This invention relates to lifeboat drains and plugs.

Today, as never before, every effort is being made to assure maximum safety and efficiency in lifeboats and lifeboat equipment.

In a well known form of drain and plug now in use the drain has a threaded lip on which the plug is screwed when the boat is in use. This lip is about one-half inch high, which keeps the bottom of the boat covered with water at all times, the water causing the paint to soften and peel off shortly after application, as a result of which the metal boat bottom is exposed to the elements for the remainder of the time before the boat is scaled out and painted again which is about once every year.

The automatic valve of the drain now in use defeats the purpose of the drain hole. It consists of a rubber ball held directly under the drain hole by a cage on the outside with four small holes in it. The rubber ball leaves about one-eighth inch of the circumference of the drain hole open, so that small particles of dirt, such as scale, rope yarn threads or small papers which may get into the boat, will plug up the drain hole during heavy rains and the boat will sometimes be filled half full of water overnight. In such a case, food and small and expensive equipment, such as flashlights, flare pistols, flares, and in the case of motor boats, the engine, ignition system and carburetor will be submerged in water and damaged. The ball rests in the bottom of the case when not floated up in the water. The ball itself almost blocks the drainage through the small holes in the cage. Water which settles in the basin of the cage will freeze the ball to the bottom in cold weather, making it impossible for it to float up and plug the hole immediately. As the rubber ball is almost entirely enclosed by the solid wall metal cage, the rubber ball will melt and stick to the cage in very hot weather due to the heat of the metal. This would also prevent the ball from floating and plugging the drain hole in an emergency.

The plug cap of the drain now in use is a separate unit and is attached to the boat near the drain by a chain lanyard. In screwing on the cap, this chain kinks and hinders the operation. At boat drills, an impatient sailor may jerk it loose. The result is that when the cap is removed, it will be dropped away from the drain and may not be found in an emergency. The exposed threads are often damaged and not immediately noticed, in scaling out boats. A careless sailor will always paint the threads, which also makes it impossible to screw on the plug.

It is accordingly the primary object of this invention to so design the drain that the drain hole will be below the bottom or shell of the boat to thereby drain the boat completely dry.

Another object of this invention is to provide the drain with an automatic valve so designed that it leaves the entire drain hole open for drainage making it impossible for any particles of dirt, etc., that gather in lifeboats to plug it up, which guarantees complete drainage in the heaviest rain squalls.

A further object of the invention is to form the drain as a unit so designed that the plug formed as a sleeve is always in position for closing the drain and so constructed as to completely enclose the machined threads of the drain thus preventing the threads from freezing in the coldest weather and against other damage which often occurs in the case of exposed threads.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is illustrated in the accompanying drawing, wherein—

Figure 1 is a vertical sectional view of the lifeboat drain and plug embodying the invention;
Figure 2 is a top plan view of the drain and plug; and
Figure 3 is a bottom plan view of the drain and plug.

Referring to the drawing in detail, 10 denotes the bottom of a lifeboat and provided at a suitable location therein is a circular opening 11. Arranged in said opening is a combined drain plug and automatic valve unit indicated generally by the reference character 12.

The combined drain, plug and automatic valve unit 12 comprises a casing structure 14 having an upper sleeve portion 15 extending vertically upwardly in co-axial relation to an attaching disc 16. Formed on the upper surface of the edge portion of the disc 16 is a flange 17 of reduced thickness defining with the body of the disc a circular shoulder 18 adapted to snugly seat within the circular opening 11 in the lifeboat bottom, the flange 17 contacting the outer surface of the lifeboat bottom 10 and being secured thereto as by
the rivets 20. When so secured, the upper sleeve portion 15 projects upwardly within the life boat above the bottom thereof and in co-axial relation to the sleeve openings 22, preferably in four number and of equal dimensions. The upper end portion 23 of the upper sleeve portion 15 is of greater thickness than the body of the sleeve and is provided with external threads 24 for mating engagement with internal threads 25 formed in the inside wall of a closure plug or cap 26. The closure plug 26 at its open end portion is made of reduced thickness as at 27 and extending therethrough is a set screw 28 which functions to limit outward movement of the closure plug relative to the upper sleeve portion in the manner readily apparent. At its upper end the closure plug 26 is formed with an integral closed top 29 having an irregular laterally extending rim 30 which defines a hand grip whereby to facilitate easy opening and closing of the closure plug. Also formed on the top 29 is a raised arrow 31 to indicate the direction of turning to effect closing movement of the closure plug. At its lower end the closure plug is formed with a pin 32 which extends from the axis of the closure plug and sleeve portion such as to wholly engage the upper surface of the disc 16 when screwed down to its complete closed position to effect a complete closing off of the drain inlet openings 22. In the position of the parts shown in Figure 1 the closure plug 26 is in its maximum raised position affording unobstructed access to the inlet drain openings 22.

Provided centrally within the disc 16 and co-axially with the upper sleeve portion 15 is an outlet drain opening 35 formed on its under side with a threaded valve seat 36, for a purpose to be hereinafter described. Depending from the disc 16 is a four legged spider cage 37 comprising arms 38 meeting together at a juncture 39 directly beneath the outlet drain opening 35. Extending upwardly from the juncture 39 within the cage 37 is a guide pin 40 rigidly secured to the juncture in any suitable manner. A conical shaped buoyant rubber valve 42 is provided with a closed bore 43 extending upwardly therefrom from the base thereof and of a diameter in excess of the diameter of the pin 40. The bottom of the bore is formed with a conical seat and the pin 40 is provided with a rounded point, thereby insuring complete centering of the valve 42 on the supporting pin 40.

The valve 42 is automatic in its action, raising or floating up to engage the seat 36 to close the outlet drain opening when the life boat is placed in the water, in the manner readily apparent. With the life boat in the water the closure plug 26 is screwed down to contact the disc 16 thus closing off the inlet drain openings 22. With the life boat out of the water as when hung on its davits, the closure plug 26 is screwed up leaving the drain inlet openings 22 completely open. The valve 42 will rest on its pin support 40 spaced from the outlet drain opening 35. Thus any water coming into the life boat will be completely drained off through the openings 22 and 35.

The bore 43 of the float valve is considerably larger than the guide pin 40, so that the float will not stick on the guide pin, and the water will enter the space between the guide pin and the float and prevent any suctional drag on the movement of the float to upward or closing position. This clearance also insures that the valve will drop by gravity to open position when the life boat is withdrawn from the sea. The valve is formed with a conical taper of approximately forty-five degrees, so that the valve will not develop a binding fit within its seat, and will easily release. The bore of the valve is guarded by the central portion of the spider cage 37 against debris which might interfere with the free vertical motion of the float valve. This new drain is compact and in one unit, with the closure plug 26 held in position for closing the same as an ordinary water tap. Even if the drain holes 22 are completely covered with ice, enough pressure could be exerted on the closure plug 26 to close it completely. The machined threads on the upper sleeve portion 15 are enclosed and are made water-proof by the mushroom-like closure plug 26 which prevents rain from getting into them. This protects the threads from freezing in the coldest weather and against other damage which often occurs in the case of exposed threads. The conical valve 42, being made preferably on a forty-five degree level and brought to a sharp point, will afford no blockage of the outlet drain hole 35 when the boat is out of the water. This feature will also prevent any dirt or mud wash in the open end of the drain thereby blocking off the drainage. The cage 37 surrounding and supporting the valve 42 will not collect dirt, etc., and will not afford a basis for water to lodge in and freeze in cold weather. It also leaves the whole surface of the rubber conical valve 42 exposed to the cool air under the boat, so that it will not melt or deteriorate in extremely hot weather.

Having thus described the invention, what is claimed is:

1. The combination with the bottom of a lifeboat having an opening therein, a disc connected to the bottom and provided with a beveled valve seat disposed in line with the opening of the bottom, a pendant spider carried by the disc and provided with a series of normally unobstructed openings through which sea water may freely circulate within the cage, a guide pin secured to the central portion of the cage and projecting upwardly, and a conical rubber float valve having a central bore receiving the guide pin and arranged to move vertically upward under the pressure of water to engage the valve seat and to drop by its own weight when the boat bottom is withdrawn from the sea, the float valve being a cone having a taper of approximately forty-five degrees so as to have a non-binding engagement with the valve seat, the central bore of the float valve being considerably larger than the guide pin so that water may enter between the guide pin and the float and prevent suctional resistance to the free movement of the float valve.

2. The combination with a life boat having a bottom provided with a drain opening, a disc mounted around the opening on said bottom and provided with a pendant spider formed with openings for the passage of water and also with an upstanding tubular portion having openings for the passage of water therein, a beveled valve seat, a guide pin secured centrally to the cage and extending toward the axis of the valve seat, a non-metallic float valve having a conical upper surface adapted to have a non-binding seating engagement with the valve seat and a central bore which receives the guide pin, the float valve having an open space between the wall of said bore and the guide pin to prevent back suction by allowing the free flow of water between
the valve and the guide pin, and a closure threaded on the upstanding tubular portion to seal the openings thereof.

3. A self-valving drain outlet for life boats consisting of a beveled disk having a valve seat and adapted to be connected to the bottom of a life bottom having a drain opening therein, a normally open spider depending from the disk and provided with a central upstanding guide pin projecting toward the center of the valve seat, and a buoyant valve constructed in the form of a cone and providing a central conical point disposed at the approximate center of the valve seat, said cone thus providing a sloping drain surface to cause water draining from the life boat to flow over the sloping cone to the openings of the cage, said valve having a central bore which loosely receives the guide pin and being adapted to rise by flotation when immersed in water and to drop by gravity when withdrawn from the water, the conical point of the valve being adapted to displace downwardly any debris which might collect in the life boat and pass through the valve when the boat is on the davits.

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