W. J. BAKER.

BOILER TUBE PLUG.

APPLICATION FILED JUNE 6, 1916.

1,213,060.

Patented Jan. 16, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

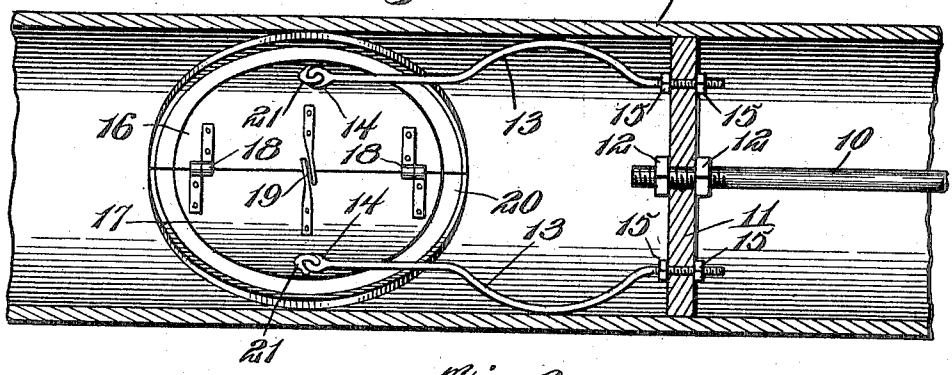


Fig. 2.

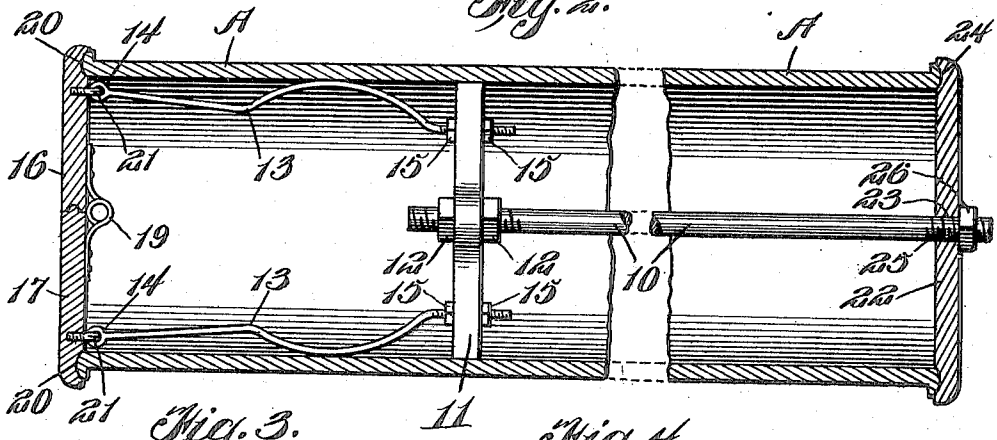
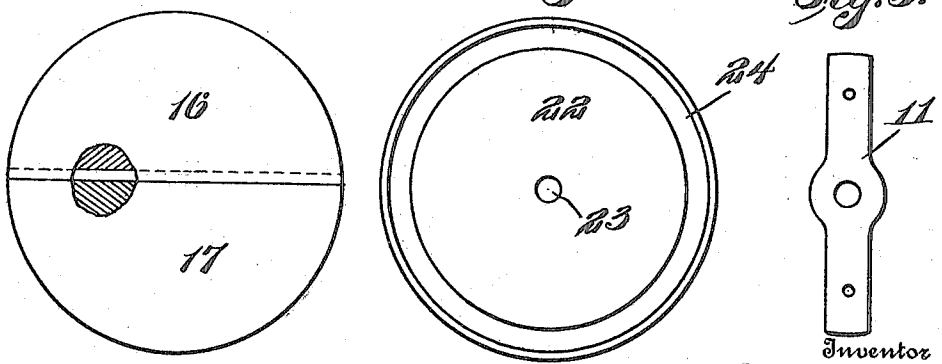


Fig. 3.

Fig. 4.

Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

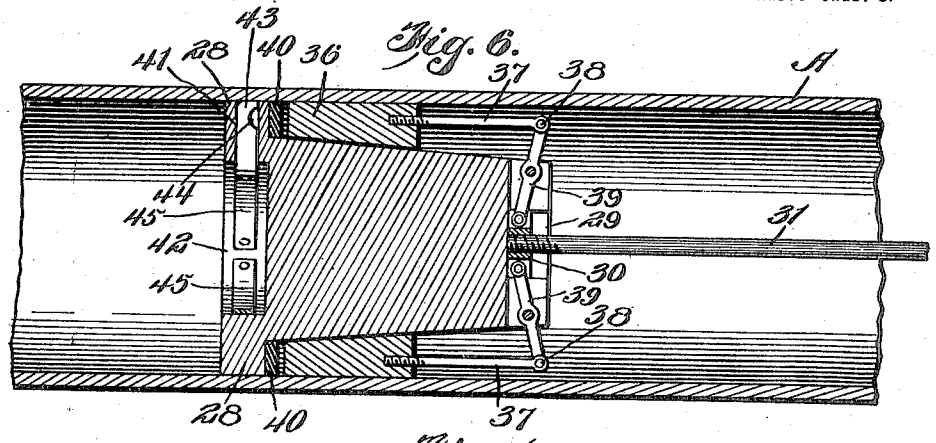


Fig. 7.

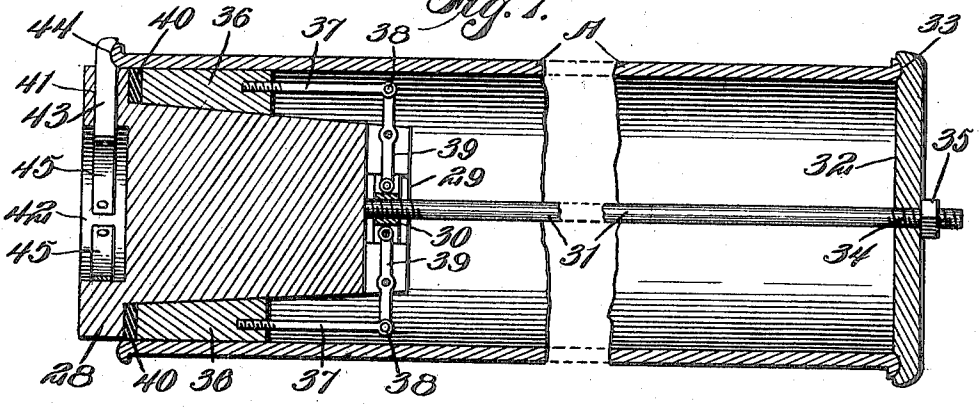


Fig. 8.

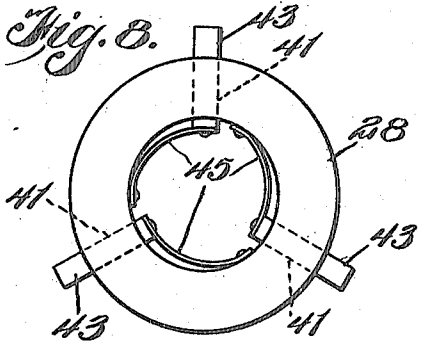
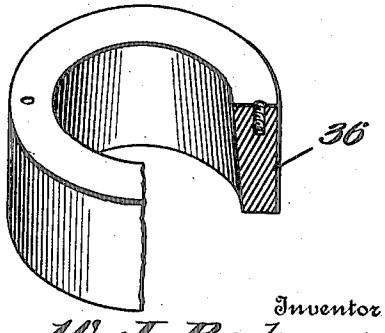


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILMER J. BAKER, OF WAKEFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES H. BAKER, OF PLATTSBURG, NEW YORK.

BOILER-TUBE PLUG.

1,213,060. Specification of Letters Patent. Patented Jan. 16, 1917.

Application filed June 6, 1916. Serial No. 102,040.

To all whom it may concern:

Be it known that I, WILMER J. BAKER, a citizen of the United States, residing at Wakefield, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Boiler-Tube Plugs, of which the following is a specification.

This invention aims to provide an apparatus capable of being easily passed through a boiler tube, and associated therewith in a manner to close both ends of the same with a view of preventing leakage of a defective boiler tube.

The nature and advantages of the invention will become apparent as the following detail description is read in connection with the accompanying drawings, the invention residing in the construction, combination and arrangement of parts as claimed.

In the drawings forming part of this specification like numerals of reference indicate similar parts in the several views and wherein:—

Figure 1 is a longitudinal sectional view through a boiler tube showing the position of parts of the apparatus during the insertion of the same within the tube. Fig. 2 is a similar view showing the apparatus operatively associated with the tube. Fig. 3 is a bottom plan view of one of the closures. Fig. 4 is a top plan view thereof. Fig. 5 is a detail view of the other plug. Fig. 6 is a view similar to Fig. 1 showing the modified form of the invention. Fig. 7 is a sectional view showing this form of the invention operatively associated with the tube. Fig. 8 is an end elevation of one of the closures. Fig. 9 is a detail view of the tapered ring.

Referring to the drawings in detail and particularly to Figs. 1 and 2, the apparatus as shown embodies an operating rod 10 upon one end of which is secured a cross piece 11, the purpose of which will be hereinafter set forth. The cross piece 11 can be secured to the rod in any suitable manner, but is preferably provided with a centrally disposed opening through which one end of the rod 10 projects, the rod having associated therewith nuts 12 which serve to hold the cross piece 11 fixed relatively to the rod. Projecting from the opposite ends of the cross piece 11 and disposed in parallelism with the rod 10 are curved resilient arms 13 terminating to provide eyes 14, while the opposite ends of the arms are preferably passed through suitable openings in the cross piece 11 and held associated therewith by means of nuts 15. The arms 13 are adapted to support a closure comprising a pair of sections 16 and 17 respectively, which are hingedly connected as at 18 along the transverse diameter of the plug. Bridging the joint between the sections is a leaf spring 19 having its opposite ends secured to the respective sections, the spring functionating to normally maintain the sections extended. The meeting edges of the respective sections of the closure are provided with a tongue and groove connection as shown, while the plug as a unit has one side provided with a circumferential groove 20. Projecting at right angles from each of the sections 16 and 17 of the closure is an eye member 21, these members being pivotally associated with the eyes 14 of the resilient arms 13.

In practice, the sections 16 and 17 of the closure are folded in the manner illustrated in Fig. 1 to permit the closure and operating rod to be inserted through the boiler tube A from the forward end thereof, during which operation a cross piece 11 serves as a guide to keep the operating rod 10 positioned centrally within the tube. In this position of parts the sections 16 and 17 of the closure are held under tension of the spring 19 so that as the closure is projected through the tube from the opposite end thereof, the spring 19 operates to extend the sections into closure form, whereupon the groove 20 of the closure will receive the adjacent edge of the boiler tube. A paste or the like such as red lead and asbestos plaster can be first positioned within the groove 20 and also between the tongue and groove connection between the respective sections of the closure so that when the paste hardens an effective joint is provided between the sections and also between the closure and boiler tube. Subsequent to the insertion of this closure and rod through the boiler tube, a second disk-like closure 22 at the opposite end of the boiler tube is positioned upon the operating rod 10, this closure having a restricted central opening 23 for the reception of the rod and also a circumferential groove 24 adapted to receive the adjacent edge of the tube. The rod is threaded as at 25 and has associated therewith a nut 26, which latter when tightened upon the rod serves to effec-

tively draw both of the closures into effective engagement with the opposite ends of the boiler tube thereby providing a tight joint. Manifestly by reason of this construction, the user can quickly and easily closure a defective boiler tube without drawing the fire or going into the combustion chamber at the back of the boiler which has been customary with the present day method of closing such tubes.

In Figs. 6 to 9 inclusive I have illustrated a modified form of the invention wherein the rear end of the boiler tube A consists of a tapered body portion 27 and an enlarged end portion 28, one end of the body portion 27 being provided with a bore opening 29 for the reception of a movable member 30 with which one end of the operating rod 31 is connected. The opposite end of the operating rod is passed through a central opening in the plug 32 of the front end of the boiler, which latter is identical in construction with the closure 22 above described, having a circumferential groove 33 for the reception of the adjacent edge of the boiler when these parts are operatively associated. The forward extremity of the operating rod is threaded as at 34 and has mounted thereon a nut 35 for holding the respective closures in effective engagement with the opposite ends of the boiler tube. Encircling the body portion 27 of the first mentioned closure is a tapered ring 36 with which the terminals of the rods 37 are connected, the opposite extremities of the rods being pivotally connected as at 38 to the cross rods 39, the latter mentioned rods having their extremities pivotally connected to the movable member 30 so that when the nut 35 is adjusted upon the operating rod 31 the latter is moved forwardly together with the movable member 30, thereby moving the tapered ring 36 into effective engagement with the body portion 27 of the closure through the instrumentality of the arms 37 and 39. Encircling the body portion 27 of the closure and interposed between the enlarged end portion 28 thereof and the ring 36 is a suitable packing 40 which provides a fluid-tight joint between the parts when the tapered ring 36 is adjusted into effective engagement with the body portion 27 of the closure. The enlarged end portion 28 is provided with a plurality of transverse bores 41 which open at their inner ends into an enlarged central recess 42, and positioned within each of said bores is a movable member 43 having one end grooved as at 44 and its opposite end projecting within the recess 42. Secured within the recess is a plurality of leaf springs 45, the free ends of which are connected in any suitable manner with the adjacent ends of the members 43 whereby these members are yieldably supported. It is obvious that the enlarged end portion 28 of the closure is of a diameter to snugly fit within the boiler tube, and is adapted to be positioned therein from the front end of the tube in identically the same manner as hereinabove described in connection with the preferred form of the invention. It is of course understood that during the initial association of the parts, or in other words while the closure 27 is being moved to its operative position through the boiler tube, the ring 36 is in the position shown in Fig. 6 while the movable members 43 have their grooved portions 55 positioned within the bores 41 and held therein by the walls of the boiler tube. However when the closure has been properly positioned within the tube so as to assume the position shown in Fig. 7, wherein the enlarged end portion 28 of the plug slightly projects beyond the adjacent end of the tube, the yieldably supported members 43 will be automatically projected from within their respective bores 41 so as to engage the edge of the boiler tube as shown. The nut 35 on the opposite end of the operating rod is then tightened whereupon the rod 31 is adjusted forward to move the tapered ring 36 into its operative position, and to force the closure 32 into engagement with the opposite end of the tube in the manner hereinabove described.

While it is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to the precise construction and arrangement of parts herein illustrated and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What is claimed is:—

1. An apparatus of the class described comprising an operating rod adapted to be inserted within a boiler tube, a member carried by one end of the rod and constituting a guide therefor, a closure associated with the rod to be inserted therewith within the tube, and including a plurality of yieldably supported sections adapted to expand into engagement with one end of the tube when projected therefrom, a second closure adjustably mounted upon the rod for engagement with the opposite end of the tube, and means on the rod for holding said closures in effective engagement with the opposite ends of the tube.

2. A device of the class described comprising an operating rod adapted to be inserted within a boiler tube, a member carried by one end of the rod and constituting a guide therefor, a closure associated with the rod and adapted to be inserted therewith within said tube, and including a plurality of hingedly connected sections, a yieldable means connected with said sections

to automatically expand the latter into engagement with one end of the tube when projected therefrom, a second closure adjustably mounted upon the rod for engagement with the opposite end of the tube, and means on the rod for holding said closures in operative position.

3. A device of the character described comprising an operating rod adapted to be inserted within a boiler tube, a member carried by one end of the rod and constituting a guide therefor, arms projecting from said member, a closure supported by said arms for insertion within the tube with said rod, and including yieldably supported members adapted to automatically expand into engagement with one end of the tube when projected therefrom, a second closure adjustably mounted on said rod for engagement with the opposite end of the tube, and means for holding said closures in operative position.

In testimony whereof I affix my signature.

WILMER J. BAKER.

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