

traps is the same so that it is the common practice to open nearly all of the ventilators in the car in an attempt to control the temperature. It will be readily understood that there is being supplied and wasted a great deal more heat than is necessary to properly warm the car. After making extensive inquiries and having had considerable practical experience along this line, I have found that there is more trouble with cars freezing in moderate weather than in extremely cold weather. Of course it must be admitted that considerable portion of the trouble with heating equipments is due to the inexperience of those whose duty it is to handle them, nevertheless, it cannot be denied that any method of heating working on the gravity system will condense upon an average of seventy pounds of water per car, per hour, through the entire heating season while the system of indirect heating being placed upon the market by the company with which I am connected has shown after exhaustive tests in weather varying from freezing point down to 40 degrees below zero, to condense upon an average of but three gallons of water per car per hour. Furthermore, with this system means have been devised whereby a frozen steam trap, heating jacket, transfer pipe, or steam coil may be quickly thawed out while the train is in motion. The method of regulating the temperature of the cars with this system is such that it does not supply any predetermined quantity of steam to any particular car in the train, but each car is supplied with just sufficient steam to maintain equal pressure throughout every car in the train and consequently an even temperature is produced automatically. It will be readily understood that by equalizing the pressure throughout the train that the car which is condensing the most steam, or losing the most heat by radiation, will be supplied with the most steam, regardless of its position in the train.

Another important and very desirable feature possible only with this system is that there is no blowing of steam from the trap to endanger the lives of the travelling public nor employees.

DIRECT STEAM SYSTEM.

What is generally termed direct steam systems of heating includes all systems wherein steam from the locomotive is conveyed by means of suitable train pipes, and steam hose couplings and is used directly in the radiating pipes placed along the truss planks on either side of the car.

Under this heading are classed three separate and entirely different systems, namely: All styles of steam systems having a supply valve which admits the steam into the radiating pipes at the highest point from there it is allowed to flow (by gravity) to the lowest point where the discharge of con-