction-tube, which so easily occurs in the ordinary atomizer and

which can be remedied only with difficulty, I provide a special form of atomizing device, which also prevents the variation or cessa- 55 tion of the spray which frequently occurs in the old forms of atomizers if the small tubes are pushed out of their proper positions. The construction of the atomizing device employed by me will be clear from Figs. 5 to 7. 60 Referring to these views, *c* is the vessel containing the medicated fluid, said vessel being provided with a laterally-projecting nose or spout in communication with the atomizer of the vessel *c*. This spout *b'* has its side walls 65 arranged in a vertical plane and so close together that the inner space between said side walls is small enough to permit a capillary action to take place in the spout with those fluids which rise by capillary action, which 70 is the class to which belong the medicated fluids employed by me. As a result of this capillary action the medicated fluid is raised in said spout above the level of the fluid in the vessel *c*. Upon the outer end of the spout 75 is mounted the nozzle *d* for steam or other fluid under pressure. When the steam escaping from the nozzle *d* passes over the spout, it causes the immediate spraying of the medicated fluid, which has been raised to the level 80 of said nozzle by capillary action. Owing to the peculiar form of the spout, the latter does not readily become clogged by small particles, as would be the case in an ordinary sprayer; furthermore, if such spout should 85 become clogged it is only necessary to draw a strip of paper or the like through the spout in order to clear the same.

The conducting-tube *f* is provided with means for admitting the outer air to the in- 90 terior of the tube, said means preferably consisting of several series of openings *j*, arranged circumferentially in rows placed one behind the other at short intervals apart. These rows of openings serve to admit the outer 95 air to the interior of the conducting-tube. Over the latter is movably mounted a shield *r*, whereby the series of openings *j* may be closed or opened. The position of the shield *r* may be adjusted with relation to the con- 100 ducting-tube *f* in any suitable way. The preferred method of providing for the ready adjustment of the cylinder or shield *r* is shown in Figs. 1 to 3, inclusive. In these

views the cylinder is shown as provided with a rack-bar *k*, engaged by a pinion *m*, mounted upon the driving-shaft, journaled upon the machine-frame, the outer end of said shaft
 5 being provided with suitable means for rotating it in either direction—as, for example, a hand-wheel *m'*. When the series of openings *j* are in the rear portion of the tube *f* at the side of the atomizer, as in the preferred
 10 construction shown in the drawings, the said portion of the tube *f* (which is preferably conical) is provided with a series of funnel-shaped ribs *g*, each rib being located between two rows of openings *j*. These ribs form en-
 15 trance-channels for the cylinder *r*, so that the air is allowed to enter the tube *f* at an incline whose slope is in the direction of the stream or current of spray.

Directly behind the mouthpiece *o* is mount-
 20 ed a thermometer *p*, whose lower end projects into the conducting-tube *f*, whereby the patient may readily read the temperature of the mixture to be inhaled. When the cylinder *r* is moved rearward and the openings *j*
 25 are all closed, the spray is insulated from the outer air, so that its temperature at the mouthpiece *o* is the same as at the atomizer or spraying device. This would give the maximum temperature of the spray. If a lower tem-
 30 perature is desired, it is only necessary to open a suitable number of rows of openings by the adjustment of the cylinder or shield *r*, so that the necessary amount of air is admitted from the outside to the interior of the con-
 35 ducting-tube *f*, where it unites with the spray, and thus lowers the temperature of the same. From this it will be seen that a rearward movement of the cylinder or shield *r* serves to in-
 40 crease the temperature of the spray, while a forward movement of said shield results in a reduction of the temperature of the spray. In this manner it is possible by this apparatus to modify the temperature of the spray accord-

45 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an inhaling device, the combination,
 50 arranged to deliver a spray to the mouthpiece, of means intermediate the atomizing device and the mouthpiece for supplying a variable

amount of temperature-changing fluid to the spray.

2. In an inhaling device, the combination, 55 with an atomizing device, and a mouthpiece arranged to receive the spray therefrom, of means for conducting the spray from the atomizing device to the mouthpiece, and means for admitting a variable amount of air 60 to the interior of the conducting means.

3. In an inhaling device, the combination, with a conducting-tube having openings serving to admit the outer air to the interior of 65 said tube, of a mouthpiece at one end of said tube, an atomizer at the other end of said tube, and means for closing the said openings in the tube.

4. In an inhaling device, the combination, with a conducting-tube having a series of 70 openings arranged in circumferential rows, a mouthpiece at one end of said tube, an atomizing device at the other end of said tube, and a shield movable over the rows of openings in the tube. 75

5. In an inhaling device, the combination, with a conducting-tube having a conical rear portion provided with openings arranged in rows, a mouthpiece at one end of said tube, and an atomizer at the other end of said tube, 80 of ribs arranged between the rows of openings, and a cylindrical shield movable over the ribs.

6. In an inhaling device, the combination, with a conducting-tube having a conical rear 85 portion provided with openings arranged in rows, a mouthpiece at one end of said tube, and an atomizer at the other end of said tube, of ribs arranged between the rows of openings, a cylindrical shield movable over the 90 ribs, and mechanism for moving the shield.

7. The combination with a vessel arranged to contain a liquid to be sprayed, of a spout communicating with said vessel and having two side walls closely approaching each other 95 and located in vertical planes, and means for delivering a jet of fluid across said spout.

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

ANTON BULLING.

Witnesses:

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 H. R. MCGINNIS.