No. 662,819. Patented Nov. 27, 1900.

S. L. RAVIER & A. JANET.

TUBE STOPPER.

(Application filed Sept. 29, 1899.)

(No Model.)

Fig. 4.

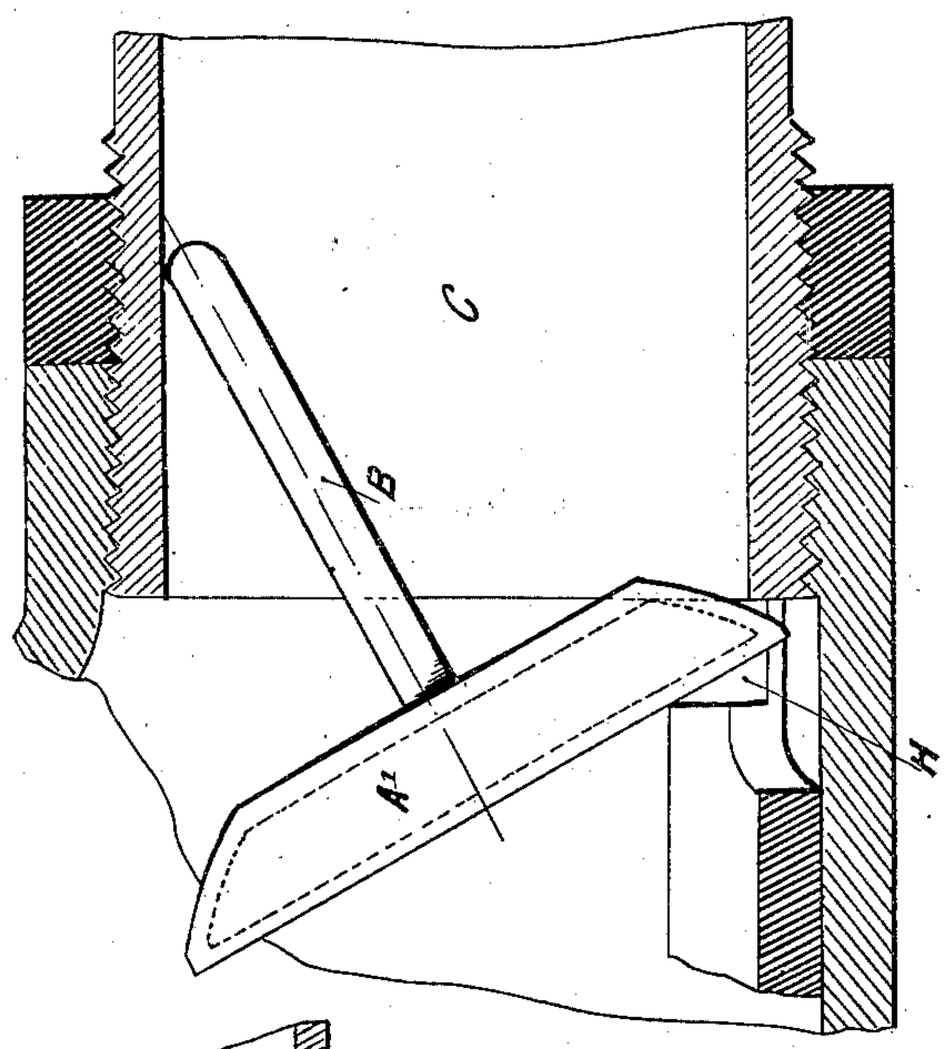


Fig. 2.

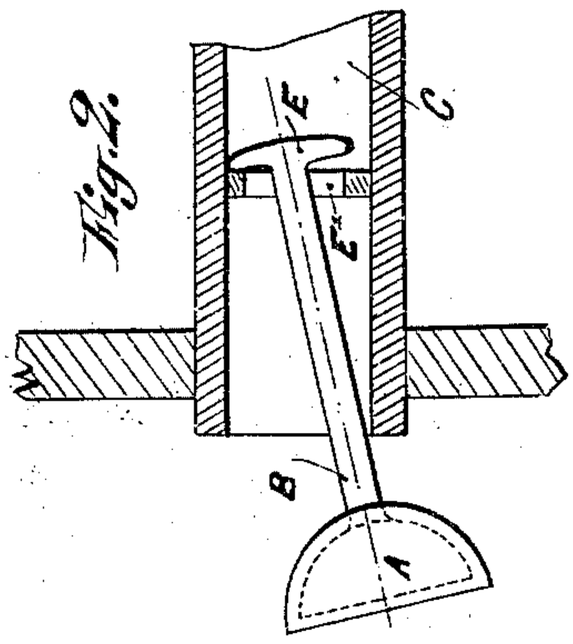
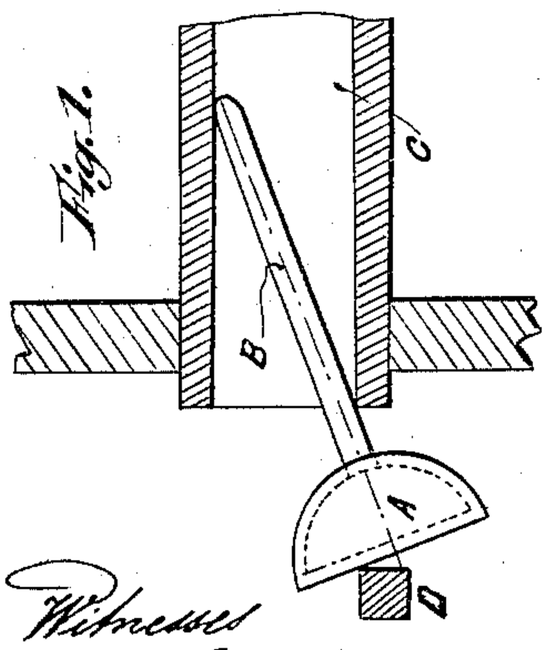
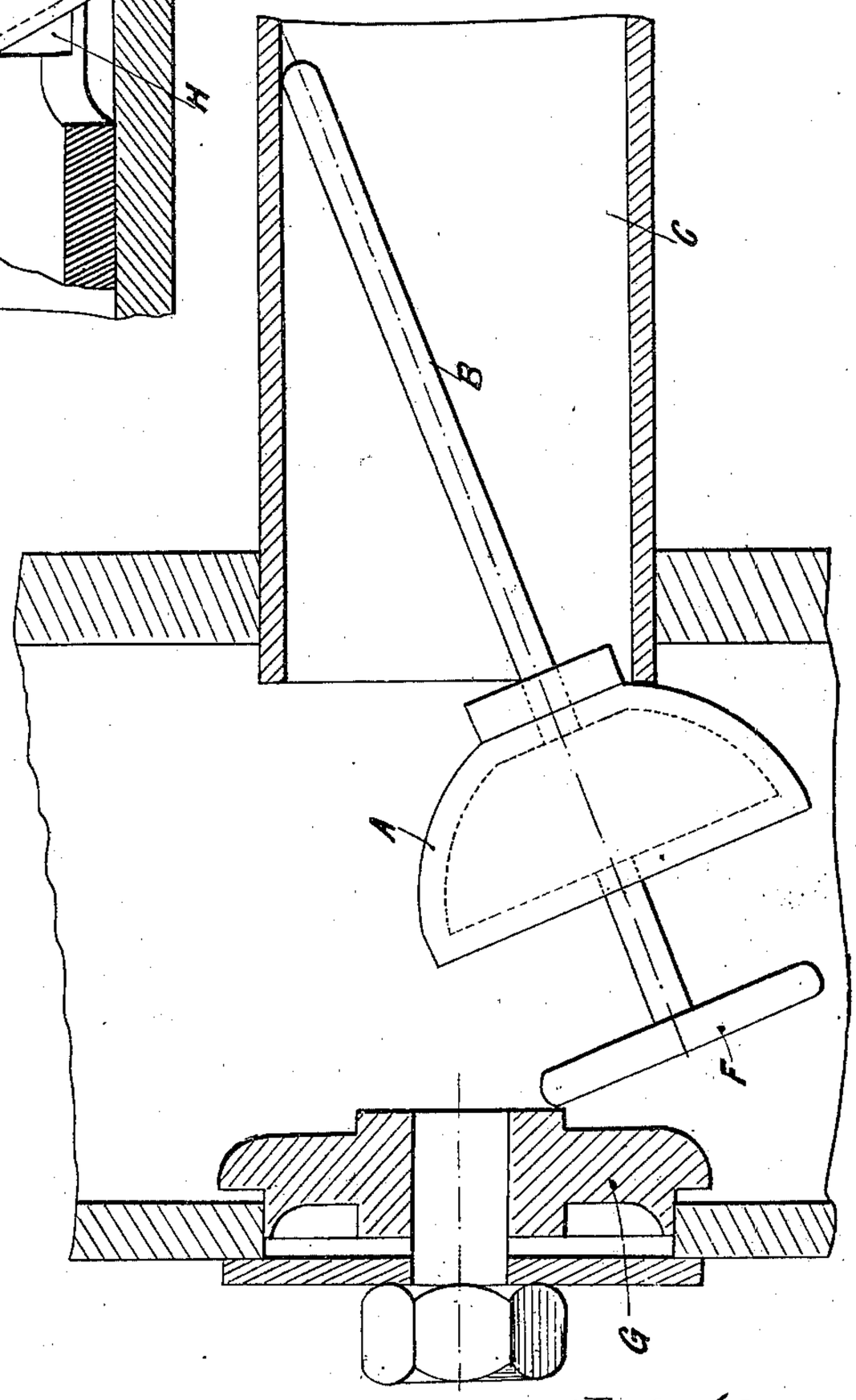


Fig. 1.



Witnesses
Benj. F. Lee Esq.
J. Wagner

Fig. 3.



Inventors
L. Louis Ravier and Armand Janet
per L. D. Aiken Jr.
Attorney.

UNITED STATES PATENT OFFICE.

SYLVAIN LOUIS RAVIER AND ARMAND JANET, OF PARIS, FRANCE.

TUBE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 662,819, dated November 27, 1900.

Application filed September 29, 1899. Serial No. 732,123. (No model.)

To all whom it may concern:

Be it known that we, SYLVAIN LOUIS RAVIER and ARMAND JANET, citizens of the Republic of France, and residents of Paris, France, have invented certain new and useful Improvements in Devices for Automatically Closing the Tubes of Water-Tube Boilers in Case of Rupture, of which the following is a specification.

This invention has for its object to provide an efficient device for automatically and efficiently closing the tubes of water-tube boilers in case of rupture whatever may be the condition of the tube ends. For this purpose we employ metal, such as lead or lead alloy, which is soft enough to apply itself closely to the edges of the openings of the tube ends even if they be irregular, or sufficiently firm non-metallic material, such as prepared leather, vulcanized rubber, fiber, or the like. We place such pieces in front of the openings of the tubes, so that in case of rupture of the tube they are caused by the current of water or steam to apply themselves to the edges of the said openings, thus stopping the passage of water or steam into the tube.

In order to prevent the device from being melted or otherwise destroyed in case of overheating, we may employ a core of a metal which fuses with difficulty—such as bronze, steel, iron, or the like—and cover the same with soft metal or sufficiently firm non-metallic material, as above said, so that even in the unlikely case of the soft metal or material fusing or being disintegrated by overheating the hard portion or core will still stop the tube when necessary, although in a less perfect manner.

In order that this our invention may be the more readily understood and carried into practical effect, reference is hereby made to the accompanying drawings, wherein—

Figures 1, 2, 3, and 4 show different embodiments of the invention.

When the device is to be applied to a tube in a "Du Temple" boiler in accordance with this invention, the said device A may be composed of a body or core of a material fusing with difficulty and of a semispherical shape, connected with a rod B, of the same kind of material, and the said body or core may be covered with a cover of soft metal or material of corresponding shape and be maintained in front of the tube C by its rod engaging with the tube and by a bar D, mounted in front of the row of tubes, Fig. 1. Such bar may become useless by using convenient devices E E′ inside the tube for holding the rod B, Fig. 2.

When the device is applied to a tube in an "Oriolle" boiler, the constructional arrangement may be similar to that aforesaid, except that the bar D is omitted, as the device is provided with an extension F to rest against the cover or jacket G of the boiler or against a part formed on the cover or jacket, Fig. 3.

When the device according to this invention is applied to a tube in a "Belleville" boiler, the shape of the device can be that of a disk A′ with curved edges like a clack-valve, resting at its edge in a groove H, wherein it can move as upon a hinge and which holds it in place in front of the tube-opening jointly with the rod B on the device engaging with the tube C itself, Fig. 4.

As aforesaid, these devices may be made entirely of soft metal or material or of a material fusing with difficulty and having soft metal or material applied thereto. In both cases the outer form can be the same for same types of boiler; but the device can be varied according to the type of boiler to which the device is applied.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a device of the character set forth, the combination with the tube of a water-tube boiler, of a rod, a suitable metal head on said rod, and means for normally holding said head in front of the opening of the tube, substantially as and for the purpose set forth.

2. In a device of the character described, the combination with the tube of a water-tube boiler, of a rod movably inserted into one end of said tube, a suitably-shaped metal head on the end of said rod outside the tube and adapted to be applied against and completely close the mouth of the latter, a coating of suitable material on said metal head and means for preventing the rod from completely leaving the tube, substantially as and for the purpose set forth.

In testimony whereof we have hereunto signed our names in presence of two subscribing witnesses.

SYLVAIN LOUIS RAVIER.
ARMAND JANET.

Witnesses:
EDWARD P. MACLEAN,
GEORGE E. LIGHT.