THE THIEF'S BOTTLE

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The term is almost as old as the oil industry; a 'thief' being a sampling device and, as a common variety made use of a glass bottle, the slang term 'thief's bottle' became accepted in the industry's vocabulary.

The changeover to dièso as the fuel to be burnt under main boilers generally throughout the Fleet has brought benefits well-known and described extensively elsewhere.

It has also brought in its wake problems, of which paramount in importance and potentially most dangerous is the ever-present possibility of flame-out due to the presence of free water in storage or service tanks.

By its nature dieso will separate readily from water, and although water-finding paste or bottles may be lowered into the tank to detect the presence of water, the most reliable method of establishing its presence is to obtain a bottom-sample. During fuelling, sampling at the goose-neck deck connection is not a

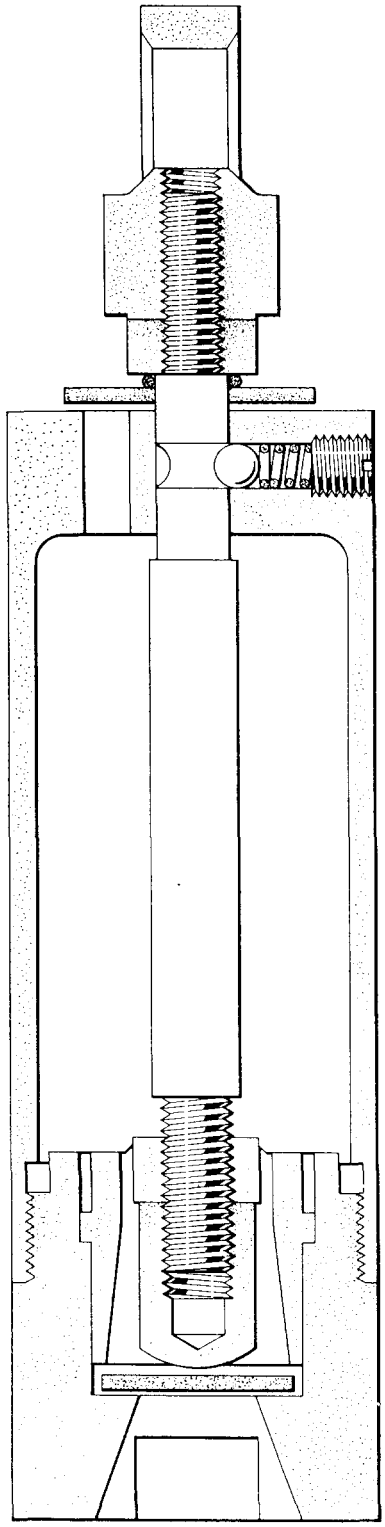

FIG. 1—THE THIEF'S BOTTLE

satisfactory method of testing because:

(*a*) Water may already be present in one or more of the tanks being filled.

(*b*) The supply pump suction may be switched from a tested tank to a contaminated tank.

Without a reliable method of checking, contaminated fuel once on board may remain undetected and may be spread to other tanks by transfer; the first hint of trouble being flame-out when the fuel is used on the boiler.

As a result of adverse experience during fuelling from lighters it was decided that improved methods of water detection should be investigated. The Admiralty Oil Laboratory undertook to design a sampling device capable of taking bottom samples from ships' tanks; the end product, the AOL miniature sampling pot, has been undergoing sea trials for the past eight months in a *Rothesay* Class frigate. A sectional view of the sampling pot which is designed to be lowered down sounding tubes is shown in the FIG. 1. It will be seen that the device consists of a container open at both ends having an entry port closed by a plate valve at the lower end and an air-escape port closed by a plate valve at the upper end. The lower plate valve is normally held closed by a central plunger running the whole length of the bottle; this plunger from which the sampling pot is suspended is in turn held in position by a spring-loaded detent at the upper end. The sampling pot is manufactured from corrosion-resistant materials and is extremely robust.

In operation, the plunger is pushed hard home closing the lower plate valve on to its seat; in this position, the air-escape port plate valve is held onto its seat by means of a step on the upper end of the plunger. In this state, the sampling pot is a closed vessel and no liquid can enter. The bottle is now lowered down the sounding tube on the end of a suitable line and on reaching the bottom, the securing line is given a sharp jolt releasing the central plunger from the detent allowing a sample to be admitted at the bottom and the air to escape from the top of the pot through the plate valves.

After allowing a short time for the sampling pot to fill, it is withdrawn; the two plate valves will now be held closed by gravity, an additional closing force being exerted on the upper plate by the flow past the sampling pot. The contents of the sampling pot is decanted into a suitable clean container and examined.

Experience has shown that the sampling pot is easy to use and an adequate sample of fuel is obtained. Samples obtained from tanks known to contain

water, as indicated by test cocks, have given ample evidence of water, illustrating the effectiveness of the device. In view of these satisfactory results, action is in hand to patternize the sampling pot for general supply to the Fleet.

It is emphasized that the 'thief's bottle' is intended as an aid to the detection of free water, and should be used as a supplement to existing testing methods such as water-finding paste and test cocks. It is confidently expected that the Fleet will be provided with a more reliable and realistic test facility, thus making a large contribution to problems associated with the detection and elimination of free water in tanks. The degree of success obtained will depend, however, on the tank/pipework configuration and tank shape. The results obtained should be verified by comparison with the existing methods until experience is gained in use.