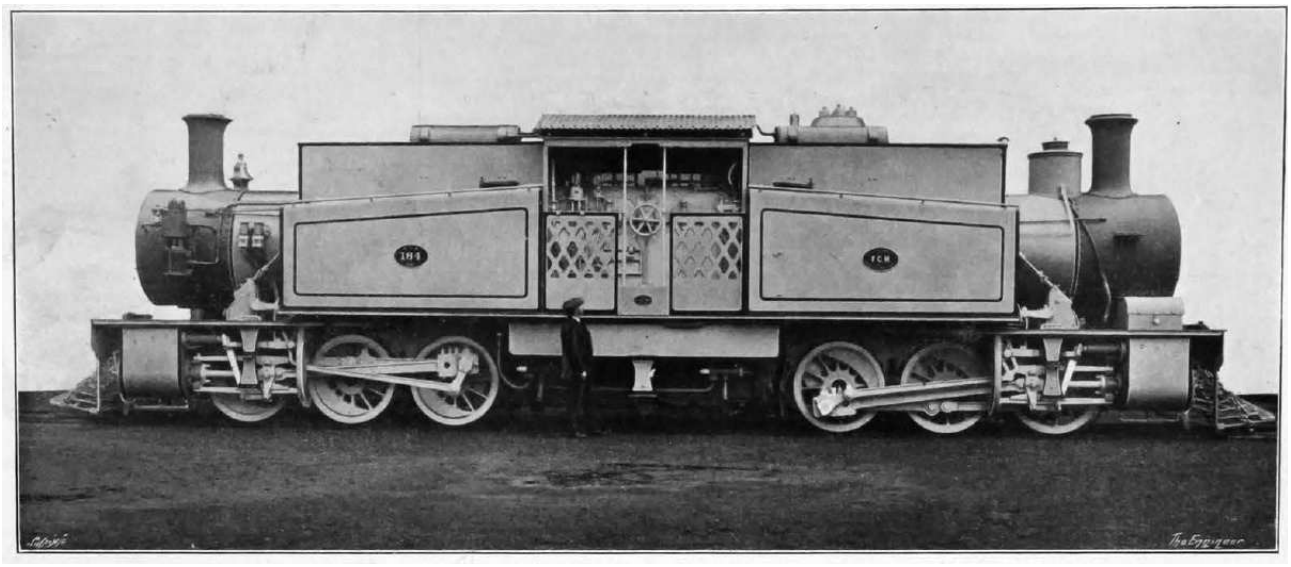
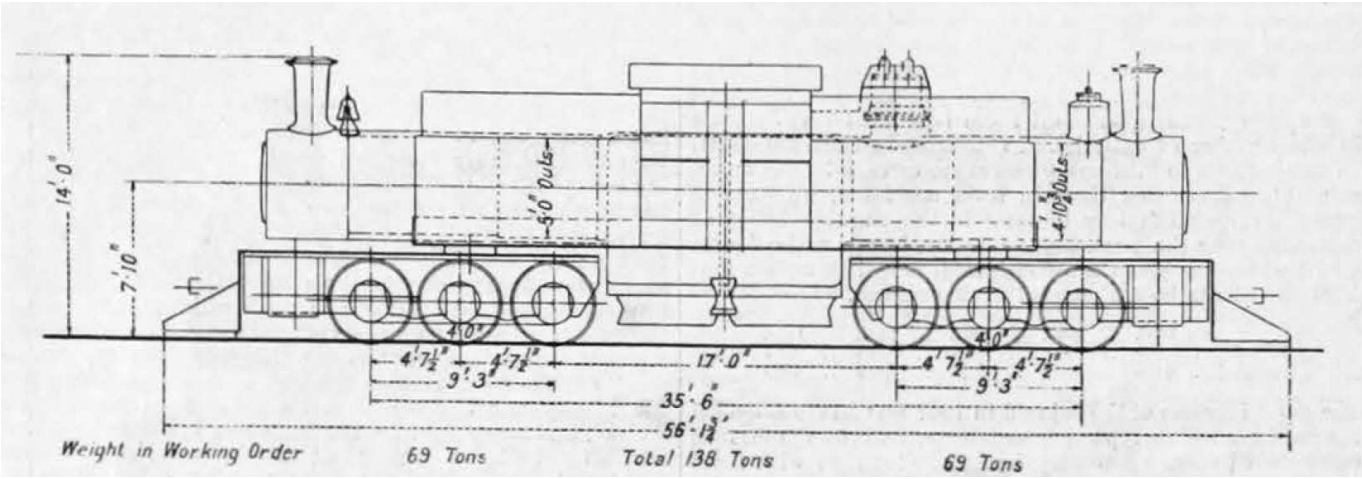
HEAVY DOUBLE-ENDED LOCOMOTIVE FOR MEXICO

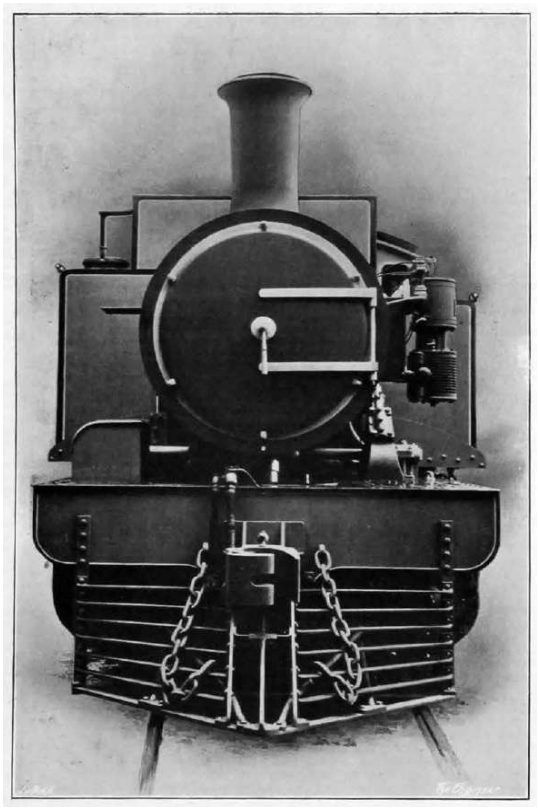
THE VULCAN FOUNDRY, LIMITED, NEWTON-LE-WILLOWS, ENGINEERS

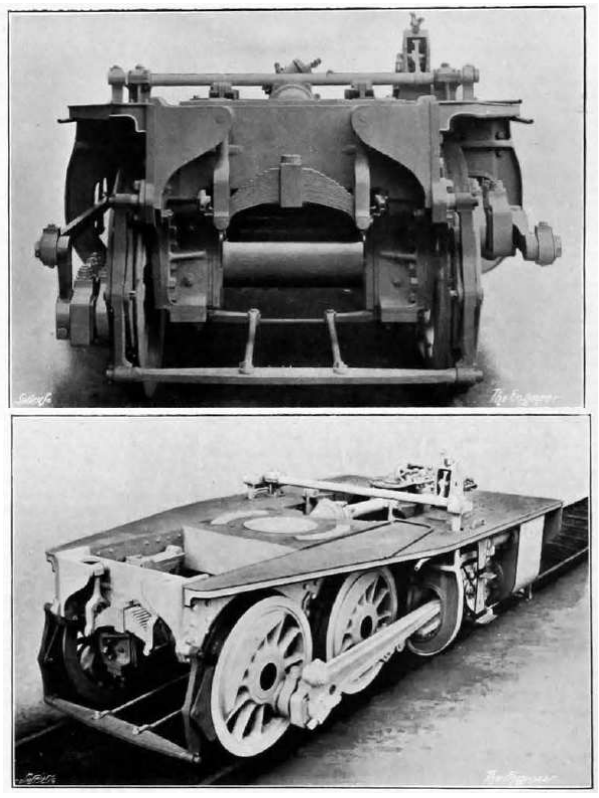


The Vulcan Foundry, Limited, of Newton-le-Willows, has recently built a powerful Fairlie type locomotive to the order of Messrs. Rendel and Robertson, Westminster, for the Mexican Railway. The engine is one of a batch of three constructed to haul trains weighing 300 tons up inclines of 1 in 25, combined with a five-chain curves and the gauge is 4ft. 8½in. The three engines each weigh 138 tons in working order.



The four driving cylinders are 19in in diameter by 25in. stroke; diameter of wheels, 4ft; wheel base of each bogie, 9ft. 3in; total wheel base, 35ft. 6in; total length overall, 56ft. 1¾in; length of boiler barrels, 18ft; diameter of barrels, outside, 5ft; height of boiler centre above rail level, 7ft. l0in; total heating surface, 2924 square feet; grate area, 47.75 square feet, and the working pressure 185lb. The tractive force developed with 90 percent boiler pressure is 62,6 l0lb, and at 75 percent 52,176lb, and the ratio of tractive force at 90 percent to adhesion is 4.34, and at 75 percent 5.9.





As can be seen above the engines are mounted on two six wheeled bogies, each driven by a pair of outside cylinders and the whole of the weight (23 tons per axle) is available for adhesion. The valve gear is of the Walschaert' pattern, operating Richardson balanced slide valves placed above the cylinders. The reversing gear has been specially designed on this locomotive to prevent the position of the valve motion being affected by the engine entering and leaving curves as the bogies rotate. The mechanism is accordingly operated from the reversing wheel by means of bevel gears that actuate a horizontal shaft connecting at each end with a diagonal shaft fixed on each bogie, together with a quadrant and worm gearing. Flexibility is given to the gear by the fitting of a ball-and-socket joint at both ends, and the bogie's movement is allowed for by a slot and sleeve on the diagonal shaft. For locking the motion, an air cylinder, operated by Westinghouse air brake apparatus, is provided. The controls for the locomotive are placed on the foot plate on the side of the fire-box occupied by the driver, and firing is accordingly effected from the opposite side. Flexibility to enable sharp curves to be taken is provided for by ball-and-socket joints, and the springs are compensated.

The boiler is constructed from 5/8in. thick steel plates, and the fire-boxes are of 5/16in. steel, with 8in. water space at the top and 6in. at the bottom. Each barrel contains 216 steel tubes, 12ft. 11in. long between tube plates, and 1 7/8in. outside diameter. On one barrel a steam dome is provided, and this has four 3½in. Ashton "pop" safety valves. The foundation ring for the two fire-boxes is of one piece weldless construction. In order that either engine may be used independently of the other, two regulator handles are provided for the driver, these being mounted one above the other in a horizontal plane, and working in a toothed quadrant. The fire-boxes are fitted with rocking grates, but are so designed that they can readily be adapted for oil firing. These locomotives are said to be the biggest yet built in this country for standard gauge.