June 8, 1937. H. D. HAMPTON 2,083,062

CORE CATCHER

Filed Jan. 27, 1936

FIG. 1.

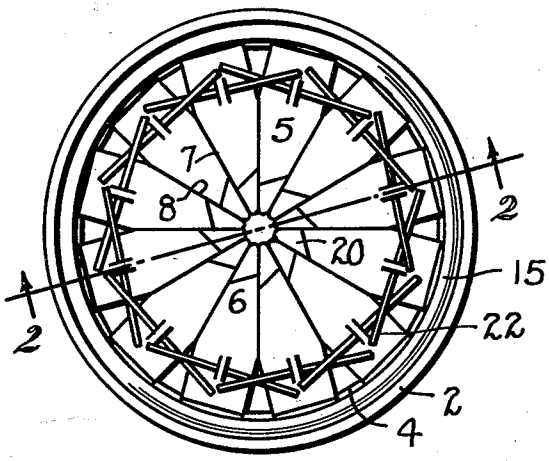


FIG. 2.

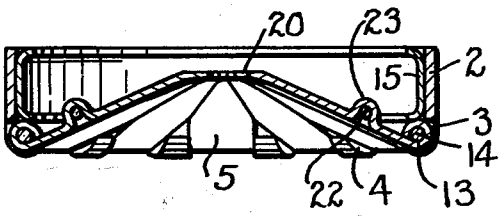


FIG. 3.

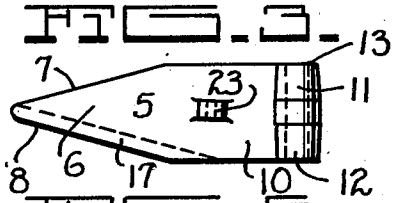


FIG. 4.

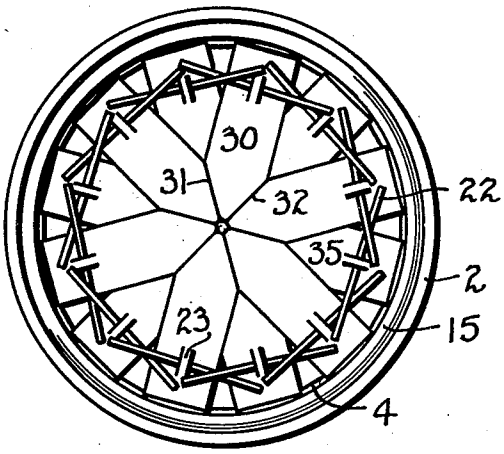


FIG. 5.

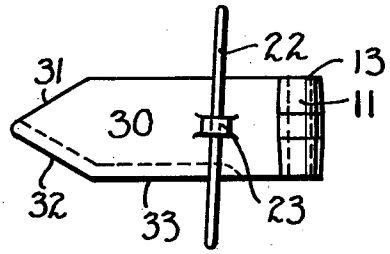
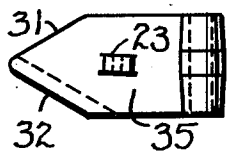


FIG. 6.



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CORE CATCHER

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Application January 27, 1936, Serial No. 61,040

8 Claims. (Cl. 255—72)

The invention relates to a core catcher of the type employed in catching the cores in well drilling operations.

Some of the formations being penetrated are of a very fine sandy nature and in some localities these sandy formations are the most prolific producers of oil and gas so that it is necessary that the core catcher be of a type which will confine the very finest sand and retain a sample of the sand when the core barrel is withdrawn from the well.

Various types of core catchers have been devised heretofore, but the present construction embodies an arrangement whereby a plurality of fingers are so constructed and arranged that they will fall into position to form a substantial closure for the core passage.

It is one of the objects of the invention to provide a plurality of interfitting finger members which are pivotally arranged to move into a closure position to trap a sample of fine sand.

Another object of the invention is to provide pivoted fingers of different lengths so that the fingers are interfitted to form a core catcher.

Another object of the invention is to provide core catcher fingers which can be readily replaced.

Another object of the invention is to provide core catcher fingers which can be held in position by a unitary ring member.

Another object of the invention is to provide core catcher fingers which may be stamped from sheet metal and arranged so that all the fingers will be held in the same horizontal plane.

Another object of the invention is to arrange a plurality of core catching fingers so that in event one of the fingers engages the core its movement will pull the other fingers into engagement with the core.

Another object of the invention is to provide a plurality of retainer pins so that the fingers will be braced one against the other to maintain them in the proper core retaining position.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawing wherein:

Fig. 1 is a top plan view looking down on the core catcher with the fingers in core retaining position.

Fig. 2 is a section taken on the line 2—2 and looking in the direction of the arrows.

Fig. 3 is one of the fingers used in the Fig. 1 form of the invention.

Fig. 4 is a top plan view looking down on the core catcher which has a somewhat different arrangement of the fingers than shown in Fig. 1.

Figs. 5 and 6 are views of the long and short fingers, respectively, which are seen in Fig. 4.

The core catchers of the general type herein described are made up as individual units which can be readily inserted in position in any type of core barrel. One such unit is shown in plan view in Fig. 1 and in section in Fig. 2, and includes a body member 2 which is in the form of a ring. This ring has its lower edge cut away at spaced intervals such as 3. The remaining portions constitute lugs which are bent inwardly as at 4 in order to serve as a support for the catcher portion. There will be a plurality of lugs as best seen in Fig. 2 and they are spaced apart a distance equal to the width of the fingers 5 which are to be positioned as shown in Fig. 2.

These fingers are constructed of a strip of metal 6 having one end formed with tapered faces 7 and 8. The body portion 10 thereof has straight sides and the outer end 11 is recurved at 12 to form a passage 13 which is arranged to receive a retainer wire 14. This wire will be passed through a plurality of passages 13 in the different fingers 5 so that they will be formed in a circle as seen in the drawing. When the parts have been thus arranged the wire will be deposited on the lugs 4 and a lock ring 15 moved into position from the top of the body 2. This retainer ring may be of such a size as to be driven into the body 2 and in this manner retain the fingers in position, or it may be welded or otherwise fastened into the body 2.

It seems obvious that the fingers 5 are arranged for limited pivotal movement upon the wire 14 so that they may move upwardly from the position shown in Fig. 2 to permit the entrance of the core formation. When the formation has passed or when the core barrel is drawn upwardly the fingers 5 will pivot inwardly toward each other in the position shown in Fig. 2 to form a substantial closure for the passage through the body 2, which is, of course, the core passage.

The tapered faces 7 and 8 are so arranged that they will engage with the corresponding faces on the adjacent fingers as seen in Fig. 1, so that there will be a close interfitting arrangement of the fingers which will prevent the sand from filtering downwardly through the core catcher.

If desired, the face 8 of each finger may be beveled as at 17 so that it will cause the finger to slide around the core being formed and not

cut into the core when the core barrel rotates relative to the core when the core first starts into the barrel. The inner end of each of the fingers is bent slightly as at 20 in order to form a flat horizontal portion to carry the load of the core. This portion 20 also projects inwardly when the fingers are standing in an upright position so that if the core starts downwardly out of the core passage or the catcher is raised relative to the core, the core will be caught by this projecting portion 20 and the fingers will be caused to dig into the core and will pivot inwardly and downwardly to retain the core.

To cause all of the individual fingers to move inwardly and downwardly to the core retaining position shown in Fig. 2 a retainer pin such as 22 is carried by each of the fingers. This pin is in the form of a metal bar which passes through an eye portion 23 in each of the fingers and extends beyond the side edges to overlap the next adjacent finger on each side. This eye portion may be stamped or otherwise formed so that it projects above the surface of the finger and permits the pin to be passed therethrough.

The retainer ring 15 is formed to receive these pins when the fingers move to the vertical position. As seen in Fig. 1, all of the pins 22 extend beyond the edges of the fingers by which they are carried and overlap the adjacent fingers so that when any one finger catches in the core it will move in and because of the arrangement of the pins will pull in the next adjacent fingers so that all of the fingers will be moved in. The pins also prevent any one finger from dropping below the others.

Fig. 4 shows a modified form of the invention wherein the fingers 30 are quite similar to the fingers 5, but the faces 31 and 32 thereof will bevel at a steeper angle than the fingers of Fig. 1. This arrangement leaves a space between the straight edges 33 of the fingers and these spaces are filled by shorter fingers 35 which are formed, however, in a manner almost identical with the fingers 30.

The long and short fingers are alternately arranged on the retainer wire 14 as seen in Fig. 4, and are provided with an eye 23 and the retainer pins 22 the same as previously described. This form of the invention is satisfactory when a harder formation is being cored and there is a possibility of catching a hard core rather than a soft formation core.

What is claimed is:

1. A core catcher including a body, a plurality of inwardly projecting spaced lugs on the lower side thereof, a wire ring supported by said lugs, a plurality of catcher fingers pivoted on said ring to fall inwardly and cooperate with each other to form a closure for said body, each of said fingers having forwardly tapered edges so that all of said fingers substantially meet adjacent the center.

2. A core catcher including a body, a plurality of inwardly projecting spaced lugs on the lower side thereof, a wire ring supported by said lugs, a plurality of catcher fingers pivoted on said ring to fall inwardly and cooperate with each other to form a closure for said body, and means carried by each finger to engage the adjacent finger at each side so as to move all of said fingers in unison.

3. A core catcher including a body, a plurality of inwardly spaced projecting lugs on the lower side thereof, a wire ring supported by said lugs, a plurality of catcher fingers pivoted on said ring to fall inwardly and cooperate with each other to form a closure for said body, and means carried by each finger to engage the adjacent finger at each side so as to hold all of said fingers in alignment, said means including an eye on each finger and a pin passing therethrough transversely of the finger and of a length to project beyond each edge of the finger.

4. A core catcher including a body, a plurality of fingers pivoted thereto, said fingers being shaped to form a closure for said body, stop means carried by the fingers to trap a core and prevent said fingers from moving below a substantially horizontal position and hold down means for said fingers to limit the upward pivotal movement thereof, said last means comprising a ring acting as a housing for said first means while the core is moving through the catcher.

5. A core catcher including a support, a plurality of fingers circumferentially arranged thereon and pivoted to swing radially to form a closure, said fingers being alternate long and short fingers, said long fingers having tapered ends to cooperate with each other and said short fingers also having tapered ends to cooperate with the side edges of said long fingers whereby a closure for soft formations is formed when the fingers are pivoted inwardly.

6. A core catcher including a support, a plurality of fingers circumferentially arranged thereon and pivoted to swing radially to form a closure, said fingers being alternate long and short fingers, said long fingers having tapered ends to cooperate with each other and said short fingers also having tapered ends to cooperate with the side edges of said long fingers whereby a closure for soft formations is formed when the fingers are pivoted inwardly, and stop means carried by the fingers to retain the fingers in alignment.

7. A core catcher comprising a ring, a plurality of fingers pivoted thereto, and a pin extending beyond the edges of each finger and arranged to contact the next adjacent fingers whereby inward movement of one finger will pull in the adjacent fingers.

8. A core catcher comprising a plurality of pivoted fingers, inter-engaging means carried by each finger and engaging the adjacent fingers at each side whereby movement of any finger to core catching position causes movement of the other fingers to core catching position.

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