

No. 616,569.

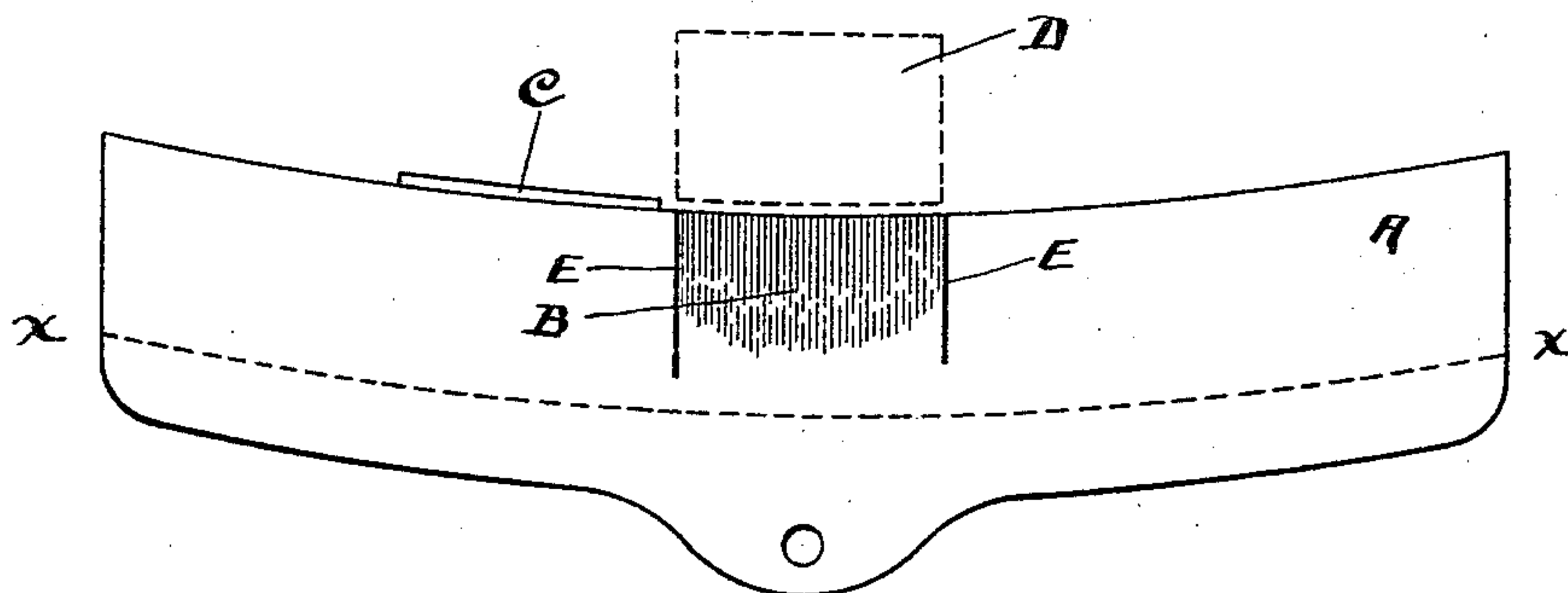
J. D. GALLAGHER.
BRAKE SHOE.

Patented Dec. 27, 1898.

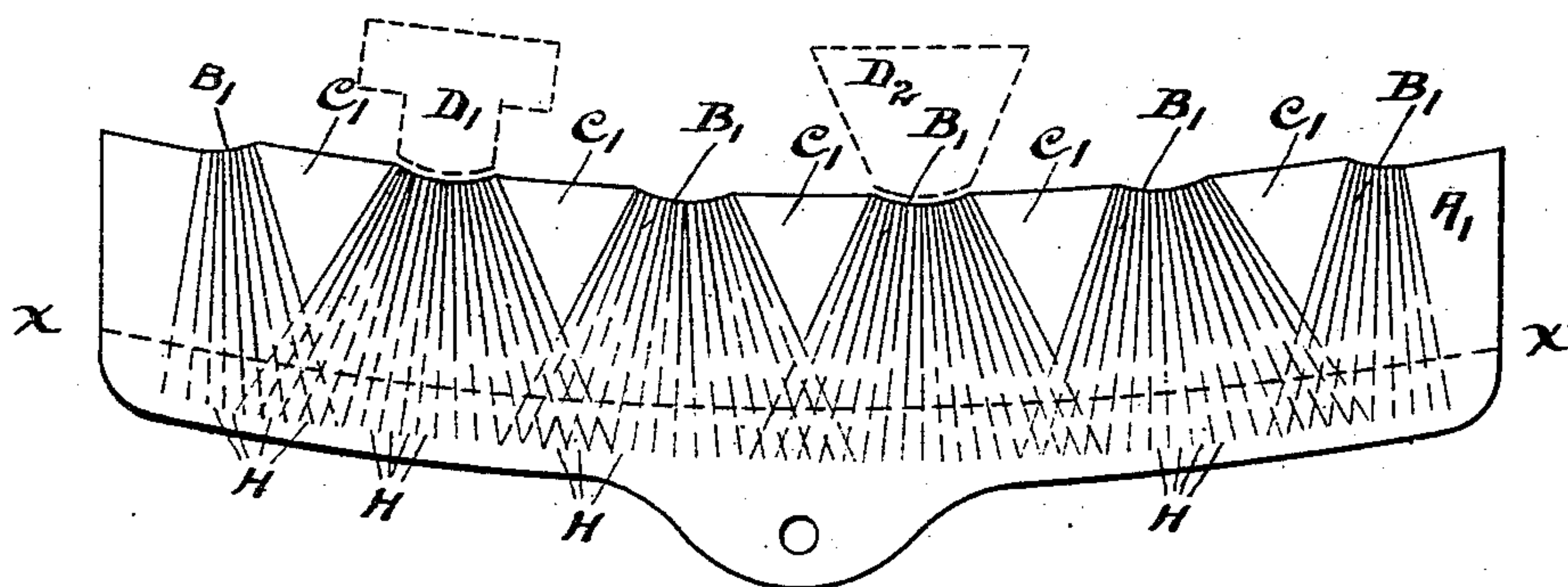
(No Model.)

(Application filed Sept. 17, 1898.)

- Fig 1. -



- Fig 2. -



- Witnesses -

Frederick E. Appley.

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UNITED STATES PATENT OFFICE.

JOSEPH D. GALLAGHER, OF GLEN RIDGE, NEW JERSEY.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 616,569, dated December 27, 1898.

Application filed September 17, 1898. Serial No. 691,160. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH D. GALLAGHER, a citizen of the United States, residing in the borough of Glen Ridge, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Brake-Shoes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form part of this specification.

My invention relates to brake-shoes to be used on locomotives and cars propelled by power of any description.

I am aware that brake-shoes having their faces composed of alternate chilled and soft iron sections are old and that brake-shoes having inserts of hard metal in soft iron are also old. These shoes have been largely used and have given good service. One objectionable feature in the shoes composed of alternate chilled and soft iron sections and also in the shoes having hard-metal inserts is the liability of such shoes to break at the point or line of junction of the soft and chilled iron, due to what is commonly known as a "chill-crack," or to break at the junction of the hard-metal insert with the soft iron, owing, probably, to an imperfect fusion of the two. Another objection to the shoes composed of alternate chilled and soft iron sections has been the fact that the chilled portion, unless made so deep as to greatly endanger the breaking of the shoe, soon wore off during use and the shoe became practically a soft-iron shoe.

It is the object of this invention to produce a brake-shoe which will have the wearing qualities of the chilled and soft iron shoe without its liability to break and which will retain these wearing qualities to the very end of the life of the shoe—that is, a shoe in which the wearing quality will be equal throughout its entire thickness.

In the accompanying drawings, Figure 1 is a longitudinal section of the shoe composed of alternate chilled-iron and soft-iron sections as now used with the cross-interlineations left out for the sake of clearness in illustration,

showing the form of the chilled section and the place where the chill-crack is usually formed. Fig. 2 is a longitudinal section of the shoe of this invention, also with the cross-interlineations omitted for the sake of clearness in illustration, showing the form of the chilled portion.

In Fig. 1, A represents a longitudinal section of the brake-shoe as now made, composed of alternate chilled and soft iron sections. B represents the chilled section, showing the shape of the chill. C represents the raised soft-iron section. D indicates by the dotted lines the chill-block of the shape commonly used. E represents the chill-cracks as commonly found in shoes of this class. The dotted curved line indicated by X X shows the surface of this shoe when worn down in use.

In Fig. 2, A' represents a shoe made according to this invention. B' represents the chilled sections; C', the soft-iron sections; D' and D², chill-blocks of the defined forms; H, the spicules of soft iron, running up into the chills. The dotted line X X shows the surface of the shoe of this invention when worn down in use.

It will be apparent from an examination of Fig. 1 that the objectionable features of this shoe are due to the shape of the chilled section, the chilled section being at right angles to the face of the shoe, and the shoe having a practically flat surface the chill-crack when formed will also be at right angles to the face of the shoe and extend from the face transversely of the shoe and to the depth of the chill, thus weakening the shoe at that point exactly in proportion to the depth of the chill. The fact that this chill-crack is liable to form has led the makers of this kind of shoe to avoid deep chills, so that in most cases the chill only goes through a small fraction of the thickness of the shoe, as readily seen in Fig. 1. When this shoe is worn down in use—as, for instance, to the dotted line X X—it is manifest that the face of the shoe is composed wholly of soft iron, and this quickly wears down in use. To overcome these two objections to the chilled shoe as now made, I have devised the one shown in Fig. 2.

It is a well-known fact that when molten iron of proper character comes into contact

with a chilling-surface the chills are formed at right angles to that surface. In order, therefore, to make the shoe shown in Fig. 2, I make a pattern having a face composed of alternate flat sections, as shown at C' in Fig. 2, and concave sections, as shown at B', Fig. 2. When the pattern is in the mold, chill-blocks D' and D², formed to fit the depressions B', are placed in the sand and held there in the usual way, so that when the pattern is withdrawn the face of the shoe in the sand is formed of alternate projecting chill-blocks and depressed sand. When now the molten iron of proper composition for chilling is poured into this mold, the portion of the iron coming into contact with the projecting chill-blocks is chilled and the chills radiate into the mass of iron at right angles to the face of the chill-block, which in this case will be at right angles to a tangent drawn to the concave section at any point therein. The result of this is that a very dense chill is formed in the face of the shoe where it comes in contact with the chill-block, and this chill radiates in fan shape away from the face of the shoe, growing lighter and lighter as it recedes, owing to the diverging of the lines. When the brake-shoe is chilled in this manner, it is obvious that if any chill-crack is formed it will not be transverse of the shoe and will not weaken it appreciably. It is also obvious that when the brake-shoe is chilled in this manner the chills radiating from the curved surface, as they do, will ultimately, if placed close enough together, overlap and will pervade the whole substance of the shoe. I avail myself of this fact and of the fact that the chill becomes less dense as it leaves the surface of the shoe to insure the even wearing of the shoe and lengthen

its life. The effect of this form of chill is that the chill is most resistant to wear on the face of the shoe and becomes less resistant as the shoe is worn down in use; but in proportion as the chill becomes less dense and resistant to wear the chilled surface increases, thus equalizing the wearing qualities of the shoe throughout. When, for instance, the shoe has become worn down in use to the dotted line X X, the gradual divergence of the lines of the chills has caused these to become considerably separated and spicules of soft iron run up between them, as shown at E. At the same time the lines of the chills have overlapped, and the face of the shoe at the line X X is composed of alternate spicules of soft and chilled iron.

I therefore claim and desire to secure by Letters Patent—

1. A brake-shoe containing a chill having its lines radiating longitudinally of the shoe from a transverse concave section, substantially as described.

2. A brake-shoe having its wearing-face composed of alternate soft-iron and transverse concave chilled-iron sections, from which the chill radiates longitudinally of the shoe, substantially as described.

3. A brake-shoe containing a plurality of chills having their lines radiating longitudinally of the shoe from the transverse, concave sections and overlapping each other, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of September, A. D. 1898.

JOSEPH D. GALLAGHER.

Witnesses:

FRANK B. SMITH,
AUGUST M. TRESCHOW.