continual expanding and contracting or heating and cooling of diaphram will continue as long as there is steam in the apparatus.

With a direct steam system there is not the same liability of the trap freezing as when applied to systems of water circulation, nevertheless, there is being experienced considerable trouble from this cause and the only means available for thawing it out are the same as when applied to Indirect systems. One of the chief disadvantages of a system of this kind is

One of the chief disadvantages of a system of the trouble has that after the car has become heated considerable trouble has been experienced in regulating the temperature, and the only really satisfactory means was to open and close the ventilators as the conditions required it.

VAPOR SYSTEM OF HEATING.

Upon the introduction of this system some few years ago it was believed by many quite experienced in the art of car heating that it would be necessary to increase or decrease the amount of heating surface according to the weather, but this is now believed to have been incorrect.

The operation of this system is similar to the other drip system in so far that the steam is admitted into the radiating pipes at the highest point and following the laws of gravity it drains to the lowest where the temperature of the escaping condensation regulates the admittance of steam into the radiating pipe. (See Fig. 5.)

With this system atmospheric pressure is maintained from the inlet valve through the radiating pipes to the diaphram in the bottom of trap. When steam is first turned into this apparat is it passes through the admission valve and into the radiating pipes and is then free to escape to the atmosphere first passing over the diaphram or coil containing the expansive fluid which, when it has expanded its maximum, shuts off the supply of steam. When the diaphram or coil has cooled, caused by the contact of cold air, the inlet valve is again opened admitting more steam so that it will be understood that there is a continual heating and cooling of the radiating pipes.

This system has an advantage over the pressure systems in mild weather in so much that it does not produce that intense heat so noticeable and so very disagreeable, but in extremely cold weather this Vapor System does not produce sufficient heat to maintain a proper degree of warmth in the cars without considerable waste of steam.

It will be noticed that the operation of all of these systems depends primarily upon a diaphram in other means for gaining expansion and contraction within the trap and the successful operation thereof depends upon the adjustment of this dia-