

colder than that in the riser pipe, and an aid to circulation. In some recently built cars the piping arrangement has been spoiled for just such foolish reasons. The piping of all double circulation systems should have the hot water of the one system run direct to the crossover pipe, and the other go to the opposite corner of the car to balance the heat of the two systems as far as possible.

The proper washing out, filling or draining of hot water systems has always been a trouble; various devices have been gotten up to overcome the troubles experienced. To afford an easier and simpler means Mr. Dunn, Foreman Steamfitter at Winnipeg Car Shops, devised a very simple and efficient fitting for overcoming all trouble experienced in this connection. It consisted of a "cross" fitting used as an elbow on the crossover pipe. In service the two extra connections were plugged. To wash out, fill or blow out, a brass brush was inserted in one opening in such a manner as to divide the cross into practically two ells, thus overcoming all the trouble of the steam or water going both ways at once. A somewhat similar arrangement has been designed for use in cars with crossovers above the floor accomplishing the same results.

Filling heaters on cars in trains has always been a slow job, and at a time when minutes count. Filling valves with plug cocks or rotary metal faces to make a joint are too unreliable, cut and leak too readily, and require to go to a shop for repairs. A new funnel cock, threaded  $1\frac{1}{2}$  pipe size, has been designed, using a 1" globe valve composition seat. The funnel serves also as the handle. When the funnel stands in position for filling the valve is open. Just before the funnel reaches a vertically downward position the valve is closed, with the pressure in the expansion drum and the weight of the funnel both helping to keep the valve closed. This prevents the chance of the water hose dragged along the roof of the car pulling the handle of the funnel cock open, and affords an easy means of knowing whether the valve is open or closed. It is simple, the seat can be renewed in a few minutes, and it is showing considerable improvement over the older valves.

Safety valves are also important. There are all kinds of them. It is not necessary that a safety valve for a car heater should be delicate and pop closely to a given figure; but it is essential that it should be rugged and seat tight, and it is better if the adjustment can not easily be altered. Rubber ball safety valves are too uncertain and too liable to failure. Diaphragm valves are more expensive than is necessary, and also they are more apt to leak. A very simple valve is one