Jan. 19, 1932. E. P. BARCLAY 1,841,929

DRILL SHAFT BUFFER

Filed Oct. 1, 1928

Fig. 2.

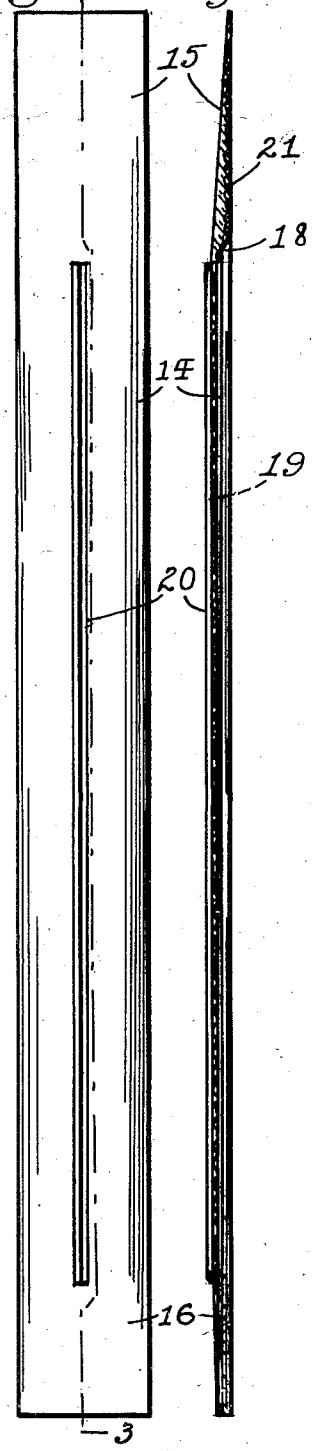


Fig. 3.

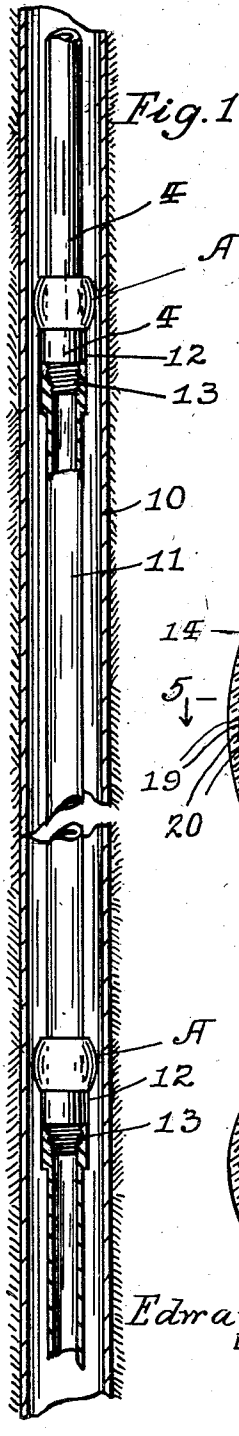


Fig. 1

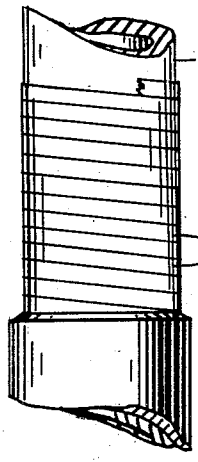


Fig. 6.

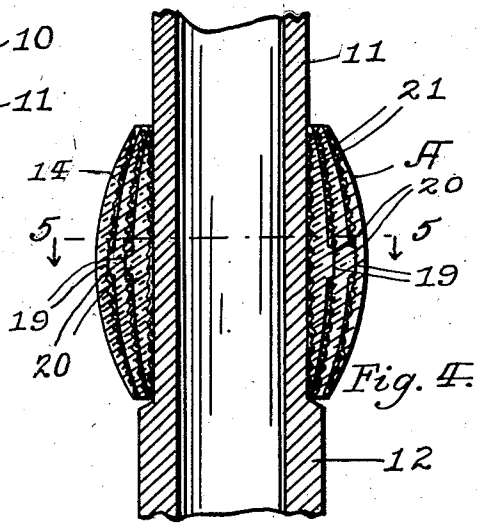


Fig. 4.

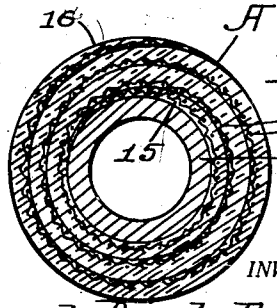


Fig. 5.

INVENTOR.

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UNITED STATES PATENT OFFICE

EDWARD PAUL BARCLAY, OF LOS ANGELES, CALIFORNIA

DRILL SHAFT BUFFER

Application filed October 1, 1923. Serial No. 309,443.

My invention relates to an improved drill shaft buffer and more particularly to a buffer which is adapted to protect the drill shaft or pipe and its joints from injurious contact with well casing. Among the objects of my improvement is to provide a buffer which can easily be applied to a sectional drill shaft so as to protect its joints from contact with well casing either after the sections of the shaft have been assembled or as the sections are being joined and the shaft lowered into a well. Another object is to provide a buffer which can be applied for use without the assistance of any mechanical means and which when applied for use will remain fixed upon the shaft without slipping up and down. A further object is to reduce cost and time consumed in application of buffers to a drill shaft and to reduce friction and power required for drilling. A still further object is to provide an improved buffer which can be applied to a drill shaft without the necessity of breaking the shaft apart into its individual sections.

With these and other objects in view, my invention comprises the features of construction and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Fig. 1 is a cross section of a portion of a deep well with a drill shaft equipped with my improved buffers; Fig. 2 is a plan of my improved buffer before it is applied for use; Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a section taken on the line 4—4 of Fig. 1; Fig. 5 is a section taken on the line 5—5 of Fig. 4, and Fig. 6 is a side elevation of a detail of a drill shaft showing one manner in which the buffer can be secured to the shaft.

In the drawings 10 indicates the usual casing of an oil well and 11 the drill pipe or shaft made in sections and separately joined together by the usual joints 12 of slightly larger diameter than that of the body of the drill pipe and terminating in tapered threaded couplings 13. Upon this drill pipe is placed a series of my improved buffers A. The size of the buffers is greater than the external diameter of the joints 12 and the buffers are placed at suitable intervals so as to protect the pipe from direct contact with the casing. The buffers are not however of sufficient diameter to close the casing against the free circulation of the usual mud laden liquid.

Each buffer consists of a single strip of suitable buffer material 14, which is wound spirally upon itself and upon the drill pipe as a core, close to the joints 12 or in any other suitable position. This strip as shown is concavo convex in cross section, excepting that portion which forms the inner wrap which is convex on its outer surface and straight on its inner surface, said straight surface merging into said concave surface at 18 (see Fig. 3). In this manner when the strip is wound spirally upon itself using the drill pipe as a core a buffer is produced which curves exteriorly up and down on the drill pipe, to produce a guiding buffer surface when the drill pipe is raised or lowered in the well. The inner and outer ends 15 and 16 of the strip 14 taper longitudinally to produce a smooth and even exterior surface on the buffer. As many wraps are cemented together and to the surface of the drill pipe to form a substantial buffer which will not unwind and loosen from the drill pipe. When desired the spiral convolutions of the buffer may be vulcanized together and to the drill pipe to secure the parts together. A central longitudinal groove 19 in the inner surface of the strip and a corresponding rib 20 on the outer surface (see Fig. 4) intermesh and serve to guide and hold the wraps of the strip in position with the side edges disposed evenly. The body of the strip may be made out of rubber or any other suitable material and the inner surface may be formed with an inelastic reinforcing fabric such as canvas 21, molded into the body of the strip. In this manner the buffer may be immovably secured to the pipe without stretching while the surface of the buffer is resilient to protect the pipe against impact and wearing the casing. The strip need not be made concavo convex in cross section within the spirit of my invention, it being obvious that it may be made of substantially even thickness throughout

its body portion and the buffer made substantially straight on its periphery vertically.

The buffer may easily and quickly be assembled on the drill pipe without breaking down joints and when mounted in the manner stated the buffers are prevented from slipping. When desired friction tape 22 may be wound spirally (see Fig. 6) around the drill pipe to secure the buffer thereon. The mud laden liquid in the well acts as a lubricant and the buffer reduces friction of the drill pipe against the casing. Excessive crookedness of the hole drilled is reduced by the use of my improved buffers because of the guiding effect produced between the drill pipe and casing. These effects are particularly advantageous in deep drilling.

In accordance with the patent statutes, I have described the principles of operation of my invention together with the construction which I now consider to represent the best embodiment thereof but I desire to have it understood that the construction shown is only illustrative and that the invention can be carried out by other means and applied to uses other than those above set forth within the scope of the following claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A drill shaft buffer, comprising a strip of buffer material adapted for being wound spirally about itself using the drill shaft as a core, said strip being formed with a longitudinal groove in one surface and a corresponding tongue on its opposite surface adapted to enter said groove when the strip is wound on said shaft and assist in holding the convolutions in place and said convolutions being secured together and to said shaft.

2. A drill shaft buffer comprising the combination with a drill shaft of a plurality of convolutions of buffer material wrapped one upon another and provided with an arcuate outer periphery whereby the buffer is of maximum thickness at a point centrally of its ends and of minimum thickness at its ends.

3. A drill shaft buffer comprising the combination with a drill shaft of a plurality of convolutions of buffer material wrapped one upon another and provided with an arcuate outer periphery whereby the buffer is of maximum thickness at a point centrally of its ends and of minimum thickness at its ends, the innermost convolutions being vulcanized to the drill pipe and the outer convolutions being vulcanized together.

4. A drill shaft buffer comprising the combination with a drill shaft of a plurality of convolutions of buffer material wrapped one upon another and provided with an arcuate outer periphery whereby the buffer is of maximum thickness at a point centrally of its ends and of minimum thickness at its ends, and means formed on adjacent convolutions for inter-locking the convolutions.

5. A drill shaft buffer comprising in combination with a drill shaft, a buffer formed of resilient material spirally wound on the drill shaft, said convolutions being of gradually increasing thickness from the ends thereof inwardly for providing a buffer of maximum thickness intermediate its ends, and means formed on adjacent convolutions for interlocking the convolutions, said convolutions being vulcanized to said drill shaft and to each other.

6. A buffer for drill shafts formed of a plurality of spirally wound convolutions adapted to be wound upon a drill shaft and provided with a longitudinal opening therethru, the outer periphery of said buffer being tapered from its center outwardly to the ends to provide a plano-convex cross section, for the purpose described.

7. A buffer for drill shafts comprising a strip of buffer material wound spirally around a drill shaft, said strip being concavo-convex in cross section except that portion which forms the inner wrap, the inner surface of which portion being straight to fit the drill shaft, and the outer surface of said portion being convex to fit the concave inner surface of the adjacent wrap.

In witness whereof I have signed my name to this specification.

EDWARD PAUL BARCLAY.