

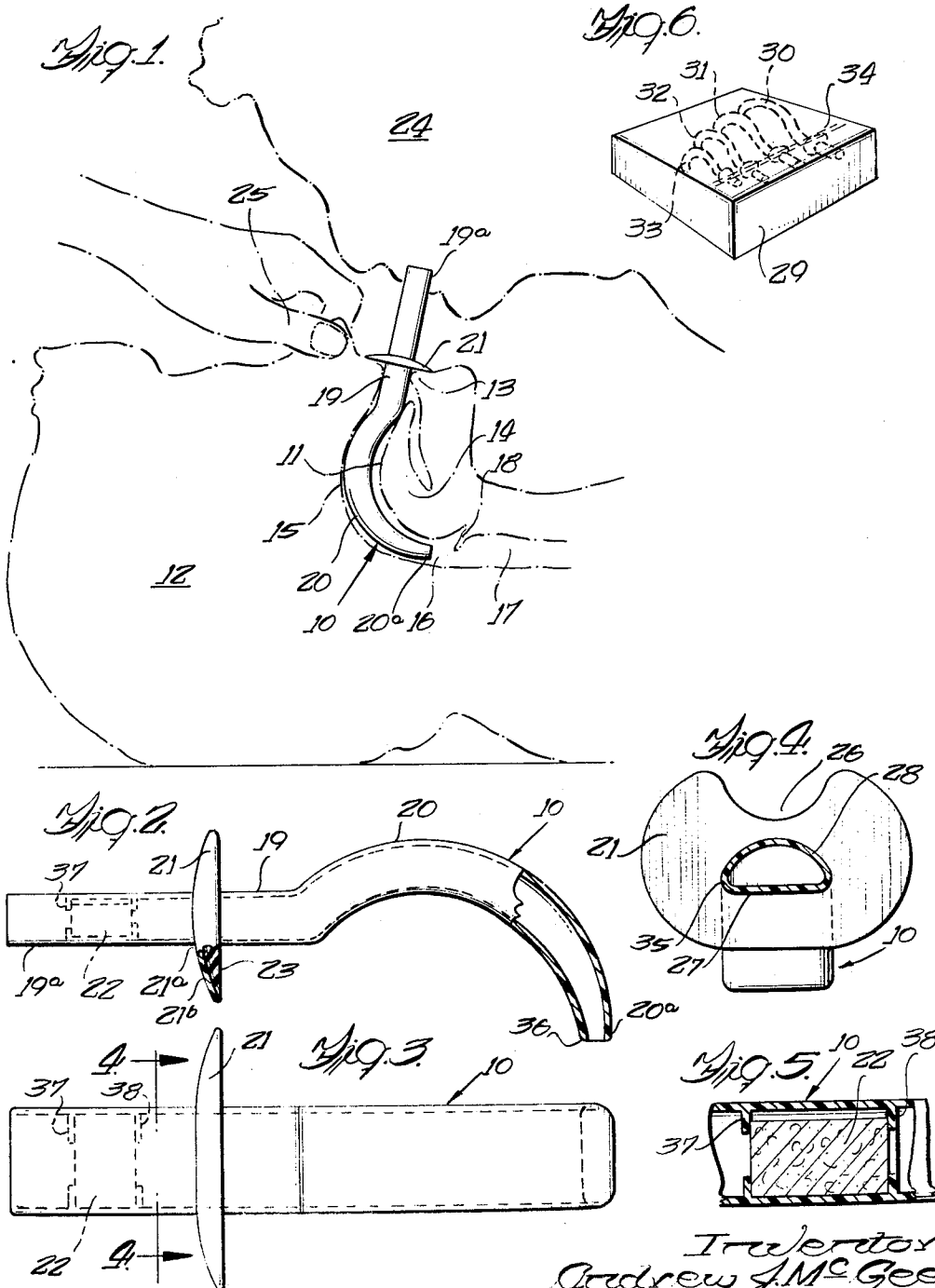
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RESCUE BREATHING DEVICE

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1

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RESCUE BREATHING DEVICE

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This invention relates to a rescue breathing device, and, more particularly, to a device which will aid in performing mouth-to-mouth artificial resuscitation.

Three problems have characterized mouth-to-mouth resuscitation methods in the past. One problem involves the aspect of contact between the mouths of the victim and the resuscitator. Although this may be considered primarily an esthetic matter, it may, in some cases, prove to be the controlling factor in whether a resuscitation is achieved. Anything short of a complete oral contact may render the resuscitation ineffective, with fatal results.

However, even when the problem of oral contact is not present, two other problems exist which may frustrate the efforts of the resuscitator. One is the common tendency of the victim to swallow his tongue, which effectively halts the rescue breathing attempt. The other problem involves the tendency of the muscles in the nasopharynx to contract and thus partially occlude the trachea. These last-mentioned phenomena are characteristic of victims of electrocution as well as drowning.

It is an object of this invention to provide a novel rescue breathing device which finds application to the resuscitation of victims through the use of the mouth-to-mouth method.

Another object is to provide a rescue breathing device which is effective to avoid the problems set forth hereinabove.

Still another object is to provide a rescue breathing device shaped and constructed to avoid any undesirable direct contact of the mouths of the victim and resuscitator and which additionally positively precludes the victim from swallowing his tongue and further which effects a channel through any constricted windpipe.

Yet another object is to provide a novel rescue breathing device arranged and constructed so as to permit the use of the mouth-to-mouth resuscitation method to victims of various ages and sizes.

A further object is to provide a device useful in mouth-to-mouth resuscitation which incorporates a novel filter mouthpiece so as to render the same useful in resuscitating victims subject to drowning.

A still further object is to provide an article of manufacture including a plurality of rescue breathing devices which permits application of a device so sized as to properly resuscitate a victim.

Other objects and advantages of this invention may be seen in the details of operation and construction set forth in this specification hereinafter.

The invention will be described in conjunction with an illustrative embodiment seen in the accompanying drawing, in which—

FIG. 1 is an elevational view of a device embodying teachings of the invention and shown installed in place in the oral cavity of a victim on which the mouth-to-mouth method of resuscitation is employed, the victim and resuscitator being shown in phantom line;

FIG. 2 is an enlarged side elevational view partially in section of the device of FIG. 1;

FIG. 3 is a top plan view of the device seen in FIG. 2;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is an enlarged side view with walls broken away showing the portion of the device which is equipped with a filter; and

2

FIG. 6 is a perspective view of an article of manufacture showing a container or package suitably marked and housing a plurality of different sized rescue breathing devices embodying teachings of this invention.

In the illustration given, the numeral 10 designates generally a rescue breathing device and is seen installed in the oral cavity or mouth 11 of a victim 12. The lips of the victim 12 are designated by the numeral 13, the tongue by the numeral 14, and the hard palate by the numeral 15.

Still referring to FIG. 1, the pharynx of the victim 12 is designated by the numeral 16, while the trachea is designated by the numeral 17. The epiglottis is designated by the numeral 18.

The device 10 is seen to include a straight portion 19 and an arcuate portion 20, the arcuate portion providing an end proximal to the pharynx.

The arcuate portion 20 is arched longitudinally and is urged by the tongue 14 against the hard palate 15. The curvature of the device 10 is therefore such as to positively preclude a victim from swallowing his tongue, and further the extreme proximal end 20a is inwardly tapered so as to effect an entry into the nasal-pharynx whether the same is constricted as in spasm or shock. The distal end 19a of the device 10 is seen to be equipped with a flange 21 and, outwardly of the flange, a filter 22.

Preferably, the device 10 is constructed of a semi-rigid, resilient material so as to provide a slight degree of accommodation to different-dimensioned throats. Suitable materials of construction for this purpose are polyvinyl chloride, polyethylene, hardened rubber, etc. Especially suited is polyethylene which is resistant to alkalies, acids, and oxygenated solvents. Its low softening point (230° C.) renders it amenable to compression molding. The flange 21 may be adhesively secured to the straight section 19 as at 21a. Further, the flange 21 is seen to be equipped with a concave inner surface 21b so as to facilitate occluding of the victim's mouth. The inner face 21b may be equipped with a pad of resilient material, i.e., foam rubber, etc., so as to facilitate this occlusion, the pad being designated by the numeral 23.

In the operation of the device just described, the flange 21 acts as a retainer to position the proximal end 20a of the device 10 just above the larynx, the sponge rubber pad 23 aiding in the mouth occlusion.

When the device 10 is used in drawing, the victim is first turned face downwardly so as to regurgitate any water retained in the respiratory tract. Thereafter, the device 10 is inserted and the mouth of a resuscitator 24 is applied to the distal end 19a of the device 10. The resuscitator both inhales and exhales with the device firmly in his mouth, there being sufficient oxygen in the exhaled breath to satisfy the breathing requirements of the victim. Thus, the victim gets the benefit of a positive pressure relative to air entering his lungs.

To make the mouth-to-mouth method workable, it is necessary to close the nasal passages of the victim. Inasmuch as the nasal construction varies widely, it is desirable to insure that this is done through the gripping of the victim's nose between the fingers 25 of a resuscitator or his assistant. Thus, the flange 21 is notched as at 26 (see FIG. 4) so as to provide a free access area for the victim's nose and which facilitates the grasping thereof by the resuscitator.

During the resuscitation operation, the filter 22 serves to retain any moisture in the resuscitator's exhaled breath and therefore prevents it from entering the lungs of the victim. For this purpose, a variety of filters may be employed such as filters constructed of activated carbon, cellulose, etc. The provision of a filter results in rigidi-

lying the distal end 19a or mouthpiece so that inadvertent closing of the same by the biting action of a resuscitator is effectively avoided.

In the illustration given, the device 10 has the cross-sectional shape of a closed, semi-oval, with the flat side or wall being designated 27. The upper or arcuate wall is designated by the numeral 28 (see FIG. 4). The flat wall 27 is effective to bear against the tongue 14, while the upper wall 28 conforms generally to the hard palate 15. I have found that this construction is singularly effective in restricting a victim from swallowing his tongue. The proximal end 20a of the device 10 (proximal relative to the victim), with the indicated taper, not only effects an opening of any windpipe constriction due to spasm, but also imparts a velocity increase to air entering the victim's lungs which is helpful in more rapidly expanding the victim's lungs.

For optimum results, the device 10 should be constructed with a predetermined relationship between the lengths of the straight portion 19 and the arcuate portion 20. The length of the straight portion 19 involved is that inward of the mouthpiece flange 21, and the length of the arcuate portion 20, projected as at A, should be about 1.75 times the length designated B in FIG. 1.

In FIG. 3, a package or container 29 is seen, which includes a plurality of devices 10, these devices being designated by the numerals 30, 31, 32 and 33. Each device is identical in shape and construction, but the devices 30-33 are graduated in size. The graduation is applicable not only insofar as length is concerned, but also insofar as the cross-sectional area is concerned. The container may be equipped with indicia such as at 34 so as to indicate to a user just what age or size person the particular device is to be used for. For example, the legend associated with device 30 may read "Large adult," the legend under device 31 "Medium adult," the legend under device 32 "Child," and the legend under device 33 "Infant." As such, the container 29 would be useful for a boating family, backyard swimming pools, a Red Cross first aid kit, and for linemen or other persons who encounter the danger of electrocution. Preferably, the container 29 is equipped with a plastic window in its top wall and is sealed against entry of bacteria and dust.

The resuscitator may position himself directly over the victim or at a slight angle to the victim so as to avoid any undue pressure on the victim's body. In inserting the device 10, the semi-rigid construction permits adaptation of the device to the differences in windpipe and mouth construction encountered in different individuals. The longitudinal and transverse edges of the device are rounded as at 35 (see FIG. 4), and 36 (see FIG. 2), which effectively avoids any traumatizing of the victim's throat.

The semi-rigid nature of the device 10 permits ready flexing of the device so as to eject the filter 22, if desired. This can be appreciated from a consideration of FIG. 5, where the tabs 37 at the distal end of the device may be flexed under the pressure exerted on the device 10 so as to eject the filter 22. An apertured wall 38 is provided inward of the tabs 37, i.e., spaced more closely to the proximal end of the device 10, so as to positively restrict movement of the filter 22 inwardly of the device.

While, in the foregoing specification, I have set forth a detailed description of an embodiment of the invention

for the purpose of illustration thereof, it will be appreciated by those skilled in the art that many changes in the details of the construction given may be made without departing from the spirit and scope of the invention.

I claim:

1. A resuscitator, comprising an elongated tubular element equipped with a fluid flow channel extending longitudinally therethrough, an opening at each end of said element communicating with said channel whereby all of the fluid entering one opening necessarily exits at the other opening, said tubular element having a longitudinally arcuate portion adjacent one end and a longitudinally straight portion at the other end, said one end being inwardly tapered, and a transversely-extending flange mounted on said straight portion, said element being generally hemi-cylindrical in cross section to provide a flat side, the flat side being adjacent the concave side of said arcuate portion.

2. A rescue breathing device, comprising an elongated pipe having a flat wall and an arcuate wall cooperating to define a longitudinally-extending fluid flow passage, said pipe being constructed of semi-rigid material and equipped with a longitudinally curved portion at one end thereof, said pipe being insertable into the mouth and throat of a victim with the proximal end of the pipe positioned adjacent the victim's trachea to dilate the nasal pharynx, said proximal end being inwardly tapered, the distal end of said pipe being straight and positioned below the uppermost point of said arcuate portion, the length of said arcuate portion projected along the direction of said straight portion being about 1.75 times the length of said straight portion, and a flange-equipped mouthpiece attached to said distal end and integral therewith.

3. A rescue breathing device, comprising an elongated pipe having a flat wall and an arcuate wall cooperating to define a longitudinally-extending fluid flow passage, said pipe being constructed of semi-rigid material and equipped with a longitudinally curved portion at one end thereof, said pipe being insertable into the mouth and throat of a victim with the proximal end of the pipe positioned adjacent the victim's trachea to dilate the nasal pharynx, said proximal end being inwardly tapered, the distal end of said pipe being straight and positioned below the uppermost point of said arcuate portion, the length of said arcuate portion projected along the direction of said straight portion being about 1.75 times the length of said straight portion, a flange-equipped mouthpiece attached to said distal end and integral therewith, a rigid filter removably mounted in said mouthpiece, and means in said mouthpiece securing said filter in position.

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