

No. 708,704.

Patented Sept. 9, 1902.

J. D. GALLAGHER.

BRAKE SHOE.

(Application filed June 13, 1901.)

(No Model.)

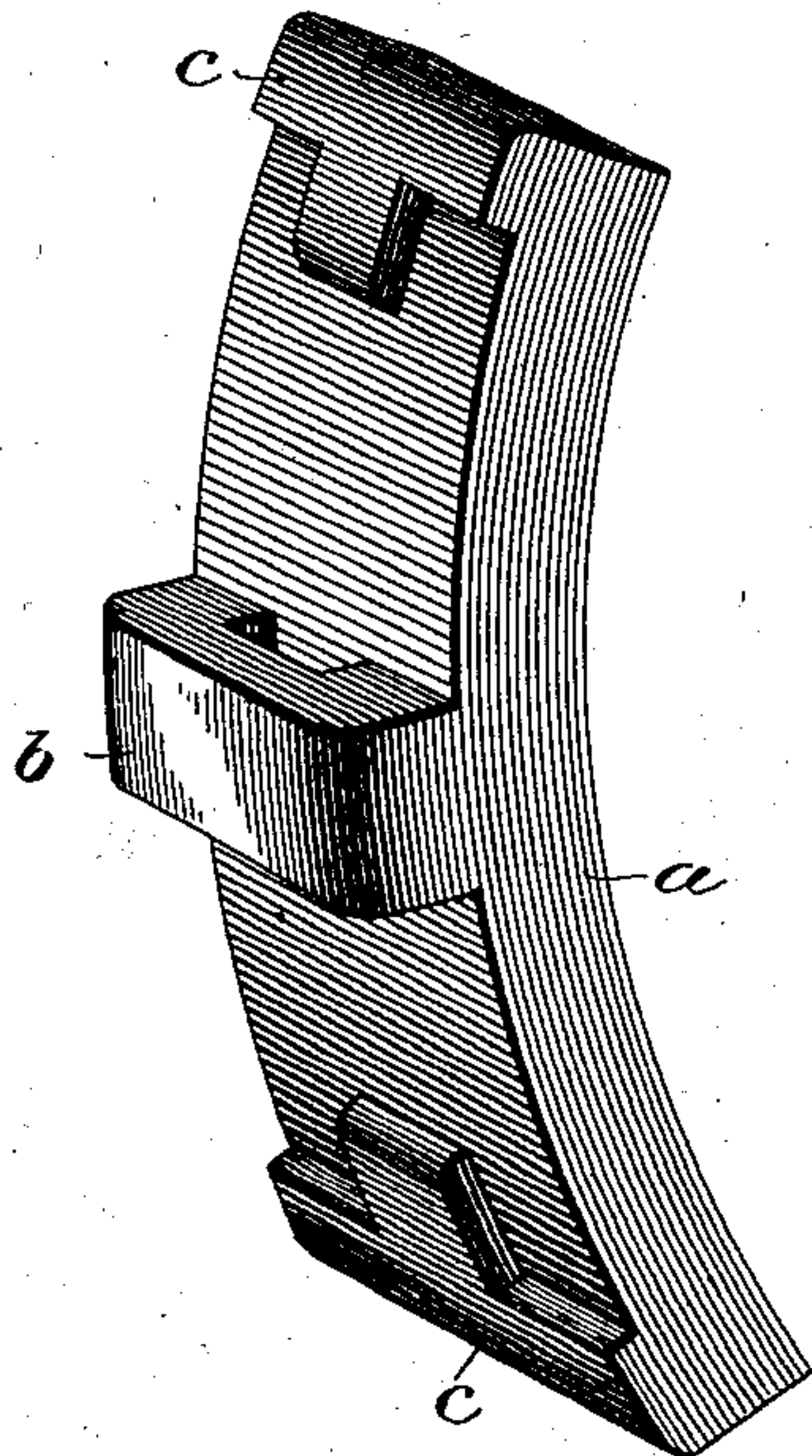


Fig. 1.

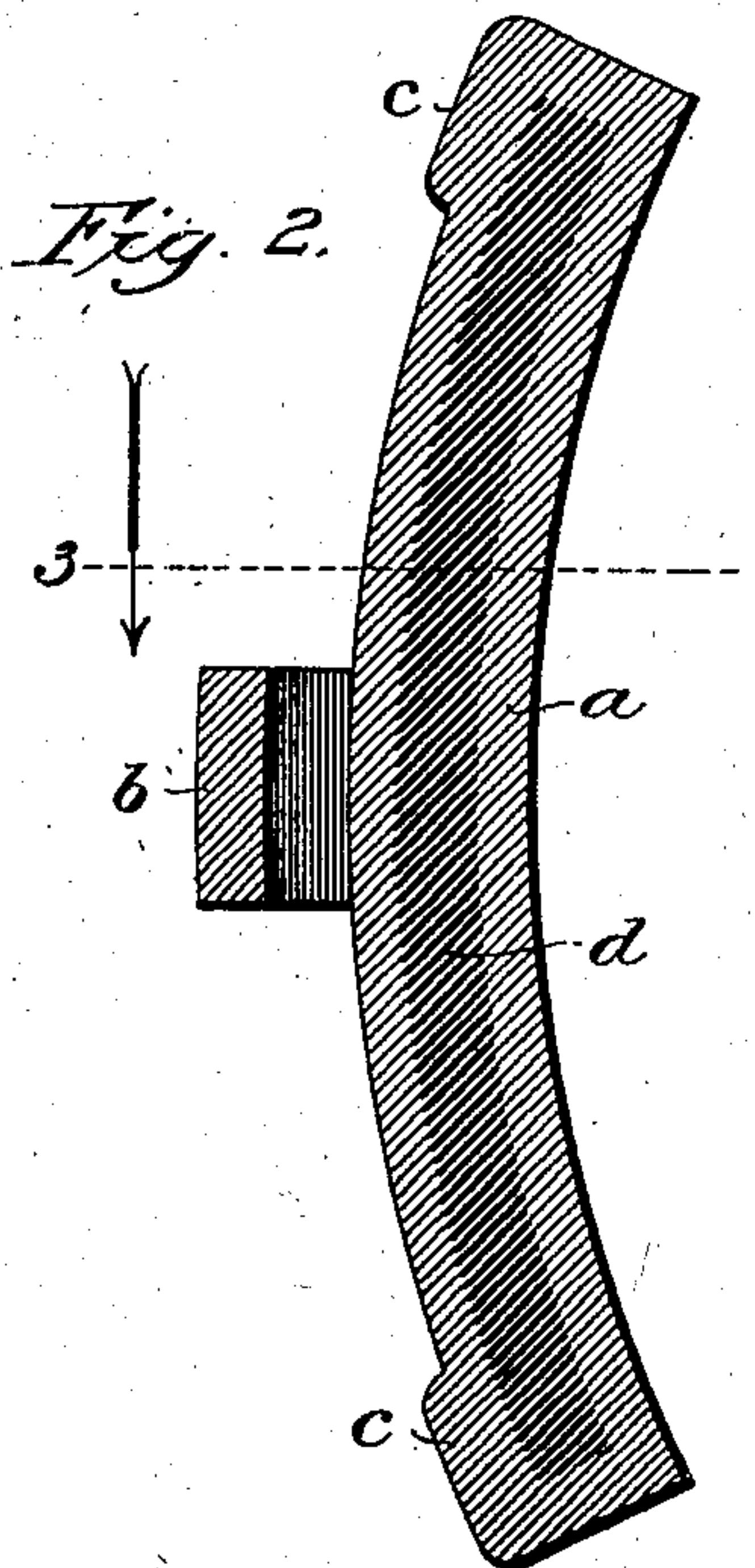


Fig. 2.

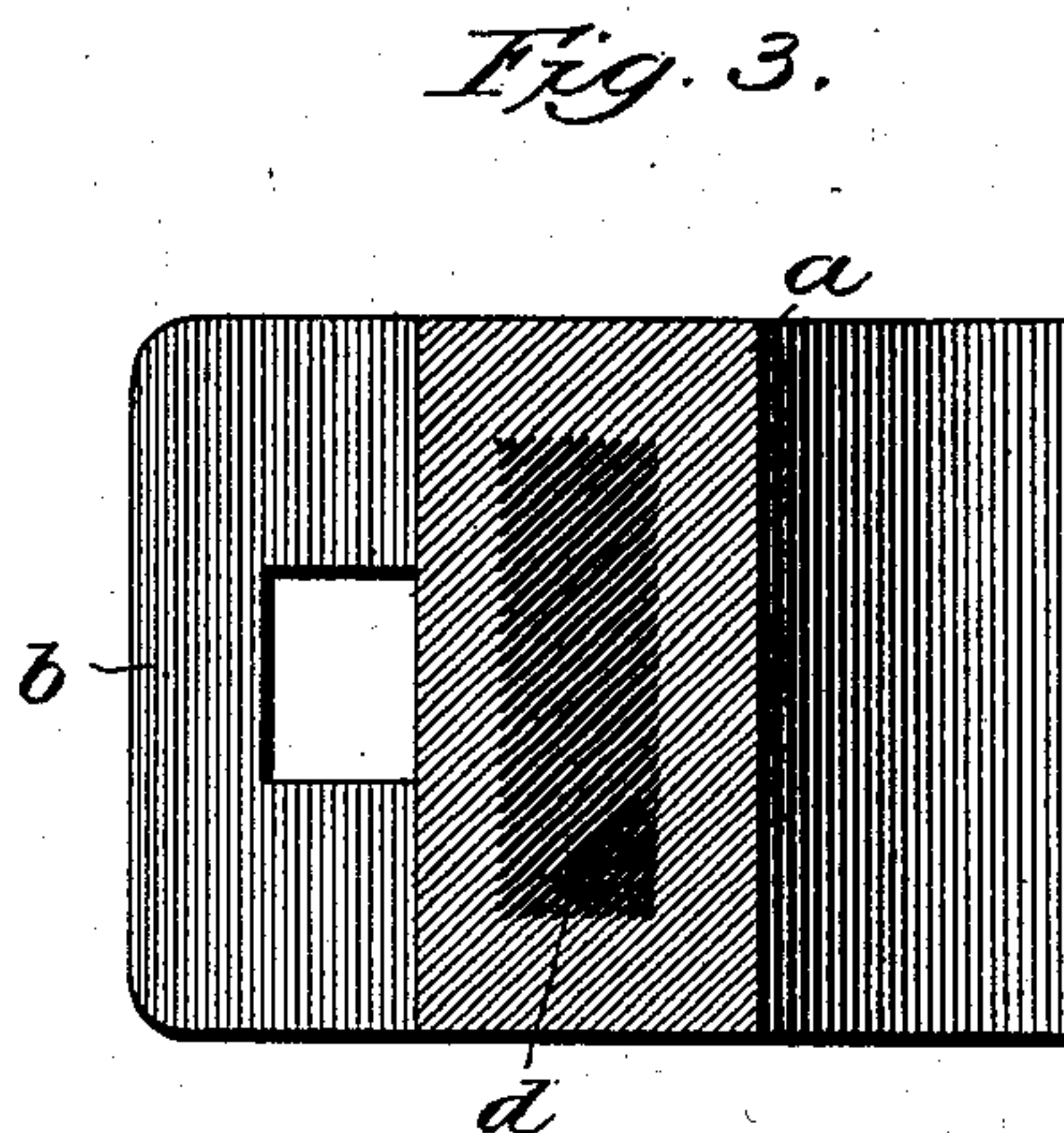


Fig. 3.

Witnesses:

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# UNITED STATES PATENT OFFICE.

JOSEPH D. GALLAGHER, OF GLENRIDGE, NEW JERSEY.

## BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 708,704, dated September 9, 1902.

Application filed June 13, 1901. Serial No. 64,482. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH D. GALLAGHER, a citizen of the United States, residing at Glenridge, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Brake-Shoes, of which the following is a specification.

My invention relates to cast-iron brake-shoes, and particularly to the means by which the integrity and efficiency of the brake-shoe are prolonged, all of which will more fully hereinafter appear.

The principal object of my invention is to provide a brake-shoe formed entirely of cast-iron in one integral structure one part of which is harder than the other to provide a compound wearing-surface and maintain the efficiency of the shoe as long as possible.

Further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in a brake-shoe formed of cast-iron the outside of which is annealed or made softer than the interior.

The invention consists, further, in a brake-shoe formed of cast-iron the back, sides, and lugs of which are annealed and made softer than the interior.

The invention consists, further and finally, in the features and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a brake-shoe constructed in accordance with these improvements; Fig. 2, a longitudinal sectional view taken through the brake-shoe at or near the longitudinal center; and Fig. 3 an enlarged cross-sectional view taken on line 3 of Fig. 2 looking in the direction of the arrow.

In the art to which this invention relates it is well known that brake-shoes when made of metal or in part of cast-iron are liable to break at the time they are worn about half way through and sometimes long before they reach such point and that in case of such breakage one or more of the broken parts is liable to fall to the ground and derail the cars, all of which is dangerous to life and limb, as well as destructive to property. The principal object, therefore, of this invention is to provide a simple, economical, and efficient brake-

shoe which will obviate these defects and tend to maintain the integrity of the shoe for a considerable period, and thus obtain more use from the metal forming the shoe, all of which will more fully hereinafter appear.

In constructing a shoe in accordance with these improvements I make a shoe provided with a body portion *a*, having the attaching-lugs *b* and the end lugs *c*, by which it is held in place on the brake-beam. This shoe is cast, preferably, from annealing-iron—that is, a hard or high grade of white cast-iron—which will resist the wearing action incident to use much better than the ordinary soft and cheaper metal. It will be understood, however, that this hard or annealing iron is so frangible that it is very liable to rupture or break during the shocks and strains incident to the use of a brake-shoe. It therefore becomes necessary to provide means to overcome this tendency and to protect and maintain the integrity and efficiency of the shoe as long as possible. In order to provide for this, I place the shoe after it has been cast in an annealing-oven and permit it to remain there for a period approximating seventy-two hours. I then remove the shoe and permit it to cool, the result being that the exterior portion of the cast metal is annealed for a depth of from a quarter to half an inch all around the back, ends, sides, and front, so that it forms practically a shell of soft malleable iron with a core *d* of hard white iron and presents to the wearing action of the wheel substantially a compound wearing-surface, particularly after the face has been worn for a short time.

The distinct advantage incident to a shoe constructed in accordance with my improvements is that it presents in one integral piece a shoe having a compound wearing-surface and a soft back and lugs, the soft back and lugs tending to resist breakage and maintain the efficiency and integrity of the shoe for a much longer time than a shoe made of homogeneous metal.

I claim—

1. As a new article of manufacture, a brake-shoe formed of annealing-iron, having an outer shell of soft metal and an inner core of hard metal, substantially as described.

2. As a new article of manufacture, a brake-



shoe formed of cast-iron, the back and lugs of which are annealed and the core of which is formed of hard iron so as to present during its use a compound wearing-surface, substantially as described.

3. As a new article of manufacture, a brake-shoe comprising malleable-iron and relatively hard cast-iron portions formed integral with each other, the malleable-iron portion comprising a layer disposed at the back of the shoe, substantially as described.

4. As a new article of manufacture, a brake-shoe comprising malleable-iron and relatively hard cast-iron portions formed integral with each other, the malleable-iron portion thereof comprising a layer disposed at the back of the shoe and the attaching-lug, substantially as described.

5. As a new article of manufacture, a brake-shoe comprising layers of malleable iron extending from the face or friction-surface thereof toward the back of the shoe and relatively hard cast-iron portions, the malleable and hard portions being integral with and

merging gradually into each other, substantially as described.

6. As a new article of manufacture, a brake-shoe comprising a layer of malleable iron disposed at the back of the shoe, layers of malleable iron extending from the face or friction-surface thereof toward the back of the shoe, and relatively hard cast-iron portions, substantially as described.

7. As a new article of manufacture, a brake-shoe comprising outer layers of malleable iron on all exposed surfaces, and an inner portion of relatively hard cast-iron, substantially as described.

8. As a new article of manufacture, a brake-shoe consisting of an integral piece of metal and comprising outer layers of malleable iron and inner portions of relatively hard cast-iron, substantially as described.

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Witnesses:

THOMAS F. SHERIDAN,  
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