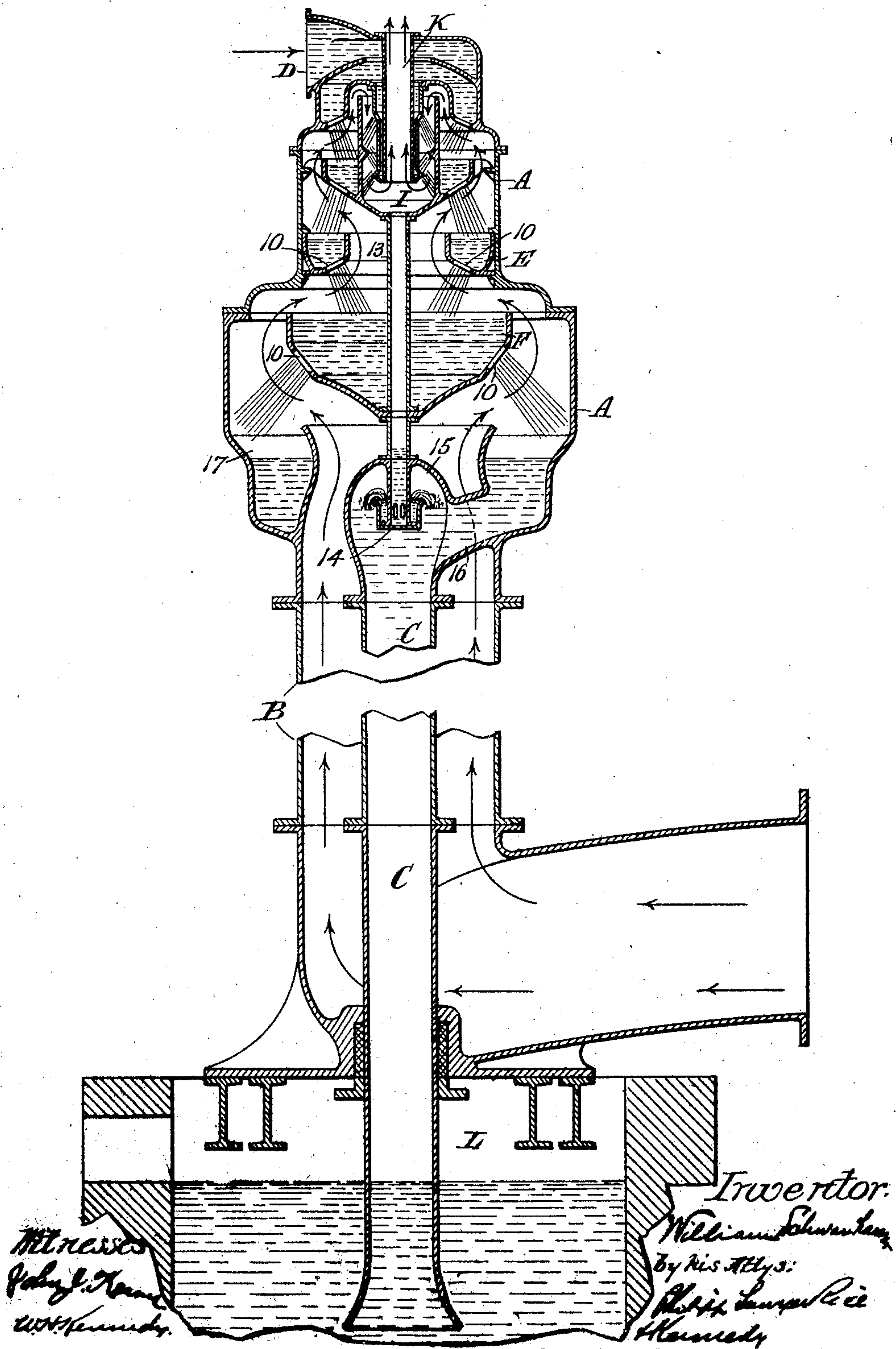


W. SCHWANHAUSSER.
CONDENSER.
APPLICATION FILED OCT. 31, 1908.

960,417.

Patented June 7, 1910.



Witnesses
John J. Hume
W. H. Kennedy

Inventor:
William Schwannhauser
By his Atty.
Philip J. Hume
Kennedy

UNITED STATES PATENT OFFICE.

WILLIAM SCHWANHAUSSER, OF NEW YORK, N. Y., ASSIGNOR TO HENRY R. WORTHINGTON, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CONDENSER.

960,417.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed October 31, 1908. Serial No. 460,409.

To all whom it may concern:

Be it known that I, WILLIAM SCHWANHAUSSER, a citizen of the United States, residing at New York city, county of Kings, and State of New York, have invented certain new and useful Improvements in Condensers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to an improved elevated or barometric counter current condenser for condensing exhaust steam of steam engines or the like, the especial object of the invention being to provide a condenser of simple and compact construction which shall secure a more efficient action than previous condensers of this class, especially as to the admission and distribution of the exhaust steam and the discharge of water from the condenser.

For a full understanding of the invention, a detailed description of a condenser embodying all the features of the same in their preferred form will now be given in connection with the accompanying drawing forming a part of this specification, and the features forming the invention then specifically pointed out in the claims.

In the drawing, which shows the condenser in vertical section, with the exhaust pipe and the tail pipe broken away to shorten the drawing, the condenser proper is shown as similar to the counter current condenser of United States Letters Patent No. 899,063, dated September 22nd, 1908, and having the condenser shell A with the injection or condensing water inlet D at the top of the condenser, the series of outer and inner trays E, F provided with the jet openings 10, the air cooler or supplementary chamber I in the upper part of the condenser, the drain pipe 13 extending downward centrally from the chamber I and water sealed at its lower end by water vessel 14, and the air pipe K through which the air is drawn off by the dry air vacuum pump, as in said Letters Patent.

Referring now to the parts to which the present invention especially relates, the exhaust steam pipe B extends upward from the foot of the tail pipe C, inclosing the latter, and at the top opens directly into the condenser proper directly below the bottom

tray F, which is preferably formed inclined inward and downward, as shown, so as to better direct the steam outward through the water jets. This admission of the steam from the open top of the large exhaust pipe secures a free admission and efficient distribution of the steam throughout the lower chamber of the condenser. The tail pipe C extends upward from the usual hot well L, upon which the exhaust steam pipe elbow preferably is mounted, and forms the support for the condenser, and at the top this tail pipe terminates in a chamber 15, which is closed at the top, except for the connection of the drain pipe 13, the water sealed lower end of the drain pipe 13 being within the chamber 15. On the side of this chamber connects also a passage 16, through which the discharge water from the condenser flows to the tail pipe from the chamber 17 formed in the lower section of the condenser about the exhaust pipe B, the jets 10 of the lower tray F being formed so as to discharge outward into this chamber and avoid danger of the water being thrown into the exhaust pipe. The tail pipe C passes into the hot well through a joint permitting movement of the tail pipe to provide for expansion, this joint being packed as shown or otherwise made air tight to prevent leakage of the air from the hot well to the condenser.

It will be understood that the invention is not limited to a counter current condenser of the special form shown, nor to the details of the exhaust pipe and tail pipe construction shown, but that the form of the condenser may be varied and modifications made in the exhaust and tail pipe connections while retaining the invention as defined by the claims.

What I claim is:—

1. In a counter current condenser, the combination with the condensing chamber having a water inlet above the chamber, water distributing devices, and the tail pipe, of a vertical exhaust steam pipe inclosing the tail pipe and open at the top into the bottom of the condensing chamber.

2. In a counter current condenser, the combination with the condensing chamber having a water inlet above the chamber, a series of trays forming water jets through which the steam passes, and the tail pipe, of

a vertical exhaust steam pipe inclosing the tail pipe and open at the top to deliver steam below the bottom tray.

3. In a counter current condenser, the
5 combination of a condensing chamber having a water inlet above the chamber, a series of trays forming water jets through which the steam passes, a tail pipe, an air
10 cooler in the upper part of the condenser, a drain pipe extending down from said cooler and discharging into said tail pipe, and a
vertical exhaust steam pipe inclosing the tail pipe and open at the top to deliver steam below the bottom tray.

15 4. In a counter current condenser, the combination of the condensing chamber having a water inlet above the chamber, a series of inner and outer trays E, F, the bottom
20 tray being central of the condenser and arranged to throw the water outward, vertical exhaust steam pipe B open at the top to deliver steam against the bottom tray within

the jets, tail pipe C inclosed by the exhaust steam pipe and closed at its upper end, and water receptacle 17 surrounding the steam
25 pipe and connected by passage 16 to the tail pipe.

5. A counter current condenser having its condensing chamber enlarged at its lower portion, a steam inlet pipe opening upward
30 into the bottom of the enlarged portion of the condensing chamber, a tail pipe within the steam pipe, and an open top receiver for the discharge water within the enlarged
35 lower portion of the condensing chamber with which the tail pipe connects.

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

WILLIAM SCHWANHAUSSER.

Witnesses:

CHARLES E. WILSON,
FRANK D. SHUMATZ.