S. E. AARON.

PUMPING APPARATUS.

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952,294.

Patented Mar. 15, 1910.

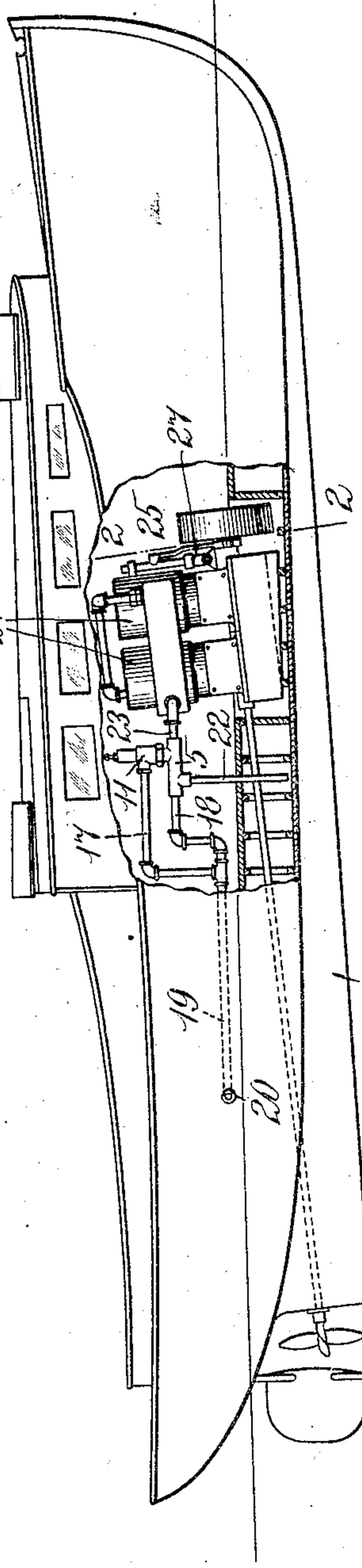

Fig. 1.

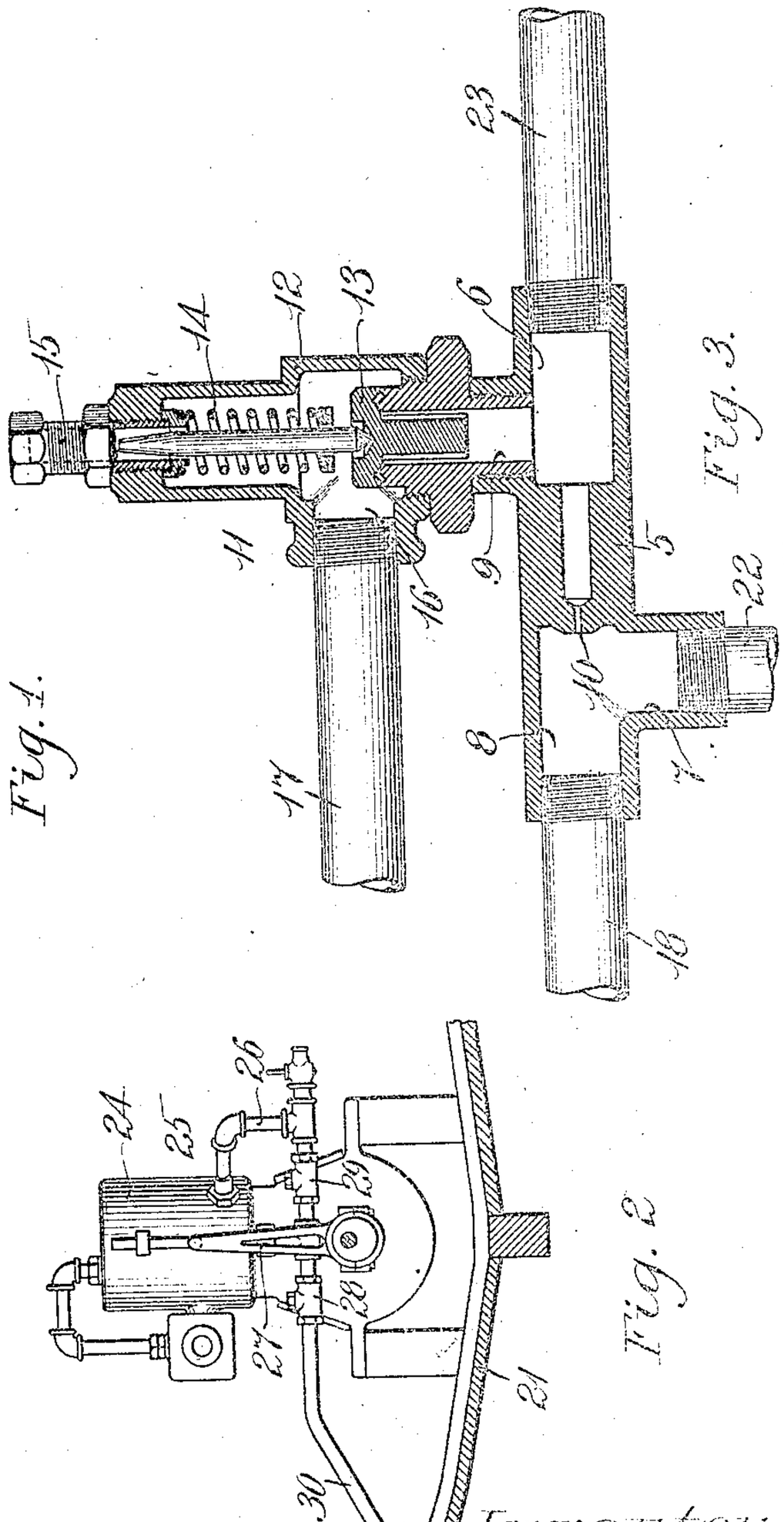

Fig. 3.

Fig. 2.

Witnesses.

Franklin E. Low.

Sydney E. Taft.

Inventor:

Solomon E. Aaron

by his attorney.

Charles S. Goodwin

UNITED STATES PATENT OFFICE.

SOLOMON E. AARON, OF CHARLESTOWN, MASSACHUSETTS.

PUMPING APPARATUS.

952,294. Specification of Letters Patent. Patented Mar. 15, 1910.

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To all whom it may concern:

Be it known that I, SOLOMON E. AARON, a citizen of the United States, residing at Charlestown, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Pumping Apparatus, of which the following is a specification.

This invention relates to an improved pumping apparatus and while the same may be employed for a variety of different purposes it is particularly adapted for use in connection with boats driven by internal combustion engines in which a pump drawing water from the exterior of the boat circulates the same through the water jacket or jackets of the engine and discharges the water overboard. Heretofore, different methods of pumping the bilge water from boats have been employed, but such methods all have objections.

The object of this invention is to provide means whereby the jacket water is employed to create a suction to lift any bilge water that may be in the boat and discharge the same, combined with the jacket water, overboard, thus automatically keeping the boat free from bilge water while the engine is running.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the appended claims.

Referring to the drawings: Figure 1 is a side elevation of a boat having a pumping apparatus embodying my invention, a portion of the side of the boat being broken away to disclose the apparatus. Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1. Fig. 3 is an enlarged detail sectional view of the ejector and the relief valve.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 is an ejector having an inlet 6 for the actuating stream, a suction inlet 7 for the entrained stream, an outlet 8 for the combined actuating and entrained streams, and having also a second outlet 9 located between the two inlets 6 and 7, said ejector being provided with the usual jet orifice 10 located adjacent to the suction inlet 7.

The outlet 9 has connected thereto a relief valve 11 of any usual or desired construction, the same in this instance comprising a valve casing 12 in which is located the valve proper 13, there being provided a compression spring 14 tending to seat the same and there being provided an adjusting screw 15 suitably arranged to vary the tension of the spring so as to vary the resistance which the valve offers to fluid passing therethrough.

The outlet 16 of the relief valve is connected by piping 17 to piping 18 leading from the outlet 8 of the ejector. When the apparatus is employed in connection with a boat, these pipes 17 and 18 are connected to a pipe 19 having an outlet 20 exteriorly of the boat 21 and the suction inlet 7 has connected thereto a bilge pipe 22 leading to a point inside and adjacent to the bottom of the boat.

The inlet 6 is connected by a piping 25 to the water jackets 24 of an engine 25 which drives the boat in any usual or desired manner. The water jackets 24 receive their supply of water from an inlet pipe 26 connected to a suitable pump 27 driven by the engine 25, there being provided two check valves 28 and 29 located on opposite sides, respectively, of said pump, the check valve 28 being connected to a pipe 30 having an inlet orifice 31 exteriorly of the boat, whereby water is drawn inwardly by the pump and forced into and through the water jackets 24 and through the ejector 5. The actuating stream of water passing into the ejector through the inlet 6 creates a suction at the suction inlet 7, thus raising any bilge water that may be in the bilge of the boat upwardly through the bilge pipe 22 and discharging the combined streams through the outlet 8.

The relief valve 12 is provided to prevent undue pressure in the connections leading to the inlet of the ejector so as to prevent the engine from doing any more work than is necessary in operating the pump 27 and to this end the spring 14 may be adjusted to the proper tension by the screw 15. In this way the requisite pressure at the jet orifice 10 is easily obtained. This system has the advantage that it is entirely automatic, requiring no attention from the operator of the boat, and furthermore, none of the bilge water passes through the pump and jackets of the engine. The system also has the further advantage that the boat is constantly kept free from vapors which tend to collect in the bottom of the boat.

Having thus described my invention, what

I claim and desire by Letters Patent to secure is:

1. An ejector provided with an inlet for the actuating stream, a suction inlet for the entrained stream, an outlet for the combined actuating and entrained streams, and an outlet between said first and second mentioned inlets; in combination with a relief valve connection to said fourth mentioned outlet.

2. A pumping apparatus having, in combination, an ejector provided with an inlet for the actuating stream, a suction inlet for the entrained stream, an outlet for the combined actuating and entrained streams, and an outlet between said first and second mentioned inlets; a relief valve connected to said second mentioned outlet, and means whereby fluid may be supplied to said first mentioned inlet under pressure.

3. The combination with an internal combustion engine having a water jacket; of a pump driven by said engine and connected to said water jacket to pump water thereto; an ejector provided with an inlet for the actuating stream connected to said pump, a suction inlet for the entrained stream, an outlet for the combined actuating and entrained streams, and an outlet located between said first and second mentioned outlets; and a relief valve connected to said second mentioned outlet.

4. The combination in a boat of an internal combustion engine having a water jacket; of a pump driven by said engine and connected to pump water from the exterior of said boat to said water jacket; an ejector provided with an inlet for the actuating stream connected to said water jacket, a suction inlet for the entrained stream, an outlet for the combined actuating and entrained streams, and an outlet located between said first and second mentioned inlets, a bilge pipe leading from said suction inlet to a point inside and adjacent to the bottom of the boat, a relief valve connected to said second mentioned outlet, a pipe leading from the first mentioned outlet to the exterior of the boat, and a pipe leading from said relief valve to and communicating with said first mentioned pipe.

5. The combination with an internal combustion engine having a water jacket; of a pump driven by said engine and connected to said water jacket to pump water thereto; and an ejector provided with an inlet for the actuating stream connected to said pump, a suction inlet for the entrained stream, and an outlet for the combined actuating and entrained streams.

6. The combination in a boat, of an internal combustion engine having a water jacket; of a pump driven by said engine and connected to pump water from the exterior of said boat to said water jacket, and an ejector having a suction inlet for the entrained stream, and an outlet for the combined actuating and entrained streams; a bilge pipe leading from said suction inlet to a point inside and adjacent to the bottom of the boat, and a pipe leading from said outlet to the exterior of the boat.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SOLOMON E. AARON.

Witnesses:
LOUIS A. JONES,
ANNIE J. DAILEY.