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WASHOUT-PLUG RETAINER

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This invention relates generally to tanks and has particular reference to a means for securing washout plugs therein.

In tanks such as are used for transporting sulphuric acid, for example, it is customary to fill the tank and discharge the lading therefrom through the top of the tank or through a tank dome. It is desirable and necessary to thoroughly wash out these tanks at intervals, and this is done by steam, water or other suitable washing medium injected into the tank through the dome. To permit the washing medium to flow from the tank, an outlet is provided which is normally closed by a suitable plug, which plug is removed while washing the tank. Means have heretofore been devised to secure a plug in the outlet in its normal position, and the present invention has for one object the provision of a strong and durable securing means for such plugs.

Another object of the invention is the provision of a securing means for washout plugs for car tanks which is easy to manipulate to holding position, and easy to release to permit removal of the plug.

A further object of the invention is the provision of a washout plug retainer which is adapted to receive a syphon pipe for the purpose of discharging the tank lading.

Other objects and advantages of this invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

Figure 1 is a top plan view of the device;

Fig. 2 is a side elevation of the device;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1; and

Fig. 4 is a side elevation of the retainer.

Referring now more particularly to the drawings in which similar characters of reference designate similar parts in the several views, Fig. 2 discloses the bottom portion of a tank indicated generally at A, the tank bottom being provided with an opening 2. A discharge outlet is provided which is indicated generally at B and which is secured to the tank A adjacent the opening 2 by any suitable means, the outlet being tubular and the bore thereof being tapered downwardly

at the upper end of the outlet to form a seat for a washout plug C, the upper edge of which latter is preferably arranged below the level of the tank bottom A whereby the tank lading may flow from the tank bottom into a recess 4 formed in the plug and constituting, in effect, a sump. Preferably, the exterior contour of the plug is a cylindrical taper, but this is merely by way of example, as obviously the plug may assume any preferred or desired form.

For securing the plug C in the outlet, a retainer D is provided, the same comprising a substantially circular tubular body portion 6 as shown in Fig. 3. The body portion of the retainer includes a head 8 and a reduced lower end 10, the latter having a plurality of slots 12 formed therein and being predetermined as to size whereby to nicely fit in the sump 4 of the plug, as clearly shown in Fig. 2. The retainer D is provided with oppositely arranged binding lugs 14, the upper edges of which are arranged intermediate the upper and lower edges of the retainer and preferably adjacent the head 8 and said upper edges are bevelled or inclined at an angle with respect to the horizontal plane through the retainer, as shown at 15 in Fig. 4. The lugs are formed integral with the head 8 and they merge into the reduced end portion of the retainer, as shown clearly in Fig. 3, thereby providing reinforcements or stiffening members for the retainer, as will be apparent. The retainer is further provided with spaced vertical stiffening ribs 16, two of which merge into the lugs 14, and hence are shorter than the others, and the remainder merge into the head 8, as shown in Figs. 2 and 3.

The retainer D extends through a guide E and through the web F of a bracket, said web terminating at its end in downturned attaching flanges G secured to the legs 18 of T-shaped standards 20 by means of suitable fasteners, such as rivets 20; the standards being riveted or otherwise rigidly secured to the tank, as shown at 22.

The web F and the standards 20 constitute a supporting bracket, and said web is provided with an enlarged aperture 24 through which the head 8 of the retainer

protrudes or extends. The guide E is preferably a plate 25 having a central aperture 26 and oppositely disposed slots 28 to permit the insertion of the retainer, as will be hereinafter described.

The plate 24 is provided on its under-surface with oppositely disposed cam surfaces 30 and 32 respectively, and the side edges of the plate are each provided with downturned stiffening flanges 34. As shown clearly in the drawings, the deepest ends of the cam surfaces are arranged adjacent the slots 28 whereby to define shoulders 29 for limiting rotation of the retainer; as hereinafter pointed out.

The retainer, as before mentioned, is tubular to permit tank lading to pass there-through into a siphon pipe to be conveyed to a suitable storage, and the bore of the retainer is so formed that the end of the siphon pipe 36 may extend into the sump 4, as clearly shown in Fig. 2. Preferably the bore of the retainer is provided with a bevelled seat 38 with which a bevelled shoulder 40 formed on the siphon pipe 36 is adapted to contact to position the pipe.

As is well understood, the pipe 36 is removable to permit the insertion of a suitable tool for freeing the retainer from its connection with the guide, and in order to permit manipulation of the retainer the upper end of the bore thereof is squared as at 42 to receive the squared lower end of an operating tool or lever, not shown, for turning the retainer.

In use, when the plug is not in position in the outlet B, a man will enter the tank and place the plug in the outlet and then the retainer D is inserted through the bracket and through the retainer guide. The lugs on the retainer are aligned with the slots in the retainer guide and the retainer is dropped until its lower end engages or rests on the plug in the recess 4 thereof. The operator then will take a suitable tool and insert it in the bore of the retainer at the squared upper portion thereof and rotate the retainer clockwise whereupon the lugs 14 will ride under the cam surfaces of the retainer guide to wedge the retainer guide to its proper position to firmly secure the plug C in the outlet B. The tank may then be filled. To discharge the lading from the tank, the siphon pipe 36 is inserted to the position shown in Fig. 2 and the lading may be conveyed to a suitable storage. By reason of the fact that the plug C is provided with a recess, it will be apparent that practically all of the tank lading will flow into the recess, the latter acting as a sump and the tank may be substantially completely emptied. After the tank has been emptied, it is necessary to wash the interior thereof, and to this end, an operator will extend a suitable tool into the squared upper end of the retainer bore and

rotate the retainer counter-clockwise. Rotation of the retainer will be continued until the lugs 14 engage the shoulders 29 thereby aligning the lugs 14 with the slots in the retainer guide; rotation of the retainer having released the latter from its firm engagement with the plug C. An operator will then forcibly push out the plug C from its seat in the outlet B and in doing this, the retainer is also pushed from its position in the bracket. The tank may then be washed, the washing medium flowing out through the outlet B, and when the tank has been completely washed, an operator may re-enter the tank and restore the plug C to its normal position and then secure the retainer in engagement with the plug.

From the above description, it is believed that the construction and operation of the device of the present invention will be fully apparent to those skilled in the art. The drawings disclose the preferred embodiment of the invention, but it is to be understood that the drawings are merely by way of example, and that various changes in the form and proportions of the device may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. In a container, the combination of a washout plug, of means for securing said plug comprising a bracket secured to the container, a retainer guide secured to and depending from the bracket, and a retainer extended through said guide and normally engaging the plug, said retainer being movable vertically upward to be freed from the plug.

2. In a container, the combination of a washout plug, of means for securing said plug comprising a bracket secured to the container, a retainer guide secured to the bracket and provided with oppositely arranged cam surfaces, a retainer for engagement with the plug, and means on said retainer adapted upon rotation thereof to engage the cam surfaces whereby the retainer is forcibly pressed against the plug to secure the latter, said retainer being adapted to be moved vertically upward to be freed from the plug.

3. In a container, a washout plug having a recess in the upper surface thereof, a retainer guide supported above the plug and provided with oppositely arranged cam surfaces on the under side thereof, a tubular retainer extending through the guide and engaging the plug in the recess therein and oppositely disposed binding lugs on the retainer adapted upon rotation of the latter to engage the cam surfaces to wedge the retainer against the plug.

4. In a container, a washout plug having a recess in the upper surface thereof, a retainer guide supported above the plug and provided with oppositely arranged cam surfaces on

the under surface thereof, a tubular retainer in said guide and supported by the plug, said retainer having openings in the lower end thereof to establish communication from the container into the retainer, oppositely disposed binding lugs formed on the retainer adapted upon rotation of the latter to engage the cam surfaces whereby to wedge the retainer against the plug.

5. A washout plug retainer comprising a tubular body portion having a plurality of slots at its lower end, and oppositely disposed binding lugs intermediate the top and bottom edges, the bore of the body portion having a bevel seat therein to support a siphon pipe and the upper end of the bore being square to take an operating tool.

6. In a container, a washout plug positioned below the interior surface thereof and provided with a recess to define a sump, a tubular retainer supported in the recess and having a plurality of slots at its lower end, a retainer guide supported above the plug and through which the retainer extends, oppositely disposed cam surfaces on said retainer guide and binding lugs on the retainer adapted to wedgingly engage the cam surfaces upon rotation of the retainer, whereby the retainer is forced to seated position in the washout plug recess.

7. In a container, a washout plug positioned below the interior surface thereof and provided with a recess to define a sump, a tubular retainer supported in the recess and having a plurality of slots at its lower end, a retainer guide supported above the plug and through which the retainer extends, oppositely disposed cam surfaces on said retainer guide, and vertically arranged stiffening members formed on the retainer, some thereof merging with the binding lugs to reinforce the latter.

In witness whereof I have hereunto set my hand.

VICTOR WILLOUGHBY.