Jan. 30, 1962 C. H. COLLETT 3,019,063

PROTECTOR FOR WELL PIPE

Filed Oct. 16, 1959

FIG. 1.

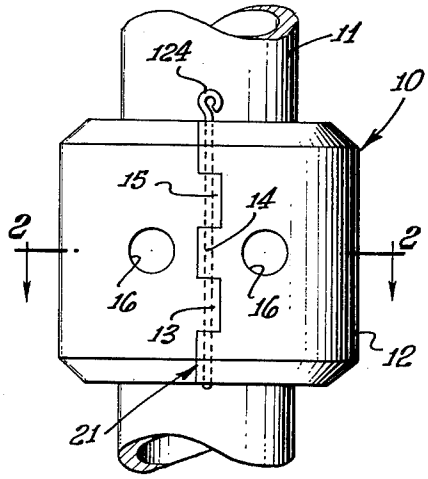


FIG. 2.

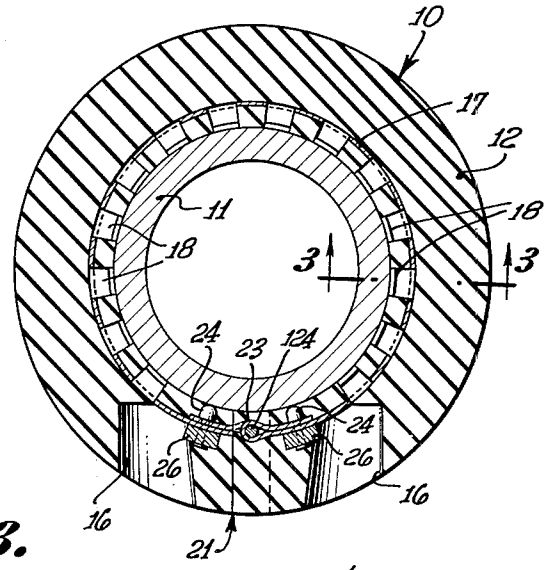


FIG. 3.

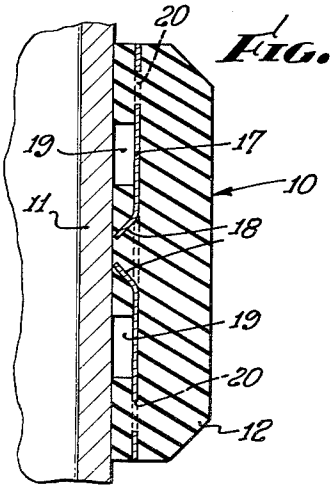


FIG. 4.

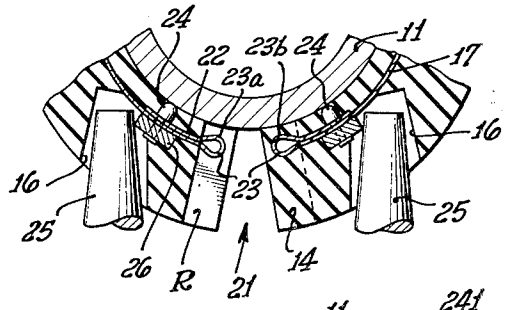


FIG. 5.

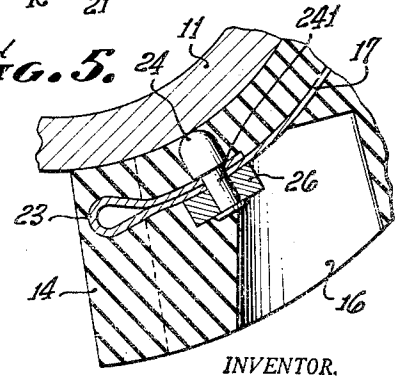
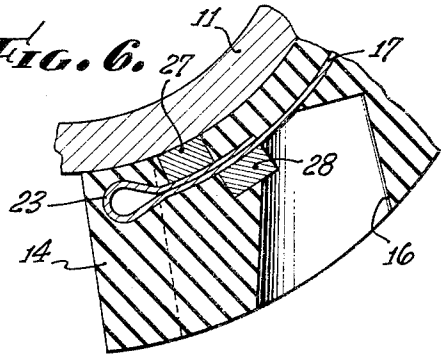


FIG. 6.



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PROTECTOR FOR WELL PIPE

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10 Claims. (Cl. 308—4)

This invention relates generally to improvements in well pipe protectors of the type employing a protective split sleeve applicable to the pipe and held thereto by circumferential tensioning of the sleeve.

More particularly, the invention is directed to improvements in split protectors having an elastomeric body containing and bonded to a metallic member, preferably in the form of a band, which has terminal loops at the body split and which are alignable to receive a locking pin when the band is fully tensioned about the pipe. Protectors of this type are dealt with in my copending application Serial No. 775,182, filed November 20, 1958 on Well Pipe Protector, in which the band member has internal projections adapted to engage and grip the pipe to hold the protector in place. The invention will be described typically in reference to that form of protector.

In application of the protector to the pipe, the band terminals are brought together by an applicator tool which circularly tensions the band and aligns its end loops. Because of the flexibility and freedom of at least one of the loops for lateral deflection, particularly under the applicator tool-imposed forces, the loops may be misaligned even though the band is tensioned, and consequently under such conditions it becomes difficult or awkward to insert the locking pin.

My general object is to assure alignability of the loops upon arrival of the band at fully tensioned condition, by the simple expedient of maintaining the band in predetermined and loop-aligning spaced relation to the pipe surface to which the protector is being applied. For this purpose I provide at the inside of the band and near the loops, projections in the nature of spacers which are pressed by the applicator tool against the pipe surface and thereby caused to assure radial alignability of the loops when they are brought into alignment circumferentially of the pipe. The band also carries means engageable by the applicator tool to transmit tension to the band between the loops, such means typically and preferably being in the form of external projections or cleats located near the band terminals and more or less at the locations of the spacer projections, to assure functionally positive relation between reception by the band of the tensioning forces, and the force transmission engaging the spacer projections against the pipe.

The invention will be understood to better advantage by reference to the accompanying drawing which is to be regarded as illustrative of the invention in certain typical and preferred forms, in which:

FIG. 1 is a side elevation showing the protector applied to the pipe as viewed at the locking pin side of the protector;

FIG. 2 is an enlarged cross-section on line 2—2 of FIG. 1;

FIG. 3 is a cross-section on line 3—3 of FIG. 2;

FIG. 4 is a fragmentary view showing the protector body and internal band spread at the split; and

FIGS. 5 and 6 are fragmentary views illustrating variational forms and relations of the spacer and external plate.

Referring first to FIGS. 1 and 2, the protector generally indicated at **10**, and shown to be applied for example to a drill pipe **11**, comprises a non-metallic body **12** made preferably of elastomeric material such as an oil-resistant rubber, the body being split lengthwise at **21** with the split defined by the interfitting and circularly overlapping portions **13**, **14**, and **15** of the body. At opposite sides

of the split, the body contains a pair of openings **16** for reception of an applicator tool as will appear.

The body is shown to contain a metallic and preferably spring steel band **17** bonded to the rubber of the body and having inwardly projecting teeth **18** engageable against the pipe so as to grip its surface when the band is circularly tensioned. The rubber body may be recessed at **19** above and below the two circular rows of teeth **18**, and the band may contain openings **20** through which the rubber is molded in integrated relation with the band.

At the split **21**, see FIG. 4, the band **17** is terminally doubled upon itself at **22** to form end loops **23** which in the FIG. 2 fully tensioned condition of the band, are alineable to receive a locking pin **124**. As will be understood, the looped terminals **23** are staggered to have an interfitting relation similar to portions **13**, **14**, and **15** of the body, by forming loop portions **23***a* to project into recess R between body portions **13** and **15**, so that they receive between them portion **23***b* of the opposite end of the band contained within portion **14** of the body.

Due to the flexibility of the band terminals, and particularly the free extents projecting out of the rubber, there may be a tendency for the loops to deflect relatively radially of the pipe under the applicator tool-applied forces, so that when circumferentially brought together, the loops may remain misalined. To assure their alinement radially of the pipe, I provide near the looped ends, spacers **24** which may be simply constituted as the heads of fasteners or rivets used to secure together the doubled-over extents **22** of the band.

It will suffice to refer to the applicator tool as comprising a pair of jaws **25** insertable within openings **16** and engageable against suitable means on the band to bring the loops together. Such means preferably comprise metal cleats **26** secured to and across the band either by the fasteners having the heads **24**, or independently thereof as by welding, the cleats desirably being close to the loops and substantially in radial alinement with the spacer projections. Thus as the jaws **25** are brought together to tension the band, the forces applied to the cleats **26** maintain the spacers **24** against the pipe surface and thus assure alinement of the loops in the FIG. 2 condition.

FIG. 5 illustrates the use of a single fastener **241** to secure the cleat **26** to the band and also provide a spacer head **24** imbedded within the body rubber.

FIG. 6 illustrates a variational form of the invention in which the spacers have the form of cleats **27** welded to the inside of the band **17**, more or less opposite the external cleats **28** engageable by the applicator tool.

I claim:

1. A well pipe protector comprising a body adapted to be placed about the pipe and having a lengthwise split, a pipe encircling member contained within the body and having terminal loops deflectable radially of the pipe at the location of said split, and rigid spacer means carried by said member at opposite sides of the loops and engageable against the pipe to effect alinement of the loops radially of the pipe when the loops are brought together circularly about the pipe.

2. A well pipe protector comprising an elastomeric body adapted to be placed about the pipe and having a lengthwise split, a pipe encircling member contained within and bonded to the body and having terminal loops deflectable radially of the pipe at the location of said split, and rigid spacer means carried by said member at opposite sides of the loops and engageable against the pipe to effect alinement of the loops radially of the pipe when the loops are brought together circularly about the pipe.

3. A well pipe protector comprising a body adapted to be placed about the pipe and having a lengthwise split, a pipe encircling member in the form of a metallic band contained within the body and having terminal loops

spaced outwardly from the pipe engaging surface of the body at the location of said split, and rigid spacer means carried by said member at opposite sides of the loops and engageable against the pipe to effect alinement of the loops radially of the pipe when the loops are brought together circularly about the pipe.

4. A well pipe protector comprising a body adapted to be placed about the pipe and having a lengthwise split, a pipe encircling member contained within the body and having terminal loops deflectable radially of the pipe at the location of said split, rigid spacer means carried by said member at opposite sides of the loops and engageable against the pipe to effect alinement of the loops radially of the pipe when the loops are brought together circularly about the pipe, and means carried by said member at opposite sides of said loops and engageable by a tool to press said spacer means against the pipe and constrict the member to loop-alined condition about the pipe.

5. A well pipe protector comprising an elastomeric body adapted to be placed about the pipe and having a lengthwise split, a pipe encircling member contained within the body and having terminal loops spaced outwardly from the pipe engaging surface of the body at the location of said split, rigid spacer means carried by the inside of said member at opposite sides of the loops and engageable against the pipe to effect alinement of the loops radially of the pipe when the loops are brought together circularly about the pipe, said member being in the form

of a metallic band bonded to the body, and means carried by the outside of said band at opposite sides of the loops and engageable by a tool insertable through openings in the body at opposite sides of the split to tension the band to loop-alined condition about the pipe.

6. A protector according to claim 5, in which said spacer means are fasteners extending through and securing together end portions of the band doubled on themselves to form terminal loops.

7. A protector according to claim 5, in which the last mentioned means are metallic cleats on the band.

8. A protector according to claim 5, in which the last mentioned means and spacer means are substantially alined radially of the pipe.

9. A protector according to claim 1, in which said body is formed of elastomeric material and said member is a metallic band bonded thereto and having projections adapted to engage and grip the pipe surface.

10. A protector according to claim 5, in which said band carries tooth-like projections adapted to engage and grip the pipe surface.

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