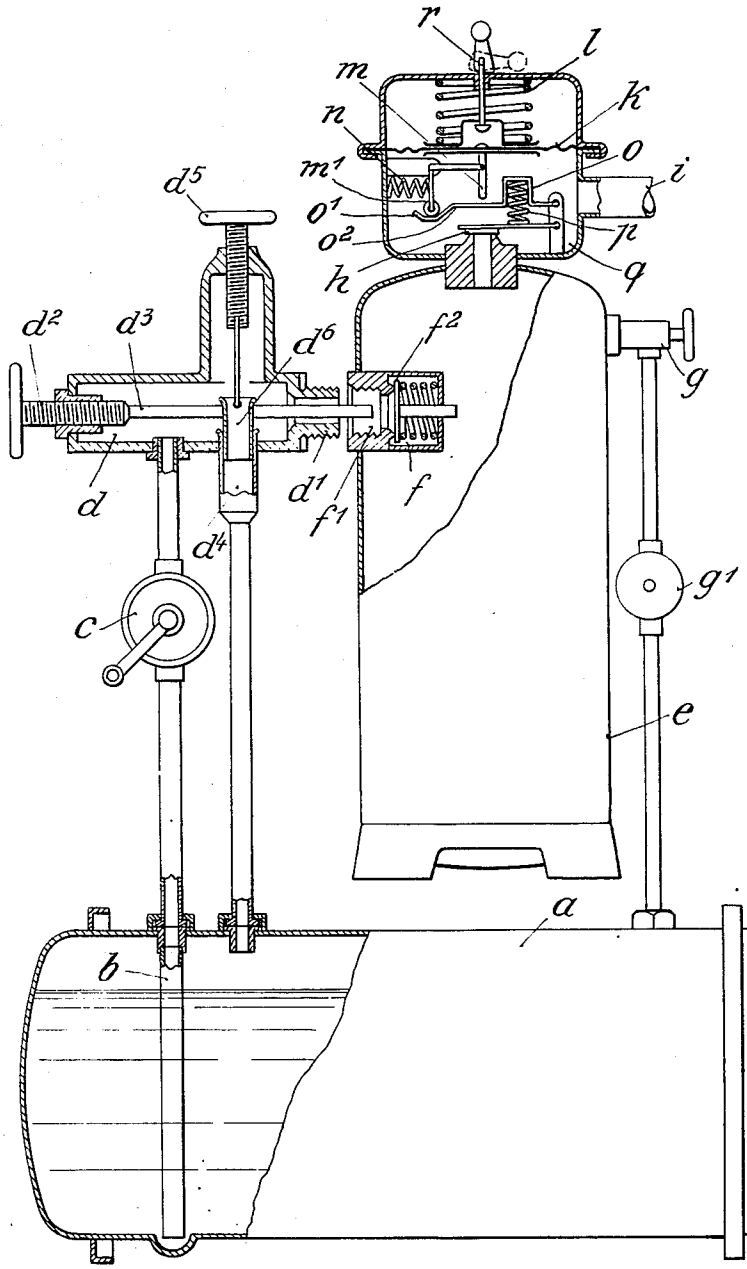
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RECEPTACLE FOR LIQUEFIED GASES

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RECEPTACLE FOR LIQUEFIED GASES

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This invention relates to improvements in pressure regulators for receptacles for hydrocarbons liquefied under pressure.

Hydrocarbons liquefied under pressure, for example, propane, butane or mixtures thereof constitute a suitable source of fuel for gas consumers in the household and industry, for heating and power plants and also for internal combustion engines.

These gases are non-poisonous, they have a considerable heat value, and they burn without leaving any residue.

Propane remains in liquid condition under a pressure of 6–8 atmospheres and can therefore be filled into light steel bottles or receptacles which are set up at the point of use.

According to the invention the receptacle is fitted with an improved regulating valve for the relief and discharge of the gas. The said valve is mounted on the receptacle which can thus be connected to the consuming appliance, for example by means of a rubber tube or a metallic tube.

The high pressure side of the receptacle is cut off from the connection to the consuming appliance, so that the receptacle can be operated without danger by the housewife.

The invention is illustrated in the figure of the accompanying drawing.

Referring to the drawing, a denotes a storage container for liquefied gas, with the suction pipe b, the filling pump c and the filling device d for filling the receptacle e by way of the inlet valve fitting f, said fitting presenting a seat for the non-return valve f_2. The filling device d is provided with a screw-threaded spigot connection d_1 screwed into the threaded socket member f_1. By turning the screw d_2 manually the pin d_3 opens the non-return valve f_2 and unmasks the filling aperture. The liquid supplied by the pump c to the receptacle can only rise to the predetermined level and then runs back by way of the overflow pipe d_4 into the storage container a. The filling device d also carries a screw d_5 associated with a tube d_6 which projects into the overflow pipe d_4, so that the overflow level can be adjusted by hand, and thus the filling operation can be effected in accordance with the quantity of the liquid to be admitted to the receptacle, with different sizes of receptacles or different temperatures. During the filling operation the overflow pipe d_4 serves for balancing the vapour pressure between the receptacle e and the storage container a. Naturally, the overflow for the return of the liquid need not be disposed in the filling device but may be located at any point on the periphery of the receptacle e. There may be provided on the receptacle a vapour outlet g above the pre-set or overflow lever, in order in special cases to lead away the excess pressure set up during the filling operation, or by the provision of a vapour suction device (compressor) g_1 a sub-atmospheric pressure may be set up in the receptacle e. In the last mentioned arrangement the liquid is drawn from the storage container, without the aid of the pump c, into the receptacle. The storage container a may be arranged above the bottles to be filled, and the filling operation may be effected from the storage container by gravity by way of the filling device d, the pump c being dispensed with.

Applied to the receptacle e is a regulating valve h for the purpose of bringing the highly compressed vapour in the receptacle e to the desired pressure for use and leading the vapour through the discharge pipe i to the consumer. The pipe i is fitted to the chamber q arranged as a protecting cap for the valve h. Also, the valve h can be used for direct discharge of vapour for diminishing the pressure in the filling of the receptacle.

The regulating valve h is closed by the spring l acting on the diaphragm k which carries a pin m connected to a lever including an arm m_1 movement of which under the action of the spring l is opposed by a spring n. The arm m_1 is engageable with cam parts o_1, o_2 on a resilient lever o acting on the valve h through a valve-holding spring p. Closure takes place when the discharge pipe i is opened or the pressure for consumption has fallen considerably. The pin m serves also to close the regulating valve h on sudden emptying of the pressure regulator chamber q. With the discharge closed or only slightly open for use, the pressure lifts the diaphragm k, partly overcoming the spring l; the lever arm m_1 thus assumes the mean position indicated and the valve h remains open. On rise of the pressure in the chamber q the lever arm m_1 is pressed against the cam part o_2 of the lever o whereby the spring p is stressed, so that it loads the valve h and controls the consumption pressure.

According to the invention it is possible to bring about closure of the valve h manually by means of the cam lever r in that, by rocking over r, the spring l is compressed and its action on the diaphragm k suspended, so that the spring n effects the closure of the valve. By adoption of this means of closing, the regulating valve can neither be influenced nor damaged by unauthor-

ized release of a special closing screw or the like.

According to the invention the cross-section of the passage controlled by the valve *h* and the load of the spring *p* on said valve are such that on rise of the receptacle pressure, for example, to 30 atmospheres, the vapour pressure in the receptacle overcomes the spring *p* and opens the valve, so that the excess pressure can escape by way of the discharge pipe *i* or a separate safety valve.

I claim:—

1. A pressure regulator for receptacles for hydrocarbons liquefied under pressure, comprising, in combination with a chamber mounted on the receptacle, a diaphragm dividing said chamber into two compartments, one of said compartments having communication with the receptacle and provided with a discharge connection, said diaphragm being exposed on one side to the vapour pressure in said last-named compartment, a spring acting on the other side of said diaphragm in opposition to the pressure in said last-named compartment, a valve controlling communication between the receptacle and said last mentioned compartment, a valve-closing spring, a cam lever for imparting movements to said valve through said spring, and a lever system interposed between said diaphragm and said cam lever for transmitting movements of said diaphragm to said valve proper.

2. A pressure regulator as claimed in claim 1 in which the diaphragm is connected with a pin engageable with the cam lever to effect closure of the valve on abrupt movement of the diaphragm under spring load occasioned by the sudden emptying of the chamber.

3. A pressure regulator as claimed in claim 1 in which the valve is carried by a lever between which and the cam-lever is interposed the valve-closing spring.

4. A pressure regulator as claimed in claim 1 including a spring acting on a lever of the lever system to oppose the movement of said lever under the action of the spring load on the diaphragm.

5. A pressure regulator as claimed in claim 1 including a manually operable device for disabling the spring which acts on the diaphragm.

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