

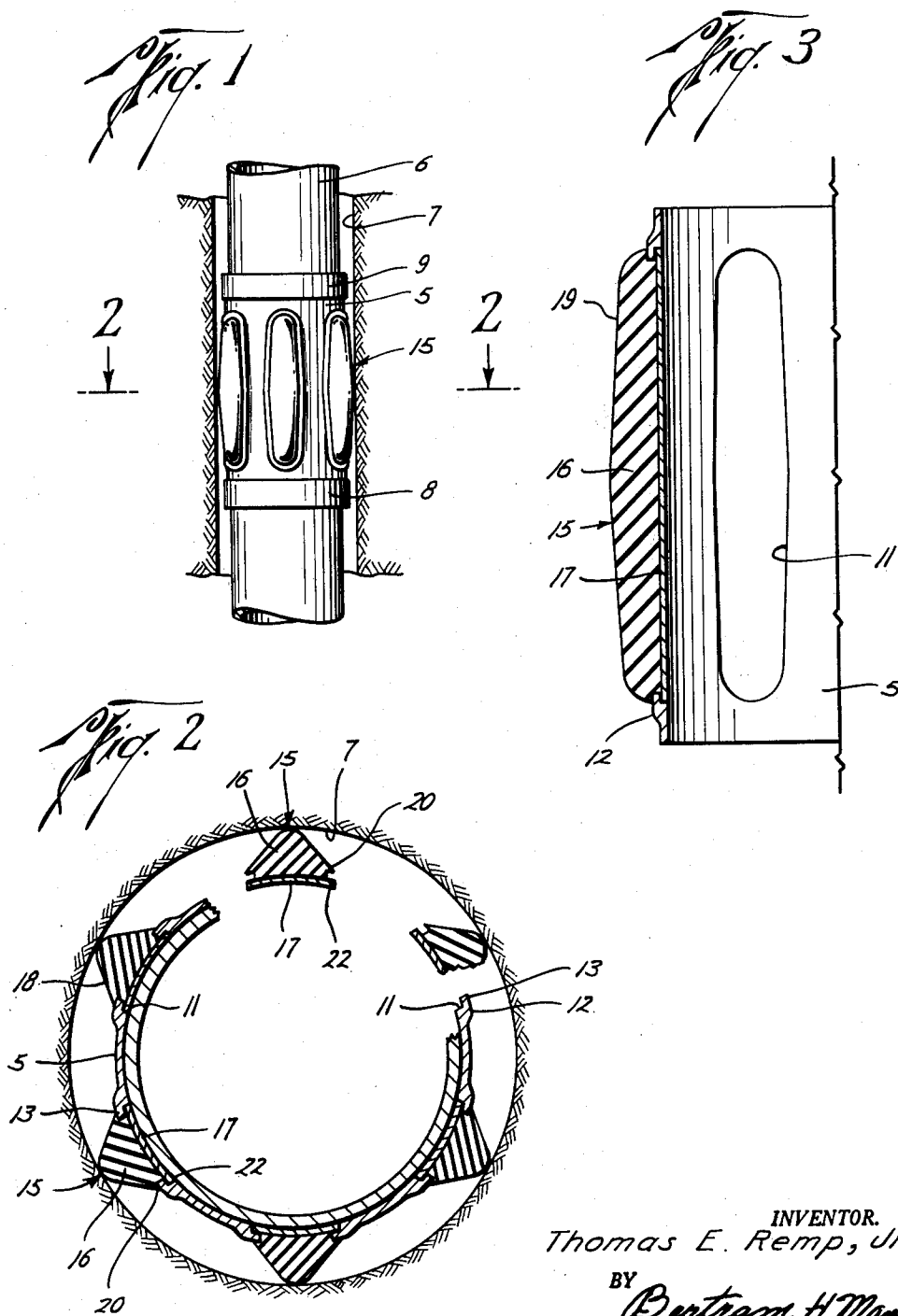
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CASING CENTRALIZER WITH REPLACEABLE WINGS

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CASING CENTRALIZER WITH REPLACEABLE WINGS

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This invention relates to devices for centering or positioning tubular members within encompassing walls. An example of such device is a centralizer for a casing or liner string inserted in an oil and gas well.

Such centralizers, customarily, are used in maintaining casing properly positioned in the bore hole preparatory to cementing. However, since these bore holes vary considerably in diameter, the centralizers likewise must vary, and with the ordinary types of centralizers this requires the stocking of various sizes by supply houses.

Furthermore, in current types of centralizers having rubber wings for providing positive positioning and for reducing electrolytic effects, the mounting of the wings has not been entirely satisfactory.

Accordingly, an object of the present invention is to provide a centering device of the above type having replaceable, yet firmly anchored rubber spacer ribs.

Another object is to provide such a device with means for substituting spacer ribs of various widths so as to vary the outside diameter of the device.

Another object is to provide improved means for mounting the rubber ribs or wings on the centralizer body.

These objects and others hereinafter appearing are attained by the device illustrated in the accompanying drawing, in which:

FIG. 1 is an elevation of the novel centralizer device mounted on a casing within a bore hole;

FIG. 2 is a transverse section taken on line 2-2 of FIG. 1; and

FIG. 3 is an axial half center section of the device.

In general, the novel centralizer consists of a tubular body which fits more or less snugly upon the casing or other tubular member to be centered and has a plurality of elongated recesses or slots arranged symmetrically therearound. Located in each slot is a separately-formed spacer rib or wing each consisting of a body of rubber or rubber-like material and a rigid plate-like base. The body and base form parallel peripheral shoulders which are positioned to overlie the periphery of the receiving slot in the tubular body to position the spacer rib. The peripheral shoulder on the rubber body portion is flexible or distortable to permit the body to be inserted from the inside, while the inner rib formed by the base portion is rigid to prevent the spacer rib from being forced outwardly entirely through its receiving slot.

With further reference to the drawing, the centralizer consists of a tubular body portion 5 shown mounted upon a casing section 6 inserted in a bore hole 7, as of an oil or gas well. The centralizer is shown secured in position by stop collar devices 8 and 9, but any other suitable positioning means may be utilized. Tubular body 5 is provided with six elongated recesses or slots 11, each in an outwardly bulged portion 12 which forms a lip 13 constituting the periphery of slot 11.

Received in recesses or slots 11 are identical separately formed spacer rib members, generally designated 15. Each rib member consists of a body portion 16, preferably of rubber or other rubber-like or similarly resilient, form sustaining material, and a plate-like base portion 17 of metal or other rigid material. Body portion 16 has tapering side and outer walls, as at 18 and 19 which, at their basal extremities terminate in a peripheral

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shoulder 20 which slightly overlies the upper surface of lip 13 of the receiving recess or slot and surrounds portion 16. Base portion 17 extends peripherally slightly beyond the body portion, as at 22, to form a second peripheral shoulder which underlies the inner surface of lip 13. Shoulder 22 extends entirely around the spacer rib and is parallel to and spaced slightly from the previously mentioned peripheral shoulder 20 on the body portion. These two shoulders form, in effect, a peripheral groove which, in the assembly, snugly receives peripheral lip 13 of the receiving slot.

To assemble the spacer rib with the tubular body, while disassembled from the casing, the resilient tapering body portion 16 is inserted into a slot 11 from the inside and then forced outwardly into position, outer peripheral shoulder 20 flexing or distorting to permit this action. However, rigid peripheral base shoulder 22, in the assembly, lodges beneath the lip 13 of the receiving slot or recess to effectively prevent the forcing of the spacer rib outwardly entirely through its receiving slot. In other words, the spacer rib is firmly lodged in the assembled position shown in the figures.

When the centralizer is mounted upon a tubular member, such as casing 6, the spacer ribs are firmly held thereby against inward displacement, even when the assembly is lodged in the bore hole 7. However, when the centralizer is not applied to casing, the spacer ribs can be removed by inward pressure applied to their outer surfaces causing the shoulder to flex so as to clear lip 13.

Of course, the outside diameter of the centralizer depends upon the size of ribs utilized. Accordingly, it is merely necessary for the supply store to stock a limited number of the tubular bodies and also stocks of the separate spacer ribs of various sizes which can be assembled with the uniform tubular bodies in accordance with requirements of particular orders. This reduces the inventory which a supplier or driller must maintain and, accordingly, the cost of the centralizer.

The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all such modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A centralizer for a tubular member comprising a tubular body for reception around the member and having a slot and a spacer rib inserted in said slot and projecting radially outwardly from said body, said rib having a body portion of resilient material and a plate-like base portion of rigid material, said base and body portions terminating peripherally in parallel shoulders forming a groove therebetween shaped to embrace the periphery of the slot in said tubular body for maintaining said spacer rib properly positioned.

2. A centralizer as described in claim 1 in which the walls of said body portion taper radially outwardly from the peripheral shoulder thereon and said rib is distortable to facilitate insertion of said rib into the slot in said tubular body from the inside.

3. A centralizer as described in claim 1 in which said tubular body is provided with a plurality of elongated slots each extending axially and each having one of said spacer ribs lodged therein.

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