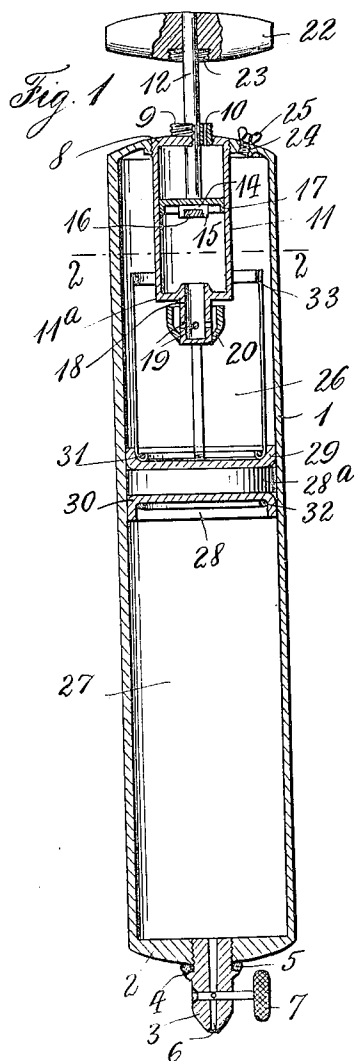
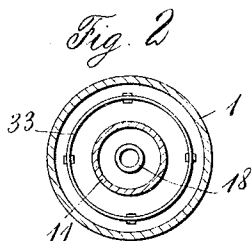


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CARBON TETRACHLORID PACKAGE.
APPLICATION FILED SEPT. 18, 1913.

Patented Aug. 4, 1914.

1,106,144.



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WILLIAM L. HARRISON, OF BRANFORD, CONNECTICUT.

CARBON-TETRACHLORID PACKAGE.

1,106,144.

Specification of Letters Patent.

Patented Aug. 4, 1914.

Application filed September 18, 1913. Serial No. 790,485.

To all whom it may concern:

Be it known that I, WILLIAM L. HARRISON, a citizen of the United States, and a resident of Branford, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Carbon-Tetrachlorid Packages, of which the following is a specification.

Carbon tetrachlorid is a liquid used extensively for various purposes, particularly for cleaning and as a fire-extinguishing substance. Considerable difficulty has been experienced hitherto in connection with receptacles (such as fire-extinguishers) containing carbon tetrachlorid. It was found frequently, and indeed, almost invariably, that after standing for a few months, the metal of the receptacle, and the leather packing generally used in apparatus of this character, showed evidences of corrosion or other deterioration to a serious extent, sufficient to impair if not to defeat entirely, the efficient operation of the apparatus. From investigations made at my instigation, it appears that the difficulties experienced in the past were due largely, and perhaps exclusively, to the presence of moisture, the carbon tetrachlorid combining with this moisture (water) and thus forming hydrochloric acid; the corrosive properties of which would readily account for the destructive results observed in practice. According to my present invention, I have succeeded in overcoming the drawbacks prevailing heretofore, by providing a hygroscopic agent, viz.: glycerin, in places where moisture might otherwise have access to the carbon tetrachlorid, such glycerin absorbing any moisture present and thus preventing the formation of any hydrochloric acid which might result from the action of carbon tetrachlorid on such moisture. In cases where the apparatus embodies packings and movable parts, the use of glycerin is valuable for two additional reasons, viz.: First, glycerin thoroughly fills the pores of the leather or other material employed for packing purposes, and thus seals the joint tightly. Second, the viscous character of glycerin gives it excellent lubricating properties, and this is of especial advantage when the carbon tetrachlorid is expelled from the receptacle by means of a piston-like member or follower provided with suitable washers or packings. The oil or like material used heretofore for lubricating

such packings, has been found to be objectionable on account of a disintegrating or corroding action which is observed after some time, both in the packing itself and in the metal of which the receptacle is made. As stated above, this detrimental action is probably due chiefly to the formation of hydrochloric acid from carbon tetrachlorid and the moisture present; such moisture is found sometimes as an impurity admixed to carbon tetrachlorid, sometimes in the lubricant (oil), in the packing material (leather), in the ambient air, and particularly in the compressed air which is employed for operating the follower which expels the carbon tetrachlorid, or for expelling such carbon tetrachlorid without the use of a follower. It is quite possible that some of the detrimental effects observed hitherto when other agents were employed instead of glycerin, were due to the absorption of such lubricating agents by the carbon tetrachlorid, whereby the packing became dry, or to the corroding action which the oil or grease, or substances formed therefrom by the action of the air, exerted on the brass or copper of which the receptacle is generally made. The use of glycerin (and particularly chemically pure glycerin, free from acid) overcomes all these defects, since glycerin is not only hygroscopic, but inert as regards air and the material (copper or brass) of the receptacles and also with respect to carbon tetrachlorid, has no injurious action on leather or other packing material, but acts as an efficient lubricant at all ordinary temperatures.

My present invention is applicable to apparatus of various kinds, it being understood that the structural features of the apparatus form no part of my present invention, which consists exclusively in using glycerin or equivalent agents in the relation set forth. Thus the invention may be applied to apparatus of the construction shown in Letters Patent of the United States No. 1,067,811 issued to me on July 22nd 1913, by applying glycerin to the washers of the follower F and also if desired to the washer interposed between the cock E and the outlet D. Or my present invention may be applied to the apparatus shown in Letters Patent of the United States No. 1,027,133, granted to Ernest M. Lawrence on May 21st 1912, by simply using glycerin instead of the oil or grease

with which Lawrence intended to impregnate the packings or washers of the piston or follower which separates the air-chamber of his apparatus from the compartment containing the fire-extinguishing compound (carbon tetrachlorid). Of course, the leather or other packing material should be in a proper condition (clean, and with open pores) to receive the glycerin.

I desire it to be distinctly understood that in referring to the particular apparatus disclosed in the two patents mentioned above, I simply intended to give examples of constructions to which my invention may be applied, without any intention to restrict myself to apparatus of this particular type or construction.

To show an example of an apparatus to which my invention may be applied, I have reproduced in the accompanying drawings, Figures 1 and 2 of the Lawrence patent mentioned above, Fig. 1 being a vertical section of the apparatus, and Fig. 2 a horizontal section on line 2-2 of Fig. 1. Briefly described, this apparatus comprises a casing 1 with a lower head 2 screw-threaded to receive the outlet nozzle 3 provided with a collar 4 to press a washer 5 against the head 2. The cock or nozzle 3 has a discharge channel 6 controlled by a rotary plug or valve 7. The upper head 8 has an externally screw-threaded boss 9 provided with a longitudinal channel 10 leading from the surrounding air to the inside of a pump cylinder 11, said boss being perforated centrally to guide the stem 12 of the piston 14. The piston head 15 is recessed in its lower face to receive a washer 16, while an inverted cupped packing member 17 is secured to the upper face of the piston head. The lower end 11^a of the cylinder 11 has a hollow cylindrical extension 18 projecting up into the cylinder (to engage the washer 16 at certain times) and also projecting downwardly from said cylinder. This lower portion of the extension 18 has ports 19 encircled by a tubular member 20 made of rubber or other yielding material. The stem 12 has a handle 22 recessed and threaded at 23 to receive the boss 9. At 24 there is indicated an escape port and filling port, normally closed by a screw-plug 25. A floating member or piston (follower) 28, with cup-shaped packing members 29, 30, held by rings 31, 32, divides the casing 1 into a compressed-air chamber 26 and a storage chamber 27 for the fire-extinguishing fluid. A guard 33 may be connected with the follower 28 to keep it from striking the lower end of the cylinder 11.

Instead of treating the piston packing with glycerin before placing the packing in the apparatus, the glycerin may be applied to the inner wall of the container, and the piston packing will take up a sufficient

amount of glycerin as the follower moves in the container or receptacle.

The lubricating properties of glycerin are of course highly valuable when this substance is used in conjunction with a movable part, as just set forth. Glycerin however also has the advantage of thoroughly filling the pores of the packing and thus securing a tight joint. This property, obviously, will be equally valuable in the case of a movable packing, just referred to above, and in that of a stationary packing employed, say, to secure a tight joint between two normally fixed parts of the container. Thus, if the washer 5 of the Lawrence patent mentioned above, is made of leather, it will be advantageous to treat this washer with glycerin so as to insure a tight joint at this place. Similarly, as suggested above, glycerin might be used to impregnate the washer shown in my aforesaid patent between the cock E and the outlet D.

So far as glycerin is relied upon to absorb any moisture present within the apparatus and to thus prevent such moisture from combining with carbon tetrachlorid and forming the corrosive hydrochloric acid, the hygroscopic quality of glycerin obviously will be equally valuable whether the glycerin be applied to a packing, or in some other manner placed within the container so as to absorb moisture and prevent the formation of hydrochloric acid. This is of particular importance in apparatus having no piston or follower of the character shown in the aforesaid two patents. If we assume that the piston or follower shown in said two patents (together with the parts secured to such follower) is omitted, the resulting apparatus will still be operative under most conditions, the compressed air and the charge of carbon tetrachlorid being no longer separated by a follower, but contained in a single chamber of the container. Even with a one-chamber apparatus of this character, it will be advisable, according to my invention, to provide a certain amount of glycerin within the apparatus, either by applying such glycerin to the inner wall of the container, preferably at the upper portion thereof (that is, in the air-space), or, and this is probably the better way, by spreading a film of glycerin on top of the carbon tetrachlorid surface, so that a thin layer of glycerin will intervene between the compressed air and the carbon tetrachlorid. Glycerin being lighter than carbon tetrachlorid, will always float on top of the carbon tetrachlorid. It will thus be seen that whether the apparatus be constructed as a one-chamber container or as a two-chamber container, the compressed air at one end of the apparatus will not be in direct contact with the carbon tetrachlorid at the other end of the container, but a barrier of gly-

cerin will be interposed between such air and such carbon tetrachlorid.

While the arrangement of the glycerin to form an actual barrier between the air and the carbon tetrachlorid is not absolutely essential to the success of my invention, I believe that this is the arrangement which will secure the best results. The use of pure glycerin is advisable for the reason that ordinary commercial glycerin often contains acids in sufficient quantity to exert a corroding action on copper or brass.

When the glycerin is applied to leather or other absorbent packing material, such packings may be simply coated, or thoroughly impregnated with glycerin. Glycerin is readily absorbed by leather and the like, retains its proper viscosity at all ordinary temperatures, and is absolutely unaffected by carbon tetrachlorid. Glycerin will not, when in contact with air or with carbon tetrachlorid, form products which injuriously affect the copper or brass of which the container is ordinarily made, even if the apparatus should stand unused for a considerable length of time. Glycerin will not evaporate to any appreciable extent. Its hygroscopic properties are extremely valuable in the present case, inasmuch as they will prevent the moisture present (either in the air, or in the leather or other packing material, or as an impurity admixed to carbon tetrachlorid), from combining with carbon tetrachlorid and thus forming hydrochloric acid, the detrimental action of which has been referred to hereinabove. When the washers are impregnated with oil or grease, as has been the practice hitherto, a corroding action is observed on the metal of the container, and the packing material employed for the washers becomes dry and rotten, often falling to pieces, particularly if the apparatus is not used for a considerable length of time, as is the case with a fire-extinguisher. These detrimental effects are due chiefly, as I have stated above, to the formation of hydrochloric acid, but there may also occur a chemical change (oxidation) in the oil or grease used hitherto for the packing, under the influence of the air, leading to the formation of compounds such as stearic or oleic acid which have a corroding action on the metal of which the container is made. Possibly also, when the packing was treated with oil or grease, the carbon tetrachlorid did dissolve or absorb such oil or grease from the packing, causing the latter to become dry, so that it would fail to preserve a

tight yet easy fit on the walls of the container. Whatever may have been the reason or reasons for the objectionable results observed when oil or grease was employed, the use of glycerin according to my invention avoids these drawbacks.

It will be understood that the use of glycerin will present the advantages set forth above, whether the liquid contained in the receptacle be commercial carbon tetrachlorid, or a mixture containing carbon tetrachlorid; similar advantages will also result from the employment of glycerin when other chlorin compounds are stored instead of carbon tetrachlorid, for instance tetrachlorethane. I therefore desire it to be understood that the appended claims cover such substances as equivalents of carbon tetrachlorid.

I claim as my invention:

1. A carbon tetrachlorid package comprising a container, a charge of carbon tetrachlorid therein, another charge of compressed air in said container, and glycerin, to prevent the formation of hydrochloric acid and other detrimental effects.

2. A carbon tetrachlorid package comprising a container, a charge of carbon tetrachlorid therein, another charge of compressed gaseous medium in said container, and a glycerin-holding packing at a portion of the container adapted to be reached by the carbon tetrachlorid.

3. A carbon tetrachlorid package comprising a container, a charge of carbon tetrachlorid therein, and glycerin to prevent detrimental effects.

4. A carbon tetrachlorid package comprising a container, a charge of air in said container, another charge of carbon tetrachlorid in the container, and a glycerin barrier between said air and said carbon tetrachlorid.

5. A carbon tetrachlorid package comprising a container, a charge of carbon tetrachlorid therein, another charge of compressed gaseous medium in said container, a follower movable in the container and separating the carbon tetrachlorid from the compressed gaseous medium, and packing, holding glycerin, applied to said follower.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILLIAM L. HARRISON.

Witnesses:

LILLIAN N. POSNER,
EDITH M. NICHOLSON.