(No Model.)

R. F. WHALEN, C. W. CASE & A. O. GARDNER.

RAILWAY BRAKE SHOE.

No. 412,572. Patented Oct. 8, 1889.

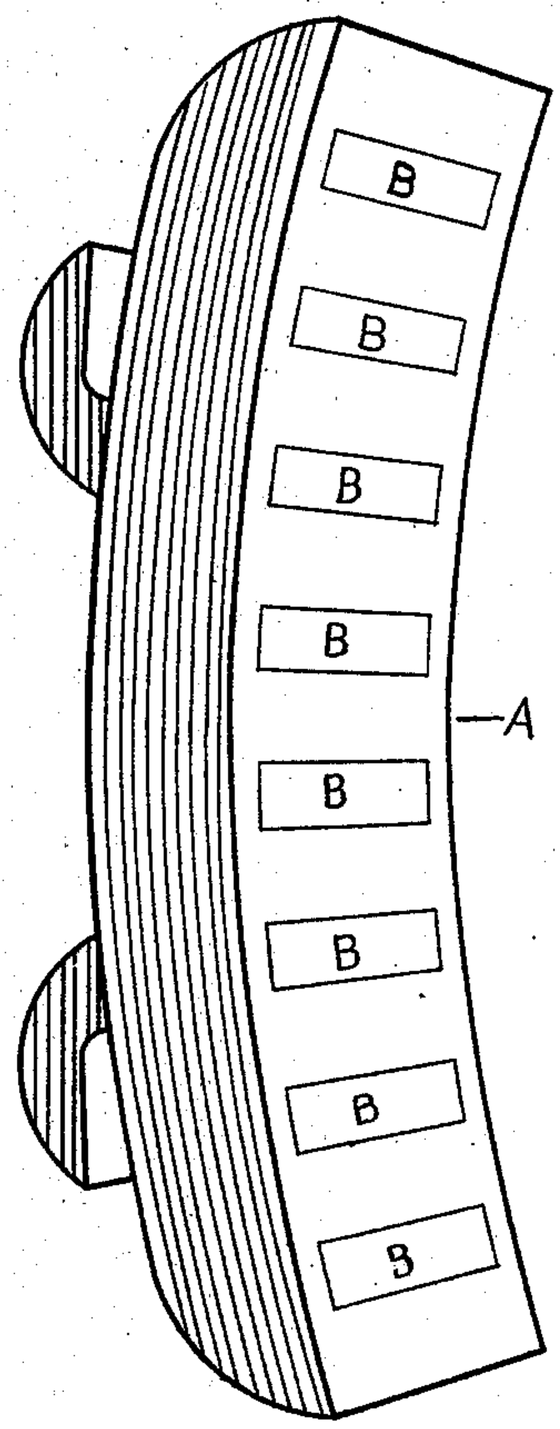

Fig. 1.

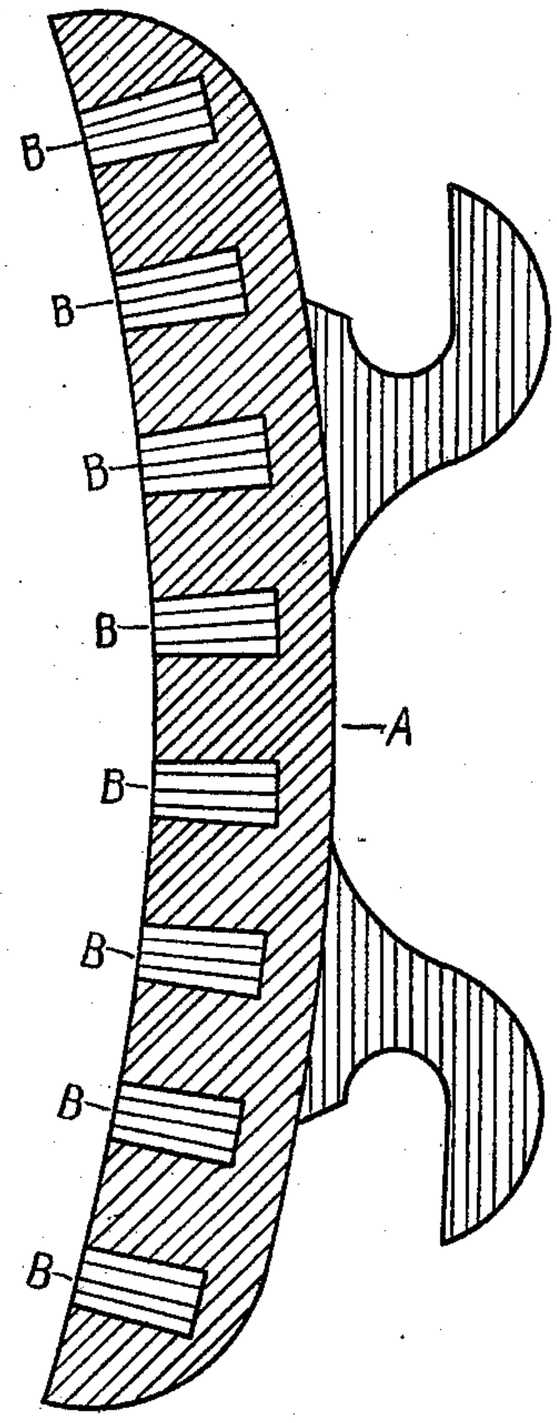

Fig. 2.

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UNITED STATES PATENT OFFICE.

RICHARD F. WHALEN, CHARLES W. CASE, AND ARTHUR O. GARDNER, OF HANNIBAL, MISSOURI, ASSIGNORS OF TWO-FIFTHS TO ERVIN C. CASE AND WILLIAM W. DRIGGS, OF SAME PLACE.

RAILWAY-BRAKE SHOE.

SPECIFICATION forming part of Letters Patent No. 412,572, dated October 8, 1889.

Application filed January 7, 1889. Serial No. 297,748. (No model.)

To all whom it may concern:

Be it known that we, RICHARD F. WHALEN, CHARLES W. CASE, and ARTHUR O. GARDNER, citizens of the United States, residing at Hannibal, in the county of Marion and State of Missouri, have invented an Improvement in Railway-Brake Shoes, of which the following is a specification.

The object of our invention is to increase the wearing properties of railway-brake shoes and to prolong the service of the wheels upon which they are applied.

Our invention consists of a brake-shoe the wearing-surface of which is composed of iron or steel alternating with an alloy of lead and antimony or its equivalent.

The accompanying drawings illustrate our improvement, Figure 1 representing a perspective view of our composite-metal brake-shoe, and Fig. 2 a vertical section through the shoe.

The body of the shoe A, which may be of any desired shape, is first cast of iron or steel, with a series of cavities or recesses in the wearing-surface extending partially through the body. These cavities or recesses are most easily formed by what is known as the "coring process." They may vary in size and shape, but should be distributed about equally distant apart throughout the face of the shoe and should extend through the wearing depth of the shoe. The composition metal B, having been heated until it assumes a molten state, is poured into these cavities or recesses until they are filled.

The composition metal B is composed of lead and antimony in varying parts, according to the degree of hardness necessary to withstand the frictional heat generated. For roads of ordinary grades we prefer twenty to forty parts of antimony with sixty to eighty parts of lead. We do not, however, desire to be limited to these proportions, as for freight-car service less than twenty parts of antimony can be used with good results, and on roads with long and steep grades we may desire to use a larger proportion of antimony, and in extreme cases antimony alone might be necessary. While we prefer an alloy of lead and antimony, we could use with good results any other metal or metals regarded as poor conductors of heat that would produce the desired degree of hardness.

It is a well-known fact that the brake-shoes in common use constructed wholly of iron or steel when applied to the wheel produce friction, from which arises a high degree of heat both in the wheel and shoe. This high degree of heat destroys the chill of the wheel and causes a rapid disintegration of both wheel and shoe. The alloy or composition metal described above is a poor conductor of heat, and when introduced into the wearing-surface of a brake-shoe in the manner above described obstructs the current of heat passing through the shoe and to the wheel and does not impair the frictional properties of the shoe. The wearing properties of both shoe and wheel are increased in proportion as the heat caused by frictional contact is decreased, and the reduction of this heat depends largely upon the frequency with which the sections of composition metal appear in the wearing-surface of the shoe.

It has heretofore been proposed to construct a brake-shoe of cast-iron with a lead filling, which is to act as a dry lubricant on the face of the wheel and shoe. A shoe constructed with this filling does not accomplish our purpose, as a filling of pure lead or an alloy as soft as lead, under the heat generated by constant frictional application to the wheel, becomes too soft and will not remain in the grooves, but runs out and disappears. Antimony being a much harder metal than lead, as well as a poor conductor of heat, produces when combined with lead an alloy sufficiently hard to withstand the heat, and will remain in the body until the shoe is worn out.

It has also been proposed to construct a shoe of a cast-metal body having rods of a softer metal than the body extending entirely through it and cast into it. This form

of construction does not answer our purpose, as a metal softer than refined iron cannot be used for the rods in combination with a cast iron or steel body.

What we claim as new, and desire to secure by Letters Patent, is—

As an improved article of manufacture, a railway-brake shoe composed of an iron or steel body filled with lead and antimony, substantially as described.

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