

Oct. 6, 1931.

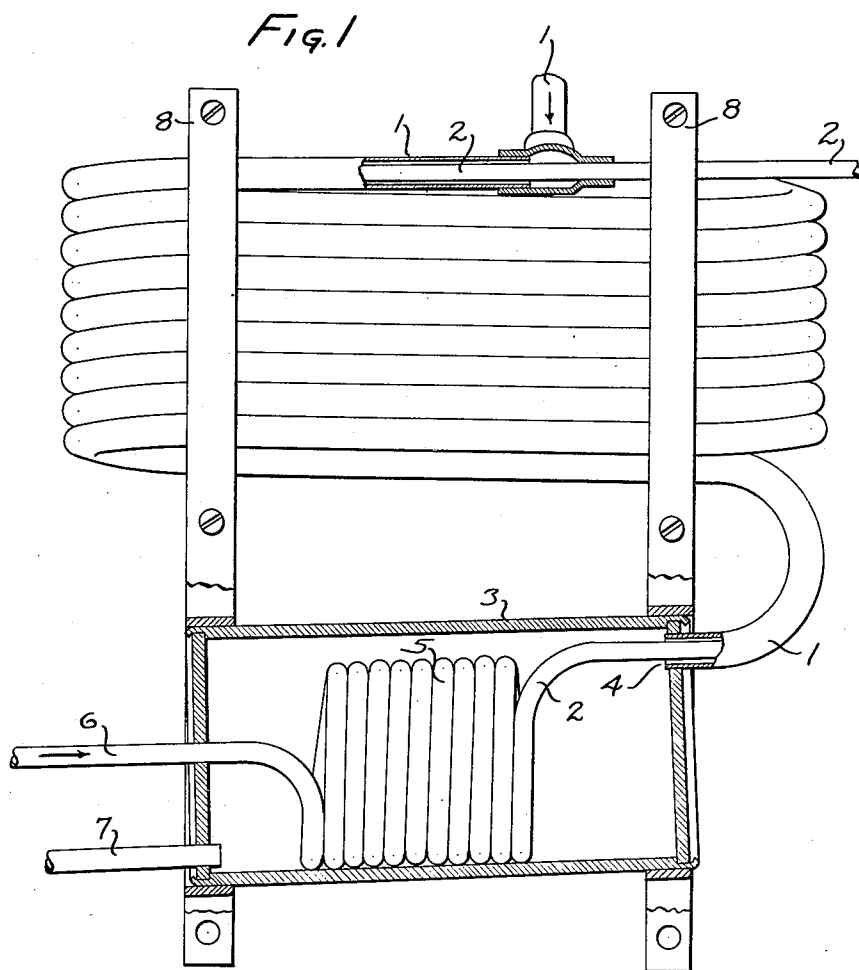
H. C. HAYES

1,826,540

CONDENSER

Original Filed May 4, 1927

2 Sheets-Sheet 1



INVENTOR
Harry C. Hayes
BY *Taulmin Taulmin*,
ATTORNEY

Oct. 6, 1931.

H. C. HAYES

1,826,540

CONDENSER

Original Filed May 4, 1927

2 Sheets-Sheet 2

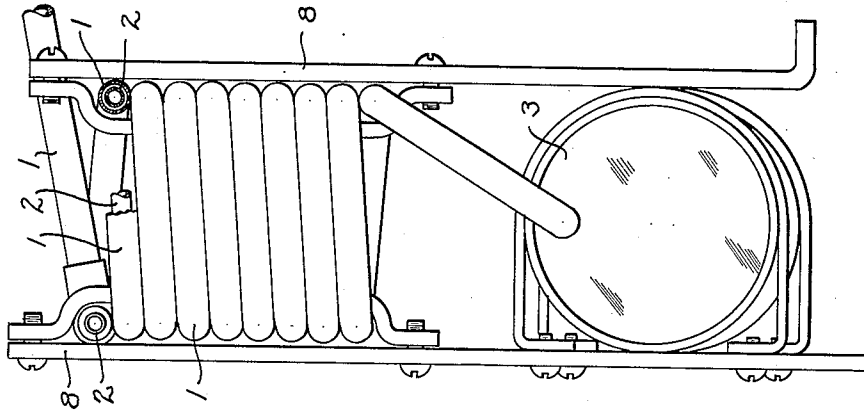


Fig. 3

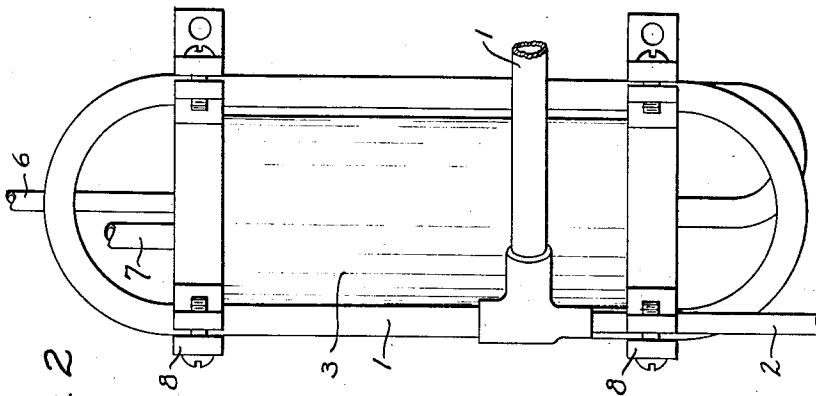


Fig. 2

INVENTOR
Harry C. Hayes
BY *Toulmin Toulmin,*
ATTORNEY

UNITED STATES PATENT OFFICE

HARRY C. HAYES, OF DETROIT, MICHIGAN, ASSIGNOR TO GENERAL NECESSITIES CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

CONDENSER

Application filed May 4, 1927, Serial No. 188,832. Renewed August 24, 1931.

My invention relates to refrigerating apparatus and in particular to the condenser thereof.

It is the object of my invention to provide an apparatus and method of cooling the refrigerant gases to reduce them to the form of refrigerant liquid and then by a separate apparatus and separate stage of the method reduce the temperature of the refrigerant liquid below that necessary to convert the refrigerant from gas to liquid.

Referring to the drawings:

Figure 1 is a front elevation of the condenser and cooling apparatus partially in section;

Figure 2 is a plan view thereof;

Figure 3 is an end elevation thereof.

Referring to the drawings in detail, 1 indicates a pipe for conveying the incoming refrigerant gas, such pipe being continued in a plurality of successive loops. Interiorly of the successive loops of the gas pipe 1 are passed similar successive loops of a water pipe 2. At the bottom of this series of loops of the water pipe and the gas pipe is located a tilted reservoir 3 for refrigerant liquid with which the open end 4 of the gas pipe 1 communicates so that the gas which has been condensed to a liquid in the gas pipe 1 will empty into the liquid reservoir 3.

The water pipe 2 makes its exit through the open mouth 4 of the gas pipe 1 entering the reservoir 3 where it is formed into a plurality of coils 5 resting on the bottom of the reservoir and being immersed in the refrigerant liquid. The water pipe makes its exit through the line designated 6. The water enters through the pipe 6 in the direction of the arrow traveling in a reverse direction to that of the refrigerant. The refrigerant liquid which is cooled by the coils of the water pipe 5 below the temperature necessary for the condensation of the gas of the refrigerant makes its exit through the exit line 7. The coils of pipes 1 and 2 are supported by

the usual brackets 8 which may be of any desired form.

My method consists in reducing the refrigerant gas by cooling to a liquid and then arranging for the further reduction of temperature of the liquid below its temperature of condensation, utilizing the same current of water through the same pipe system first applying the coldest water to the condensed refrigerant and then the water is applied to the gas where the temperature need not be as low as that utilized in reducing the refrigerant liquid to a lower temperature in order to reduce the gases to a condensed liquid.

It will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination, a refrigerant coil for use as a condenser, a reservoir connected therewith for collecting the condensed refrigerant from said coil, and a cooling fluid pipe passing into and located within said reservoir and thence passing through the interior of the refrigerant gas coil.

2. In combination a refrigerant gas pipe coiled for use as a condenser, a cooling water pipe in said coiled gas pipe, and a reservoir connected to said refrigerant gas pipe for collecting condensed refrigerant, said cooling water pipe passing through the reservoir and coiled therein.

3. In combination, a refrigerant gas pipe coiled for use as a condenser, a cooling water pipe passing through said coiled gas pipe, and a reservoir connected to said refrigerant gas pipe for collecting condensed refrigerant, said cooling water pipe passing through the reservoir and coiled therein, said water pipe in the reservoir and the water pipe associated with the gas coil being

formed of an integral pipe whereby the incoming cold water to the coil will reduce the temperature of the refrigerant in the reservoir first and then reduce the temperature of the gas in the condenser coil on the way to the water exit.

4. In a refrigerating apparatus, a reservoir, a vapor pipe coiled above said reservoir with one end inserted in said reservoir, and a cooling pipe extending through the reservoir and through said vapor pipe, said cooling pipe being coiled in the reservoir.

In testimony whereof, I affix my signature.

HARRY C. HAYES.

15

20

25

30

35

40

45

50

55

60