

SACRAMENTO NORTHERN MARINE DIVISION

For over 21 years, Sacramento Northern's *Ramon* has been the only electric train ferry in the world. This ferry boat which plies the Suisun Bay between Mallard and Chipps was hailed in 1928 as the world's smallest car ferry, but at the time of her construction in 1914 at Pittsburg, California, by the predecessor Oakland Antioch and Eastern, she boasted the world's largest marine gas engine. This 600-horsepower, distillate-burning, 8-cylinder engine, which still powers the *Ramon*, was built by the Union Gas Engine Company of Oakland, California. Even by today's standards, its 44-foot length is impressive.

The 236-foot long, steel-hulled *Ramon* with her 58-foot beam, draws a maximum of 12 feet of water. She is a propeller-driven double-ended vessel, and she was built to replace the ill-fated *Bridgit* which was destroyed by fire, Thurs-

day, May 7, 1914, after less than a year's service. The Oakland Antioch and Eastern had plans under way to bridge the 2,000 feet of water that divides the electric railway between Oakland Sacramento into two sections when the *Bridgit* and the *Ramon* were built.

On Wednesday, July 2, 1913, the *Bridgit* had the honor of ferrying the first electric train between Chipps and Mallard. This train which carried officials of the then new electric railroad was the first electric train to run from Sacramento to Oakland. The *Bridgit* had just arrived from her builders the day before. She was built by Schultze, Robertson, and Schultze, of San Francisco, in 1913.

Unlike the *Ramon*, the *Bridgit* was a wooden-hulled vessel, but she had the same three-track arrangement and overhead trolley wires that the *Ramon* has today. Like the

Ramon, she could handle six interurban passenger cars or eight freight cars. The *Bridgit* was 186 feet long with a 57-foot beam and drew 13 feet when loaded. On September 3, 1913, the regular electric train service between Oakland and Sacramento began.

However, the *Bridgit* was not the first electric car ferry to have been built, although she was the largest at the time of her construction. On August 1, 1912, a gasoline-powered sidewheeler, the *Henderson*, began carrying electric interurban cars between Evansville, Indiana, and Henderson, Kentucky, on the Ohio River. This little steel-hulled boat could only accommodate two 50-foot interurban cars on its one track. The little *Henderson* bowed out in the early 1920's leaving the undisputed title of the world's only electric train ferry to the *Ramon*. Until August, 1940, the *Ramon* was one of the attractions of the longest electric interurban passenger trip in the United States—between San Francisco and Chico. Today the *Ramon* and the Sacramento Northern serve an important role as a short line between Sacramento and Oakland for Western Pacific freight.



Large Motor-Driven Railway Train Ferry, "RAMON"

This description of the building of the "RAMON" was sent in by George Comer and is from the July 1915 "International Marine Engineering" magazine.....

Probably the most noteworthy motor-driven vessel outside of Europe has been completed recently in California, and is at the present time in continuous service. Both the hull and machinery equipment possess features of unusual interest to those who have followed marine engineering developments of the past few years, and the progress of this installation has been watched with considerable interest by Pacific Coast engineers.

The *Ramon*, as this vessel was christened, was built by the Oakland, Antioch & Eastern Railway

and is being used to transport their trains across an arm of San Francisco Bay. The main line of this road operates between Sacramento and San Francisco, Ca., through the rich farming lands found in the deltas of the San Joaquin and Sacramento rivers, and the construction of the road over this low-lying country has necessitated building many miles of bridges and trestle work. At one point a considerable expanse of water had to be crossed, and it was decided that the most feasible way for negotiating this stretch would be to ferry the trains

The *Ramon* commences her 10-minute run across the Suisun Bay with a freight gondola and the sole remaining passenger car MW-302 on May 15, 1948. She is shown leaving the west terminal of Mallard on the occasion of the yearly official inspection trip of S. N. Railway officials.

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over on a boat. This method has been used for a great many years by the Southern Pacific Railway at a similar point in connection with their transcontinental line.

In considering the construction of a suitable vessel, the engineers of the road had three main considerations to take into account, namely, reliability, economy, and time of delivery. Of course it might be said that the first two are the prime considerations for any marine installation, but they were of especial importance in the present case on account of the nature of the service for which the vessel is intended. Reliability was a vital point, as the schedules of the whole system would be upset by any interruption in the service of this boat, which, as stated above, was to operate at a point on the main line of the road. The relative

economy of steam and internal combustion engines in intermittent service was carefully considered, with the result that the latter were adopted principally on account of the saving effected by this type of power between trips. It was also found that the use of distillate (paraffin) engines would reduce the size of the boat and the number of men necessary for its operation. The short time of delivery required for the complete installation was the consideration that influenced the design of the hull to a large extent, necessitating a departure from usual practice in order to expedite construction. The time factor also worked to the advantage of an oil engine equipment.

The hull of the Ramon is built entirely of steel, which was manufactured by a local rolling mill and erected by the railroad co. The total weight of the steel used amounts to 320 tons.

The principal dimensions of the Ramon are as follows: Length over all, 236 ft; breath 58 ft; maximum draft, 12½ ft.

On account of the short time allotted for the construction of the vessel all curved plates were eliminated and a box-like design was adopted which allowed for the use of flat plates throughout. The hull is built about a central girder formed by two longitudinal bulkheads extending the entire length of the boat. In this way extreme

longitudinal stiffness and general rigidity have been obtained. The engine room is located between these two bulkheads, thus providing an exceptionally stiff engine bed necessitated by the length of the engine--i.e. 46 ft. The fore and aft limits of the engine room, which is 70 ft long by 13 ft wide by 16 ft deep, are determined by two transverse bulkheads extending the entire width of the vessel. These two additional bulkheads divide the hull into eleven watertight compartments, making it well nigh unsinkable. At either end of the engine room is located an intermediate deck, on which the auxiliary machinery is located.

It will be seen from the side elevation that there are two deck houses which form the base for the pilot's bridge. These houses will contain toilets, a lamp room and cabin.

The crew's quarters, galley and dining room, seating sixty people, are located below decks.

At either end of the boat there are two steel towers for carrying the trolley wires which make contact with the wires on the apron through switches controlled from the pilot house. The three tracks on deck will each be 220 ft. long, accommodating a total of twelve passenger coaches. The rails will be flush with a wooden deck which thus insuring the safety of passengers promenading while the boat

is in transit. The propeller and balanced rudder on either end will be protected by a skag constructed of two 10-inch ship channels with a 10-inch by 16-inch timber between them.

The propelling machinery of the Ramon possesses unusual interest, as it consists of the largest internal combustion motor of the electric ignition type ever built in any part of the world. This fact can be appreciated when it is stated that the completed engine will weigh approximately 100,000 lbs., its total length being 46 ft.

The engine is an eight-cylinder unit designed to develop 600 horsepower at a normal speed of 200 revolutions per minute. It is an "open crosshead type" engine, and its construction has been undertaken by the Union Gas Engine Co. of San Francisco. This type of distillate (paraffin) engine is perhaps one that will not be familiar to British engineers, as it has been developed solely on the Pacific Coast. The open crosshead in this case is slightly different in design from that which obtains in steam and large diesel installations, and consists of a water jacketed extension on the lower end of the cylinder which acts as a crosshead guide. The piston is exceptionally long, and the lower end, which holds the wrist pin, acts as a crosshead. There are openings fore and aft in both cylinder and piston, thus allowing a circulation

INTERNATIONAL MARINE ENGINEERING

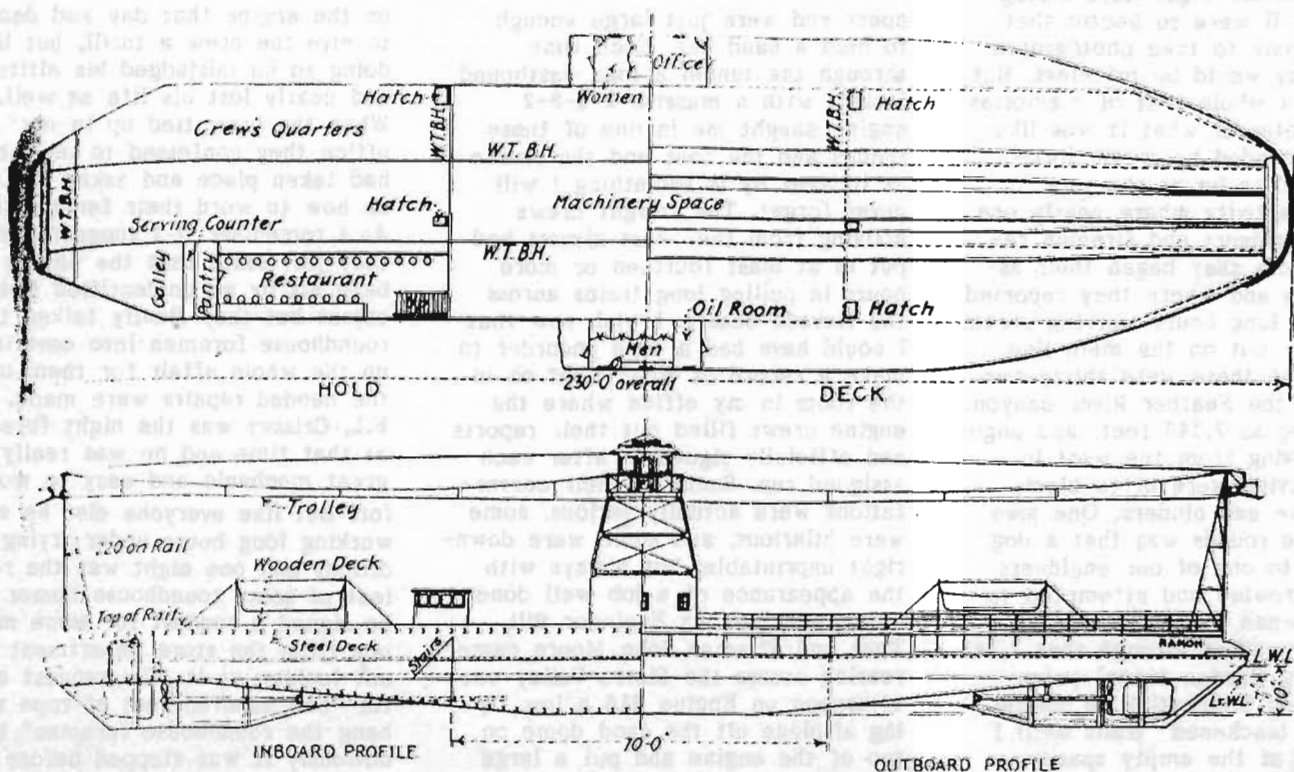


Fig. 4.—Deck Plan and Outside Profile of the Ramon

of air about the wrist pin. The inlet and exhaust valves are disposed on either side of the cylinder in the familiar "T" head arrangement; the exhaust valves are water cooled. It will be seen from the profile of the engine room arrangement that the cylinders are grouped in four pairs to correspond to the four sections of the crank shaft.

The fuel that is to be used is known on the Pacific Coast as "engine distillate" and corresponds closely to British "paraffin". The vaporizing device consists of two carburetors used in connection with two jacketed inlet manifolds of special construction, heated by the exhaust gases in order to prevent condensation of the heavy fuel.

Each manifold supplies four cylinders. Lubrication of the cylinders and bearings will be accomplished by means of force feed lubricators mounted on the back of the engine and driven from the cam shaft. The crank-pin bearings are lubricated by a centrifugal ring oiling device mounted on each crank web and connecting with oil holes leading out to the center of the crank-pin.

The engine is placed in the center of the hull and is connected to a four-bladed propeller, 72 inches in diameter, on either end. The Ramon as stated above, is double-ended, and in order to eliminate the necessity of a reverse gear the two propellers are made of opposite pitch and are thrown in and out of action by a clutch mounted on each end

of the engine. At one end of the engine room a 20 horsepower, two-cylinder, distillate engine is belted to a generator for supplying current for lighting purposes about the ship and also to the coaches in transit.

This installation of 600 odd horsepower will require only one engineer in the engine room, which will be a considerable reduction in the number required for a steam plant of equal capacity. The greatest saving, however, will be shown in the elimination of all fuel expense while the vessel is tied up at the wharf, and it is this consideration that will undoubtedly lead to the further development of the internal combustion engine for ferryboat service, especially about San Francisco Bay, where this type of vessel is used to a large extent.



SURROUNDED BY STEAM LOCOMOTIVES DURING THE GRAND AGE OF STEAM

Unfortunately those days during World War II were so hectic that I had no time to take photographs which today would be priceless. But I do have a whole host of memories and anecdotes of what it was like to be surrounded by steam locomotives and to be at the very center of activity where nearly one hundred engineers and firemen reported before they began their assigned runs and where they reported back after long hours working steam locomotives out on the main line. At one time there were thirty-two tunnels in the Feather River canyon, one as long as 7,343 feet, and engine crews arriving from the west in freight service were often black from smoke and cinders. One joke making the rounds was that a dog belonging to one of our engineers actually growled and attempted to bite him when he arrived home. I personally walked through that 7,343 foot Spring Garden tunnel twice using a long broomstick to scrape along the blackened walls until I found one of the empty spaces which were about one fourth mile

The second part of John R. Daly's article of steam in Portola

apart and were just large enough to hold a hand car. Each time through the tunnel a long eastbound freight with a massive 2-8-8-2 engine caught me in one of those spaces and the roar and the smoke as it went by is something I will never forget. The freight crews arriving from the east almost had put in at least fourteen or more hours in pulling long trains across the Nevada desert. I wish now that I could have had a tape recorder to make a record of what went on in the room in my office where the engine crews filled out their reports and officially signed in after each assigned run. Some of their conversations were actually serious, some were hilarious, and some were downright unprintable, but always with the appearance of a job well done.

For example, as Engineer Bill Tout and Fireman John Moore came roaring across the Sierra Valley one afternoon on Engine 316 a low flying airplane hit the sand dome on top of the engine and put a large hole in it. The pilot knew who was

on the engine that day and decided to give the crew a thrill, but in doing so he misjudged his altitude and nearly lost his life as well. When the crew tied up in my office they confessed to me what had taken place and asked my advice on how to word their federal report. As I remember it I suggested that they just state that the engine had been hit by an unidentified flying object but they finally talked the roundhouse foreman into covering up the whole affair for them until the needed repairs were made. F.L. Crissey was the night foreman at that time and he was really a great mechanic and easy to work for. But like everyone else he was working long hours under trying conditions and one night was the recipient of some roundhouse humor when he signed a request for some materials from the store department without looking at it. The request asked for "one hundred feet of rope to hang the roundhouse foreman" but obviously it was stopped before it