

(No Model.)

N. T. DE GOLYER, Dec'd.

E. W. DE GOLYER, Administrator.

STEAM BOILER.

No. 487,696.

Patented Dec. 6, 1892.

Fig. 1.

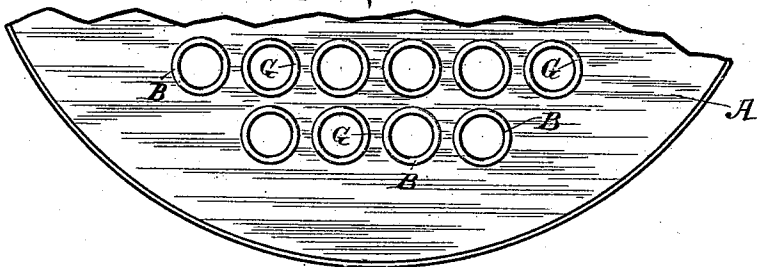


Fig. 2.

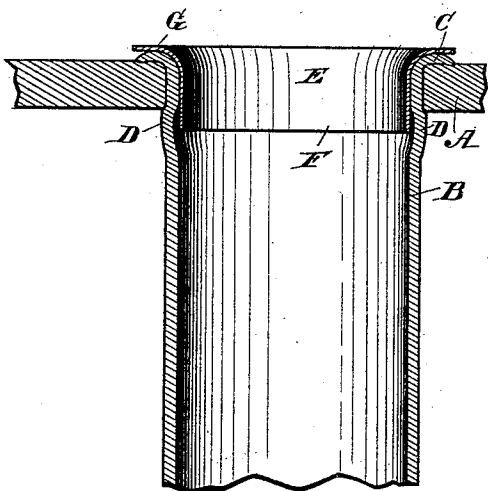


Fig. 3.

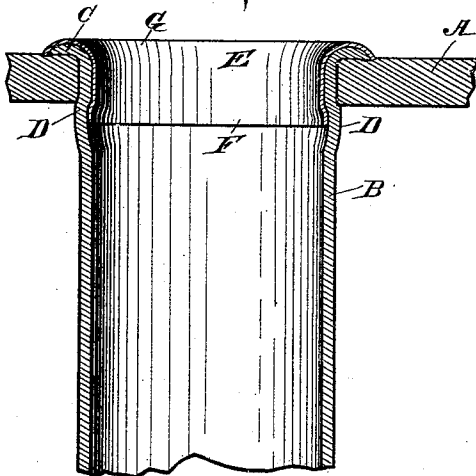
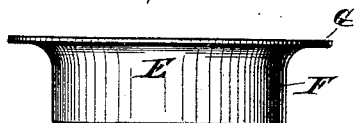


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

NORMAN T. DE GOLYER, OF BEAVER DAM, WISCONSIN, ASSIGNOR OF ONE-HALF TO EVERARD W. DE GOLYER, OF SAME PLACE; E. W. DE GOLYER ADMINISTRATOR OF NORMAN T. DE GOLYER, DECEASED.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 487,696, dated December 6, 1892.

Application filed March 4, 1891. Serial No. 383,661. (No model.)

To all whom it may concern:

Be it known that I, NORMAN T. DE GOLYER, of Beaver Dam, in the county of Dodge and State of Wisconsin, have invented a new and
5 useful Improvement in Steam-Boilers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

In that class of steam-boilers in which the
10 heat and products of combustion are carried by flues from the fire-box through the boiler much trouble is experienced by the destruction or burning up by the heat of the ends of the tubes forming the flues in and about the
15 boiler-head or fire-sheet, and such burning and destruction of the ends of the tubes so far destroys the value of the tube that it must be removed from the boiler and a new one substituted.

20 The object of my invention is to provide a means consisting of a bushing or lining for the ends of the tubes forming the flues, which ends are exposed to the fiercest of the fire and are not protected against burning by the im-
25 mediate contact of the water in the boiler.

My improved device is adapted to be used in all forms of steam-boilers—stationary, locomotive, or marine.

In the drawings I have shown my improved
30 device in connection with a fragment of a tubular stationary boiler for convenience of illustration.

Figure 1 is a fragment of a boiler-head or fire-sheet, showing the flues and my improved
35 device about them in the tubes. Fig. 2 is a central longitudinal section of the boiler-flue with my thimble or bushing inserted in the end of the tube before it has been expanded and fitted to its place. Fig. 3 is a central longitudinal section of the same fragment of the
40 boiler shown in Fig. 2 with my improved bushing or lining fitted in the end of the tube. Fig. 4 is the bushing or lining in the form used by me ready for being placed in the tube.

45 A is a boiler-head or fire-sheet.

B are tubes forming the flues for the passage of the products of combustion through

the boiler from the fire-box to the smoke-discharge. These tubes are secured in the apertures therefor in the boiler-head by having
50 their outer ends C overturned against the outer surface of the boiler-head. The joint about the tube is made tight by forcing the tube outwardly against the boiler-head or fire-sheet and raising an annular rib or boss D
55 about the tube just inside of the boiler-head by and through the use of an expander. In this way of course a corresponding annular groove is formed upon the inner side of the tube. It is this part of the tube that is on the outside
60 of the boiler-head or just in the aperture that is liable to be burned and destroyed by the action of the fire. To protect this portion of the boiler, I use a lining or bushing E, consisting of a metal thimble F, having a flange
65 G, constructed usually of copper or wrought-iron. The band or thimble F is inserted in the end of the tube and its inner end is enlarged or formed into an annular rounded shoulder or rib, whereby the bushing is held
70 securely in place. The flange G is then turned over and fitted tightly upon the flange C of the tube B, covering and protecting it from the direct action of the fire. This bushing is an inexpensive means of protecting the ends
75 of the tubes, and when they are destroyed or burned to some extent may be removed and replaced by new ones with much less expense than the cost of removing and inserting new tubes when the ends only are destroyed by
80 the fire.

What I claim as new, and desire to secure by Letters Patent, is—

In a steam-boiler, the combination of a boiler-head, a tube serving as a flue inserted in
85 the boiler-head and provided at its outer end with a flange overturned against the outer surface of said boiler-head and at a point slightly removed from its end, with a boss engaging the inner surface of the boiler-head, said boss
90 forming a corresponding groove upon its inner surface, and a sheet-metal bushing constructed of tensile metal in undivided tubular form inserted in the end of the tube, the

inner end of which bushing is provided with
an annular rounded rib or shoulder fitting
the complementary groove of the tube and
having its outer end turned over outwardly
5 against the boiler-head and covering the flange
forming the extremity of the tube, substan-
tially as set forth.

In testimony whereof I affix my signature in
presence of two witnesses.

NORMAN T. DE GOLYER.

Witnesses:

J. E. HOSMER,

EMIL A. SCHEMMEL.