UNITED STATES PATENT OFFICE

1,940,135

COUPLING TUBE FOR INHALATORS

Frederick M. Luchs, Pittsburgh, Pa., assignor to
Mine Safety Appliances Company, Pittsburgh,
Pa., a corporation of Pennsylvania

Application September 4, 1931. Serial No. 561,121

3 Claims. (Cl. 128—203)

This invention relates to coupling tubes for inhalators.
Inhalators or resuscitating apparatuses are generally made by attaching the assembled parts to a support such as the bottom of a portable case. The removable gas bottles or tanks are ordinarily held in the case by a clamp at one end, and by rigid attachment of the outlet pipe from the valve in the neck of the bottles at the other end to a bracket on the case. The valve's drawoff pipe is thus used to secure one end of this bottle in fixed position in the case. This pipe must be connected to the manifold which is fixed to the case. The coupling portions of the bottle valves used with the apparatus are not always accurately positioned, but as the manifold is secured in fixed position, coupling it to the bottle valves by rigid nipples or tubes may not always be possible due to variations in the bottle valve connections, and bad alignment is apt to result in strain on the connections. This strain may be increased by shocks incident to carrying the inhalator about from place to place, and sometimes results in cracking or breaking off the connections. Such defects may not be discovered until it is necessary to use the inhalator, which may thus fail when needed in an emergency.

As it is preferable to attach the gas containers directly to the support by the valve connection, it is not desirable to connect a flexible member directly to the outlet valves. It is among the objects of this invention to provide means for connecting the bottles directly to the case, while also connecting the bottles to the manifold which will minimize or eliminate strain at all points associated with the connections, and which will also permit the container to be held in position in the case by direct attachment of the outlet valve.

In the accompanying drawing Fig. 1 is a plan view of an inhalator; Fig. 2 a perspective view of the flexible and loosely mounted coupling member; and Fig. 3 a longitudinal cross section of the rigid portion of the tube showing its mounting.

Referring to the drawing, high pressure gas containers or cylinders 1, are removable secured at one end in case 2 by clamp 3. This clamp is adjustable vertically by means of hand nut 4 threaded on a stud in base plate 5 attached to the bottom of the case.

Secured to the bottom of the case between the cylinders are manifold 13, pressure reducing valve 12, and reduced pressure control valve 14. These are connected by suitable couplings, tube 15 extending from the control valve 14 to breathing bag 16 attached to the cover of the case. A rubber hose 17 leads from the bag and terminates in a face mask 18 adapted to fit over the nose and mouth of a patient so that he may breathe resuscitating gas from the breathing bag through the hose. Gauge 19, connected to the manifold, registers the gas pressure.

Closing valves 21, are attached to the ends of the cylinders opposite to the clamped ends, and are connected to the manifold. In the preferred embodiment of the invention one end of a flexible tube 22, called to increase its flexibility, is soldered to a nipple 23 which is connected to an inlet of the manifold by coupling nut 24. A similar nipple 25 is soldered to the other end of the flexible tube 22 and is joined to nipple 26 by nut 27, the opposite end of the nipple 26 being coupled to outlet portion 28 of valve 21 by union nut 29. This flexible construction permits the coupling to adjust itself to irregularities in the arrangement or positioning of the valves and prevents undue strain upon the connections.

To anchor the cylinder, means is provided for allowing nipple 28 enough freedom of movement in all directions to permit it to align itself with outlet portion 28. This means comprises a spool 31 securely attached to nipple 26 and extending through an enlarged aperture 32 in bracket 33 attached to the bottom of the case. Considerable force is required to tighten nut 29 on valve 21, which tends to twist nipples 26 and 25 off the flexible tube. Therefore, aperture 32 and the central portion of the spool have non-circular shapes so that the spool and nipple 26 can not turn in the bracket. One flange of the spool, as shown in Fig. 2, is formed by a nut 34 threaded on its reduced portion. The nut is not turned on the spool far enough to lock it against the bracket which would defeat the purpose of the invention by exerting strain on the connection, but a space is left between all points of the spool and the bracket so that the spool is loosely retained therein. This results in the container being held in position without strain upon the valves or the coupling.

According to the provisions of the patent statutes, I have explained the principle and operation of my invention and have described what I now consider to be its best embodiment. However, I desire to have it understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.
I claim:

1. The combination in an inhalator apparatus, of a support, a compressed gas container attached at one end thereto and provided with an outlet, a manifold rigidly mounted on said support, and a coupling member connecting said outlet with said manifold, said coupling member comprising a flexible portion and a rigid portion attached thereto, means rigidly connected to said rigid portion for preventing the rigid portion from sliding therein, and means for loosely mounting said first means with said rigid portion on the support to permit them to align themselves with said outlet but restraining them from substantial displacement in every direction.

2. The combination in an inhalator apparatus, of a support, a container for inhalation gas under pressure secured at one end thereto, a valve controlling flow of said gas from said container, a manifold secured to said support, means for conducting gas from said manifold to a breathing apparatus, a coupling member connecting said valve with said manifold and comprising a substantially rigid tube attached to said valve, means rigidly connected to said tube for preventing the tube from moving therein, means holding said first means with said tube to the support but permitting limited lateral and longitudinal movement thereof, and a flexible tube connecting said rigid tube with said pressure reducing means.

3. The combination in an inhalator apparatus, of a support, a container for inhalation gas under pressure secured at one end thereto, a valve controlling flow of said gas from said container, a manifold secured to said support, means for conducting gas from said manifold to a breathing apparatus, a coupling member connecting said valve with said manifold and comprising a substantially rigid tube attached to said valve, means rigidly connected to said tube for preventing the tube from moving therein, means holding said first means with said tube to the support but permitting limited lateral movement thereof, means securing said tube against rotation, and a flexible tube connecting said rigid tube with said pressure reducing means.

FREDERICK M. LUCHS.