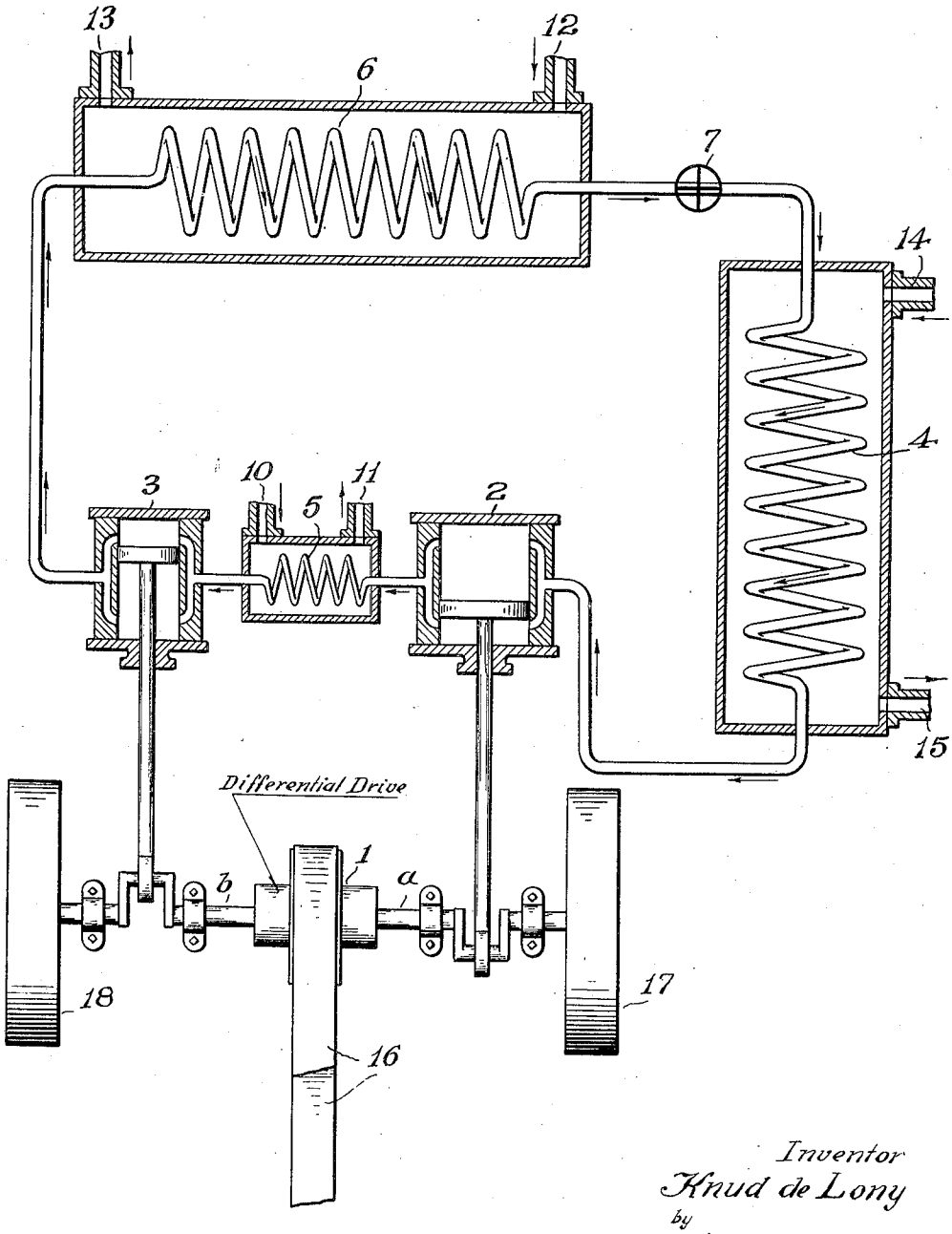
Jan. 26 , 1926. 1,570,995

K. DE LONY

REFRIGERATION

Filed March 24, 1925



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UNITED STATES PATENT OFFICE.

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REFRIGERATION.

Application filed March 24, 1925. Serial No. 17,876.

To all whom it may concern:

Be it known that I, KNUD DE LONY, a citizen of the United States, residing at the city of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Refrigeration; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to refrigeration and has for its object to increase the efficiency of refrigerator engines of the compression type.

The accompanying drawing shows a schematic elevation of a combined compression type refrigerator plant employing two compressors with my invention attached.

The invention consists in the introduction of a differential drive mounted in a housing 1 between the shafts *a* and *b* of the low and high pressure compressors 2 and 3 that are driven from a common source of power by a belt 16 which turns the housing 1.

The differential drive is preferably shown herein as mechanical, but the same effect may be obtained by other means.

4 is the evaporator, 5 the receiver and intercooler, 6 the condenser and 7 the expansion valve, all of the usual or known type.

The operation is as follows:—

The low pressure compressor 2 draws the vaporized refrigerant from the vaporizer 4, compresses it to the receiver pressure and discharges it to the receiver and intercooler 5, where the superheat is removed by a cooling medium entering at 10 and leaving at 11. The high pressure compressor 3 draws the vapor from the receiver 5, compresses it to the condenser pressure and discharges it to the condenser 6, where it is liquefied by the cooling medium entering at 12 and leaving at 13. The liquefied refrigerant expands through the expansion valve 7 to the vaporizer 4, where it is vaporized, thus cooling the brine entering at 14 and leaving at 15.

As the power is distributed through a differential drive, the torques on the compressor shafts *a* and *b* are equal. With the same load on both compressors they will run with the speed of the driving gear or housing 1, but as the load changes with a change in the saturation temperatures of the condenser or the vaporizer, due to the change in density of the refrigerant, the relation of the speeds of the compressors will change, but their sum will remain equal to double the speed of the driving gear. In all instances, irrespective of the means employed to effect the differential drive, by reason of this variation of speed of the two compressors, the capacity of the plant increases automatically with an increase in the saturation temperature of the condenser owing to the equal torque, the fly wheels 17 and 18 serving to temporarily store the energy, and as the engine works without throttling or so-called capacity regulation, its superior efficiency is at once recognized.

The invention has been shown only in connection with a compound type, but can be attached to a two cycle type or to any refrigerator plant employing two compressors.

What is claimed is:—

1. In a compound refrigerator having a condenser, an evaporator and two compressors with shafts driven from a common source of power, the combination of the compressor shafts with a differential drive, distributing said power whereby the ratio between the two torques imparted to each compressor is maintained constant.

2. The process of refrigeration which consists in compressing a refrigerant in two compressors, condensing and evaporating the said refrigerant, and in automatically maintaining constant the relation between the torques delivered to the compressors.

3. In refrigerating apparatus, a condenser, an evaporator connected to the condenser and two compressors connected in series to withdraw refrigerant from the evaporator and to force it under pressure into the condenser, said compressors each provided with a drive shaft, and means to rotate the shafts comprising a differential drive.

4. In refrigerating apparatus, a condenser, an evaporator connected to the condenser, a plurality of compressors connected in series between the evaporator and the condenser, and automatic means for supplying equal torque to each of the compressors.

In testimony whereof I affix my signature hereto.

KNUD DE LONY.