O. B. KIBELE.

PUMPING SYSTEM.

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1,263,679.

Patented Apr. 23, 1918.

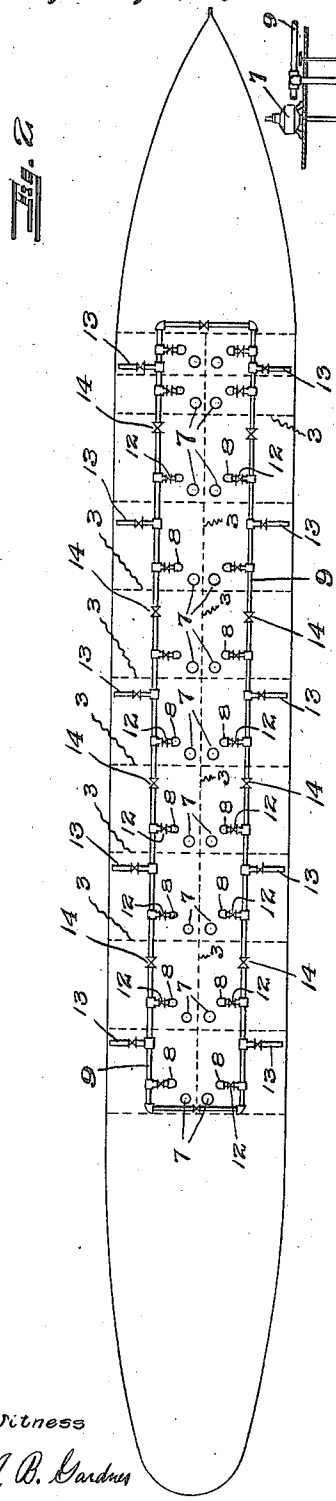


Fig. 2

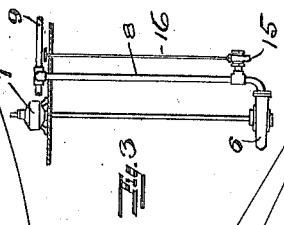


Fig. 3

Fig. 1

Witness

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PUMPING SYSTEM.

1,263,679. Specification of Letters Patent. Patented Apr. 23, 1918.

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To all whom it may concern:

Be it known that I, OTTO B. KIBELE, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented a new and useful Pumping System, of which the following is a specification.

The invention relates to a system of pumping liquids, particularly oils, to or from a plurality of tanks, as in a tank ship or tank farm.

An object of the invention is to provide a pumping system for tank ships which affects the elimination of pump rooms and their necessary inclosing bulkheads.

Another object of the invention is to provide a pumping system in which any number or varieties of liquids may be pumped simultaneously without intermixing.

A further object of the invention is to provide a pumping system which eliminates the employment, in a tank ship, of pipes which extend through the bulkheads and tanks near the bottom of the ship. These pipes are suction pipes for the pumps and are often of considerable length, a feature which is deleterious, because heavy liquids, such as oils, do not readily flow through long suction lines. The joints between these pipes and the tank walls cannot be kept tight, on account of expansion and contraction and hence there has generally been leakage between tanks. With the pumping system of my invention these suction pipes are dispensed with and a separate pump is arranged adjacent the bottom of each tank. By this system the tanks may be more quickly emptied than with the old systems and in handling a ship's cargo, time is an essential element.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In the drawings I have shown only one specific form of my generic invention, but it is to be understood that I do not limit myself to such form, because my invention may be embodied in a multiplicity of forms, each being a species of my said invention. In the said drawings I have shown the invention as applied to a tank ship, but it is to be understood that it is not limited to such application.

Referring to said drawings:

Figure 1 is a side elevation of a tank ship embodying my invention, part thereof being broken away and shown in section.

Fig. 2 is a deck view of the ship equipped with my invention.

Fig. 3 is a detail of one pump and its associated elements.

The tanks on ships are arranged amidships and occupy the greater portion of the body of the ship, and extend upward from the bottom to the deck, and means are provided for pumping the oil from the tanks. Heretofore, several pump rooms have been provided between the tanks and lines of pipe have extended from the pump, through the bulkheads and tank walls into the various tanks. The provision of a pump room between two tanks requires a bulkhead on each side of the pump room, a feature which adds considerably to the cost of the ship. In the larger tank ships, three pump rooms have been provided, which are spaced apart between the tanks, occupying considerable space and requiring the installation of three additional bulkheads. In accordance with my invention, I eliminate the pump rooms and their inclosing bulkheads, thereby increasing the tankage capacity of the ship and reducing its cost.

A ship embodying my invention is provided with a plurality of contiguous tanks 2, separated by the tank walls 3. At their ends the series of tanks are provided with bulkheads 4—5 which divide the tankage a space from the engine and boiler rooms and from the forward hold. No bulkheads are arranged between the successive tanks. Each tank 2 is provided with an individual rotary pump 6, which is arranged adjacent to the bottom of the tank and which is driven by a motor or other suitable driving means 7 arranged above the tank, and the motors may be controlled to drive the pumps either individually or collectively. Each pump is provided with a discharge pipe 8, which is connected to the header 9, arranged on deck and a valve 12 is arranged between each discharge pipe and the header. The header is provided with branch lateral pipes 13, arranged at suitable intervals through

which the oil is discharged from the ship, and with valves 14, by means of which the course of the oil may be governed.

In loading the liquid cargo into the tanks, the piping of my system may also be advantageously used. Each pipe 8 is provided near its point of connection with the pump 6 with a valve 15 which is controlled by the rod 16 extending through the top of the tank. In filling a tank, the valve 15 is opened and the liquid being pumped in enters the tank at the bottom. This feature is particularly advantageous in handling oil, since it prevents foaming and also prevents the release of the gas in the oil.

Heretofore, when the pump-room construction was employed, each pump usually serves about four tanks, so that only one of the four tanks could be emptied at one time, whereas with the present construction all of the tanks can be emptied at once if desired. Also, in the old construction water ballast could not be pumped into one of the tanks which is served by a pump during the time that the pump was engaged in removing oil from one of the other tanks, but in the present construction, in which each tank contains its individual pump, that pump may be used to load or discharge water ballast while the pumps in the adjacent tanks are unloading or loading oil. The present invention also eliminates the large number of pipes and valves which extended from the pump rooms into and through the various tanks, and also lessens the length of pipe through which the oil is pumped, since there are no long suction pipes.

When the pumping system is used on a tank farm, each tank is provided with an individual pump immersed in the liquid therein and these pumps force the liquid through pipes to the accumulating tank at the high pressure pumping station. From this tank the liquid is forced through the pipe line by the high pressure pump to the next line pumping station. The length of the suction pipe of the high pressure pump is, therefore, very short, a feature which increases the efficiency of the pump.

I claim:

1. The combination with a plurality of tanks, of a pump arranged in each tank and means for individually or collectively driving the pumps.

2. The combination with a plurality of contiguous tanks, of a pump arranged in each tank, means for individually or collectively driving said pumps, a header and pipes connecting the pumps with said header.

3. The combination with a plurality of contiguous tanks separated only by tank walls, of a pump arranged in each tank and adapted to be submerged in the liquid therein and means for individually or collectively operating said pumps.

4. The combination with a plurality of tanks for storing like or unlike fluids, of a pump arranged in each tank adjacent the bottom for loading and unloading said fluids from said tanks, a pipe connected to the discharge side of each pump, a valve on said pipe adjacent the pump, means for operating said valve and means outside of the tanks for individually driving said pumps.

5. The combination in a tank ship of a plurality of contiguous tanks entirely separated from each other by tank walls, a submerged pump in each tank, motors directly connected to the several pumps and arranged on the ship's deck for individually or collectively driving said pumps, and a header on the deck to which the pump discharges are connected.

6. The combination in a tank ship of a plurality of contiguous tanks arranged amidship supported at their ends by bulkheads and separated from each other by tank walls, a pump arranged in each tank, manual means for cutting out the pump located outside of the tank, a motor for driving each pump, and a header to which said pumps are connected.

7. In combination with the hull of a vessel for storing oil, a plurality of contiguous tanks, a pump mounted in each tank, a direct connected motor for each pump; and means in working relation with the loading and unloading conduit or pipe for placing the pipe in communication with the tank at the bottom of the latter.

In testimony whereof, I have hereunto set my hand at San Francisco, California, this 16th day of June 1915.

OTTO B. KIBELE.

In presence of—
H. G. PROST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C.