Jan. 26, 1937. S. DOUGLASS 2,068,665

DETACHABLE MUD COLLECTOR FOR DRILL PIPES

Filed Jan. 28, 1936

Fig. 4.

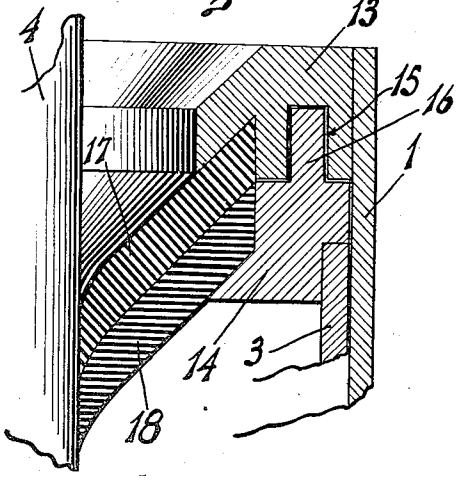


Fig. 3.

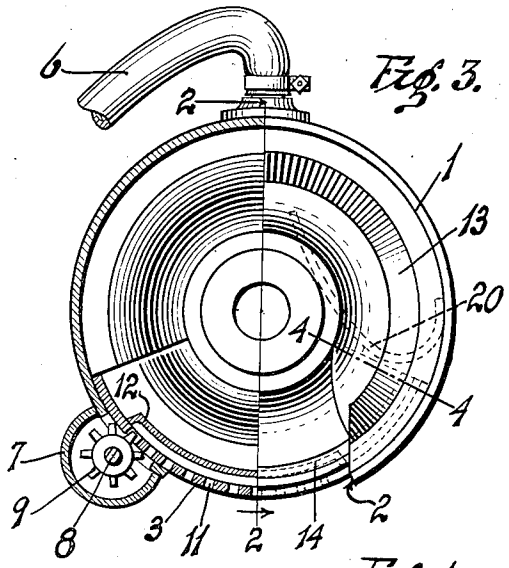


Fig. 2.

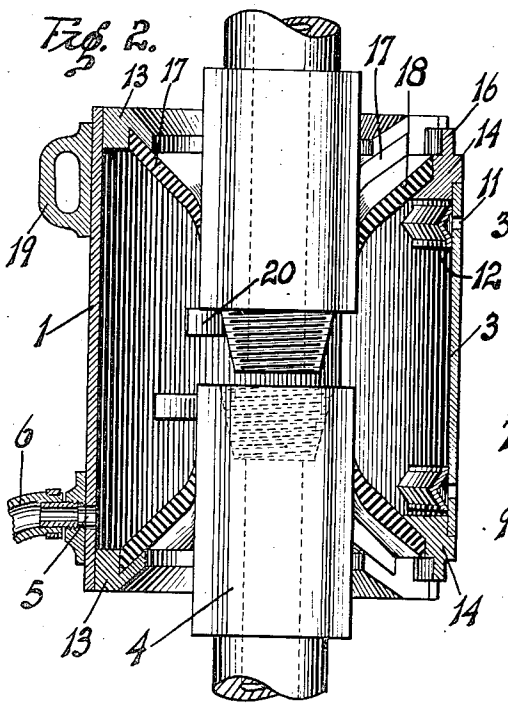
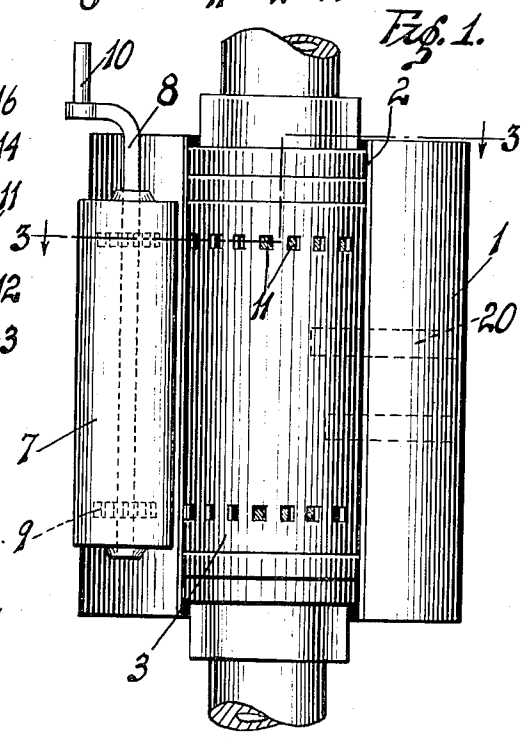


Fig. 1.



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DETACHABLE MUD COLLECTOR FOR DRILL PIPES

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7 Claims. (Cl. 166—16)

This invention relates to a detachable mud collector which is adapted to be arranged around the tool joint in a string of drill pipe so that the drilling mud in the stand of pipe above the collector will flow into the collector and will be drained off, instead of flowing out indiscriminately onto the workmen, as is usual in the present practice.

An object of my invention is to provide a detachable mud collector of the character stated which is positioned around the tool joint and is so constructed that when the joint is unthreaded, the drilling mud in the upper stand of pipe will flow into the collector and will be drained off, the collector being provided with suitable packing to prevent the escape of mud around the tool joint.

Another object is to provide a novel means in a mud collector for opening and closing the gate which partially encircles the pipe.

Another object is to provide a novel means of holding the collector in position around the tool joint while the collector is in operation.

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 side elevation of my mud collector.

Figure 2 is a sectional view taken on line 2—2 of Figure 3.

Figure 3 is a view—half in section and half in plan—taken on line 3—3 of Fig. 1.

Figure 4 is a fragmentary sectional view taken on line 4—4 of Fig. 3.

Referring more particularly to the drawing, the numeral 1 indicates the arcuate cylindrical housing of my mud collector. This housing has an opening 2 on one side thereof which extends longitudinally of the housing, and this opening is of sufficient size to permit the tool joint to enter the housing.

An arcuate gate 3 is mounted in the housing 1 and is adapted to slide within the housing to open and close the opening 2 during operation of the device.

My collector in closed position surrounds the tool joint 4 and when the joint is unthreaded, as shown in Fig. 2, the mud in the upper stand of pipe is drained into the collector and is then drawn off thru the outlet 5 in the lower part of the housing 1. If desired, a hose 6 may be attached to the outlet so that the mud will drain into the sump or any other suitable place of collection.

The gate 3 is moved across the opening 2 by the following arrangement: A cover 7 is attached to the side of the housing 1 and a vertical shaft 8 is journaled in the cover. A plurality of sprockets 9 are fixedly mounted on the shaft 8 and these sprockets are rotated with the shaft by means of the handle 10. The sprockets 9 engage a rack 11 on the gate 3 and this rack may consist of properly spaced and horizontally arranged holes.

It will be evident that when the shaft 8 is rotated, the gate 3 will be moved across the opening 2 to either open or close said opening. Guard plates 12 on the inside of the gate 3 cover the holes 11 to prevent the mud from pouring out of these holes.

Arcuate rings 13 are fixedly attached to the housing 1 at the top and bottom of said housing. Arcuate guide rings 14 are fixedly attached to the top and bottom of the gate 3. Each of the rings 13 is provided with a groove 15 into which a tongue 16 of the ring 14 extends. Thus, the gate is accurately guided in its movement within the housing.

An arcuate packing strip 17 is fixedly attached to each of the rings 13 and these strips project inwardly to engage the tool joint and pack it off to prevent mud escaping around said tool joint. The gate 3 is also provided with arcuate packing strips 18, 18 which are attached to the upper and lower rings 14 and these last named packing strips engage the tool joint opposite the opening 2 for the purpose of preventing leakage around said tool joint. The packing strips 17 and 18 overlap, as shown in Fig. 4, for a portion of their length so that the packing strips will not interfere when the gate 3 is moved.

The internal diameter of the ring 14 is greater than the internal diameter of the ring 13, as shown in Fig. 4, the reason for this arrangement being to permit the strips 17 and 18 to flex downwardly where they overlap and to still effectively engage the tool joint.

The collector is suspended in the derrick from a suitable ring 19 on the housing 1, and this suspension prevents the collector from moving downwardly.

To keep the collector from being pushed upwardly under pressure of the mud which enters, I provide a plurality of spaced spring fingers 20. These fingers are attached to the housing 1, and one of the fingers will engage the lower edge of the unscrewed tool joint, as shown in Fig. 2, thus

preventing the collector from moving upwardly.

In operation, the gate 3 is moved to one side by rotating the shaft 8. The tool joint 4 can then enter the opening 2 and said joint assumes a central position in the housing 1. The gate 3 is then closed by rotating the shaft 8, and the packing strips 17 and 18 completely surround the tool joint. The joint is then unscrewed and the mud in the upper stand of pipe collects in the housing 1 and is trained thru the pipe 6. If the collector tends to move upwardly after the tool joint is unscrewed, a spring 20 will engage the bottom of the upper half of the tool joint, thus holding the collector in proper position.

Having described my invention, I claim:

1. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in one side thereof, a gate slidably mounted in the housing, said gate being adapted and arranged to move across the opening, manually operable drive means engaging the gate whereby said gate is moved in the housing, packing means in the upper and lower end of the housing, and packing means on the upper and lower end of the gate.

2. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in one side thereof, a gate slidably mounted in the housing, said gate being adapted and arranged to move across the opening, manually operable drive means engaging the gate whereby said gate is moved in the housing, packing means in the upper and lower end of the housing, packing means on the upper and lower end of the gate, and spring means adapted to engage the drill pipe at the thread joint whereby the collector is held in position around the drill pipe.

3. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in the side thereof adapted to receive the drill pipe, a gate slidably mounted in the housing, said gate being adapted and arranged to move across the opening, a rack on the gate, a sprocket engaging the rack, a shaft on which the sprocket is mounted, said shaft being manually rotatable whereby the gate is moved across the opening, upper and lower packing means on the housing, and upper and lower packing means on the gate.

4. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in the side thereof adapted to receive the drill pipe, a gate slidably mounted in the housing, said gate being adapted and arranged to move across the opening, a rack on the gate, a sprocket engaging the rack, a shaft on which the sprocket is mounted, said shaft being manually rotatable whereby the gate is moved across the opening, upper and lower packing means on the housing, upper and lower packing means on the gate, and spring fingers attached to the housing, said spring fingers being adapted to engage the joint in the drill pipe whereby the collector is held in position.

5. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in one side thereof thru which the drill pipe enters, said housing having a drain opening adjacent the bottom thereof, an arcuate gate adapted to be moved across the first named opening in the housing, arcuate rings secured to the upper and lower end of the housing, arcuate rings secured to the upper and lower end of the gate, a tongue formed on each of the last named rings, said first named rings having a groove to receive said tongue whereby the gate is slidably mounted in the housing, packing strips attached to the first named rings, packing strips secured to the last named rings, and manual means engaging the gate whereby the gate is moved in the housing.

6. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in one side thereof thru which the drill pipe enters, said housing having a drain opening adjacent the bottom thereof, an arcuate gate adapted to be moved across the first named opening in the housing, arcuate rings secured to the upper and lower end of the housing, arcuate rings secured to the upper and lower end of the gate, a tongue formed on each of the last named rings, said first named rings having a groove to receive said tongue whereby the gate is slidably mounted in the housing, packing strips attached to the first named rings, packing strips secured to the last named rings, manual means engaging the gate whereby the gate is moved in the housing, said manual means including a rack on the gate, a sprocket engaging the rack, a shaft on which the sprocket is mounted, said shaft being manually rotatable whereby the gate is moved.

7. A detachable mud collector for drill pipe, comprising an arcuate housing, said housing having an opening in one side thereof thru which the drip pipe enters, said housing having a drain opening adjacent the bottom thereof, an arcuate gate adapted to be moved across the first named opening the housing, arcuate rings secured to the upper and lower end of the housing, arcuate rings secured to the upper and lower end of the gate, a tongue formed on each of the last named rings, said first named rings having a groove to receive said tongue whereby the gate is slidably mounted in the housing, packing strips attached to the first named rings, packing strips secured to the last named rings, manual means engaging the gate whereby the gate is moved in the housing, said manual means including a rack on the gate, a sprocket engaging the rack, a shaft on which the sprocket is mounted, said shaft being manually rotatable whereby the gate is moved, and spring fingers in the housing adapted to engage the joint in the drill pipe whereby the collector is held in position on the drill pipe.

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