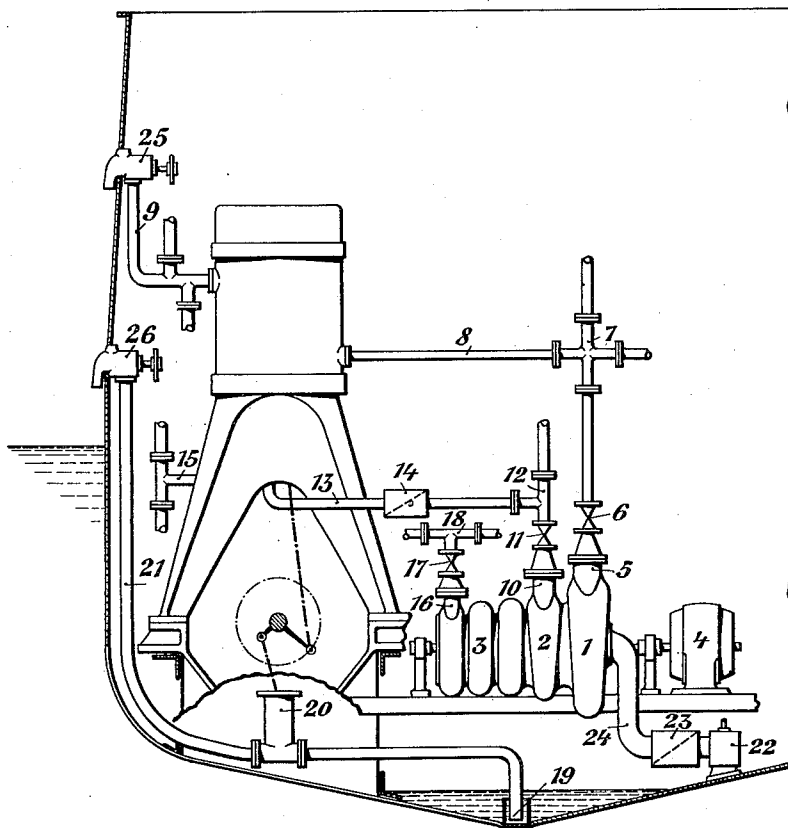


May 20, 1924.

1,494,595

E. ENSSLIN

APPARATUS FOR SUPPLYING WATER OF DIFFERENT PRESSURES
ON SHIPS PROPELLED BY INTERNAL COMBUSTION ENGINES
Filed Aug. 14, 1923



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APPARATUS FOR SUPPLYING WATER OF DIFFERENT PRESSURES ON SHIPS PROPELLED BY INTERNAL-COMBUSTION ENGINES.

Application filed August 14, 1923. Serial No. 657,455.

To all whom it may concern:

Be it known that I, EUGEN ENSSLIN, a citizen of the Republic of Switzerland, and residing at Basle, Switzerland, have invented certain new and useful Improvements in Apparatus for Supplying Water of Different Pressures on Ships Propelled by Internal-Combustion Engines, of which the following is a specification.

On board ship it is necessary to have water of low pressure for the purpose of cooling, cleaning, etc., water of medium pressure for some other purposes—for example for cooling the pistons of the internal combustion engines, and water of high pressure for fire extinguishing purposes, boiler feeding and the like.

As a rule separate pumps with independent drives are provided for supplying water for the different purposes, for instance one pump supplies feed water to the boiler, another pump water for cooling purposes, and so forth, but the present invention differs from such known arrangements in that the water required for the various purposes on board, whether of low or high pressure, is supplied by one and the same pump, which needs only one driving motor. This arrangement has the advantage that, as in a ship there is never need to supply water simultaneously for different purposes, the load on the motor driving the pump is a favourable and a uniform one, so that working is much more economical than in the known independent arrangements. For the same reason, the power of the motor need not be so great as in the case of several pumps with independent motors which have each to be built for the maximum output. As the provision of separate pumps driven by as many separate motors entails a complicated system of electric wiring, the arrangement according to this invention offers the additional advantage of requiring only a single pair of leads, so that the cost of installation of the apparatus according to the invention is greatly reduced.

The pumping apparatus used for supplying water of different pressures for all purposes on board ship, is constructed as a multistage or multisection pump, the individual impellers or sets of impellers and the

conduits connecting together the individual pump sections or stages being so dimensioned, and the several discharge branches so arranged that water can be obtained at the pressure, or in the quantity, necessary for the various requirements and purposes, the pump stages which supply the higher pressures, obtaining their water from the impellers of the next lower stage. A first pump stage can supply water of low pressure for cylinder cooling of the internal combustion engines, a second one water of medium pressure for cooling the pistons of these engines and a third pump stage water at high pressure for boiler feeding, fire extinguishing purposes and the like.

One construction of an apparatus according to the invention is diagrammatically illustrated by way of example in the accompanying drawing.

1 is the low pressure section, 2 the medium pressure section and 3 the high pressure section of a pump driven by a motor 4. The low pressure system comprises the pump 1, discharge branch 5, stop cock 6, and distributing branch 7, from which leads a pipe 8 conveying cooling water to the cylinders whence it escapes through an outlet pipe 9. The medium pressure system comprises the pump section 2 having a discharge branch 10, stop cock 11, distributing branch 12, and supply pipe 13 provided with a filter 14, through which cooling water is supplied to the pistons whence it escapes through an outlet pipe 15. The high pressure system in the example shown has three impellers connected in series and is provided with a discharge branch 16, stop cock or closing valve 17 and distributing branch 18.

The operation of the apparatus is as follows:

The sea water to be used, passes through the sea valve 22 and the filtering device 23 into the suction pipe 24 and is forced by the first pump section (which is shown as a single stage pump in the drawing) into the corresponding pressure chamber. A portion of the water passes thence into the suction chamber of the second section, whilst the rest, for instance the water to be used for cooling the cylinders and the injection air pumps, and for cleaning pur-

poses, passes through the discharge branch 5 and the valve 6 into the distributing branch 7 of the low pressure system. From the distributing branch the water is conveyed to the points where it is to be used, for instance the water required for the cylinder cooling is conveyed through the pipe 8 into the respective cooling jackets. The hot water is discharged through the outlet pipe 9 (which may have a control valve 25) into the sea or into the bilge or may be conveyed to an installation for utilising waste heat. The second pump section conveys some water into the suction chamber of the third pump section and some through the discharge branch 10 and 11 into the distributing branch 12 of the medium pressure system, whence it is distributed to the points where such medium pressure water is to be used. This water may for instance pass through the pressure filter 14 and the pipe 13 into the piston cooling device and can be delivered from that point to an installation for utilising waste heat or it can be discharged direct overboard or conveyed into the bilge of the ship. The water discharged by the high pressure section of the pump (which in the drawing is shown as having three stages) is led to the distributing branch 18 and thence through various pipes to its destination.

In order to pump water out of the bilge, a piston bilge pump 20 may be provided driven by the internal combustion engine or independently, this pump drawing water from the lowest point 19 of the engine room and discharging it overboard through a pipe 21 which may be provided with a valve 26.

I claim:

1. In an apparatus for supplying water of different pressures on board ships propelled by internal combustion engines the combination with a single multi-stage or multi-section pump for supplying the water for all purposes, having the individual impellers or sets of impellers and the conduits connecting the various pump stages so dimensioned and the several discharge branches so arranged on the pressure chambers that water can be obtained at the pressures, or in the quantities, required for the various purposes, the pump stages working at higher pressure obtaining their wa-

ter from the impellers of the next lower stage.

2. In an apparatus for supplying water of different pressures on board ships propelled by internal combustion engines the combination with a single multi-stage or multi-section pump for supplying the water for all purposes, having the individual impellers or sets of impellers and the conduits connecting the various pump stages so dimensioned and the several discharge branches so arranged in the pressure chambers that water can be obtained at the pressures, or in the quantities, required for the various purposes, the pump stages working at higher pressure obtaining their water from the impellers of the next lower stage, and a first pump stage or section supplying water of low pressure for cooling the cylinders of the internal combustion engines, and a second pump section delivering water of medium pressure for cooling the pistons of the internal combustion engines.

3. In an apparatus for supplying water of different pressures on board ships propelled by internal combustion engines the combination with a single multi-stage or multi-section pump for supplying the water for all purposes, having the individual impellers or sets of impellers and the conduits connecting the various pump stages so dimensioned and the several discharge branches so arranged in the pressure chambers that water can be obtained at the pressures, or in the quantities, required for the various purposes, the pump stages working at higher pressure obtaining their water from the impellers of the next lower stage, and a first pump stage or section supplying water of low pressure for cooling the cylinders of the internal combustion engines, a second pump section of medium pressure for cooling the pistons of these engines and a third pump section delivering water of high pressure for boiler feeding, fire extinguishing purposes or the like.

In testimony whereof I affix my signature to this specification.

EUGEN ENSSLIN.

Witnesses:

AUGUST THUEGG,
LISE LUBER.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,494,595, granted May 20, 1924, upon the application of Eugen Ensslin, of Basle, Switzerland, for an improvement in "Apparatus for Supplying Water of Different Pressures on Ships Propelled by Internal-Combustion Engines," errors appear in the printed specification requiring correction as follows: Page 1, line 55, for the misspelled word "dsicharge" read *discharge*; page 2, line 97, claim 3, for the words "pump section" read *section water*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of October, A. D. 1924.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.