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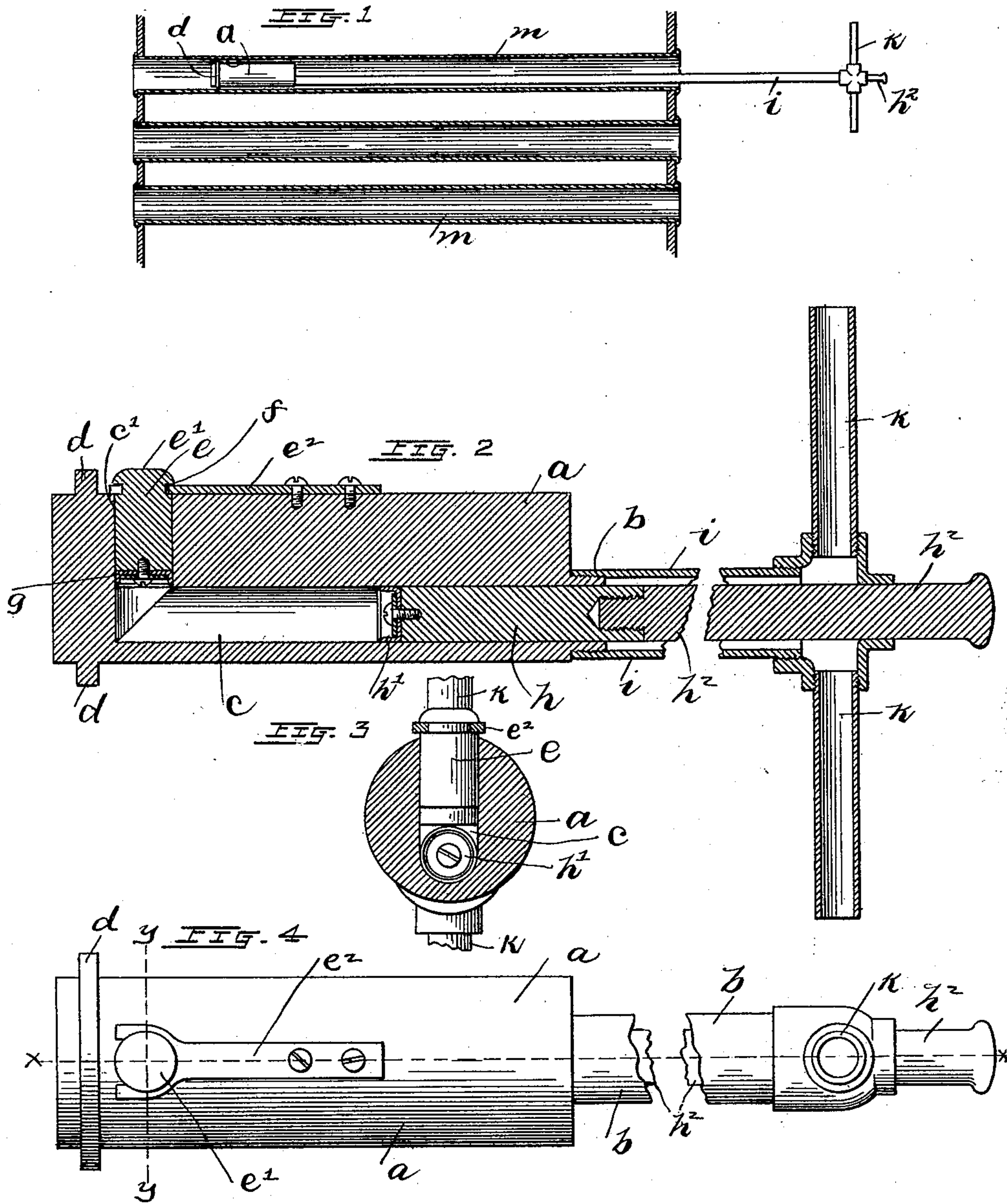
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E. F. GWYNN.

DEVICE FOR REMOVING SCALE FROM BOILER TUBES.

(Application filed July 21, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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DEVICE FOR REMOVING SCALE FROM BOILER-TUBES.

SPECIFICATION forming part of Letters Patent No. 607,168, dated July 12, 1898.

Application filed July 21, 1897. Serial No. 645,359. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. GWYNN, a citizen of the United States, residing at Delaware, in the county of Delaware and State of Ohio, have invented a certain new and useful Improvement in Devices for Removing Scale from Boiler-Tubes, of which the following is a specification.

My invention relates to devices for removing scale from boiler-tubes; and the objects of my invention are to provide an improved device of this class of such construction and arrangement as to admit of its insertion and use within the tubes of boilers and to produce other improvements the details of construction and arrangements of parts of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 represents in section a portion of the tubes of a boiler, my improved scale loosening and removing device being shown in position for use in one of the said tubes. Fig. 2 is a central longitudinal section of my improved device, taken on line $x x$ of Fig. 4. Fig. 3 is a transverse section on line $y y$ of Fig. 4, and Fig. 4 is a plan view of my device.

Similar letters refer to similar parts throughout the several views.

In the construction of my improved scale-removing device I employ a substantially cylindrical body or head a , the latter being provided at its rear end with an eccentrically-located neck extension b . Extending through the neck portion b and into the body a is a horizontal passage c . The forward end of this passage c communicates at its inner end with a passage or opening c' , which leads outward through the side of the body a in a direction at right angles with the passage c .

Between the passage c' and the forward end of the body or head a I provide the latter with a peripheral shoulder d .

Within the passage-arm c' is arranged to fit and slide a hammer-head e , the outwardly-extending end of which is rounded or formed convex, as indicated at e' . This hammer e is normally retained in the position shown in the drawings by means of a suitable spring-strip e^2 , one end of which is secured to the

body a and the remaining end of which engages with a peripheral groove f , formed in the outwardly-projecting end portion of the hammer e . The inner end of the hammer e is, as indicated in the drawings, provided with a suitable packing-disk g , of leather or similar material.

Extending within the passage c through the neck portion b is a plunger h , the inner end of the latter being provided with a suitable packing-disk h' . The plunger h has connected with its outer end portion an extension or hammer rod h^2 , which may be of any desirable length. Upon the neck extension b of the body a is secured a tube i , which loosely incases a portion of the plunger extension h^2 . At its outer end the tube i has suitably secured thereto the desired number of outwardly-extending arms k . The space between the inner end of the hammer e and the inner end of the plunger h is adapted to be filled with a suitable liquid.

For utilizing my invention the head a and a necessary portion of the extension h^2 and tube i is, as indicated in Fig. 1 of the drawings, inserted within a tube m of a boiler. This being accomplished the stroke of a hammer against the outer end of the plunger extension h^2 must result, as will readily be seen, in the inward movement of the said plunger and a consequent compression of the liquid contained between the plunger and the hammer. The stroke imparted to the plunger is thus contributed through the compression of the liquid to the hammer e , resulting in an outward stroke of the latter. These strokes of the hammer against the inner surface of the boiler-tubes, successively administered, must result, as will readily be seen, not only in loosening but removing any scale or other foreign matter which may cling to the surface of the tube.

It will be observed that the shoulder d is of such circumference as to provide a bearing for the head a within the tube and that the head of the hammer e is so supported as to be normally in contact with or in close proximity to the inner surface of the tube. Said hammer being thus limited in its movement it is obvious that the blow imparted to

the tube is in the nature of a quick jar or concussion which, while not injuring the tube, results in removing the scale therefrom.

It is evident that the head *a* may be rotated within the tube to any desired position and that this rotation is facilitated by turning the handle or arms *k*. It is also evident that the head may be thrown outward or inward, so as to apply the stroke of the hammer to any desired point on the inner surface of the tube.

Although the stroke on the plunger extension is described herein as imparted by the hand, it is obvious that any well-known means may be employed in imparting successive strokes to said plunger extension.

It will be observed that my improved scale-removing device is of such construction and form as to admit of its being produced at a low cost to manufacture and of its being readily and effectively placed in use.

If desired, I may form within the head *a* one or more additional passage-arms *c'*, thus admitting of the employment of additional hammers *e*, which would be operated simultaneously by one blow on the plunger.

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

1. In a device for removing scale from boiler-tubes, the combination with a body adapted to be inserted within a boiler-tube, said body having an angular passage therethrough, of a hammer contained in one arm of said passage, a movable plunger contained

in the other arm of said passage and a quantity of liquid between said plunger and hammer, substantially as and for the purpose specified.

2. In a device for removing scale from boiler-tubes, the combination with a body adapted to be inserted within a tube, said body having an angular passage therethrough, of a hammer movably retained in one arm of said passage, a plunger adapted to move in the remaining passage-arm, a tubular neck extension of said body, a handle-arm extending therefrom and a quantity of liquid contained between said plunger and hammer, substantially as and for the purpose specified.

3. In a device for removing scale from boiler-tubes, the combination with a body adapted to be inserted and rotated within the tube, said body having an angular passage therethrough and a peripheral shoulder on said body of a hammer movably fitting in one arm of said passage, a groove in the head of said hammer, a spring secured to the body and engaging in said hammer-groove, a plunger movably contained in the remaining arm of said passage, a quantity of liquid contained in the passage between the hammer and plunger and means for imparting successive blows to said plunger, substantially as and for the purpose specified.

EDWARD F. GWYNN.

In presence of—

P. S. KARSHNER,
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