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**F16L 55/16**

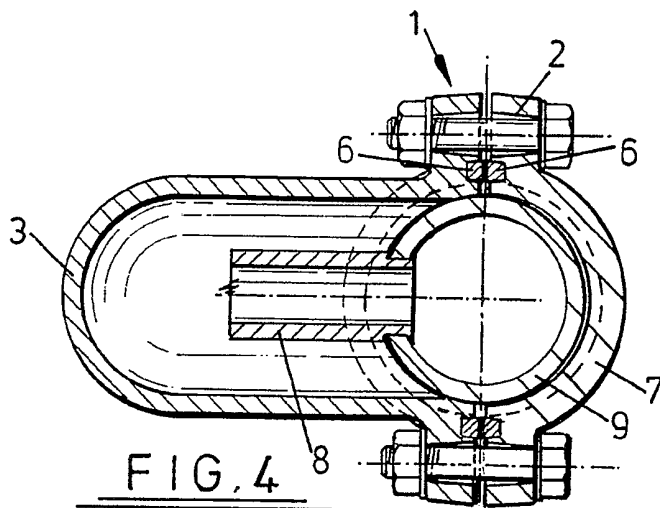
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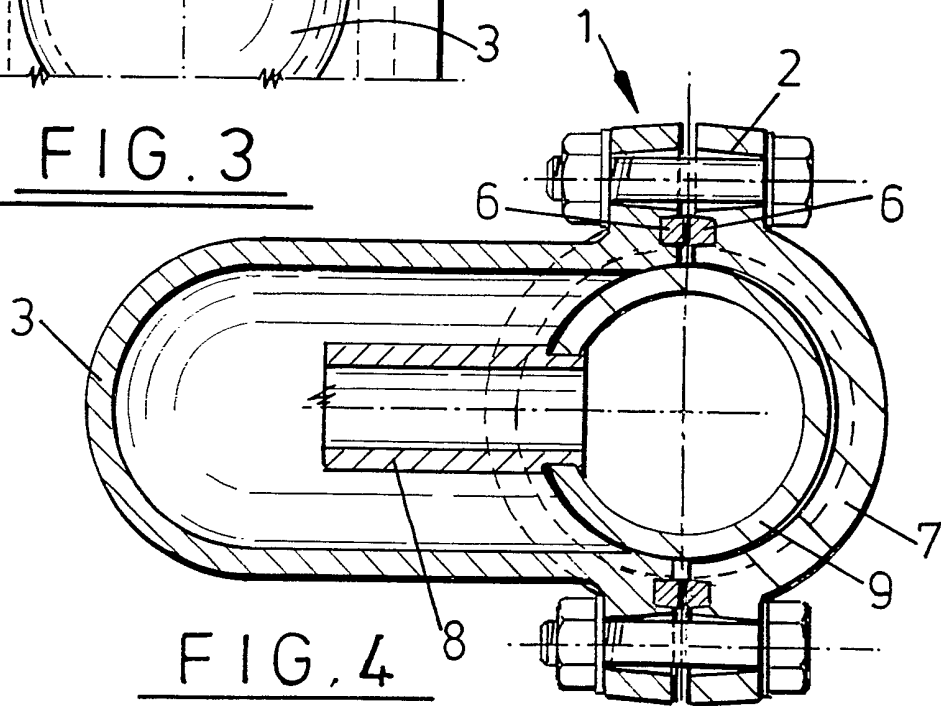
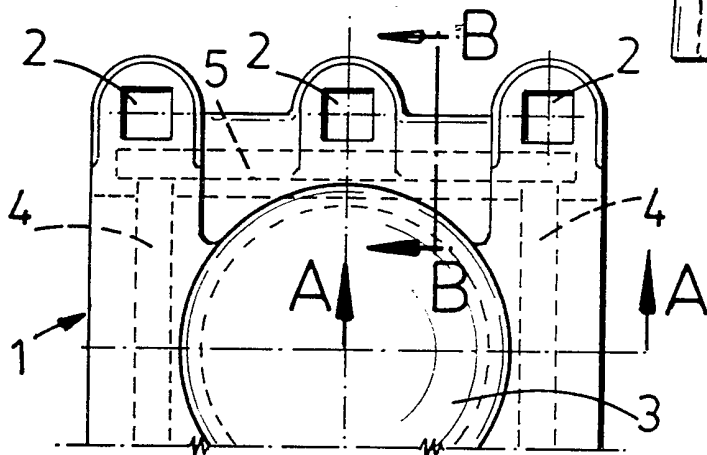
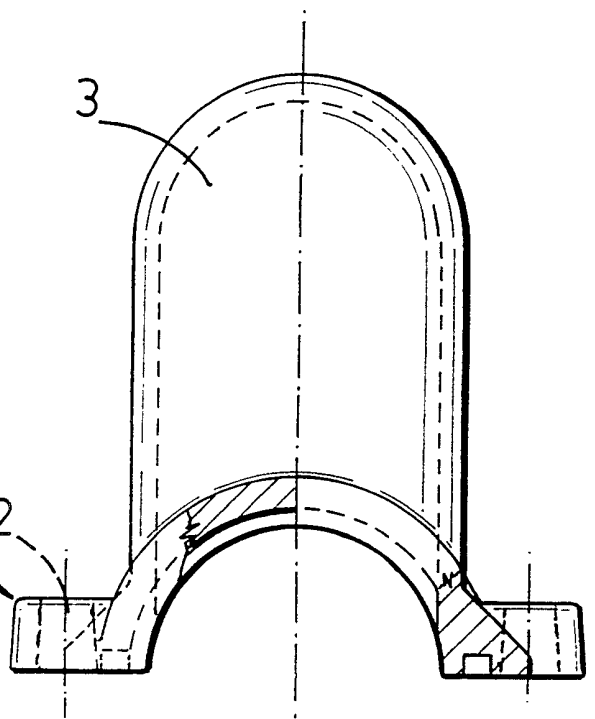
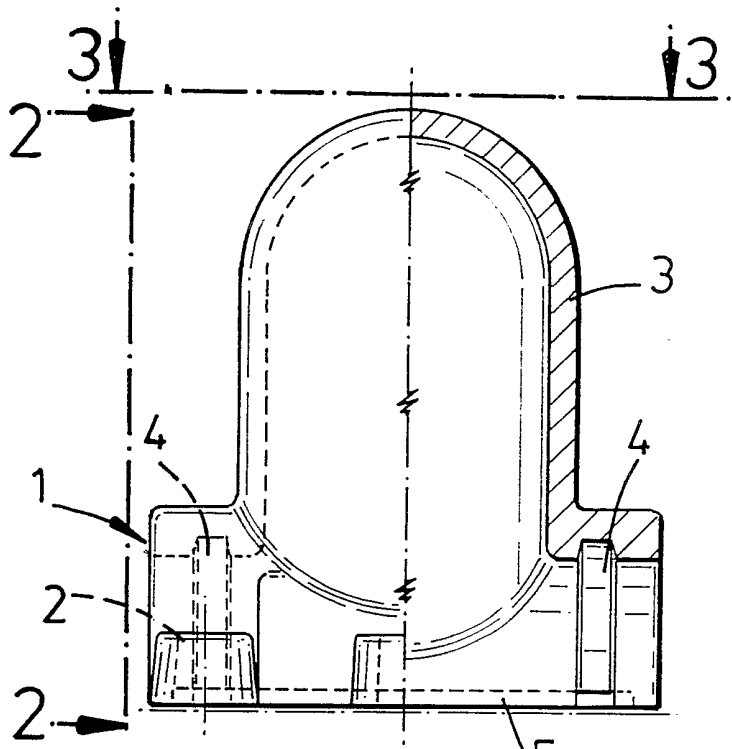
(56) Documents Cited  
**GB 2011014 A GB 1579022 A GB 1433423 A**

(58) Field of Search  
UK CL (Edition M ) **F2G GX G41 , F2P PTBM PTBX**  
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(54) **Branch Connection Seal**

(57) A split collar 1 is provided for sealing a branch connection 8 which is connected to a pipe 9. The branch connection 8 may be in the form of a ferrule from which a lead pipe extends. The lead pipe is flattened so as to be at least partially blocked, and the flattened portion of the branch connection 8 is then severed to define a stub projecting from the ferrule. A split collar 1 is then clamped onto the pipe so that the stub and ferrule are enclosed within a cavity defined by the collar 1 and sealed by engagement between the collar 1 and the pipe 9. The split collar 1 forms a permanent fixture which prevents any leakage from the branch connection stub 8, the ferrule, or cracks or holes in the pipe 9 adjacent the branch connection 8 which might appear at a later date.





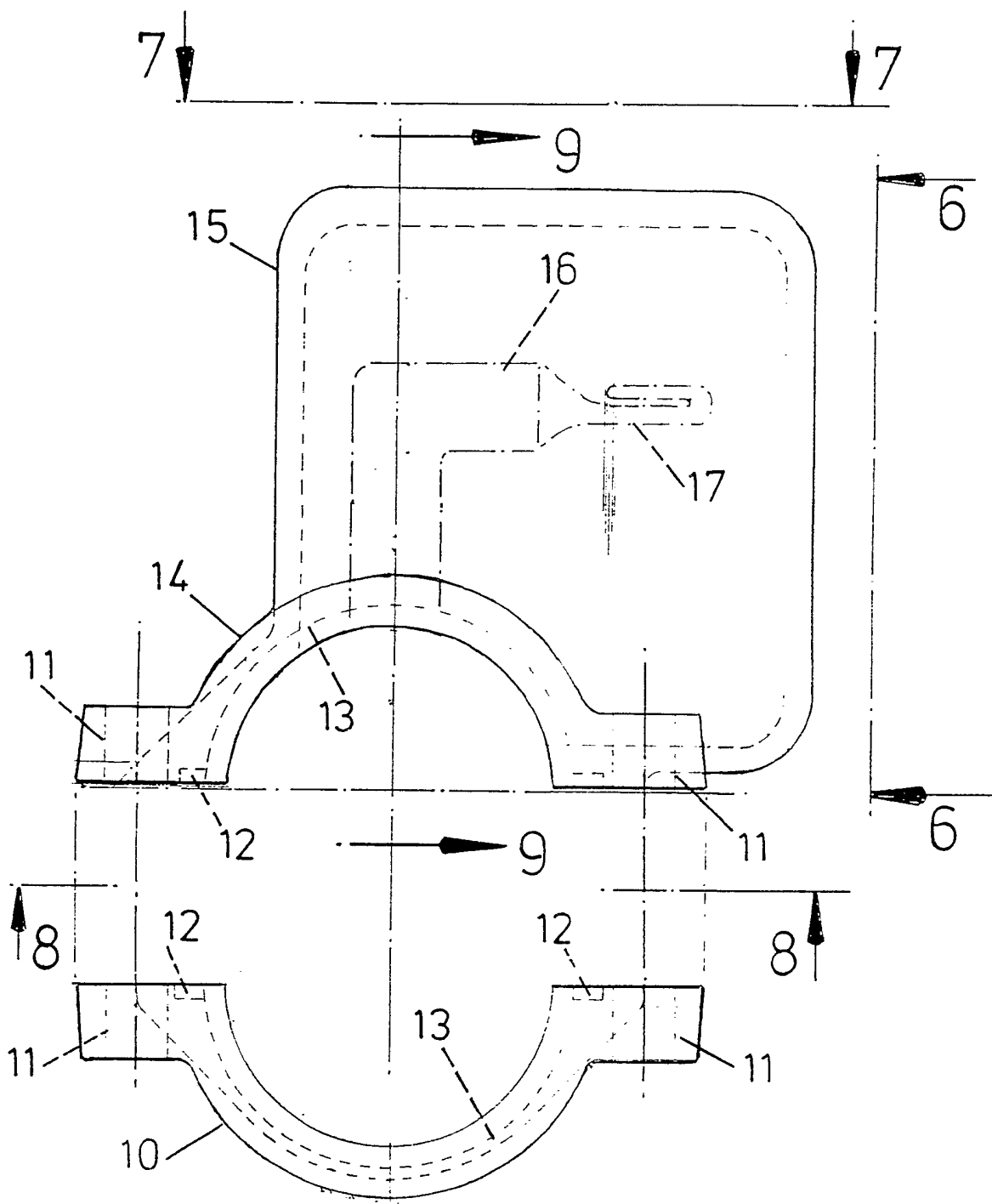


FIG. 5

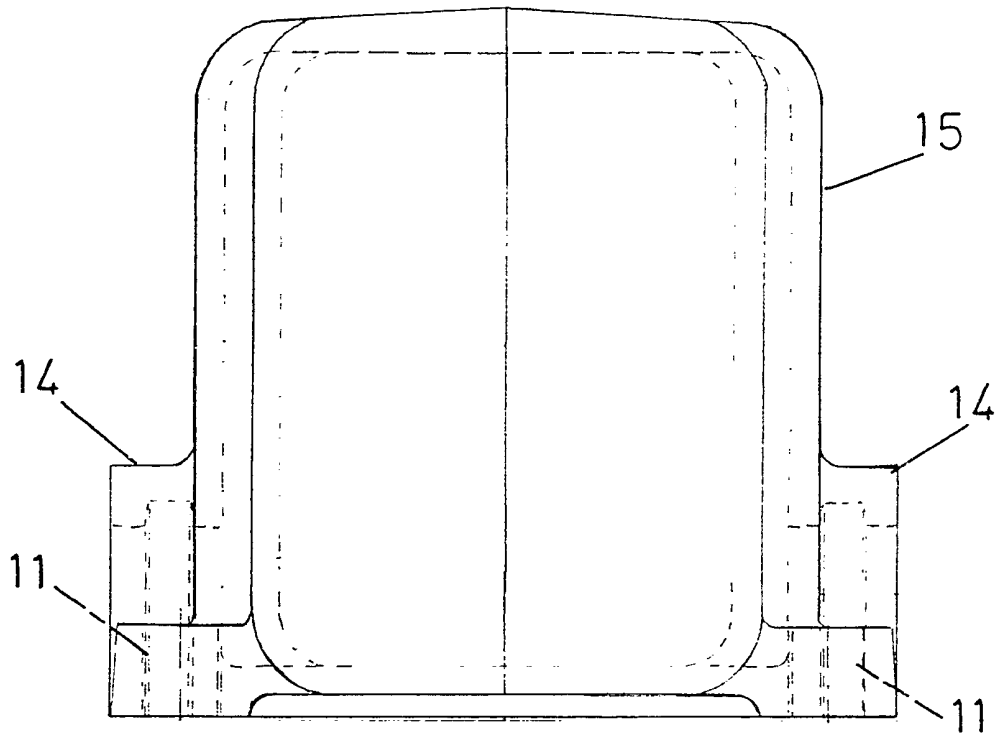


FIG. 6

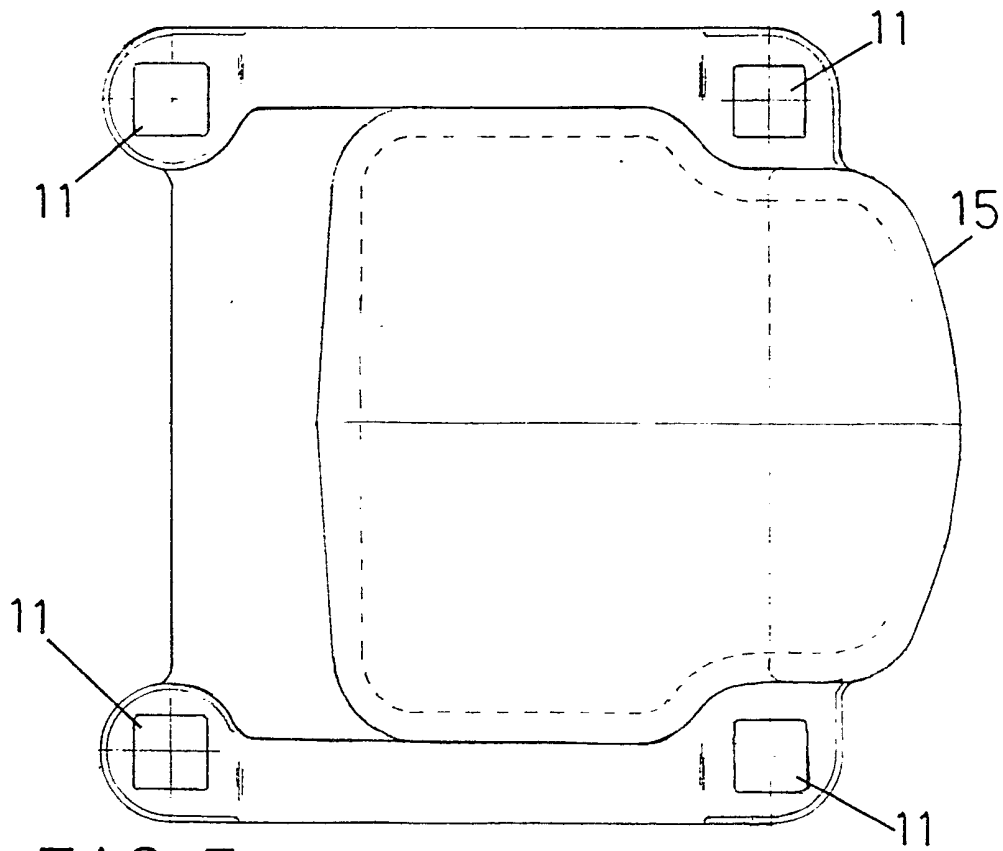
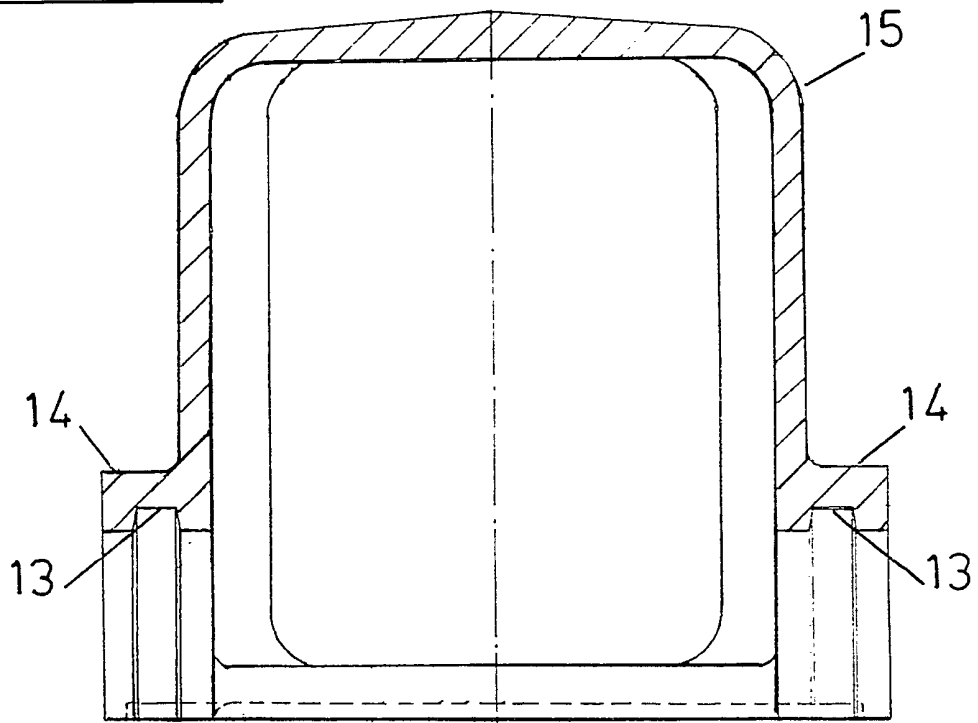
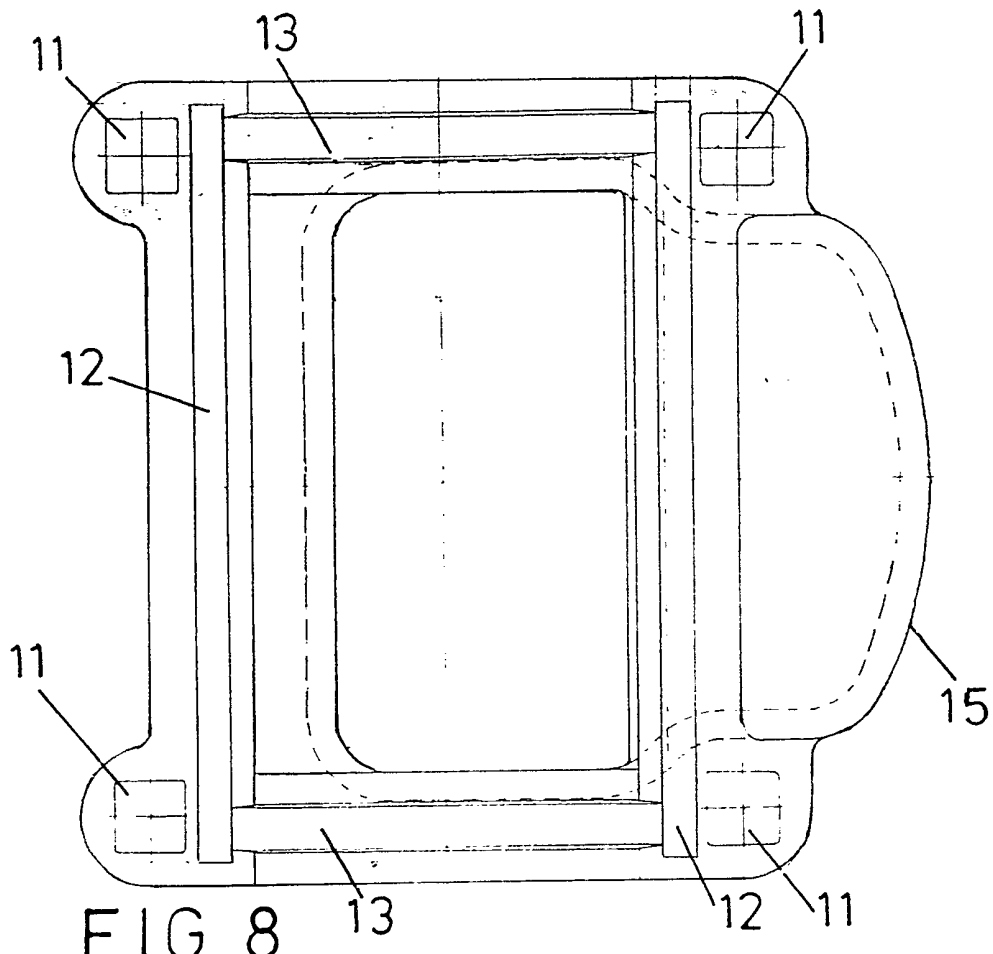


FIG. 7



BRANCH CONNECTION SEAL

The present invention relates to a split collar and a method for sealing a leaking or disused branch connection connected to a pipe using such a split collar.

Split collars are well known for sealing circumferential and other cracks and holes in cast iron and asbestos-cement water mains. Cast iron and asbestos-cement water mains can be of considerable age and over time can leak due to the effects of corrosion, ground movements, or traffic loading from the highway above. This problem can be solved using a conventional split collar which is made up of two C-shaped components that may be bolted together around the leaking pipe using four or six bolts extending through flanges extending radially outwards from the sides of the C-shaped components. Longitudinal seals and semi-circumferential seals are provided on the inner surfaces of each C-shaped component so that as the bolts are tightened the longitudinal seals are compressed against each other, as are the ends of the semi-circumferential seals, with the latter also being compressed against the external surface of the pipe on either side of the leak, thereby defining a seal around the leak. The split collars are left in position, forming a permanent and reliable seal.

In existing cast iron and asbestos-cement water distribution pipe systems, branch connections from cast iron or asbestos cement water mains are generally formed from lead pipe connected to the cast iron main by an appropriate coupling, normally in the form of a right-angled bend, commonly known as a ferrule. Over time, leaks can occur at the ferrule position, either from the ferrule, from the lead pipe connected to it, or from the main at that position. In addition, it is generally desirable to replace lead water pipes with plastics pipe, and ideally this is done by drilling a hole into the cast iron or asbestos cement pipe at a point spaced from the original lead pipe ferrule and inserting a new ferrule into the drilled hole. This means that the existing lead pipe ferrule must be closed off in a reliable leak-proof manner. It has proved extremely difficult to do this in the past, and accordingly major problems have been experienced when lead connections to cast iron or asbestos-cement pipes are being replaced.

Not the least of the problems is the fact that complete removal of the lead pipe and its associated coupling can only be achieved after the cast iron or asbestos-cement pipe is taken out of service. To do this it is necessary to cut off the supply to all of the water users connected to a predetermined length of the cast iron main, and this can only be done after giving prior notice to all of the affected users. Furthermore, problems with water discolouration can arise after the service is re-connected, and there is a slight risk of contamination of the potable water supply unless further precautions are taken.

It is an object of the present invention to obviate or mitigate the problems outlined above.

According to the present invention there is provided a split collar for sealing a pipe, comprising first and second components which may be assembled together to define an annulus extending around the pipe, and means for clamping the assembled components together, each component supporting sealing means which are compressed when the components are clamped together so as to prevent leakage of fluid from the portion of the pipe around which the collar is clamped, wherein the assembled components define a cavity which may be positioned so as to receive a branch connection extending from the pipe.

Preferably the cavity is defined by a casing formed in one of the components. The casing may be offset relative to the annulus to enable it to receive an L-shaped connection.

The invention also provides a method for sealing a branch connection connected to a pipe, wherein the branch connection is severed at a point spaced from the pipe so as to leave a stub projecting from the pipe, and a collar is clamped onto the pipe so that the stub is enclosed within a cavity defined by the collar and sealed by engagement between the collar and the pipe.

The branch connection will generally be in the form of a ferrule from which a lead pipe extends. Preferably a portion of the lead pipe is flattened to at least partially block the connection, and the flattened portion of the lead pipe is severed to define the stub. Thus, as the lead pipe can be flattened whilst the main pipe remains under pressure, a branch connection can be severed and sealed without making it necessary for the main pipe to be taken out of service.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a side view of one component of a split collar in accordance with a first embodiment of the present invention;

Fig. 2 is a part sectioned view of the component of Fig. 1 taken in the direction of lines 2-2;

Fig. 3 is a partial view of the component of Fig. 1 taken in the direction of lines 3-3 in Fig. 1, the lines A-A in Fig. 3 representing the section shown in Fig. 1 and the lines B-B representing the section shown in Fig. 2;

Fig. 4 is a section through an installed split collar incorporating the component shown in Figs. 1 to 3.

Fig. 5 is an end view of the two components of a second embodiment of the invention, the two components being shown spaced apart;

Fig. 6, 7 and 8 are views of the lines 6-6, 7-7 and 8-8 of Fig. 5; and

Fig. 9 is a section of the lines 9-9 of Fig. 5

The illustrated component comprises a generally C-shaped body 1 defining half of a tube split along the tube axis. The body is provided with six bolt holes 2 spaced apart in two sets of three along each side. A casing 3 in the form of a tube with a closed end extends radially outwards from the main body, defining a bell-shaped cavity. The inner surface of the body 1 is grooved so as to provide semi-circular-shaped grooves 4 along each axial end of the body and straight grooves 5 along each side of the body. These grooves are provided to receive a closed-loop sealing gasket 6 (Fig. 4) which is a push fit in the grooves.

The illustrated component is in use bolted to a further component 7 (shown in Fig. 4). The further component differs from the illustrated component only insofar as it is not provided with a cavity-defining casing but rather has a simple part-cylindrical outer surface.

When the two components are bolted together around a pipe, the seals 6 provided in the grooves 4 and 5 are compressed, the portion of the seals in grooves 5 being compressed against each other, and the portion of the seals in grooves 4 being compressed against the outer

surface of the pipe. Thus a closed space is defined between the split collar and that portion of the pipe about which it is fitted. The cavity beneath the casing 3 forms part of this closed space. Accordingly the split collar can be positioned to receive a projection extending radially outwards from the pipe onto which the split collar is clamped.

The split collar can be used as shown in Fig. 4 to seal a branch connection 8 extending from a cast iron water main 9. In Fig.4, the branch connection 8 is shown schematically as a simple straight pipe extending directly from the main pipe 9. In reality, the branch connection will generally be in the form of a ferrule mounted on the main pipe 9 and connected to a lead pipe. The lead pipe can be hydraulically compressed to flatten it in a region say 10 to 15 cm away from the cast iron pipe. The lead pipe can then be severed downstream of the flattened portion and the flattened portion can be folded over and crimped to provide a reasonably reliable temporary seal. This process can be carried out without it being necessary to take the cast iron pipe out of normal service. Once the lead branch connection has been severed, a short stub of say 10 cm in length is left projecting from the cast iron pipe. The component illustrated in Figs. 1 to 3 is then positioned over that stub so that the stub is received in the cavity defined by the casing 3. The other half of the split collar is then secured to the casing-defining component by four or six bolts, and the bolts are tightened down until the resilient gaskets 6 supported by the two components provide a reliable seal. Any leakage which would otherwise occur from the severed end of the branch connection stub or the coupling between the branch connection stub and the cast iron pipe is thus prevented as a result of the cooperation between the split collar and the outer surface of the cast iron pipe.

Referring to Figs 5 to 9, the illustrated second embodiment of the invention is intended for use in circumstances where the branch connection is not in the form of a simple straight pipe extending radially from the main pipe. It is often the case that branch connections are in the form of an L-shaped ferrule one end of which is mounted on the main pipe to extend in the radial direction and the other end of which extends parallel to the main pipe and is

connected to a lead pipe. Given an L-shaped ferrule, the cavity defined by the component illustrated in Figs. 1 to 4 would be too small to accommodate both the ferrule and a sealed lead pipe stub extending from the ferrule. The embodiment of the invention illustrated in Figs. 5 to 9 defines a larger casing which is offset so as to accommodate such an assembly.

As shown in Figs. 5 to 9, the illustrated split collar comprises a first C-shaped component 10 provided with four bolt holes 11 and grooves 12, 13 to receive seals of the type described with reference to Figs 1 to 4, and a second component 14 which includes a casing 15 that defines a cavity that is offset relative to the C-shaped pipe-gripping parts of the assembly. The second component 14 is also provided with bolt holes 11 and grooves 12, 13.

The cavity defined by the casing 15 is sufficiently large to receive an L-shaped ferrule and a flattened lead pipe extending from the ferrule. Fig. 5 shows in broken line the approximate position which would be assumed by an L-shaped ferrule 16 and flattened lead pipe 17 if the component was mounted on a pipe from which the ferrule extends initially in a radial direction. Thus it can be seen that by providing an offset cavity a variety of ferrule configurations can be accommodated using a common split collar.

CLAIMS

1. A split collar for sealing a pipe, comprising first and second components which may be assembled together to define an annulus extending around the pipe, and means for clamping the assembled components together, each component supporting sealing means which are compressed when the components are clamped together so as to prevent leakage of fluid from the portion of the pipe around which the collar is clamped, wherein the assembled components define a cavity which may be positioned so as to receive a branch connection extending from the pipe.

2. A split collar according to claim 1, wherein the cavity is defined by a casing formed in one of the components.

3. A split collar according to claim 2, wherein the casing is offset relative to the annulus to enable the cavity to accommodate a branch connection which is L-shaped.

4. A method for sealing a branch connection connected to a pipe, wherein the branch connection is severed at a point spaced from the pipe so as to leave a stub projecting from the pipe, and a collar is clamped onto the pipe so that the stub is enclosed within a cavity defined by the collar and sealed by engagement between the collar and the pipe.

5. A method according to claim 4, wherein the branch connection is in the form of a ferrule from which a lead pipe extends, a portion of the lead pipe is flattened to at least partially block the connection, and the flattened portion of the lead pipe is severed to define the stub.

6. A split collar substantially as hereinbefore defined with reference to Figs 1 to 4 or Figs. 5 to 9 of the accompanying drawings.

7. A sealing method substantially as hereinbefore defined with reference to the accompanying drawings.

**Amendments to the claims have been filed as follows**

1. A split collar for sealing a pipe, comprising first and second components which may be assembled together to define an annulus extending around the pipe, and means for clamping the assembled components together, each component supporting sealing means which are compressed when the components are clamped together so as to prevent leakage of fluid from the portion of the pipe around which the collar is clamped, wherein the assembled components define a cavity which is offset relative to the annulus and which may be positioned so as to receive a branch connection extending from the pipe.

2. A split collar according to claim 1, wherein the cavity is defined by a casing formed in one of the components.

3. A method for sealing a branch connection connected to a pipe, wherein the branch connection is severed at a point spaced from the pipe so as to leave a stub projecting from the pipe, and a collar is clamped onto the pipe so that the stub is enclosed within a cavity defined by the collar and sealed by engagement between the collar and the pipe.

4. A method according to claim 3, wherein the branch connection is in the form of a ferrule from which a lead pipe extends, a portion of the lead pipe is flattened to at least partially block the connection, and the flattened portion of the lead pipe is severed to define the stub.

5. A split collar substantially as hereinbefore defined with reference to Figs 1 to 4 or Figs. 5 to 9 of the accompanying drawings.

6. A sealing method substantially as hereinbefore defined with reference to the accompanying drawings.

**Relevant Technical Fields**

- (i) UK Cl (Ed.M) F2G G41, GX; F2P PTBM, PTBX;
- (ii) Int Cl (Ed.5) F16L 55/10, 55/16, 55/17, 55/172;

Search Examiner  
 PHIL THORPE

Date of completion of Search  
 23 DECEMBER 1994

**Databases** (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
 1 TO 7

(ii) ONLINE DATABASE: WPI

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A	GB 1579022 A (AVON LIPPIATT)	
X	GB 1433423 A (BTR) see whole document	1, 2

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