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W. D. JOHNSTON
GAS DISPENSING DEVICE

3,012,694

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2 Sheets-Sheet 1

FIG. 1

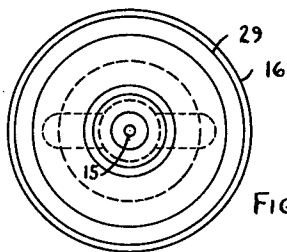
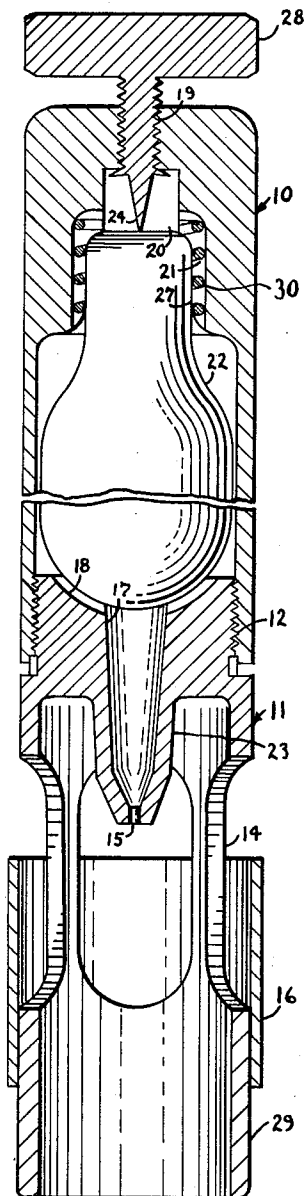


FIG. 2

FIG. 3

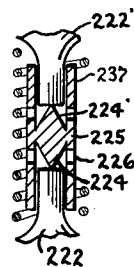
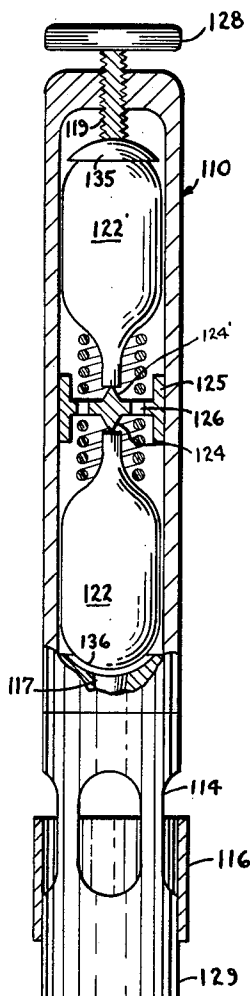


FIG. 4

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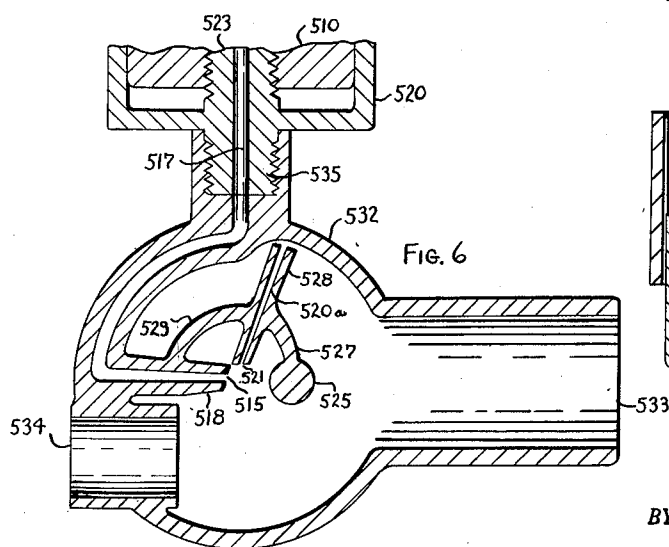
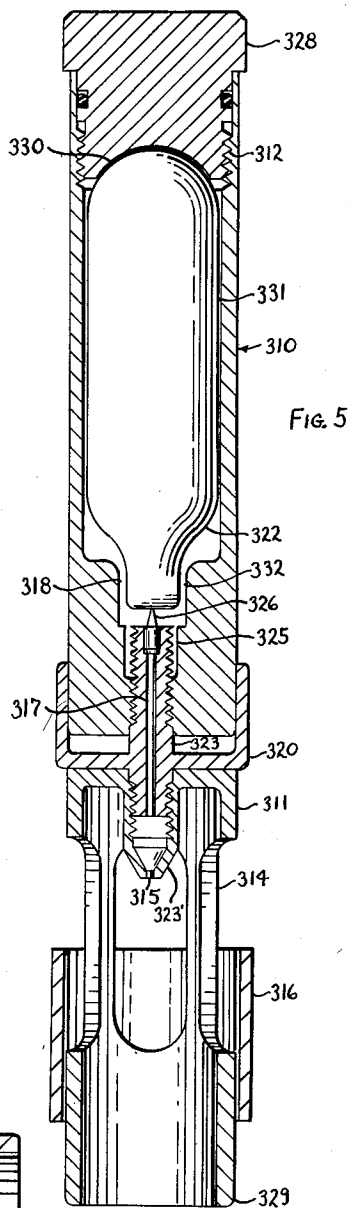
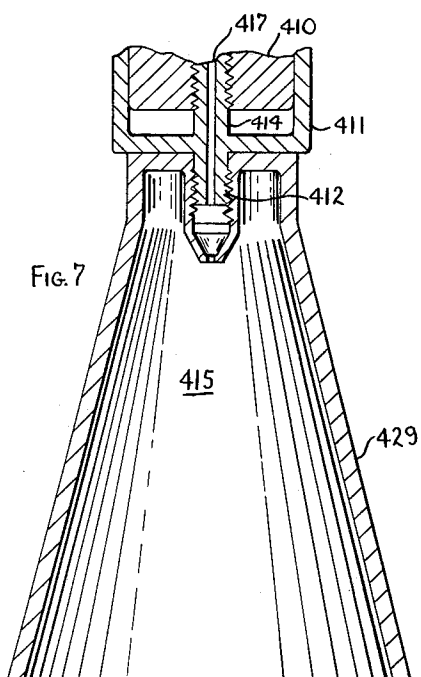
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GAS DISPENSING DEVICE

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10 Claims. (Cl. 222-5)

This invention relates to dispensers and, more particularly, to gas dispensers for dispensing gas such as oxygen for human inhalation.

The device disclosed herein has particular utility for dispensing gas for human consumption; however, it also has utility for dispensing gases which do not support combustion such as carbon dioxide for use as a fire extinguisher.

Oxygen dispensers for human inhalation which were previously constructed were complicated and expensive to manufacture and subject to mechanical failure. The present invention discloses a self-contained oxygen dispensing and inhaling unit which is extremely simple and economical. It incorporates an improved feature which is by way of a piercer which also forms a needle valve for stopping the flow of oxygen from the container and incorporates an improved venturi for mixing gas with air in combination with the device aforesaid.

Specifically, it is an object of this invention to provide a device for dispensing oxygen which is simple in construction, economical to manufacture, and simple and efficient to use.

Another object of this invention is to provide an improved self-contained device for dispensing oxygen for human consumption.

A further object of the invention is to provide an improved valve and piercing arrangement in an oxygen dispensing device.

A still further object of the invention is to provide an improved dual container unit for dispensing oxygen.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

FIG. 1 is a longitudinal cross sectional view of an oxygen dispensing device according to the invention;

FIG. 2 is a top view of the oxygen dispensing device shown in FIG. 1;

FIG. 3 is a longitudinal cross sectional view of another embodiment of the invention;

FIG. 4 is a view of another embodiment of the piercing mechanism;

FIG. 5 is a view of another embodiment of the invention;

FIG. 6 is a view of a nebulizer head for use with the device shown in FIG. 5; and

FIG. 7 is a view of a fire extinguisher head for the device.

Now with more specific reference to the drawings, in FIG. 1, an oxygen dispensing device 10 is shown having a hollow cylindrical body. A breathing device 11 is threadably attached to the hollow cylindrical body by means of threads 12 which are formed on a reduced size portion of the breathing device 11 which provides a shoulder adjacent to the reduced size portion. The shoulder engages the end of the body of the device 10.

The breathing device 11 has circumferentially spaced, elongated or graduated round openings 14. A sleeve 16 is formed on the medicinal end of the breathing device 11. The sleeve 16 may be moved longitudinally on the breathing device 11 to restrict the openings 14 and thereby

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regulate the amount of air that is drawn into the device 11 by oxygen passing through an orifice 15. The orifice 15 will be made of proper size to allow a desired amount of oxygen to escape. For example, the orifice 15 could be made .020 inch in diameter.

An enlarged bore 17 communicates with the orifice 15 and the inside of the hollow cylindrical body and the intermediate openings 14 so that gas flows laterally from the orifice 15 to the openings 14. A counterbore 18 is formed in the breathing device 11 which receives the end of a container 22 opposite a neck 27. The neck 27 is received in a counterbore 21 which is an enlarged counterbore of a counterbore 20 which in turn is the counterbore of a threaded bore 19. The threaded bore 19 receives a threaded pintle member 24 which has a point thereon which, when a hand-wheel 28 is rotated, is forced into the sealed cover of the container 22 and punctures and opens it. Then when the wheel 28 is rotated slightly in the opposite direction, gas can escape in the opening so formed and when the wheel 28 is again tightened, the gas is restrained from escaping by the needle valve action of the pintle member 24. The orifice 15 is formed in a dispensing member 23 formed inside the annular bore therearound. A spring 30 urges the container 22 away from the pintle 24.

Therefore, to use the device shown, a full container of oxygen under pressure as indicated at 22 will be inserted in the hollow cylindrical body and the breathing device 11 will be threaded into place. Then the handwheel 28 will be rotated so that the member 24 pierces the container 22. The handwheel 28 will then be backed off slightly so that gas can escape into the inside of the hollow cylindrical body and the gas will flow up between the base of the container 22 through the bore 17 and the orifice 15 and out of a discharge end 29. Air will be drawn through the openings 14 and mix with the oxygen at a concentration dependent upon the setting of the sleeve 16. The handwheel 28 may be adjusted to control the rate of flow of gas.

In the embodiment of the invention shown in FIG. 3, a device similar to that shown in FIG. 1 is disclosed wherein bottles 122 and 122' are supported in a dispensing device 110, the dispensing device 110 having a cylindrical body with a bore 117 similar to that shown in FIG. 1. A sleeve 116, openings 114, and a discharge opening 129 are similar to those shown in FIG. 1.

A handwheel 129 operates the threaded member in a bore 119 to move a pressure member 135 to force the bottle 122' against a point 124' to pierce it. The force opposing this force will be applied to a point 124 which will enter the neck of the bottle 122. Oxygen will flow through openings 126 between a rim 136 to the bore 117 and then find its way into the discharge opening 129, drawing air through the openings 114 at a rate dependent upon the setting of the sleeve 116 as aforesaid. A collar 125 fits snugly and slidably inside the inner surface of the cylindrical body member.

In the embodiment of the invention shown in FIG. 4, a piercer which could be used with the embodiment shown in FIG. 3 is disposed. The piercer has a hollow cylindrical sleeve 225 having an internal bore 237 which is adapted to fit over the necks of bottles 222 and 222'. Points 224 and 224' pierce holes in the sealed ends of the bottle necks and, therefore, allow gas to escape into the hollow cylindrical body through openings 226 which can later be breathed by a person.

In the embodiment of the invention shown in FIG. 5, an oxygen dispensing device having a hollow cylindrical body 310 is shown and a breathing device 311 is threadably attached to the hollow cylindrical body 310. The breathing device 311 is also hollow and cylindrical and

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has circumferentially spaced elongated openings 314 formed in its wall around its periphery. A sleeve 316 is concentrically and slidably supported on the open end of the breathing device 311.

The sleeve 316 may be moved longitudinally on the breathing device 311 to restrict the openings 314 and thereby regulate the amount of air that is drawn into the device 311 by the oxygen passing through the orifice 315, thereby regulating the mixture of oxygen to air. The orifice 315 may be made of proper shape and size to allow the desired amount of oxygen to escape for a particular application. For example, the orifice 315 could be .020 inch in diameter.

An elongated bore 317 communicates between the orifice 315 and the inside of the hollow cylindrical body 310 and the intermediate openings 314. A cap member 320 has a concentric core 323 which is threaded to be received in an opening 325 in the body 310. The core 323 has a point 326 fixed to the end thereof which pierces the sealed end of a bottle 322 when a plug 328 is tightened in its threaded opening 312 against an end 330 of the bottle 322.

The body 310 has a counterbore 331 which forms the hollow therein and receives the bottle 322. A bore 332 receives the neck of the bottle 322. The bore 332 is, in fact, a counterbore of a bore 318 and this, in turn, is a counterbore of the threaded opening 325 which receives the core member 323. The threaded core member 323 is integral with a nozzle 329. The orifice 315 is formed in the end of a nozzle member 323'.

The device shown in FIG. 6 is adapted for use with the bottle arrangement of a body 510 and it has a cap 520 therein with a core member 523 similar to that shown in FIG. 5; however, a bore 517 follows a curved path and terminates in a nozzle 518 with an orifice 515 therein. Oxygen under pressure flowing from the nozzle 518 strikes air drawn up through a bore 520a in a member 528 and which is discharged through an orifice 521. Therefore, the air drawn through the orifice 521 and mingled with oxygen from the orifice 515 impinges on a spherical member 525 and the oxygen is nebulized with the air. The spherical member 525 is fixed to a web 527 which is in turn fixed to the body member 528 in turn fixed to a web 529 which is in turn fixed to a spherical head 532. The hollow spherical head 532 is fixed to a threaded neck 535 and a hollow tubular discharge nozzle 533 is attached to the head 532. A hollow tubular inlet member 534 is connected to the head 532 which allows air to enter the head 532.

The device shown in FIG. 7 is used to mount on a body such as the body 310 shown in FIG. 5. The body shown in FIG. 7 is indicated at 410. This device may be used to dispense carbon dioxide for fire extinguishing purposes. A cap 411 has a bell shaped nozzle 429 thereon which is attached to the cap 411 by threading onto a threaded core member 412. The threaded core member 412 is integral with an inside flared surface 415 of the nozzle 429. The core member 412 has a bore 417 therethrough and a core 414 extends inwardly concentric with the cap 411. The neck of the body 410 is received in the cap 411 as shown.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A device for dispensing oxygen comprising a hollow cylindrical body open at one end and closed at the other, said closed end having a threaded bore therein and a threaded member received in said bore, a point on the inner end of said threaded member, means to support a

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sealed bottle of gas under pressure in said hollow body, a breathing device attached to the open end and closing the open end of said hollow body, said breathing device having an orifice therein, a hollow cylindrical member attached to said breathing device and disposed concentric to said orifice, openings in said hollow cylindrical member spaced around said orifice, a sleeve disposed on said hollow cylindrical member and rotatable thereon, said sleeve being adapted to cover said openings in said cylindrical member whereby the rate of air flow through said openings drawn thereinto by said oxygen flowing through said orifice is limited, said point being adapted to be tightened into the opening formed thereby in said sealed bottle to stop the flow of air therefrom.

2. The device recited in claim 1 wherein said orifice is formed in a projecting member having an annular groove disposed between it and the inside of said breathing device, and said orifice is disposed radially at an intermediate point of said openings in the edge of said breathing device.

3. A device for dispensing oxygen comprising a hollow cylindrical body, a breathing device attached to one end of said hollow cylindrical body, said breathing device having spaced apertures therein, a sleeve over said apertures and movable to adjust the exposed opening of said apertures, two bottles containing oxygen under pressure inside said hollow cylindrical body with their necks facing each other, a piercing member having opposed points thereon, a flanged member interposed between said necks, said points engaging the ends of said necks of said bottles, said points being disposed on said flanged member, said flanged member being disposed concentric to the necks of said bottles, means to force said bottles toward each other to cause said points to puncture said necks, and a spring engaging one said bottle at each end thereof.

4. The device recited in claim 3 wherein said flanged member is supported on the inner walls of said cylindrical body.

5. The device recited in claim 3 wherein said flanged member on said piercing member overlies the necks of said bottles and engages the necks thereof and is disposed concentric thereto.

6. The device recited in claim 5 wherein a threaded member is disposed in one end of said hollow body, and means on said threaded member engaging one of said bottles, forcing said bottle against said piercing member.

7. A device for dispensing oxygen comprising a hollow cylindrical body having a closed end, a threaded member having a point extending into said hollow body on said closed end of said hollow cylindrical body, said point engaging the sealed neck of a bottle, a handwheel on said threaded member for tightening said threaded member, a breathing device in the open end of said threaded member closing the opening therein and engaging the bottom of said bottle, said breathing device having a hollow cylindrical portion extending from the part attached to said hollow cylindrical body, an internal annular groove formed in said open end, said internal groove disposed around a generally cylindrical member extending into the hollow end, an orifice in the end of said generally cylindrical member, circumferentially spaced openings in the sides of said hollow cylindrical portion disposed circumferentially around said orifice, a sleeve disposed on said hollow cylindrical portion, said sleeve overlying said spaced openings in said hollow cylindrical portion and movable to adjust the respective effective size of said openings whereby the amount of air drawn through said openings by said oxygen flowing from said orifice is regulated.

8. A device for dispensing oxygen comprising a hollow cylindrical body having a bore therein and open at one end, said open end having internal threads and a threaded plug engaging said threads, a bottle containing oxygen under pressure in said bore, means in said body to puncture said bottle, said bottle being engaged by

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said plug to force it into engagement with said means to puncture it, a hollow cylindrical breathing device attached to an end of said body, a sleeve fitting on said breathing device, an orifice in said body communicating from the inside thereof to the inside of said breathing device, and laterally spaced apertures in the sides of said breathing device whereby air may be drawn in by oxygen escaping from said orifice, said sleeve being longitudinally movable to move a part of said sleeve out of alignment with said apertures in said breathing device.

9. A device for dispensing oxygen comprising a hollow cylindrical body, a bottle for containing oxygen under pressure in said hollow body, an opening in one end of said body, a member in said opening extending outwardly therefrom, a hollow breathing member on said body disposed around said member, laterally spaced openings in the sides of said breathing member, and an opening through said member communicating from the inside of said body to the inside of said breathing member, and a hollow sleeve fitting on said breathing member, said sleeve being longitudinally movable to move a part of said sleeve out of alignment with said openings in said breathing member.

10. A device for dispensing oxygen comprising a hollow body closed at one end, means to close the other end of said body, a cap over said closed end, a threaded bore in said closed end, a first threaded member on said

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cap extending into said threaded bore, a second threaded member on said cap extending outwardly, a bore through one of said threaded members, a hollow cylindrical breathing device having a hollow internally threaded member disposed concentrically therein, said second threaded member disposed in said hollow internally threaded member, an orifice in said hollow internally threaded member communicating with the inside of said hollow breathing device, laterally spaced openings in the sides of said breathing device, and a hollow cylindrical member slidably supported on said breathing device for adjusting the effective size of said openings therein.

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