Jan. 19, 1954 J. E. HALL, SR 2,666,241

BAND END CONNECTION

Filed March 23, 1950

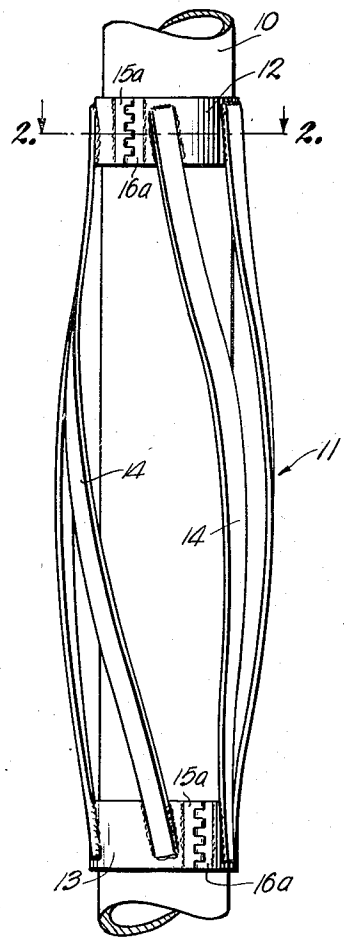


Fig. 1.

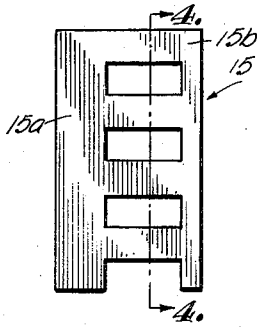


Fig. 3.



Fig. 4.

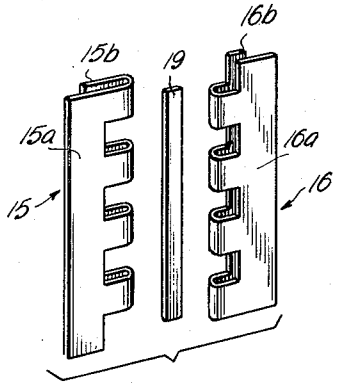


Fig. 5.

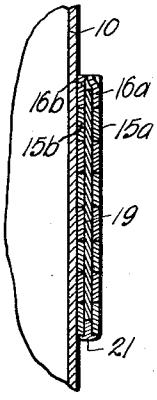


Fig. 6.

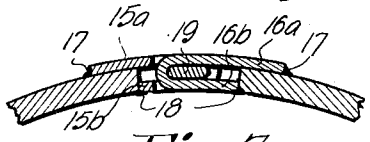


Fig. 7.

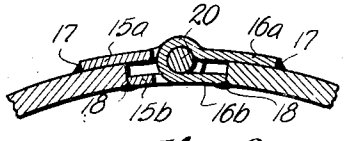


Fig. 8.

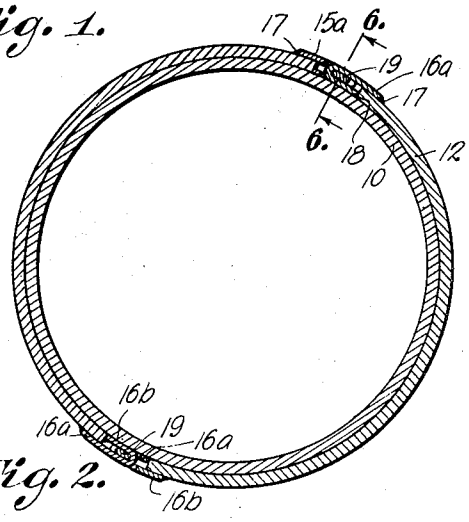


Fig. 2.

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BAND END CONNECTION

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4 Claims. (Cl. 24—201)

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This invention relates to improvements in fasteners, and refers more particularly to fastening devices for use on scratchers and centralizers employed in oil production to condition the well bore prior to cementing.

The essence of the invention resides in the construction of the collar extremities by which the tools are attached to the casing or cylindrical objects lowered in the well during the conditioning operation, including use on logging devices. The collar extremities are performed and doubled back to form registering keeper loops through which pintles are threaded. The perforations are so positioned as to produce staggering of the loops on abutting collar extremities and registration of said extensions with the cutaway portions on the opposite collar extremities.

An object, therefore, is to provide separable fasteners for the collars of scratchers and centralizers which permit easy attachment or mounting, and easy removal to and from the casing or support.

Another object is to provide separable fasteners of relatively rugged construction capable of withstanding the abuse to which the collars are subjected in oil well conditioning operations.

Another object is to provide a fastener construction easily applied to the collars of the tools by welding the edges of separate perforated strips forming the keeper loops of the collar.

Other objects will be apparent from the description which follows.

In the accompanying drawings which form a part of the specification and are to be read in conjunction therewith, and in which like reference numerals are employed to indicate like parts in the various views:

Fig. 1 is a side elevational view of a spiral centralizer utilizing fasteners which embody the invention.

Fig. 2 is a view taken along the line 2—2 in Fig. 1, in the direction of the arrows.

Fig. 3 is an enlarged detail of a hinge plate showing the manner of perforating before being doubled back to form the keeper member.

Fig. 4 is a view taken along the line 4—4 in Fig. 3, in the direction of the arrows.

Fig. 5 is an enlarged disassembled perspective view of the keeper members and pintle before being welded to the collar.

Fig. 6 is a sectional view taken along the line 6—6 in Fig. 2, in the direction of the arrows.

Fig. 7 is a sectional view taken through one of the fasteners utilizing a flat pintle.

Fig. 8 is a sectional view taken through one of

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the fasteners in which a pintle of circular cross section is used, so that the fastener serves as a hinge between the sections of the collar.

Referring to the drawings, at 10 is shown a casing such as is commonly used in oil well production. On the casing is mounted a spiral centralizer, designated as a whole by the numeral 11. The centralizer has an upper collar 12 and a lower collar 13 with spiral bands or blades 14 extending between the collars and welded thereto at their ends. Collars 12 and 13 are split diametrically, as shown in Fig. 2, and to the abutting edges or extremities of the collars are welded keeper members 15 and 16, best shown in Fig. 5. The manner of welding the keeper member to the collars is shown in Figs. 7 and 8. It will be noted that the outer flanges of the hinge, or those portions designated by the numerals 15*a* and 16*a*, are welded to the outside of the collars, as shown at 17, while the shorter turned back portions of the keepers, designated by the numerals 15*b* and 16*b*, respectively, are welded flush with the inside surface of the collar, as shown at 18.

In Fig. 3 is indicated the method of perforating the keeper plates shown at 15. The same keeper may be used on opposite sides of the engaging collar extremities by turning the keeper plate through 180° so that the bottom becomes the top. The perforations through the plates are so located that when the plates are doubled back, as shown in Fig. 5, the tab extensions or loops of one plate register with the cutaway portions of the other so pintle 19 may be threaded therethrough to hold the collar extremities together.

In Fig. 8 a similar type of construction is shown in which a cylindrical pintle 20 is used in place of the flattened strip 19, shown in Fig. 7, so that the two sections of the collar are hinged together and can swing about the pintle as a pivot. In the bottom of the lowest doubled back portion of keeper member 16 is a retaining stop 21, shown in cross section in Fig. 6. This stop prevents the pintle from sliding downwardly through the loops and after the pintle has been dropped in place, one side of the upper loop of plate 15 is bent inwardly, as shown in Fig. 6, to prevent dislodgement of the pintle upwardly from the loops.

While in the drawings there is shown application of the fasteners only to a centralizer, it is contemplated as well that fasteners of a like construction may be used on the collars of scratchers. When so used it has been found necessary to have but a single fastener in the cylindrical collars since the collars are sufficiently flexible to permit deformation so they can be easily wrapped about

the casing. In other words, the opening between the collar ends can be widened greater than the casing diameter.

While the keeper members shown in the drawings are indicated as separate plates perforated, doubled back and then welded to the extremities of the collar, it is also contemplated that the extremities of the collars themselves may be perforated in the manner shown and doubled back, thus avoiding the separate welding operation necessary where separate plates are employed.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the invention.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter set forth in the specification or shown in the drawings is to be interpreted as illustrative and not in a limiting sense.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

Having thus described my invention, I claim:

1. A fastener element of the character described, comprising a member having a plurality of aligned perforations and having a flange portion extending along said perforations across one side of the aligning edges of the perforations and having another flange extending along said perforations at the opposite side of the perforations, one of said flanges being wider than the other flange, said member having a re-entrant bend across said perforations, with the portions of said member between said perforations constituting aligned loops adapted to receive a pintle therein, whereby said fastener element is adapted to be secured to one end of a split collar of an oil well scratching or centering tool, or the like, with the wider flange of said member overlapping and welded to the outer surface of the collar and the other flange of said member abutting endwise and welded to the end surface of the collar with the inner surface of said member flush with the inner surface of the collar and with said loops of said members spaced forwardly of the end of the collar.

2. A fastener of the character described, comprising, in combination, two complementary fastener elements, each of said elements having a plurality of aligned perforations and having a flange portion extending along said perforations across one side of the aligning edges of the perforations and having another flange extending along said perforations at the opposite side of the perforations, one of said flanges being wider than the other flange, said member having a re-entrant bend across said perforations, with the portions of said member between said perforations constituting aligned loops adapted to receive a pintle therein whereby said fastener element is adapted to be secured to one end of a split collar of an oil well scratching or centering tool, or the like, with the wider flange of said member overlapping and welded to the outer surface of the collar and the other flange of said member abutting endwise and welded to the end surface of the collar with the inner surface of said member flush with the inner surface of the collar and with said loops of said member spaced forwardly of the end of the collar, the loops of said members being staggered relatively to each other whereby the loops of said members align with each other when the members are brought together, and a pintle removably insertable into the aligning loops of both members whereby the fastening elements and the ends of the collar to which they are secured are releasably fastened together.

3. A fastener as set forth in claim 2, and which includes a rigid stop at the bottom of the lowermost loop of the fastener adapted to stop and hold the pintle against passing downwardly out of said loops.

4. A fastener as set forth in claim 3, in which the top of the upper loop of the fastener is deformable inwardly, whereby a pintle buried within said loops is confined against upward displacement from said loops.

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