April 13, 1926. 1,580,325

L. H. PERRY

EXPANSION JOINT

Filed May 5, 1925

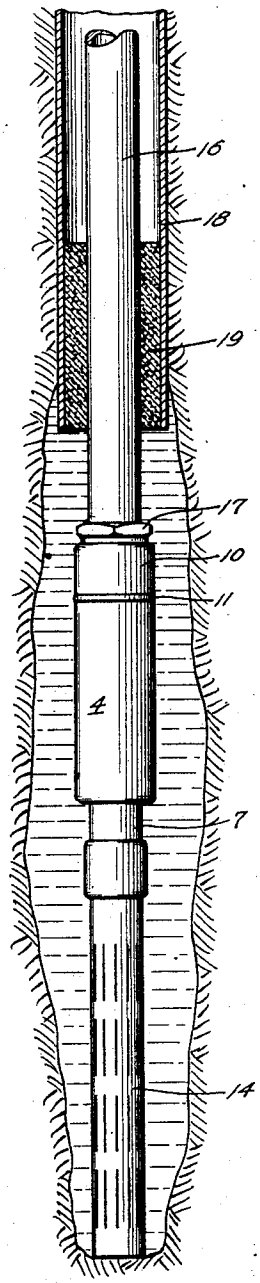


Fig. 2.

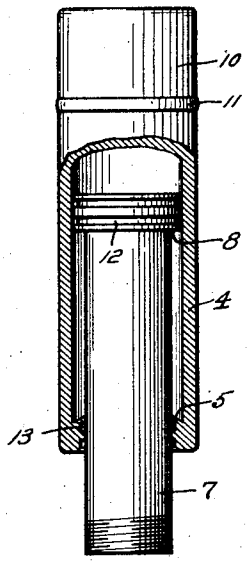


Fig. 3.

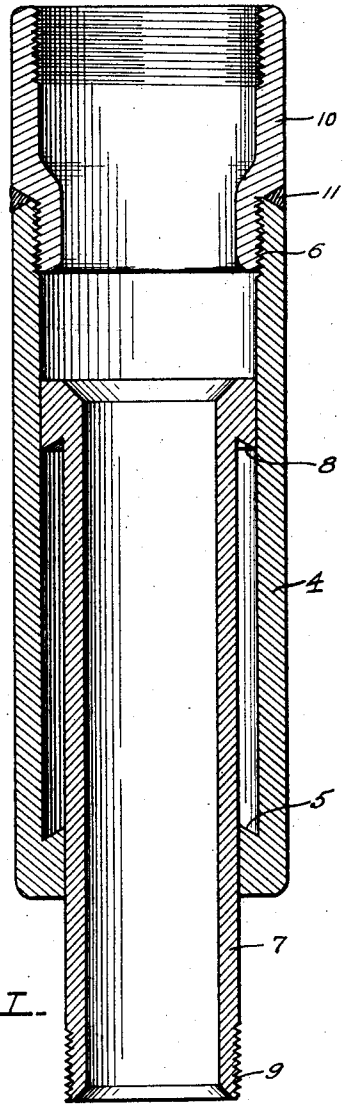


Fig. 1.

Inventor;
Leroy H. Perry,
per Arthur J. Farnsworth.
Attorney.

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UNITED STATES PATENT OFFICE.

LEROY H. PERRY, OF GARDENA, CALIFORNIA, ASSIGNOR TO SPENGLER FISHING TOOL COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

EXPANSION JOINT.

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To all whom it may concern:

Be it known that I, LEROY H. PERRY, a citizen of the United States, residing at Gardena, in the county of Los Angeles and State of California, have invented a new and useful Expansion Joint, of which a specification is set forth below.

In this specification, and the accompanying drawing, I shall describe and show a preferred form of my invention, and specifically mention certain of its more important objects. I do not limit myself to the forms disclosed, since various changes and adaptations may be made therein without departing from the essence of my invention as hereinafter claimed; and objects and advantages, other than those specifically mentioned, are included within its scope.

My invention relates to expansion joints and particularly joints adapted for use in deep wells. Among its salient objects are: first, to provide a joint of this nature adapted for supporting heavy weights hung therefrom; second, to provide a joint capable of relatively great longitudinal slipping without sacrificing alignment; and, third, to provide a construction that is simple and relatively inexpensive.

My objects are attained in the manner illustrated in the accompanying drawing, in which—

Figure 1 is a longitudinal central section of my complete joint by itself;

Figure 2 is a sectional elevation of the lower portion of a deep well with my joint installed on the discharge pipe therein, the figure being drawn to a much reduced scale; and

Figure 3 is a broken elevation of a modified form of my joint on a scale intermediate between the other two figures.

Similar reference numerals refer to similar parts throughout the several views.

It is well known that in deep wells, where the depth is say several thousand feet, the temperature of the liquid being pumped is relatively high. This temperature is of course communicated to the discharge line and results in great longitudinal expansion thereof. Thus if the discharge line at atmospheric temperature is lowered into a well and bottomed therein, as soon as the hot fluid begins to flow therethrough a large amount of expansion takes place. The force exerted by this expansion when the discharge line is bottomed is very great and results either in the buckling of the line or damage to the closure of the well at the surface.

My invention permits of longitudinal slipping of the cooperating parts of an expansion joint sufficient to take up the variation in length in the discharge pipe due to variations in temperature. It is obvious that such a device as above described must be capable of sustaining relatively heavy weights hung therefrom when it is being lowered into the well. Unless adequate provision is made for carrying these weights the expansion joint is liable to be damaged by stretching, or otherwise, in such a manner that it will either become useless or less efficient in operation.

My construction comprises a tubular casing 4 having an internally flanged lower extremity 5 and an internally screw-threaded upper extremity 6.

Within the casing is a longitudinally slidable tubular member 7 having a flanged head 8 and its lower end 9 exteriorly screw-threaded and projecting below the internally flanged extremity of the casing.

A tubular coupling 10 is screwed into the upper end of the casing after member 7 has been inserted therein. After thus being screwed home in the casing, the tubular coupling is circumferentially welded thereto as at 11.

In the modified form of my invention shown in Fig. 3 flanged head 8 and internal flange 5 at the lower end of the casing are circumferentially scored as shown at 12 and 13 respectively.

For use in a deep well a strainer pipe 14 is screwed to the lower end of the tubular member 7. The discharge pipe 16 is connected to coupling 10 directly or by means of a bushing such as 17.

Figure 2 illustrates a common practice in oil well drilling where the well casing 18 is cemented off at 19. Obviously if expansion is not provided for, and the discharge pipe is bottomed in the well expansion will result either in buckling the lower end of the discharge pipe or breaking the cement seal 19 and damaging the closure of the well at the surface of the ground.

I prefer to undercut the opposed faces of the flanges at 5 and 8 as shown to best advantage in Fig. 1. This undercutting is done at the same angle so that these opposed flange faces may become mutually engaged.

This undercutting has a tendency to prevent stretching of the flanged extremity of the casing when heavy weights are hung upon tubular member 7.

Having thus fully described my invention in a manner that will be clear to those familiar with the art concerned, I claim:

1. An expansion joint comprising; a tubular casing having an internally flanged extremity; and a longitudinally slidable tubular member having a flanged head within the casing, and its other end projecting from said extremity; the opposed faces of said flanges being undercut at the same angle to adapt them for mutual engagement to resist peripheral stretching of said extremity when said joint is subjected to tension.

2. An expansion joint comprising; a tubular casing having an internally flanged extremity; and a longitudinally slidable tubular member having a flanged head within the casing, and its other end projecting from said extremity; the opposed faces of said flanges being undercut at the same angle to adapt them for mutual engagement to resist peripheral stretching of said extremity when said joint is subjected to tension; and the peripheries of both said flanges being circumferentially scored.

3. An expansion joint comprising; a tubular casing having one of its extremities internally screw-threaded, and the other extremity internally flanged; a longitudinally slidable tubular member having a flanged head within the casing, and its other end projecting from said flanged extremity; and a tubular coupling screwed into the threaded extremity of the casing for retaining said slidable member therein; the opposed faces of said flanges being undercut at the same angle to adapt them for mutual engagement to resist peripheral stretching of said extremity when said joint is subjected to tension.

4. In a well, in combination with a discharge line an intermediate expansion joint in the line comprising; a tubular casing having an internally screw-threaded extremity and an opposed internally flanged extremity; a longitudinally slidable tubular member having a flanged head within said casing, and its other end projecting from said flanged extremity; and a bored fitting screwed into the threaded extremity of said casing for retaining said slidable member therein; said fitting being circumferentially welded to said casing after being screwed thereinto; and the opposed faces of said flanges being undercut at the same angle to adapt them for mutual engagement to resist peripheral stretching of said internally flanged extremity when said joint is subjected to tension.

LEROY H. PERRY.