

DEVICE FOR UTILIZING THE HEAT OF GASES DISCHARGED FROM COMPRESSORS.

929,460.

WITNESSES  
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# UNITED STATES PATENT OFFICE.

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DEVICE FOR UTILIZING THE HEAT OF GASES DISCHARGED FROM COMPRESSORS.

No. 929,460.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed February 13, 1908. Serial No. 415,697.

*To all whom it may concern:*

Be it known that I, FRANK PETER MORAN, a citizen of the United States of America, and resident of 911 West Court street, Cincinnati, county of Hamilton, and State of Ohio, (post-office address Fifth and Race streets, in the city of Cincinnati, county of Hamilton, and State of Ohio,) have invented an Improved Device for Utilizing the Heat of the Gases Discharged from Compressors; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to devices for utilizing the heat of the gases discharged from compressors and it has for its object the improvement in the construction of such devices whereby they are simplified and rendered more efficient in action.

The novelty of my invention consists in the combination and sub-combination of the parts as will be hereinafter set forth and specifically pointed out in the claim.

In the drawings the figure is a side elevation partly in section of the devices which embody my invention.

A indicates an ammonia compressor.

A<sup>2</sup> is the suction pipe and A<sup>3</sup> is the discharge pipe.

B is an ordinary slide valve engine.

B<sup>2</sup> is a pipe that leads from the engine B to the heater C. The pipe B<sup>2</sup> enters the heater from the top forming a coil in the center of the heater and passing out from the bottom of the heater, from whence it passes to the condensers of an ordinary refrigerating plant.

The heater C is composed of two cylinders, one within the other, C<sup>2</sup> is the outer cylinder and C<sup>3</sup> is the inner cylinder; there is no communication between the inner cylinder C<sup>3</sup> and outer cylinder C<sup>2</sup>. The pipe B<sup>2</sup> is formed into a coil within the inner cylinder C<sup>3</sup>. In the space between the cylinders C<sup>2</sup> and C<sup>3</sup>, hot water or exhaust steam can be circulated. The inner cylinder C<sup>3</sup> has an inlet pipe D and an outlet pipe D<sup>2</sup>. The pipe D<sup>2</sup> leads to the engine B. There is an exhaust pipe E, which leads from the en-

gine B to an atmospheric condenser F. The pipe D<sup>2</sup> also connects with the exhaust pipe E. That portion of the pipe D<sup>2</sup> which connects with the exhaust pipe E, has in it a pressure regulating valve I which can be set so as to allow the gases passing through the pipe D<sup>2</sup> to be kept at any pressure desired. From the atmospheric condenser F, a pipe F<sup>2</sup> leads to a pump G and from the pump G, a pipe D, leads to the heater C.

The pump G has its piston attached to the crank shaft of the compressor A, so that when the compressor runs it causes the pump to run. The crank shaft of the engine B is connected to the crank shaft of the compressor A by a coupling H.

The operation of my device is as follows: I first circulate hot water or exhaust steam in the space between the cylinders C<sup>2</sup> and C<sup>3</sup> of the heater C. This heat converts the liquid ammonia within the cylinder C<sup>3</sup> into a gas, thereby creating a pressure. This gas is carried by pipe D<sup>2</sup> to the engine B and after it has performed its work in the engine the gas is exhausted through pipe E into the atmospheric condenser F where it is liquefied and passes from the condenser through pipe F<sup>2</sup> to suction of pump G and is forced by the pump through pipe D back into the inner cylinder C<sup>3</sup> where it is again converted into a gas. The compressor A being connected to engine B by the coupling H, the working of the engine operates the compressor. When the compressor is working the hot gases from the compressor pass around the jacket of the engine cylinder B and from this, pass through pipe B<sup>2</sup> through the coils located within the inner cylinder C<sup>3</sup>. These coils are surrounded with liquid ammonia and the heated gas from the compressor gives up a portion of its heat to the liquid ammonia converting it into a gas and this gas passes from the heater and goes through the same cycle of operations as that described above. Having described my invention what I claim is:

In a device for utilizing the hot gases from a compressor, a jacketed cylinder to receive the hot gases, a coil through which the gas passes from the jacket, the coil located within a cylinder and surrounded

with liquid ammonia, a pipe leading from the top of this cylinder conducting the gas generated to an engine, exhausting from the engine into a condenser, a back pressure  
5 valve located between the supply pipe and the exhaust pipe of the engine, a pump to pump the liquid ammonia from the con-

denser to the tank where the gas is generated, all substantially as described.

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Witnesses:

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