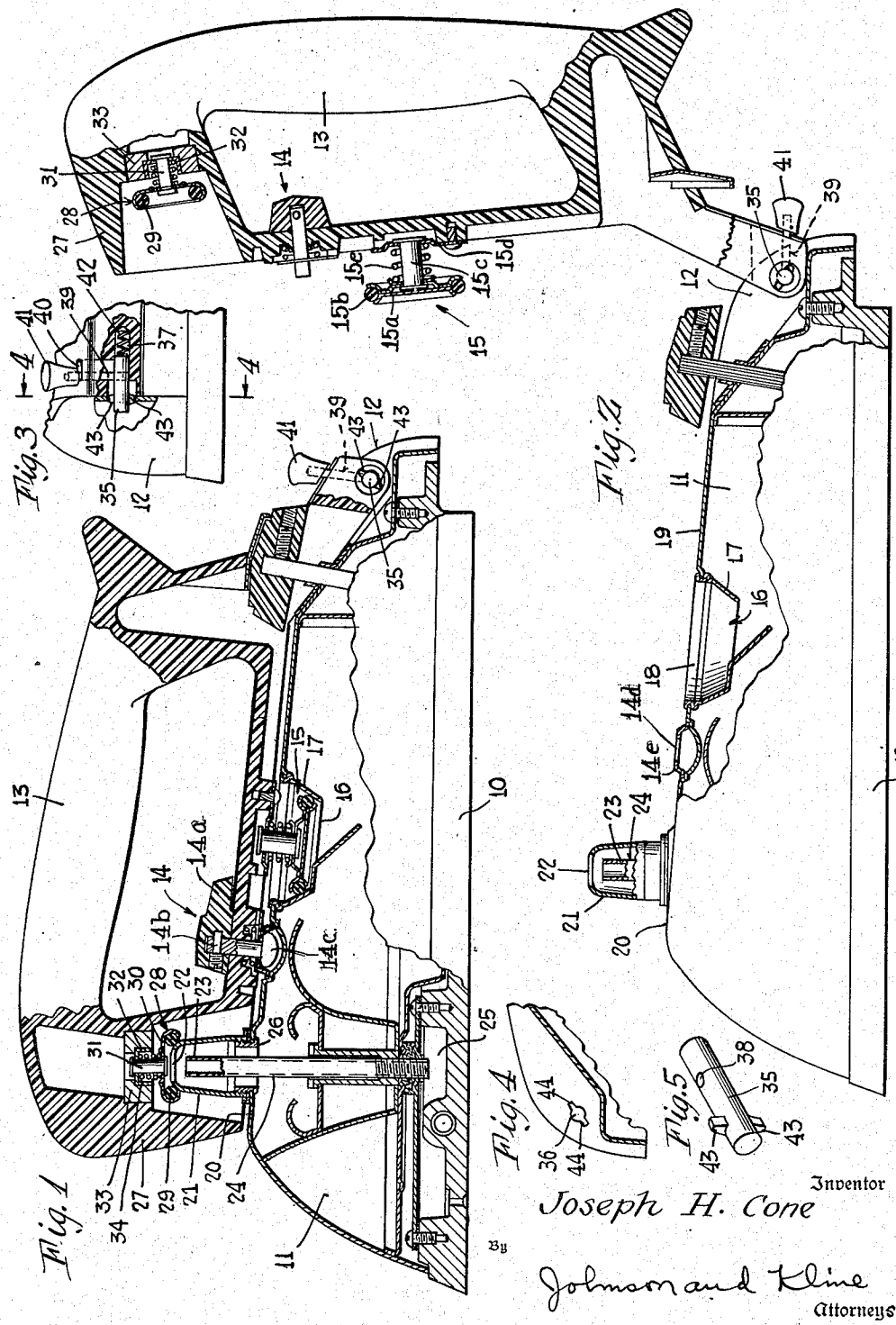
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STEAM AND DRY FLATIRON

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## STEAM AND DRY FLATIRON

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21 Claims. (Cl. 38—77)

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This invention relates to steam flatirons of the type having a tank or boiler, and in its more specific aspect more particularly to such irons having a hinged handle structure extending over the tank, provided with stopper means to close a funnel-like filling opening in the tank.

In this type of iron the filler opening or orifice is located at the bottom of a funnel which has a relatively wide mouth secured to the top wall of the tank, the funnel extending down into the tank. By such construction the filling of the tank is obviously made very easy, and the likelihood of spillage during the filling operation is minimized.

However, it sometimes becomes necessary for the housewife to drain the water completely out of the tank, when it is desired to use the iron for dry ironing, and when the filler funnel is incorporated as part of the tank or boiler as above set forth, complete emptying of the tank through the filler opening is not possible due to the inward extension or disposition of the funnel.

Nor is the total emptying of the tank contents through the steam discharge openings in the sole plate of the iron practical, because this procedure is inconvenient and very slow, and does not completely drain the tank. Thus it sometimes happens that a housewife, if first using the iron for steam ironing must, before the iron is ready for dry ironing, wait awhile after running the water out of the boiler through the filler opening, since the inability to completely empty the boiler necessitates the remaining water being vaporized and discharged as steam.

An object of the present invention is to provide an improved steam iron of the tank or boiler type, wherein the tank or boiler may at any time, whether the iron is hot or cold, be very easily and quickly completely emptied of its contents, thus overcoming the disadvantages and drawbacks above mentioned.

Another object of the invention is to provide a steam or dry iron of the type wherein the handle is swung away from the tank to fill or empty the latter which is so organized and improved that a user may by merely retaining hold of the handle after it is swung away, have complete control of the iron body so as to readily and conveniently invert or otherwise position the body, as required to fill or empty the tank or boiler thereof.

Still another object of the invention is to provide a steam iron improved as above, which has relatively few parts of simple structure, and which is economical to fabricate and reliable in use.

In accomplishing the above objects I provide, in

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accordance with the invention, a novel and improved water outlet and stopper means therefor at the top portion of the tank, which is separate from the usual filler means and stopper of the tank and is especially arranged and adapted to provide complete emptying of the tank contents when the iron is inverted. This novel outlet and stopper means, in the embodiment of the invention illustrated, comprises a hollow raised portion or boss on the tank top, and a closure comprising a resilient sealing ring carried on the underside of the hinged handle structure whereby the outlet is automatically closed when the handle is in operative or ironing position, and automatically exposed and open when the handle is swung back to filling or emptying position.

Preferably where, as in the specific iron structure illustrated and described herein, the tank is a boiler or steam generator as distinguished from the water storage means found in flash-type steam irons, the raised hollow portion or boss on the top of the iron may also constitute the steam dome, and may enclose the top of the steam discharge pipe which leads to the steam chamber of the sole plate. In such case the closure for the boss may be conveniently carried in the hollow front post of the handle structure, into which post the steam dome usually extends.

I advantageously arrange the outlet boss or steam dome to be devoid of portions projecting to any appreciable extent into the boiler, and thus when the iron is turned upside down, the boiler may be substantially completely emptied.

In addition to constituting a desirable emptying means for the boiler, the outlet boss or steam dome also functions as an advantageous air vent to prevent bubbling of water in the filler funnel during the filling operation, thus enabling a user to more easily and quickly refill the boiler. The vent is always open during the filling operation, due to the stopper for the vent being carried by the hinged handle structure. Heretofore, in steam irons of the funnel-filler type, vent holes were provided in the side walls of the funnel, necessitating a slower filling procedure and a deeper funnel, and this latter consideration further prevented a complete emptying of the boiler. By this invention, however, a relatively shallow funnel may now be used, devoid of vent holes in its side walls.

In connection with the present novel emptying means and stopper, which may be disposed respectively on the boiler and handle structure of the flatiron, I provide a releasable locking means for the handle structure whereby the latter can

be locked in its open or filling position so as to rigidly support the tank during the emptying operation. Preferably the locking means is automatic so that its locks each time the handle structure is moved to the filling position without attention from the user, and must be manually released before the handle structure can be returned to operative position.

In the specific embodiment of the invention illustrated herein the locking means is associated with the pivot or hinge means for the handle structure, and comprises a pintle having laterally projecting lugs adapted to extend into adjacent recesses, one in the casing of the iron and the other in the handle structure, so as to key together the relatively movable parts when the handle is in raised position.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a vertical longitudinal sectional view through an improved steam iron embodying the invention, a portion of the casing being shown in side elevation and the handle structure being in its lowered or operative position.

Fig. 2 is a side view of the steam iron showing the handle structure in raised or filling position, portions of the iron body and handle structure being shown in longitudinal section.

Fig. 3 is a fragmentary rear elevational view of one corner of the flatiron, portions being broken away and shown in section to reveal the details of the handle locking mechanism.

Fig. 4 is a fragmentary view, partly in section and partly in elevation, of the casing of the iron taken on line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of the locking pintle or hinge pin of the handle structure.

The steam iron illustrated in the above-listed figures is in many respects similar to the steam iron illustrated and described in detail in the copending application of Joseph O. Thibault, Serial No. 103,437, filed July 7, 1949, entitled Steam Electric Iron, and for details not specifically described herein reference may be had to the said copending application.

Referring to Figs. 1 and 2 the present improved steam iron comprises a sole plate 10 having a boiler or tank 11 secured to its top, and having a casing 12 at its rear to which latter a handle structure 13 is hingedly secured. The handle structure 13 may occupy either a lowered, operative position as shown in Fig. 1, being held therein by a latch mechanism 14, or a raised, filling position as shown in Fig. 2. As illustrated, the latch mechanism 14 comprises a knob 14*a* affixed to a shaft 14*b* having at its lower end a crosshead 14*c* adapted to be received in a slot 14*d* of a latch plate 14*e* secured to the top of the tank 11. When the knob 14*a* is in the position shown in Fig. 1 the crosshead 14*c* will extend across the slot 14*d*, locking the handle structure 13 to the tank 11. When the knob 14*a* is rotated 90 degrees from the position of Fig. 1, as indicated in Fig. 2, the crosshead 14*c* will be aligned with the slot 14*d*, enabling the crosshead to pass out through the slot to release the handle structure 13 for upward swinging movement. On its underside the handle structure 13 carries a valve or stopper 15, adapted to close a filler opening or orifice 16 in a funnel 17 having a wide mouth or rim 18 which is secured to the top wall 19 of the boiler 11.

The stopper 15 comprises a disk 15*a* carrying a resilient rubber-like annulus 15*b* adapted to seat itself in the funnel 17. The disk 15*a* is mounted on a stud 15*c* carried by a plate 15*d* secured to the underside of the handle structure 13, the stud also carrying a helical compression spring 15*e* by which the stopper 15 is urged against the seat 17 when the handle is in the operative position of Fig. 1.



As shown in Fig. 2, when the handle structure 13 is in the raised or filling position, the stopper 15 is located remote from the funnel 17 and the latter is freely exposed to enable the boiler 11 to be easily and quickly filled.

In accordance with this invention I provide a novel emptying means on the top portion of the boiler 11, which is separate from the filler funnel 17 and is so arranged that when the flat iron is inverted with the handle structure in the filling or emptying position of Fig. 2, virtually all of the contents of the boiler 11 may be emptied easily and quickly, thus adapting the iron immediately for use in dry ironing. This novel emptying means is closed or stoppered automatically when the handle structure 13 is in the lowered, operative position of Fig. 1, and therefore quick and easy filling or emptying of the boiler may be accomplished as desired, whenever the handle structure is in its raised position. Preferably the emptying means, according to this invention, also constitutes the steam dome of the boiler 11, so that an economy in the structure and use of parts is realized.

Accordingly, referring to Figs. 1 and 2, I provide on the forward, upper wall portion 20 of the boiler 11 a hollow upstanding boss 21 having a relatively large opening or orifice 22 in its top, said boss enclosing the upper end portion 23 of a steam pipe 24 which communicates with a steam chamber 25 in the sole plate 10. As seen in Fig. 1, the boss 21 may be a drawn metal shell, threaded onto a nipple 26 which is crimped over on the underside of the boiler wall 20.

The handle structure 13 has a hollow front post 27 adapted to receive the boss or stream dome 21, and in said post there is provided, for engagement with the boss 21, a valve or stopper 28, comprising a resilient sealing annulus 29 engageable with the top exterior surface of the boss 21. The annulus 29 is carried in a shell 30 which is mounted on a stud 31 axially movable in a collar 32 carried by a bushing 33 fitted into the post 27. A helical compression spring 34 is provided on the stud 31 and normally holds the stopper 28 in engagement with the steam dome 21 when the handle 13 is in its lowered position. For this position, therefore, the opening 22 in the steam dome is effectively closed and sealed, causing steam which is generated in the boiler 11 to pass without escape from the steam dome into the discharge pipe 24 and the steam chamber 25 in the well known manner.

Whenever it is desired to completely empty the contents of the boiler 11, either while the iron is hot or cold, this may be easily and quickly done by simply swinging the handle structure 13 to the raised position shown in Fig. 2 and then inverting the flatiron, whereupon water will drain out of the boiler through the steam dome 21, completely emptying the boiler.

According to the present invention means are provided for automatically locking the handle structure 13 in the raised emptying position shown in Fig. 2 whenever it is moved to said position, thereby providing for a rigid support of the tank by the handle structure and making it easier and more convenient to hold the tank in proper position for emptying.

Referring to Figs. 3, 4 and 5 this locking means

comprises a pintle or pivot pin 35 carried in recesses 36 and 37 of the casing 12 and handle structure 13 respectively. The pin 35 has a cross hole 38 receiving an operating pin 39 which passes through a slot 40 in the handle structure and at its outer end carries a knob 41. Thus the pin 35 is permanently keyed to the handle structure, although axially movable therein. A compression spring 42 is disposed in the recess 37 of the handle structure to normally urge the pintle 35 outwardly of said structure, the outward movement being limited by engagement between the operating pin 39 and the end of the slot 40 through which the pin passes.

The pintle 35 has lugs or ears 43 adapted to be received in notches 44 in the recess 36 whereby the pintle can be splined or keyed to the casing 12 for a given position of the handle 13. The notches 44 in the casing are located to be in registration with the lugs 43 when the handle structure 13 is in its fully raised or emptying position, and as soon as such registration occurs the spring 42 will shift the pintle 35 axially and cause the lugs thereof to enter the notches, locking the handle structure 13 in this position. Manual release of the handle structure is effected by applying pressure to the knob 41 to return the pintle axially to its inner or retracted position.

It should be noted that the emptying and stopper means as above set forth provides an effective air vent for the boiler 11 when the latter is being filled. Air within the boiler will not be trapped and cause bubbling at the funnel 17 during the filling operation as occurred heretofore; instead, the air in the boiler will pass out through the large opening 22 in the dome 21, enabling the incoming water to quickly and smoothly flow through the funnel into the boiler. Moreover, the funnel 17 may be relatively shallow and of simple structure and shape, since it does not require vent openings in its side walls.

While the present invention has been embodied in a steam iron of the type having a water boiler as distinguished from a plain water storage tank, and having a hinged handle structure occupying positions closely adjacent the boiler or swung away therefrom, it should be understood that the invention is not limited to this specific type of iron, since it has utility and advantage in connection with other steam and dry irons, including flash-boiler irons and irons having fixed or non-hinged handles. The scope of the invention is therefore more properly determined from a consideration of the claims, and variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A steam iron comprising a body including a water tank open at the top for filling and draining; closure means therefor; a handle hinged at one end of the body, occupying either an operative position over the open top of the tank or an emptying position away from the open top of the tank; releasable means for latching the handle rigid with the body in its operative position; and releasable means for latching the handle rigid with the body in its emptying position.

2. A steam iron comprising a body including a water tank open at the top for filling and draining; closure means therefor; a handle hinged at one end of the body, occupying either an operative position over the open top of the tank or an emptying position away from the



open top of the tank; releasable means for latching the handle rigid with the body in its operative position; releasable means for latching the handle rigid with the body in its emptying position; and means maintaining the closure means in operative position when the handle is in operative position over the tank.

3. A steam iron comprising a body including a water tank open at the top for filling and draining; closure means therefor; a handle hinged at one end of the body, occupying either an operative position over the open top of the tank or an emptying position away from the open top of the tank; releasable means for latching the handle rigid with the body in its operative position; releasable means for latching the handle rigid with the body in its emptying position; and means for mounting said closure means on the handle to move therewith, said handle maintaining the closure means in operative position when the handle is in operative position over the tank.

4. A steam iron comprising a water tank having emptying means providing an unobstructed passage from the lowermost point of the tank when the iron is inverted to emptying position, including a discharge opening enabling substantially all the water in the tank to run out; a hinged handle structure adapted to occupy either an operative position extending over the tank or an iron-emptying position extending away from the tank; and a stopper carried by the handle structure, closing the said discharge opening of the tank when the handle is in operative position.

5. A steam iron comprising a water tank provided with an outwardly dished top wall having an upper portion raised above the remainder of the wall and provided at its top with a water discharge opening whereby substantially all the water in the tank is enabled to readily run out when the tank is turned upside down; a hinged handle structure adapted to occupy either an operative position extending over the tank or an emptying position extending away from the tank; and a stopper carried by the handle structure, closing the discharge opening of the tank when the handle is in operative position.

6. A steam iron comprising a casing and a water tank in the casing, said tank having emptying means providing an unobstructed passage from the lowermost point of the tank when the iron is inverted to emptying position, including a discharge opening enabling substantially all the water in the tank to run out; a hinged handle structure adapted to occupy either an operative position extending over the tank or an iron-emptying position extending away from the tank; a stopper carried by the handle structure, closing the said discharge opening of the tank when the handle is in operative position; and means for releasably locking the handle structure to the casing in emptying position, to provide rigid support of the tank and casing by said structure during said emptying.

7. A steam iron comprising a boiler provided with an outwardly dished top wall having an upstanding steam dome surrounding the upper end of a steam discharge pipe, said dome having a water-discharge opening in its top and being shaped together with the top wall to enable substantially all the water in the boiler to run out when the boiler is turned upside down; a hinged handle structure adapted to occupy either an operative position extending over the boiler or an emptying position extending away from the

boiler; and a stopper carried by the handle structure, closing the discharge opening of the boiler when the handle is in operative position.

8. A steam iron comprising a water tank having a raised top portion shaped substantially like an inverted cone, said portion at its apex having a water discharge opening whereby substantially all the water in the tank is enabled to run out when the tank is turned upside down; a hinged handle structure adapted to occupy either an operative position extending over the tank or an emptying position extending away from the tank; and a stopper carried by the handle structure, closing the discharge opening of the tank when the handle is in operative position.

9. A steam iron comprising a water tank having a top provided with a depending filler funnel, said top comprising a water emptying means including a top opening separate from the filler funnel, enabling substantially all the water in the tank to run out when the tank is turned upside down; a hinged handle structure adapted to occupy either an operative position extending over the tank or a filling-and-emptying position extending away from the tank; and stoppers carried by the handle structure, closing the filler funnel and top emptying opening of the tank when the handle is in the operative position.

10. The invention as defined in claim 4 in which the handle structure includes a hollow front post, in which the tank emptying means comprises a hollow dome carried by the tank, extending upward into the hollow of said post when the handle structure is in operative position, and in which the stopper has a mounting member separate from and fitted into the said hollow post.

11. A steam iron comprising a casing and a water tank in the casing, said tank having emptying means providing an unobstructed passage from the lowermost point of the tank when the iron is inverted to emptying position, including a discharge opening enabling substantially all the water in the tank to run out; a hinged handle structure adapted to occupy either an operative position extending over the tank or an iron-emptying position extending away from the tank; a stopper carried by the handle structure, closing the said discharge opening of the tank when the handle is in operative position; and manually releasable means, automatically locking the handle structure in emptying position in response to movement of said structure thereto, thereby to provide rigid support of the tank by said structure during said emptying.

12. The invention as defined in claim 1 in which the body and handle structure have recesses adjacent the hinge point, and in which said locking means comprises an axially movable pintle for the handle structure, having lateral projections receivable in said recesses.

13. The invention as defined in claim 1 in which the body and handle structure have juxtaposed recesses, and in which the said locking means comprises a slide bolt occupying both said recesses when the handle structure is locked.

14. The invention as defined in claim 13 in which the slide bolt has a finger piece by means of which it may be operated.

15. In a steam iron of the type having a water tank provided with a filler funnel extending into the tank, and having a hinged handle structure and a stopper carried thereby to close the filler funnel when the handle structure is in operative position over the tank, the improvement which comprises: the top of the tank having a hollow raised portion separate from said filler funnel, adapted to be covered by said handle structure when the latter is in operative position, said raised portion having a water outlet opening in its top; and a stopper carried by the handle structure, adapted to close the opening in said raised portion when the handle structure is in operative position, said portion being exposed and the outlet opening thereof uncovered when the handle structure is swung back to filling position whereby the contents of the tank may be completely emptied through said outlet opening by turning the iron upside down.

16. A steam iron comprising a water tank having a filling opening; means extending around the filling opening and into the water tank, providing a water passage into the tank, said means extending below the top of the tank and preventing complete emptying of the tank through said filling opening; a steam tube extending upwardly through said tank; a steam dome spaced from said filling opening and extending above the top of the tank and having an aperture at its uppermost portion which is located above the top of the steam tube, said steam dome and the aperture therein having unobstructed communication with every part of the tank when the steam iron is inverted whereby the tank and the steam dome may be completely emptied of water through said aperture in the steam dome; a valve seat around said aperture; and a valve releasably engaging said seat for closing the aperture in the steam dome.

17. A steam iron comprising a water tank having a filling opening; means extending around the filling opening and into the water tank, providing a water passage into the tank, said means extending below the top of the tank and preventing complete emptying of the tank through said filling opening, said tank having an emptying opening spaced from the filler opening and located at its uppermost portion in unobstructed communication with every part of the tank when the steam iron is inverted whereby the tank may be completely drained of water through said emptying opening; a valve seat around said emptying opening; and a valve mounted for controlled movement between an open position clear of the valve seat and a closed position on the seat.

18. A steam iron comprising a water tank having emptying means, including a discharge opening, providing an unobstructed passage from the lowermost point of the tank when the iron is inverted to emptying position, enabling substantially all the water in the tank to run out, said tank having a filling orifice separate from said discharge opening; a manually operable member movably mounted with respect to the tank and movable between two positions; and a pair of separate closure means simultaneously actuated by said member, for closing said opening and orifice respectively when the member is in one of said positions, said closure means being separated from and exposing the opening and orifice respectively when the member is in its other position.

19. The invention as defined in claim 18, in which there is yieldable means associated with the closure means for the discharge opening, providing for unsealing of said opening in response to a predetermined steam pressure in the tank, thereby to provide safety valve action.

20. The invention as defined in claim 4, in which the handle structure includes a hollow

front post, in which the tank emptying means comprises a hollow dome carried by the tank, extending upward into the hollow of said post when the handle structure is in operative position, and in which the stopper has a mounting member separate from and fitted into the said hollow post.

21. In a steam iron of the type having a water tank provided with a filler funnel extending into the tank, and having a hinged handle structure and a stopper carried thereby to close the filler funnel when the handle structure is in operative position over the tank, the improvement which comprises: the top of the tank having a hollow raised portion separate from said filler funnel, adapted to be covered by said handle structure when the latter is in operative position, said raised portion having a water outlet opening in its top; and a stopper means carried by the handle structure, adapted to close the opening in said raised portion when the handle structure



is in operative position; means mounting said stopping means on the handle structure to enable the stopper means to yield in response to excess steam pressure in the tank to provide a safety valve action and said raised portion being exposed and the outlet opening thereof uncovered when the handle structure is swung back to filling position whereby the contents of the tank may be completely emptied through said outlet opening by turning the iron upside down.

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