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TANK CLEANING DEVICE

Filed Sept. 10, 1928

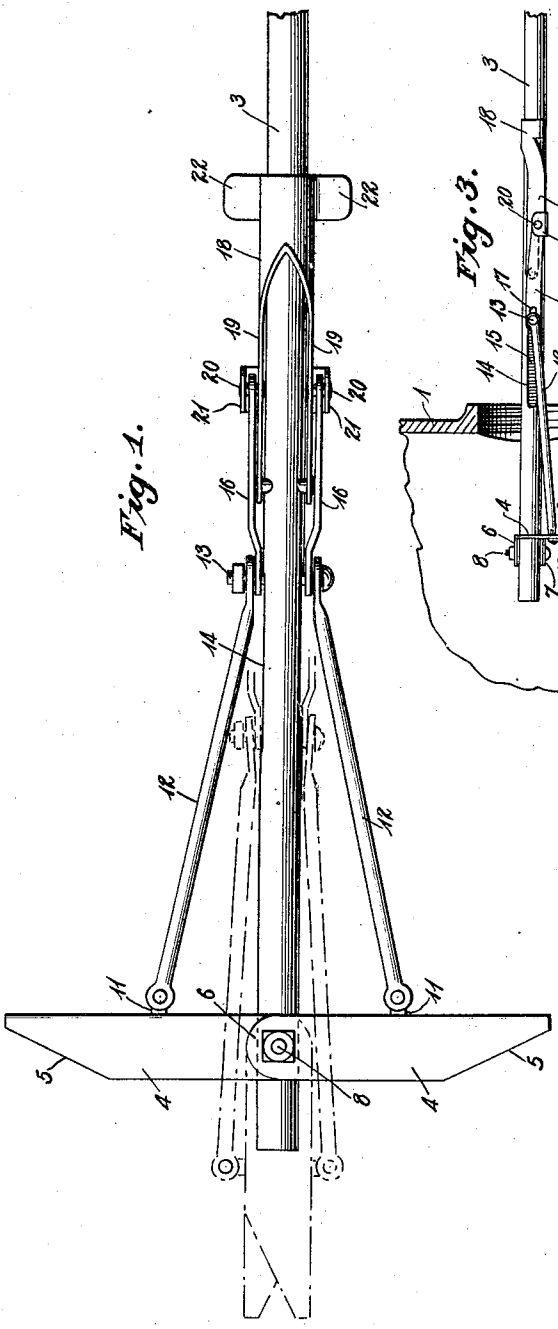


Fig. 1.

Fig. 3.

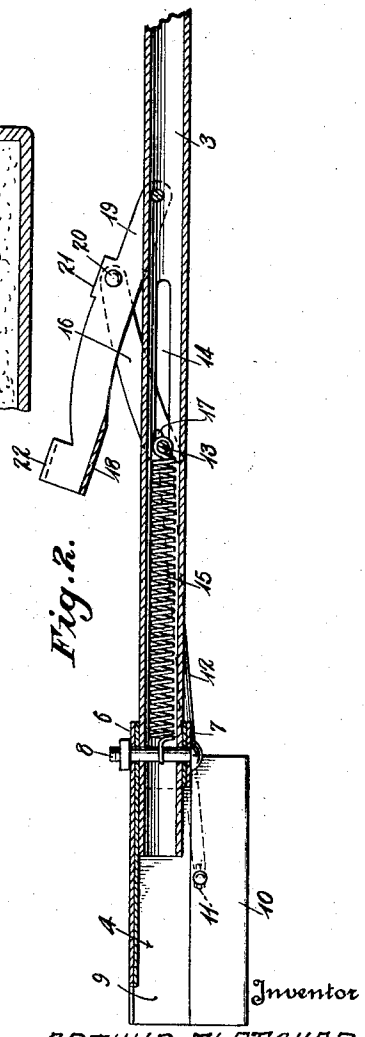


Fig. 2.

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UNITED STATES PATENT OFFICE

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TANK-CLEANING DEVICE

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The invention relates to improvements in device for cleaning mud, waste dirt or sediment, or the like from storage tanks. The invention has particular application for such a device in the cleaning of oil storage tanks.

In the handling of oil, tanks are provided for storing large quantities of various cuts or types of oil. Dirt, sediment waste and the like rapidly accumulate in these tanks, and settle to the bottom thereof. It has been the general practice in the past for a laborer to enter such a tank to remove these deposits. This has been a costly as well as dangerous practice. There is generated in the tanks dangerous fumes which have led to many fatalities among the laborers who have been compelled to enter them for cleansing purposes.

This invention comprises a cleaning device for effectively removing the waste mud or sediment that accumulates in a tank without requiring the operator thereof to enter the interior of the tank.

With the foregoing conception in mind, the invention embodies a tool which may be contracted and readily inserted into the interior of the tank and operated therein from the exterior thereof, and with equal ease removed from the tank when the cleaning operation has been consummated.

In the preferred embodiment of my invention I provide a tool having blades or wings that may be collapsed or folded to be inserted through a pipe opening into the interior of the tank and which blades or wings are then expanded from the exterior of the tank so that upon a reciprocation of a suitable handle the blades will draw from surfaces of the tank sediment or dirt accumulating therein. The operating devices for the blades also permit the same to be again contracted and withdrawn through the pipe opening when the tank has been cleaned.

In the accompanying drawings Figure 1 illustrates a detailed view of the tool;

Figure 2 is a section thereof; and,

Figure 3 is a view of the device after insertion through a pipe opening into a tank.

Referring now more particularly to the drawings, wherein like reference characters indicate corresponding parts, the numeral 1 designates a suitable storage tank. This tank is provided with a pipe opening 2 through which the contents of the tank may be discharged. The pipe is in close proximity to the bottom of the tank where dirt, etc., accumulates.

The tool embodies a handle 3 which may be constructed of metal or other suitable material. Near the outer end of this handle there is pivotally connected to the tool a pair of collapsible wings or blades 4. As each blade is of the same construction a description of one will suffice for both. Each blade is of angular formation. The top flange 5 near its outer end is tapered, while each blade at its inner end is fashioned so as to provide ears 6 and 7 fitting over the handle 3 and apertured to receive the pivot bolt 8 passing therethrough.

The side portion 9 of each blade may have a rebent part 10 which serves to strengthen the blade. The side portion of each blade also carries an outstanding ear 11 to which a lever is connected for the purpose of operating the blade.

It will be observed that the blades are mounted so that they may be drawn outwardly to extend at right angles to the handle 3. They are in this position when the tank is to be cleaned. It is furthermore apparent that the blades or wings collapse so as to substantially interfit one another and form in their collapsed position a continuation of the handle 3.

To actuate the blades in order that they may be collapsed when they enter the pipe opening 2 of the tank and expanded after they enter this tank the following mechanism is provided.

To the ear 11 of each blade there is pivotally connected a link 12. The forward end of each link is connected with a cross-pin 13, which cross-pin traverses an elongated slot 14 in the handle 3. The cross-pin is also connected with a tension spring 15 disposed within the interior of the handle, the forward end of the tension spring being connected to the pivot pin 13 for the collapsible blades. The

spring serves therefore to normally urge the blades in a collapsed position by reason of the links 12 connected with the pin 13 and the blades.

A pair of arms 16 are connected with the cross-bolt 13, these arms having elongated slots 17 at their point of connection.

When the blades are collapsed the arms 16 extend at an angle to the shaft or handle 3 and at an angle to the links 12. The forward end of each arm is connected to a manually operable lever 18, the same having separated side portions 19 pivoted to the handle 3 beyond the elongated slot 14 therein. The connection may be effected by the provision of outstanding pins 20 on the arms 17 which pass through openings formed in rebent portions 21 of the lever 18. The end of the lever 18 is provided with finger gripping extensions 22 by means of which the same may be grasped to operate the cleaning wings. This portion of the lever is also shaped to fit the contour of the shaft or handle 3. Its operating lever and all of its associated mechanism is coextensive with the handle 3.

In the use of this tool when it is to be inserted in a tank the operating lever 18 is thrown toward the collapsible cleaning wings 4. When this lever passes its center point the coil spring 15 acting upon the cross-bolt 13 urges this bolt and the links 12 forwardly. This action of the spring serves to collapse or bring together the cleaning wings 14. Consequently the entire mechanism can be inserted through a small opening into the interior of the tank.

When the wings enter the interior of a tank they must then be expanded in order to be brought to a cleaning position. By grasping the lever 18 and moving the same toward the rear of the handle 3 against the tension of the spring 15 the wings 4 are drawn outwardly at right angles to the handle 3 through the levers 16 and the connected links 12.

The pin 13 connecting these levers and links is free to ride in the elongated slot 14 in the handle 3. The movement of the hand lever 18 is continued until it reaches a position as shown in Figure 3 where it lies parallel with the handle 3. The tendency of the coil spring 15 at this time is to hold the hand lever 18 in this position. The tool is then reciprocated in the tank until deposits have been removed through the pipe opening therein. To remove the tool from the tank the wings are collapsed through the operation of the handle 18 in a manner which has heretofore been described. It is to be observed that when the wings are in an expanded or operating position the forward end of the handle projects beyond said wings to protect them against injury in the tank.

Having thus described my invention, what I claim is:

1. A cleaning tool comprising a handle, an angular cleaning member having a flat top portion pivotally connected to said handle and a vertical scraper portion, means carried by said handle for retaining said member in such position that said vertical scraper portion extends outwardly at an angle from the handle, and means for releasing the retaining means and for permitting said scraper portion to move into alignment with said handle.

2. A cleaning tool comprising a handle, a scraper member pivoted to said handle, a longitudinal slot in said handle having a pin movable therein, a spring secured within said handle and attached to said pin, a link connected to said scraper member and pin, and means attached to said pin for retaining said spring expanded to thereby hold said scraper member extended outwardly from said handle, said means being releasable to permit said spring to force said scraper member into alignment with said handle.

In testimony whereof I affix my signature.

ARTHUR FLETCHER.