

Nothing but wooden brake shoes were in use previous to the year 1850, commencing with that year wrought iron strips were introduced in wooden shoes. The wooden shoe was not abandoned till 1860. The development of the brake shoe has been slow when compared with other parts of railway equipment, still it has received a great deal of study and investigations date as far back to 1830. In the year 1878 a cast iron brake shoe with wrought iron inserts was brought before the M. C. B. convention. Several very complete tests of brake shoes were made for M. C. B. in 1901, and the results seems to show that while the grey cast iron brake shoes gave always a good retarding power, its wear was very great and overheating caused it to crack and break. The steel back was designed to overcome the breaking and brake shoes with inserts to make it more durable. The steel back increases the life of the shoe at least 30% and no shoe should be considered of satisfactory design that will not give better than 50% wear before it is necessary to scrap it. Just recently I made a test between a medium hard cast iron shoe and one with a trytangular steel insert, the conditions of test were average. Pressure on shoe and surface exposed number of application and length of application. All were exactly alike. I found the cast iron shoe was reduced 3.5 lbs. to 1 of shoe with insert. So the value of material in this shoe with inserts can be 3.5 times greater and still show a saving because the necessity for renewals with use of inserts shoes will be 350% less than common cast iron shoes. In Locomotive Practice no complaint is made that shoe with steel inserts wear tire too quickly.

Mr. R. G. Gilbride,—

I have not had enough experience in brake shoes to say anything more to what Mr. MacNicol has said. I know that when I was at York we used to get the large engines from Sarnia Tunnel with the shoes so badly worn that we had to change the whole set and I used to think that the shoes were in bad shape leaving Sarnia Tunnel, but I now find that this is not the case. I have noticed these shoes with the steel backs would break on the first application. It seems to me that if they made a thicker cast iron shoe that they would be more preferable than the steel insert shoes.

Mr. Black,—

I think Mr. MacNicol covered all the ground with regard to the heavy power engines. I know a case where the steel insert shoes were applied to a switch engine, the tires of which were in bad condition and they made a material improvement in the tire dressing qualities of the shoes and added to the life of the shoes, a long way ahead of the cast iron shoes. I understand the tread wear is decreased and the running