too moist for comfort. Ruttan of Cobourg passed the air over water. This proved not so effective, but the car was dryer; yet his system collected so many impurities in the purposely contracted passages, that it was not used with success on long trips. A double roof with the open space between, bell-mouthed at each end, and the lower roof perforated, will act as efficiently as a distributing flue in securing full admission of air (and a double roof insures a cool ceiling), but it is no nearer to the securing of clean air, and much increases the fire risk. A fan, worked from the car axle, drawing its air supply through gauze-covered opening in the *side* of car, passing it over an ice box, distributing it around top of car from a 6 in. tube and exhausting through the floor, has proved very effective when the car was running at full speed; but when going slow, or climbing grades, it did not give sufficient supply, and passengers were provoked to break the windows which (necessarily in this as in all artificial systems) had been fastened down. It should not be forgotten that all similar schemes result in a car being oppressively close when it is not in motion.

There are several patents for taking air in front of the engine, warming or cooling it there as required, and forcing it to each car through a continuous train pipe by an independent steam motor. The bulk size of the apparatus involved will probably discourage experiment in this direction until all other possible expedients have failed.

For purifying the air there seems be no scheme equalling that of W. D. Mann, who says, "taking my cue from nature's provision in the human nose..... I have adopted a 'nose' through which all air is obliged to pass. This consists of a mass of 'excelsior' (fine wood shavings like hair), held loosely by spindles of wire, and kept moist by the melting of ice over it..... the air being first discharged directly on the surface of a large pan of water, the product of the melting ice."

LIGHTING.—The existing sources of artificial light are candles, oil, gas (coal, oil, water), and electricity. Candles are wanting in brilliancy, cleanliness and safety, and are not now used. Oil has been roundly abused in the public press and in some State Legislatures; nevertheless mineral oil of 300° fire or flash test is, all things considered, a safe source of light—absolutely so if there be no other source of fire in the car than the lighted lamp itself. Certainly there are but few, if any, cars destroyed by fire in summer, when the increased train service partially balances the fewer hours per night that lamps have to burn, and, if steam warming be adopted, all trains will, in winter, be as safe from fire risk as they now are in summer.

Coal-gas carried within wrought iron reservoirs, under a pressure of