

Durability and wearing qualities, and,
Effect of the shoe upon the tire.

1st. A plain cast-iron shoe is not desirable for Locomotive service as while it possesses the requisite friction, yet this is more than offset by its very short life, thus making its use too costly. This kind of a shoe is further objected to, because of its poor tire dressing effect. Another objection is that owing to its short life, there is a great expense involved in the constant changing of shoes.

2nd. A cast-iron shoe with hard metal inserts and reinforced steel back is recognized as the ideal shoe. It has been found that a shoe constructed in this manner gives 4 to 5 times greater life than the plain cast-iron shoe. The inserts are placed in the face and groove of the shoe and when inserts are made of carefully selected metal give the desired durability. Experience has shown that the inserts should be placed so as to give a shearing or tire dressing effect and with due regard paid to this, it has been found that the friction or retarding effect is all that is desired. Another advantage from a shoe with the inserts arranged in this manner is, that it will wear the wheel tread to the greatest extent where the tread is least worn by the rail and will dress down the flange and maintain it in proper proportion to the tread of the wheel, thus eliminating danger of derailment and wear of frogs and switches. Another feature which appeals to the motive power superintendent is, that a shoe constructed in this manner keeping as it does, the tires dressed down to a practically normal condition, reduces the necessity of the engine going into the shop thus increasing its earning capacity. Such a shoe would not be sufficient for the service it is called upon to perform unless it be equipped with what is known as the reinforced steel back. The object of this back is obvious, viz:—In case of fracture, the entire shoe is held together and can be continued in service until completely worn down to the back. The reinforced back being constructed of soft steel, no service (no matter how hard) has been found to break it. The steel back when applied to insert shoes permits the use of thicker inserts, thus increasing the life of the shoe. It has been found that the chilling of the shoes has not proven satisfactory and therefore can be safely dispensed with. The chill is never uniform and unless the entire back of the shoe is completely covered with a steel back, there is always the probability of the chilled ends breaking, with the danger of derailment then existing, besides which loss of service and the reduction in friction until the chilled part has been worn away must be considered. A writer on this subject has made this statement: