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RECEPTACLES OF LIGHT METAL FOR LIQUEFIED GAS, PARTICULARLY ADAPTED FOR RECHARGING LIQUEFIED GAS LIGHTERS

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Fig.1

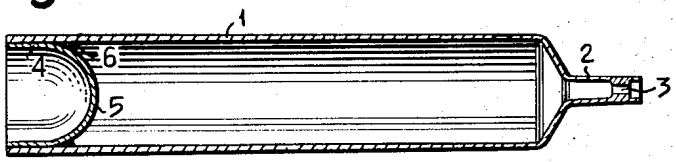


Fig.2

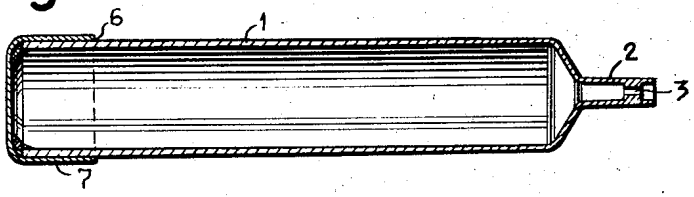


Fig.3

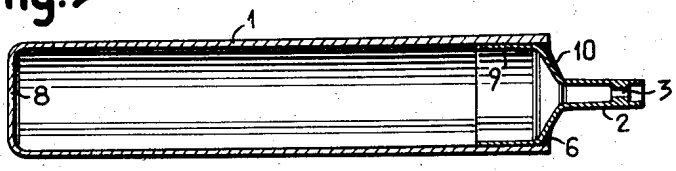
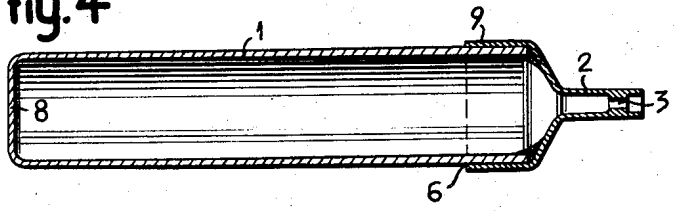


Fig.4



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RECEPTACLES OF LIGHT METAL FOR LIQUEFIED GAS, PARTICULARLY ADAPTED FOR RECHARGING LIQUEFIED GAS LIGHTERS

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2 Claims. (Cl. 220—3)

Various types of metallic receptacles for liquefied gas, particularly adapted for recharging liquefied gas lighters, are known.

Known receptacles are obtained by successive stampings and compression of one of their ends in such a manner as to form a part adapted to receive the closure and connecting device. Another known type of receptacle is formed by two stamped shells soldered one to the other, to which is also soldered a part receiving the closure and connecting device. These receptacles are very expensive as their manufacture is relatively complicated.

Other receptacles, of simpler construction, are formed by a cylinder of a light alloy, obtained by impact spinning and closed by a part adapted to receive a closure device, said part being connected to the first by crimping and the fluid-tightness being obtained by means of a flexible joint.

When receptacles of said latter type are being filled with liquefied gas, care must be taken not to effect the filling to too great an extent, so as always to leave a predetermined volume of non-liquefied gas in the interior of the receptacle. Without this precaution the static pressure in the interior of the receptacle may reach considerable values, for example as a result of an increase in temperature, which pressure may disengage the said part. Said latter is then violently expelled by the expansion of gas contained in the receptacle, which thus constitutes a source of danger. Further, it is known that it is exceedingly difficult to connect together hermetically by soldering, two thin walls of light metal.

The invention has for its object to permit of the construction of a simple receptacle, at little expense, which does not have the above-mentioned danger. It has for its subject a receptacle of light metal for liquefied gas, particularly adapted for recharging liquefied gas lighters. Said receptacle is characterised in that there is formed a substantially cylindrical part having an open end, by imparting to the wall of this part a thickness which is greater near the open end than at the opposite end, whilst this open end is closed by means of a second part, said two parts fitting at least partly one into the other, and that they are connected together by means of an organic material forming a joint, said material being so placed as to be urged mainly only by shearing.

In the above connection, the invention has for its further object an article of manufacture in the form of a safe, strong, light, disposable, inexpensive tubular receptacle which may be made economically by cold impact extruded metal procedures and wherein the wall portion of greater thickness telescopically receives a cap or plug secured by a polymerized resinous seal while the thinner portion of the wall is frangible under internal pressure lower than the pressure tending to apply rupturing shearing force on the seal which would tend to disconnect the cap or plug from the receptacle with the force of an unrestrained and unguided projectile.

Four forms of construction of the subject of the invention are shown, by way of example, in the accompanying drawings, wherein:

Figs. 1 to 4 of the drawing are longitudinal sections of four receptacles according to these forms of construction.

The receptacle shown in Fig. 1 comprises a part 1 of aluminium, in the form of a tube. Said part is obtained by impact extrusion in the cold and is closed at one of its ends by a nozzle member 2, having an orifice 3 for filling and for the outflow of liquefied gas contained in the receptacle. Said member 2 is provided so as to allow of the connection of the receptacle to a valve of the lighter to be filled. The open end of the tube 1 is closed by a part comprising a cylindrical wall 4, secured to a bottom 5, which is arched towards the outside relatively to said wall. The arched bottom 5 is first introduced into the open end of the part 1 and the plug thus formed is connected to the said part 1 by means of a polymerised synthetic resin 6, for example epoxy resin of the eth-oxyline class. After fitting the plug 4, 5, the tube is placed into a stove for ensuring the polymerization of the resin 6. This forms a joint which is positioned in such a manner as urged principally only by shearing action. For this purpose, the wall of the tube 1 is made of greater thickness near the open end than at the opposite end, that is to say near the connecting member 2. This variation of the thickness of the wall is of the order of 10 to 20% and is obtained by imparting a determined shape to the die used for the production of the tube. In this manner, when the tube is subjected to an exaggerated internal pressure, its wall is deformed near the end carrying the member 2 and, when this pressure is sufficient, the wall splits at this point, whereby the gas is allowed to escape. Meanwhile, by reason of its greater thickness, the wall has practically not been subjected to any deformation in the vicinity of the plug 4, 5, so that the resistance of the connection between the said plug and the wall of the tube has not decreased. It is known in fact that synthetic resins of the type referred to have a high resistance to shearing forces, but a much lower resistance to tension forces. The variation of the thickness of the wall of the tube 1 thus permits of avoiding an expansion of the latter under the action of the pressure of the liquefied gas, and consequently preventing traction forces from being generated between the plug 4, 5 and the wall of the tube 1. Further, it will be understood that the thickness of the wall of the tube, at the point at which it is thinner, should be sufficiently weak so as to creak under the action of a pressure which is insufficient to apply shearing forces on the binding material 6 which are greater than those which it can resist.

It will be understood that in the form of construction according to Fig. 1, the plug 4, 5 may be introduced in the opposite direction, in such a manner that the arched bottom 5 is located as near as possible to the open end of the tube 1. The capacity of the tube is thus increased by a volume corresponding substantially with that of the plug 4, 5.

Fig. 2 shows a first modification according to which the open end of the tube 1 is closed by a plug 7 comprising a cylindrical part surrounding the end of the tube. The thickness of the wall of the latter also increases in approaching the end closed by the plug 7. Also in this case the joint 6 is not subjected to shearing forces between the plug 9 and the walls of the tube 1.

In the modifications shown in Figs. 3 and 4, the part in the form of a tube 1 has a bottom in one piece 8. The thickness of the wall of said tube increases as it approaches its open end which is closed by a part having an outflow orifice 3, provided in a member 2. In Fig. 3 said part comprises a cylindrical part 9, attached to the member 2 by a conical wall 10. The cylindrical wall 9

is fitted into the open end of the tube 1 sufficiently in the interior of the latter so that the outer edge of the conical wall is located in the interior of said tube and that the material 6, forming the joint, is comprised between the inner face of the tube, on the one hand, and the outer face of the cylindrical wall 9 and at least a portion of the conical wall 10, on the other hand.

The form of construction shown in Fig. 4 only differs from that shown in Fig. 3 by the fact that the cylindrical wall 9 surrounds the end of the tube instead of being fitted into this.

It will be understood that the part in the form of a tube may have a polygonal, particularly rectangular, cross-section.

The material used for binding together the two parts of the receptacle may be of an organic material different from resins of the ethoxyline class, for example a gum with a cellulose base.

I claim:

1. As an article of manufacture, a capsule for containing liquefied gas or the like which generates substantial pressures in passing from the liquid to the gaseous phase, comprising a cylindrical body of cold impact extruded metal, said body having a substantially uniform bore and having walls tapering from one end to the other, thereby providing a relatively thin wall at one end, said thin wall portion of said body being formed with a reduced neck portion, said neck being sealed closed by a manually puncturable disc, the other relatively thicker wall end of said body being closed by an annular plug having an arcuate bottom and an integrally formed annular upstanding flange, said plug being smaller than the bore of the said body and being mounted in the bore with the peripheral rim of the said flange flush with the peripheral rim of the relatively thicker end of the said body wall and the convex side of the bottom facing the neck portion of the capsule in the provision of an annular recess, and a polymerized synthetic plastic sealing composition between the outer annular surface of the said flange and the said annular recess at the base of the said arcuate bottom wall and the contiguous portion of the interior wall of the bore of the body, said sealing compound when aged serving to provide a seal of greater strength and resistance to fracture than the thin wall at the opposite end of the body, whereby excessive pressures developed in the container will fracture the said thin portion of the wall to thereby relieve said pressures without disturbing said plug in its sealed mounting.

2. As an article of manufacture, a strong, light, disposable, inexpensive tubular receptacle for recharging lighters with a liquefied gas which generates substantial pressures in passing from the liquid to the gaseous phase, said receptacle being adapted to be shelf-stocked and

safely carried on the person of a user to hold and dispense said liquefied gases; comprising a cylindrical body of cold impact extruded metal, said body having a substantially uniform bore and having walls tapering in thickness from one end to the other, thereby providing a relatively thin wall at one end, a closure member on the relatively thick wall end of the body, said closure member having a wall portion and also having an annular flange angularly extending from said closure wall portion, said annular flange being in telescopic engagement with the said relatively thick end of the body and coacting with said angularly connected closure wall and a contiguous portion of said body at said relatively thicker end of said body wall in the provision of an annular fillet, and a polymerized resinous sealing composition between the respective contiguous surfaces of the walls of the said body and the said annular flange of said closure wall and within said annular fillet, said sealing composition when aged in closure sealing position serving to provide a closure seal of greater strength and resistance to fracture than the relatively thin wall end of the body at the opposite end thereof from said closure, whereby excessive pressures developed in the receptacle will fracture the said thin wall end, to thereby relieve said pressures without disturbing said closure with its sealed mounting.

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