

(No Model.)

C. F. WOHLFARTH.  
BRAKE SHOE.

No. 543,072.

Patented July 23, 1895.

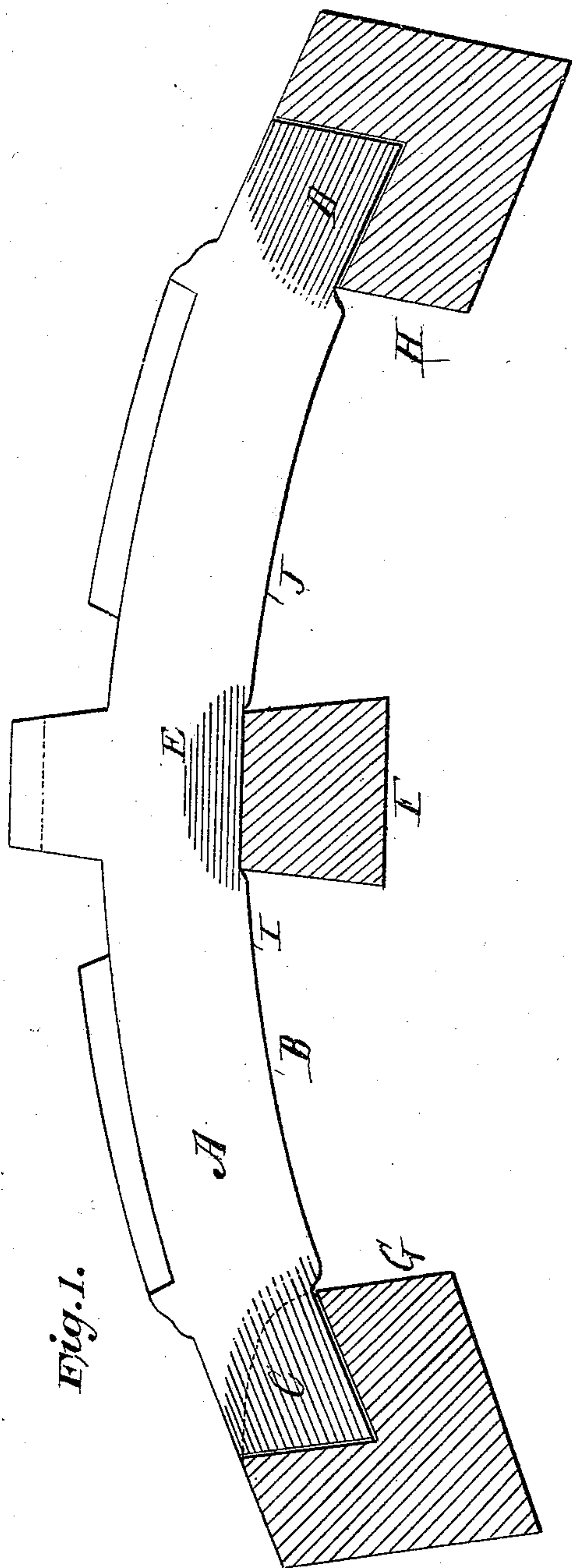


Fig. 1.

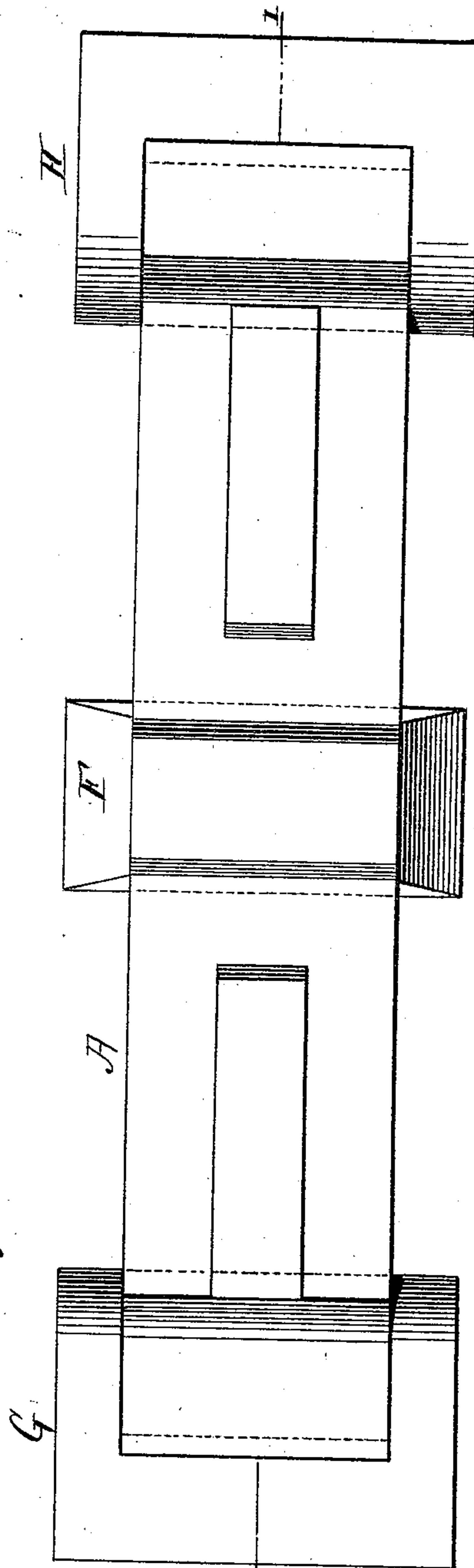


Fig. 2.

WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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LAPPIN BRAKE SHOE COMPANY.

## BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 543,072, dated July 23, 1895.

Application filed March 28, 1894. Serial No. 505,380. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. WOHLFARTH, of Bloomfield, Essex county, New Jersey, have invented a new and useful Improvement in Brake-Shoes, of which the following is a specification.

My invention relates to that class of brake-shoes in which certain parts of the shoe are hardened by chilling during the process of casting, other parts being left soft.

The invention consists in a brake-shoe the metal at both ends of which is chilled through the whole thickness of the shoe, all as hereinafter more particularly set forth.

In the accompanying drawings, Figure 1 is a sectional view of my improved brake-shoe on the line 1 1 of Fig. 2, showing the chills in place and as arranged during the casting process for producing the hardened end portions and a hardened surface at the middle portion on the face. Fig. 2 is a top view of the same.

Similar letters of reference indicate like parts.

A represents the shoe; B, the face thereof; C and D, the end portions hardened by chilling through the entire thickness of the shoe, as indicated by shading; E, the middle portion of said shoe also hardened by chilling, and to a moderate depth, also as shown by shading.

F is a solid chill-block of metal, which, by contact with the hot iron of the brake-shoe, produces the chilled portion at E.

G and H are chill-boxes, which in like manner produce the chilled ends C and D.

In molding the chill-boxes G and H and the solid central chill-block F are embedded in the sand of the mold, with proper reference to the pattern of the shoe, and therefore maintain their positions when the pattern is removed and with relation to the brake-shoe during the casting process. The shoe is cast face downward.

From Fig. 2 it will be seen that the chill-boxes G and H are constructed to inclose the shoe at the ends on all sides except the top, thereby producing a chilling of the ends completely through the shoe.

I am well aware that brake-shoes are now made having alternate chilled and soft portions on their faces; but in all brake-shoes

thus made the chilled portion of the shoe is upon one side only, as is shown at E, Fig. 1; and although in brake-shoes as heretofore made there are chilled surfaces at the ends of the shoe in no case does the chill extend from the face to the back of the shoe.

The advantages which were secured by brake-shoes having surfaces of alternating soft and chilled portions were, first, that the life of the shoe was much longer than the life of the ordinary shoe made of homogeneous iron, and, secondly, that the skidding or sliding of the wheels was prevented, with their consequent flattening, which rendered them useless. These good results were obtained by the shoes of alternating chilled and soft surfaces only so long as the chilled portions remained; but inasmuch as the chilled portions were confined to the front or face of the shoe as the wheels gradually wore off the surface of the shoes the chilled portions disappeared, leaving the shoe composed only of soft iron. The friction or holding power of a soft-iron shoe is so great as to stop the revolution of the wheels when firmly applied, and thus cause the objectionable sliding or skidding which the shoe of alternating surfaces was designed to prevent. The shoe also rapidly wore out when the chilled portions were gone. In order to give the shoe with alternating surfaces the required length of life it has heretofore been customary to allow the chills to penetrate as far toward the back of the shoe as was consistent with safety; but this latter practice was liable to render the shoe brittle and to break at the most critical time when the most force was required to be brought to bear upon the shoe.

My invention is designed to overcome the defects of the shoe having alternating surfaces of soft and chilled iron on its face, and at the same time to retain all its well-known advantages. To that end I have carried on many experiments and made brake-shoes in many different ways, and I have found that a brake-shoe having its body composed of soft iron with chilled ends, so that the chill extends from surface to back, meets all the requirements.

The advantages I claim for my new brake-shoe are the following:



First. The chilled ends add from thirty to thirty-five per cent. to the life of the shoe, because I am able to secure a large percentage of chilled surface without so weakening the shoe as to render it not only useless but dangerous.

Second. The proportion of chilled and soft-iron surface may be so adjusted as to give the shoe the requisite friction or holding power, combined with wearing qualities, which proportion will remain practically constant until the shoe is entirely worn out.

Third. The skidding or sliding of the wheels is by my shoe reduced to a minimum during the whole life of the shoe.

Fourth. The desired length of life of the shoe is obtained without having such a large percentage of the face of the shoe composed of chilled iron as to render it dangerously deficient in friction or holding power. In my shoe I cause the soft iron to project slightly beyond the chilled portions, as shown at I J, so that the face will wear down rapidly to the ex-

act bed on the car-wheel before said chilled portions meet the same; but afterward there is no time when the abrasion of the wheel is met by nothing but soft iron, nor can the soft iron wear away any faster than the margin or chilled portions.

The middle portion of the shoe may also be chilled, as shown at E, Fig. 1, but this is not necessary; nor do I claim the surface-chill at E as any part of my invention.

I claim—

A brake shoe having the metal at its extremities chill-hardened through the entire mass, in contradistinction to being hardened only through a fractional portion thereof: whereby, at all times during the life of the shoe, the effects of abrasion are resisted by hard metal.

CHARLES F. WOHLFARTH.

Witnesses:

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WINFIELD S. DEHART.