May 9, 1950 R. E. FORREY 2,506,865

ARTIFICIAL RESPIRATOR

Filed March 26, 1947

Fig. 1

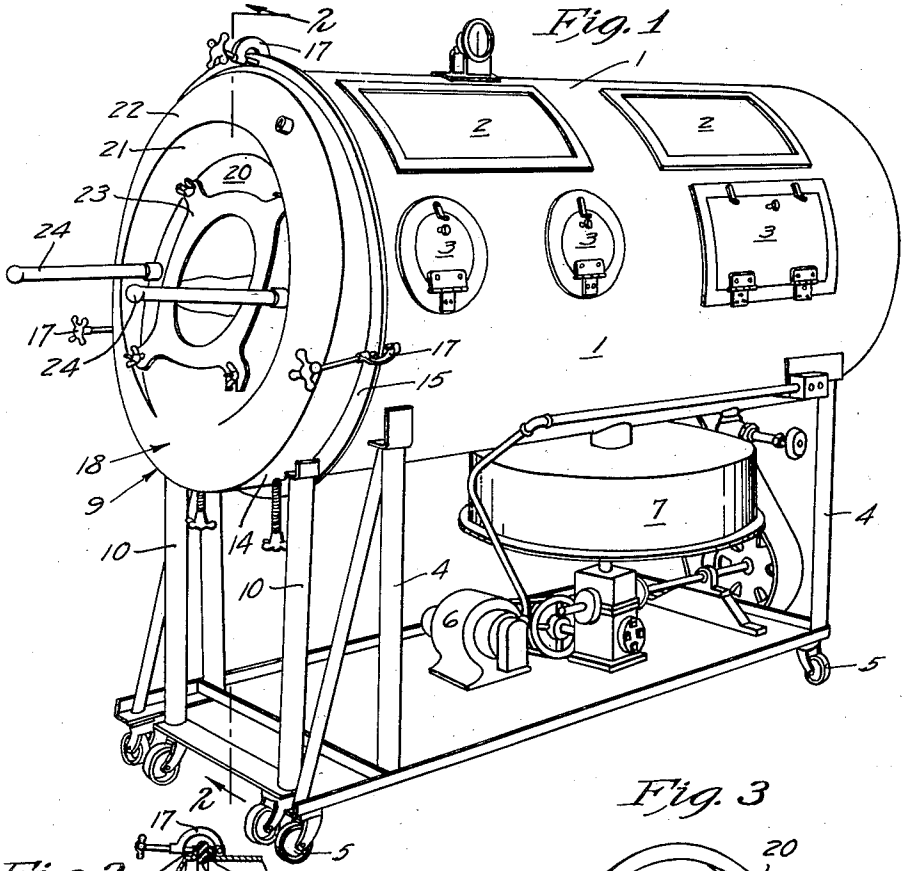


Fig. 2

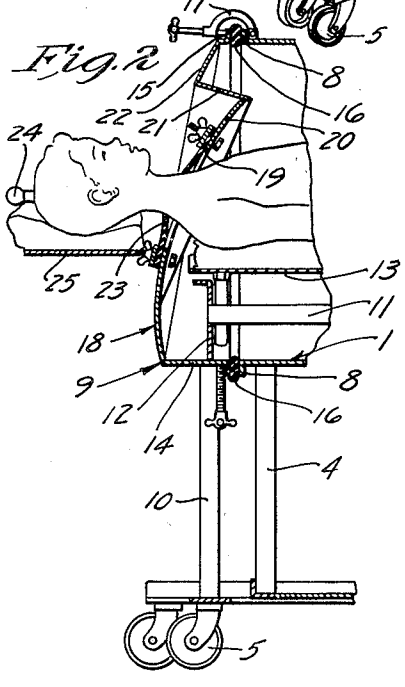
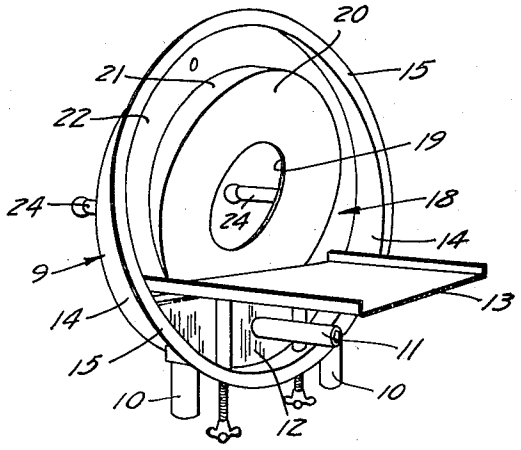


Fig. 3



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ARTIFICIAL RESPIRATOR

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1 Claim. (Cl. 128—30)

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My invention relates to improvements in artificial respirators known colloquially as "artificial lungs."

In the use of "artificial lungs" for the treatment of poliomyelitis, particularly in the treatment of bulbar cases, where the lungs have collapsed, it becomes desirable to perform a tracheotomy upon the patient while he is undergoing treatment within the respirator. Practicing surgeons have found it extremely difficult to perform these windpipe operations, in order to force oxygen into the lungs, in respirators constructed according to the teachings of prior art. The reason for this is that the end plates through which the necks of the patients project, do not expose a sufficient portion of the patient's neck to allow the surgeon to readily perform a tracheotomy. Recognizing this problem, prior inventors have pitched the neck-receiving wall of the respirator casing slightly upwardly and backwardly in an attempt to expose more of the upper neck surface. However, there is a limit to the extent to which the entire neck-receiving wall can be so pitched because of the fact that excessive pitching results in projecting the base of the casing out so far beyond the patient's head and neck that it prevents doctors and attendants from getting as close as is desirable and necessary.

An important object of my invention is the provision of a respirator drum of convention length, which exposes sufficient of the upper neck surface of a patient to readily permit a surgeon to perform a tracheotomy, and which is simple to build and rugged in construction.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

Fig. 1 is a view in perspective of a respirator incorporating my invention;

Fig. 2 is a fragmentary cross section, taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary perspective view showing the interior of the respirator drum head.

Referring with greater particularity to the drawings, the numeral 1 indicates, in its entirety, a cylindrical respirator drum having suitable observation ports 2 and working manholes 3. The drum is supported by a frame 4 mounted on caster wheels 5.

Means for generating alternate positive and negative air pressures within the drum 1 are of conventional design and include a motor 6 and a conventional pump, indicated in its entirety by the numeral 7.

The drum 1 is sealed at its foot end by an imperforate plate, not shown, and at its head end is provided with a radially outwardly projecting circumferential flange 8. A head, indicated in its entirety, by the numeral 9, is supported by caster wheel-equipped legs 10 and guided for axial movements into and out of engagement with the open end of the drum 1 by means of a guide rod 11 secured to a segmental cross-sectionally angular bracket 12 on the inside of the head 9. A supporting platform 13 is secured to the inner side of the head 9 for sliding movements therewith. The platform 13 is supported at its other end within the drum by means, not shown.

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The removable head 9 includes a cylindrical side wall 14 having at its inner end a radially-projecting circumferential flange 15 between which, and the flange 8 of the drum 1, is interposed a sealing washer 16. A plurality of pivoted screw clamps 17 secure the head 9 to the drum 1 to provide a seal. It will be observed that the cylindrical side wall 14 of head 9 is of a progressively less axial length from its base to the top thereof, whereby an end plate 18, secured thereto by welding or the like, is pitched rearwardly upwardly and backwardly with respect to the casing 1. It will be seen, by reference to Figs. 1 and 2, that the end wall 18 is annular in form, generally outwardly-bulged, and is provided with an axial neck-receiving opening 19. An annular wall section 20 extends radially outwardly from the neck-receiving opening 19 and is flush with an annular outer end wall section 22 at its base, being preferably formed integrally therewith, but pitched upwardly and backwardly with respect thereto to provide a working recess. A gusset or wall section 21 connects the concentric end wall sections 20 and 22. Thus, it will be seen that the wall sections 20, 21, and 22 make up the composite end wall 18 which is entirely closed with the exception of the neck-receiving aperture 19. The end wall section 20 is provided with a flexible resilient neck-engaging collar 23, which closely engages the neck of the patient to provide a seal thereabout. A pair of axially-projecting head-supporting rods 24 are secured to the end wall section 20, one on each side of the aperture 19. A suitable head-supporting device 25 is supported by the rods 24 for supporting the patient's head.

It will be seen, particularly by reference to Fig. 2, that the backward slope of the annular section 20 exposes sufficient of the throat area of a patient to allow adequate working space for a surgeon to effectively perform a tracheotomy.

My device has been thoroughly tested by numerous surgeons during the 1946 poliomyelitis epi-

demic in Minnesota and has been found to be completely satisfactory for the accomplishment of the above objects and has satisfactorily filled a heretofore unfilled need.

What I claim is:

In a device of the class described, a horizontally-disposed respirator drum having a generally outwardly bulging but upwardly and rearwardly pitched end wall, said end wall comprising rigid inner and outer annular concentric wall sections, the inner section of which is provided with a concentric neck-receiving opening, said inner wall section being flush with the outer wall section at its base and being pitched upwardly and rearwardly with respect thereto to provide a working recess, a segmental axially-extended wall section connecting said inner and outer annular wall section, a pair of axially outwardly-projecting rods secured to the inner end wall section, one on each side of said neck-receiving opening, and head-supporting means carried by said rods.

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