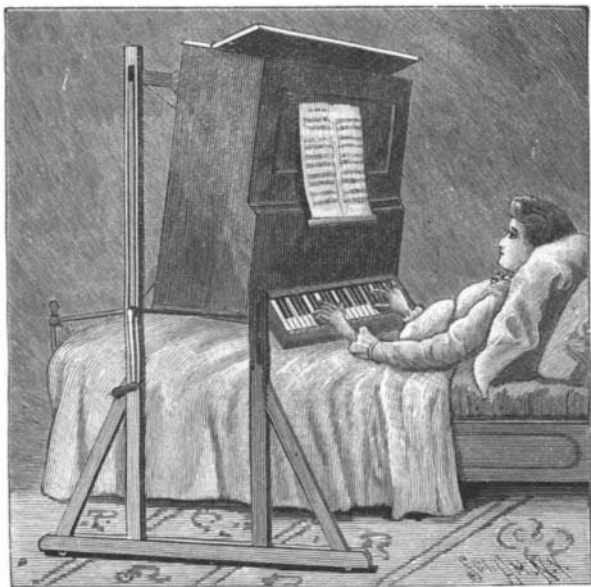


**A PIANO FOR INVALIDS.**

One of the things which physicians have to contend with is the lack of occupation for the convalescent. The case may be a surgical one, leaving the faculties perfectly unclouded, yet the patient must lie for days upon the bed with no other amusement than reading or conversation.

We illustrate a piano for invalids which will be a boon to many a sick musician. On each side of the bed are the uprights of a frame, the base being mounted on casters. This frame supports a small upright piano. Adjusting devices are provided which will enable the piano to be firmly secured in any desired position. The keyboard is inclined so that the keys may be easily reached by the sick person. Of course, such a piano would almost necessarily be a luxury for the rich, but there seems to be no good reason why it should not be rented for cases of temporary illness and in



**A PIANO FOR INVALIDS.**

some private sanitariums, where the music would not be disagreeable to the other inmates.

This instrument has been put upon the market in England, but we believe that it has not yet been introduced into this country.

**THE TRANSPORTATION BY RAIL OF FISH AND FISH EGGS.**

The United States Commission of Fish and Fisheries have just published an interesting work entitled "A Manual of Fish Culture, Based on the Methods of the United States Commission of Fish and Fisheries, with Chapters on the Cultivation of Oysters and Frogs." By kind permission we are enabled to present some engravings of the United States Fish Commission car.

The work of the United States Commission of Fish and Fisheries is carried on at twenty-five stations or hatcheries located at suitable places throughout the country. At Wood's Hole and Gloucester, Massachusetts, cod, mackerel, lobster and other important marine species are propagated and the fry are deposited on the natural spawning grounds along the coast. At Battle Creek, Baird and Hoopa Valley in California, at Clackamas in Oregon and Little White Salmon River, Washington, the eggs of the Pacific salmon are collected and hatched, and the fry are planted on the spawning-beds in the neighboring streams. The Atlantic and land-locked salmons are cultivated in Maine at Craig Brook and Green Lake to restock the depleted streams and lakes of New England and northern New York. On the Great Lakes, at Cape Vincent, New York; Put-in-Bay, Ohio; Alpena, Michigan; and Duluth, Minnesota, the work is with whitefish and lake trout, in order to sustain the great commercial fisheries conducted for those species. Hatcheries in the interior at St. Johnsbury, Vermont; Wytheville, Virginia; Northville, Michigan; Manchester,

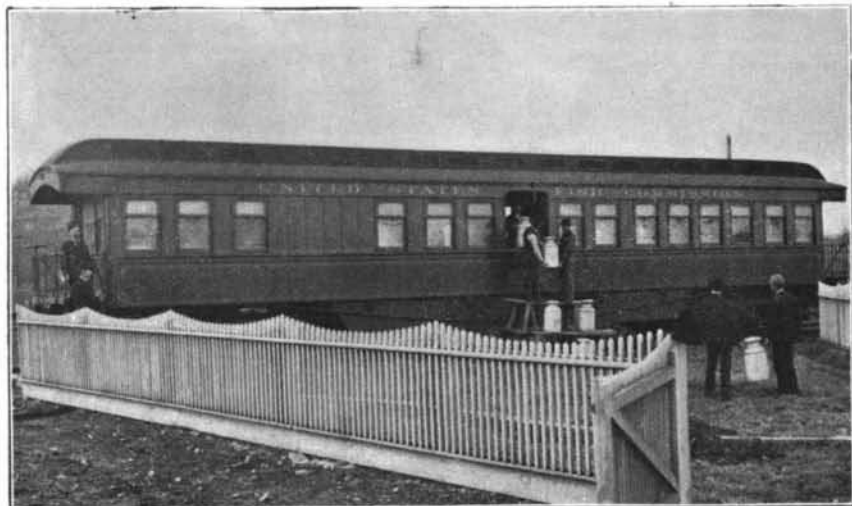
Iowa; Bozeman, Montana; Neosho, Missouri; Quincy, Illinois; San Marcos, Texas; and Leadville, Colorado, are devoted to the important work of maintaining in the inland lakes and streams the supply of brook trout, rainbow trout, black bass, crappie and other fishes. During the spring, on the Potomac, Delaware, and Susquehanna rivers, shad are hatched and are distributed in suitable streams along the Atlantic coast. For the distribution of fish and eggs the commission has four cars specially equipped with tanks, air-circulating apparatus and other appliances.

During the earlier years of the Commission young fish were carried by messengers in baggage cars on regular passenger trains, but as the work increased it was found that this method was inadequate and other arrangements must be made to transport the large number of fish which were being hatched. Accordingly, in 1879-80, experiments were successfully made in moving shad fry in specially equipped baggage cars, and it was found that large numbers of fish could be economically moved with little loss. A car was then constructed specially adapted for the distribution of live fishes, the requirements of such a car being a compartment for carrying the fish in which an even temperature could be maintained. Proper circulation of air and water in the vessels containing the fish and sleeping and living accommodations for the messenger attending them were also provided. A baggage car which was 51 feet long, 9 feet 10 inches wide, and 13 feet 8 inches high was purchased. At one end of the car was a room, containing a stove, sink and berth for the use of the cook, besides a boiler, pump, etc., and at the other end were two sections of berths like those in a Pullman car, which would accommodate two men at each side.

Each compartment was about 7 feet long. In its center was a refrigerator compartment 30 feet 3 inches long, extending up to the clear story. The ice was carried in racks holding one ton each, which were located in the corners of the refrigerator diagonally opposite each other. Cylinder cans placed on galvanized iron tanks, 9 feet 4 inches long, 28 inches wide and 8 inches high, were provided in which to carry the fish. The tanks were placed on opposite sides of the car, with a passageway between them. An apparatus for circulating water was arranged, a long semicircular iron tank being carried on the roof. From this the water was brought into a 6-inch pipe extending all around the refrigerator compartment. The pipe contained a sufficient number of pet-cocks to supply the number of cans carried, the water being conveyed to the cans through rubber tubing. From the cans it passed into tanks through the same size tubing, which was turned into 2-inch pipes underneath the car, and from these pipes was pumped up to the tank in the clear story. This circulating apparatus worked well, but this arrangement necessitated carrying a large amount of

water in the top of the car, thus causing it to roll from side to side in such a manner as to make it unsafe. Another car was built to remedy this and other defects.

The Commission now has four transportation cars in use. They differ somewhat in construction, and the car known as No. 2 is regarded as the best type. It is equipped with six-wheel Pullman trucks, paper wheels, combination couplers, etc., so that it can be hauled on

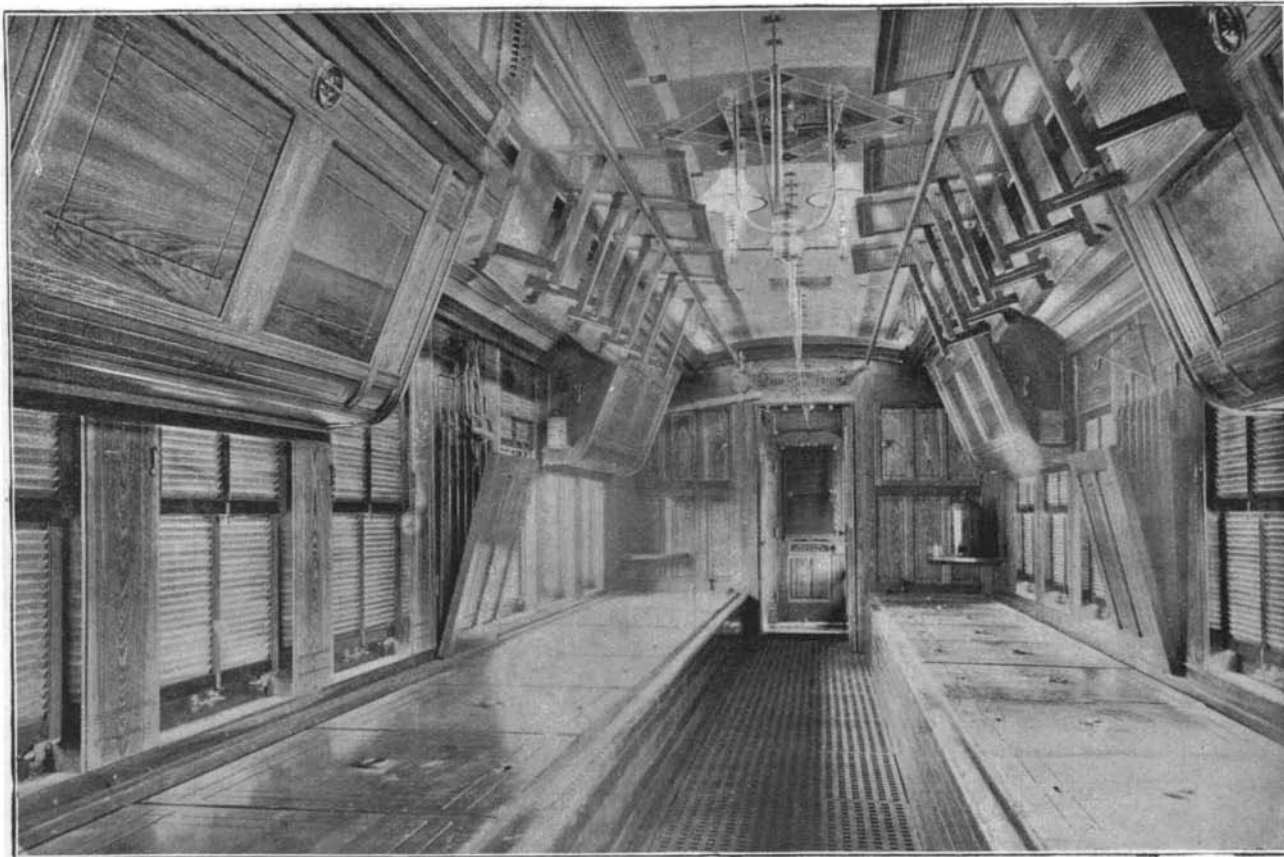


**UNITED STATES FISH COMMISSION CAR LOADING AT NEOSHO, MISSOURI.**

passenger trains. Underneath, between the trucks, are boxes for carrying provisions, tools, etc., and a water tank. Inside, the car is finished in white ash, and due arrangements are made for the comfort and convenience of the crew. At one end is an office for the use of the captain and at the other end is the kitchen and the 5-horse power boiler, steam pump and air pump.

The fish are carried in tanks or cans arranged into refrigerating compartments each side of the passageway. These compartments have two upper berths at each side for the accommodation of the crew. The refrigerating chambers are 26 inches high, 34 inches wide, and are provided with lids; the partitions are filled with cork, which is used on account of its non-conducting properties. At one end of the chambers is an ice-box which holds about three fourths of a ton of ice. The transportation tanks used in carrying yearling and adult fishes are made of heavy galvanized iron, and are 27 inches long, 27 inches wide and 24 inches deep, holding 52 gallons each. They are heavily coated with asphalt before being used. For the transportation of fry ordinary 10-gallon iron cans of tin are used. The supply of water is carried in an iron pressure tank of 500-gallon capacity which is located in the body of the car next to the office. The water is circulated by a steam pump through galvanized iron piping which runs from the pump to the pressure tank, thence along the sides of the refrigerator to the transportation tanks, whence it flows by gravity to a tank below the floor, from where it is pumped into the supply tank for distribution. In order to provide sufficient air circulation, the air is driven by a pump to a 30-gallon reservoir in the top of the car, over the boiler room, from which it is taken to the transportation tanks or cans through two lines of iron piping running along the sides and top of the car.

One pet-cock is placed in the pipe for each tank to be supplied with air, which comes to it through a hole  $\frac{1}{8}$  of an inch in diameter. From the pet-cock the air is carried into the tank with rubber hose and released in the water through liberators made of American linden placed in hard rubber holders. This car is also fitted with a hatching outfit. Our engravings show the exterior of the car and the interior, with berths and chairs which hang up so that the compartments can be opened.



**INTERIOR OF FISH TRANSPORTATION CAR SHOWING BERTHS AND CHAIRS.**

TRAFFIC on the railroad between Tientsin and Pekin has increased so much that a double track must be laid at once.