

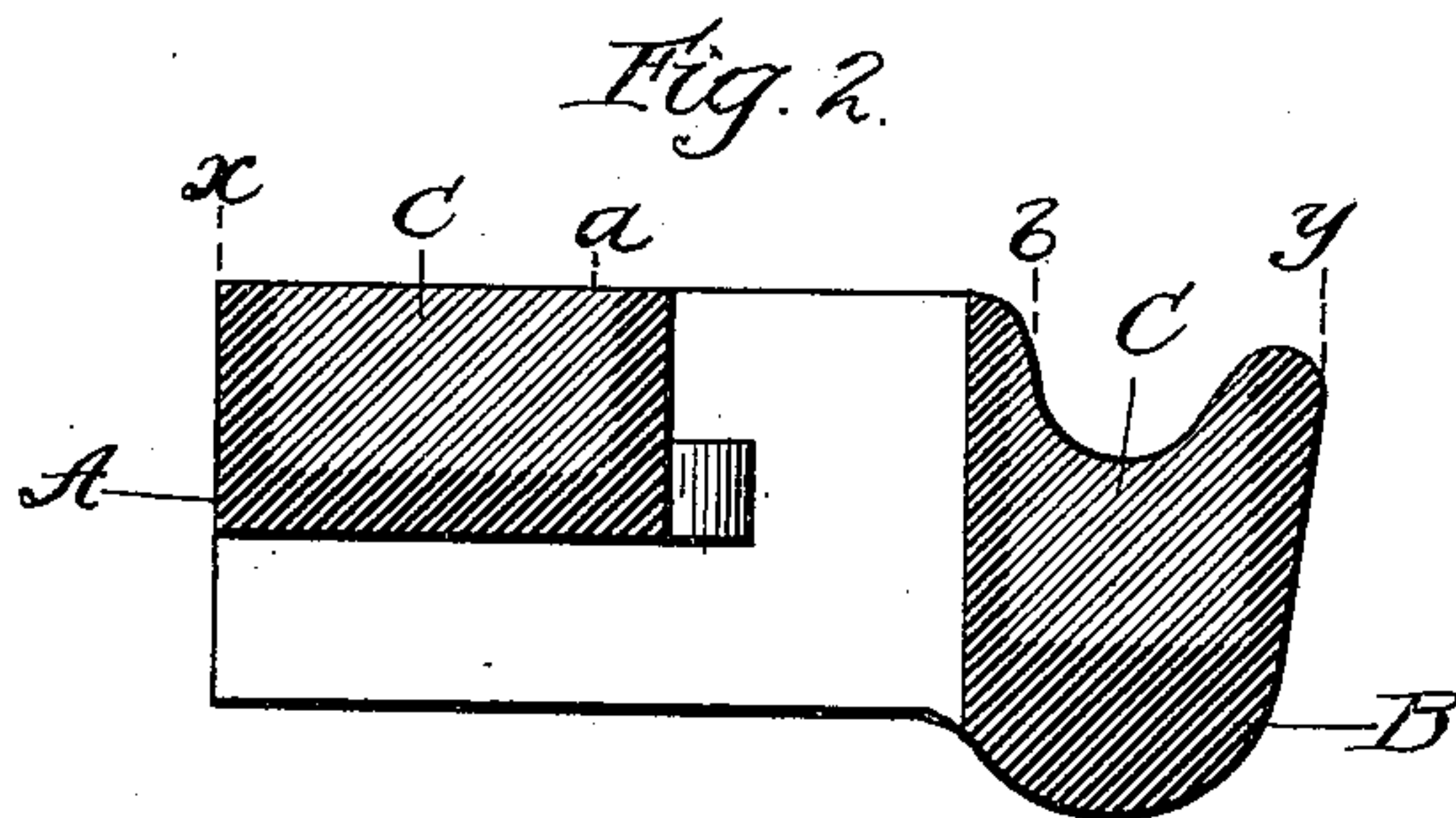
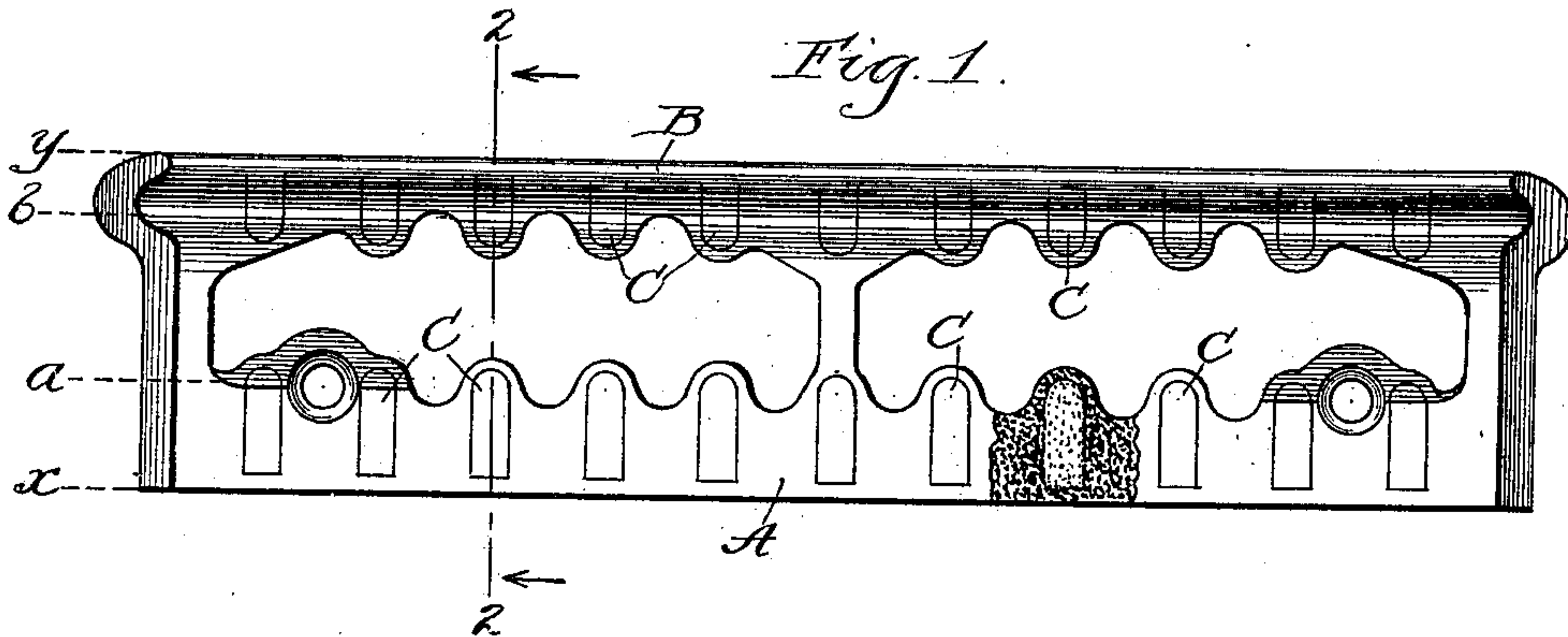
No. 622,397.

W. D. SARGENT.
BRAKE SHOE.

Patented Apr. 4, 1899.

(Application filed Apr. 26, 1898.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM DURHAM SARGENT, OF CHICAGO, ILLINOIS.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 622,397, dated April 4, 1899.

Application filed April 26, 1898. Serial No. 678,877. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DURHAM SARGENT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Brake-Shoes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in brake-shoes of the "Sargent" type, and more particularly to that class having a composite wearing-surface.

The prime object of this invention is to have a brake-shoe of the lightest possible construction, and yet possessing all the advantages of a brake-shoe having a composite wearing-surface, with all the desirable qualities of strength and frictional or braking power.

Another object is to enable the production of such a shoe either in "skeleton" or "channeled" form, with the composite wearing-surface so disposed as to not disturb the proportioning of the wearing-surface to the wear of the rail upon a car-wheel and at the same time to prevent the formation of cutting edges upon shoes of the above-mentioned character as previously constructed.

These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a face or plan view of a brake-shoe embodying my invention. Fig. 2 represents a transverse vertical section thereof on the line 2 2 of Fig. 1, looking in the direction indicated by the arrows.

Similar letters of reference indicate the same parts in both figures of the drawings.

The brake-shoe illustrated in the drawings is of the type exemplified in Letters Patent No. 523,084, granted me July 17, 1894, in which the wearing-surface of the shoe is so proportioned and distributed with relation to the wear of the rail upon a car-wheel as to practically compensate for such wear by proportionately wearing or dressing the car-wheel so that it will maintain a practically uniform outline on its tread during the life of the wheel, and thus avoid the necessity for turn-

ing the wheel true. While my invention is particularly applicable to this form of shoe, it is equally applicable to that form of brake-shoe which is channeled over that part of the shoe which opposes that part of the tread of a car-wheel which is worn by the rail or which contacts with the rail.

Referring now by letter to the accompanying drawings, A indicates that portion of the brake-shoe which opposes the area of minimum wear on the tread of the car-wheel—to wit, that portion which does not make contact with the rail. This portion of the brake-shoe lies between the lines *a x*, approximately. Approximately between the lines *b y* of the brake-shoe is that portion B which opposes the area of minimum wear upon the flange of a car-wheel.

That portion of the brake-shoe lying between the lines *a b* approximately represents the area of wear of the car-wheel resulting from contact with the rail, and the distribution of the metal of the brake-shoe between these points is intended to correspond with the distribution or proportionate wear upon the car-wheel, the least metal opposing the area of maximum wear with a gradually-increasing wearing-surface connecting with the full or continuous wearing-surfaces A B.

I have found in practice that to give the brake-shoe the maximum strength and lightness it is necessary to form the same of cast-steel; but in use and under the great heat of a heavy application of the brakes the particles flow lengthwise of the shoe and upon sudden cooling form cutting edges, which reduce if they do not destroy the further usefulness of the brake-shoe, because such cutting edges have a very bad effect in dressing the wheel. To avoid this difficulty, I propose to employ cast-iron inserts C, which may be chilled or otherwise hardened and which are set into the continuous wearing-surfaces A and B of the dressing-surface of the brake-shoe, but extend into that portion of the brake-shoe opposing the area of proportionate wear of the wheel. These cast-iron inserts are set in the molds and the soft-steel body of the shoe is cast around, so as to embed them therein. This construction produces a composite wearing-surface in which the body of the shoe is soft cast-steel, and therefore of the lightest possible

construction, while the inserts are of chilled cast-iron. The introduction of these chilled cast-iron inserts serves to retard the wear of the brake-shoe, and hence promotes the longevity thereof, while at the same time preventing the heating up of the soft cast-steel body of the shoe and the formation of cutting edges, for the particles of the steel which become detached or flow are arrested by the cast-iron inserts, while the particles of the cast-iron inserts as they are worn off become embedded in the cast-steel body, and thus form a most perfect wearing-surface.

I am aware that it has heretofore been proposed to form brake-shoes having composite wearing-surfaces obtained by different combinations of metals, in one instance the cast-iron body of the brake-shoe being cast about wrought iron or steel inserts and in another instance chilled inserts being formed in a cast iron or steel body by filling recesses therein with cast iron or steel, which become chilled and hardened when formed. Brake-shoes made in either of these ways would differ materially from those made in accordance with my present invention both structurally and mechanically, while in the qualities of durability and effect upon the wheel-tire they would be very inferior to my present brake-shoe. In both of these old brake-shoes the inserts are not only insecurely fastened in position, but throughout the life of the shoe they retain their separate and individual form, which greatly weakens the body of the brake-shoes, while at the same time the inserts in use form sharp cutting edges which tend to injure rather than to dress and benefit the tire. These results are brought about in the first instance by casting iron with its much lower melting-point about steel or wrought-iron in a cold state, the result of course being that there is no integral formation in the completed shoe between the body and the inserts. In the other instance the cast metal poured into the recesses in the body of the shoe becomes chilled and shrunken as a result thereof, and here again there is no integral structure. With my present invention, however, where the molten steel, having a very high melting-point—say 2,500°—as compared with the chilled cast-iron inserts, is cast about such

inserts, the insert and the steel body of the shoe become practically welded together, producing an integrity of structure which is of vital importance to the successful use of the shoe and which cannot be produced in either of the shoes before referred to. This integrity of structure in fact represents the difference between success and failure, for without it no shoe having inserts can be practically successful. Furthermore, this integral structure of the shoe produces a maximum beneficial result in braking qualities and in the effect of the shoe upon the tire, and completely eliminates all danger of the formation of cutting edges around the inserts, which is a necessary incident to the construction of brake-shoes under the prior patents hereinbefore referred to.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a brake-shoe, the combination with a soft cast-steel body, of chilled cast-iron inserts about which the body is cast, substantially as described.

2. In a brake-shoe, the combination with a soft cast-steel body, of chilled cast-iron inserts about which the body is cast, said inserts extending from the areas of maximum wear, as from a to x , and b to y , into the area of proportionate wear, as between a and b , substantially as described.

3. As a new article of manufacture, a soft cast-steel "skeleton" or "channeled" brake-shoe, having a wearing-face proportioned to the wear of a car-wheel by contact with a rail, comprising areas of maximum wear, opposing the tread and flange of a wheel, as from a to x and b to y , and an area of proportionate wear between said first-mentioned areas, as from a to b , and chilled cast-iron inserts located in said areas of maximum wear and extending into said area of proportionate wear, the soft cast-steel body of the shoe being cast around the chilled cast-iron inserts, substantially as described.

WILLIAM DURHAM SARGENT.

Witnesses:

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