

1,266,624.

Patented May 21, 1918.
2 SHEETS—SHEET 1.

FIG. 1.

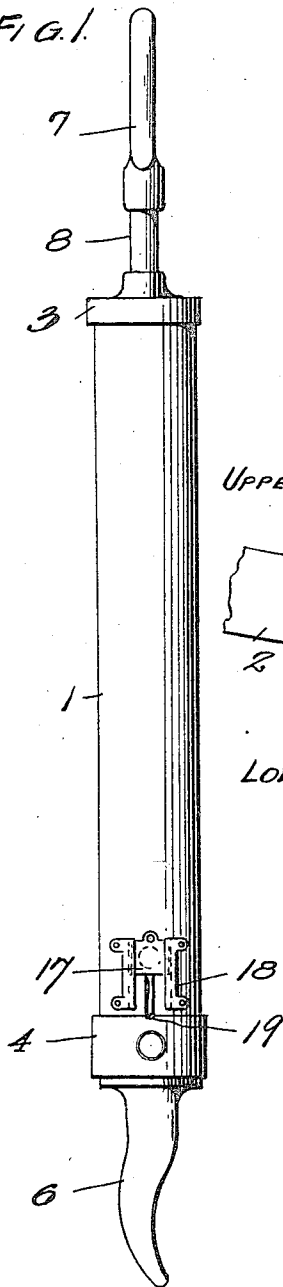
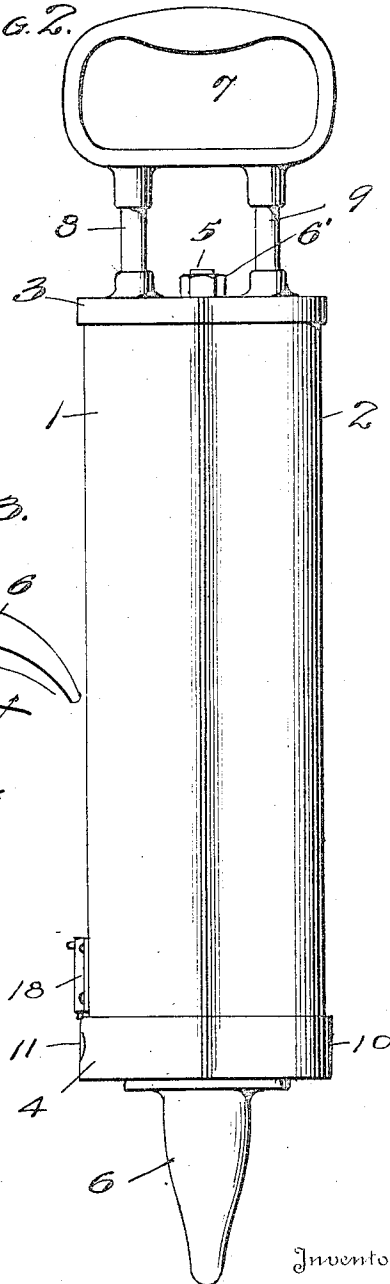
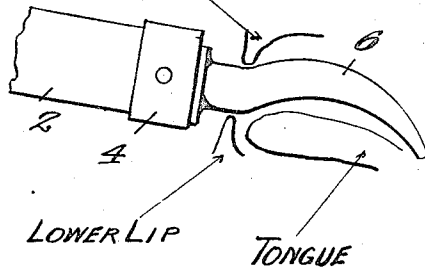


FIG. 2.



UPPER LIP

FIG. 3.



LOWER LIP

TONGUE

Inventor

HUBERT H. RAMSAY

By

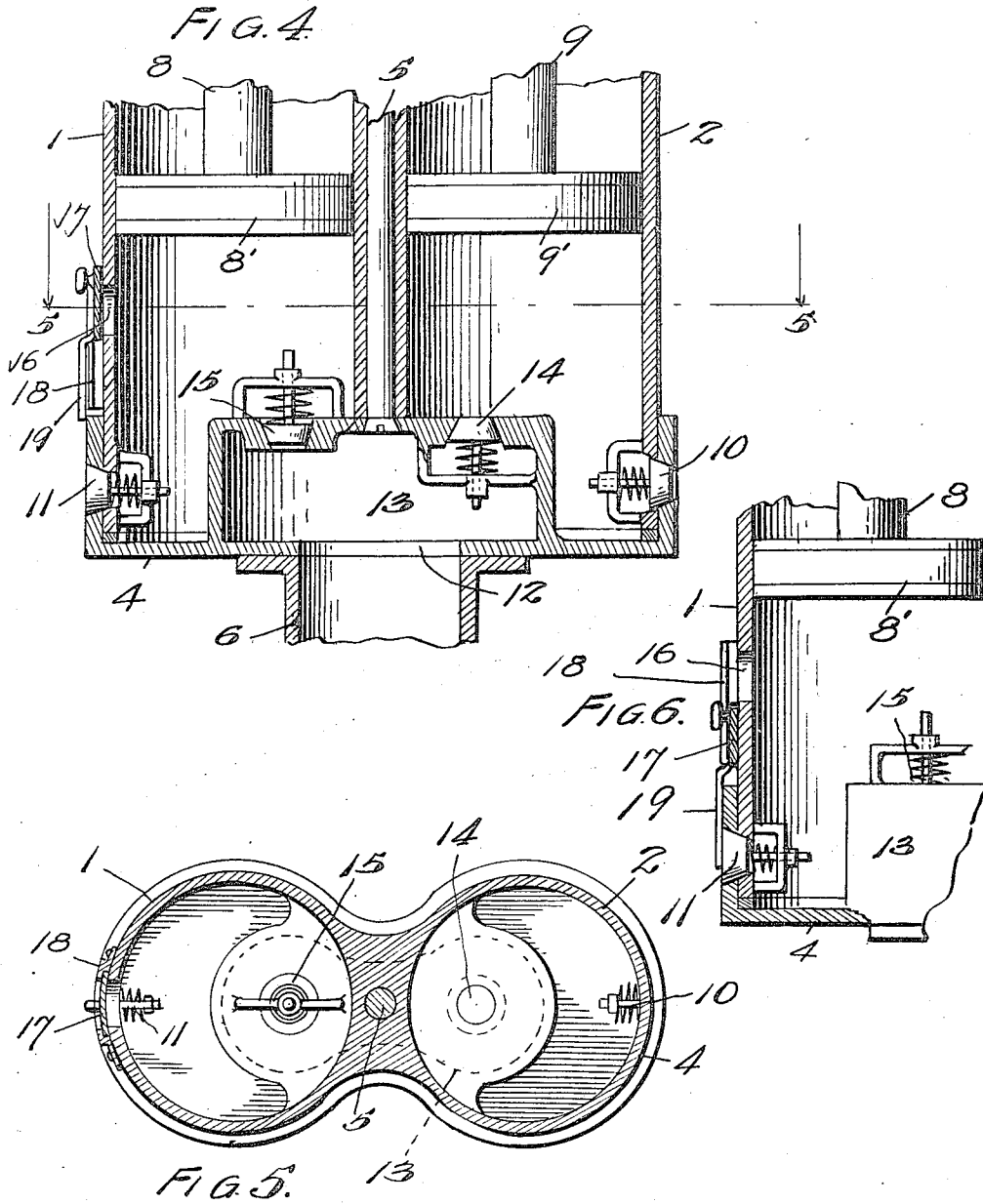
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RESPIRATOR.
APPLICATION FILED APR. 28, 1917.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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RESPIRATOR.

1,266,624.

Specification of Letters Patent.

Patented May 21, 1918.

Application filed April 28, 1917. Serial No. 165,300.

To all whom it may concern:

Be it known that I, HUBERT H. RAMSAY, a citizen of the United States, residing at Tylertown, in the county of Walthall and State of Mississippi, have invented a new and useful Respirator, of which the following is a specification.

My invention relates to respirators; and the objects thereof are: first, to supply compressed, atmospheric air to a new-born babe, as a means of perpetuating its existence at the crucial period of birth; second, to provide as well an injector of pure air, as an exhaust or ejector of impure, contaminated air for this purpose; third, to provide an effective, reliable mechanism to this end; fourth, to provide a simple structure to achieve these objects; and fifth, to attain these ends with structural economy.

I accomplish these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the structure; Fig. 2 is a front view thereof; Fig. 3 is a view diagrammatically showing the use of the instrument; Fig. 4 is an enlarged sectional view, showing the valves; Fig. 5 is a transverse, sectional view on line 5—5 of Fig. 4; and Fig. 6 is a fragmentary, sectional view showing the use of the device as an inflater only.

The same designations indicate corresponding parts in all the views.

The twin cylinders 1, 2 are joined at the top by cap 3, held in place by nut 6', through which the headed coupling bar 5 passes. The piece 6 is inserted in the mouth of the infant, over the tongue, to connect the air-chamber of the device with the respiratory organs of the body, not entering the throat. The handle 7 actuates the piston rods 8, 9 so as to draw air into the cylinder 2 and exhaust it through the cylinder 1. The cap 4 holds the cylinders together at the bottom. Pistons 8', 9' are integrally secured at the respective bases of the stems or rods 8, 9. On the up-stroke of the piston 9', atmospheric air is drawn by suction, through valve 10, and on the down-stroke of the same piston this same air is forced, by the pressure of the piston, through the inlet valve 14 opening to air chamber 13, inside of cap 4, whence it goes through opening 12, in cap 4, to the mouth piece 6. As the pistons 8, 9 move synchronously in the same direction it follows that the same up-stroke

that draws air through valve 10 into cylinder 2, operates by suction to open valve 15, which exhausts into the cylinder 1, for atmospheric discharge through valve 11, the vitiated air accumulated in the chamber 13, derived from the lungs through piece 6. On the down-stroke of piston 9' the fresh air passes through valve 14, into chamber 13 and is then injected into the lungs of the babe. The up-stroke of piston 8' draws the vitiated air from chamber 13, through valve 15 into cylinder 1 for expulsion, through valve 11 on the down-stroke of the piston 8'. These are not shown on the drawings, because their omission does not affect the operativeness materially of the device herein shown and described, nor do these elements enter into the claim. A port 16 is provided, in cylinder 1, controlled by slide valve 17, reciprocating in grooved guide ways 18, having a retaining finger 19. The object of this port is to enable the pump to be used as an inflater only, temporarily suspending the use of cylinder as an exhaust. The opening of this port allows free ingress and egress of atmospheric air, thereby dispensing with the suction that opens valve 15. The cylinder 2, under such condition, pumps air into the lungs with each down-stroke of piston 9'. When complete inflation has been accomplished, the tension on valve 15 from the air pressure of the lungs, forces the valve open and automatically permits the escape of an excess of air. When the inflation process is completed, the port is manually closed, and if the babe does not breathe naturally, the operator uses the apparatus as an artificial respirator, so long as there is any heart-sound whatever. The valve 15 thus performs the duplex office of aiding the act of respiration, during use of the apparatus as a respirator and acting as a safety valve, during the act of inflation.

This apparatus is of particular utility in those cases where infants are born with the heart acting but asphyxiated; which condition is due to the infant's inability to draw air into the lungs (known as atelectasis or collapsed lungs) which necessitates inflation of collapsed lungs before artificial respiration could be successful.

An apparatus intended to provide artificial respiration without provision for inflation would fail to accomplish the desired result, because the capacity of its pump represents normal breathing only, or tidal air,

while the lung capacity is several times this amount. It would then be self-evident that the small amount of air thus available—the breathing capacity—would be insufficient in quantity to inflate the lungs completely collapsed, to the point where artificial respiration could, be successful. I therefore provide, in my apparatus, the utilization of an injector pump, to deliver several times the capacity, before artificial respiration is resorted to as a means of resuscitation.

The operation of my device is as follows:

Upon childbirth it frequently happens that the lungs of the babe are completely collapsed (atalectasis), though its heart is beating and insufficient capacity of the respiratory organs exists. In this situation, the continuity of life depends upon producing artificial inflation and respiration.

To this end, using the apparatus as an inflator, my device draws atmospheric air through valve 10 into cylinder 2, on the up-stroke of piston 9' and injects the same air into the lungs of the child, through valve 14, chamber 13 and mouth-piece 6.

Using the apparatus as a respirator, the up-stroke of piston 8' draws vitiated air from the lungs into cylinder 1, through chamber 13, valve 15—which is expelled through valve 11 on the down-stroke of piston 8'.

I am aware that heretofore artificial respiration has been produced for substantially the same purposes herein indicated; and

also in cases where by partial drowning, or by inhalation of gases, suspended animation resulted. This has heretofore been achieved by cumbrous machinery, incapable of transportation by a physician to the beds of accouchement. It is therefore my aim by a portable apparatus, manually operated by the attending physician, to accomplish the same purpose.

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

In respirators, the portable structure herein shown and described, consisting of twin injector and ejector cylinders, pistons therefor operated manually by the same movement so that the ascent of one piston is synchronous with the ascent of the other; an inlet valve for atmospheric air in the injector cylinder; an outlet valve in the base of the same cylinder; an outlet valve in the ejector cylinder; an inlet valve at the base of the same cylinder; a port in the same cylinder, controlled by a slide valve, manually operated, whereby said cylinder temporarily ceases its function as an ejector, while said port is open; a common air chamber uniting both cylinders at their respective bases, and the mouth piece, whereby the atmospheric air is injected into the lungs of the subject, and the vitiated air withdrawn therefrom, for the purposes herein fully shown and described.

HUBERT H. RAMSAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."