Originally there were 838 wooden tressels and bridges along the route; these have been reduced to 257, all being constructed of iron or steel; the longest 200 feet, the shortest 50 feet. This wholesale elimination was achieved by filling in tressels, and replacing the smaller span bridges with culverts in solid banks. The bridges were designed for consolidation (2—8—0) engines, with 44,000 lbs. per driving axle, and train loads of 4,000 lbs per foot of track.

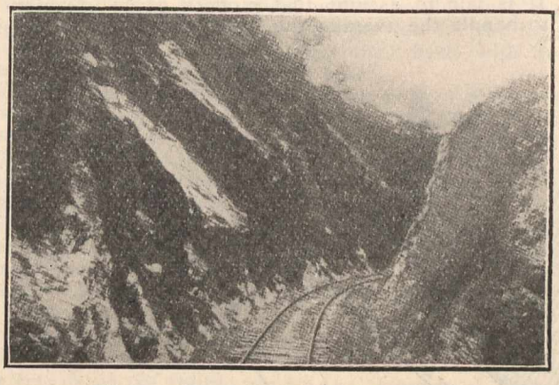

Fig. 5.—Example of Rock Cutting.

According to Mr. Whitfield, there were in 1899, 16 engines mostly of Belgian make, with two heavy Baldwin Mogul freight locomotives. The heaviest engines (2—8—0) are of 67 ton consolidation; ten wheel type (4—6—0) are also in use. Some of the engines were designed for oil fuel, and others are being fitted to use this fuel. Oil from Beaumont, Texas, is used, being brought by tank steamers to Coatzacoalcos, where there is a storage tank of 1,500,000 gallons' capacity. It is distributed to 6,500 gallon tanks located at various stages along the railway. Since oil has been discovered on the Isthmus, it is expected shortly to furnish from the local wells, all the oil needed for engine fuel. Many of the box freight cars are provided with roof openings 10 x 8½ feet, covered by steel sliding doors for facilitating the direct haulage of freight by the dock cranes. The rolling stock equipment comprises a special weed-killing car, from which is sprayed by steam a hot chemical solution, over the rank vegetation which grows almost in a night on the tracks in the humid tropical section of the Gulf watershed. The main workshops were at first located at Coatzacoalcos, but have been removed to Ruicon Antonio, at the height of land, where a model town for the employees has been laid out. The average weight of freight trains is 560 tons, and the trip across the Isthmus is made in 13 hours by freight, and 9 hours by passenger trains. There are 30

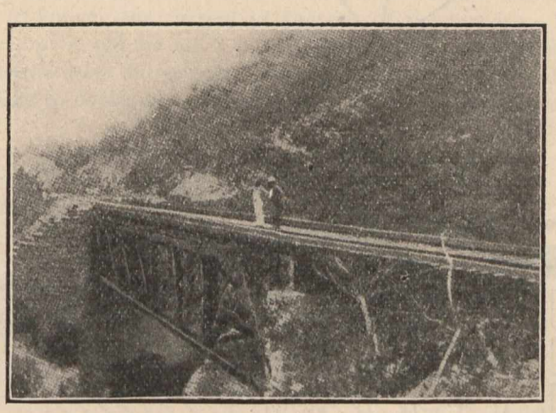

Fig. 6.—Typical Steel Bridge.

passing sidings, 2,000 to 3,000 feet long, with a maximum distance of seven miles between sidings. The present traffic is 75,000 tons per month.

Harbors and Terminals.

At Coatzacoalcos, the Atlantic terminus, there was at first an old-fashioned wharf, two or three hundred yards up the river, with a shallow sand-bar at the mouth, over which it was impossible for large steamers to ride in during the "northers," i.e., "a very rough sea with a gale of wind blowing from the north;" a phenomenon of frequent occurrence. But as the wide river is 50 feet deep, and hence provides an admirable inland harbor, it was only necessary to increase the depth of water at the bar from 12 to 30 feet, to admit the largest vessels afloat at all tides. This will be accomplished in a few months by dredging, aided by the converging jetties or training walls 4,265 feet long, built of loose quarry rock. The old wooden wharf has been replaced by a series of structural steel wharves, having a total frontage of 3,640 x 85 feet wide, supported on 6" solid steel piles, and decked with timber. The wharf tracks are to have six 5 to 10 ton electric cranes; six 10 to 20 ton steam cranes; six sets of conveyors and electric capstans for handling cars; which, together with the lighting of the adjoining town, are operated from a central power station. Behind the wharves and steel sheds is the railway terminal yard, embracing 13 miles of tracks. Gravity is utilized on these tracks—a system which though claimed as American, is said to have originated in Great Britain.

At Salina Cruz, the Pacific terminus, the works are more extensive, and include an outer harbor formed by two huge, curved breakwaters, reaching out 3,280 feet and 1,900 feet long respectively, into 60 feet of water, and embracing an area of about 20 acres, with an inner tidal basin nearly three-quarters of a mile in length, which has been dredged out to a depth of 33 feet at low water on the site of the old town.

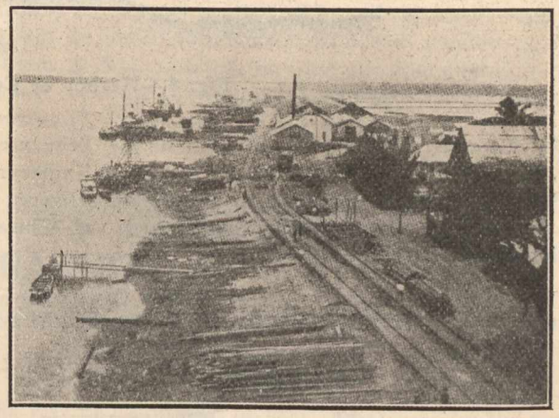

Fig. 7.—Coatzacoalcos Harbor: Atlantic Terminus.

The capacity of this basin can be more than doubled when increase of traffic demands. The wharf system and general traffic equipment is similar to that at the Gulf terminus, to which has been added a commodious graving or dry dock, 600 feet long, 100 feet wide, and 31 feet deep, and is thus capable of accommodating the largest vessels. At the wharves, berths for two 12,000-ton steamers are to be ready this month.

As the original village was on the site of the inner basin, a new town has had to be built on higher ground, near the harbor, as shown on Fig. 3. It is laid out in open squares, and supplied with modern systems of drainage, water supply, and electric lighting.

Minor steamship lines are already using the two ports; and it is calculated that by September, 1906, the harbor works at each end will be practically completed, and the whole transit system of the Tehuantepec Railway ready for transcontinental traffic; enabling the largest ocean-going vessels to discharge or load the heaviest freight alongside the commodious wharves, in all sorts of weather.

The commercial advantages of the Tehuantepec route as compared with that of Panama, were admirably set forth in an official report to the United States Government in 1870, by Admiral Shufeldt. He says:—

The fact that Tehuantepec is nearer to the "Axial" line of commerce of the world—Hong-Kong, Yokohama, San Francisco, New York, Liverpool—gives this route great advantages over Panama. An inspection of a globe will show that the shortest ocean route from Panama to the East—Hong-Kong, Yokohama—must pass along our coast to at least off San Francisco. In fact, the shortest line, the great