

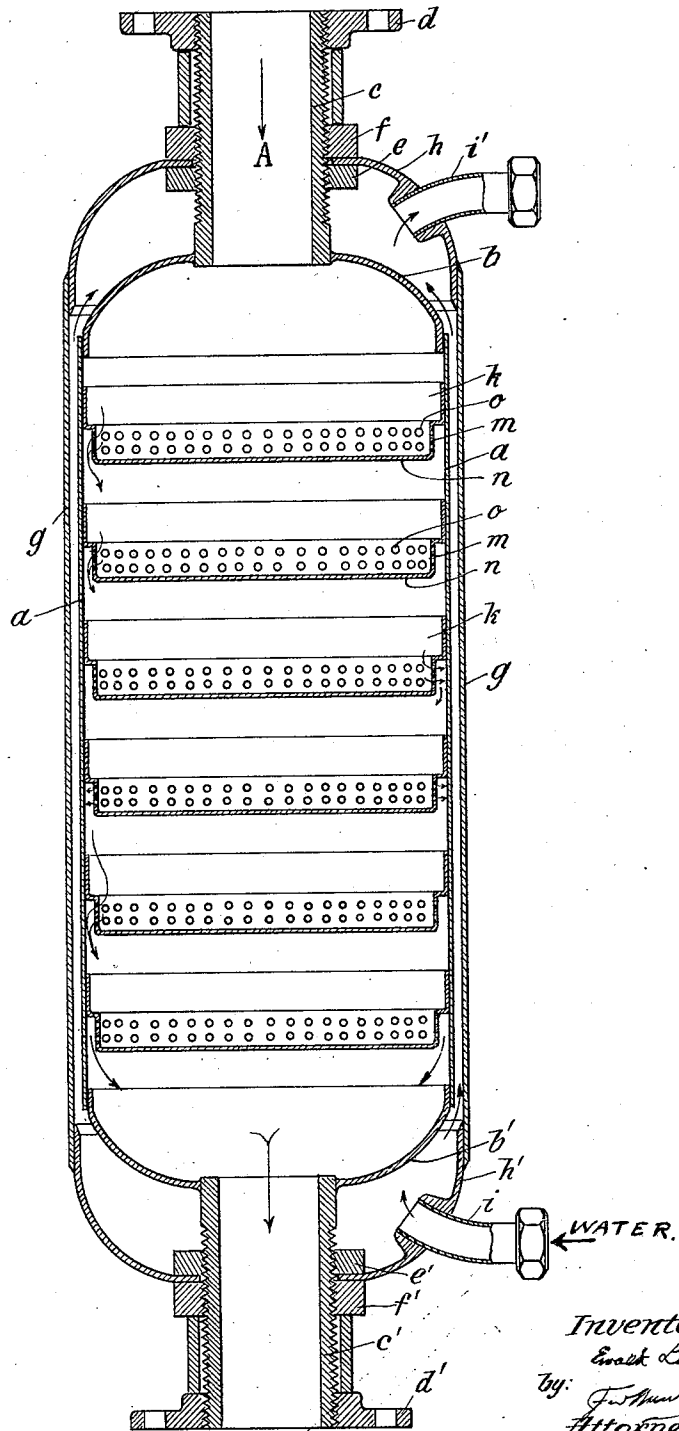
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COOLER

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UNITED STATES PATENT OFFICE

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COOLER

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This invention relates to a cooler for compressed air, gas or steam such as used, for instance for pneumatic postal delivery and other plants in which, in a narrow gap between two telescoped tubes or pipes, a stream of cooling water flows in counter current to a stream of pressure-medium which flows through the central tube.

The invention has for its object to ensure a more rapid and more intensive cooling of the pressure medium which is flowing through the cooler and consequently to reduce to a minimum the length of the cooler and the cost of manufacture as well as the space required. With these objects in view cup-shaped distributors for the pressure-medium are arranged, at short distances apart, in the shell or pipe for the pressure medium, said cup-shaped distributors having perforated side walls so that through the holes in the side walls the pressure medium is blown as through nozzles upon the cooled wall of the shell and cooled very rapidly and intensively.

An embodiment of the invention is shown, by way of example, in the accompanying drawing, in which the only figure shows an improved cooler in longitudinal section.

The inner shell *a*, through which the stream of the pressure medium to be cooled flows in the direction of the arrow *A*, is made of very thin sheet metal and has at each end a closing hood *b* or *b'* to which is secured a threaded pipe *c* or *c'*. Secured to the outer end of each pipe is a flange *d* or *d'* whereby each pipe may be attached to the main pipe which carries the pressure medium. The outer shell *g* of the cooler has a thicker wall than the inner shell and is wider than this inner shell so that it can be placed over the same. The shell *g* has a closing hood *h* or *h'* at each end, said hoods being water-tightly clamped between the nuts *e, f* and *e', f'* respectively. The closing hood *h'* of the outer shell *g* has a tubular inlet *i* and the closing hood *h* has a tubular outlet *i'* so that cooling water can flow in through the tubular inlet *i* and out through the tubular outlet *i'*. In the inner shell *a* cup-shaped distributors are arranged spaced at uniform short distances. Each distributor comprises an upper ring-shaped part *k* which

fits tightly into the shell *a*, a lower ring-shaped part *m* of smaller diameter than the upper ring-shaped part *k*, and a bottom plate *n*. The side wall of the lower ring-shaped part *m* has perforations *o*. These cup-shaped distributors are mounted in the shell *a* so that their open ends face the inflowing current of pressure medium (steam or gas), the upper ring-shaped part *k* of each distributor bearing air-tightly against the inner surface of tube *a*. The pressure medium which flows into the shell *a* at the top end in the direction of the arrow *A* passes then from one distributor to the other in the direction of the arrows in flowing through the holes *o* of the side walls *m* of the lower ring-shaped part, which holes have a nozzle-like effect, against the cool wall *g* so that the pressure medium, which flows through the cooler is cooled very rapidly.

The cooler according to the invention is specially adapted for use with pneumatic postal delivery tubes and for other conduits for compressed air in which the air has to be cooled.

As the cooling medium, i. e. the water, flows from the tubular inlet *i* to the tubular outlet *i'* in counter current to the medium to be cooled and is thus heated to a certain degree, the apparatus might also be used for heating a medium. According to the purpose for which the cooler is to be used, the one or the other medium, i. e. the pressure medium or the cooling medium, is made to flow through the inner tube.

I claim:—

A cooler for compressed air, gas and steam, comprising a shell of circular or other cross section, a second shell of similar cross section and made of thin sheet metal enclosed in said first mentioned shell and being of slightly shorter diameter than said first mentioned shell so that a narrow gap is formed between said two shells, a hood for each end of the inner shell, a threaded pipe secured to each hood, a closing hood secured to each end of said outer shell, each hood having an aperture through which one of the threaded pipes projects, means for securing the said hoods to the threaded pipes, an inlet for cooling water

at the lower end of said outer shell, a water outlet at the upper end of said outer shell so that the cooling water flows through said narrow gap in counter current to the flow of pressure medium, cup-shaped distributors mounted at short distances apart in said inner shell so that the open ends of said distributors face the inflowing current of pressure medium each distributor consisting of an upper ring-shaped part tightly fitting in said inner shell and a lower ring-shaped part of shorter diameter than said upper part and closed at the bottom and having a perforated side wall so that the pressure medium flows through these perforations, which exert a nozzle like action, onto the cooled wall of said inner shell and then into the next following distributor.

In testimony whereof I affix my signature.

EWALD LÜTSCHEN.