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J. C. BALLAGH

2,272,395

DRILL PIPE WIPER

Filed May 29, 1939

Fig. 1

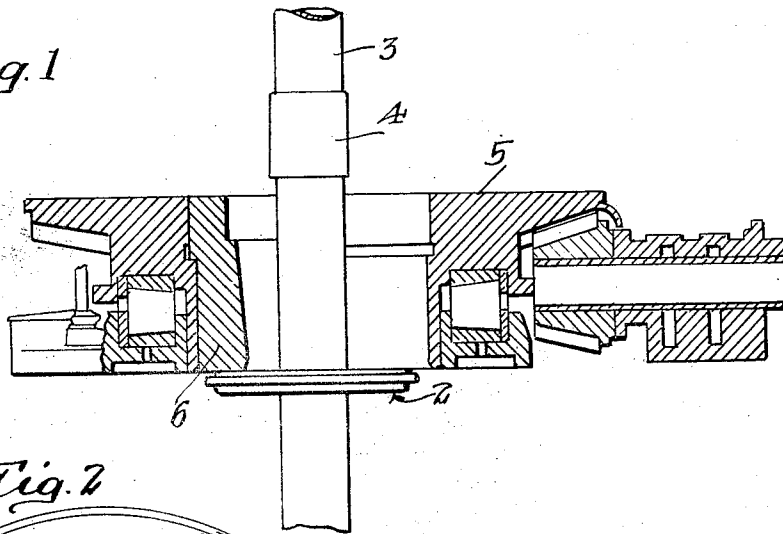


Fig. 2

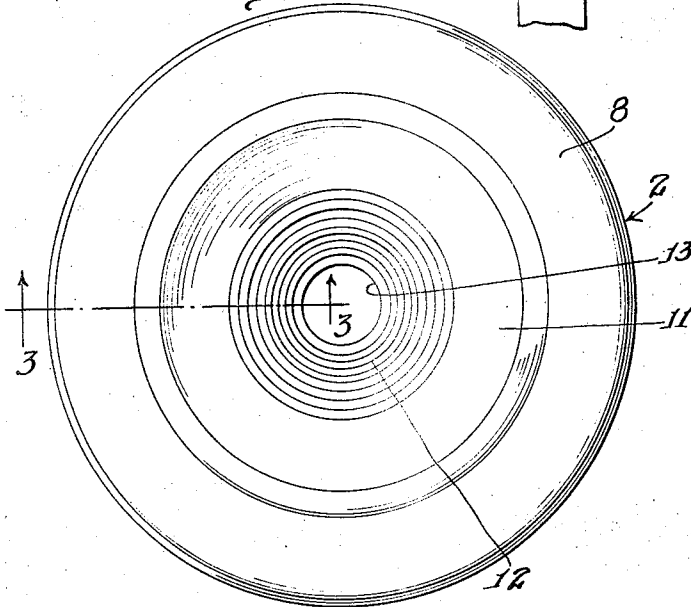


Fig. 4

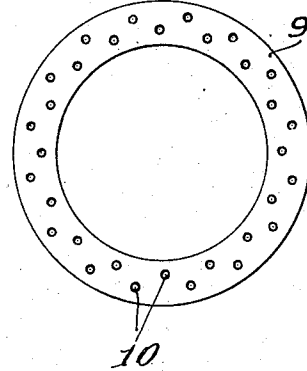
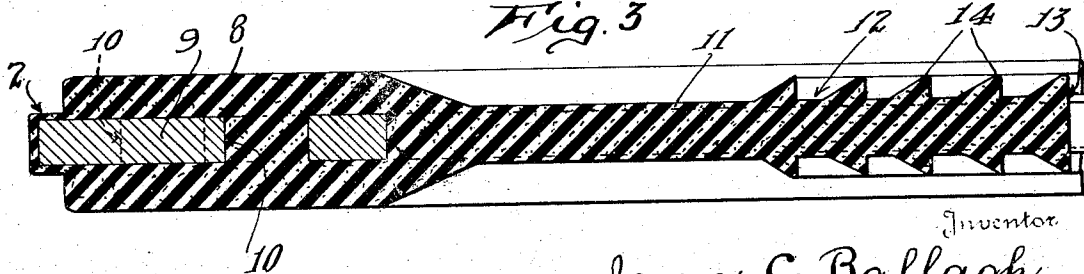


Fig. 3



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DRILL PIPE WIPER

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3 Claims. (Cl. 15—210)

This invention relates to a device to be employed in the drilling of oil wells by the rotary system and to be installed under the bushings of the rotary table for the purpose of covering the drill hole and contacting the drill pipe for the purpose of cleaning the drill pipe from mud during the time the drill pipe is removed from the well hole.

In the rotary system of drilling oil wells a string of pipe, known as drill pipe, is used to transmit power from the rotary table to the drilling bit mounted upon the lower end of the drill pipe. During the process of drilling, the well hole is filled with fluid consisting of a suspension of mud, which is employed for the purpose of removing the cuttings from the well hole and to prevent the walls of the well hole from caving in. The drill pipe and drilling bit must frequently be withdrawn from the well hole. The drill pipe is made up in sections or strings or "stands," and in the removal from the well the drill pipe is pulled up and these "stands" are disconnected one at a time. These "stands" are placed in an assembly at a designated place in the derrick and must later be re-connected as the drill pipe is lowered into the well hole.

In the removal of the "stands" of drill pipe from the well hole a certain part of the mud adheres to the drill pipe, which if allowed to remain drains off onto the floor of the drilling derrick, causing a dangerous condition to exist as the mud is very slippery and the men are liable to slip or fall. To minimize this, it is the present practice to apply wash water to the "stands" of drill pipe as it is being removed from the well hole for the purpose of washing the mud from the drill pipe. This has the disadvantage that it thins the mud in the well hole and changes its consistency. A device adapted to remove mud fluid from the outside of the drill pipe as it is removed from the well hole so as to eliminate the necessity of washing the pipe with water is, therefore, of great benefit to the operator, and the major object of the present invention is to provide such a device. By the present invention, there is provided a disc of flexible material, such as rubber reinforced with fabric, as for example belting material, which disc is adapted to encircle the drill pipe, and it is so designed as to wipe against the drill pipe as it is removed from the well hole for cleaning and removing the mud therefrom. The drill pipe and its various couplings are not of uniform diameter, and it is essential that such device be so constructed that it is capable of passing and

wiping not only the body of the drill pipe itself, but the enlargements thereof which may be provided by the collar and joints.

The drill pipe wiper of the present invention accordingly is constructed with an inflexible disc-like outer portion, preferably reinforced with metal, in order to provide the device with sufficient body to retain its form under the stresses of the different wiping actions, and the substantially inflexible outer portion of the wiper is integrally connected with a relatively flexible web in the center thereof which is joined to the outer portion preferably by a reduced portion for facilitating flexing of the center. Through the center portion of the web there is a hole through which the drill pipe operates, which hole is preferably made somewhat smaller in diameter than the drill pipe itself so that there is a wiping effect on the drill pipe to increase the life of the wiping portion of the disc, it is preferably provided with a series of concentric rings encircling the center hole. These concentric rings or ridges are of such design as to keep the rubber of the disc from tearing and to increase its effective life and effective wiping area by providing a thickened portion at the point of contact with the pipe. Furthermore, the series of concentric rings provide lines by which the operator of the drill pipe wiper can cut the wiper to suit the diameter of the drill pipe which he has occasion to use.

An important feature of the present invention resides in the employment of the reinforced substantially non-flexible outer portion containing a metallic ring molded therein so as to be entirely covered by the rubber composition of the disc itself. This constitutes a valuable feature in that it provides the wiper with the necessary outer rigidity without permitting any metal-to-metal contact between the wiper and other portions of the drilling apparatus, which metal-to-metal contact, if existing, would create a danger of fire.

A further object and advantage of the present invention resides in the fact that the drill pipe wiper operates as an effective cover for the hole of the well, minimizing the danger of losing tools therein.

The drill pipe wiper of the present invention, together with various further objects and advantages of the same, will best be understood from a description of the preferred form or example of a device embodying the invention, and for this purpose I have illustrated a preferred form of such wiper and have described the same

in connection with the accompanying drawing, in which—

Figure 1 is an elevation partially in vertical section showing the drill pipe wiper applied to a drill pipe in position below the rotary table of the drilling web and its intended manner of use.

Figure 2 is a plan view of the wiper.

Figure 3 is an enlarged fragmentary vertical section through approximately one-half of the wiper.

Figure 4 is a plan view of reduced size of a metallic reinforcing in the outer portion of the wiper.

Referring, first, to Figure 1 of the drawing, the drill pipe wiper, generally indicated at 2, is shown as mounted in wiping contact with a drill pipe 3, which is indicated as built of sections connected together by coupling members 4. It is the drill pipe 3 which is coated with mud from the well and the coupling members 4 which are to be wiped clean by the device of the present invention. The drill pipe 3 is indicated as passing through the center opening of a rotary table 5, which is indicated as provided with the usual master bushing 6, but the kelly bushings (not shown) are indicated as moved where it is desired to withdraw the drill pipe from the well hole. The drill pipe wiper of the present invention is of such a diameter as to have its outer portion bear against the master bushing 6 to be restrained therefrom and from being removed from the well hole. The drill pipe wiper 2 is indicated as provided with the outer annular portion 8, which is preferably of relatively greater thickness than the remainder of the wiper, and has embedded therein the metallic disc 9 disposed within the center of the outer portion 8 and entirely covered thereby. The disc 9 is designed to render the outer portion of the wiper substantially non-flexible and is preferably so constructed as to be restrained from movement relative to the rubber composition of the remainder of the wiper. For this purpose, I have indicated the metallic ring 9 as provided with a plurality of apertures 10, and in the construction of the wiper it is to be understood that the wiper is molded around the metallic ring so that the rubber composition thereof extends through the openings 10, forming keys to prevent relative movement between the metal and the rubber composition. The inflexible outer portion 8 of the wiper is provided with a reduced portion or flexible web-like member 11 interconnecting the outer portion 8 with the inner or wiping section 12. The inner or wiping section 12 is provided with an opening 13, which is preferably of a diameter slightly smaller than that of the pipe to be encompassed by the wiper so as to have some wiping pressure against the drill pipe. In order to increase the effective life and likewise the effective wiping area of the portion 12, said portion is provided with a plurality of concentric ridges 14 thereon, which ridges 14 are, it is to be

understood, a part of the wiper and molded on the wiping portion 12 in the operation of producing the wiper. A plurality of such molded ridges 14 is provided for the purpose of both keeping the wiping section 12 from tearing as well as increasing the effective wiping area. The molded ridges 14 also serve a further purpose in that they permit a single drill pipe wiper to be supplied to the driller independent of the size or diameter of the drill pipe to which the wiper is to be applied. The operator may then cut the wiper around any one of the concentric ridges, in accordance with the diameter of the drill pipe to which the wiper is applied, and thus adapt the wiper for use on any desired drill pipe.

It is to be understood that apart from the metallic ring 9 the remainder of the drill pipe wiper of the present invention constitutes one integral body of rubber composition, or in certain cases reinforced rubber, such as belting material and the like, various fabric reinforced rubber compositions being useful in connection with the wiper of the present invention.

While the particular form of drill pipe wiper herein described is well adapted to carry out the objects of the present invention, it is to be understood that various modifications and changes may be made, and the invention includes all such modifications and changes as come within the scope of the appended claims.

I claim:

1. A drill pipe wiper, comprising a reinforcing member in the form of a flat apertured ring, a wiper member of resilient rubber composition having a section enclosing the reinforcing member and extending through the apertures thereof, said wiper member having a central wiping section apertured for receiving the drill pipe with a plurality of adjacent concentric reinforcing rings, the wiper member further providing a flexible web-like section interconnecting the reinforced section and the wiping section.

2. A drill pipe wiper, comprising a wiping member of resilient rubber composition having a central aperture through which a drill pipe may be passed, and reinforcing rings adjacent the central aperture, the wiping member having an enlarged body portion with a metallic flat reinforcing ring embedded therein, said reinforcing ring being apertured and the rubber composition extending through the apertures of the reinforcing ring, the wiper member having a section connecting the enlarged reinforcing section and the section provided with the reinforcing rings.

3. A drill pipe wiper, comprising a resilient rubber composition member of a general flat disc shape with a central aperture for receiving a drill pipe, said member having its outer portion reinforced by a flat apertured reinforcing ring which is embedded therein with the composition of the member extending through the apertures of the reinforcing ring.

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