A. E. L. SCANES.

CONDENSER OR COOLER.

APPLICATION FILED NOV. 26, 1915.

1,238,574. Patented Aug. 28, 1917.

Fig. 1.

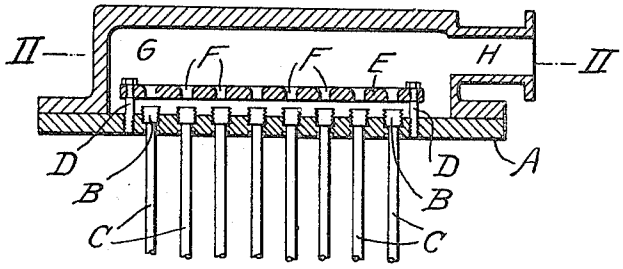


Fig. 2.

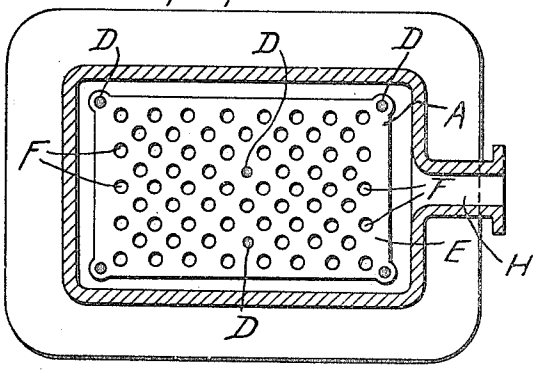
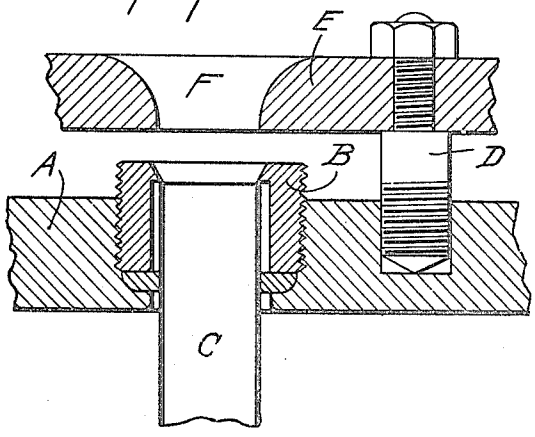


Fig. 3.



INVENTOR.

Arthur E. L. Scanes.

BY

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UNITED STATES PATENT OFFICE.

ARTHUR EDWIN LEIGH SCANES, OF ASHTON-UPON-MERSEY, ENGLAND, ASSIGNOR TO THE BRITISH WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, LIMITED, OF LONDON, ENGLAND.

CONDENSER OR COOLER.

1,238,574. Specification of Letters Patent. Patented Aug. 28, 1917.

Application filed November 26, 1915. Serial No. 63,656.

To all whom it may concern:

Be it known that I, ARTHUR EDWIN LEIGH SCANES, a subject of the King of Great Britain, residing at Ashton-upon-Mersey, England, have invented a new and useful invention in Condensers or Coolers, of which the following is a specification.

My invention relates to condensers or coolers of the surface type, such, for example, as condensers for condensing the steam exhausted from an engine or turbine.

One object of my invention is to provide improved means for preventing the deposit of flocculent or similar matter on the ends of the condenser tubes or ferrules connected with the tube plates. Another object is to reduce the loss of head due to friction in the water entering the tubes, and a still further object is to minimize corrosion of the metal of the condenser due to electrolytic action.

These objects are attained, according to the present invention, by placing a sheet or plate of suitable metal of ample thickness and of substantially the full area of the effective part of the tube plates in front of the tubes and substantially parallel with the tube plates of the condenser. Opposite the end of each tube in the condenser the said plate is pierced with a hole of approximately the same diameter as, and registering with, the internal bore of said tube. The outer end of each hole in the plate, *i. e.*, the end farthest removed from the condenser tube, is preferably countersunk or otherwise suitably shaped to afford an easy entry for the cooling water. The metal of which said sheet or plate is made is preferably such as will counteract any electrolytic action in the condenser. Such a metal is one which is electro-positive to the metal of which the tubes are constructed and aluminium may, for example, be used with advantage.

The plate above mentioned is placed at such a distance from the tube plate that any irregularity in the ferrules holding the tubes will not cause these to come in contact with the plate, a small distance being left in all cases between the plate and the ferrules.

The plate may be supported at the requisite distance from the tube plate by any suitable means, for instance, by studs of Muntz metal, which will form a good electric contact with the tube plate.

In the accompanying drawing, Figure 1 is a sectional view of a portion of a surface condenser constructed according to my invention. Fig. 2 is a section on the line II—II of Fig. 1, and Fig. 3 is a detail drawn to an enlarged scale, the same letters of reference denoting similar parts in all the figures.

In the drawing, A is the tube plate of a surface condenser, and B, B the ferrules supporting the tubes C. D, D are the metal studs supporting the plate E. F, F are the countersunk holes in the plate E concentric with the tubes C, C. These holes may advantageously be shaped as shown in Fig. 3 so as to form a series of nozzles and thus reduce the friction of the water passing therethrough. The cooling water arrives through the inlet H in the water box G and passes through the holes F, F in the plate E into the tubes C. Owing to the shape of the holes F, F the water will pass through them in an even stream with a minimum amount of loss. The plate E will effectually prevent any flocculent or other similar matter from being deposited on the edges of the ferrules B, B.

I am aware that blocks of some suitable metal, such as zinc or aluminium, connected to the tube plates, have been successfully employed in the water spaces of surface condensers to minimize the effect of corrosion. This arrangement is objectionable owing to the space occupied by such blocks in the water boxes of the condenser, and also, unless very carefully arranged, these blocks affect the distribution of the water paths through the condenser.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare what I claim is:

1. In a condenser or cooler of the surface type, a plate of metal located substantially parallel with, and in front of, the tube plate, pierced with holes which register with the condenser tubes; said first mentioned plate being formed of metal which is electropositive to the metal of the tubes and having a metallic connection with said tubes.

2. In a condenser or cooler of the surface type, a metal plate located substantially parallel with but spaced from the tube plate and provided with apertures which are located substantially in line with the tubes of the condenser or cooler and are of approximately the same diameter as the tubes; said

first mentioned plate being formed of metal electropositive to the metal of the tubes and having metallic connection with such tubes.

3. In a condenser or cooler of the surface type, a metal plate located substantially parallel with but spaced from the tube plate and provided with converging liquid directing nozzles located substantially opposite to the inlet ends of the condenser or cooler tubes; said first mentioned plate being formed of metal which is electropositive to the metal of the tubes.

4. In a condenser of the surface type, a metallic plate, for counteracting electrolytic action within the condenser, located substantially parallel with the tube plate but spaced therefrom and provided with apertures for delivering water to the tubes of the condenser and metallic studs connecting said plates.

In testimony whereof I have hereunto subscribed my name this eighth day of November, 1915.

ARTHUR EDWIN LEIGH SCANES.

Witnesses:
JAS. STEWART BROADFOOT,
LUCY E. MASON.