

renewals, and the fact that we are dealing with about 80,000,000 ties, a tie saved here and there—if you only saved, for instance, three or four or 10 ties per mile of track, you would save over the whole system a very large number of ties. No tie should be taken out of the track until it has entirely outlived its usefulness, and it is a well known principle of maintenance-of-way work that in no branch of that work is there so much of an opportunity for waste, and, at the same time, for saving, as in the annual tie renewal. So that by closer inspection, by more rigid inspection with respect to ties that should be taken out, we saved about \$1,000,000 last year, and from my own judgment, from riding over the track, I do not think the character of the track has been materially affected, in fact, I think, if anything, it is rather better than it was in 1922.

*By Mr. Stewart:*

Q. Do you think that saving will be reflected in this year's depreciation? That is, will there be a greater depreciation of renewals of ties this year on that account?—A. No.

*By Mr. Stork:*

Q. In the matter of replacements; are they replaced by creosoted ties?—A. Some are. We are increasing annually the number of creosoted ties put in the track, and that is a wise policy for two reasons. In the first place, it conserves our timber supply, which is already disappearing at an alarming rate, and, secondly, it saves track-work, because every time you put in ties it means you have to re-surface. You destroy the old bed of the tie, the compact earth or ballast which has become compressed underneath the tie. The moment you haul the old tie out and put a new one in, you destroy that old bed, and it means that in addition to putting in the tie you have to do an increased amount of surfacing, so you economize in a good many ways in rigidly examining the ties to be taken out of the track.

*By Mr. Kyte:*

Q. What is the length of the life of a creosoted tie as compared with a tie in the natural state?—A. About double.

*By Mr. Stewart:*

Q. Have you experimented enough with hard-wood ties to explain their use for our benefit—I mean the treating of hard-wood ties?—A. I don't think hard-wood ties should be treated. These deteriorate in two ways, either mechanically or from the ravages of nature. They deteriorate mechanically because they are worn out, that is, the adzing underneath the rails gradually gives way with the weight, and sooner or later it may break; in other words, it may be broken or destroyed from mechanical causes. That is one way. The other way is from the ravages of nature. That is simply rot. If you can find an inferior wooden tie which is strong enough to resist mechanical wear, and at the same time can be treated chemically so it will resist the ravages of nature, then you have as good a tie as if you took an expensive hard-wood tie and treated it. So my theory is—and I think I am right—to secure the cheaper, inferior, wooden tie which will stand up mechanically, provided that wood can be treated chemically so that it will not rot. The inferior wooden tie treated chemically is just as good as a hard-wood tie treated chemically, therefore why waste money on the more expensive tie? Usually hard-wood ties, such as white oak, are used and are preferred untreated, because untreated it lasts longer than spruce or pine or beech. Now, beech is a wood which deteriorates with rapidity from the ravages of nature, but is strong mechanically, so if you can take a beech tie and treat it mechanically, creosote it, in other words, to resist rot, you have as good a tie as the original white oak tie.