Jan. 25, 1938. W. E. HAUSER 2,106,637

TRUCK REFRIGERATOR

Filed June 17, 1937 2 Sheets-Sheet 1

FIG. 1.

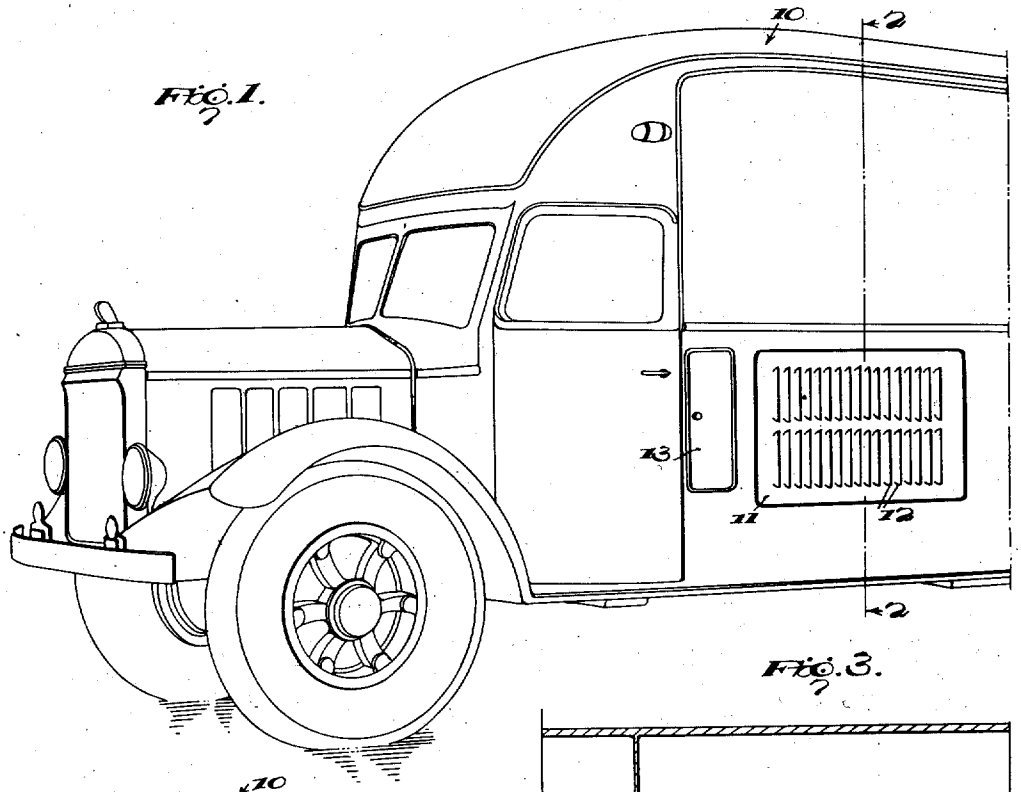
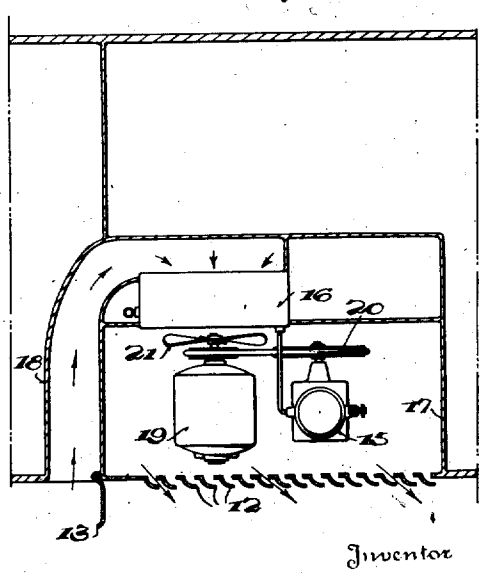


FIG. 3.



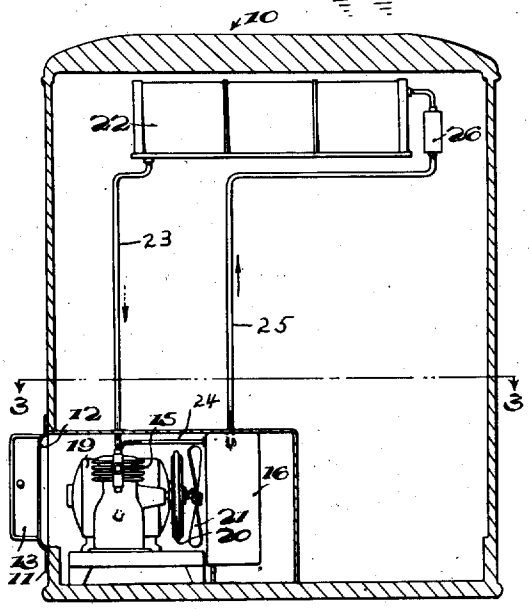


FIG. 2.

Inventor

Walter E. Hauser

By

Attorney

Jan. 25, 1938. W. E. HAUSER 2,106,637

TRUCK REFRIGERATOR

Filed June 17, 1937 2 Sheets-Sheet 2

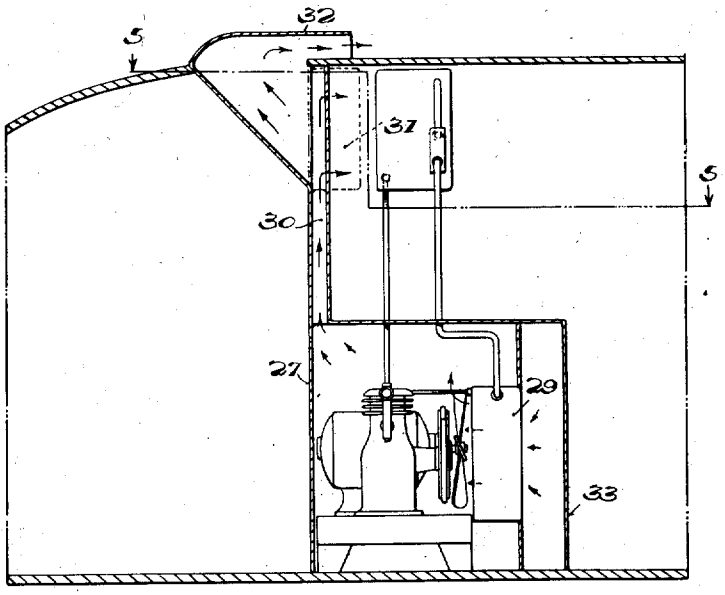


FIG. 4.

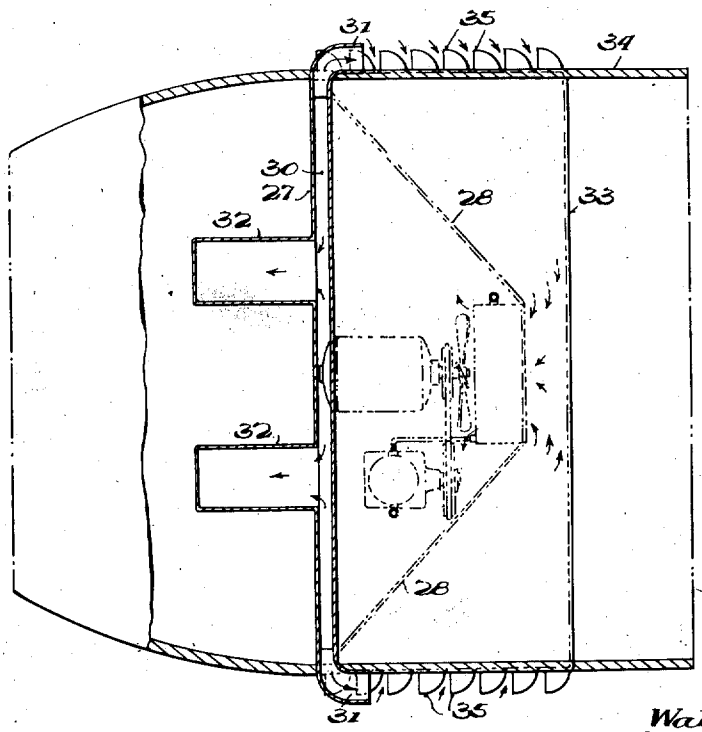


FIG. 5.

Inventor

Walter E. Hauser

By

Attorney

Patented Jan. 25, 1938

2,106,637

UNITED STATES PATENT OFFICE

2,106,637

TRUCK REFRIGERATOR

Walter E. Hauser, Rochester, N. Y.

Application June 17, 1937, Serial No. 148,778

2 Claims. (Cl. 62—117)

The present invention relates generally to trucks, delivery cars, trailers and moving vehicles of this general type having closed bodies which, for the better preservation of the contents thereof, need refrigeration, and the invention has for its primary object the provision of a refrigerated truck body, in which the refrigerating mechanism is reduced to what may be said to be minimum simplicity, in connection with an arrangement which will take up minimum space within the vehicle body and is such as to positively avoid the disadvantages of overheating under any conditions of use.

It is a well-known fact that refrigerating apparatus for trucks and other closed body vehicles have, up to the present time, given but limited satisfaction and that one of the outstanding disadvantages has been the tendency of the refrigerating unit or apparatus to overheat especially where the unit or apparatus has been limited to the essentials of a compressor, condenser, expander circuit, in which in such installations effective air cooling of the condenser is an absolute necessity to efficient continuous performance.

The invention proposes a construction and arrangement of parts in which the condenser of such a circuit as above described is exposed at one face to a forced air draft in the normal operation of the vehicle through an air duct which completely surrounds one surface of the condenser, the other face of the condenser being exposed to a chamber in which the refrigerating unit is housed and which chamber is in communication with a forced outlet draft so that a positive cooling circulation is thus set up which, with the assistance of the usual condenser fan, permits of housing the unit in a limited space while insuring its continuous effective operation. It has been found after long experiment that such an arrangement, involving a forced air intake and a forced air outlet, is adaptable with but slight modification to closed vehicle bodies of various types and to the requirements not only of various sizes of bodies but also various degrees of refrigerating temperatures.

Certain of the adaptable forms of the present invention may be better understood in connection with the detailed description thereof to follow, reference being made to the accompanying drawings which form a part of this specification and in which,

Figure 1 is a perspective side view of a portion of a vehicle of the closed body type, showing one way of providing for forced air intake and outlet;

Figure 2 is a vertical transverse section taken therethrough substantially on line 2—2 of Figure 1;

Figure 3 is a horizontal sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a vertical sectional view showing a modified arrangement adaptable to greater refrigerating requirements; and

Figure 5 is a horizontal sectional view taken substantially on line 5—5 of Figure 4.

Referring now to these figures and particularly to Figure 1, I have shown a truck which, by way of illustration of the invention, has a closed body generally indicated at 10, one side of which has an inserted panel 11 forming a part thereof and preferably removable therefrom, this panel being provided with one or more rearwardly inclined louvers 12 which thus provide for the forced outlet of air through the panel 11, the latter, as will be presently shown, forming one side wall of the chamber in which the refrigerating unit is housed within the vehicle body. The body 10 is also provided forwardly of its removable side panel 11 with a side air intake opening, and this opening may be protected by one or more forwardly inclined or intake louvers, or, as shown in Figure 1, a hinged door 13 may be provided, which is, of course, opened more or less during the normal or forwardly operating movement of the vehicle.

The refrigerating unit as shown in Figure 2 and which it is contemplated will involve a refrigerant compressor 15 and refrigerant condenser 16, is located within a casing 17 along which an air intake flue 18 extends from the air intake opening of the vehicle side wall so that the inner portion of this flue completely surrounds the outer surface of the condenser 16, the latter of which is set into one wall of the casing 17 so that the forced draft entering the flue 18 will pass from the latter directly through the condenser and into the space within casing 17 and around the compressor 15 and motor 19, the latter of which operates the compressor through a belt 20 and also operates the condenser fan 21 located adjacent to the inner surface of the condenser.

For the above purposes, the compressor 15 and condenser 16 as well as the motor 19 may be of any suitable make, and current for the operation of the motor may be supplied from any suitable source.

It is obvious that the casing 17 may under the

above circumstances, and as most plainly shown in Figure 2, be mounted closely adjacent to one side wall of the vehicle so as to utilize the panel as one side wall of the casing, thus exposing the entire outer side of the space within the casing 17 to the forced outlet of air through the louvers 12.

It is, of course, contemplated that within a suitable part of the vehicle body a refrigerating coil 22 will be mounted, the expanded gas return leading from this coil through a pipe 23 to the intake side of the compressor 15, the latter of which feeds from its outlet compressed liquid refrigerant through a pipe 24 to the upper portion of the condenser 16. From the lower portion of the condenser 16 this liquid refrigerant which has been closed by the adjacent forced circulation of air is fed through a pipe 25 to an expander generally indicated at 26 opening into the refrigerating coil 22.

Figures 4 and 5 show a slightly modified form of the invention in which the refrigerating unit is mounted between a cross wall 27 of the vehicle body at its forward end and inclined walls 28, the latter of which extend inwardly, rearwardly from the sides of the cross wall 27 to the sides of the condenser 29. These inclined walls 28 form between them and the cross wall 27 a chamber for the refrigerating unit, which chamber is in communication with an upright flue 30 whose upper end is in communication with side louvers 31 and top louvers 32 inclined rearwardly at the sides and top of the vehicle body to thus create a forced outdraft from the chamber of the refrigerating unit.

The inclined walls 28 also form between them and a cross wall 33 a transverse intake air channel to which the outer surface of the condenser 29 is exposed. This channel extends to the side walls 34 of the vehicle and to portions of these side walls having forwardly inclined louvers 35 providing for the forced intake of air into the outer flaring or widened ends of the intake air channel at the center of which the condenser 29 is exposed at its outer face as previously mentioned.

Obviously, in either form of the invention as described, the condenser is exposed at one face to and within an air duct or channel in which a forced indraft of air is maintained at all times during normal operation of the vehicle, and thus in either form there is an ample supply of air which, with the assistance of the condenser fan, passes continually through the condenser in order to effectively reduce the temperature of the previously compressed refrigerant passing through the condenser in liquid form. The air so passing through the condenser immediately enters the chamber in which the refrigerating unit is housed, for passage around the compressor and the motor for actuating the latter and the fan. At the same time this chamber is in open communication with a forced outdraft of air according to either of the forms illustrated and described, so there can be no danger in normal operation of the vehicle of any check of the complete effective circulation, and no churning of air within the chamber housing the refrigerating unit which occurs in similar apparatus now in use and which so frequently causes back pressure through the condenser against the cool incoming air so necessary for continuous effective operation of the apparatus.

What is claimed is:

1. A refrigerated vehicle having a closed body provided in the forward portion thereof with a cross wall, a pair of similarly rearwardly inwardly inclined walls forming with said cross wall a transversely extending chamber, a refrigerating unit in said chamber including a refrigerant condenser between the rear inner ends of the inclined walls and exposed at its inner surface within the said chamber, said vehicle body having outlet air louvers in communication with said chamber, a second cross wall forming between the same and said inclined walls a laterally flaring air duct opening at its ends through air intake louvers in the body sides, said latter cross wall being spaced at its central portion from the condenser whereby the latter is exposed at its outer surface to the intake air duct.

2. In combination with a vehicle of the closed body type, the body of which is provided with an air intake and an air outlet and has means for forcibly directing air into said inlet and from said outlet during normal running of the vehicle, a mechanical refrigerating unit within said body comprising a refrigerant compressor, a condenser and means for pulling air through the condenser from its outer to its inner side, a casing in which said unit is housed having communication at one side with the air outlet, and means forming an air flue within the vehicle leading from the air intake to the opposite side of said casing, the said condenser being set into the wall of the casing at its last-mentioned or intake side, with the outer surface of the condenser exposed to the air intake flue and arranged to form through the condenser the sole air inlet into the space within the casing.

WALTER E. HAUSER.

CERTIFICATE OF CORRECTION.

Patent No. 2,106,637. January 25, 1938.

WALTER E. HAUSER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 17, for the word "closed" read cooled; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of March, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

above circumstances, and as most plainly shown in Figure 2, be mounted closely adjacent to one side wall of the vehicle so as to utilize the panel as one side wall of the casing, thus exposing the entire outer side of the space within the casing 17 to the forced outlet of air through the louvers 12.

It is, of course, contemplated that within a suitable part of the vehicle body a refrigerating coil 22 will be mounted, the expanded gas return leading from this coil through a pipe 23 to the intake side of the compressor 15, the latter of which feeds from its outlet compressed liquid refrigerant through a pipe 24 to the upper portion of the condenser 16. From the lower portion of the condenser 16 this liquid refrigerant which has been closed by the adjacent forced circulation of air is fed through a pipe 25 to an expander generally indicated at 26 opening into the refrigerating coil 22.

Figures 4 and 5 show a slightly modified form of the invention in which the refrigerating unit is mounted between a cross wall 27 of the vehicle body at its forward end and inclined walls 28, the latter of which extend inwardly, rearwardly from the sides of the cross wall 27 to the sides of the condenser 29. These inclined walls 28 form between them and the cross wall 27 a chamber for the refrigerating unit, which chamber is in communication with an upright flue 30 whose upper end is in communication with side louvers 31 and top louvers 32 inclined rearwardly at the sides and top of the vehicle body to thus create a forced outdraft from the chamber of the refrigerating unit.

The inclined walls 28 also form between them and a cross wall 33 a transverse intake air channel to which the outer surface of the condenser 29 is exposed. This channel extends to the side walls 34 of the vehicle and to portions of these side walls having forwardly inclined louvers 35 providing for the forced intake of air into the outer flaring or widened ends of the intake air channel at the center of which the condenser 29 is exposed at its outer face as previously mentioned.

Obviously, in either form of the invention as described, the condenser is exposed at one face to and within an air duct or channel in which a forced indraft of air is maintained at all times during normal operation of the vehicle, and thus in either form there is an ample supply of air which, with the assistance of the condenser fan, passes continually through the condenser in order to effectively reduce the temperature of the previously compressed refrigerant passing through the condenser in liquid form. The air so passing through the condenser immediately enters the chamber in which the refrigerating unit is housed, for passage around the compressor and the motor for actuating the latter and the fan. At the same time this chamber is in open communication with a forced outdraft of air according to either of the forms illustrated and described, so there can be no danger in normal operation of the vehicle of any check of the complete effective circulation, and no churning of air within the chamber housing the refrigerating unit which occurs in similar apparatus now in use and which so frequently causes back pressure through the condenser against the cool incoming air so necessary for continuous effective operation of the apparatus.

What is claimed is:

1. A refrigerated vehicle having a closed body provided in the forward portion thereof with a cross wall, a pair of similarly rearwardly inwardly inclined walls forming with said cross wall a transversely extending chamber, a refrigerating unit in said chamber including a refrigerant condenser between the rear inner ends of the inclined walls and exposed at its inner surface within the said chamber, said vehicle body having outlet air louvers in communication with said chamber, a second cross wall forming between the same and said inclined walls a laterally flaring air duct opening at its ends through air intake louvers in the body sides, said latter cross wall being spaced at its central portion from the condenser whereby the latter is exposed at its outer surface to the intake air duct.

2. In combination with a vehicle of the closed body type, the body of which is provided with an air intake and an air outlet and has means for forcibly directing air into said inlet and from said outlet during normal running of the vehicle, a mechanical refrigerating unit within said body comprising a refrigerant compressor, a condenser and means for pulling air through the condenser from its outer to its inner side, a casing in which said unit is housed having communication at one side with the air outlet, and means forming an air flue within the vehicle leading from the air intake to the opposite side of said casing, the said condenser being set into the wall of the casing at its last-mentioned or intake side, with the outer surface of the condenser exposed to the air intake flue and arranged to form through the condenser the sole air inlet into the space within the casing.

WALTER E. HAUSER.

CERTIFICATE OF CORRECTION.

Patent No. 2,106,637. January 25, 1938.

WALTER E. HAUSER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 17, for the word "closed" read cooled; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of March, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)