A. WEDDERBURN.

CONDENSER FOR WATER JACKETED ENGINES.

APPLICATION FILED JULY 28, 1911.

1,182,825.

Patented May 9, 1916.

3 SHEETS—SHEET 1.

Fig. 1

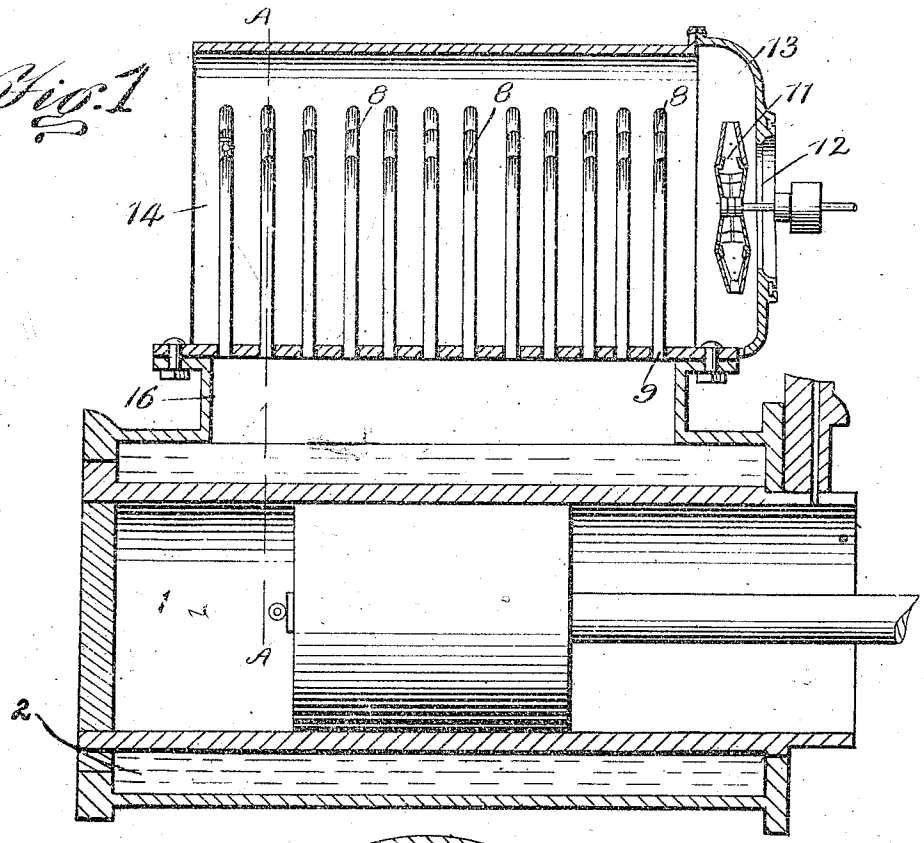
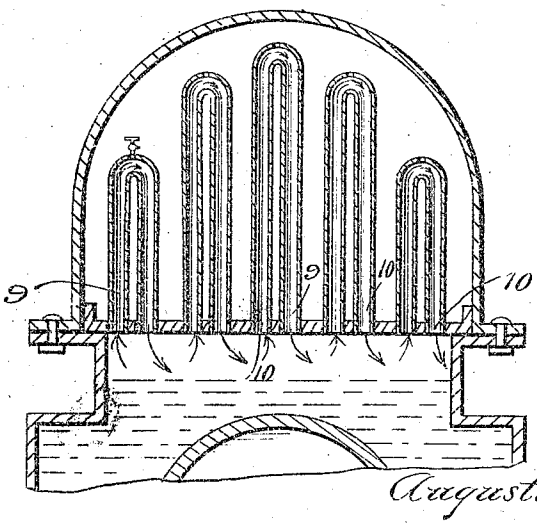


Fig. 2.



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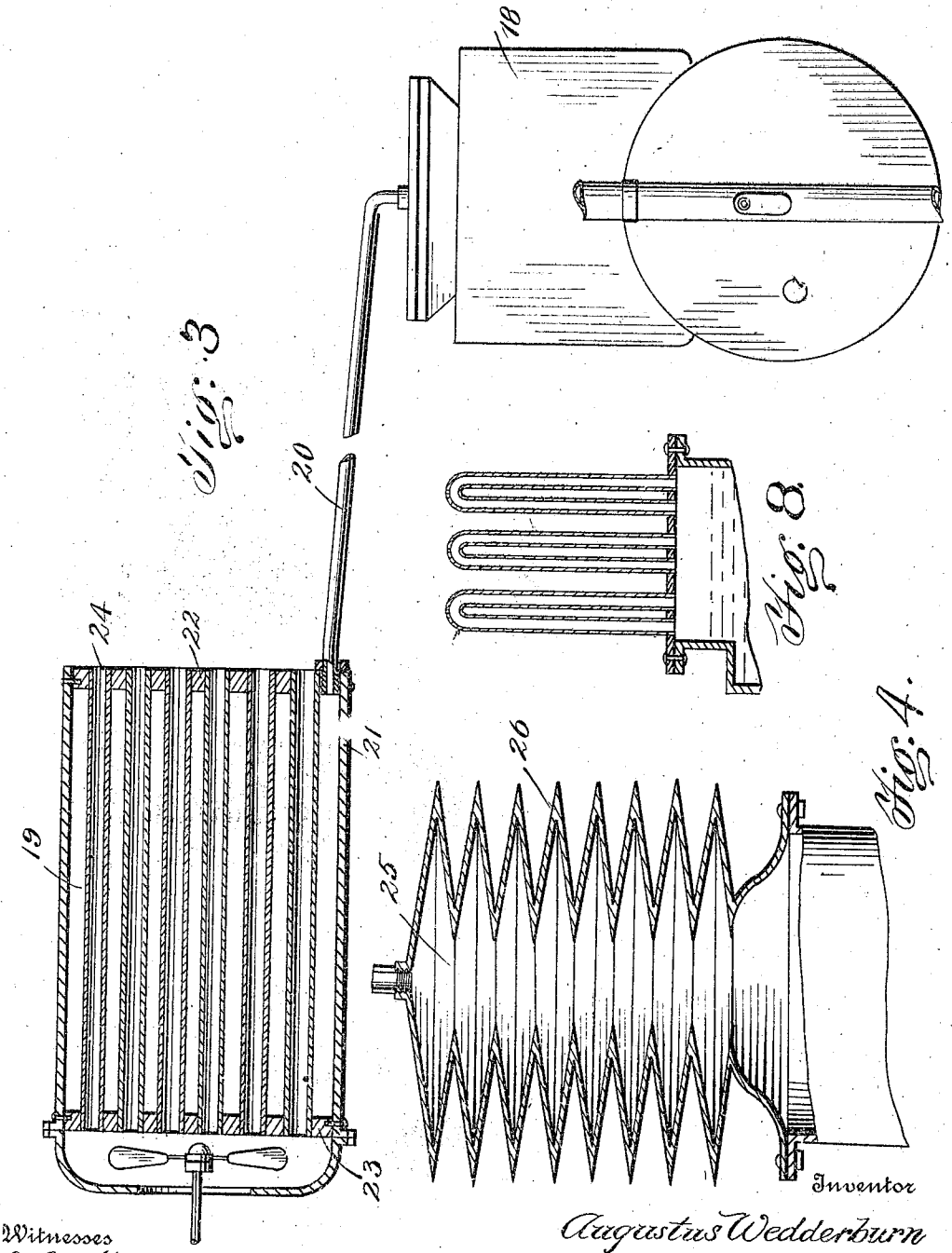


Fig. 3

Fig. 8

Fig. 4.

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3 SHEETS—SHEET 3.

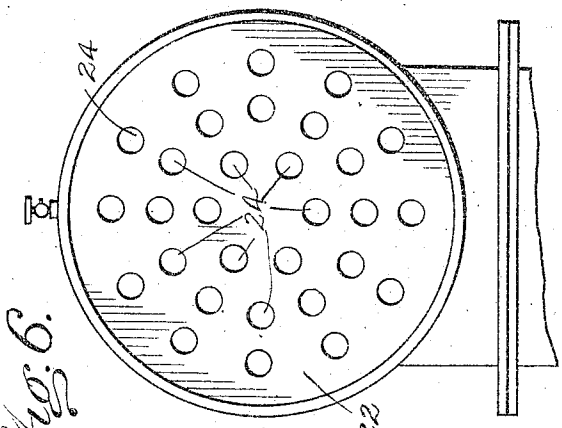


Fig. 6.

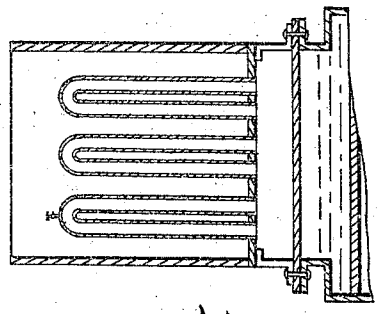


Fig. 7.

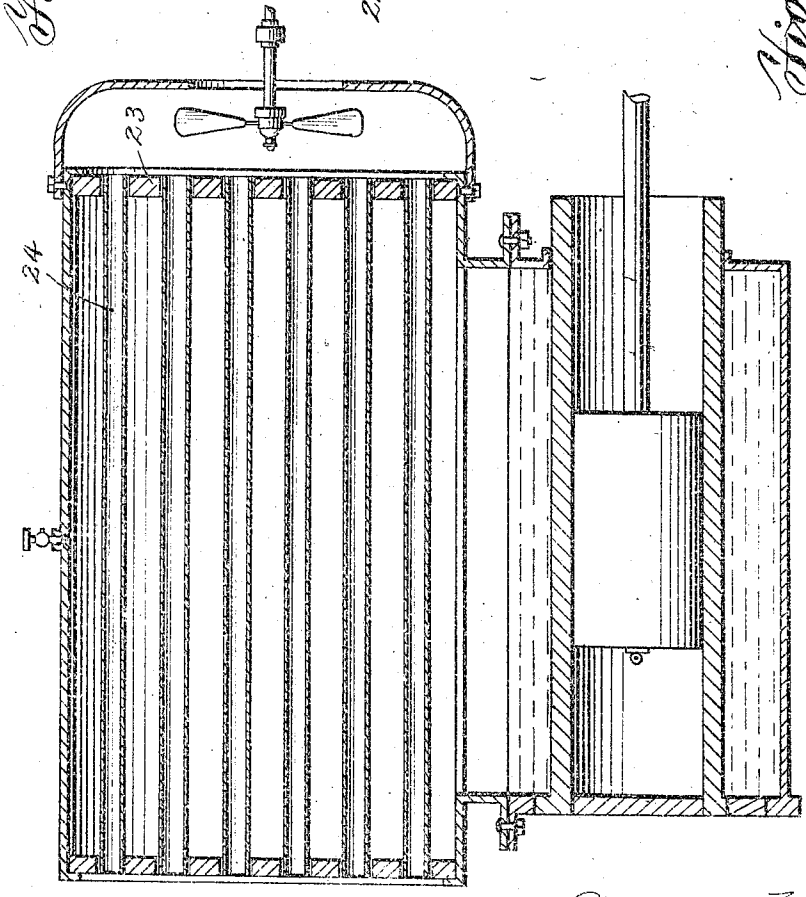


Fig. 5.

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UNITED STATES PATENT OFFICE.

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CONDENSER FOR WATER-JACKETED ENGINES.

1,182,825. Specification of Letters Patent. Patented May 9, 1916

Application filed July 28, 1911. Serial No. 641,119.

To all whom it may concern:

Be it known that I, AUGUSTUS WEDDERBURN, a citizen of the United States, residing at Wedderburn, in the county of Fairfax and State of Virginia, have invented certain new and useful Improvements in Condensers for Water-Jacketed Engines, of which the following is a specification.

This invention relates to improvements in cooling means for internal combustion engines and relates especially to water-jacketed engines.

The object of the invention is to provide means whereby the steam arising from the hot water jacket will be condensed and return to the jacket, or to a water tank and thence to the jacket over and over again, thereby requiring a much smaller quantity of tank water and eliminating the danger of the water supply becoming exhausted.

With the above and other objects in view which will hereinafter be more fully explained, I have invented the device shown in the various forms of the invention in which—

Figure 1 is a vertical sectional view of a water-jacketed engine cylinder and condenser, Fig. 2 is a sectional view taken on line A—A thereon, Fig. 3 is an elevational sectional view of a modified form of the invention, Fig. 4 is a vertical sectional view of another form of the invention, Fig. 5 is a view similar to Fig. 1 of another modification of the invention, Fig. 6 is an end elevational view of Fig. 5 partly broken away, Fig. 7 is a vertical sectional view of another modification of the device, and Fig. 8 is a view similar to Fig. 7 of still another modification of the invention.

Like reference characters indicate like parts throughout the specification and in the several views in the accompanying drawings in which—

1 indicates a conventional form of internal combustion engine cylinder and 2 a water jacket therefor, the upper part of which opens into the water supply tank 16 mounted above the tank or hopper 16, and securely sealed thereto is a casing 14 being open at its opposing ends. A series of U-shaped pipes 8 have their ends 9 fixed in the lower wall of said casing 14, said pipes opening on the hopper 16 whereby steam may arise into the pipes 8 where it is condensed. These pipes 8 are kept cool by means of a constant draft of air passing through the casing 14, the entire end 14 of said casing being open in order that the passage of air will not be retarded in passing from the casing. The series of pipes 8 are so spaced that the draft of air will have free access to all parts thereof by which means said pipes are kept sufficiently cool to cause condensation of any steam arising thereinto. The water produced by this condensing process will naturally flow back into the hopper 16 and thence to the water jacket 2, thus at all time providing a sufficient water supply for cooling the engine cylinder.

A fan 11 of any suitable character may be provided adjacent the opening 12 in the end 13 of said casing 14 in order to produce artificial draft for cooling the pipes 8. A safety valve 15 may be connected with one of the pipes 8 or at any convenient point on the hopper 16 or condenser in order to relieve heavy steam pressure.

Where a condenser is to be used in connection with an automobile or aeroplane engine, it will be so positioned on the vehicle that the natural draft of air will be sufficient to cool the condenser pipes 8.

In Fig. 3 I show a different form of condensing chamber which consists of a closed cylinder 21 having tubes 24 extending horizontally therethrough, the ends of which are mounted in the walls 22 and 23 of said cylinder 21. In this form of the invention the passage of air through the tubes 24 cools the interior of the cylinder 21 where the steam is condensed, the condensed water passing either through the tube 20 into the hopper 13 or it may pass directly from the cylinder 21 into the hopper as shown in the construction illustrated in Fig. 5.

In Fig. 4 is another modification of the invention in which the condenser is in the form of a drum 25 which consists of a series of fins 26 whereby the cooling surface exposed to the air on the outside and to the steam on the inside is greatly increased without requiring any considerable amount of space.

In Figs. 7 and 8 I show another slight modification in which the U-shaped pipes 26 are mounted in an upright casing 28. Fig. 8 shows the casing removed.

Having now described my invention that which I claim to be new and desire to procure by Letters Patent is:—

1. In combination with a water-jacketed

engine cylinder, an independent closed steam condensing chamber, said chamber and jacket being so relatively positioned that re-condensed steam will return by gravity to said jacket, said chamber being supported by said jacket, said chamber consisting of a plurality of pipes, and means whereby an air current may be directed against said pipes, said last means consisting of a fan.

2. In combination with a water-jacketed engine cylinder, an independent closed steam condensing chamber, said chamber and jacket being so relatively positioned that re-condensed steam will return by gravity to said jacket, said chamber being supported by said jacket, said chamber consisting of a plurality of pipes, and means whereby an air current may be directed against said pipes, said last means consisting of a fan, and a hood for said pipes.

3. In combination with a water-jacketed engine cylinder, an independent closed steam condensing chamber, said chamber and jacket being so relatively positioned that re-condensed steam will return by gravity to said jacket, said chamber being supported by said jacket, said chamber consisting of a plurality of pipes, and means whereby an air current may be directed against said pipes, said last means consisting of a fan, and a hood for said pipes, said hood being open at its opposing ends.

4. In combination with a water jacketed engine cylinder, an independent closed steam condensing chamber, said chamber and jacket being so positioned that recondensed steam will return by gravity to said jacket, said chamber being supported by said jacket, said chamber consisting of a plurality of pipes.

5. In combination with a water jacketed engine cylinder, an independent closed steam condensing chamber, said chamber and jacket being so positioned that recondensed steam will return by gravity to said jacket, said chamber being supported by said jacket, said chamber consisting of a plurality of pipes, and means whereby an air current may be directed against said pipes.

6. The combination of a water jacketed engine, a closed condensing chamber mounted on the water jacket, said chamber having a plurality of condensing units.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS WEDDERBURN.

Witnesses:
E. FLORES,
H. W. CANFIELD.