Aug. 11, 1931. R. O. MONROE 1,818,343

AIR COOLING DEVICE

Filed June 4, 1928

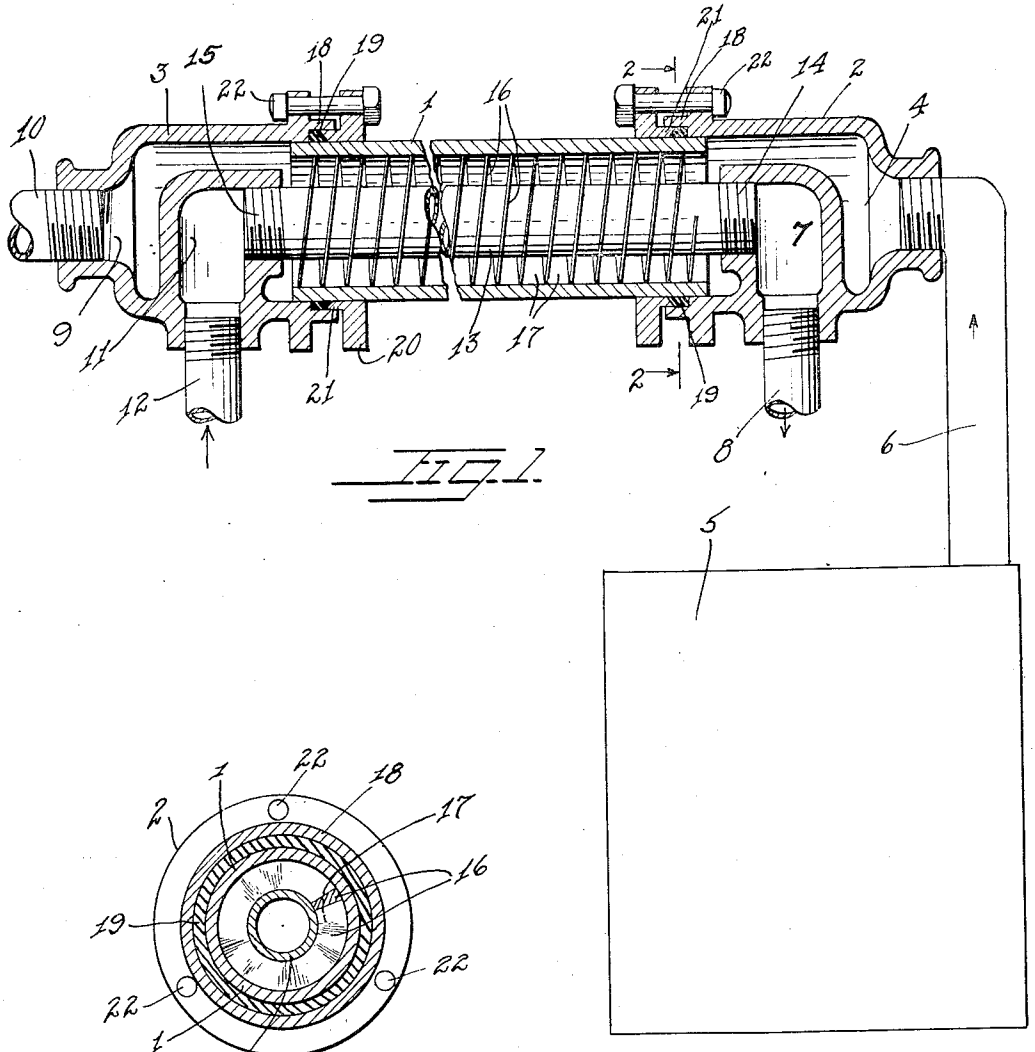


FIG. 1.

FIG. 2.

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Patented Aug. 11, 1931 1,818,343

UNITED STATES PATENT OFFICE

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AIR COOLING DEVICE

Application filed June 4, 1928. Serial No. 282,784.

My invention relates to improvements in air cooling devices, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide an air cooling device which is especially adapted to be attached to an air compressor for receiving the air and cooling the air as it passes from the compressor.

A further object of my invention is to provide a device of the type described by means of which the moisture and oil are condensed by the cooling of the air.

A further object of my invention is to provide a device of the type described which is simple in construction, durable and efficient for the purpose intended, and which may be manufactured inexpensively.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a longitudinal sectional view of my device, and

Figure 2 is a section along the line 2—2 of Figure 1.

In carrying out my invention, I provide an outer casing 1 having head portions 2 and 3 disposed upon the ends thereof. The head portion 2 is provided with an air inlet 4 which is in communication with a compressed air tank 5 by means of a tube or pipe 6. A water outlet passageway 7 is provided in the head portion 2 and is in communication with a water outlet pipe 8.

The head portion 3 is provided with an air outlet opening 9 which has an air outlet pipe 10 disposed in communication therewith for supplying air under pressure to any desired mechanism, such as a spray gun, not shown. A water inlet passageway 11 is provided in the head portion 3 and is in communication with a water supply pipe 12.

An inner casing 13 has threaded ends 14 and 15 which are received in the passageways 7 and 11 of the head portions 2 and 3. A continuous spiral fin or partition 16 extends around the inner casing 13. The spiral partition engages with the inner wall of the outer casing 1 and with the outer wall of the inner casing 13, thus providing a solid continuous spiral passageway 17 from the interior of the head portion 2 in communication with the inlet opening 4 to the interior of the head portion 3 in communication with the outlet opening 9.

The head portions 2 and 3 are provided with annular flanges 18 which are spaced away from the outer casing 1 so as to receive lead packing rings 19 betwen the flanges and the outer casing. Glands 20 are provided with annular projections 21 which are adapted to engage with the packing rings 19 beneath the annular flanges 18. The glands 20 are disposed concentric with the outer casing 1 and are adapted to be moved toward the head portions 2 and 3 by means of bolts 22 or the like.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. It is a well known fact that during the operation of compressing air, heat is created, which tends to vaporize any water or oil that may be present in the air. These vapors prove injurious to the efficient operation of devices such as spray guns through which the compressed air is directed. It is also a well known fact that it is quite impossible to separate one vapor from another. This invention provides a means for cooling the air after it has been compressed and before it passes through any desired mechanism, such as a spray gun.

Water is allowed to pass through the water supply pipe 12, through the inlet passageway 11, the inner casing 13, the outlet passageway

7, and through the outlet pipe 8. The compressed air in passing from the compressed air tank 5 passes through the pipe 6 and into the interior of the head portion 2. In order that the air may pass through the outlet 9, it must first travel through the spiral passageway 17 formed by the spiral partition 16. This is a means for holding the air in close contact with the inner casing 13 which is cooled by the steady flow of water therethrough. The cooled casing and the water will extract the heat from the air and thus condense the vapors. Therefore, by the time the air reaches the head portion 3, it will have been cooled and the vapors being condensed will permit the air to pass through the outlet opening 9 and the pipe 10 in a cooled dry condition.

It will be observed that the air is admitted from one end of the device and is caused to move in a spiral path therethrough while the water is admitted at the other end and passing counterflow with respect to the air. In this manner the heat is extracted from the compressed air.

I claim:

1. A device of the type described comprising an outer casing, a head portion disposed upon each end of said outer casing, said head portions having annular flanges spaced away from said outer casing, packing rings disposed concentric with said outer casing and beneath said flanges, glands disposed concentric with said outer casing and having projections adapted to extend beneath said flanges and in engagement with said packing rings, means for moving said glands toward said head portions for compressing said packing rings whereby said head portions may be secured to said outer casing, an inner casing disposed in said outer casing, portions integral with said head portions for forming liquid passageways and for receiving the ends of said inner casing, a spiral partition disposed in said outer casing for forming a spiral passageway therethrough and around said inner casing whereby compressed air may pass therethrough, and means for directing a cooling liquid through said inner casing and said liquid passageways for cooling the compressed air passing through said spiral passageway.

2. A device of the type described comprising an outer casing, a head portion at each end of said casing having an opening arranged to receive the casing, means including a packing gland for securing each head portion to the casing, an inner casing disposed centrally of said outer casing, means for securing said inner casing to said heads, a passageway in each head communicating with said inner casing, and a passageway in each head communicating with the space between the inner and outer casings.

3. A device of the type described comprising an outer casing, a head portion at each end of said casing having an opening arranged to receive the casing, means including a packing gland for securing each head portion to the casing, an inner casing disposed centrally of said outer casing, means for securing said inner casing to said heads, a passageway in each head communicating with said inner casing, and a spiral partition disposed in the space between the inner and outer casings.

Signed at South Bend, in the county of St. Joseph, and State of Indiana, this 22d day of May, A. D. 1928.

ROLLO O. MONROE.