Oct. 27, 1925. 1,558,878

J. E. HITCHCOCK

SAFETY ATTACHMENT FOR ROTARY HOSE

Filed Feb. 10, 1923

Fig. 1.

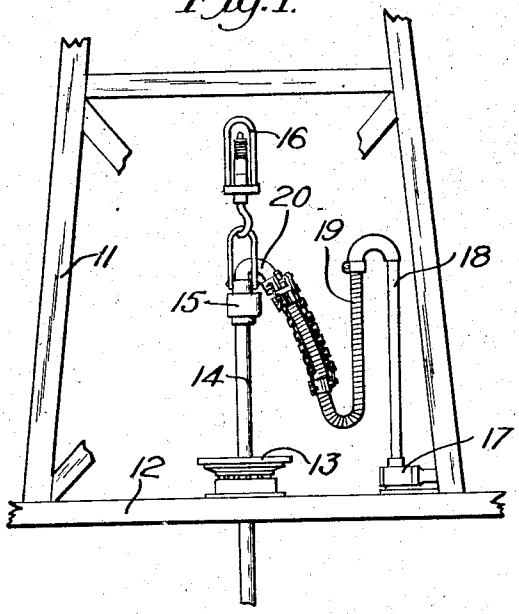


Fig. 2.

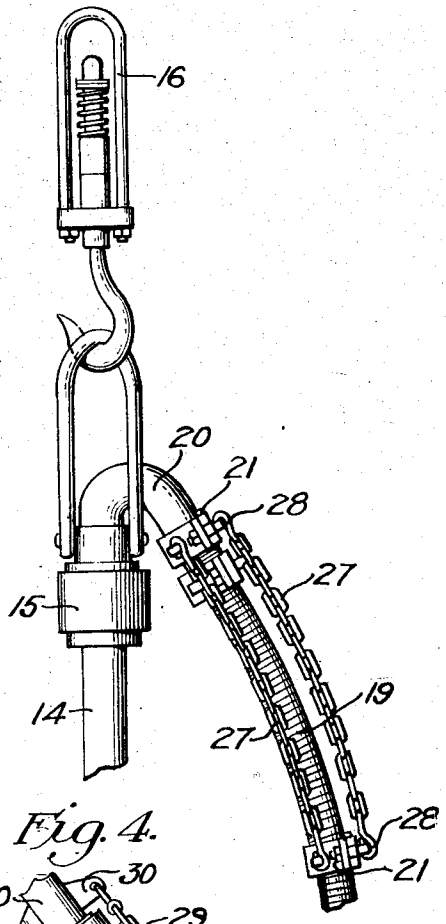


Fig. 3.

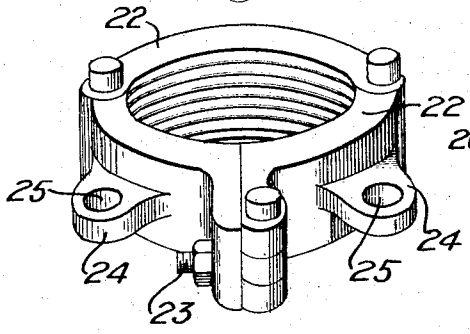


Fig. 4.

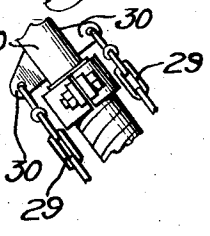
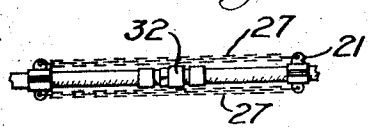


Fig. 5.



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Patented Oct. 27, 1925. 1,558,878

UNITED STATES PATENT OFFICE.

JAMES E. HITCHCOCK, OF FULLERTON, CALIFORNIA.

SAFETY ATTACHMENT FOR ROTARY HOSE.

Application filed February 10, 1923. Serial No. 618,331.

To all whom it may concern:

Be it known that I, JAMES E. HITCHCOCK, a citizen of the United States, residing at Fullerton, in the county of Orange and State of California, have invented a new and useful Safety Attachment for Rotary Hose, of which the following is a specification.

This invention relates to rotary well drilling equipment and constitutes a safety attachment for use with high pressure rotary hose.

In the drilling of wells by the rotary system a suitable cutting tool is rotated in contact with the bottom of the hole being formed by a string of drill pipe which is customarily driven by a rotary table situated on the floor of the derrick, which table engages a drill stem which is screwed on the upper end of the line of drill pipe and is suspended within the derrick from a swivel head. During the drilling operation water or mud is introduced into the drill pipe through a gooseneck situated upon the swivel head and is forced under pressure through an opening in the boring tool situated at the lower end of the string of drill pipe. The mud employed for this purpose is delivered from a mud pump through a flexible hose to the gooseneck of the swivel head. When the depth of the hole being drilled reaches several thousand feet, the resistance against the flow of the mud within the well becomes very pronounced, the pressure required to maintain circulation at times reaching 1500 lbs. It will be seen therefore that the rotary hose is subjected to very heavy stresses and that breakage thereof, or disconnection of joints, is not infrequent. When the hose breaks when under high pressure or any one of the connections thereof becomes detached, the hose, due to the action of the sudden relief of pressure therein, will swing about with considerable force with the result that a serious injury to the workmen often occurs upon the parting or disconnecting of the hose under pressure.

It is an object of my invention to provide a safety attachment which may be employed with a rotary hose and which has the function of restraining the hose against swinging about in case of breakage, therefore preventing injury to workmen. This device provides flexible members which are extended parallel to the hose and are connected to the hose in such a manner that in case of breakage of the hose between the joints of connection, the force of parting is carried by the flexible member, thus restraining the hose against swinging about.

Further advantages of my invention and further objects thereof will be made evident hereinafter.

Referring to the drawing which is for illustrative purposes only,

Fig. 1 is a diagrammatic view showing a manner of employment of the invention.

Fig. 2 is an enlarged fragmentary view showing the swivel head, illustrated in Fig. 1, with one form of my safety attachment in use therewith.

Fig. 3 is a perspective view showing a form of hose clamp which may be employed in securing the flexible members employed in the safety device.

Fig. 4 is a fragmentary view showing the manner in which the end of the swivel gooseneck may be prepared for attachment thereto of the safety device.

In the drilling of wells by the rotary system, it is customary to employ, as shown in the diagrammatic Fig. 1, a derrick 11 having a floor 12 upon which the rotary table 13 is mounted. Through the rotary table 13 a drill stem 14 extends. This drill stem hangs from a swivel head 15 which is supported by suitable tackle 16. From a mud pump 17, mud is delivered through a stand pipe 18 and a flexible high pressure rotary hose 19 to the gooseneck 20 situated on the swivel head, from which swivel head the mud is forced under pressure down through the string of drill pipe, not shown, to the point of cutting operation. The hose 19 is secured to the stand pipe 18 and the gooseneck 20 by couplings upon which the end of the hose is clamped. When the hose is under pressure, strong forces are in operation which tend to cause the pulling of the hose from the coupling member, and it often occurs that the clamps fail to grip the hose tightly, whereupon the end of the hose comes loose and lashes about until the pressure is relieved.

In Fig. 2 of the drawing I show a manner in which the hose is prevented, or restrained, from lashing about in case of breakage of the hose or breakage of the hose or coupling, or of the end of the gooseneck 20. Above the end of the hose 19 a clamp 21 is attached,

and upon the hose, at a distance of four or five feet down from the gooseneck, another clamp 21 is placed. This clamp 21, as shown in Fig. 3, provides a number of members 22 which are hinged together, so that they may be constricted around the hose by a bolt 23, and have lugs 24 projecting therefrom provided with openings 25. Flexible members 27 are extended between the clamps 21 and when so placed extend parallel to the hose, or substantially so, so that in case of breakage of parts between the clamps 21 dangerous movement of the hose will be prevented, due to the fact that the clamps are held in spaced relationship by the members 27. These members 27 preferably consist of chains having hooks 28 or other means which engage the openings 25 in the lugs 24.

As shown in Fig. 4 of the drawing, instead of employing the upper clamp 21, it may be desirable to attach chains 29 to lugs 30 formed upon the gooseneck 20. However, the employment of a pair of clamps 21 makes it possible to employ the safety device at various points upon the hose 19 which is at times desirable when a weak spot appears in some points of the hose; or it may be desirable, as shown in Fig. 5, to place one of the clamps 21 upon each side of a repair coupling 32 which is inserted in the hose at the point of a previous break. These repair couplings employ double end nipples and the hose is attached thereto by clamps, and it often occurs that the hose is pulled from the coupling due to the failure of clamps to hold the ends thereof securely. The chains 27 of the device when employed as shown in Fig. 5 serve to prevent the hose from swinging about in case of failure at the coupling 32, and also relieve the couplings of a certain amount of pressure.

I claim as my invention:

1. In a safety attachment for rotary hose, the combination of: a swivel; a standpipe; a flexible rotary hose connecting said swivel to said standpipe and exposed to special wear and strain in the region of this connection; a clamp secured on said hose between said standpipe and said swivel; and non-extensible flexible means connecting said clamp to said swivel in such manner as to restrain the movements of said hose in case of breakage in said region.

2. In a safety attachment for rotary hose, the combination of: a swivel; a standpipe; a flexible rotary hose connecting said swivel to said standpipe and exposed to special wear and strain in the region of this connection; a clamp secured on said hose between said standpipe and said swivel; and a chain connecting said clamp to said swivel in such manner as to restrain the movements of said hose in case of breakage in said region.

3. In a safety attachment for rotary hose, the combination of: a swivel; a standpipe; a flexible rotary hose connecting said swivel to said standpipe and exposed to special wear and strain in the region of this connection; a clamp secured on said hose between said standpipe and said swivel; and a plurality of chains connecting said clamp to said swivel in such manner as to restrain the movements of said hose in case of breakage in said region.

In testimony whereof, I have hereunto set my hand at Fullerton, California, this 2nd day of February, 1923.

JAMES E. HITCHCOCK.