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OXYGEN INHALING ASSEMBLY

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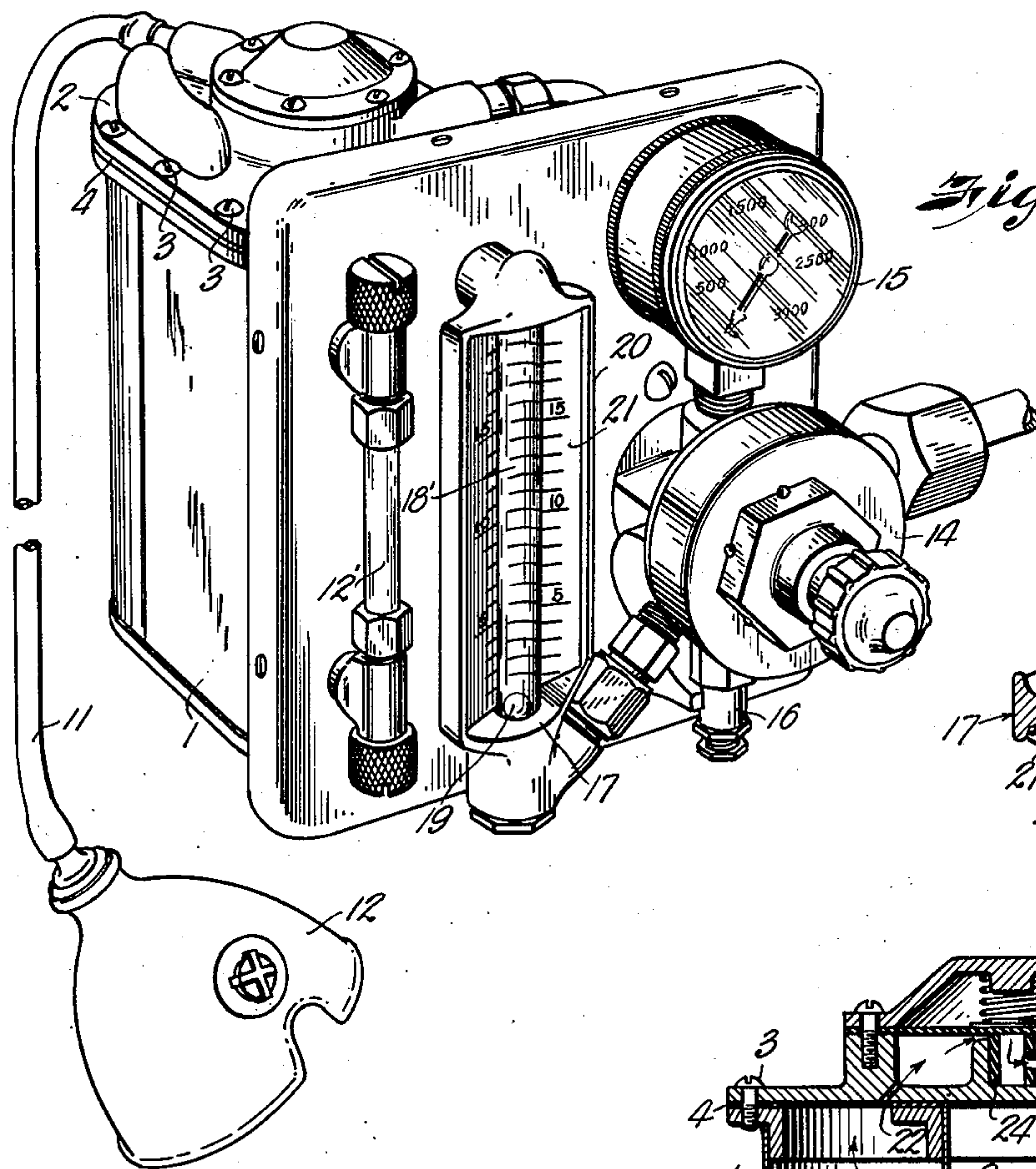


Fig. 1.

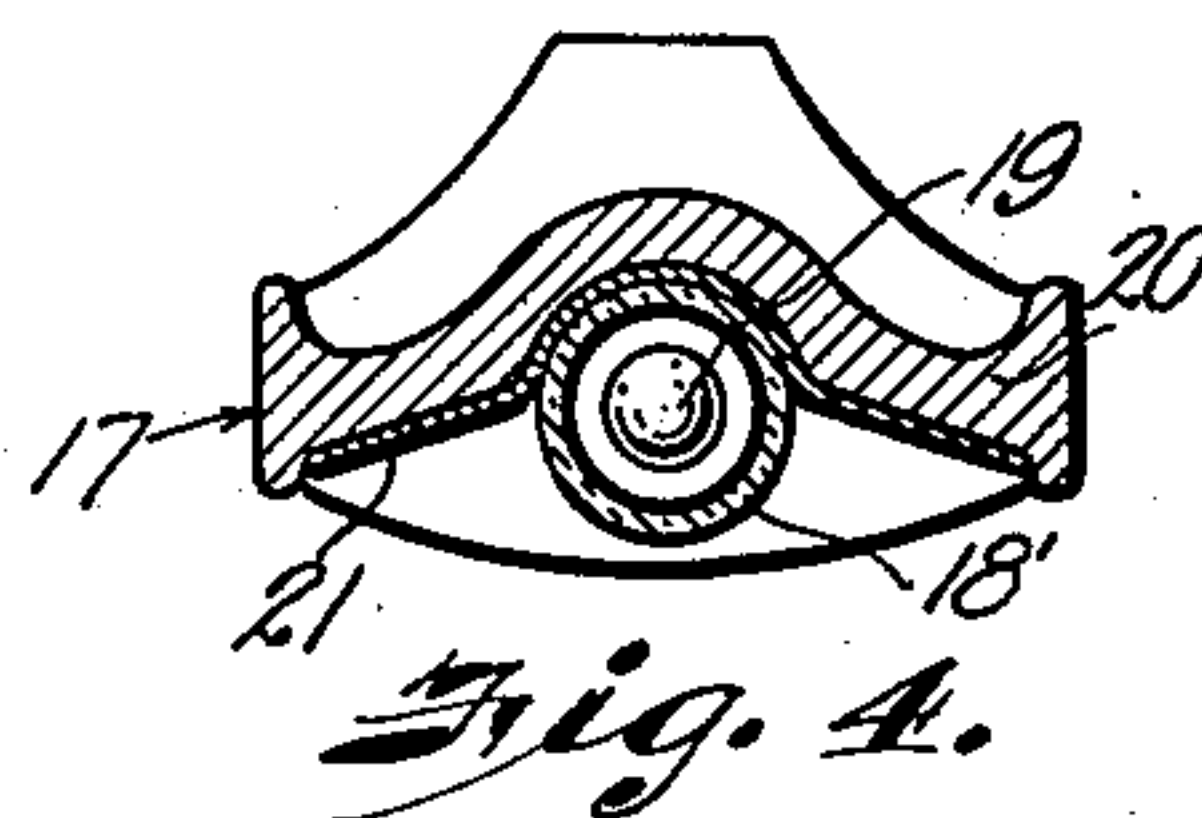


Fig. 4.

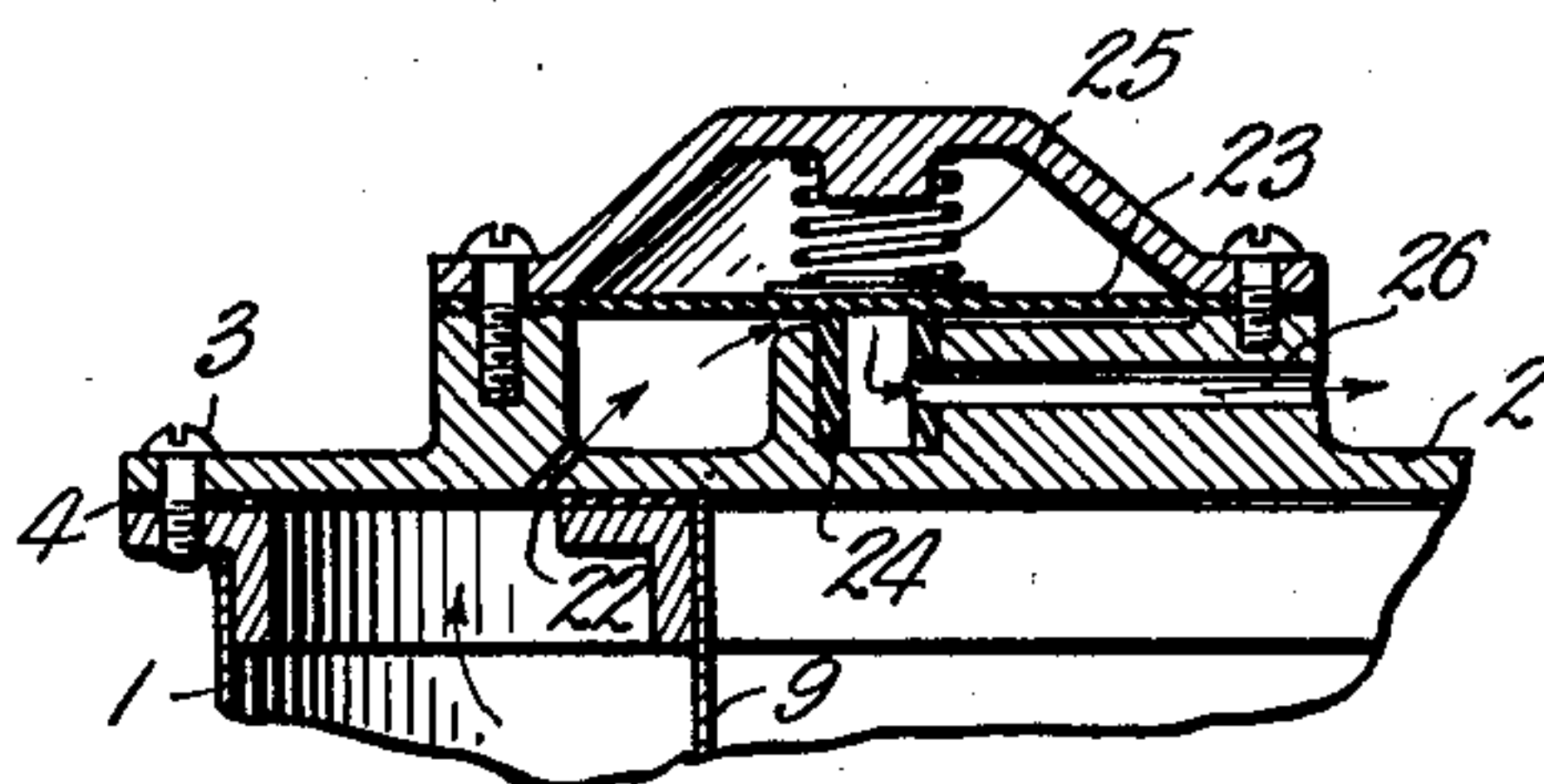


Fig. 3.

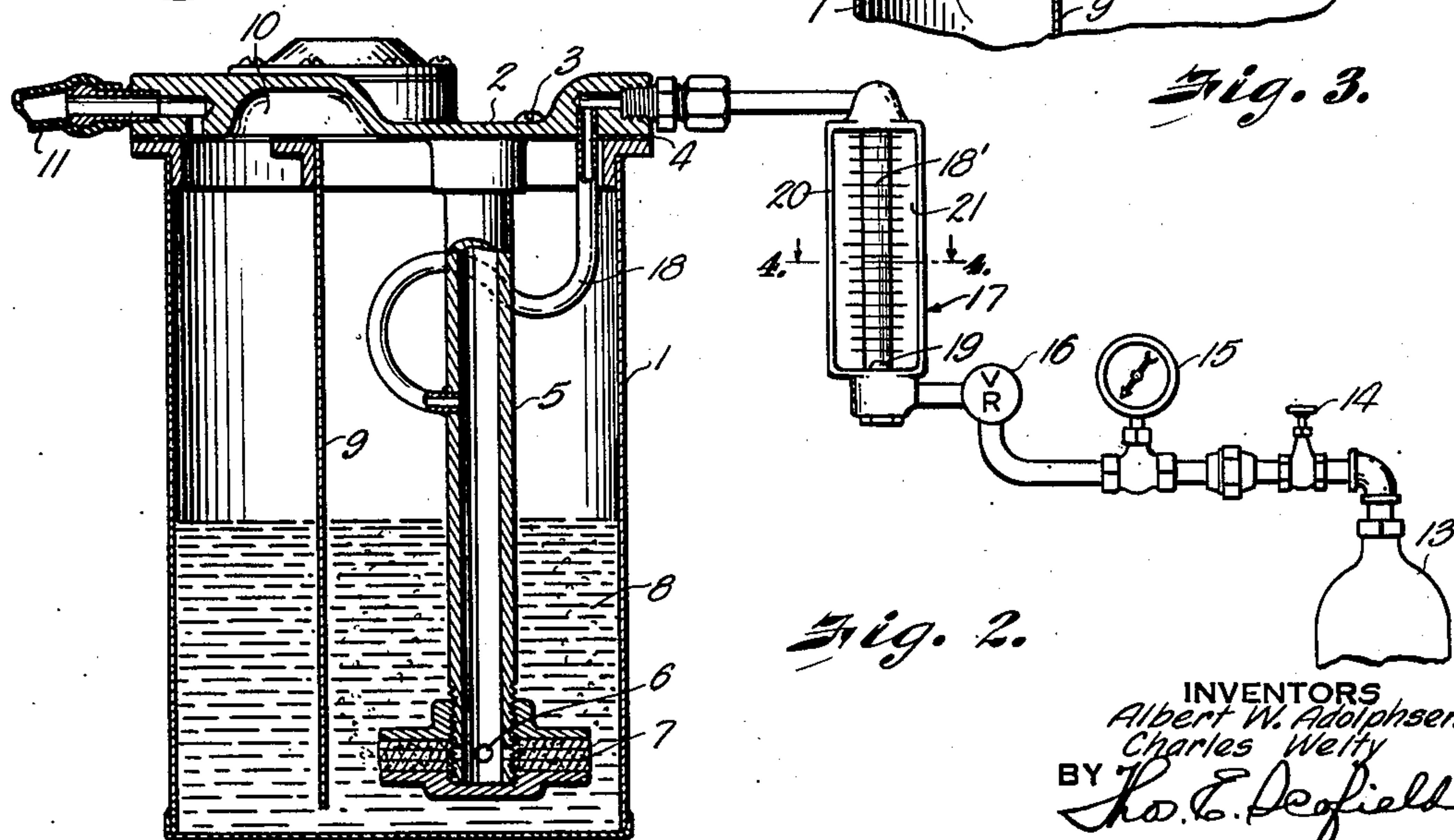


Fig. 2.

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OXYGEN INHALING ASSEMBLY

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3 Claims. (Cl. 128—185)

Our invention relates to an oxygen inhaling assembly and more particularly to an assembly adapted to be used for supplying oxygen to patients in need of the same, as for example those suffering from pneumonia.

This application is an improvement over Patent 2,166,574, to Albert W. Adolphsen, one of the joint inventors herein.

Patients to whom oxygen is being administered are usually weak. The oxygen is usually administered through an elongated flexible conduit in the form of a rubber tube or the like. It sometimes happens that a patient will roll over and obstruct the flow of gas through the tube and, in such cases, the patient will not receive required oxygen since an attendant may not always be present.

It is also of vital importance, especially in the administration of some gases and where a patient's heart is weak, that an accurate means be provided for determining the rate of flow of the gas being administered.

One object of our invention is to provide a handy assembly for supplying oxygen to a patient through a reducing valve and humidifying construction, in which, whenever the oxygen line becomes clogged up for any reason, a warning signal will be emitted.

Another object of our invention is to provide an assembly in which the rate of flow of the oxygen or other gas being administered may be readily, expeditiously and accurately determined.

Other and further objects of our invention will appear from the following description.

In the accompanying drawing which forms part of the instant specification and are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views;

Figure 1 is a perspective view of our assembly, viewed from the front.

Figure 2 is a diagrammatic view of our assembly with parts in section.

Figure 3 is a fragmentary sectional view, showing our sounding device for indicating the stoppage in the oxygen line to the patient.

Figure 4 is a sectional view on an enlarged scale, taken on a line 4—4 of Figure 2.

Referring now to the drawing, we provide a casing 1 which may be made out of any suitable material. The casing is fitted with a head 2, secured thereto by screws 3 or in any other suitable manner. A gasket 4 is provided for forming a gas-tight joint. A pipe 5 is suspended from the head 2 and is provided at its lower end with

a plurality of openings 6, communicating with a plurality of felt washers 7. Water 8 half fills the casing 1, the lower end of the pipe 5 and the humidifying felt washers 7 being submerged in the water. A baffle 9 is suspended in the casing, forcing humidified gases to pass through a re-entrant portion 10 formed in the head 2 so that any entrained water will be freed from the gases before they pass into the tube 11, leading to the mask 12 which is fitted over the nose and mouth of the patient.

A gauge glass 12' communicates with the casing 1 and is adapted to show the level of the water 8 therein.

Referring now to Figure 2, the compressed gas is contained in a cylinder 13 controlled by a valve 14. The pressure of the compressed gas is shown by gauge 15. The gas passes to a double-stage reducing valve 16 and thence through a novel gauge 17 whence it is conducted through a trap 18 into the pipe 5 for humidification and passage to the patient. The gauge 17 comprises a gauge glass 18' which is provided with a tapered bore; that is, the lower end of the glass bore is of smaller cross-sectional diameter than the upper end of the glass bore. A metal ball 19 is positioned within the glass. As the oxygen flows through the gauge glass, the ball is forced upwardly. As the ball travels upwardly, an increasingly greater cross-sectional area is provided for the passage of the gas through the space between the ball and the internal walls of the gauge glass. The arrangement is such that the position of the ball will indicate the flow of the gas in liters per minute. The gauge glass is set into a casting 20 and carries a calibrated scale 21. The backing for the gauge glass is shaped as shown in Figure 4 with the sides tapered toward the line of sight. The arrangement is such that the scale can be read from either side as well as from in front.

Referring now to Figure 3, the head 2 is provided with a bore 22 communicating with the casing 1. A diaphragm 23 is normally seated against a seat 24 by means of a spring 25. As long as the tube 11 leading to the patient is free, gas will flow normally. If, for any reason, the tube 11 becomes clogged up, such as by compression of the flexible tube by the patient or another, the gas can no longer escape through pipe 11 and pressure will build up within the casing. As soon as pressure begins to build up, the diaphragm 23 will begin to lift, releasing the gas from the casing for passage through duct 26 to the atmosphere. The arrangement is such,

however, that the diaphragm will vibrate, emitting a sound similar to that of an air horn. The sound immediately warns the attendant that the patient is not getting oxygen due to the obstruction of the eduction flow from the casing.

It will be seen that we have accomplished the objects of our invention. We have provided an assembly for administering humidified medicinal gases to patients in which both a visible and an audible means are provided for indicating the stoppage of flow of the gases to the patient. The audible signal device also acts to relieve pressure within the casing 1. The visible signal is such that the scale can be read from a plurality of angles and the position of the ball will indicate as well the amount of gas flowing, in liters per minute.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, we claim:

1. In a gas inhaling assembly, a humidifier including in combination a casing adapted to contain water, means for humidifying gas positioned within said casing and submerged in said water, a source of compressed gas, means providing communication between said source of gas and said humidifying means, means for withdrawing humidified gas from said casing for passage to a patient, audible signal means, a passage providing communication between said casing and said audible signal means, said audible signal means including a vibratory diaphragm and a spring centrally positioned with respect thereto for preventing said diaphragm from vibrating until a predetermined pressure acts upon said diaphragm, said passage from the casing to the audi-

ble signal means terminating at the diaphragm outside the area contacted by the spring, and a second passage providing communication between said diaphragm and the atmosphere terminating beneath the diaphragm and covered by the bottom area of the spring, the construction being such that when said diaphragm is vibrating, gas within said casing acting to vibrate the diaphragm may pass through said passages to the atmosphere.

2. A gas inhaling assembly as in claim 1, including in combination a reducing valve between said humidifying means and said source of compressed gas, means providing communication between said reducing valve and said humidifying means, said last means including a vertical transparent tube provided with an internally tapered bore; a ball in said tube, a calibrated scale provided with a recess, said tube being set into said recess whereby the calibrations may be read from a plurality of angles, the construction being such that the position of the ball will visibly indicate the rate of flow of the gas.

3. In a gas inhaling assembly a humidifier including in combination a casing adapted to contain water, a source of compressed gas, means providing communication between said source of gas and the casing, means for withdrawing humidified gas from said casing for passage to patients, audible signal means comprising a diaphragm and a spring centrally positioned with respect thereto, a passage providing communication between said casing and said audible signal means terminating beneath the diaphragm outside the area contacted by the spring, a second passage terminating at the diaphragm and covered by the bottom area of the spring providing communication between said diaphragm and the atmosphere, the construction being such that obstruction to the passage of gas through the outlet passages will cause venting of gas through the audible signal means.

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