No. 715,423. Patented Dec. 9, 1902.

G. F. RYAN.

JOINT FOR METALLIC AND EARTHENWARE PIPES.

(Application filed Jan. 20, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

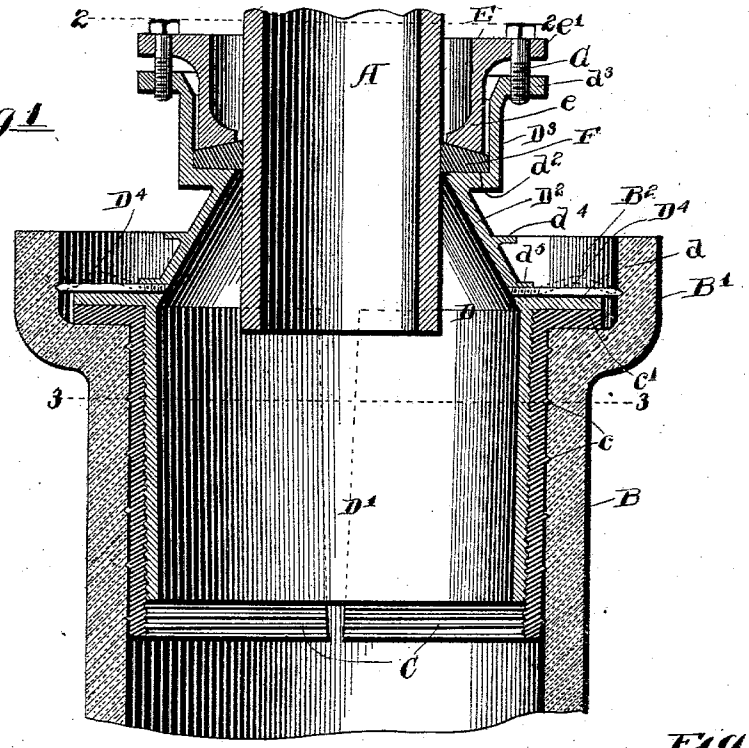


Fig 2

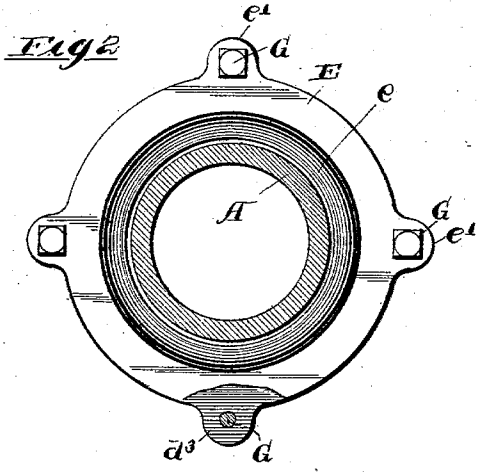
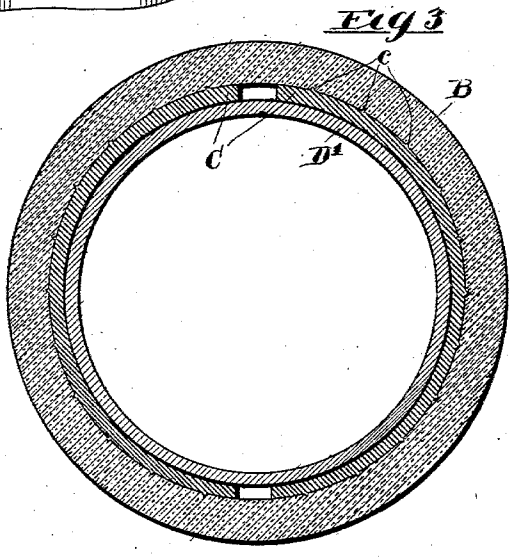


Fig 3



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig 4

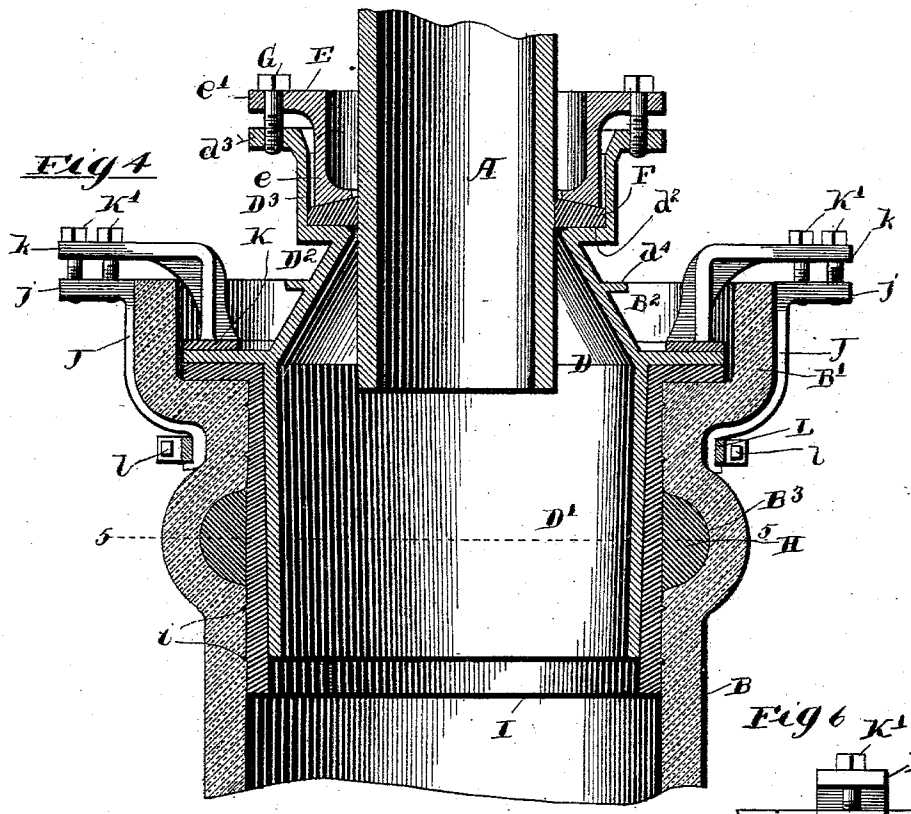


Fig 6

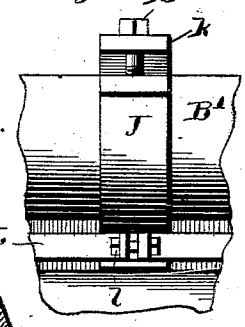
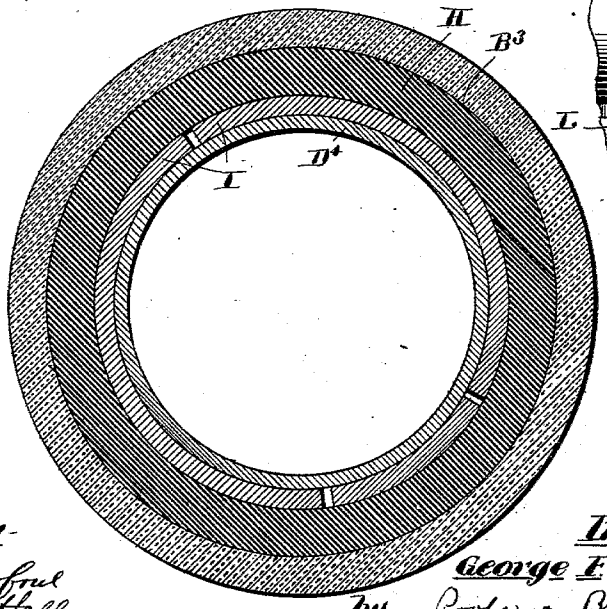


Fig 5



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UNITED STATES PATENT OFFICE.

GEORGE FRANCIS RYAN, OF CHICAGO, ILLINOIS.

JOINT FOR METALLIC AND EARTHENWARE PIPES.

SPECIFICATION forming part of Letters Patent No. 715,423, dated December 9, 1902.

Application filed January 20, 1902. Serial No. 90,375. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FRANCIS RYAN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Joints for Metallic and Earthenware Pipes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to pipe-joints of that class by which a metallic soil-pipe is connected with a non-metallic or earthenware pipe, the joint being so constructed as to provide a strong and durable connection and to prevent the passage of fluid past the same.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a longitudinal vertical section of the adjacent ends of a metallic soil-pipe and an earthenware drain-pipe connected by a joint embodying the main features of my invention. Fig. 2 is a transverse section taken on line 2 2 of Fig. 1 with parts broken away. Fig. 3 is a transverse section taken on line 3 3 of Fig. 1. Fig. 4 is a longitudinal vertical section of the adjacent ends of a coil and non-metallic pipe, illustrating a modification of the connecting-joint. Fig. 5 is a transverse section taken on line 5 5 of Fig. 4. Fig. 6 is a fragmentary side elevation of the earthenware pipe and one of the clamps shown in Fig. 4.

First referring to the construction shown in Figs. 1 to 3, A designates a section of a metallic pipe which extends into and communicates with the adjacent end of the earthenware pipe B. Said earthenware pipe B is provided on its outer end with an outwardly-curved flange B′, which forms a socket B^2, adapted to receive parts of the device constituting the joint between said pipes.

C designates a split ring which fits within the pipe B and is provided with interior screw-threads and on its outer surface with short radially-projecting spurs *c*, adapted to be pressed into the inner surface of the earthenware pipe when the parts of the ring are spread or expanded outwardly in the manner hereinafter described. The parts of the ring are provided on their upper ends with flanges *c*′, which rest on the bottom of the socket when the ring is in place in the pipe B. Said ring is tapered on its inner side.

D designates a fitting comprising a lower tapered part D′ of circular cross-section, an upwardly and inwardly tapered part D^2, and a cylindric part D^3 at the outer end of said tapered part D^2. Said parts D^2 D^3 constitute, in effect, a reducing-ring made integral with the part D′ to receive the soil-pipe A. Said lower tapered part of the fitting D is provided with exterior screw-threads adapted to engage the interior screw-threads of the split ring C when inserted into the latter.

The fitting D is provided at the upper end of the screw-threaded tapered portion D′ thereof with a radial annular flange *d*, which is adapted to fit flat upon the flange *c*′ of the expansible ring C or upon a yielding gasket interposed between said flanges. The cylindric upper end D^3 of the fitting D is made somewhat larger than the upper end of the tapered portion D^2 of said fitting, and between said cylindric and tapered portions of the fitting is formed inside of said fitting an annular upwardly-facing shoulder d^2, which is concentric with the axis of the fitting. The soil-pipe A passes into the fitting some distance beyond said shoulder d^2. Located within said cylindric upper end of the fitting and surrounding the soil-pipe A is an annular packing-ring E, which is provided at its lower end with an inwardly-directed annular flange *e*, between which and the opposing annular shoulder d^2 of the fitting is interposed a packing-gasket F, which surrounds and fits closely upon the soil-pipe A. The upper surface of the gasket F is inclined outwardly, as shown in Fig. 1, and the lower surface of the packing-ring is correspondingly inclined, so that pressure exerted by said packing-ring upon the gasket tends to shift the gasket inwardly into close contact with the outer surface of the soil-pipe. Pressure is transmitted to said packing-ring through the medium of a plurality of bolts G, which extend through apertured radial lugs *e*′, formed on the outer end of the packing-ring E, and have screw-threaded engage-

ment with apertured lugs d^3, formed on the outer end of the cylindric portion of the fitting D.

In assembling the joint the parts of the expanding-ring C are first inserted into the open end of the sewer-pipe B. The tapered lower end D′ of the fitting D is next inserted into the said expanding-ring and turned downwardly thereinto, and the tapered construction of said lower end of the fitting D and the split ring acts to gradually expand or cause the parts of said ring to be spread outwardly against the inner surfaces of the earthenware pipe, so that the spurs on the outer surface of said ring are embedded or forced into the earthenware pipe. The ring is thus locked in the earthenware pipe, and withdrawal therefrom is prevented so long as the fitting is turned down in place. Thereafter the soil-pipe A is inserted into the upper reduced end of the fitting, the gasket F fitted thereover, and the packing-ring E clamped down upon said gasket through the medium of the bolts G in the manner described to complete the joint between the soil-pipe and said fitting. If desired, flat packing rings or gaskets may be interposed between the flange c' of the said split ring and the bottom of the socket in the end of the earthenware pipe and between the said flange and the flange d of the fitting D. Furthermore, the socket B^2, at the upper end of the earthenware pipe above the flanges d, referred to, will desirably be filled with a mass or body of cement of a character usually employed by plumbers, which more effectively prevents the escape of water and gases between said fitting and the earthenware pipe. Said fitting is provided on the exterior part of the tapered portion D^2 thereof with a short annular flange d^4, located at the level of the upper margin of the flange B′ of the earthenware pipe, which annular flange determines the depth of the body of cement in said socket.

As a further and separate improvement and in order to prevent the fitting D from turning in the split expanding-ring C, I provide locking devices, as follows: D^4 D^4 designate metal spikes or lugs, which are formed on or attached at their inner ends to the fitting D and are adapted for interlocking engagement at their outer ends with the flange B′ of the earthenware pipe. As herein shown, said lugs or spikes are made separate from said fitting and have screw-threaded engagement with apertured enlargements d^5 on the outer surface of the fitting. Said spikes before the fitting is inserted into the earthenware pipe are bent upwardly at their intermediate portions, as indicated in dotted lines in Fig. 1, and after said fitting has been set in place and turned downwardly and before the cement has been inserted in the socket B^2 in the manner before described said spikes are straightened by tapping the upwardly-curved parts thereof with a hammer or like tool, and the straightening of the spikes in this manner causes the outer pointed ends thereof to be driven or embedded into the inner surface of the flange B′, as shown in Fig. 1. Desirably the spikes are so located with respect to the flange d of the fitting D that when said spikes are straightened they lie flat upon said flange, the flange preventing the same from being bent downwardly beyond a straight position, which would act to withdraw the same from engagement with the earthenware pipe. The spikes are engaged with the earthenware pipe in the manner stated to prevent rotation of the fitting D in the expansible ring, and therefore prevent disengagement of said parts. When it is desirable to remove the fitting from the earthenware pipe, the spikes D^4 are first removed by bending the same upwardly or cutting the same off, after which said fitting may be unscrewed from the split ring and the parts disassembled.

In Figs. 4 and 5 I have shown a modification of the joint, the modifications embracing principally the provision of a packing-gasket between the split expansible ring and the earthenware pipe and also another manner of producing pressure on the split ring to expand the same into contact with the earthenware pipe. As shown in said figures, the earthenware pipe is provided below the flange or hub B′, at the upper end thereof, with an internal annular recess or groove B^3, which is herein shown as formed by an annular flute or corrugating the wall of the pipe. Located in said annular recess or groove is a rubber or fiber gasket H, which is shown as rounded on its outer surface to conform to the shape of the recess or gooove and is made flat on its inner surface and adapted to bear against a split expansible ring I, inserted into said pipe and which corresponds generally to the split ring C, hereinbefore referred to. Said split ring I is made of three separate parts to facilitate the insertion thereof into an earthenware pipe. Instead of employing a screw-threaded connection between the lower tapered end D^4 of the fitting D and the split ring I, as in the construction previously described, the contacting tapered surfaces of said lower end of the fitting and the ring are made smooth, and said ring is expanded by pressing or forcing the fitting into the ring. This is accomplished by means of a plurality of clamps J, which are formed to fit outside of or embrace the hub of the pipe B and a ring K, located within the socket B^2 and surrounding the tapered part D^2 of the fitting D. Said ring K is provided at its outer end with a plurality of radial lugs k, and the ring is pressed inwardly to force the tapered end of the fitting into the split ring by means of a plurality of clamping-bolts K′, which extend through said apertured lugs k and into apertured lugs j, formed on the upper ends of the clamps J. In order to prevent the lower ends of said clamp from spreading outwardly when said clamping-bolts are turned downwardly, the lower ends of the clamps are shown as encircled by a ring L. Said ring when used

with the form of pipe shown in Fig. 4 is an open ring and adapted to be clamped together at its ends by bolts *l*, as shown in Fig. 6; but when used with the form of pipe shown in Fig. 1 may be made a complete circle and slipped upwardly over the pipe and clamps. Desirably the overlapping lugs *j k* of the ring K and clamps J are made of considerable length. Clamping-bolts K′ for each pair of lugs may be provided, as shown in Fig. 4. After the bolts have been turned downwardly a slight advance of the inner bolts will serve to throw the lower ends of the clamps more firmly against the outer surface of the hub.

The remaining parts (shown in Figs. 4, 5, and 6) are in all substantial respects like the corresponding parts shown in the preceding figures and bear like reference-letters.

It is manifest that the parts constituting the joint shown in the several figures of the drawings when assembled produce a very strong and durable joint between an earthenware and a metallic soil-pipe and at the same time a joint which effectually prevents the escape of gases and fluids between said pipes. It is furthermore obvious that the essential features of that part of the construction embodying the connections between the earthenware pipe and the fitting D may be employed for connecting a cover or closure with a sewer clean-out branch, the closure proper being attached to the outer end of a fitting corresponding to the fitting D and said fitting being connected with the clean-out branch of the sewer in substantially the same manner as the fitting D illustrated is connected with the earthenware pipe B.

An important advantage gained by the employment for joining the soil-pipe with the earthenware pipe of clamping means embracing a plurality of circumferentially-separated and separately-adjustable clamping-bars is that such bars are adapted to adjust themselves to irregularities of the hub when tightened against the latter.

I claim as my invention—

1. The combination with an earthenware sewer-pipe, of an expansible metal ring contained within the end of said pipe and provided on its exterior surface with spurs or projections, a fitting provided with a tapered inner end which enters said expansible ring, and means for forcing said tapered part of the fitting into said ring.

2. The combination with an earthenware pipe, of a metal expansible ring contained within the end of said pipe, a packing-ring interposed between the outer surface of said ring and the pipe, a fitting provided at its inner end with a tapered sleeve adapted to enter said ring, and means for forcing said tapered sleeve into the ring.

3. The combination with an earthenware pipe, of an expansible metal ring which enters the end of said pipe, a gasket interposed between said ring and said pipe, outwardly-projecting spurs on the outer surface of said ring adapted to engage the inner surface of said pipe, a fitting provided at its inner end with a tapered sleeve adapted to enter said ring, and means for forcing said tapered sleeve into said ring.

4. The combination with an earthenware pipe, of an expansible metal ring in the end of said pipe, a fitting constructed at its outer end to receive and form a joint with a soil-pipe and provided at its inner end with a tapered part adapted to enter the expansible ring in said pipe, and means for forcing said fitting into said ring.

5. The combination with an earthenware pipe, of an expansible ring which enters the end of said pipe, an annular gasket surrounding said ring and interposed between the same and an annular recess in said pipe, a fitting provided at its inner end with a tapered part which enters said ring, and means for forcing said tapered part of the fitting into said ring.

6. The combination with an earthenware pipe provided at its end with a hub and a soil-pipe which communicates with the earthenware pipe, of a packing device entering said hub and surrounding said soil-pipe, and a plurality of circumferentially-separated clamping-bars which fit outside of and embrace said hub and are connected at their outer ends with the packing device by means exerting endwise strain separately on the bars to pull the clamping device into the hub.

7. The combination with an earthenware pipe provided at its end with a hub and a soil-pipe which communicates with the earthenware pipe, of a packing device entering said hub and surrounding said soil-pipe, and a plurality of circumferentially-separated clamping-bars which fit outside of and embrace said hub and are connected at their outer ends with the packing device by means exerting endwise strain separately on the bars to pull the clamping device into the hub, and means for holding the ends of the clamping-bars remote from the packing device in engagement with said earthenware pipe.

8. The combination with an earthenware pipe having a flange at its end forming a hub, of an expansible metal ring in the end of said pipe, a fitting provided at its inner end with a tapered part which enters said ring and a plurality of clamp-bars which fit outside of and embrace said hub and are connected at their outer ends with said fitting.

9. The combination with an earthenware pipe having a flange at its end forming a hub, of an expansible metal ring in the end of said pipe, a fitting provided at its inner end with a tapered part which enters said ring, a plurality of clamp-bars which fit outside of and embrace said hub and are connected at their outer ends with said fitting, and a ring encircling the inner ends of said clamp-bars.

10. The combination with an earthenware sewer-pipe having a flange at its end forming a hub, of an expansible metal ring which enters the end of said pipe, a fitting provided

with a tapered inner part which enters said ring, a plurality of radial lugs on said fitting, a plurality of clamps which fit outside of and embrace said hub, lugs on the outer ends of said clamps, and two clamping-bolts passing through each of the fitting-lugs and into the lugs of the clamps, the bolts of each pair being located one radially inside the other.

11. The combination with an earthenware pipe, of an expansible ring which enters the end of said pipe and provided on its outer surfaces with projections adapted to engage the wall of the pipe, a fitting provided with a tapered sleeve adapted to enter said expansible ring, and interlocking connections between said fitting and the earthenware pipe for preventing said fitting from turning with respect to said pipe.

12. The combination with an earthenware pipe, of an expansible ring which enters said pipe, said ring being provided with an annular flange adapted to engage an opposing annular surface at the end of the pipe, a fitting provided with a tapered sleeve adapted to enter said ring, and means for forcing said tapered sleeve into said ring.

13. The combination with an earthenware pipe, of an expansible ring which enters said pipe, said ring being provided with an annular flange adapted to engage an opposing annular surface at the end of the pipe, a fitting provided with a tapered sleeve adapted to enter said ring, and means for forcing said tapered sleeve into said ring, said fitting being provided at the upper end of said tapered part with an annular flange adapted to fit upon the annular flange of the expansible ring.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 15th day of January, A. D. 1902.

GEORGE FRANCIS RYAN.

Witnesses:

WILLIAM L. HALL,

GERTRUDE BRYCE.