

O. D. KILLEBREW.
METHOD OF TREATING METAL TUBING.
APPLICATION FILED JUNE 2, 1913.

1,093,435.

Patented Apr. 14, 1914.

Fig. 1.

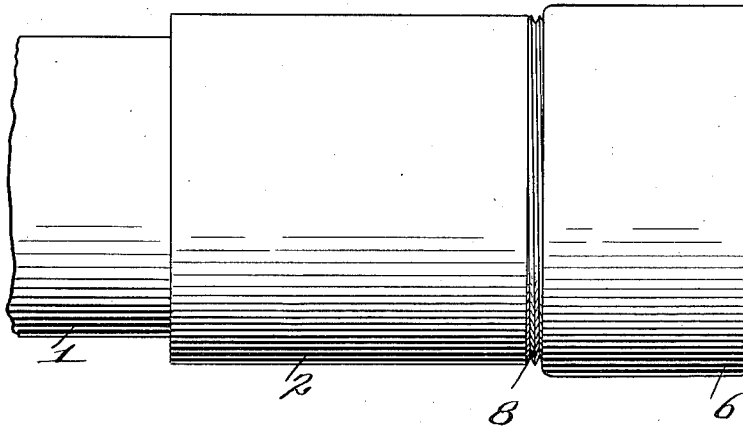
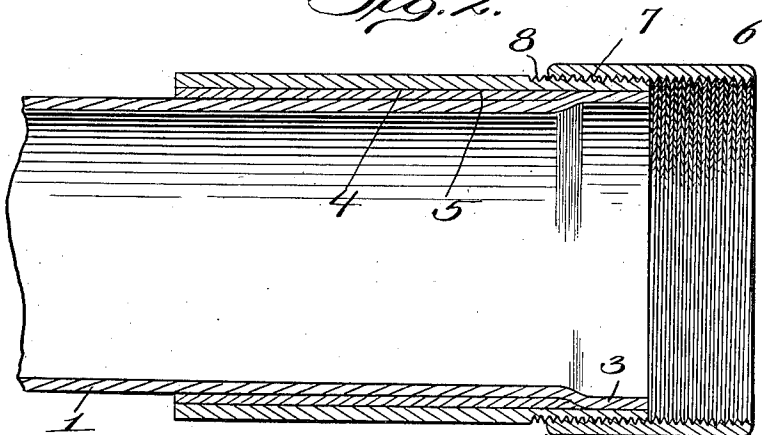


Fig. 2.



Witnesses:

W. H. Keeler
W. H. Keeler

Inventor

Oscar D. Killebrew

by

James L. Norris
Attorney

UNITED STATES PATENT OFFICE.

OSCAR D. KILLEBREW, OF RICHMOND, VIRGINIA.

METHOD OF TREATING METAL TUBING.

1,093,435.

Specification of Letters Patent.

Patented Apr. 14, 1914.

Application filed June 2, 1913. Serial No. 771,300.

To all whom it may concern:

Be it known that I, OSCAR D. KILLEBREW, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented new and useful Improvements in Methods of Treating Metal Tubing, of which the following is a specification.

This invention has reference to the utilization of boiler tubes with standard pipe fittings.

At the present time, the removal of tubes or flues from boilers is due, mainly, to their ends becoming burned too thin to withstand the pressure. In some instances, the burned ends of such tubes are cut off, and the tubes are either utilized directly in shorter boilers, or are provided with new ends, which are welded thereon. For the most part, however, the tubes, when once removed, are sold for scrap iron, since they are incapable of being threaded and employed as ordinary piping.

This invention, therefore, proposes, briefly, an improved method of treating such tubes, whereby they can be equipped with fittings, and used for the purpose stated.

In the accompanying drawing, Figures 1 and 2 are, respectively, a side elevation and a longitudinal section of a boiler tube treated in accordance with the invention and connected to a pipe fitting.

The improved method consists, substantially, in inserting the end of one of the afore-mentioned tubes into a short section of standard pipe, (*i. e.*, pipe of conventional or stock size), which is rigidly supported in any suitable manner and which has previously been threaded. The end of the tube is brought flush with the end of the pipe section and is then expanded continuously directly against the inner surface of the latter, so as to form a tight joint and thus fasten the tube end and section together, after which the support above referred to is removed. The combined tube and section may then be connected to any standard fitting of proper size, and may be used as ordinary piping, and it has been found from actual tests that such structure will withstand a pressure in excess of 200 pounds per square inch.

It will be understood, of course, that the internal diameter of the pipe section is slightly greater than the external diameter of the tube, so that an annular or tubular

space or chamber will exist between the section and tube. While not strictly necessary, it is considered advisable to fill this chamber with a suitable packing, preferably molten metal, which, when solidified, will increase the rigidity of the joint between the section and tube, and thus strengthen the same to an appreciable extent.

The pipe section is obviously comparatively short, as compared with the tube to which it is fitted, but should be long enough to be gripped by a wrench or other implement when the tube is to be manipulated for use with a fitting, as the tube itself is too thin to permit such treatment.

In the construction shown in the said drawing, 1 indicates the boiler tube, and 2 the pipe section in which the tube end is inserted. The expanded portion of the tube end is designated by the numeral 3, and this portion may have any length which may be considered necessary or advisable. The space or chamber between the tube and pipe section is indicated by the numeral 4, and is here shown as filled with the metal packing 5. The fitting to which the tube and pipe section are connected is indicated by the numeral 6, said fitting having the usual internally threaded end portion 7 in which the externally threaded end 8 of the pipe section is engaged.

Having fully described my invention, I claim:—

1. The hereindescribed method of treating metal tubing which consists in inserting the end of a tube into a short section of standard pipe having an internal diameter slightly greater than the external diameter of the tube, so as to produce an annular chamber between said pipe section and tube; expanding the end of said tube in said pipe section continuously and directly against the inner surface of the latter, to form a continuous tight joint between said tube and pipe section; and filling said chamber with metal packing.

2. The hereindescribed method of treating metal tubing which consists in inserting the end of a tube into a short externally-threaded section of standard pipe; expanding the end of said tube in said pipe section continuously and directly against the inner surface of the latter, to form a continuous, tight joint between said tube and pipe section; and applying an internally-threaded

standard pipe fitting upon the threaded end of said pipe section.

3. The hereindescribed method of treating metal tubing which consists in inserting
5 the end of a tube into a short externally-threaded section of standard pipe having an internal diameter slightly greater than that of the tube, so as to produce an annular chamber between said pipe section and tube;
10 expanding the end of said tube in said pipe section continuously and directly against the inner surface of the latter, to form a continuous tight joint between said tube and pipe section; filling said chamber with metal
15 packing; and applying an internally-threaded standard pipe fitting upon the threaded end of said pipe section.

4. As a new article of manufacture, a
20 metal tube having a short externally threaded section of standard pipe fitted upon its end, the end of said tube terminating flush with that of said pipe section and being continuously expanded within the latter and directly against the inner surface thereof, to

form a continuous tight joint between said 25 tube and said pipe section; and an internally-threaded standard pipe fitting applied upon the threaded end of said pipe section.

5. As a new article of manufacture, a
30 metal tube having fitted upon its end a short section of standard pipe, the internal diameter of which pipe section is slightly greater than that of the tube, to produce an annular chamber between said pipe section and tube, the end of said tube terminating flush with
35 that of said pipe section and being continuously expanded within the latter and directly against the inner surface thereof, to form a continuous tight joint between said
40 tube and said pipe section; and a filling of metal packing inserted in said chamber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

OSCAR D. KILLEBREW.

Witnesses:

REGINA H. CLANCEY,
H. C. McCARTENEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."