

No. 754,921.

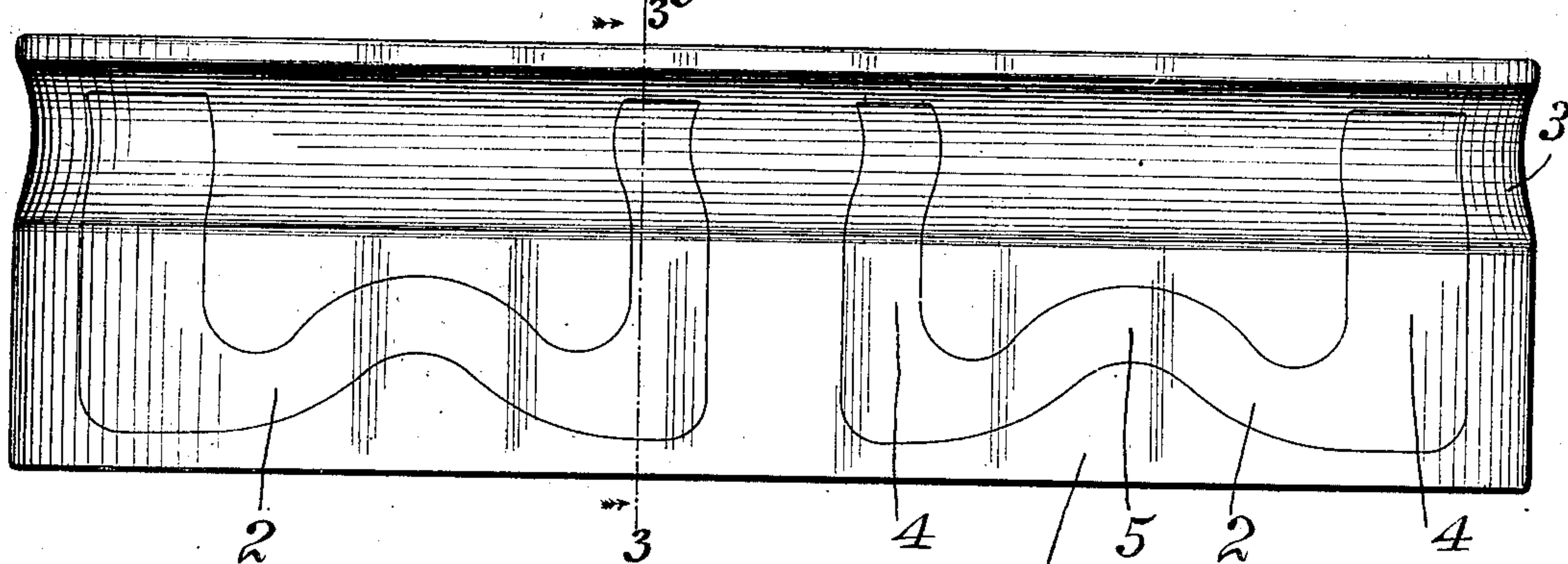
PATENTED MAR. 15, 1904.

C. G. ETTE.  
BRAKE SHOE AND METHOD OF PRODUCING SAME.

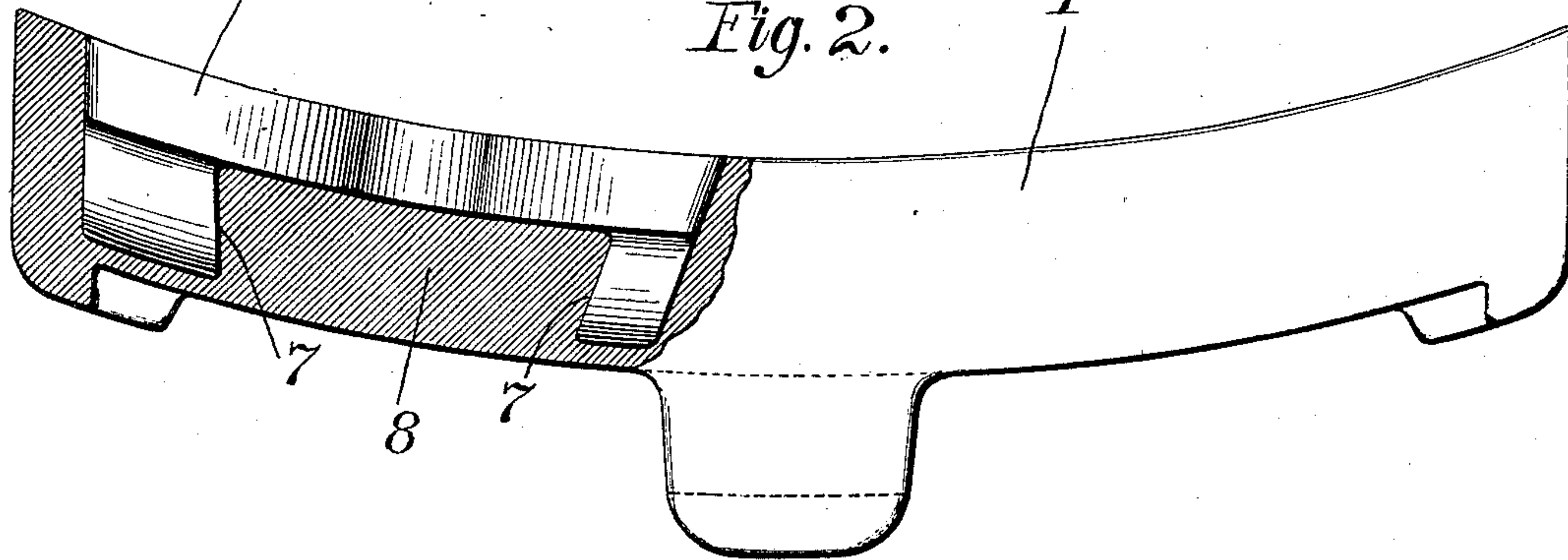
APPLICATION FILED OCT. 30, 1903.

NO MODEL.

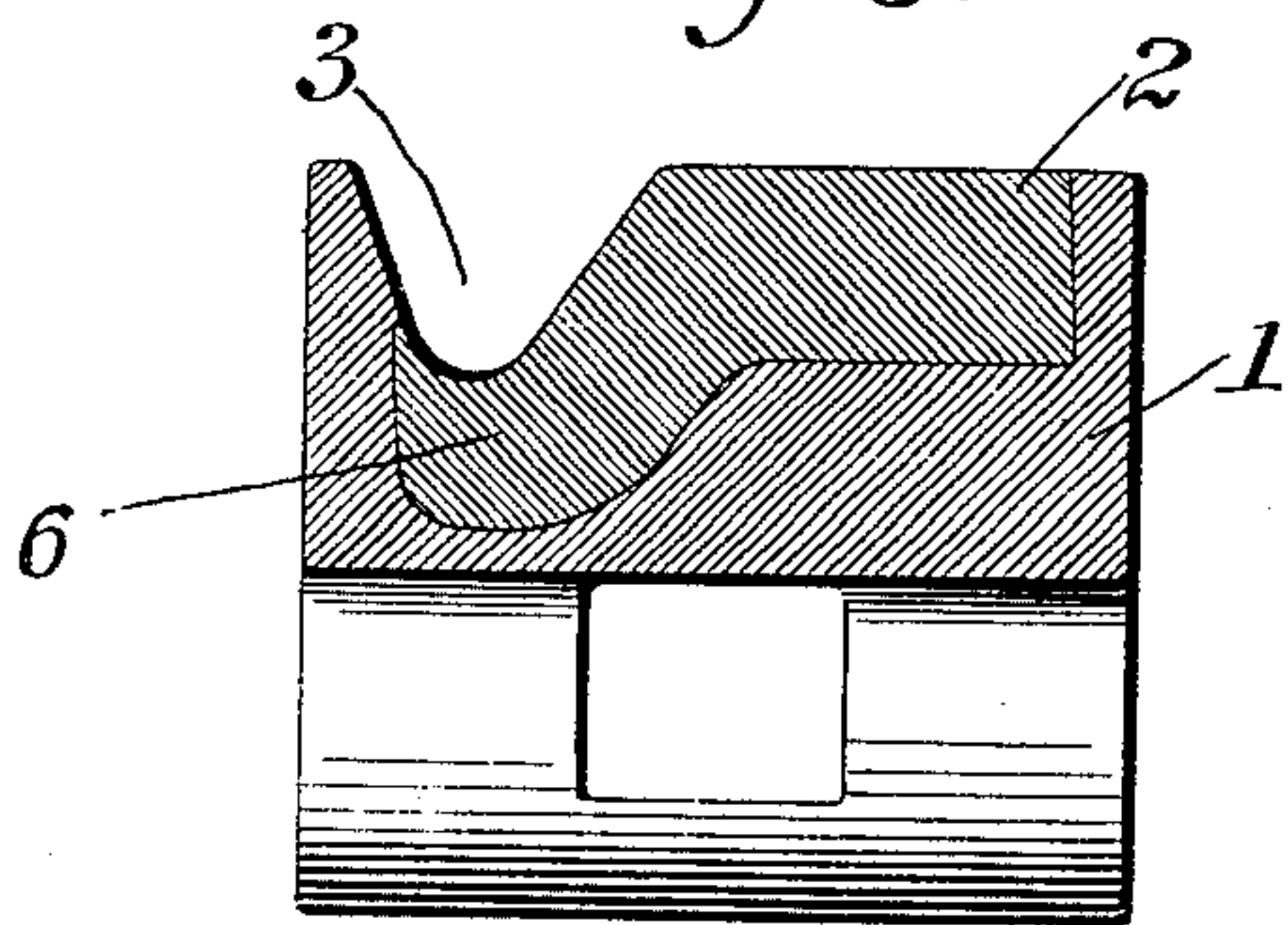
*Fig. 1.*



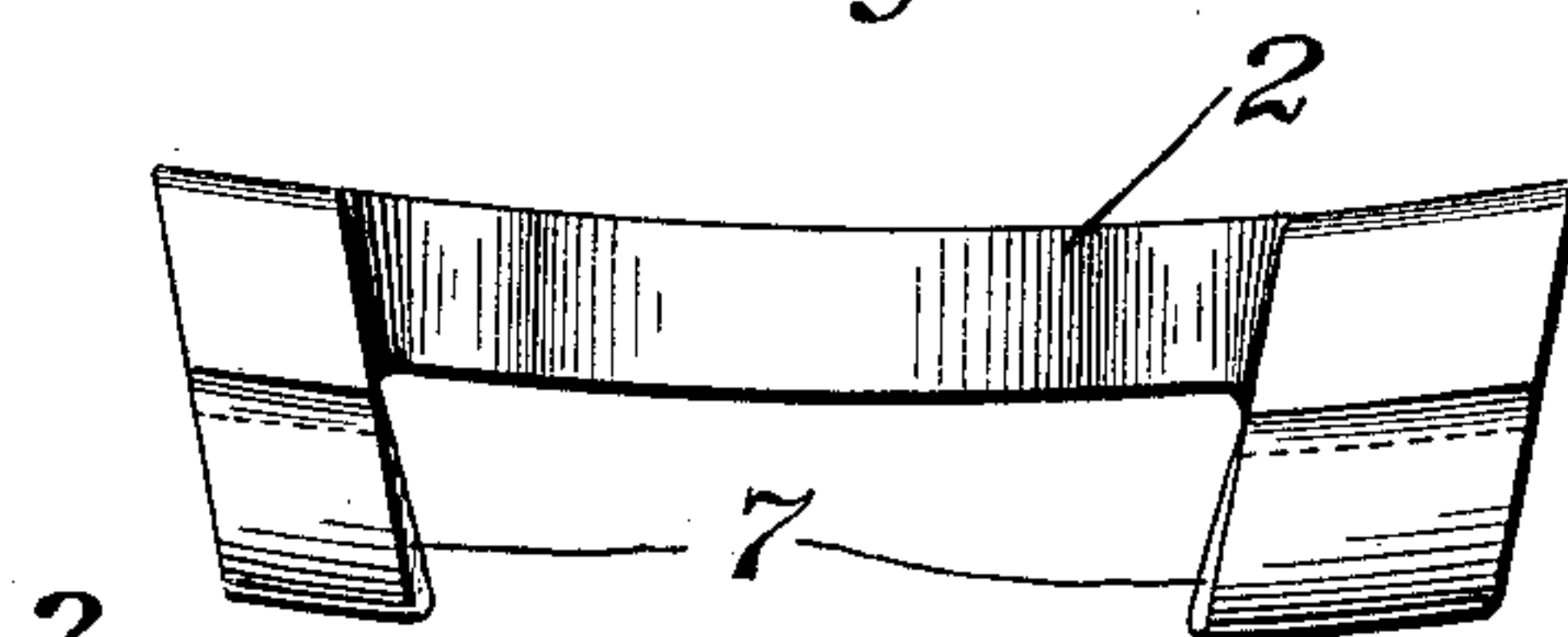
*Fig. 2.*



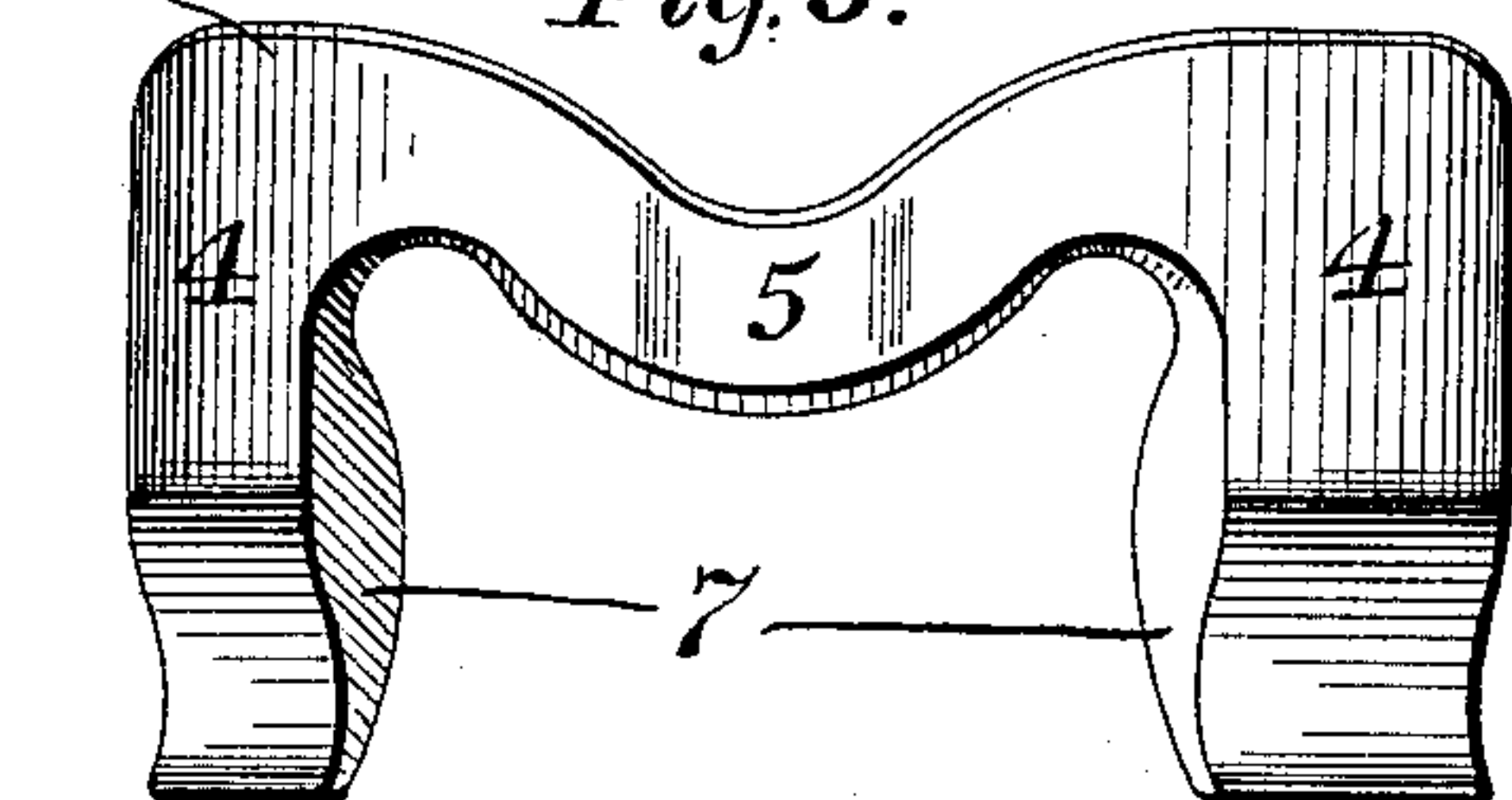
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## BRAKE-SHOE AND METHOD OF PRODUCING SAME.

SPECIFICATION forming part of Letters Patent No. 754,921, dated March 15, 1904.

Application filed October 30, 1903. Serial No. 179,132. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES G. ETTE, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Brake-Shoes and Methods of Producing the Same, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a face view. Fig. 2 is an elevation, partly in section, on about the line of the contour of one of the inserts shown in Fig. 1. Fig. 3 is a transverse sectional elevation on about the line 3 3 of Fig. 1. Fig. 4 is a side view of one of the inserts, showing the side opposite that illustrated in Fig. 2; and Fig. 5 is a face view of one of the inserts.

This invention relates to improvements in brake-shoes and methods of producing the same, and more particularly to composite brake-shoes having body portions of one material cast about inserts of another material. Brake-shoes of this general type are old and well known. The inserts are usually of hard metal, which is as a rule too brittle to be satisfactorily use alone, and for this reason a body portion of relatively soft metal is cast about the insert in order to prevent breaking of such insert. As the shoes have heretofore been constructed the insert is first made and is then placed in the mold for the finished shoe, after which the material to form the body portion of the shoe, such as gray iron, is poured into the mold and permitted to set about the insert. The molten metal thus poured into the mold meets the cold insert, and the body portion of the brake-shoe thus becomes chilled along its surface in contact with the insert. This is highly objectionable. In the first place the chill of the body portion decreases gradually away from the contacting surface of the insert, so that the transition from the relatively soft-metal to the hard-metal insert is gradual, and therefore the brake-shoe does not grip the wheel as firmly and effectively as results when the line of demarcation between the soft metal and the hard

metal is well defined. Secondly, the chilling of the body portion serves to weaken it and to thus lessen its value as a strengthening member for the hard-metal insert, and this weakening of the body portion occurs at the very point at which such body portion should be strongest—that is to say, the chilling and consequent weakening occurs at the walls of the groove or channel in which the insert is received, thus making these walls particularly weak, so that these walls are apt to chip and break, whereby the insert-receiving channel becomes widened and the insert is liable to fall out of place. Should the insert become broken, the broken pieces are particularly apt to fall from such widened channel. Thirdly, the chilling of the body portion of the brake-shoe at the walls of the insert-receiving channel of course produces contraction of the metal at said walls, and thus causes the walls to recede from the insert, whereby the channel is undesirably widened, a firm snug fitting of the body portion of the brake-shoe about the insert is rendered impossible, and the insert is consequently apt to become loose and to fall from its channel.

The primary object of the present invention is to overcome the difficulties above indicated.

To this end and also to improve generally upon devices and methods of the character indicated the invention consists in the various matters hereinafter described and claimed.

Referring now more particularly to the accompanying drawings, 1 indicates the body portion of the brake-shoe, the insert or inserts 2 being received in suitable channels in said body portion. The body portion is not chilled at any point, so that its relatively soft character is retained up to the insert or inserts. Such a shoe having no portion of its body 1 chilled can be readily cast about the inserts in the usual manner if such inserts be first coated with plumbago or red lead.

A brake-shoe having an insert or inserts of hard material and a body whose portion in contact with such insert or inserts is not chilled presents many advantages. The line of demarcation between the two metals in the wearing face of the brake-shoe is sharply de-



fined, and the brake-shoe thus firmly and effectively grips the wheel. Furthermore, the original toughness of the inclosing body is retained, and a binder and strengthening member possessing the unimpaired strength and toughness of the relatively soft gray iron is thus secured. Again, the gray-iron body fits snugly against the insert or inserts, and thus holds them firmly in position. Even should an insert crack by reason of its brittleness the pieces are still firmly held in the channel by reason of the tough snugly-fitting walls of the body portion of the shoe.

In practice most satisfactory results have been obtained by casting the inserts from malleable iron before it is annealed and permitting this iron to remain unannealed and by casting the body portion from gray iron.

In the present embodiment of the invention the brake-shoe is provided with the usual groove 3 for receiving the wheel-flange. Each insert has what may be termed a "body portion," which is received in the tread of the brake-shoe, while upon said body portion are extensions which have their outer faces in the flange-receiving groove 3. The body portion of each insert is here shown as comprising transverse end pieces 4, connected by a curved or sinuous connector 5, said end pieces 4 having backwardly and outwardly extending projections 6, whose exposed surfaces lie in said flange-receiving groove 3. The inner surfaces 7 of said end pieces and their extensions incline backwardly—i. e., away from the face of the shoe—and inwardly—i. e., toward the transverse center of the insert—whereby these extensions 6 not only form a convenient means of presenting inserts in the flange-receiving groove, but also present large inclined surfaces against which the substantially wedge-shaped filler portion 8 of the gray-iron body can engage, whereby each insert is firmly held in position.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device and in the steps of my method can be made and substituted

for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a brake-shoe, a body portion having a flange-groove, and an insert embedded in said body portion, said insert having a body portion in the tread of said brake-shoe, and projections upon said body portion of said insert and extending into and embedded in the flange-groove portion of said body portion, said extensions having backwardly and inwardly inclined inner faces which embrace a substantially wedge-shaped filler portion of the body portion of said brake-shoe; substantially as described.

2. In a brake-shoe, a body portion having a flange-groove therein, and an insert embedded in said body portion, said insert comprising a connector embedded in the tread of said brake-shoe, transverse end pieces connected by said connector and also in said tread, and backwardly and outwardly extending projections upon said end pieces and embedded in the flange-groove portion of said body portion, said transverse end pieces and their extensions having their inner faces inclining backwardly and inwardly; substantially as described.

3. The method of producing composite brake-shoes which consists in first producing an insert, coating said insert with a material which is a non-conductor of heat, and then casting the body portion of the shoe about the insert so coated, whereby chilling and shrinkage of said body portion about said insert is prevented; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 27th day of October, 1903.

CHARLES G. ETTE.

Witnesses:

EDW. P. KYLE,  
F. H. MITCHELL.