

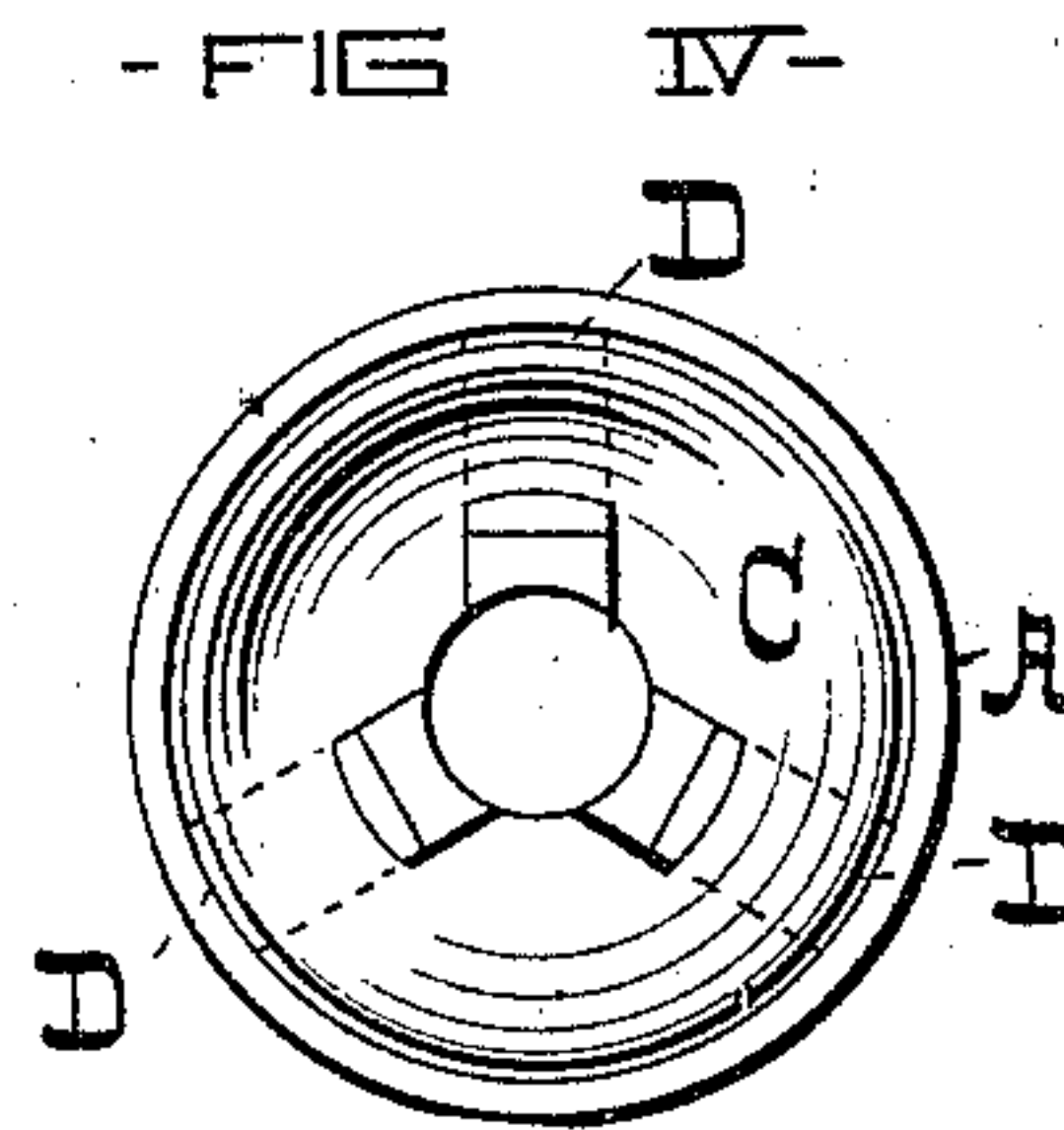
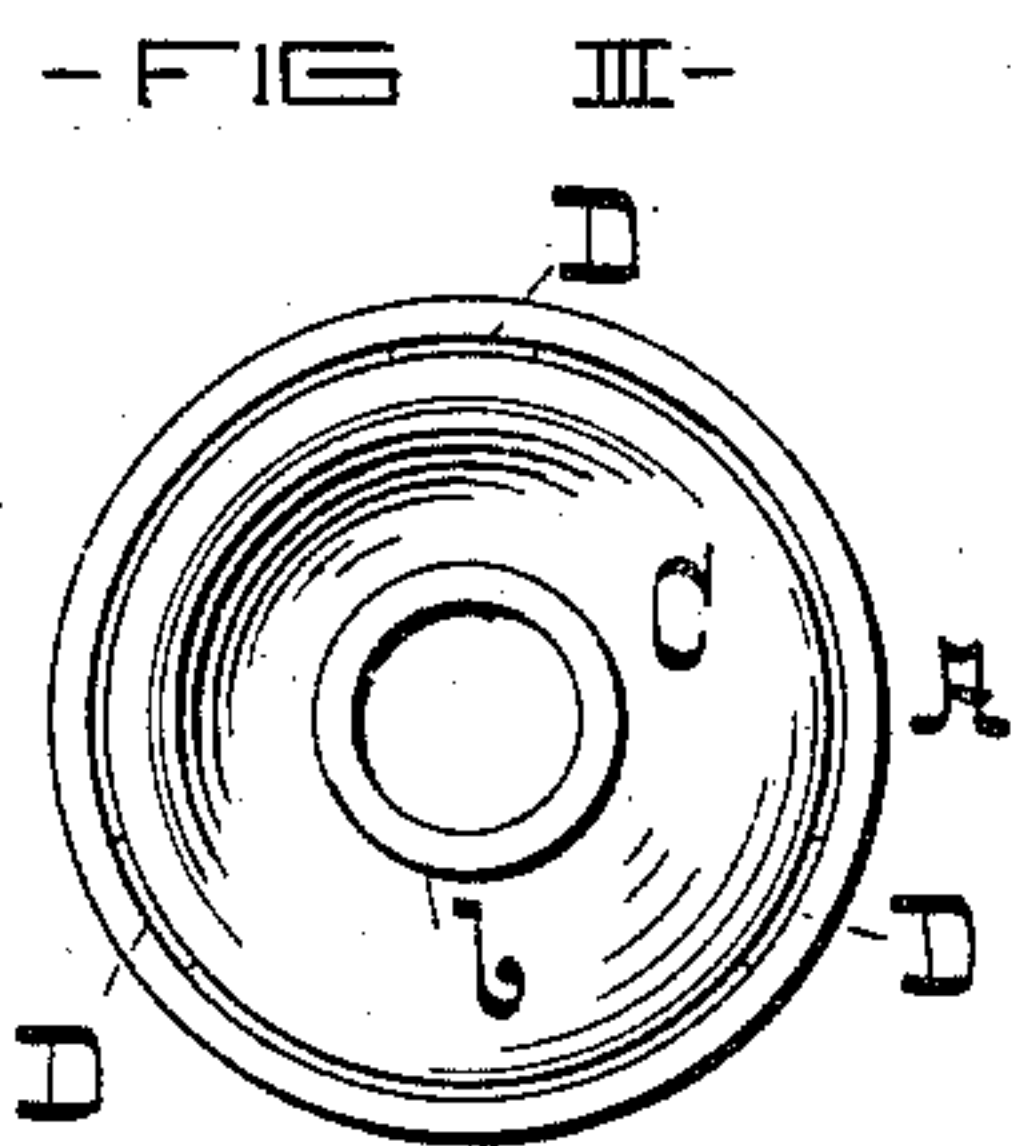
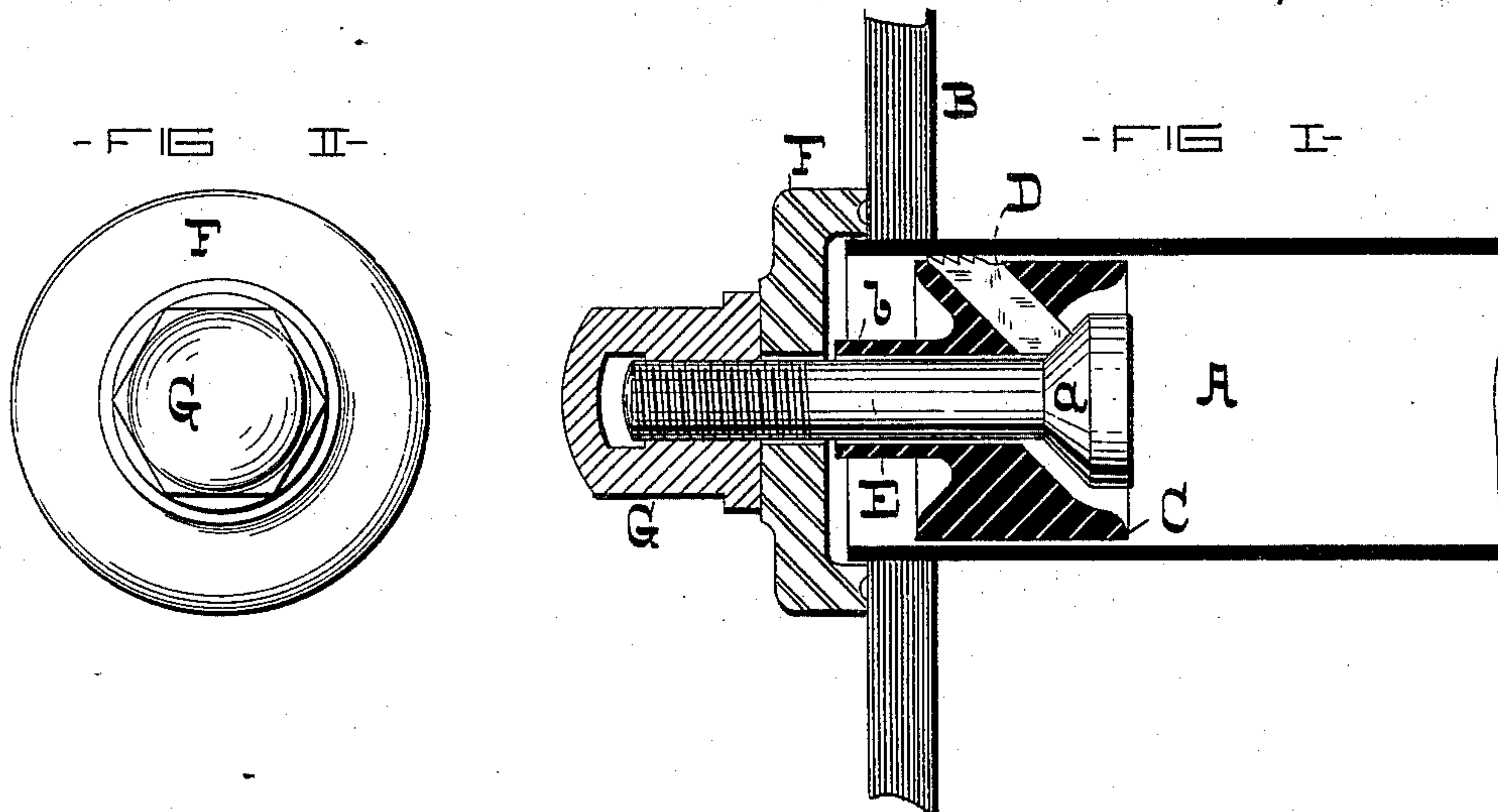
(No Model.)

G. WASHINGTON.

TUBE STOPPER.

No. 309,368.

Patented Dec. 16, 1884.



- WITNESSES -

*Danl. Fisher*

*Chas. B. Cassady*

- INVENTOR -

*George Washington,*  
*by G. H. H. Howard,*  
*Atty.*

# UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON, OF BALTIMORE, MARYLAND.

## TUBE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 309,368, dated December 16, 1884.

Application filed August 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE WASHINGTON, of the city of Baltimore and State of Maryland, have invented certain Improvements in Tube-  
5 Stoppers, of which the following is a specification.

The object of this invention is to provide stoppers which may be easily applied to leaking tubes to close them. They may also be  
10 employed to close the ends of tubes in sectional boilers, and for a variety of other purposes.

In the drawings forming a part hereof, Figure I is a longitudinal section of the invention applied to a tube. Fig. II is an exterior end view of the invention. Figs. III and IV are respectively a front and a rear end view of a part of the stopper.

A represents a boiler-tube, and B the tube-sheet in which the tube is expanded.

C is a cylindrical block slightly less in diameter than the interior of the tube A. This block is provided with three grippers, D, consisting of hardened steel bars, which rest  
25 loosely in holes set at an angle of about forty-five degrees with reference to the longitudinal center line of the tube. The outer ends of the grippers are provided with sharp corners, or with a number of teeth, as shown in  
30 the drawings, and their inner ends bear against the conical head *a* of the bolt E.

F is a cap placed over the end of the tube, and it is grooved at its edge to receive packing to facilitate the formation of a tight joint  
35 with the tube-sheet. The bolt E passes through the cylindrical block C and the cap F, and has a nut, G, at its outer end. The stopper is applied to the tube with all its parts in position, as shown in Fig. I. The nut is then

turned to draw the bolt outward, and as the  
40 conical head bears against the grippers they are forced in contact with the inner surface of the tube, the teeth forming slight depression therein. The bolt is thus held firmly in place, and a tight joint can be easily and  
45 readily formed between the cap and the face of the tube-sheet. An extension, *b*, of the block C gives the proper distance between the cap and block, so that the edges of the grippers are partially within the tube-sheet. This  
50 prevents the bursting of the tube in case undue strain should be placed on the bolt in setting up the nut.

I do not limit myself to the exact shape or construction of the block C, as its use is merely  
55 to support the grippers, and a block of almost any shape, provided it has holes for the grippers, would answer the purpose of the one shown.

In applying the stopper to sectional boiler-  
60 tubes, where it is necessary for water to pass the block to give circulation, the block could be of skeleton form.

I claim as my invention—

In a tube-stopper, a block to fit in the tube, 65 a series of grippers placed in an angular position in holes in the said block, and adapted to be projected beyond the said block and in contact with the inner surface of the tube, combined with a bolt having an angular or taper-  
70 ing head, which rests against the inner ends of the grippers, a cap to cover the end of the tube, and a nut, substantially as specified.

GEORGE WASHINGTON.

Witnesses:

CHAS. B. CASSADY,  
DANL. FISHER.