No. 773,047. PATENTED OCT. 25, 1904.

J. C. BAYLES.

FLEXIBLE AND EXPANSIBLE PIPE COUPLING.

APPLICATION FILED AUG. 21, 1900. RENEWED MAR. 17, 1904.

NO MODEL.

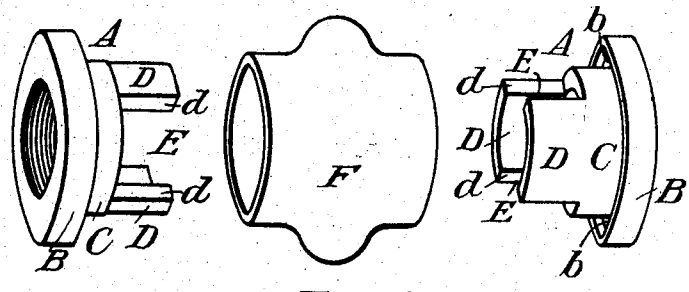


Fig. 1.

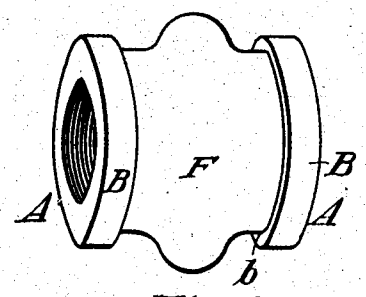


Fig. 2.

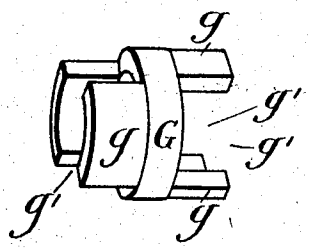


Fig. 3.

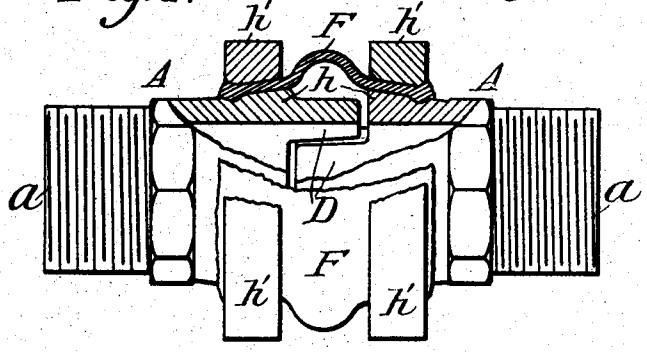


Fig. 4.

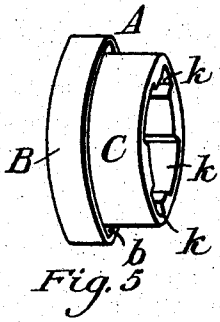


Fig. 5

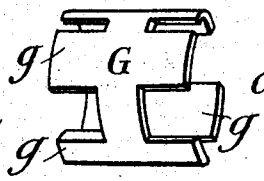


Fig. 6.

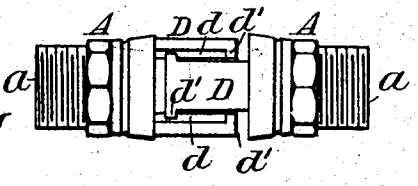


Fig. 7.

WITNESSES

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PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 773,047. Patented October 25, 1904.

UNITED STATES PATENT OFFICE.

JAMES C. BAYLES, OF NEW YORK, N. Y.

FLEXIBLE AND EXPANSIBLE PIPE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 773,047, dated October 25, 1904.

Application filed August 21, 1900. Renewed March 17, 1904. Serial No. 198,663. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. BAYLES, a citizen of the United States, residing at New York city, county of New York, State of New York, have invented a certain new and useful Improvement in Flexible and Expansible Pipe-Couplings, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

The invention relates generally to mechanism for flexibly and expansibly connecting rigid sections of pipe; and the main objects of my invention are to provide means for preventing a twisting motion of the rigid sections of the pipe relatively to each other without interfering with the other relative motions of the rigid pipe-sections necessary to preserve the flexibility and expansibility of the joint and also to provide improved means for connecting the rigid pipe-sections with a flexible and expansible section. I am also enabled by my invention to limit the movement of the ends of the rigid pipe-sections away from each other, and thus to prevent strain on the flexible section due to this cause.

So far as my invention relates to the means for preventing the relative twisting motion of the rigid pipe-sections it may be applied to any flexible coupling irrespective of the character of the flexible or expansible pipe-section used in connection therewith and irrespective of the manner of attaching such flexible or expansible section to the rigid pipe-sections and, if desired, may be used without a flexible or expansible section. These means consist generally of lugs projecting from the adjoining ends of the rigid pipe-sections or from parts attached to said ends, the lugs on each pipe-section fitting into corresponding indentations on the opposite pipe-section. The preferred form of these lugs is illustrated in the drawings and is hereinafter described.

So far as my invention relates to an improved form of flexible and expansible sleeve and means for connecting the same with the rigid pipe-sections it consists generally in coupling-rings, the outer ends of which are provided with any suitable means for attaching the same to the rigid pipe-sections and a sleeve of lead or other ductile and expansible material by which the coupling-rings are flexibly connected. These coupling-rings consist, preferably, of a base, a crown, inwardly-projecting lugs, and indentations in the crown between said lugs. The lugs on one coupling-ring are made to fit loosely into the indentations on the other coupling-ring in such manner that the two rings may not be twisted relatively to each other, and yet are capable of the other relative movements necessary to preserve the flexibility of the joint between them.

Referring to the drawings, Figure 1 is a perspective view of my flexible and expansible pipe-coupling, showing the separated parts that make up the same. Fig. 2 is a perspective view of my coupling, showing the parts fitted together. Fig. 3 is a perspective view of an extension-section for use in my flexible joint. Fig. 4 is a side elevation of a flexible joint in which the flexible sleeve is attached to the coupling-rings in a manner different from that shown in Figs. 1 and 2. The flexible sleeve and coupling-rings are partly cut away, thus showing these parts in section. Fig. 5 is a view in perspective of a modified form of coupling-ring, and Fig. 6 of a modified form of extension-section corresponding to said form of coupling-ring. Fig. 7 is a side elevation of a flexible joint, showing a modified form of lugs and indentations, the flexible sleeve not being shown.

In the drawings, A A are the coupling-rings, B B are the bases, C C the crowns, and D D the projecting lugs, of said coupling-rings. The spaces E E between said lugs constitute the indentations on each coupling-ring. Preferably the bases of the said coupling-rings are flanged outwardly beyond the crowns thereof, and the interior faces of said projecting bases are channeled, as shown at *b b*, to receive the ends of the flexible sleeve. The outer ends of the coupling-rings, as shown in Figs. 1 and 2 of the drawings, are provided with interior threads, so that said coupling-rings may be screwed upon the ends of rigid pipe-sections; but said coupling-rings may obviously be provided with any other suitable

means of attaching the same to the ends of the rigid pipe-sections—as, for example, exteriorly-threaded ends, as shown in Figs. 4 and 7—and may be made of different shapes from those shown in the drawings. The projecting lugs D D are slightly tapered, as indicated in Fig. 4, and their lateral edges *d d* are inclined, since these edges are formed by substantially radial planes. The lugs are made slightly smaller than the indentations, thus permitting the lugs of one coupling-ring loosely to fit into the indentations of the other ring, thus making a flexible joint, yet preventing any twisting movement of the rings relative to each other. It is obvious that the lugs and indentations may be rounded instead of tapered or may be of other forms so long as the lugs on one coupling-ring fit loosely into the indentations on the other ring in such manner that the rings will be incapable of any substantial twisting motion relative to each other, but will be capable of such other motions as are necessary to maintain the flexibility and expansibility of the joint.

In cases where there is no danger of the ends of rigid pipe-sections becoming eccentric to each other or where suitable means are provided to prevent such eccentricity a single lug on the end of each rigid pipe-section or on each coupling-ring will be sufficient to prevent the relative twisting of the pipe-sections. Where two lugs with beveled edges or more than two lugs are used on each pipe end or coupling-ring, the interlocking of the lugs and indentations will in itself prevent eccentric movement of the ends of the pipe-sections or of the coupling-rings as well as relative twisting. As in practice I believe two or more lugs will be used on each pipe-section or coupling-ring except in rare cases, I shall hereinafter refer to such lugs in the plural; but I desire it to be understood that such reference, whether in the specification or in the claims, is intended to cover the use of a single lug as well as two or more lugs.

Fig. 7 shows an important modification of my invention. The lugs are here provided with heads *d' d'* of greater width than the body of the lug. In order to insert the heads *d' d'* into the corresponding indentations on the opposite coupling-ring or pipe-section, it is necessary where two or more lugs are used in each coupling-ring or pipe-section to bend one set of lugs outward, slip them over the other set of lugs, and then bend the first set of lugs back into line and into the indentations. When the joint is thus made, the motion of the pipe ends or coupling-rings away from each other will be limited by the impingement of the heads of one set of lugs on the heads of the other set. Thus all rupturing strain is removed from the flexible sleeve. The heads of these interlocking lugs may be rounded or of any other suitable shape.

F is the flexible sleeve, preferably of lead or other ductile metal, the ends of which said sleeve fit over the crowns of the coupling-rings and project into the channels *b b*. The ends of the sleeve may then be secured to the coupling-rings by soldering or in any other suitable manner. The flexible sleeve is of course attached to the rigid pipe-sections in cases where no coupling-rings are used and may be similarly attached even when coupling-rings are used.

Where a long joint is desired, an extension-section G, as shown in Fig. 3, may be used loosely to connect the coupling-rings or the ends of the rigid pipe-sections instead of lengthening the lugs themselves. This coupling-section is provided with lugs *g* and indentations *g'*, corresponding with the lugs and indentations on the coupling-rings or pipe ends. The action between the lugs and indentations on the ends of the extension-section and those of the coupling-rings or pipe ends is therefore exactly the same as that which takes place between the lugs and indentations when no extension-section is used.

It is obvious that the lugs and indentations of my invention may be applied directly to the ends of the rigid pipe-sections instead of to coupling-rings attached to the ends of said pipe-sections and that any suitable method of attaching a flexible extensible sleeve to the ends of said rigid pipe-sections or to said coupling-rings may be employed. If the outer ends *a a* of the coupling-rings in Fig. 4 were prolonged, said figure would properly represent the lugs and indentations attached directly to the ends of rigid pipe-sections. In that figure the flexible sleeve F is shown attached to the coupling-rings by means of the compression of the ends of said sleeves between shoulders *h h* on the coupling-rings and compression-rings *h' h'*. It is also obvious that lugs and indentations may be applied to the ends of the rigid pipe-section or to the coupling-rings in various manners without departing from the spirit of my invention. Fig. 5 illustrates one of such modifications in connection with a coupling-ring, but which is equally applicable to the end of a rigid pipe-section. In this case the indentations are not cut all the way through the crown of the coupling-ring, but constitute pockets *k k* in its inner wall, into which the lugs on the extension-section shown in Fig. 6 or similar lugs on the opposite end of a rigid pipe-section or on a coupling-ring fit loosely. When the lugs are inserted into these interior pockets, relative twisting movement of the pipe-sections is prevented, and the ends of such sections are of course kept from eccentric displacement.

The relative twisting of rigid pipe-sections connected by flexible sleeves is destructive of said flexible sleeves, and even slight twisting causes the joint between the flexible and rigid sections to open. There is particular danger

of this twisting of the rigid sections when workmen are laying pipe-lines or repairing the same. The use of my invention completely does away with all danger from this source. The use of two lugs with beveled edges on each coupling-ring or on each end of the rigid pipe-sections, the use of more than two lugs on each of said parts, or the use of the crown with interior pockets also prevents the ends of the rigid sections from becoming eccentric to each other, and thus bringing a severe strain to bear upon the flexible sleeves. The fitting shown in Figs. 1 and 2 is not only novel but simple, inexpensive, and convenient for use.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A flexible fitting for pipe-lines, consisting of coupling-rings composed of flanged bases, projecting crowns the ends of which have lugs and indentations, the lugs on each crown corresponding to and coacting with the indentations on the other crown, and a flexible expansible pipe-section attached to and connecting the crowns of said coupling-rings, substantially as and for the purpose set forth.

2. A flexible fitting for pipe-lines comprising rigid pipe-sections the ends of which are provided with lugs and indentations, said lugs having heads of greater width than the body of said lugs, and the lugs on the end of each rigid pipe-section corresponding to and coacting with the indentations on the end of the other rigid pipe-section, substantially as and for the purpose set forth.

3. A flexible fitting for pipe-lines comprising coupling-rings the ends of said coupling-rings being provided with interlocking lugs and indentations, said lugs having heads of greater width than the body of said lugs to prevent excessive torsional and longitudinal movement of said coupling-rings and a flexible pipe-section rigidly secured to said coupling-rings.

4. A flexible fitting for pipe-lines comprising coupling-rings formed with flanged bases, there being channels formed in said flanged bases, projecting crowns, the ends of said crowns being formed with lugs and indentations, the lugs on each crown corresponding to and coacting with the indentations on the other crown and a flexible expansible pipe-section having its ends rigidly soldered in said channels.

5. A flexible fitting for pipe-lines comprising coupling-rings provided with channels in their opposing faces, a flexible expansible pipe-section soldered in said channels, said coupling-rings being provided with interlocking lugs and indentations to prevent excessive torsional movement of said rings.

6. A flexible fitting for pipe-lines comprising coupling-rings formed with flanges, there being channels formed in the faces of said flanges and a flexible expansible pipe-section having its ends rigidly secured in said channels, there being coacting means on said coupling-rings to prevent excessive torsional movement of said coupling-rings.

7. A flexible fitting for pipe-lines comprising coupling-rings, there being channels formed in said coupling-rings and a flexible expansible pipe-section having its ends rigidly secured in said channels.

JAMES C. BAYLES.

Witnesses:
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FREDERICK S. DUNCAN.