

June 17, 1952

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2,600,521

INLET FIXTURE FOR LIQUID TANKS

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2 SHEETS—SHEET 1

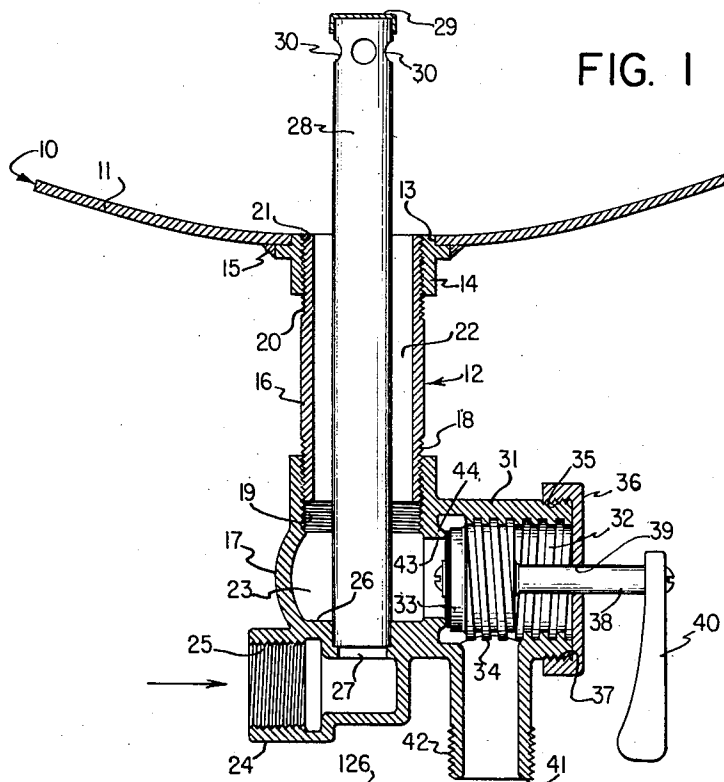


FIG. 1

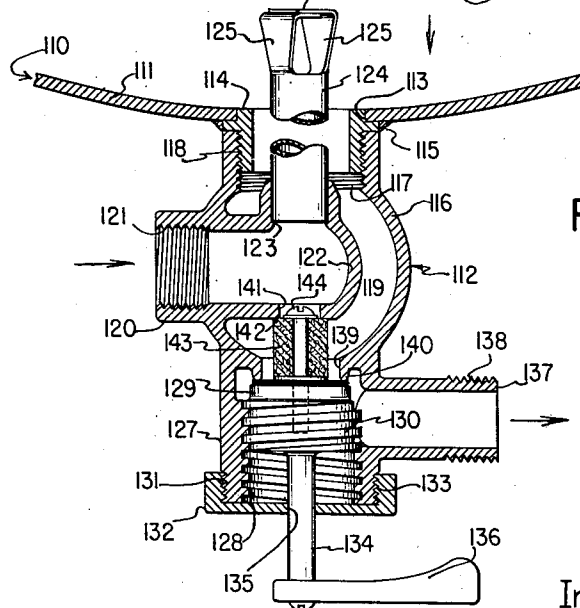


FIG. 2

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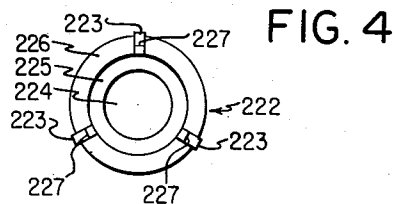
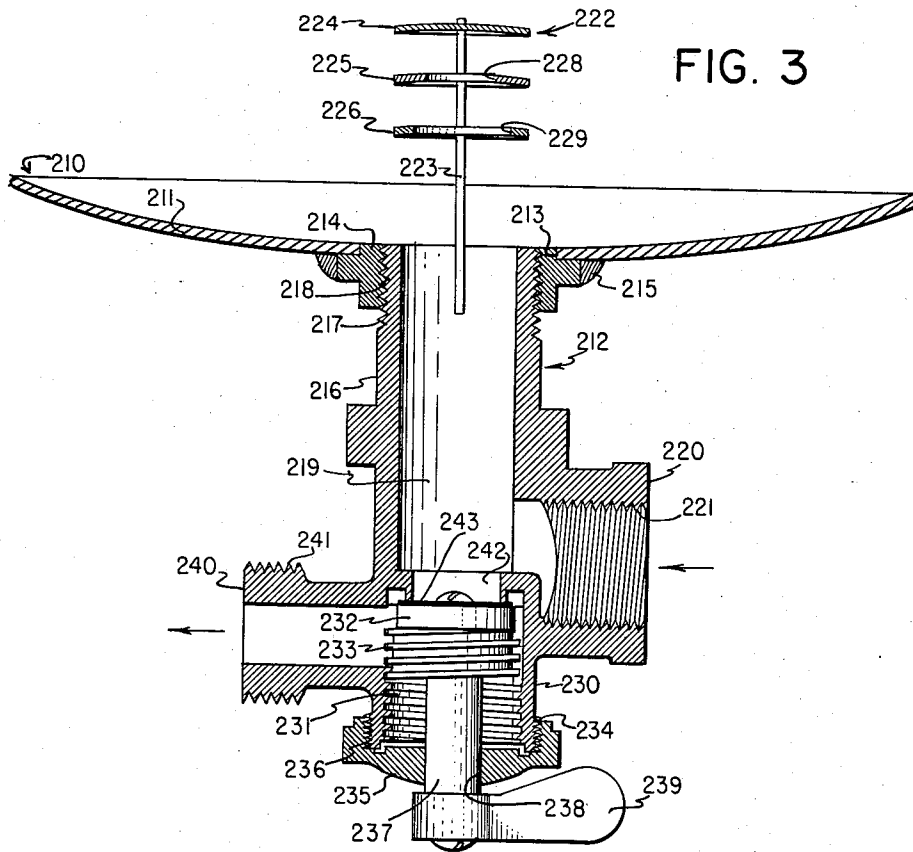
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2 SHEETS—SHEET 2



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INLET FIXTURE FOR LIQUID TANKS

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2 Claims. (Cl. 137—21)

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The present invention relates to combined inlet and drain fixtures for liquid tanks, and more particularly to such fixtures that are especially suited for use in hot water tanks.

It is a general object of the present invention to provide an improved fixture of the character noted that may be supported by a single spud arranged in an opening provided in the bottom wall of the associated hot water tank.

Another object of the invention is to provide an improved fixture of the character noted that carries diffusion structure projecting through a supporting spud arranged in an opening provided in the bottom wall of the associated hot water tank so that incoming cold water does not materially mix with and stir up hot water stored in the upper portion of the tank.

A further object of the invention is to provide an improved fixture of the character noted that accommodates complete and ready drainage of the associated hot water tank.

A further object of the invention is to provide an improved fixture of the character noted that prevents silt and other foreign materials settling therein from the associated hot water tank from being stirred up by incoming cold water in order to provide clear, clean hot water and to facilitate the removal of this foreign material from the bottom of the tank.

Further features of the invention pertain to the particular arrangement of the elements of the combined inlet and drain fixture, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings, in which Figure 1 is a fragmentary longitudinal sectional view of the lower portion of a hot water tank carrying a combined inlet and drain fixture embodying the present invention; Fig. 2 is a fragmentary longitudinal sectional view of the lower portion of a hot water tank carrying a modified combined inlet and drain fixture embodying the present invention; Fig. 3 is a fragmentary longitudinal sectional view of the lower portion of a hot water tank carrying a further modified combined inlet and drain fixture embodying the present invention; and Fig. 4 is an inverted plan view of diffusion structure carried by the upper portion of the casing of the fixture shown in Fig. 3.

Referring now to Fig. 1, there is illustrated a

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hot water storage tank 10 provided with a convex bottom wall 11 supporting a combined inlet and drain fixture 12 embodying the features of the present invention. More particularly, the lowermost portion of the bottom wall 11 has a centrally located opening 13 formed therein into which a spud 14 is arranged and secured in liquid-tight relation with respect to the bottom wall 11 by a ring of fused metal 15. More particularly, the spud 14 may be directly welded in place upon the bottom wall 11 and projecting through the opening 13 formed therein.

The fixture 12 comprises an upper casing section 16 and a lower casing section 17; the lower end of the upper casing section 16 being externally threaded, as illustrated at 18, and the upper end of the lower casing section 17 being internally threaded, as illustrated at 19. More particularly, the upper end of the lower casing section 17 is detachably secured to the lower end of the upper casing section 16, the threaded portions 19 and 18 being engaged in order to provide a liquid-tight joint therebetween. Also the upper end of the upper casing section 16 is externally threaded, as illustrated at 20, and the spud 14 is internally threaded, as illustrated at 21. More particularly, the upper end of the upper casing section 16 is detachably secured to the spud 14, the threaded portions 20 and 21 being engaged in order to provide a liquid-tight joint therebetween. The upper casing section 16 is of hollow construction providing an upstanding substantially cylindrical chamber 22 therein communicating through the spud 14 directly with the lower portion of the tank 10; and the lower casing section 17 is of hollow construction providing a substantially cylindrical chamber 23 therein communicating directly with the chamber 22; whereby the chambers 22 and 23 constitute, in effect, one continuous chamber in the fixture 12.

Also the lower casing section 17 is provided with an inlet connection 24 that is internally threaded, as illustrated at 25, in order to receive an externally threaded cold water inlet pipe or conduit, not shown. Further the lower casing section 17 comprises wall structure 26 having an opening 27 formed therein and supporting an upstanding conduit 28. More particularly, the lower end of the conduit 28 is suitably secured in place in the opening 27 and communicates through the opening 27 with the inlet connection 24. The conduit 28 extends upwardly through the chambers 23 and 22 and projects through the spud 14 into the lower portion of the tank 10. The extreme upper end of the conduit 28 is closed

by a cap 29; and a plurality of holes 30 are formed in the side wall of the conduit 28 just below the cap 29 and cooperate therewith to provide diffusion structure. Accordingly, liquid from the inlet connection 24 may be supplied through the opening 27 into the conduit 28 and thence through the holes 30 into the lower portion of the tank 10. Specifically, the arrangement of the holes 30 in the side wall of the conduit 28 just below the cap 29 carried by the extreme upper end of the conduit 28 cooperate to bring about a diffusion action; whereby cold water moving upwardly in the conduit 28 is deflected outwardly and horizontally over the bottom wall 11 adjacent to the bottom of the tank 10. This arrangement prevents the incoming cold water entering the inlet connection 24 from mixing with and churning up the hot water stored in the upper portion of the tank 10, thereby maintaining temperature stratification.

Also the lower casing section 17 comprises a hollow valve housing 31 that is internally threaded, as illustrated at 32, and receives a valve element 33 that is externally threaded, as illustrated at 34, the valve element 33 being arranged within the valve housing 31 and the threaded portions 32 and 34 being engaged. The outer end of the valve housing 31 is externally threaded, as illustrated at 35, and carries a cap 36 that is internally threaded, as illustrated at 37, the threaded portions 35 and 37 being engaged. The valve element 33 is provided with an operating stem 38 that projects through a centrally disposed hole 39 formed in the cap 36, the outer end of the stem 38 carrying an operating handle 40. Further the lower casing section 17 is provided with a drain connection 41 that is externally threaded, as illustrated at 42, in order to receive an internally threaded drain pipe or conduit, not shown. The drain connection 41 directly communicates with the interior of the valve housing 31; while the interior of the valve housing 31 communicates with the chamber 23 through a connecting passage 43 that is provided with a surrounding valve seat 44 facing the interior of the valve housing 31 and cooperating with the adjacent face of the valve element 33.

It will be understood that when the valve element 33 occupies its closed or seated position with respect to the valve seat 44, the interior of the valve housing 31 is closed off from the chamber 23 through the passage 43. On the other hand when the valve element 33 occupies its opened or unseated position with respect to the valve seat 44, the interior of the valve housing 31 is opened to the chamber 23, through the passage 43. Accordingly, when the valve element 33 occupies its opened position the lower portion of the tank 10 is placed in communication with the drain connection 41 through the spud 14, the chambers 22 and 23, the passage 43 and the interior of the valve housing 31. Of course, it will be understood that the valve element 33 may be operated between its opened and closed positions by manipulating the handle 40, the stem 38 causing the threaded portion 34 to travel in the corresponding direction with respect to the threaded portion 32.

During normal operation of the tank 10 when the valve element 33 occupies its closed position, silt and other foreign material in the tank 10 has a tendency to settle upon the bottom wall 11 and fall through the spud 14 and thence through the chamber 22 into the chamber 23,

wherein it is accumulated. The silt and foreign material accumulating in the chamber 23 and on the bottom wall 11 of the tank 10 are not churned up or otherwise disturbed by the cold water entering the tank 10 through the inlet connection 24 since the conduit 28 passes directly through the connecting chambers 23 and 22 and the spud 14. Accordingly, when the valve element 33 is subsequently operated to its opened position the water in the tank 10 moves through the chambers 22 and 23 sweeping the accumulated silt and other foreign material in the chamber 23 through the passage 43 and the interior of the valve housing 31 into the drain connection 41. Moreover, the water passing from the lower portion of the tank 10 sweeps the bottom wall 11 carrying with it any silt or other foreign material accumulated thereon into the chamber 22 and thence through the drain connection 41. At this time incoming cold water through the inlet connection 24 also passes through the conduit 28 into the lower portion of the tank 10 and thence into the chamber 22 and ultimately out through the drain connection 41; whereby the cold water inlet piping may also be drained through the tank 10 into the drain connection 41. Further when the tank 10 is empty, the incoming cold water from the conduit 28 washes the silt and foreign material accumulated on the bottom wall into the chamber 22. This arrangement is very advantageous as it not only positively insures that silt and other foreign material in the tank 10 may be readily flushed therefrom, but it also provides for the draining of the cold water inlet piping.

Thus it will be appreciated that the fixture 12, as a whole, may be readily detached from the spud 14 by disengaging the associated threaded portions 20 and 21; whereby the conduit 28 and the associated diffusion structure carried thereby may be readily withdrawn through the spud 14. This arrangement is very advantageous as it permits ready cleaning and repair of the diffusion structure carried by the conduit 28. Also at this time the lower portion of the tank 10 is readily accessible from the exterior through the spud 14 in order to permit cleaning of the interior of the tank 10 in the event such is necessary. Subsequently, the upper end of the conduit 28 and the associated diffusion structure carried thereby may be inserted through the spud 14 into the lower portion of the tank 10 and then the upper casing section 16 secured in liquid-tight relation to the spud 14 by re-engaging the threaded portions 20 and 21.

Referring now to Fig. 2, there is illustrated a hot water storage tank 110 provided with a convex bottom wall 111 supporting a modified form of the combined inlet and drain fixture 112 embodying the features of the present invention. More particularly, the lowermost portion of the bottom wall 111 has a centrally located opening 113 formed therein into which a spud 114 is arranged and secured in liquid-tight relation with respect to the bottom wall 111 by a ring of fused metal 115. More particularly, the spud 114 may be directly welded in place upon the bottom wall 111 and projecting through the opening 113 formed therein.

The fixture 112 comprises a casing 116, the upper end of which is internally threaded, as illustrated at 117, and the spud 114 is externally threaded, as illustrated at 118. The upper end of the casing 116 is detachably secured to the

spud 114, the threaded portions 117 and 118 being engaged in order to provide a liquid-tight joint therebetween. The casing 116 is of hollow construction providing an upstanding substantially spherical chamber 119 therein communicating through the spud 114 directly with the lower portion of the tank 110.

Also the casing 116 is provided with an inlet connection 120 that is internally threaded, as illustrated at 121, in order to receive an externally threaded cold water inlet pipe or conduit, not shown. Further, the casing 116 comprises wall structure 122 having an opening 123 formed therein and supporting an upstanding conduit 124. More particularly, the lower end of the conduit 124 is suitably secured in place in the opening 123 and communicates through the opening 123 with the inlet connection 120. The conduit 124 extends upwardly through the chamber 119 and projects through the spud 114 into the lower portion of the tank 110. The extreme upper end of the conduit 124 is provided with two integral side pieces 125 that are bent in overlapped relation adjacent to the outer ends thereof and secured together in order to provide a top wall 126. Thus the extreme upper end of the conduit 124 is closed by the top wall 126; and two holes are formed in the side wall thereof by the side pieces 125 just below the top wall 123 and cooperate therewith to provide diffusion structure. Accordingly, liquid from the inlet connection 120 may be supplied through the opening 123 into the conduit 124 and thence through the two holes provided in the extreme outer end thereof into the lower portion of the tank 110. Specifically, the arrangement of the two holes in the side wall of the conduit 124 just below the top wall 126 carried by the extreme upper end of the conduit 124 cooperate to provide a diffusion action; whereby cold water moving upwardly in the conduit 124 is deflected outwardly and horizontally over the bottom wall 111 adjacent to the bottom of the tank 110. This arrangement prevents the incoming cold water entering the inlet connection 120 from mixing with and churning up the hot water stored in the upper portion of the tank 110, thereby maintaining temperature stratification.

Also the casing 116 comprises a hollow valve housing 127 that is internally threaded, as illustrated at 128, and receives a valve element 129 that is externally threaded, as illustrated at 130, the valve element 129 being arranged within the valve housing 127 and the threaded portions 128 and 130 being engaged. The outer end of the valve housing 127 is externally threaded, as illustrated at 131, and carries a cap 132 that is internally threaded, as illustrated at 133, the threaded portions 131 and 133 being engaged. The valve element 129 is provided with an operating stem 134 that projects through a centrally disposed hole 135 formed in the cap 132, the outer end of the stem 134 carrying an operating handle 136. Further the casing 116 is provided with a drain connection 137 that is externally threaded, as illustrated at 138, in order to receive an internally threaded drain pipe or conduit, not shown. The drain connection 137 directly communicates with the interior of the valve housing 127; while the interior of the valve housing 127 communicates with the chamber 119 through a connecting passage 139 that is provided with a surrounding valve seat 140 facing the interior of the valve housing 127 and cooperating with the adjacent face of the valve ele-

ment 129. Also the wall structure 122 has a passage 141 formed therein and providing a communication between the inlet connection 120 and the chamber 119. Further, the passage 141 is provided with a surrounding valve seat 142 that cooperates with a supplemental valve element 143 secured to the end of the valve element 129 by an arrangement including a screw 144. The valve seat 142 surrounding the passage 141 faces the passage 139 and cooperates with the adjacent face of the valve element 143.

It will be understood that when the valve element 129 occupies its closed or seated position with respect to the valve seat 140, the interior of the valve housing 127 is closed off from the chamber 119 through the passage 139; and also the valve element 143 occupies its closed or seated position with respect to the valve seat 142 in order to close off the inlet connection 120 from the chamber 119 through the passage 141. On the other hand, when the valve element 129 occupies its opened or unseated position with respect to the valve seat 140, the interior of the valve housing 127 is opened to the chamber 119 through the passage 139; and likewise the valve element 143 occupies its opened or unseated position with respect to the valve seat 142 in order to open the inlet connection 120 to the chamber 119 through the passage 141. Accordingly, when the valve element 129 occupies its opened position, the lower portion of the tank 110 is placed in communication with the drain connection 137 through the spud 114, the chamber 119, the passage 139 and the interior of the valve housing 127; and likewise, when the valve element 143 occupies its opened position, the inlet connection 120 is placed in communication with the drain connection 137 through the passage 141, the chamber 119, the passage 139 and the interior of the valve housing 127. Of course, it will be understood that the valve elements 129 and 143 may be operated simultaneously between their opened and closed positions by manipulating the handle 136, the stem 134 causing the threaded portion 130 to travel in the corresponding direction with respect to the threaded portion 128.

During normal operation of the tank 110 when the valve elements 129 and 143 occupy their respective closed positions, the inlet connection 120 is closed off from the chamber 119 and the chamber 119 is closed off from the drain connection 137. At this time silt and other foreign material in the tank 110 has a tendency to settle upon the bottom wall 111 and fall through the spud 114 and thence into the chamber 119, wherein it is accumulated. The silt and other foreign material accumulating in the chamber 119 and on the bottom wall 111 of the tank 110 are not churned up or otherwise disturbed by the cold water entering the tank 110 through the inlet connection 120 since the conduit 124 passes directly through the chamber 119 and the spud 114. Accordingly, when the valve elements 129 and 142 are subsequently operated to their open positions, the water in the tank 110 moves through the chamber 119 sweeping the accumulated silt and other foreign material in the chamber 119 through the passage 139 and the interior of the valve housing 127 into the drain connection 137. Moreover, the water passing from the lower portion of the tank 110 sweeps the bottom wall 111 carrying with it any silt or other foreign material accumulated thereon into the chamber 119 and thence through the drain connection 137. Also at this time cold water from the inlet connec-

tion 120 moves through the passage 141, the chamber 119, the passage 139 and the interior of the valve housing 127 and ultimately out through the drain connection 137; whereby the cold water inlet piping may also be drained directly into the drain connection 137. This arrangement is very advantageous as it not only positively insures that silt and other foreign material in the tank 110 may be readily flushed therefrom, but it also provides for the draining of the cold water inlet piping.

Thus it will be appreciated that the fixture 112, as a whole, may be readily detached from the spud 114 by disengaging the associated threaded portions 117 and 118; whereby the conduit 124 and the associated diffusion structure carried thereby may be readily withdrawn through the spud 114. This arrangement is very advantageous as it permits ready cleaning and repair of the diffusion structure carried by the conduit 124. Also at this time the lower portion of the tank 110 is readily accessible from the exterior through the spud 114 in order to permit cleaning of the interior of the tank 110 in the event such is necessary. Subsequently the upper end of the conduit 124 and the associated diffusion structure carried thereby may be inserted through the spud 114 into the lower portion of the tank 110 and then the casing 116 secured in liquid-tight relation to the spud 114 by reengaging the threaded portions 117 and 118.

Referring now to Figs. 3 and 4, there is illustrated a hot water storage tank 210 provided with a convex bottom wall 211 supporting a further modified form of the combined inlet and drain fixture 212 embodying the features of the present invention. More particularly, the lowermost portion of the bottom wall 211 has a centrally located opening 213 formed therein into which a spud 214 is arranged and secured in liquid-tight relation with respect to the bottom wall 211 by a ring of fused metal 215. More particularly the spud 214 may be directly welded in place upon the bottom wall 211 and projecting through the opening 213 formed therein.

The fixture 212 comprises a casing 216, the upper end of which is externally threaded, as illustrated at 217, and the stud 214 is internally threaded, as illustrated at 218. The upper end of the casing 216 is detachably secured to the spud 214, the threaded portions 217 and 218 being engaged in order to provide a liquid-tight joint therebetween. The casing 216 is of hollow construction providing an upstanding substantially cylindrical chamber 219 therein communicating through the spud 214 directly with the lower portion of the tank 210.

Also the casing 216 is provided with an inlet connection 220 that is internally threaded, as illustrated at 221, in order to receive an externally threaded cold water inlet pipe or conduit, not shown, which inlet connection 220 communicates directly with the chamber 219. The upper end of the casing 216 carries diffusion structure 222 projecting through the spud 214 into the lower portion of the tank 210. The diffusion structure 222 comprises three upstanding substantially equally angularly spaced-apart legs 223 and three deflecting plates 224, 225 and 226 arranged in longitudinally spaced-apart relation. The lower end of each of the legs 223 is provided with a notch 227 therein in order to provide a shoulder engaging the extreme upper end of the casing 216. This arrangement properly positions the diffusion structure 222 on the upper

end of the casing 216; and the lower ends of the legs 223 are suitably secured rigidly to the adjacent cylindrical surfaces of the casing 216; whereby the diffusion structure 222 is carried with the casing 216. The uppermost deflecting plate 224 is imperforate; the intermediate deflecting plate 225 has a relatively small centrally located hole 228 formed therein; and the lowermost deflecting plate 226 has a relatively large centrally located hole 229 formed therein. Accordingly, liquid from the inlet connection 220 may be supplied through the chamber 219 into the lower portion of the tank 210. Specifically, the arrangement of the deflecting plates 224, 225 and 226 respectively carried by the extreme upper end of the casing 216, cooperate to provide a diffusion action; whereby cold water moving upwardly from the chamber 219 into the lower portion of the tank 210 is deflected outwardly and horizontally over the bottom wall 211 adjacent to the bottom of the tank 210. This arrangement prevents the incoming cold water entering the inlet connection 220 from mixing with and churning up the hot water stored in the upper portion of the tank 210, thereby maintaining temperature stratification.

Also the casing 216 comprises a hollow valve housing 230 that is internally threaded, as illustrated at 231, and receives a valve element 232 that is externally threaded, as illustrated at 233, the valve element 232 being arranged within the valve housing 230 and the threaded portions 231 and 233 being engaged. The outer end of the valve housing 230 is externally threaded, as illustrated at 234, and carries a cap 235 that is internally threaded, as illustrated at 236, the threaded portions 234 and 236 being engaged. The valve element 232 is provided with an operating stem 237 that projects through a centrally disposed hole 238 formed in the cap 235, the outer end of the stem 237 carrying an operating handle 239. Further the casing 216 is provided with a drain connection 240 that is externally threaded, as illustrated at 241, in order to receive an internally threaded drain pipe or conduit, not shown. The drain connection 240 directly communicates with the interior of the valve housing 230; while the interior of the valve housing 230 communicates with the chamber 219 through a connecting passage 242 that is provided with a surrounding valve seat 243 facing the interior of the valve housing 230 and cooperating with the adjacent face of the valve element 232. It will be understood that when the valve element 232 occupies its closed or seated position with respect to the valve seat 243, the interior of the valve housing 230 is closed off from the chamber 219 through the passage 242. On the other hand, when the valve element 232 occupies its opened or unseated position with respect to the valve seat 243, the interior of the valve housing 230 is opened to the chamber 219 through the passage 242. Accordingly, when the valve element 232 occupies its opened position, the lower portion of the tank 210 is placed in communication with the drain connection 240 through the spud 214, the chamber 219, the passage 242 and the interior of the valve housing 230. Of course, it will be understood that the valve element 232 may be operated between its opened and closed positions by manipulating the handle 239, the stem 237 causing the threaded portion 233 to travel in the corresponding direction with respect to the threaded portion 231.

When the valve element 232 is operated to its

opened position, the water in the tank 210 moves through the chamber 219, the passage 242 and the interior of the valve housing 230 into the drain connection 240. At this time incoming cold water through the inlet connection 220 also passes into the chamber 219 and through the passage 242 into the drain connection 240; whereby the cold water inlet piping may also be drained into the drain connection 240. When the tank 210 is thus drained, any silt or foreign material therein is flushed through the chamber 219 into the drain connection 240. This arrangement is very advantageous as it not only positively insures that silt and other foreign material in the tank 210 may be readily flushed therefrom, but it also provides for the draining of the cold water inlet piping.

Thus it will be appreciated that the fixture 212, as a whole, may be readily detached from the spud 214 by disengaging the associated threaded portions 217 and 218; whereby the diffusion structure 222 carried by the upper end of the casing 216 may be readily withdrawn through the spud 214. This arrangement is very advantageous as it permits ready cleaning and repair of the diffusion structure 222. Also at this time the lower portion of the tank 210 is readily accessible from the exterior through the spud 214 in order to permit cleaning of the interior of the tank 210 in the event such is necessary. Subsequently, the diffusion structure 222 may be inserted through the spud 214 into the lower portion of the tank 210 and then the casing 216 secured in liquid-tight relation to the spud 214 by re-engaging the threaded portions 217 and 218.

In view of the foregoing, it is apparent that there has been provided combined inlet and drain fixtures for hot water tanks, that are of improved construction and arrangement.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a liquid tank provided with a bottom wall having an opening therein, and a spud arranged in said opening and secured in liquid-tight relation to said bottom wall; the combination comprising a unitary combined inlet and drain fixture normally carried by said spud and provided with a casing detachably secured in liquid-tight relation thereto, said casing including a chamber communicating through said spud with the lower portion of said tank, a conduit arranged in said casing and extending through said chamber and projecting through said spud into the lower portion of said tank, said casing including a liquid inlet connection communicating with the lower end of said conduit, liquid diffusion structure carried by the upper end of said conduit and communicating therewith and positioned in the lower portion of said tank in order to cause liquid moving from said conduit into the lower portion of said tank to be deflected outwardly over said bottom wall, said casing including a liquid drain connection and a first

passage communicating between said chamber and said drain connection, said casing including a second passage communicating between said inlet connection and said chamber, valve mechanism arranged in said casing and selectively operative to open and to close said passages, liquid from said chamber moving through said first passage into said drain connection and liquid from said inlet connection moving through said second passage into said chamber when said valve mechanism is operated to open said passages, and an operating member associated with said valve mechanism and extending through a hole provided in said casing to the exterior.

2. In a liquid tank provided with a bottom wall having an opening therein, and a spud arranged in said opening and secured in liquid-tight relation to said bottom wall; the combination comprising a unitary combined inlet and drain fixture normally carried by said spud and provided with a casing detachably secured in liquid-tight relation thereto, said casing including a chamber communicating through said spud with the lower portion of said tank, a conduit arranged in said casing and extending through said chamber and projecting through said spud into the lower portion of said tank, said casing including a liquid inlet connection communicating with the lower end of said conduit, liquid diffusion structure carried by the upper end of said conduit and communicating therewith and positioned in the lower portion of said tank in order to cause liquid moving from said conduit into the lower portion of said tank to be deflected outwardly over said bottom wall, said casing including a valve housing and a first passage communicating therebetween and said chamber and a liquid drain connection communicating with said valve housing, a first valve seat surrounding said first passage and facing said valve housing, said casing including a second passage communicating between said inlet connection and said chamber, a second valve seat surrounding said second passage and facing said valve housing, a valve element arranged in said valve housing and selectively operative to open and to closed positions with respect to said valve seats, liquid from said chamber moving through said first passage into said drain connection and liquid from said inlet connection moving through said second passage into said chamber when said valve element is operated to its open position, and an operating member associated with said valve element and extending through a hole provided in said casing to the exterior.

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