No. 685,561. Patented Oct. 29, 1901.

R. BETTERMANN.

FLUE PLUG FOR BOILERS.

(Application filed Nov. 3, 1900.)

(No Model.)

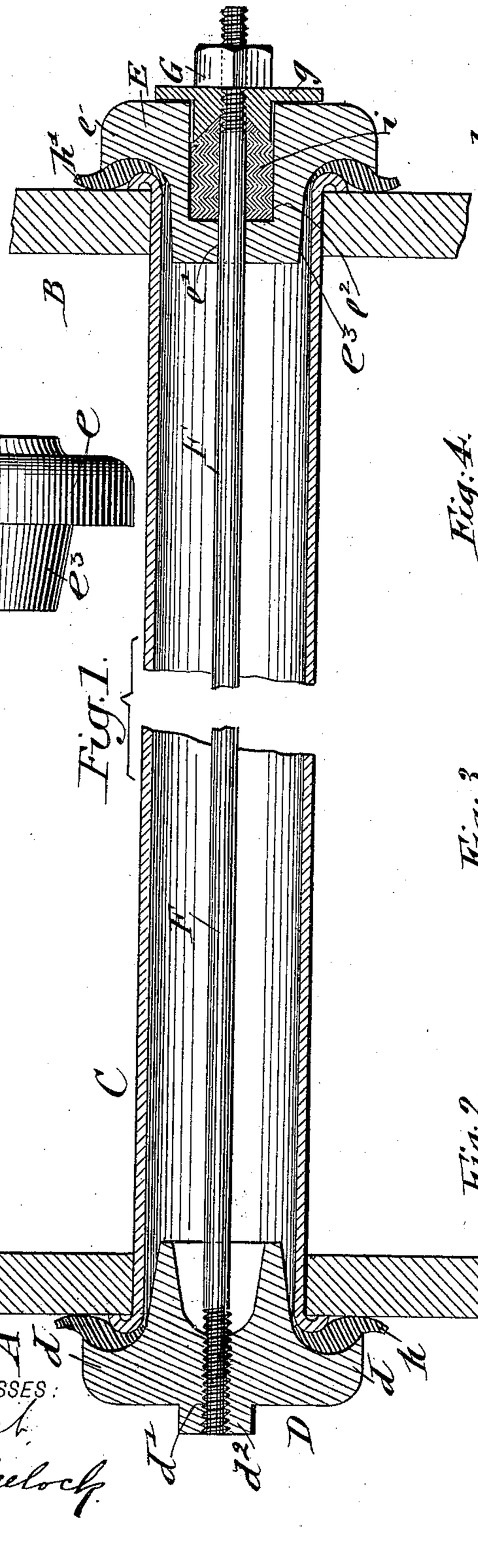

Fig. 1.

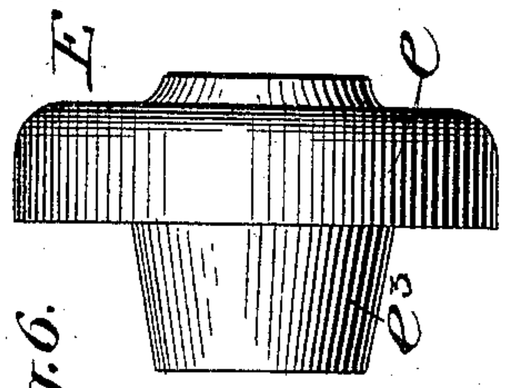

Fig. 6.

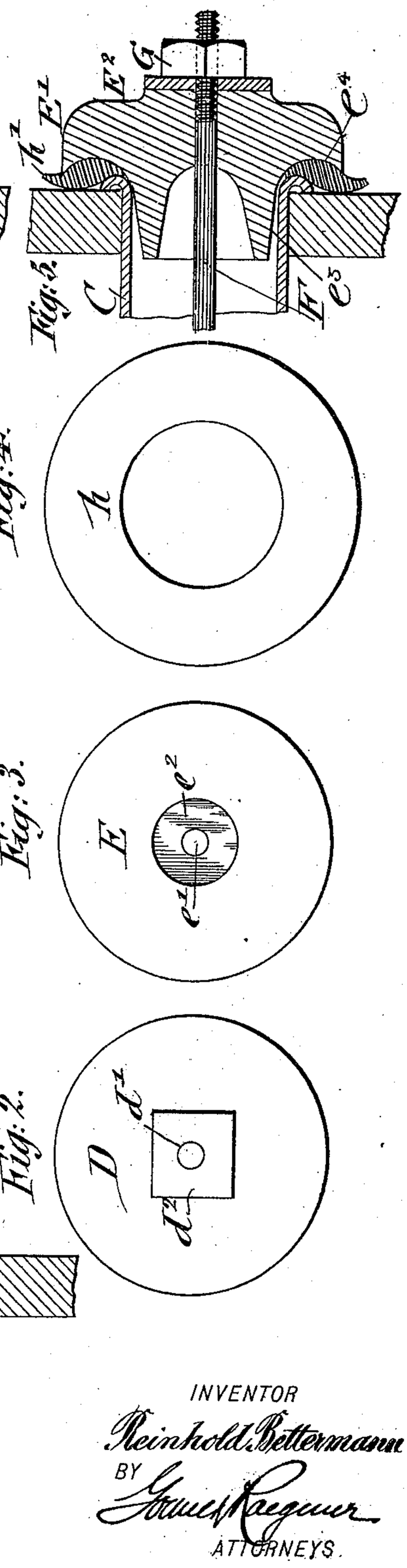

Fig. 5.

Fig. 4.

Fig. 3.

Fig. 2.

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FLUE-PLUG FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 685,561, dated October 29, 1901.

Application filed November 3, 1900. Serial No. 35,331. (No model.)

To all whom it may concern:

Be it known that I, REINHOLD BETTERMANN, a citizen of the United States, residing at Johnstown, Cambria county, Pennsylvania, have invented certain new and useful Improvements in Flue-Plugs for Boilers, of which the following is a specification.

The invention relates to plugs for stopping up the flues of boilers and which are employed by steam-users and boiler-makers in repairing a leaky flue, they being customarily of tapered form, driven into the ends of the flues, and must be of proper taper and fit nicely. The fire is usually drawn and the steam run down and a heavy hammer used to drive the plug sufficiently tight into the flue. This method is very injurious to the boiler, (in the flue-sheet in particular,) and quite often another flue is loosened up by the jarring, and it also will leak. The brickwork also has to be removed in order to make room to perform the work. In repairing vertical boilers it is frequently impossible to drive the plug in with a hammer at the fire-box end for the lack of room. Another and as equally injurious procedure is the removing of the plug thus driven in when the flue is to be replaced by a new one. The work is rendered still more difficult on boilers where the boiler-maker cannot get inside the boiler to cut out a part of the flue and remove the flue-plug from the inside. In this case it is drilled out, which is a slow and tedious operation.

It is the object of my invention to overcome these difficulties; and to this end the invention consists in certain features of construction and combinations of parts to be hereinafter described and then claimed.

In the accompanying drawings, Figure 1 is a longitudinal section of a boiler-flue, showing my improvement applied. Figs. 2 and 3 are respectively elevations of the outer ends of each flue-plug. Fig. 4 is a plan view of one of the washers. Fig. 5 is a section of a modified form of plug, showing it applied to a flue; and Fig. 6 is a perspective view of the plug shown in Fig. 5.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A indicates the plate at the front or fire end of the boiler, and B the plate at the rear or smoke-box end, the same being connected by tubular flue C.

D indicates the plug for the fire end of the flue C, and E the plug for the smoke-box end of the same. Both plugs taper at their inner ends at e^3 and are provided with annular flanges d on plug D and e on plug E. The tapered inner ends e^3 of the plugs fit into opposite ends of the flue, the plugs being connected by a rod F, which extends axially through the flue. The plug D has an axial screw-threaded bore d' to receive one threaded end of the rod F and is provided with a square boss d^2 to receive a wrench. The other plug E has a smooth axial bore e', through which a plain portion of the rod passes, while beyond said smooth bore the rod is threaded to receive a nut G, which holds the parts in position. The flanges of the plugs are dished at e^4, and between their concave under sides and the end plates of the boiler around the ends of the flue are applied asbestos washers h h', which are well saturated with linseed-oil. The washers when the plugs are in place make all irregularities between the flanges of the plugs and the flue-sheets perfectly secure. Plug E is provided with a cavity e^2, which is filled with yielding packing i, similar to that used for packing piston-rods, and against this packing a follower g is tightly set by the nut G. When the parts are all in the position shown in Fig. 1, the whole is drawn tight until no leak appears at either end, and then the work is done.

In the modification shown in Fig. 5 the plug E′, corresponding with E, is made with a finished surface, and a copper washer E^2 instead of the follower and packing is used.

The flanges of all the plugs and the tapered portions of the same are imperforate with the exception of the bores or perforations for the connecting-rod, whereas the taper of the plugs and the dishing of the same are formed on one continuous curve, so that by reason of the special tapering of the plugs they are each enabled to be applied to various sizes of boiler-flues, while at the same time the special dishing permits the packing to be squeezed between the flange and the flue-sheet and the

end of the flue, as well as between the taper of the plug and the end of the flue, without in any wise injuring or cutting the packing, and thereby permits the hermetic closure of the boiler-flue at each end.

Among the advantages incident to my invention are that no skill is required, no injury to boiler or flue-sheet takes place, there is no risk to the workman while mending, no extra room is required, and there is no trouble in taking the attachment out. It can be used over and over again. The plugs are cheap and can be kept in stock and be applied in a very few minutes. The plugs are safe in all cases.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In means for plugging the ends of a boiler-flue, the combination of two tapering plugs provided with annular flanges, said flanges being dished in their under sides, the dishing and the tapering of said plugs being in one continuous curve, a connecting-rod between said plugs, said plugs being perforated only for the passage of said rod, and being otherwise imperforate, and means for securing said rod to said plugs for tightly drawing the tapering ends of the plugs into the ends of the flue, substantially as set forth.

2. The combination of two plugs, one having a central screw-threaded bore, and the other a smooth bore, both of said plugs being otherwise imperforate, the plug with the smooth bore having a central cavity in its outer end, a connecting-rod having a screw-thread at one end for the screw-threaded plug, and its opposite end passing through said smooth bore and cavity, and also being screw-threaded, suitable packing in said cavity, an annularly-flanged follower inserted in said cavity against the packing, said rod passing through said follower, and the flange of the follower abutting against the outer end of the plug, and a nut screwed on the said rod against said follower, whereby the packing is squeezed in said cavity against the rod, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

REINHOLD BETTERMANN.

Witnesses:
OTTO SCHARMANN,
JOHN M. BANZE.