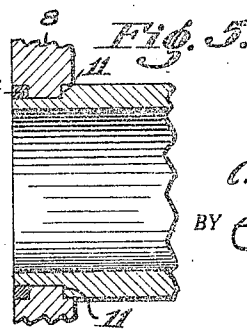
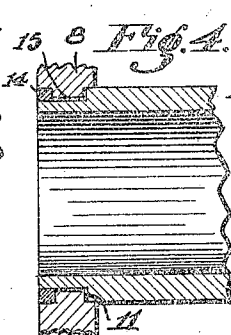
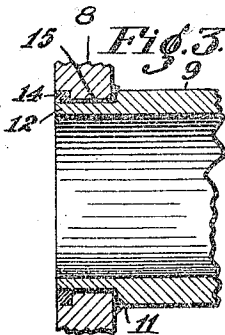
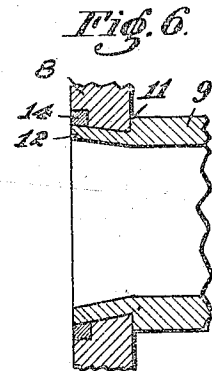
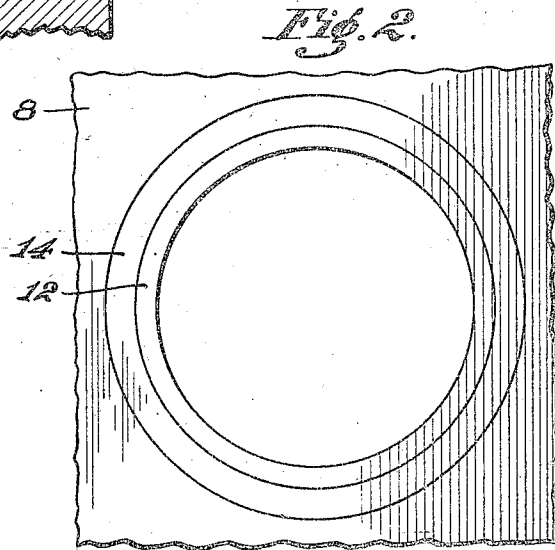
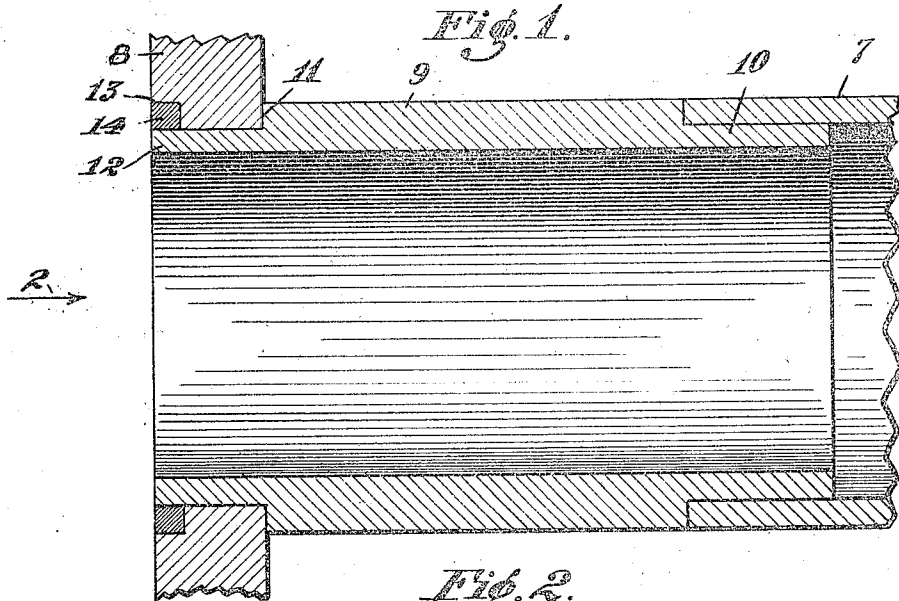


C. S. COLEMAN.
BOILER TUBE CONNECTION.
APPLICATION FILED APR. 14, 1917

1,299,396.

Patented Apr. 1, 1919.



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BOILER-TUBE CONNECTION.

1,299,396.

Specification of Letters Patent.

Patented Apr. 1, 1919.

Application filed April 14, 1917. Serial No. 162,153.

To all whom it may concern:

Be it known that I, CHARLES S. COLEMAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Boiler-Tube Connection, of which the following is a specification.

This invention relates to a boiler tube connection and particularly pertains to a means and method of attaching the end of a boiler tube to the fire box end plate of the boiler by a weld joint.

It is the object of this invention to provide a means and method for welding boiler tubes to the boiler end plate to form a sealed joint and one which is not liable to be separated by expansion and contraction of the tube end plate and thus provide a construction by which a non-leakable joint will be obtained.

Another object is to provide a weld joint for boiler tube end connections which will permit of the tube being disconnected from the end plate without damaging either the tube or the plate so that the tube may be replaced and rewelded to the end plate.

Other objects will appear hereinafter.

The invention is illustrated in the accompanying drawings, in which:

Figure 1 is a view in vertical section showing the boiler tube as connected to the boiler plate and illustrating one embodiment of my invention.

Fig. 2 is a view in elevation as seen in the direction indicated by the arrow 2 in Fig. 1.

Figs. 3, 4, 5 and 6 are views illustrating modified forms of the invention.

More specifically 7 indicates the boiler tube and 8 the boiler end plate. In carrying out the invention the boiler tube is fitted with an end section 9 having an outside diameter corresponding to that of the tube and with a wall thickness substantially twice the thickness of the tube wall. The tube end is connected to the tube by forming the tube end with a reduced outside diameter 10 which is inserted within the tube and the joint thus formed welded together, as more particularly set forth in my co-pending application bearing Serial Number 148,105, filed February 12, 1917.

The outer end of the section 9 is reduced in diameter to form a shoulder 11, and a reduced end portion 12 of a length substan-

tially corresponding to the thickness of the boiler end plate. The end plate is formed with an opening to receive the portion 12 which is inserted into the boiler plate from the rear thereof. The outer face of the boiler plate is formed with an annular channel 13 around the marginal edge of the boiler tube opening, having a width and depth slightly greater than the thickness of the wall of the portion 12. This channel is designed to receive an annulus of metal 14 of a degree of fusibility or hardness slightly less than that of the metal of which the tube section 9 and end plate 8 are formed. In assembling the connection the reduced portion 12 is inserted in the opening in the end plate with the shoulder 11 tightly abutting against the inner face of the end plate. The portion 12 is then rolled tight against the wall of the opening whereupon the metal 14 is welded in the channel 13 and to the portion 12 thus effectively joining the tube section 9 to the end plate. When thus connected, the end of the tube section may extend flush with the fire face of the boiler end plate thus forming the latter free from projections.

By forming the metal 14 with a degree of fusibility or hardness less than that of its surrounding metal it may be removed by a suitable cutting tool without injuring either the end plate or the tube section so that the latter may be removed and replaced as occasion may require.

The joint thus formed provides the advantage derived by a weld joint with this added feature of permitting the removal and replacement of the boiler tube which can not be effected where the tube end section is welded to the end plate throughout the thickness of the latter or beaded over the outer face of the end plate with the bead welded to the latter.

In the form of the invention shown in Fig. 3 a copper gasket 15 is interposed between the portion 12, shoulder 11 and the end plate 8.

Fig. 4 shows the shoulder 11 as countersunk in the end plate and the gasket 15 concealed.

Fig. 5 shows a construction substantially corresponding to Fig. 1 with the exception that the shoulder 11 is countersunk in the inner face of the end plate.

In some instances it may be desirable to

bevel the opening in the end plate outwardly as shown in Fig. 6 in which case the portion 12 will be rolled to conform to the bevel thus formed.

- 5 Various other modifications of the invention may be resorted to as occasion may require without departing from the spirit and scope of the invention as set forth in the appended claims and the essence of which
10 resides in welding a metallic annulus to the tube end and the boiler end plate.

I claim:

1. A boiler tube and end plate connection comprising an end section of an outside-diameter equal that of a boiler tube and thickness greater than that of the tube, said end section having reduced ends forming flat annular shoulders, a boiler tube within which one end of the end section is inserted, a
15 boiler end plate having an opening in which the other reduced end portion of the end section is inserted with the shoulder abutting throughout its surface against the end plate, and an annulus of metal welded to the
20 outer end of the end section and to the boiler end plate, said annulus arranged in a channel in the outer face of the end plate and co-

operating with the shoulder abutting against the opposite side of the end plate to hold the end section against displacement and
25 effect a tight joint.

2. A boiler tube and end plate connection comprising an end section of an outside diameter equal that of a boiler tube and having a wall thickness greater than that of the
30 tube, said end section having reduced ends forming flat annular shoulders, a boiler tube within which one end of the end section is inserted, a boiler end plate having an opening in which the other reduced end
35 portion of the end section is inserted with the shoulder abutting throughout its surface against the end plate, a metallic gasket interposed in the joint between the end section and the wall of the opening in the boiler
40 end plate, and an annulus of metal welded to the outer end of the end section and to the boiler end plate, said annulus arranged in a channel in the outer face of the end plate and cooperating with the shoulder abutting
45 against the opposite side of the end plate to hold the end section against displacement and effect a tight joint.

CHARLES S. COLEMAN.