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PORTABLE MUD DITCH
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Claims.
(CL. 61—15)

1. This invention relates to a mud ditch which is used in the drilling of an oil well and provides for the circulation of the mud as it returns from the well and then flows to a pickup sump where the mud pumps pick up the mud and again return it into the well.

Hereinafter, the mud ditch, as well as the sumps, have been built of wood, thus requiring the labor of a considerable number of men, and the consumption of a considerable amount of time.

An object of my invention is to provide a novel portable mud ditch formed of a plurality of metal units, the various units fitting together to provide a complete mud circulating system of sumps and ditches.

Another object of my invention is to provide a novel portable mud ditch in which the various units need not be precisely placed, but on the contrary can be misaligned and misaligned to a considerable extent, and the units will still effectively fit together and perform their required function of conducting the flow of mud from a well to a sump.

Another object of my invention is to provide a novel portable mud ditch in which the various units can be quickly and easily coupled in a minimum amount of time.

A feature of my invention resides in the novel means of packing the fitting unit from the trough unit to prevent leakage between the fitting and the trough.

Another feature of my invention is to provide fitting units which permit angular positioning of the trough units.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a fragmentary top plan view of my portable mud ditch.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a fragmentary plan view as viewed from the line 3—3 of Figure 2.

Figure 4 is a diagrammatic fragmentary plan of the T-fitting and the mud troughs.

Figure 5 is a fragmentary plan view similar to Figure 4 and showing a different position of the T-fitting and mud troughs.

Figure 6 is a view similar to Figure 5 and showing still another position of the T-fitting and mud troughs.

Figure 7 is a fragmentary plan view showing an angular positioning of the mud troughs.

Figure 8 is a fragmentary perspective view of the T-fitting and one of the mud troughs.

Referring more particularly to the drawing, the numeral 1 indicates a collecting sump into which the mud spills as it comes from the well and then flows into the trough unit 2, and thence into the fitting element 3, then into a second trough element 4, and finally into the sump 5, from which the mud pumps pick up the mud and return it to the well which is being drilled.

As thus far described, the arrangement of parts is usual and well known in the art, and the position and operation of the mud pump, for example, forms no part of my invention.

Hereinafter, the sumps 1, 2 and 4, have been constructed of wood and this required a separate structure to be erected on each new well, and then subsequently destroyed or moved when the well was completed. In my construction, the sumps 1 and 5, as well as the troughs 2 and 4, and the fitting element 3 are all constructed of metal. It will be evident that the sumps 1 and 5 cannot readily be positioned accurately around an oil well to within a fraction of an inch, nor is it feasible to have to position the fitting element 3 accurately with relation to the sumps 1 and 5.

To permit a considerable amount of variance in alignment of the parts 1, 3 and 5, I provide a means of coupling the troughs 2 and 4 to the elements 1, 2 and 5, so that there can be a considerable misalignment both horizontal and vertical and also a variance in spacing, and the various elements can still be effectively connected with the troughs so that the mud will flow from the collection sump 1 to the sump 5 in a continuous stream, and without loss of the mud in transit.

Considering first the trough 2, this is made of metal, is substantially U-shaped and open at the top as shown in Figure 2. The bottom is flat as shown at 8, and the sides 1 are substantially at right angles to the floor 6 and also the floor and sides are connected by a curved fillet 5. The purpose of this construction is to enable the packing arrangement, which will be subsequently described, to more effectively engage and seal off the trough to prevent leakage around the trough as the mud flows from the sump 1 to the sump 5. The trough 2 extends from the sump 1 to a fitting generally indicated as 3, and this fitting is preferably T-shaped so that the trough 4 can extend substantially at right angles to the trough 2. The fitting 3 rests on a metal frame or foundation 5, which in turn rests on the ground. The frame 5 may vary both as to distance from
and alignment with the sumps 1 and 5, and to permit of this variance, I provide the fitting 3 with two or more outlets 10, into which the troughs 2 and 4 can extend substantially as shown. The side walls 11 and 12 and the bottom 5 which extend from the openings 10 flare outwardly from an angle so that the troughs 2 and 4 can enter the fitting 3 at various angles substantially as shown in Figures 4, 5 and 6. This permissive misalignment of the parts 2, 3 and 4 is of considerable importance in that the walls need not square to the openings 10 flare outwardly at an angle from the openings so that the troughs 2 and 4 can enter the fitting 3 at various angles substantially as shown in Figures 4, 5 and 6.

A channel 13 is welded or otherwise fixedly secured to the fitting element 3 at each of the openings 16, and a packing 14 fits in this channel, the packing being preferably circular in cross section. The packing 14 projects beyond the inner edge of the channel 13 to engage the side walls 7 and bottom walls 6 of the troughs 2 or 4. Due to the fact that the side wall 7 and bottom 6 are substantially straight lines, the packing 14 can more effectively engage and pack off against these surfaces, thus eliminating any leakage around the trough. There is not a great deal of pressure on the drilling mud which flows through the troughs and, consequently, the seal need not be very precise nor operable under high pressures. To hold the troughs 2 and 4 in position, I provide J-bolts 15 which extend from the top flange 16 of the fitting 3 and engage the upper surface of the trough substantially as shown in Figure 8.

If it is necessary to arrange the trough 2 or 4 at an angle, I may provide fittings 17 as shown in Figure 7. These fittings may be arranged at any fixed acute angle and they include a trough-like structure with side walls 18 and with packings 20 and 21, and each end to engage the troughs 22 and 23 as shown. The method of packing off around the trough 22 and 23 is the same as described to pack off the trough 2 or 4.

Similarly, if the troughs must be elongated, I provide a fitting 24 as shown in Fig. 7 which is open at both ends, and is provided with packings 25 at each end respectively, these packings accompanying a second trough 27 in alignment with the trough 23. The mud, as it moves from the trough 4 is diverted through one or more outlets 23 into the sump 5, where the mud pumps again pick it up to recirculate the same. A fitting 28 similar to the fitting 24 is mounted on the inlet 24 and similarly a fitting 30 accommodates the end of the trough 4 so that the mud is directed into the final distributing trough 31.

Having described my invention, I claim:

1. A channel 13 flitch comprising a trough, said trough being open on the top thereof, an angular fitting element, said fitting element being open on the top, one end of said trough extending into the fitting element and packing means in the fitting element engaging the sides and bottom of the trough to prevent leakage between the trough and the fitting element, the sides of said fitting element adjacent the trough being tapered outwardly away from said trough to permit horizontal and vertical movement of the trough relative to said fitting element.

2. A portable mud ditch comprising a trough, said trough being open on the top thereof, an angular fitting element, said fitting element being open on the top thereof, one end of said trough extending into the fitting element and packing means in the fitting element engaging the sides and bottom of the trough to prevent leakage between the trough and the fitting element, the sides of said fitting element adjacent the trough being tapered outwardly away from said trough to permit horizontal and vertical movement of the trough relative to said fitting element.

3. A portable mud ditch comprising a collecting sump, and a second sump spaced from the first named sump, troughs extending from the collecting sump to the second sump, a fitting element, one end of each of said troughs projecting into the fitting element, each of said troughs being open on the top thereof and said fitting element having openings therein to receive one end of each of the troughs, and a packing means mounted in the fitting element in said openings, said packing means engaging the sides and bottom of the troughs to pack off between the trough and the fitting element.

4. A portable mud ditch comprising a collecting sump, and a second sump spaced from the first named sump, troughs extending from the collecting sump to the second sump, a fitting element, one end of each of said troughs projecting into the fitting element, each of said troughs being open on the top thereof and said fitting element having openings therein to receive one end of each of the troughs, and a packing means mounted in the fitting element in said openings, said packing means engaging the sides and bottom of the troughs to pack off between the trough and the fitting element, and fastening means on the fitting element engaging the trough to press said trough against the packing means.

5. A portable mud ditch comprising a collecting sump, and a second sump spaced from the first named sump, troughs extending from the collecting sump to the second sump, a fitting element, one end of each of said troughs projecting into the fitting element, each of said troughs being open on the top thereof and said fitting element being open on the top thereof, said fitting element having openings therein to receive one end of each of the troughs, and a packing means mounted in the fitting element in said openings, said packing means engaging the sides and bottom of the troughs to pack off between the trough and the fitting element, and fastening means on the fitting element engaging the trough to press said trough against the packing means.

6. A portable mud ditch comprising a collecting sump, and a second sump spaced from the first named sump, troughs extending from the collecting sump to the second sump, a fitting element, one end of each of said troughs projecting into the fitting element, each of said troughs being open on the top thereof and said fitting element being open on the top thereof, said fitting element having openings therein to receive one end of each of the troughs, and a packing means mounted in the fitting element in said openings, said packing means engaging the sides and bottom of the troughs to pack off between the trough and the fitting element, the sides of said fitting element adjacent the trough being flared outwardly away from the trough to permit
3. A portable mud ditch comprising a collecting sump, and a second sump spaced from the first named sump, troughs extending from the collecting sump to the second sump, a fitting element, one end of each of said troughs projecting into the fitting element, each of said troughs being open on the top thereof and said fitting element being open on the top thereof, said fitting element having openings therein to receive one end of each of the troughs, and a packing means mounted in the fitting element in said openings, said packing means engaging the sides and bottom of the troughs to pack off between the trough and the fitting element, the sides of said fitting element adjacent the trough being flared outwardly away from the trough to permit horizontal and vertical swinging movement of the trough, said fitting element being substantially T-shaped and having a plurality of openings therein shaped to receive one end of a trough.

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