May 27, 1952 E. GAGNAN ET AL 2,598,248

COMPRESSED GAS CONTAINER WITH REDUCING VALVE AND AUXILIARY OPENING MEANS THEREFOR

Filed Dec. 11, 1946

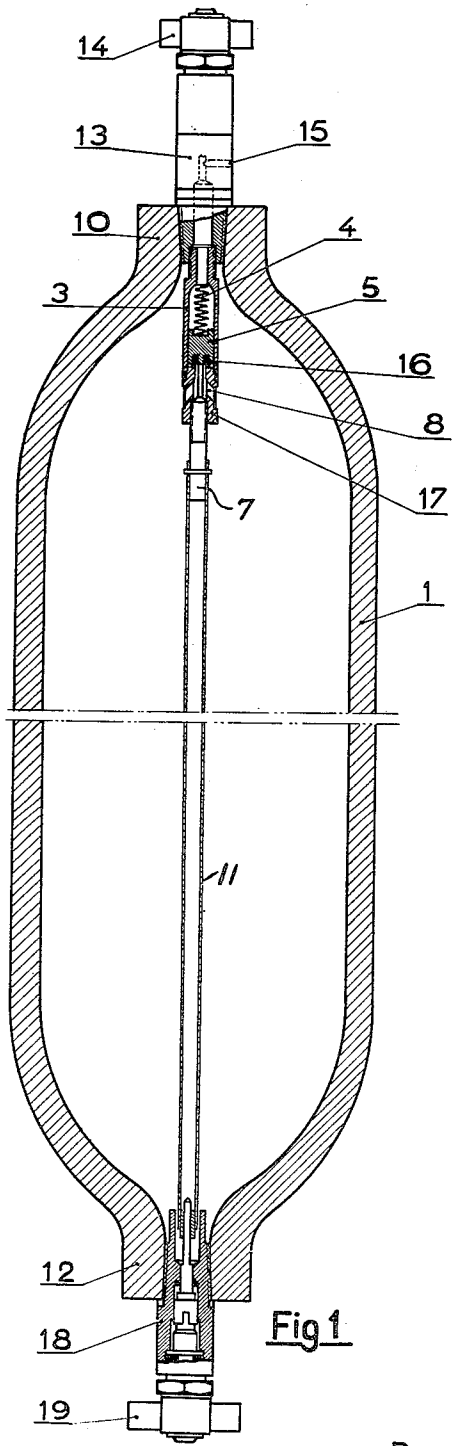


Fig 1

Fig 2

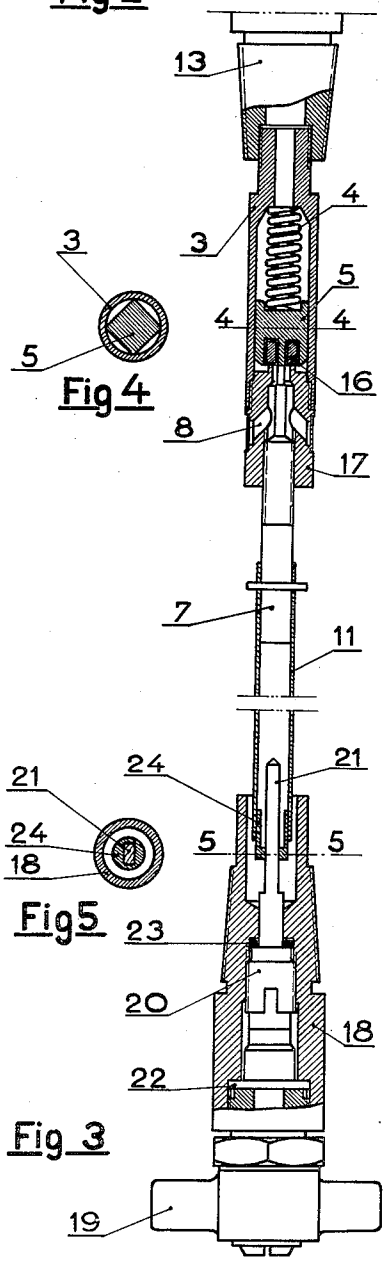


Fig 4

Fig 5

Fig 3

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Patented May 27, 1952

2,598,248

UNITED STATES PATENT OFFICE

2,598,248

COMPRESSED GAS CONTAINER WITH REDUCING VALVE AND AUXILIARY OPENING MEANS THEREFOR

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Application December 11, 1946, Serial No. 715,434
In France December 15, 1945

3 Claims. (Cl. 222—3)

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When utilizing compressed gas containers, for example for supplying respiratory appliances with air or oxygen, a reserve device has often been provided, consisting of a separate container which is put in operation when the air or other breathable gas is exhausted in the main containers. Such a device is especially useful in diving appliances, in which a substantial time is often necessary for the diver again to rise to the surface after a more or less prolonged stay at a substantial depth, so that a more or less important gas reserve must be available to him.

According to this invention, a reserve system is obtained without an auxiliary container being necessary. For this purpose the compressed gas container or containers supply the utilization appliances through a valve which is adjusted for opening only for a predetermined value of the gas pressure and allows the gas to pass so long as the pressure inside the container or containers is above this value, and automatically stops the supply when the pressure still obtaining in the containers becomes equal to the adjusted one. It is under that remaining pressure that the gas reserve is formed. In order to utilize it, the action of the valve is removed by hand operating a suitable device which may be a valve-lifting device, so that the gas remaining in the container may be supplied again.

A method of designing such a device consists in utilizing as a compressed gas container a two-neck cylinder. One neck bears the cock through which the gas flows towards the utilization apparatus, the valve being placed, inside the container, at the inlet of this cock. On the other neck there is provided a hand-operated controlling member, which may cause the valve no longer to work, this member acting on the valve through the medium of a system of rods or any other transmission system which is located inside the body of the container and, when operated, provokes the lifting of the valve.

A form of embodiment of the reserve device according to the invention is represented by way of example in the accompanying drawing, in which:

Fig. 1 is a view, partly in longitudinal section and partly in elevation, of a container provided with a reserve device according to the invention, the central portion of the container being not shown;

Fig. 2 is a longitudinal section, on a scale larger than that of Fig. 1, of a portion of the reserve device;

Fig. 3 is a view, partly in longitudinal section and partly in elevation, and on the same scale as that of Fig. 2, of another portion of the reserve device;

Fig. 4 is a cross section, taken along line 4—4, of the device shown in Fig. 2;

Fig. 5 is a cross section, taken along line 5—5, of the device shown in Fig. 3.

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The container 1, which is of substantially cylindrical shape, is provided at its two ends with necks 10 and 12 respectively. Into the neck 10 is screwed a cock 13 which bears a hand wheel 14 and is provided with a gas outlet 15. On the end of the body of the cock is secured a valve casing 3, the seat of which 17 presents apertures 8 through which flows the gas from the container. The valve casing encloses a spring of adjusted strength, which presses against a valve member 5 of square section, inside which is inserted a valve gasket 16, which the pressure of the spring tends to press against the seat 17.

A cock body 18, into which a shaft 20 may be screwed through the medium of a handwheel 19, is screwed into the other neck 12 of the cylinder, two gaskets 22 and 23 providing for the tightness of the device. The shaft 20 ends in a flattened portion 21 which slides inside a housing 24 of coresponding elongated shape provided at an end of a tube 11 extending along the axis of the cylinder. The other end of the tube bears a push-rod 7 which is screwed into the seat 17.

The operation of the device is as follows:

The push-rod is initially disposed in its lowermost position. So long as the pressure of the gas within the cylinder is higher than that for which the spring has been adjusted it pushes the valve gasket away from its seat and the gas is flowing past the valve. This flow stops when the pressure of the gas inside the cylinder falls down to the perssure for which the spring has been adjusted. The gas which at that time remains in the cylinder forms a reserve which is only available through a further operation. The latter consists in turning the handwheel 19 in the suitable direction. This rotation, which acts on the intermediate motion-transmitting gear, provokes the lengthwise motion of the push-rod, which lifts the valve-member from its seat, thus allowing the gas of the cylinder to flow again.

We claim:

1. A gas dispensing device comprising a pressure resisting gas cylinder provided with two opposite neck-like ends, a cock inserted into one of said ends and controlling the flow of the gas from the cylinder through said end, a valve placed

inside the cylinder adjacent said cock and having an orifice through which the gas passes on its way from inside the cylinder to said cock, a movable element adapted to close said orifice on the side which tends to open by the pressure of the gas inside said cylinder, resilient means adapted to resist said opening with a predetermined force, a gas-tight closure for the other of said ends of the cylinder, a movable member passing through said closure and adapted to be operated from outside the cylinder, and a motion-transmitting device located inside the cylinder between said movable member and the movable element of the valve and adapted to act on said element in the opening direction of the same.

2. A gas dispensing device comprising a pressure resisting gas cylinder provided with two opposite neck-like ends, a cock inserted into one of said ends and controlling the flow of the gas from the cylinder through said end, a valve casing connected to the inlet of said cock and having an orifice through which the gas passes on its way from inside the cylinder to said cock, a movable element in said valve casing adapted to close said orifice on the side which tends to open by the pressure of the gas inside said cylinder, a spring adapted to urge said movable element to resist said opening with a predetermined force, a rotatable push-rod screwed into the valve casing and adapted to act upon the movable element in the opening direction, a gas-tight closure for the other of said ends of the cylinder, a rotatable shaft passing through said closure bearing a rotating means outside the cylinder and ending inside the cylinder in a flattened portion, and a tube extending through the cylinder, said tube being at one of its ends, rigidly coupled with the push-rod and ending, at its other end, in a portion of elongated inside section in which may slide said flattened portion of the rotatable shaft.

3. A gas dispensing device comprising a pressure resisting gas cylinder provided with two opposite neck-like ends, a cock inserted into one of said ends and controlling the flow of the gas from the cylinder through said end, a valve casing connected to the inlet of said cock and having an orifice through which the gas passes on its way from inside the cylinder to said cock; a movable element in said valve casing adapted to close said orifice on the side which tends to open by the pressure of the gas in the cylinder, a spring adapted to urge said movable element to resist said opening with a predetermined force, a rotatable push-rod screwed into the valve casing and adapted to act upon the movable element in the opening direction, a gas-tight closure for the other of said ends of the cylinder, a rotatable shaft screwed in said closure and ending inside the cylinder in a flattened portion, a hand member outside the closure rotatively coupled with said rotatable shaft, and a tube extending through the cylinder, said tube being, at one of its ends rigidly coupled with the push-rod and ending, at its other end, in a portion of elongated inside section in which may slide said flattened portion of the rotatable shaft.

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