thermometer which for weeks at a time stays in the neighborhood of zero, frequently descends to 40° below. On the other hand, California crude oil has the consistency of molasses and cannot run or be pumped unless it is at a temperature of 60° F. This oil to be delivered from the service tank to the locomotive must be heated to at least 100° F. and not more than 110°, as a higher temperature would start evaporation of the volatile parts, thus reducing the efficiency of the said oil as a fuel. From the above data it is evident that the proper heating of this oil is a question of great economic importance, and the design, therefore, has been worked out to meet the above conditions.

Each fuel station, at the various divisional points, is located at 400 feet from the centre of the roundhouse near the boiler room, from which the necessary steam for heating is obtained.

The station is composed of two buildings, one 20 x 20 x 35 feet, containing in the basement a receiving tank with a capacity of 8,400 Imp. gal., on the ground floor a set of two pumps, indicators, etc., and on the upper floor a service tank with a capacity of 21,000 Imp. gal. The other building of dodecagonal form, 56 feet x 27 feet high, contains the storage tank with a capacity of 350,000 Imp. gal.

The service tank delivers the oil to the outbound track and a storage track is located between the two buildings. The building of the service tank rests on a concrete foundation forming the basement and is composed of a wooden structure, covered on the outside with corrugated galvanized iron nailed to ship-lap and on the inside with ship-lap, hair insulator, nailing strips and ship-lap. The building containing the storage tank is a wooden frame structure resting on concrete foundations and covered with a roof made of five-ply roofing on ship-lap and the sides made of ship-lap, hair insulator, nailing strips, ship-lap and corrugated galvanized iron.

The receiving tank, which replaces the concrete sump generally used, will overcome the difficulty of heating and maintaining a concrete structure, which is almost impossible to keep water or oil-tight, especially where the ground is soft as it is at McBride and Smithers.

The receiving and storage tanks include a new feature in the design of their bottoms. Usually these large tanks have a bottom composed of rectangular plates with lap joints, which have to be assembled and riveted in the field. The assembling and riveting of such a large bottom is very difficult and has to be done on staging, which afterwards has to be removed while lowering the bottom to the ground. This is often the cause of deformation and rupture of rivets and plates and the disturbance of the foundation ground, which ought to be well levelled. It is not an unusual occurrence to be obliged to raise the tank several times before water-tight joints are finally obtained. Besides these difficulties, it is very hard to completely clean the bottom of the tank when necessary or to replace parts affected by rust or other causes of deterioration. To overcome all of these difficulties the bottom of the tank is divided into segments of such a size as can be readily furnished by the mills. These segments have small angles shop riveted on them, the vertical legs of which are punched in order to connect the different segments together by riveting in the field. The whole bottom has a slight grade towards the centre, which is made of a shallow tank one foot deep, shop riveted and with the top angle turned inside; on this top angle the narrow ends of the segment are riveted. This arrangement allows the foundation, made of gravel and sand, to be well prepared, rolled to a true surface after the placing of the centre part, then the different segments are placed side by side, temporarily bolted and the riveting is done without disturbing the bottom. In case of accident, the replacing of a part is easily accomplished by cutting the rivets in the vertical legs of the angles.

To operate these fuel oil stations one to three cars, placed on the storage track, are located so as to have their outlet pipes directly over cast iron catch basins which carry the oil through 8-inch pipes direct to the receiving tanks. Steam pipes going through the said pipes are used to heat the oil running through the pipes and also the oil in the cars, by means of hoses connecting the ends of the steam pipes to the heating systems in the cars. The oil in the receiving tank is heated, if necessary, by a set of steam coils placed in the centre; the temperature being controlled automatically by a regulating valve, which will keep a constant heat of 60° F. This oil can be pumped direct to the service tank or to the storage tank through a 6-inch pipe, ended with an articulated galvanized iron spout to the extremity of which is attached a float keeping this extremity from two to three feet below the surface of the oil. To the float is attached a cable which works the indicators placed in the pump room. When there are no oil cars available the oil is taken from the storage tank and pumped directly to the service tank. The suction line is an 8-inch pipe leading from the floor of the storage tank directly underneath the tracks to the pumps. Both the inlet and outlet suction pipes together with steam lines, passing between the two buildings, are enclosed in wooden conduits. Each pump is of sufficient capacity to fill the service tank in two hours. Both pumps can be operated together in case of rush, and either pump may be shut off allowing the other to work.

A system of steam coils, with a regulating valve, is placed in the storage tank, in order to keep the constant temperature of 60° required around the suction pipe. A set of steam pipes with a regulating valve, giving a constant temperature of 100 to 110° F. is also placed in the service tank. The oil from the service tank is delivered directly through a spout to the locomotive placed on the outbound track. This spout, when not in use, is raised and protected from the weather in a recess built in the side of the building. A "Bowser" self-regulating pipe line measure is located on the delivery pipe in order to indicate the amount of oil delivered to each engine.

The steam necessary for heating and pumping in these stations is provided from the boiler room of the roundhouse through a 4-inch steam main at a pressure of 60 lbs. per square inch.

All the above conveniences to handle oil properly would be off-set if the proper cars, to transport the oil from Prince Rupert to the different divisional points, where not provided. The ordinary oil tank car which is generally used is certainly not suitable for this country, and especially for a long haul, economical handling, and quick service.

The ordinary tank is usually of too small a capacity, *i.e.*, 8,000 U.S. gallons, which would mean transportation of a comparatively heavy dead-load for a small quantity of fuel. This would not be economical on a long distance. A great objection to the ordinary car also, is that the valve is located above two feet off the centre line, which means that in making up a train, careful attention has to be taken to have the cars headed the same way, which in railway practice is almost an impossibility. Another great objection to the ordinary tank car is the small opening in the dome which is generally closed by a round cover,