

"With shoes of heavy chilled areas, where there is very little grinding, the sliding action over the steel tire is emphasized and friction is reduced. The hard chilled or tough ductile surfaces polish over and slide where the open or granular structure make more intimate contact with the wheel face and hold better."

3rd. Cast-steel shoes. We quote from a paper on this class of shoes read at a meeting of the Master Car Builders' Association at Atlantic City last June, and the following extract will be of interest:—

"Under the third head, are cast-steel shoes, used exclusively on Locomotive Driver wheels, where thin shoes are necessary. In the case of insert shoes which offer sharp projections or cutting edges to dig into the tire, the friction is increased in proportion to the cutting effect, whereas in shoes of a ductile metal, such as soft steel, wrought or malleable iron, the projections on the shoe face tend to flatten out, the shoe to polish, and a sliding action to result against the steel tire, reducing the friction. With such shoes, however, when the temperature rises to a point at which the metal begins to flow, it frequently happens that lumps form on the face of the shoe which becomes highly heated and burn, causing hard spots which cut into the tire. The cast-steel shoes in use on locomotives are recessed over the limit of rail wear and bear over the flange and on the outer tread, performing in a similar manner to the insert shoe, a wearing action on that portion of the wheel not worn by the rail. The trouble, however, with steel shoes is scoring principally on the outer tread by the flowed metal from the shoe, or metal torn off the wheel and welded to the face of the shoe. Furthermore, the recessed portion of the steel shoe picks up flowed metal which when the shoe is worn down to contact with the wheel over the limits of rail wear, tend to increase the grooving of the tire by the cutting action of the flowed metal which is extremely hard."

No shoe, no matter how perfectly constructed, will give the required service, unless proper attention is paid to the hanging of the shoe and reversing them, where the head will permit, to overcome the taper wear thus obtaining maximum life; but shoes not reinforced cannot be reversed without subsequent breakage.

There are numerous types of brake shoes upon the market and new ideas are being constantly developed, but so far, it has been found that a shoe made to the following specification has given the best results as a whole. No determination can be reached regarding the efficiency of a shoe until