

it burns out, it burns something out complete. Of course there is a great difference in the cost. It would be a matter of tearing out the motor and rewinding it, which is a very expensive job.

Speaking of the speed of the electric locomotive. In elevated and underground service practically each car is a locomotive, controlled by one man on the head car, and on that account an electric locomotive cannot pick up a train of cars anything like as quickly as is done on these roads.

Chairman,—

We would like to hear from Mr. Black.

Mr. Black,—

I am an interested listener.

Mr. Bly,—

There may be one thing which perhaps is a little disadvantageous in the electric locomotive, that is of using the alternating current. When you use an alternating current to start with it takes from three to five times as much current to start as the running current, so you can imagine to start a train it would take a tremendous amount of power. I think this is one of the reasons that the Westinghouse people experimented with the direct and alternating current together.

Mr. Sperry,—

Do the Westinghouse people use the shunt or compound?

Mr. Bly,—

Series, I think.

Mr. Duguid,—

What is the actual difference in cost of one steam horse power and one electric horse power?

Mr. Bly,—

It is hard to say where you would start to reckon that horse power. I do not know very much about the steam locomotive. As to the efficiency of the compound condensing engine, it is about 20 to 23 per cent., and the rest is thrown away. Now if you put that on the electric horse power and generate same, it would give you about 92 per cent. of its efficiency, so that the cost of generating an electric horse power by steam and sending it out to the track to the electric locomotive, there is quite a loss in it. As I do not know the efficiency of a steam locomotive at the rails, perhaps some other member may be able to give us this information.

Mr. Sperry,—

It is an impossible question to answer because of the fact that in some engines the cost per horse power will be just two or three times greater than in another. The same is true in your generators. To get any sort of a statement at all,