

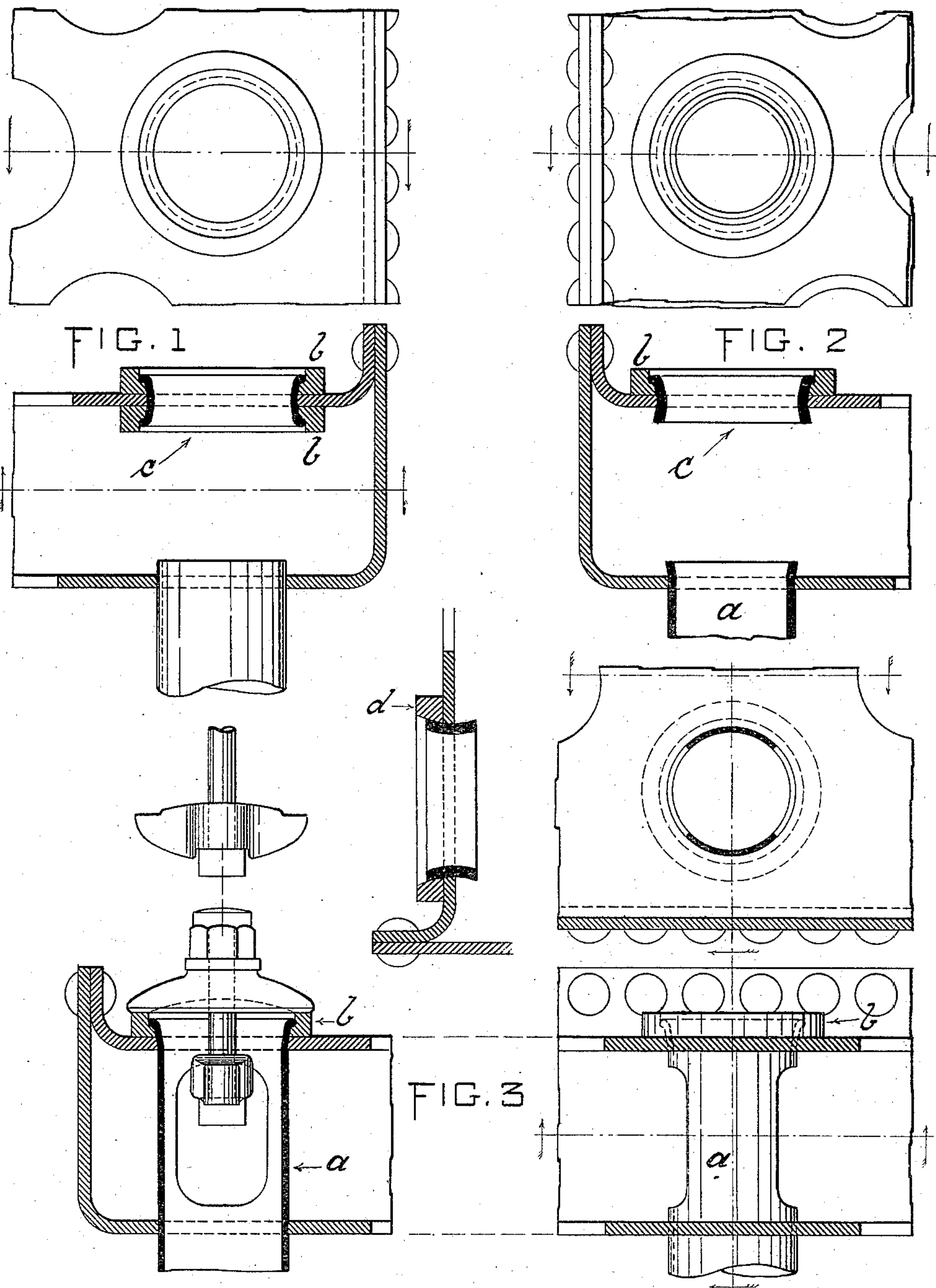
(No Model.)

N. W. PRATT & C. P. HIGGINS.

HAND HOLE SEAT FOR BOILERS.

No. 305,633.

Patented Sept. 23, 1884.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## HAND-HOLE SEAT FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 305,633, dated September 23, 1884.

Application filed April 22, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, NATHANIEL W. PRATT, of Brooklyn, in the county of Kings and State of New York, and CAMPBELL P. HIGGINS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have made a joint invention of a certain new and useful Improvement in the Construction of Hand-Hole Seats for Boilers; and we do hereby declare that the following is a full, clear, and exact description and specification of the same, reference being had to the accompanying drawings.

This invention relates to a new method of forming raised seats for hand-hole plates in that class of water-tube boilers wherein the heating-tubes are secured into one of the sheets of a water-box, the other sheet having hand-holes placed directly opposite to the ends of the tubes, and at the same time to give greater stiffness to the plate, which is materially weakened by cutting out the hand-hole openings. Various methods have been used to close such openings—such as internal hand-hole plates of oval shape—as commonly used in the water-legs of locomotive and other boilers, said plates being packed with rubber or other perishable packing. These packings have to be renewed each time the joints are opened for inspection or cleaning, and are liable to leak through the burning out of the packing material. Hand-hole plates have also been used on the outside of the sheets, seated directly on the sheet without any packing, the sheet itself being finished off to make a metal-to-metal joint with the hand-hole plate. When the hand-hole plates are seated in the manner last described, it is difficult to replace them and secure a tight joint, as they have to be replaced exactly in the original position, that portion of the seat not covered by the hand-hole plate becoming corroded from exposure, and is not suitable for forming a joint with the hand-hole plate, and where the seat is on a level with the plate it is difficult to refinish when once it becomes corroded. Brass plugs have also been used, screwed into the outside plate, having taper threads. These are liable to become stuck fast by accumulation of sediment or rust,

and are difficult to remove. Besides this, the thread in the sheet is very apt to become battered up during the operation of cleaning out the interior of the tubes.

To obviate these difficulties and to stiffen the sheet so that the pressure of the clamp which holds the hand-hole plate in position shall not tend to throw the sheet out of shape, we have designed a new method of securing a raised hand-hole seat consisting of a ring of cast or wrought metal faced off on one side to form a joint with the hand-hole plate, and secured to the sheet by means of an expanded nipple, which fits tightly into the interior of the ring and the hole in the boiler-plate, being expanded into both so as to make a metal-to-metal contact, the same as a boiler-tube is expanded into its seat, the outer face of such rings being finished off as a seat for the caps to shut against. These hand-hole seats and the expanded nipple, which secures them to the sheet, may be of such internal diameter as to allow the heating-tubes to be drawn through them if it should become necessary to replace them, as shown in Fig. 2, in which *a* is the heating-tube; *b*, the hand-hole seat; and *c*, the expanded nipple, which serves to secure the hand-hole seat in position.

Where very thin plates are used for low pressures, or where heavy pressures are to be used with ordinary thickness of plates, it becomes desirable to still further stiffen the sheets through which the hand-hole openings are cut. This is done by securing two rings, *b b*—one on each side of the sheet through which the hand-hole openings are cut—the nipple being expanded into both the inner and outer rings, and the intermediate plate, forming a tight joint with all three pieces, as shown in Fig. 1. In some cases, where the heating-tubes are prolonged through the water-space and are expanded into both the inside and outside sheets of a water-box, the hand-hole rings or seats may be secured to the end of the heating-tube itself, as shown in *b* in Fig. 3, wherein the end of the heating-tube is shown expanded into the ring forming the hand-hole face, as well as into the two sheets forming the water-box.

For the purpose of more firmly securing the



ring to its connecting-nipple, the interior of the ring may be flared outwardly, as shown at *d*; or a groove may be made toward the outer face of the ring, as shown in the rings *b b*, Figs.

5 1 and 2. The flare or groove serves the purpose of allowing the end of the nipple to be increased in diameter when it is expanded, thus effectually preventing it from becoming displaced by pressure or otherwise.

10 We claim as our invention—

1. A raised hand-hole seat consisting of a ring of metal secured in position by means of an expanded nipple.

2. A ring forming a raised hand-hole seat on one side of a sheet of metal and a stiffening- 15 ring on the opposite side, in combination with a nipple expanded into the inside and outside rings and the intermediate plate.

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