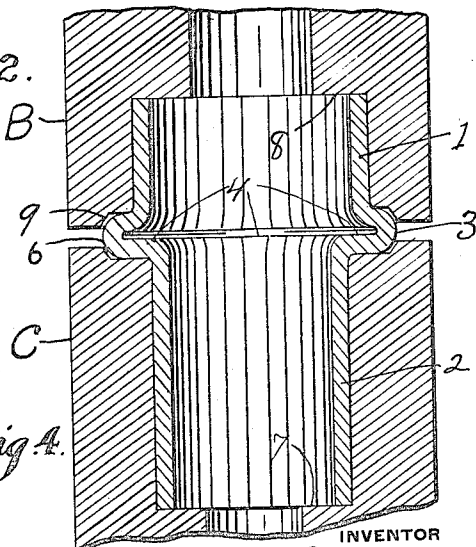
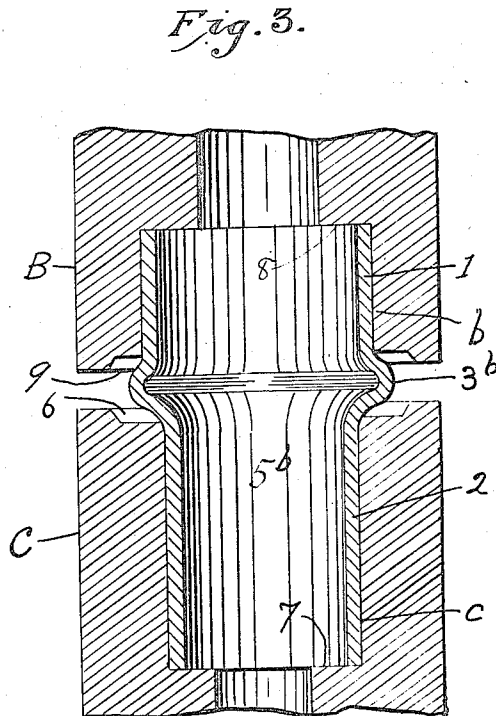
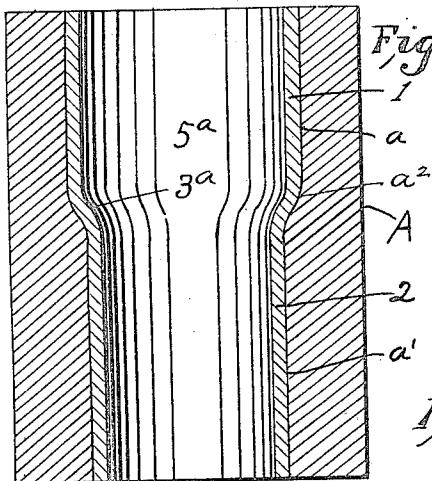
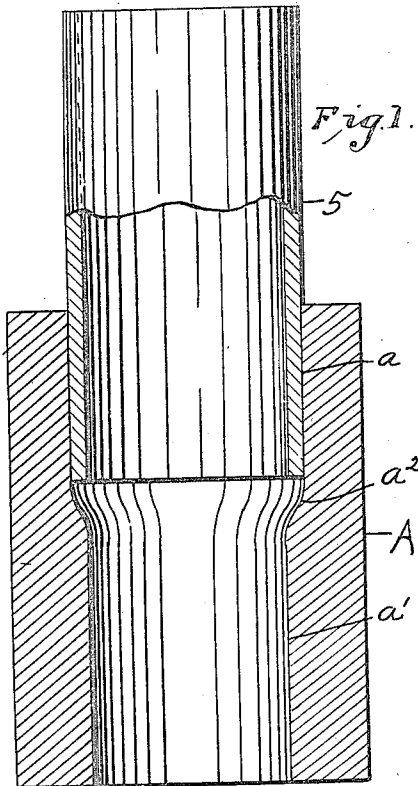


A. M. STEWART.
METHOD OF MAKING TUBING RINGS.
APPLICATION FILED DEC. 16, 1914.

1,152,858.

Patented Sept. 7, 1915.



WITNESSES

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METHOD OF MAKING TUBING-RINGS.

1,152,858.

Specification of Letters Patent.

Patented Sept. 7, 1915.

Application filed December 16, 1914. Serial No. 877,521.

To all whom it may concern:

Be it known that I, ANDREW M. STEWART, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Methods of Making Tubing-Rings, of which the following is a specification.

My invention relates to the manufacture of tubing rings, which are tubular devices supported by the casing-heads of well-drilling apparatus and in which tubing is suspended by the tube couplings, resting on internal shoulders in the tubing rings.

Heretofore, tubing rings have been made of castings which, in order to withstand the strain for the purposes for which they are intended, had to have their outer diameters too large to permit the rings to fit in standard tops furnished with casing heads.

It is the object of the present invention to make the tubing rings out of malleable pipe which after having been heated is brought to the proper dimensions and shape by the use of suitable dies or by treating the malleable pipe to a series of steps.

Referring to the accompanying sheet of drawings, Figure 1 is a vertical section, partly in side elevation, showing the preferred die in which a straight piece of heated malleable pipe is preliminarily treated; Fig. 2, a vertical section of the die and tube at the close of the treatment of the pipe in the said die; Fig. 3, a vertical section of a pair of dies in which the pipe or blank shaped in the die shown in Figs. 1 and 2 is brought to an intermediate stage of manufacture between the form shown in Fig. 2 and its final form, shown in Fig. 4; and Fig. 4, a vertical section like Fig. 3 showing the dies and the tubing ring at their final position.

The tubing ring in its completed form is shown within the dies B and C, Fig. 4. It comprises two axially-alined tubular portions 1 and 2 connected by the outwardly extended head or flange 3 integral with the portions 1 and 2, the portion 1 being of larger diameter than the portion 2, whereby the internal upwardly-faced shoulder 4 and the top of the portion 2 is provided for the support of the lower end of a pipe coupling connecting two lengths of pipe, the coupling being in the portion 1 and the lower of the two coupled pipes being in the section 2. The tubing rings, comprising the parts num-

bered 1, 2, 3, and 4, are old and their functions well known. It may, however, be stated that the section 2 is made to fit in casing-head tops having standard openings therein to receive the portion 1. When the tubing rings are made of castings they have their walls made thicker in order to make them sufficiently strong. Inasmuch as the internal diameter of the tubing rings must be maintained so as to receive standard tubing, the additional thickness of cast tubing rings must be added to the outside of the same, which prevents the use of the said standard top, it being necessary to provide extra tops to fit the various sizes of tubing rings.

Preferably I make a tubing ring as follows: I provide the steel-die A, which has a central opening in the same from end to end, the opening having its ends of different diameters. The upper portion *a* of the opening has the outside diameter of the portion 1 of the tubing ring and the lower portion *a'* of the opening has the outside diameter of the portion 2 of the tubing ring. The portions *a* and *a'* of the die opening are in axial alinement and connected together by the curved or inclined portion *a²* tapering from the portion *a* to the portion *a'*.

5 is a short piece of pipe, preferably of uniform diameter and being composed of steel or other metal which, when heated, will under pressure conform itself to the internal shape or configuration of the die A. The pipe 5 is slightly longer than the tubing ring to be made to compensate for the bead 3. It is brought to at least a good red heat, for example, to approximately from 1400° F. to 1600° F. along that portion thereof in which the metal will have to flow to assume the shape thereof taken when driven into the die A, as shown in Fig. 2. The lower end of the pipe 5 when suitably heated is inserted in the portion *a* of the die A as shown in Fig. 1. The pipe is then driven downwardly in the die A. As the portions of the pipe 5 successively pass the inclined portion *a²* of the die, the pipe becomes contracted to the cross-area of the portion *a'* of the die. When the pipe 5 has been driven into the die as shown in Fig. 2, the portion *a* of a tubing ring has been formed, the portion 2 being the unchanged upper end of the pipe 5. The portions 1 and 2 in the die A on Fig. 2 are connected by the downwardly inclined or tapered portion

3^a, which forms under the action of the dies B and C the major part of the rib or flange 3 of the tubing ring.

The blank 5^a comprising the portions 1, 2, and 3^a (Fig. 2) is extracted from the die A and its lower, that is, its contracted or reduced portion 2 is inserted in the opening *c* in the die C. The opening *c* preferably has its diameter conforming to the exterior diameter of the portion 1 of the blank 5^a. The top of the die C terminates preferably approximately at the line where the portion 3^a merges with the portion *a'* of the blank, the upper face of the die C having the annular recess 6, having its outside diameter at least equal to the diameter of the rib or flange 3. The bottom of the opening *c* is formed by the shoulder 7 on which the lower end of the blank 5^a rests.

The die B has in its lower face the opening *b* to receive the portion 1 of the blank 5^a, the opening *b* being terminated by the shoulder 8 which rests on the end of the said portion 1. The lower face of the die B has around the opening *b* the annular recess 9. The length of the opening *b* will be such as to leave enough of the blank between the dies B and C to form the rib or flange 3 with the required diameter. After the blank 5^a has been assembled in the dies B and C as described with approximately the portion 1 in the die B, approximately the portion 2 in the die C, and approximately the portion 3^a between the dies B and C, the dies B and C are caused to move, one toward the other, as by forcing the die B toward the die C. As the die B travels toward the die C, the portion of the blank 5^a between the dies will double or bend outwardly, at one stage forming the bead 3^b, (Fig. 3) and at the final stage forming the rib or flange (Fig. 4), which is formed by the internal face of the blank being crimped or bent approximately upon itself. The recesses 6 and 9 engage the portions of the

blank protruding into the same and press the upper and lower members of the rib 3 toward each other. The recesses may obviously be omitted, leaving the opposing faces of the dies B and C plane. By first reducing the lower end of the blank 5 and then pressing the ends thereof toward each other and causing the rib 3 to be on the outer face of the finished product, I am enabled to produce the internal annular shoulder 4 on the upper end of the reduced portion 2. The dies B and C are separated from the tubing ring and the latter is ready for use. Owing to the superior strength of the metal in the same, its wall may be thinner than required when gray iron or other castings are employed.

I do not limit myself to the use of the dies shown as the blanks and final product may be formed in various ways.

I claim—

1. The method of producing an integral flange and an internal shoulder on a tube of different cross-sections connected by an intermediate section, which consists in confining the sections at the ends of the intermediate section to their original dimensions while applying end pressure, thereby producing an external flange and an internal shoulder, substantially as set forth.

2. The method of making tubing rings, which consists in confining to their original dimensions the adjacent portions of a metal tube of different diameters connected by an inclined portion and subjecting the same to end pressure, one toward the other, until the metal adjacent to the said inclined portion is doubled outwardly as a flange.

Signed at Pittsburgh, Pa., this 11th day of December, 1914.

ANDREW M. STEWART.

Witnesses:

ALICE E. DUFF,
F. N. BARBER.