operated by air pistons whose valves are controlled by electro magnets which receive current through the master controller from a set of storage batteries which are charged from a small motor generator set on the locomotive. The quadrant of the master controller has 20 notches, 17 of which are running positions, the other three being known as switching notches and are used when coupling up trains, or at times when slow speed is desired. When two or more locomotives are connected together, all are operated from one controller.

The equipment of each half unit consists of the pantagraph which makes electric contact with the trolley lines, the autotransformer, switch groups, control system, three main motors, electrically driven air compressor, electrically driven fan or blower, wiring and meters, air brake and hand brake equipment, electro-pneumatic and mechanical sanders and lighting and heating circuits.

The locomotive frames are of the rigid outside bar type and consist of two cast steel side frames, joined at the ends by cast steel bumper girders and reinforced by cross braces at two intermediate points. The main journal boxes are carried in the side frames in recesses fitted with gibb and wedges.

The driving wheels are 62 inches in diameter and are built up with steel centres and steel tires secured in place with double "Mansel" retaining rings.

The entire weight of the locomotive is on the three pairs of drivers.

The cab is built of sheet steel with Z-bar frame built up on an angle iron base frame.

The auxiliary apparatus is arranged on each side of the cab. leaving a comparatively wide aisle between.

Trap doors are provided above each of the three motors to make them accessible.

A master controller and set of brake valves are mounted at each end of the cab so that the locomotive may be operated from either end.

Heavy currents are carried from one piece of apparatus to another in the cab by means of corded copper rods, while the smaller currents are carried by rubber insulated wire placed in iron conduit.

The motors are connected in multiple, and are so arranged that any one or two motors can be disconnected in the event of trouble.

The cut-out switches are designated by numbers and are mounted on the end of the reverse group.

The blower supplies air for ventilating the motors and auto-transformers and also for cooling the air compressor heads.