

$\frac{3}{4}$ inches. It was simply a case where the heating had continued so long that the crown sheet became so soft that it was not strong enough to stand the pressure.

Regarding defects in boilers. I wish I had brought some data on this subject. The locomotives running on this continent have a very much lower average for explosions than any other record we have. This is due largely to the fact that the locomotive runs so many miles and is then taken into the shop and looked after properly. It is a matter of inspection at the proper time. Our ordinary stationary boilers do not get this, and generally not more than once a year, and sometimes not that often. I am getting out a schedule of the defects found on inspection in the last year in boilers. Such things as water gauges, safety valves, etc., and each one of these defects went about five to seven per cent. of our inspections. The greatest difficulty was found due to bad boiler setting. We often find where people have set the boiler so low that they were wasting fuel.

The locomotive boiler running from 160 to 200 pounds' pressure is far safer than the average stationary boiler as it is better taken care of.

Mr. Richardson,—

In reference to the blowing out of the crown sheets. You say this is due to extreme pressure on the crown sheets. Would this be prevented by the safety valve being opened?

Mr. A. M. Wickens,—

It would not make any difference whether the safety valve was open or not, excepting this way: if we had a piece of metal hot so that 500 pounds would bend it, if you could let your steam off quick enough it would not bend down. As soon as you have a piece of metal red hot it takes a less amount of pressure to bend it.

Mr. J. V. Jackson,—

This question is very broad and is worthy of great thought and discussion, in the first instance we take a flat crown sheet which has become short of water and overheated, at which point the injectors are started and water proceeds to raise in boiler, and on coming to the level of top of crown will at once proceed to cover same, this undoubtedly causes the already hot sheet to contract materially, and causes a liability to fracture said crown sheet. This, of course, does not signify that the boiler has exploded, or is in any way liable to explode from the reason of injecting the water into said boiler.

Whereas with the radial crown sheets allowed to become short of water and overheated, I find the sheet will expand between the staybolts more or less and buckle or corrugate