

ignition chamber, two side passages and an upper chamber, through which the products of combustion pass and are led to and fro before they enter the tubes. For the ignition of the peat-powder there is, under the nozzle through which the peat is blown, a small grate carrying a coal fire. The consumption of coal for this purpose averages 3 to 4 per cent of the weight of the peat-powder.

The ordinary exhaust nozzle in the smoke-box did not work satisfactorily with peat-powder, and therefore had to be modified. A spark catcher was unnecessary, as the sparks are so small and light that they are extinguished before they reach the ground. As a matter of fact there are no sparks at all from the peat-powder when the firing is properly attended to.

As the result of some previous experiments, 1.4 pounds of peat-powder were considered to possess equal heating value to 1 pound of British coal. To arrive at a more accurate and definite result, these tests were undertaken, the locomotive in question having been in use for some time. The tests were made on the Hallsberg-Mjölby section (60 miles) between two locomotives of the same type, peat-powder being used in the one and coal in the other. The specifications for these tests stipulated for a freight train of 700 tons weight being run at normal service speed, which was taken as averaging 22 miles per hour. The train was to consist of cars loaded with coal, and each type of locomotive was to make three journeys. An alteration was made at the last journey, when the train was composed of bogie passenger carriages, the weight being 300 tons, and the average speed being 34 miles per hour. On the test section there is, over a distance of 3.6 miles, a rising gradient of 1 per 100, with numerous small curves with radii of from 1,000 to 1,500 feet. The speed was here reduced to 8½ miles per hour for the freight train and to about 20 miles for the passenger train. Steam pressure and water level in the boiler could, it was proved, be maintained through the whole of this gradient.

The consumption of water was read from a scale fitted to the tender tank; the results consequently include the losses from the starting of the injector and the consumption of the steam-worked blower on the peat-powder locomotive. The consumption of fuel was recorded by weighing before and after each half of a journey. To ascertain the heating values, samples of the fuel were taken on each journey. The results gave an average of 7,920 B.t.u. for the peat-powder and 13,030 for the coal. The analyses showed the following results:

| | Peat | Coal |
|---------------|------|------|
| Carbon..... | 47.0 | 73.5 |
| Oxygen..... | 29.5 | 4.4 |
| Hydrogen..... | 4.5 | 8.6 |
| Sulphur..... | 0.5 | 1.5 |
| Nitrogen..... | 1.1 | 1.2 |
| Ash..... | 3.2 | 6.2 |
| Water..... | 14.2 | 4.6 |