

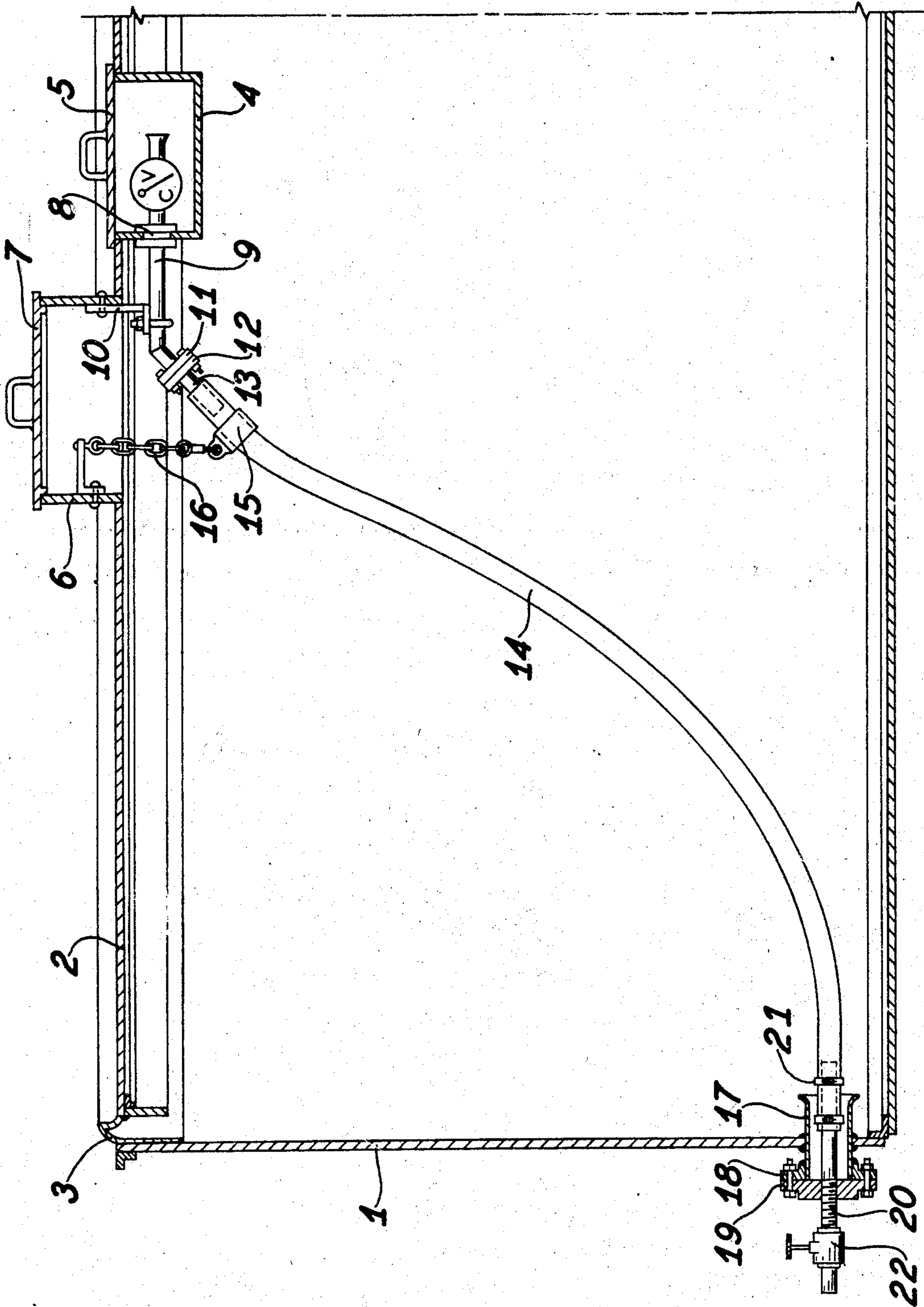
March 30, 1943.

H. M. STEVENSON

2,315,023

WATER DRAIN FOR FLOATING ROOF TANKS

Filed June 10, 1939



INVENTOR  
BY *Hugh M. Stevenson*  
*G. L. Young* ATTORNEY.



## UNITED STATES PATENT OFFICE

2,315,023

WATER DRAIN FOR FLOATING ROOF  
TANKSHugh M. Stevenson, Houston, Tex., assignor to  
Standard Oil Development Company, a corpo-  
ration of Delaware

Application June 10, 1939, Serial No. 278,442

## 1 Claim. (Cl. 220—26)

The present invention is directed to an improvement in floating roof tanks and has a particular reference to means for preventing the accumulation of water on the roofs of such tanks.

Various types of roof tanks are known in the art. In general, the floating roof has a sliding fit with the inner walls of the tank which is achieved by a ring of packing material around the circumference of the roof. Necessarily, this fit cannot be too tight, because it must permit free movement of the roof. For this reason, the prevention of leakage of water into the tank has always presented a problem.

It has been the practise to provide a sump on the floating roof for the collection of water and a conduit from this sump to a point outside the tank for the drainage of the collected water. Because the roof is movable the drainage pipe must necessarily be one which can be moved with the roof. It has been the practice, therefore, to use a metal drainage pipe composed of joints swingingly connected to each other and arranged inside the tank having one of its ends connected to the sump and the other connected to an outlet at the bottom of the tank. The joints in this drainage pipe have always been a source of trouble since they are inclined to leak and as soon as a leak develops it is necessary for workmen to enter the tank and repair it. Because of safety requirements, workmen cannot enter a tank until it has been wholly freed of toxic vapors and gases. The cleaning of a tank in this manner involves an expenditure of several hundred dollars and when this procedure has to be repeated several times a year, its cost becomes prohibitive.

The principal object of the present invention is the provision of a drainage pipe for a floating roof which will eliminate the difficulties attending drainage pipes of known types and which will also make possible a new method of replacement in which workmen need not enter the tank.

Specifically, the present invention resides in the provision of a flexible drainage pipe resistant to oil which is so connected to the sump at one end and to the bottom of the tank at the other that it can be removed and replaced from the outside.

The present invention will be better understood from the following detailed description of the accompanying drawing in which the single figure is a vertical section through a floating roof tank, only part of which is shown, showing the drainage pipe of the present invention in place.

Referring to the drawing in detail, numeral 1

designates the vertical wall of a tank having a floating roof 2 which is provided with a circumferential seal 3 of conventional type which will permit the roof to slide along the surface of wall 1. The roof is provided at its center with a sump 4 having a covering 5 and with a hatch 6 spaced a short distance from the sump and provided with a cover 7.

Arranged in the wall of the sump is a packing 8 through which passes a pipe 9 which extends from the sump to a point underneath the hatch where it is held in place by a bracket 10. The end of the pipe under the hatch terminates in a flange 11 to which is bolted a flange 12 carrying a nipple 13 which frictionally holds one end of a rubber-like hose 14. This hose is preferably made of a synthetic rubber which is resistant to oil such as of polymerized butadiene, chlorprene, or the like. The hose is made in a conventional manner with fiber reinforcement and in laminated form. It is sufficient if the outside layer of the hose is made of oil resistant material. For safety it is preferred to make both the outside and inside layers of the hose of the aforesaid synthetic rubber. In order to relieve the load on the friction between the hose and the nipple the hose is provided a short distance from this connection with a clamp 15 which is connected to a chain 16 anchored in the hatch opening.

Near its lower end, the tank is provided with an opening in which is welded a pipe 17 greater in diameter than the hose 14. The outer end of this pipe is provided with a flange 18 to which is bolted another flange 19 through which is screwed a pipe 20 to the inner end of which the hose 14 is frictionally connected and bound with clamps 21. The outer end of the pipe 20 is provided with a gate valve 22, so that if the hose should spring a leak, loss of oil can be prevented.

When it is necessary to repair the hose 14, a line is connected to its upper end through the hatch 7 and its upper end is then disconnected from nipple 13 and chain 16. Either then, or before, the oil is drained out of the tank to a point below the level of pipe 17. Flange 19 is then removed and the hose is drawn out through pipe 17 carrying the aforesaid line with it. The end of the line after it is pulled out of pipe 17 is connected to the upper end of the replacement hose which is then pulled up into place through hatch 7 and connected to nipple 13 and chain 16. The lower end of the replacement hose is connected to pipe 20 in the manner shown and flange 19 is bolted back in place.

It will be apparent that changes can be made



In the specific construction shown without departing from the scope of applicant's invention. While applicant has mentioned specific synthetic rubbers which may be employed, there may be other flexible materials having oil resistivity which can also be utilized and some such materials may be later developed which will be applicable. It may be mentioned also that applicant's invention offers considerable advantages over present practices even when a rubber hose is employed, because the cost of such hose and its replacement, even though such replacement is frequently necessary, is less than the expense incurred with the use of the drainage pipe hitherto employed.

The nature and objects of the present invention having been thus described and illustrated, what is claimed as new and useful and is desired to be secured by Letters Patent is:

In a floating roof tank a sump for collection of water on said roof, a hatch in said roof adjacent said sump, an outlet nipple on said sump having its end projecting into the interior of said tank at a point beneath said hatch and adjacent thereto, a short pipe arranged in the wall of the tank adjacent the bottom end to project into the interior of the tank and provided with a flange at its outer end, a mating flange detachably secured to said first mentioned flange, a nipple having a smaller area than said pipe secured to said mating flange and extending through said pipe into the tank whereby said pipe loosely houses said nipple, a flexible hose arranged in said tank with its ends connected to said nipples and a flexible member attaching the upper end of said hose to said hatch.

HUGH M. STEVENSON.