

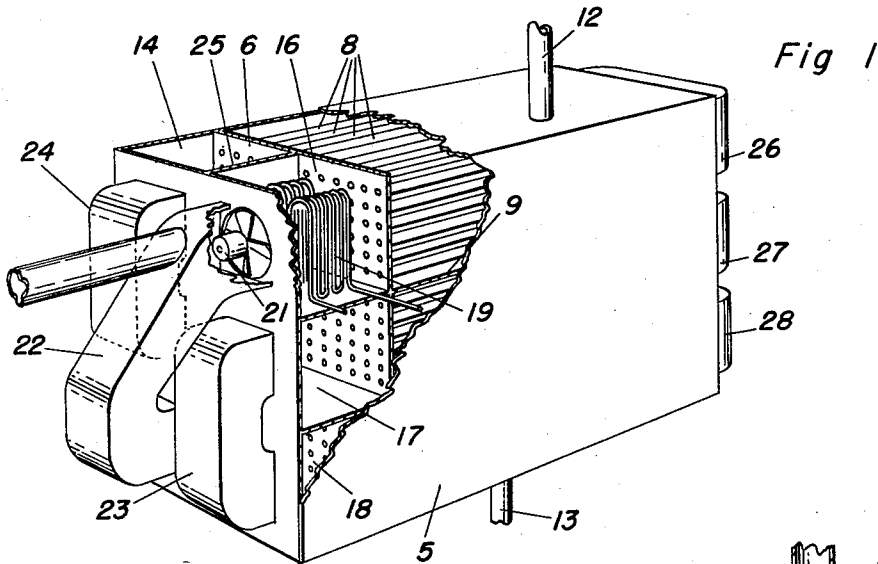
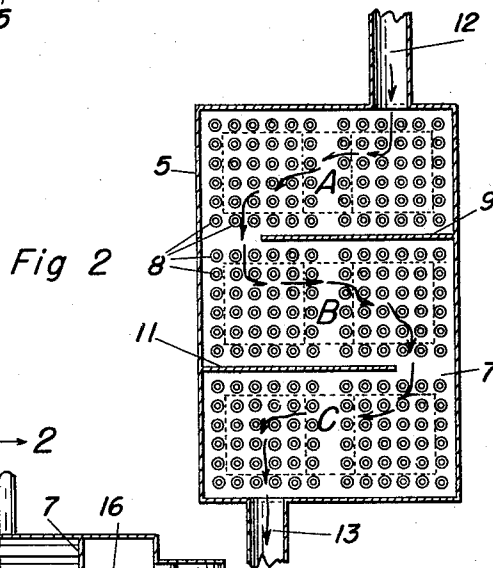
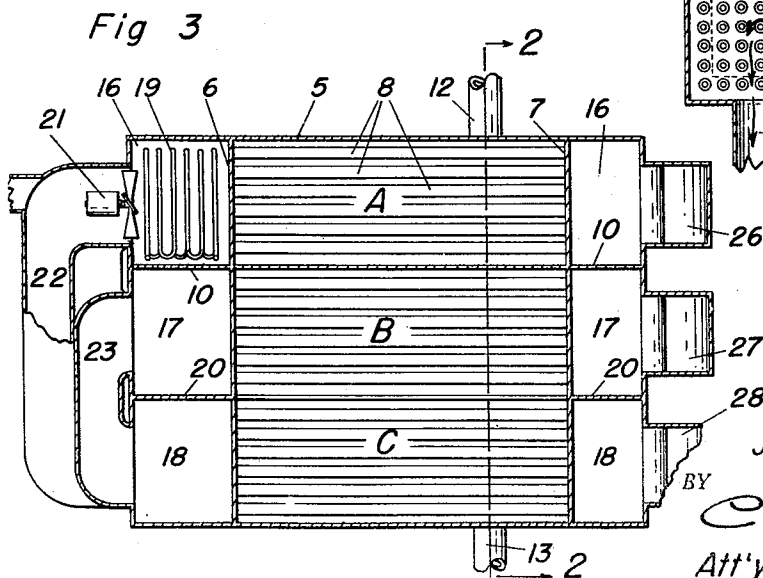
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AIR CONDITIONING COOLING SYSTEM FOR STEAM CONDENSERS

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## UNITED STATES PATENT OFFICE

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AIR CONDITIONING COOLING SYSTEM FOR  
STEAM CONDENSERS

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1 Claim. (Cl. 62—125)

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This invention relates to improvements in air conditioning cooling systems.

The principal object of this invention is to provide means for condensing steam without the use of large quantities of cold water, as is now the general practice.

A further object is to provide a condensing system which is efficient, light in weight, and one which takes up a minimum amount of space.

A further object is to produce a condenser which may be used in places where heavy insulation could not be installed.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a perspective view of my condenser, having a portion thereof broken away,

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 3, and

Fig. 3 is a side elevation of Fig. 1, with the side plate removed.

There are many instances where it is necessary to condense the steam of a steam generator after the steam has been used so that it can be returned to water for re-use in the generator. It has been common practice to pass this steam over or through tubes which are either filled with or surrounded by water of a sufficiently-low temperature to condense the steam and convert it back to water. Such plants are often found in ships which sail the seas and employ the salt water in the sea as a cooling medium. There are many instances where this salt water is comparatively warm and, therefore, its condensing effect requires large volumes of water which, in turn, results in large condensing units being employed. Installations of this character prevent the operation of the boilers when the ships are in dry dock, due to the lack of water to circulate through the condensers.

Applicant has, therefore, devised a condenser which is relatively small in size, and one which does not employ water as a cooling medium and, therefore, it is unnecessary to install heavy equipment common with water-cooled condensers.

Further, with applicant's device, it is possible to condense the steam when a ship is in dry dock or in a locality where water is scarce or unavailable in sufficient quantities to properly chill the condenser steam.

Referring to the accompanying drawings wherein, for the purpose of illustration, is shown

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a preferred embodiment of my invention, the numeral 5 designates a substantially-rectangular condenser housing in which is positioned parallel tube plates 6 and 7, between which tubes 8, extend.

Baffle plates 9 and 11, extend in opposite directions from the opposite sides of the condenser housing so that steam entering the inlet pipe 12, will pass over the condenser pipes in the upper portion A of the housing, then over the pipes in the portion B of the housing, and then over the pipes in the portion C of the housing and then, exhausted as condensed water, through the pipe 13.

By viewing Fig. 3, it will be noted that the plates 6 and 7, serve to divide the housing into a central section and spaced end sections. These end sections are, in turn, divided by horizontal plates, as shown at 10 and 20, and by vertical plates, as shown by the plate 25. (See Fig. 1.) This results in the formation of cells, as shown at 14, 16, 17 and 18 in Figs. 1 and 3, the same numbers being applied to the cells at both ends.

In the cell 16 I install a plurality of refrigeration coils 19 and at 21 I have shown a motor-driven fan which is installed in the conduit 22, which conduit serves to connect the lower left-hand cell of the housing at one end with the top right-hand cell at the same end.

A conduit 23, serves to connect the middle right-hand cell at one end with the bottom right-hand cell at the same end, while a conduit 24, serves to connect the top left-hand cell with the middle left-hand cell at this same end.

At the opposite end of the housing, conduits 26, 27 and 28, serve to connect the right-hand and left-hand cells on the same level.

The result of this construction is that, when my condenser is connected to a source of steam supply, the steam will enter through the pipe 12 and flow over the pipes, as shown by the dotted arrows in Fig. 2. At the same time, the motor-driven fan 21, will force air over the refrigeration coils 19, thence through the tubes 8, communicating with the cell 16 in which the refrigeration coils are mounted. The air passing through the tubes will enter the cell at the opposite end and then will pass into the conduit 22, and be conducted to the cell adjacent thereto, to be conveyed through the tubes 8, into the cell 14, from which point the air will pass downwardly through the conduit 24, into the middle cell on one side of the housing, thence through the tubes to the cell at the opposite end of the housing, thence through the conduit 27, and into the adjacent

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cell, thence through the tubes into the cell 17 and by conduit 23, into the cell 18, thence by tubes and cell to the conduit 28, which will return the air to the bottom cell for return through the tubes to the bottom left-hand cell, from which point the air will again be recirculated through the conduit 22, to the cell 16.

Or, in other words, a closed circuit may be employed if desired, to recirculate the air through the cooling tubes to effect a condensation.

It will thus be seen that my device will produce all the results above set forth.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:  
A condenser comprising a housing having a

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central section and spaced end sections, tubes positioned in said central section and in communication with said end sections, said end sections being formed into cells, conduits connecting said cells, whereby air moving through said cells and said tubes will be progressively circulated through all of said tubes and said cells, and refrigerating coils positioned in one of said cells to chill said air to effect the cooling of said tubes.

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