III.—DESCRIPTION OF THE UNITED STATES FISH COMMISSION CAR NO. 2, DESIGNED FOR THE DISTRIBUTION OF YOUNG FISH.

By Frank S. Eastman.

This car was built for the transportation of young fish from the hatching stations of the United States Commission of Fish and Fisheries to the several sections of the country to which it is desirable to transport young fish for the purpose of propagation. It is of the F. S. Eastman patent, adapted by the patentee to the special uses of the Commission, and is constructed with sufficient strength and durability to safely transport a load of 20,000 pounds over any road in the country at passenger rate of speed. It also affords comfortable and tasteful accommodations for the officers and employés of the Commission who superintend the distribution of the load.

The material used in construction is of the best quality of its several kind, and put together in the best and strongest manner.

Plates I and II represent the general appearance outside of the car. Having been built at the car-shops of the Baltimore and Ohio Railroad Company the name of their road is by courtesy retained upon the letter-board, but that in no way signifies ownership. It is of the standard passenger car style, with moderate ornamentation. It has two six-wheel standard trucks of 4 feet 8½ inches gauge, each truck complete in all its parts, fitted with springs of unusual strength and standard quality. The brakes are of the Westinghouse air patent, complete in all their details, ready for attachment to any passenger train. The Miller platform has been used, with Janney couplers and continuous draw-bar. The car has extra suspension trusses under the intermediate as well as under each outside sill, springing over body bolsters, and attached to head frames. The doors at the sides are for convenience in handling the cans containing the young fish into and from the middle and refrigerating compartment of the car.

Plate I shows the side opening and the cans in process of handling, with the grating for protecting the side of the car from injury, which is thrown up when the doors are closed.

Plate III shows the interior arrangement of the middle section of the car, with the covers to the refrigerator chambers in place. The seats for passengers are hung up and out of the way to facilitate work among the fish cans. The intermediate sills of the car are spaced to conform to the dimensions of the refrigerator chambers, with diagonal brace and counter-brace, post and panel, trusses constructed upon them; each

brace with counter tension-rod, and each post with continuous tension-rod through plates and sills. These trusses spring from the ice boxes located over the body bolsters of the car, and form the inside walls of the refrigerator chambers. The top cords of the auxiliary trusses are 30 inches above the floor. The spacing of the floor, sides, and roof-framing of the car is of standard dimensions. The carlins and rafters are of the usual size, and the carlins in the vicinity of the ice boxes pass across the car from wall plate to wall plate, with binding rods in the floor and roof structure. The roof is of first-class car pattern, with lights and ventilators spaced and paneled as in a first-class passenger car. The general arrangement and details of the floor, wall, and roof framing is that of a passenger car strengthened for transportation of a load of 20,000 pounds at passenger rate of speed.

There are four ice boxes, two near each end, and over the trucks of the car. The space between the ice boxes forms the passage from the middle to the end compartment of the car, with communicating doors. The ice boxes have corner and intermediate parts framed to sills, plates, and carlins of the car in a most substantial manner. They run from the floor to top of the wall plates of the car, and the exterior of the ice boxes conforms to the finish of that portion of the car in which it is located. The ice boxes on each side of the car are connected by a low, continuous refrigerator chamber as shown in the plate. The top, floor, exterior and interior sides of refrigerator chambers and ice boxes are filled with cork used for non-conducting material. The top of the chambers are fitted with covers which admit of easy access to the interior, in which the cans of fish are placed. The refrigerator chambers are 34 inches wide, 26 inches high, and 34 feet in length, inside measurement. The ice boxes are capable of carrying 3,000 pounds of ice.

The whole interior of ice-boxes and refrigerator chambers are lined with zinc, and admit of being easily drained and cleaned.

The middle section of the car is fitted with four sleeping berths, and forms an attractive and comfortable saloon for the accommodation and comfort of the employés of the Commission accompanying the car, while the young fish are transported in the low refrigerator chambers, cooled by the circulation of the cold air from the ice-boxes, and rendered easy of access by the removal of the covers.

Plate IV represents the covers thrown back, and showing cans in refrigerated space, also showing the method of handling the cans through the side door, and of running them lengthwise of the car on the traveling truck suspended on the bar passing overhead the whole length of the compartment.

Plate V shows the office end of the car, and looking through open doors into the middle section. The manner in which officers and employés accompanying the car are accommodated with meals is shown in this plate, where also the seats for their accommodation are shown in place. The office is fitted with sleeping-berth, wash-room, and closet

for a Baker heater, which supplies heat through pipes running under floor grating to the compartments, without affecting the temperature of the refrigerator chambers in which the fish are transported.

Plate VI represents the sleeping-berths prepared for the occupants, with side doors open for ventilation.

The end of the car opposite the office is furnished as kitchen and pantry. The pantry is desirably shelved and fitted with tray and drawers. The kitchen space around the stove is arranged for the proper stowage of utensils, and the sink has a waste-pipe through the floor of the car.

In the same end, on the opposite side of passage, is the pump and blower room. By means of this pump and blower a circulation of water and air is sustained for supply to the young fish in the cans, which are connected by a system of pipes and rubber hose, which permits a perfect circulation through them. Suspended in each ice-box is a galvanized iron tank, separated from the ice by a hinged 3-inch grating, which contains fresh aerated water for supplying the waste through the circulating system. The pump and blower are actuated by means of a friction roller which bears upon the tread of the truck of the car and communicates its motion to the machine-room by means of belts and pulleys.

The load on the car is so distributed as to make it unusually safe and easy running at high rates of speed, and the extra trusses forming the inside walls of the refrigerator chambers give the car superior strength and rigidity.