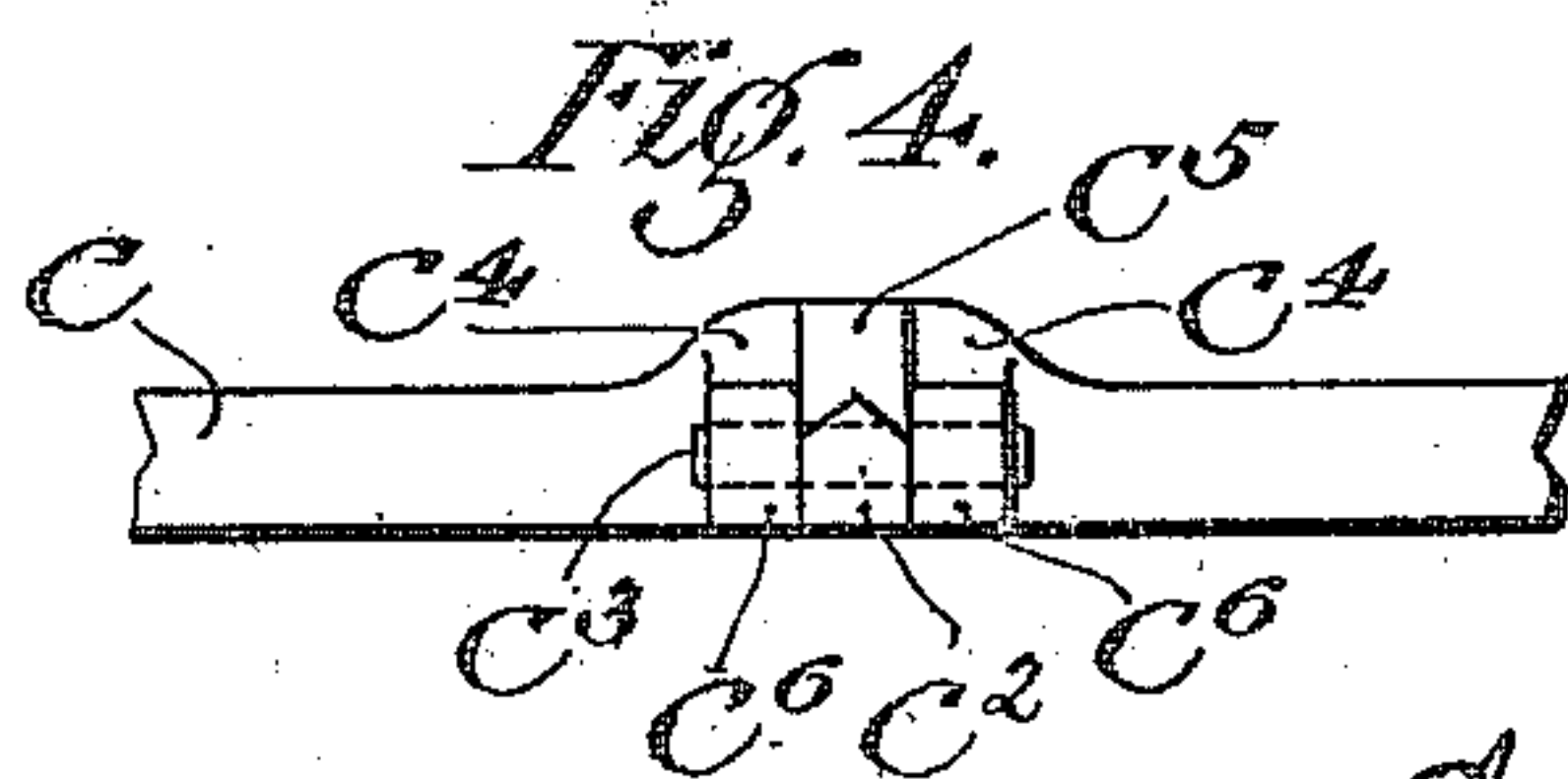
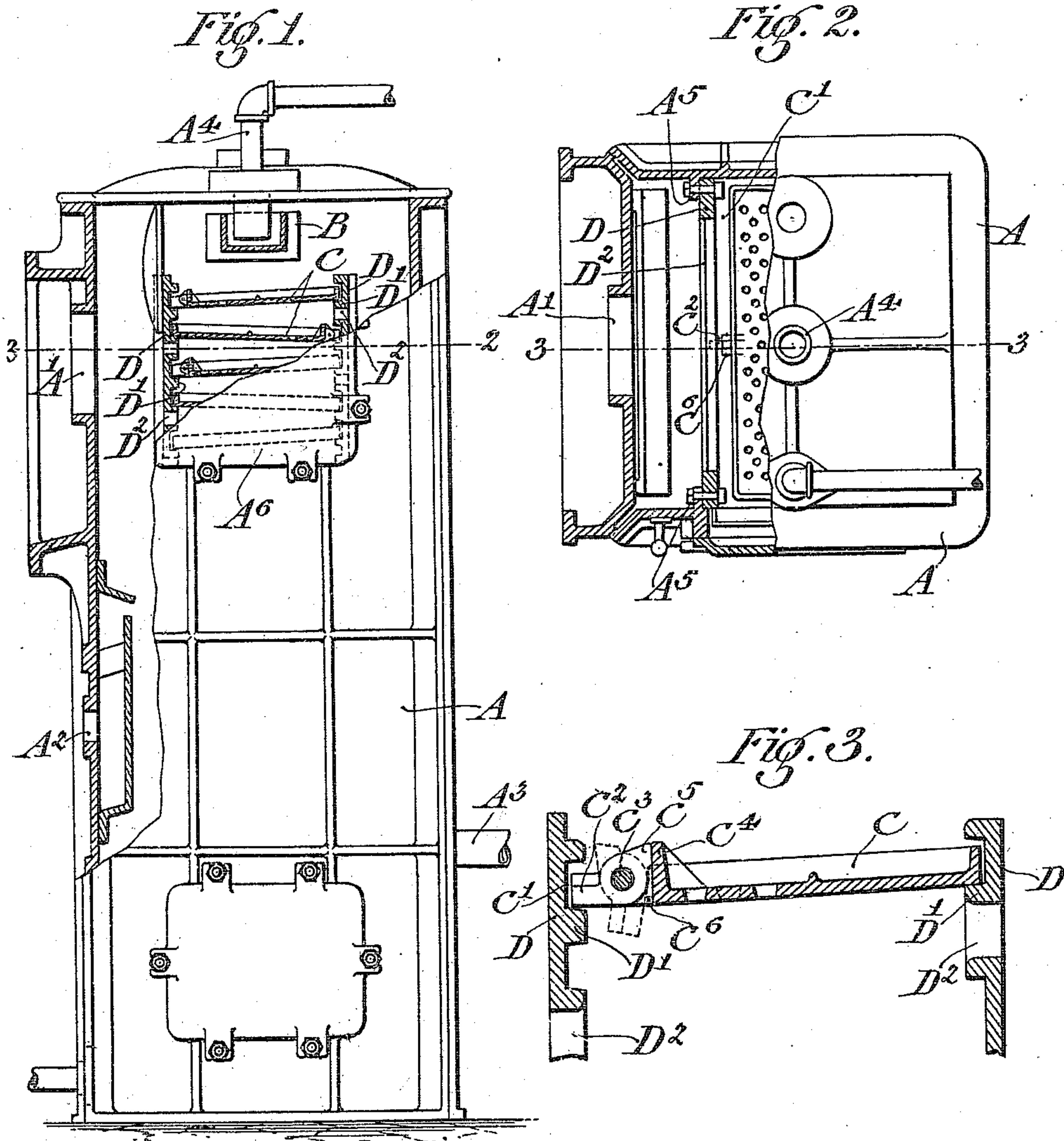


J. W. GAMBLE.
 COLLAPSIBLE TRAY FOR WATER HEATERS.
 APPLICATION FILED NOV. 9. 1909.

985,337.

Patented Feb. 28, 1911.



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COLLAPSIBLE TRAY FOR WATER-HEATERS.

985,337.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH W. GAMBLE, a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Collapsible Trays for Water-Heaters, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention relates to water heaters, such as open feed water heaters in which water is heated by the direct action of steam. In such a heater trays are so arranged that the water to be heated will flow over them in more or less thin films to thereby facilitate the abstraction of the water of the heat of the steam admitted to the heater.

The object of the invention is to provide a simple and effective tray for heaters of the kind specified which may be collapsed when necessary to facilitate the insertion and removal of the trays regardless of dirt which may accumulate on and adhere to the tray or supports therefor.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described one form in which the invention may be embodied.

Of the drawings, Figure 1 is an elevation, partly broken away and in section showing a heater provided with my improved trays. Fig. 2 is a plan, partly in section, on the line 2—2 of Fig. 1. Fig. 3 is a partial sectional elevation on the line 3—3 of Fig. 2, but on a larger scale than Figs. 1 and 2, and Fig. 4 is a front side elevation of a portion of a tray.

In the drawings, A represents the body of an open feed water heater of a well known type in common use.

A' represents the steam inlet to the heater, A² the overflow connection limiting the height of the water level in the heater, A³ the service outlet for hot water, and A⁴ the cold water inlet pipe. The cold water from pipe A⁴ is discharged into a trough like re-

ceptacle B from which it passes on to the upper one of a series of oppositely inclined trays C. The trays C are supported by a pair of vertical plate like supports D which are secured to the body of the heater A as by bolting them to the lugs A⁵. Each support D is provided on its inner side with a series of horizontal guide ribs or shoulders D', each supporting one edge of one of the trays while the opposite edges of the trays are supported by the guide ribs D' of the other support D. As is clearly shown in Fig. 1, the guide ribs supporting the opposite edges of each tray are not at the same level so that each tray is inclined to the horizontal and adjacent trays are oppositely inclined. A space C' is provided between the lower edge of each tray and the adjacent support D through which the water running down the tray may escape. D² are ports through which steam may pass into the spaces between the trays.

A door A⁶ is formed in the body of the heater which, when open, permits the trays to be moved in the direction of their length into and out of their operative positions, their removal for cleaning being necessary from time to time.

Except for features of construction of the trays C to be hereinafter referred to, the heater disclosed is identical with heaters which have long been in extensive use. With such heaters difficulty has been experienced in sliding the trays out for the purpose of cleaning the heater because of the dirt which adheres to the trays C and tray supports D, and clogs the space between the ribs D'. With some kinds of water frequently met with in practice, after a short period of operation the trays become cemented, so to speak, to the tray supports in such a manner as to make it difficult to remove the trays by sliding them out along the guide ribs D'. This difficulty I avoid with the present invention by making the trays collapsible. As shown clearly in Figs. 2 and 3, each tray comprises a body portion of a width less than the distance between the tray supports. The upper edge of the body of the tray rests on the appropriate guide D' of one of the tray supports D, and the lower edge of the body of the tray is separated from the other tray support by the space C'. To support the lower edges of the trays and to permit

them to be collapsed as hereafter described, tray portions in the form of dogs or members C^2 are pivotally connected at C^3 between the ears C^6 projecting from the lower edges of the bodies of the trays. Where, as shown, only one dog C^2 is employed in each tray, it is located midway between the ends of the tray. Each dog C^2 is formed with a tail C^5 which abuts against the shoulder C^4 of the tray body. When the tray and dog are in place in the appropriate guide ways D' , as shown in full lines in Fig. 3, to prevent the tray from collapsing by buckling downward while permitting the tray to collapse or buckle by moving the pivotal connection C^3 upward as indicated by the dotted lines in Fig. 3.

With trays constructed as described, it will be clearly apparent to those skilled in the art that when the spaces between the guide ribs D' are clogged with dirt or for other cause it is difficult or impossible to remove or insert a tray by sliding it along its supporting guide ribs D' , the tray may be easily moved out of engagement with the tray supports by applying a slight force to the underside of the tray to lift the pivotal connection C^3 and cause the tray to buckle upward or collapse.

While in accordance with the provisions of the statutes I have herein described and illustrated the best form of my invention now known to me it will be obvious to those skilled that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention.

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

1. In a water heater of the kind specified, the combination with a pair of spaced apart tray supports, of one or more collapsible trays, formed each of relatively movable portions normally cooperating to form a tray extending between and supported by said supports, said portions being adapted to be moved relatively to each other to permit the tray to

be collapsed and moved out of the normal engagement with said tray supports.

2. In a water heater of the kind specified, the combination with a pair of spaced apart tray supports of one or more collapsible trays normally supported between said supports, each tray comprising relatively movable portions and being adapted to collapse by buckling upward to permit the tray to be moved out of engagement with the tray supports, and means for preventing the trays from collapsing by buckling downward.

3. In a water heater of the kind specified, the combination with a pair of spaced apart tray supports formed with shoulders on their adjacent sides, of one or more collapsible trays each comprising two portions hinged together, one portion normally engaging a shoulder on one tray support and the other portion a shoulder on the other support, and being adapted to collapse by buckling upward to thereby move out of engagement with the supporting shoulders, the two portions of each tray having cooperating parts which engage to prevent the tray from collapsing by buckling downward.

4. In a water heater of the kind specified, the combination with a pair of vertical spaced apart tray supports formed each with a series of horizontal shoulders on its side adjacent the other support, a series of trays alternately inclined in opposite directions each comprising a body portion of a width less than the distance between said supports and having its upper edge resting on a shoulder of one of said supports, and a dog pivotally connected to its lower edge and adapted to swing into and out of engagement with a shoulder on the other adjacent tray support, the dog and body portion of each tray having cooperating parts which engage to limit the upward movement of the free end of the dog relative to the body portion.

JOSEPH W. GAMBLE.

Witnesses:

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