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UNITED STATES PATENT OFFICE.

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REFRIGERATING PROCESS.

No Drawing. Application filed May 27, 1918, Serial No. 236,873. Renewed March 18, 1922. Serial No. 544,972.

To all whom it may concern:

Be it known that I, ALBERT G. CRAWFORD, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Refrigerating Process; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has reference more particularly to a refrigerant and the process of using same whereby it is adapted for commercial use in ice making, in cold storage plants or for general refrigeration purposes.

The refrigerants now commonly used, such as ammonia gas, for example, are objectionable for the reason that they are not only poisonous and corrosive to the pipes and receptacles in which they are used, but they as well as carbon dioxide also require a high pressure and consequently a heavy installation in order to condense them into the liquid state.

It is an object of this invention, therefore, to provide a medium which may be utilized for carrying on the process of refrigeration or ice making and which not only requires a lower pressure and consequently a lighter and less expensive installation to utilize the same, but which is also unaccompanied with the danger of poisoning and does not have the corrosive action on the apparatus of the refrigerants heretofore used.

I have found that propane of the formula C_3H_8, having a boiling point of —45° C., gives excellent results as a refrigerant. It is easily liquefiable under cold or pressure and does not decompose after being used for a long time in a refrigerating machine, and my experiments show that very low temperatures can be obtained by using this material as a refrigerant.

The refrigerating process using propane as the refrigerant is carried out by using this refrigerant in a manner similar to that in which refrigerants have been used heretofore, except that it requires less pressure to condense and liquefy than some of the refrigerants heretofore employed, a lighter installation may be used and it is unnecessary to provide precautions against corrosion and poisonous gas as with refrigerants heretofore employed.

The propane is introduced into a circulating system consisting of a compresser which applies pressure to the gas and reduces it to a liquid form, and the liquid, after being suitably cooled to dissipate the heat of compression, is led to and allowed to evaporate in proximity to the material or compartment which is to be cooled, and as the evaporation takes place heat is absorbed thereby and a reduction in temperature takes place around the point at which the evaporation takes place. The gas resulting from the evaporation is then led back to the compressor and again liquefied by pressure and a continuous circulation thereof is thereby maintained, the propane being alternately compressed and liquefied and then expanded so as to continuously absorb heat and maintain the desired low temperature.

I claim as my invention:

1. A refrigerating process including compressing propane gas to liquefy the same, and evaporating the liquid by relieving the pressure thereon to extract heat from adjacent materials.

2. A refrigeration process including compressing a non-acid gas having a hydrocarbon content consisting substantially wholly of propane to liquefy the propane, and evaporating the liquid by relieving the pressure thereon to extract heat from adjacent materials.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

ALBERT G. CRAWFORD.

Witnesses:

LAWRENCE REIBSTEIN,

FRANK R. BREMER, JR.