United States Patent [19]

O'Brien et al.

[11] **3,869,156**

[45] **Mar. 4, 1975**

[54] **JOINTS**

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[21] Appl. No.: **349,840**

[30] **Foreign Application Priority Data**

Apr. 10, 1972 Australia 8546/72

[52] **U.S. Cl.** ..... **285/374,** 24/249 R, 285/344, 285/403, 285/421, 339/274

[51] **Int. Cl.** **F16l 19/06**

[58] **Field of Search** ..... 285/339, 421, 177, 178, 285/314, 374, 403, 307, 358, 359, 394, 395; 403/352, 351; 279/81, 1 T; 339/270 R, 274; 24/132 AC, 132 R, 249 R, 249 PC

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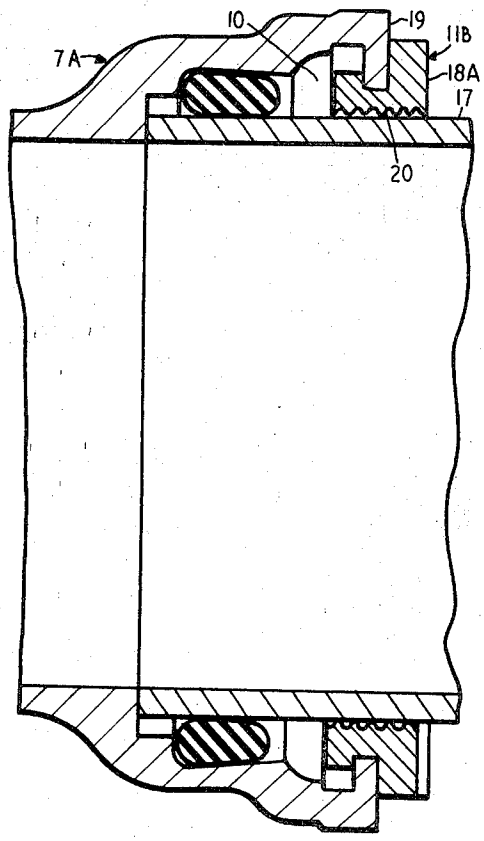
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Assistant Examiner—Moshe I. Cohen
Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] **ABSTRACT**

In a spigot and socket pipe joint, radially inward flanges, each reducing in width from one end to the other, are formed on the outer end of the socket so as to provide a circumferential space of varying width between the flange and the spigot. A circumferential wedge channelled to receive the flange is inserted in the wide flange-to-spigot space and is then displaced circumferentially to wedge the flange and spigot together.

3 Claims, 12 Drawing Figures



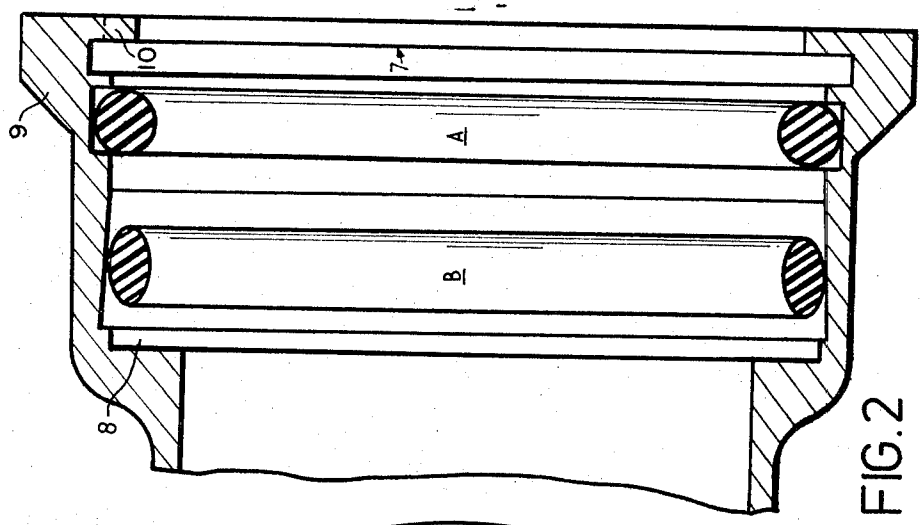


FIG.2

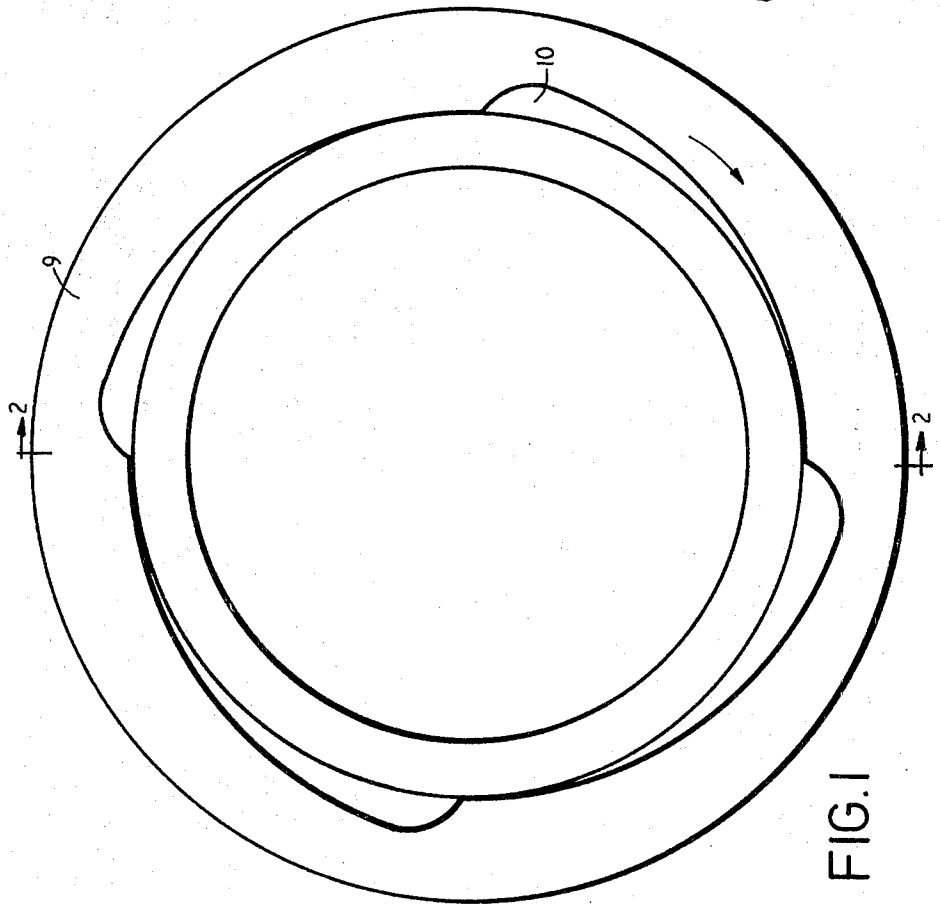
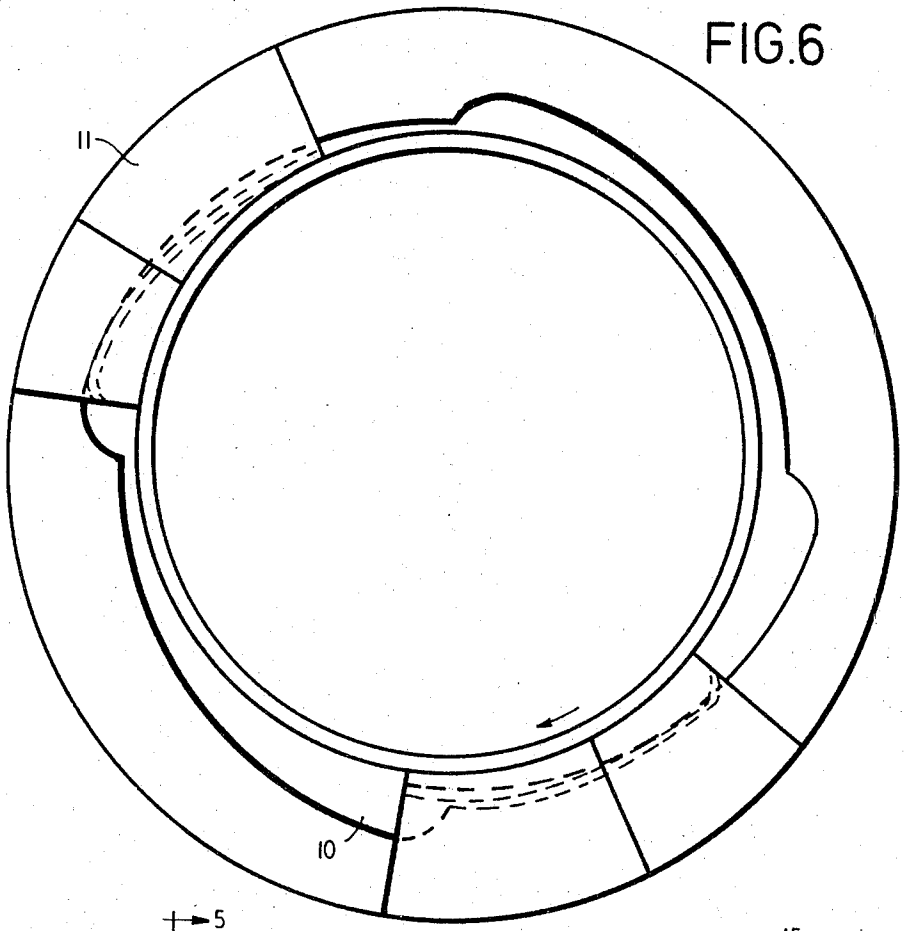


FIG.1

FIG.6



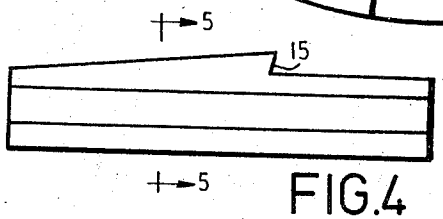


FIG.4

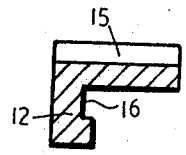


FIG.5

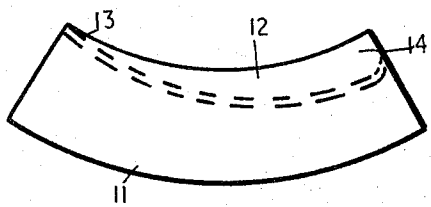


FIG.3

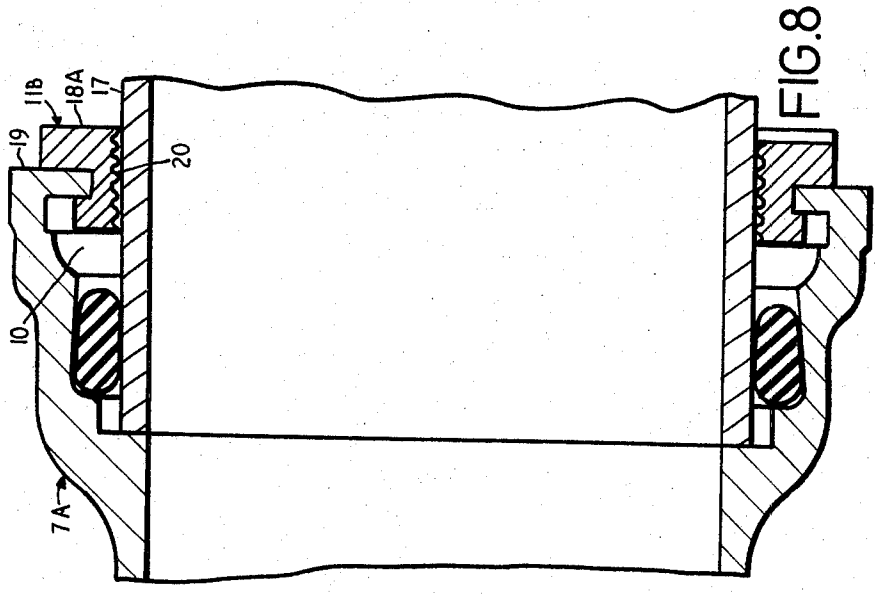


FIG.8

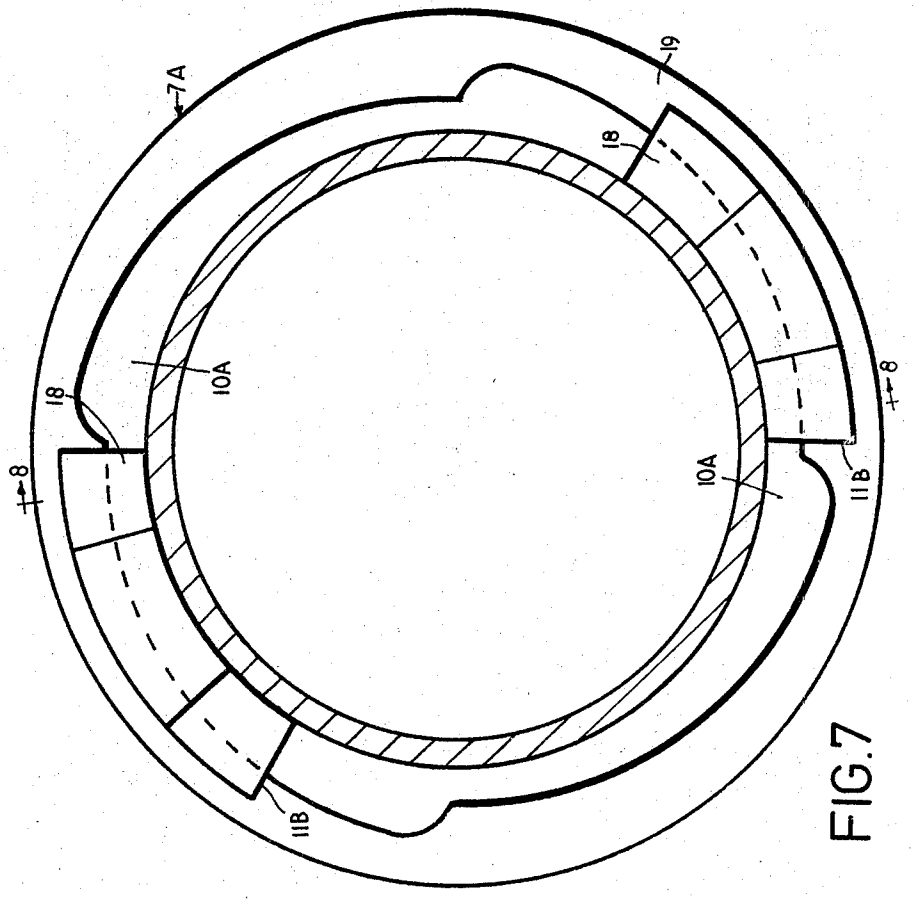


FIG.7

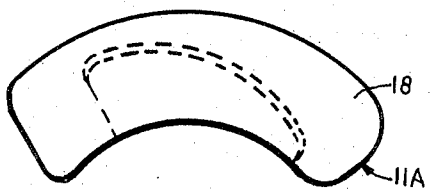


FIG.9

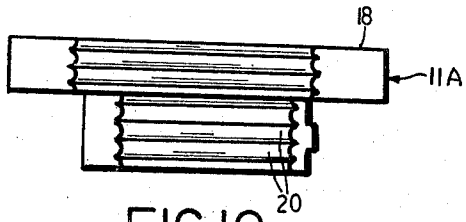


FIG.10

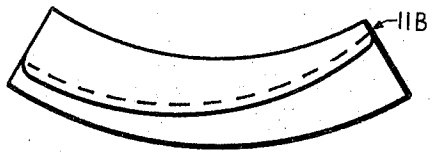


FIG.11

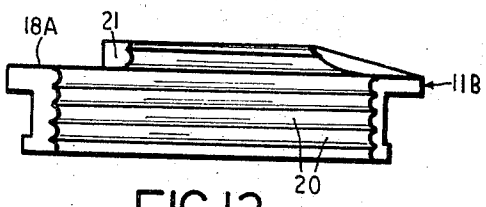


FIG.12

JOINTS

BACKGROUND OF THE INVENTION

This invention relates to spigot and socket joints of the general type illustrated in the accompanying drawings in which a socket has an inward shoulder to receive the end of an associated spigot and a sealing ring surrounds the spigot inside the socket.

In previous spigot and socket joints of this type the principal sealing effect was achieved by the sealing ring being tightly clamped between the inside of the socket and the outside of the spigot.

SUMMARY OF THE INVENTION

This arrangement has certain disadvantages and the object of the present invention is substantially to overcome these disadvantages. This is achieved in the present instance by locating in the space between the outside of the spigot and the inside of the socket two or more wedges adapted in one position to have a small clearance between the outside of the spigot and the inside of the socket, the inside of the socket and the wedges being so formed that on circumferential displacement of each wedge it jams tightly between the outside of the spigot and the inside of the socket.

The invention in one form is a spigot and socket pipe joint wherein the socket has an axially inward shoulder to limit axially inward movement of the spigot, a resilient sealing ring in the space between the spigot and socket compressed so as to engage tightly the inside of the socket and the outside of the spigot and means for detachably retaining the spigot in the socket. This means comprises at least one radially inward circumferential flange on the outer end of the socket, each flange having one or more circumferential sections, the free inward edge of each flange section being widely spaced from the outside of the spigot at one end and converging towards the outside of the spigot towards its other end, and at least one circumferential wedge receiveable in the wide space, channelled along its outer edge to receive the flange and displaceable circumferentially towards the narrow space so as to wedge the socket and spigot together against relative axial displacement.

BRIEF DESCRIPTION OF THE DRAWINGS

Three preferred forms of the invention are shown in the accompanying drawings in which:

FIG. 1 is a plan view of the end of the socket according to a first form of the invention,

FIG. 2 is a section on the line 2–2 of FIG. 1,

FIG. 3 is a plan view of a typical wedge,

FIG. 4 is a side elevation of the wedge,

FIG. 5 is a section on the line 5–5 of FIG. 4,

FIG. 6 is a plan of the socket and spigot showing the wedges in the locking position,

FIG. 7 is a plan view of a second form of the pipe socket,

FIG. 8 is a section on the line 8–8 in FIG. 7,

FIG. 9 is a plan view of a wedge used with the second form of the socket shown in FIGS. 7 and 8,

FIG. 10 is an inner side elevation of the wedge shown in FIG. 9,

FIG. 11 is an inverted plan of an alternative form of wedge for use with the socket shown in FIGS. 7 and 8 and

FIG. 12 is an inner side elevation of the wedge shown in FIG. 11.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 2, a typical "O" ring seal is depicted in its outer position A and its inner sealing position B. In its inner position B it has been distorted when jammed between the outside of the spigot (not shown) and the inside of the socket 7. The socket is generally of conventional shape having an axially inner shoulder 8 projecting radially inwardly. At its outer end, as shown in FIGS. 1 and 2, socket 7 has a radially inward flange 9 provided with four cut away portions or scallops 10. At its wide end each scallop receives a wedge 11 to be described later and when the wedge is displaced in the direction of the arrow the jamming action takes place.

In FIGS. 3, 4 and 5 the lower portion 12 of the lower or depending portion of the wedge varies in width from a minimum at 13 to a maximum at 14. The upper or outer portion of the wedge has a shoulder 15 which enables the wedge to be readily tapped so as to move circumferentially from the loose to the tight position. The channel 16 of the depending portion of the wedge and associated flange 9 prevent axially outward movement of the wedge once it has been moved into the jammed position.

The invention is not limited to the case where there are four scallops in the flange 9 and four wedges 11. The number of scallops and wedges may be varied.

A second form of the socket 7A is shown in FIGS. 7 and 8. The cut away scallops 10A are provided as in the first embodiment, but two alternative forms of wedge 11A and 11B can be used to secure a pipe 17 in place.

In the first form of wedge 11A, shown in FIGS. 9 and 10, the upper land 18 of the wedge is narrower than the outer face 19 of the socket 7A. Also the inner face of the wedge 11A is provided with a series of parallel arcuate serrations 20 which grip the pipe 17 and resist axial displacement of said pipe from its socket.

The second form of wedge 11B, shown in FIGS. 11 and 12 is also provided with the serrations 20, but its upper land 18A is provided with a raised shoulder 21 which serves the same purpose as the shoulder 15. The wedge 11A is suited to pipes and sockets of small diameter, whilst the wedge 11B is intended for use with large diameter installations.

What we claim is:

1. A socket and spigot pipe joint wherein the socket has an axially inward shoulder having an inner diameter smaller than the outer diameter of the spigot limiting axially inward movement of the spigot, a resilient sealing ring in the space between the spigot and socket compressed between the inside of the socket and the outside of the spigot and means for detachably retaining the spigot in the socket, said means comprising at least one radially inward circumferential flange on the outer end of the socket, each said at least one flange having at least one circumferential section, the free inward edge of each flange section being widely spaced from the outside of the spigot at one end and converging towards the outside of the spigot towards its other end, and a separate circumferential wedge having an outer portion and a depending portion extending therefrom received in the wide space of each said at least one flange, each said wedge depending portion being channelled along its outer edge receiving the respective flange and having a thickness, with respect to the radius

of said spigot, greater at the trailing end than the leading end, each said wedge depending portion being circumferentially displaceable towards the narrow space of the respective flange so as to wedge the socket and spigot together against relative axial displacement.

2. A joint as in claim **1,** wherein the radially inward surface of each wedge depending portion is smooth.

3. A joint as in claim **1,** wherein the radially inward surface of each wedge depending portion is serrated.

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