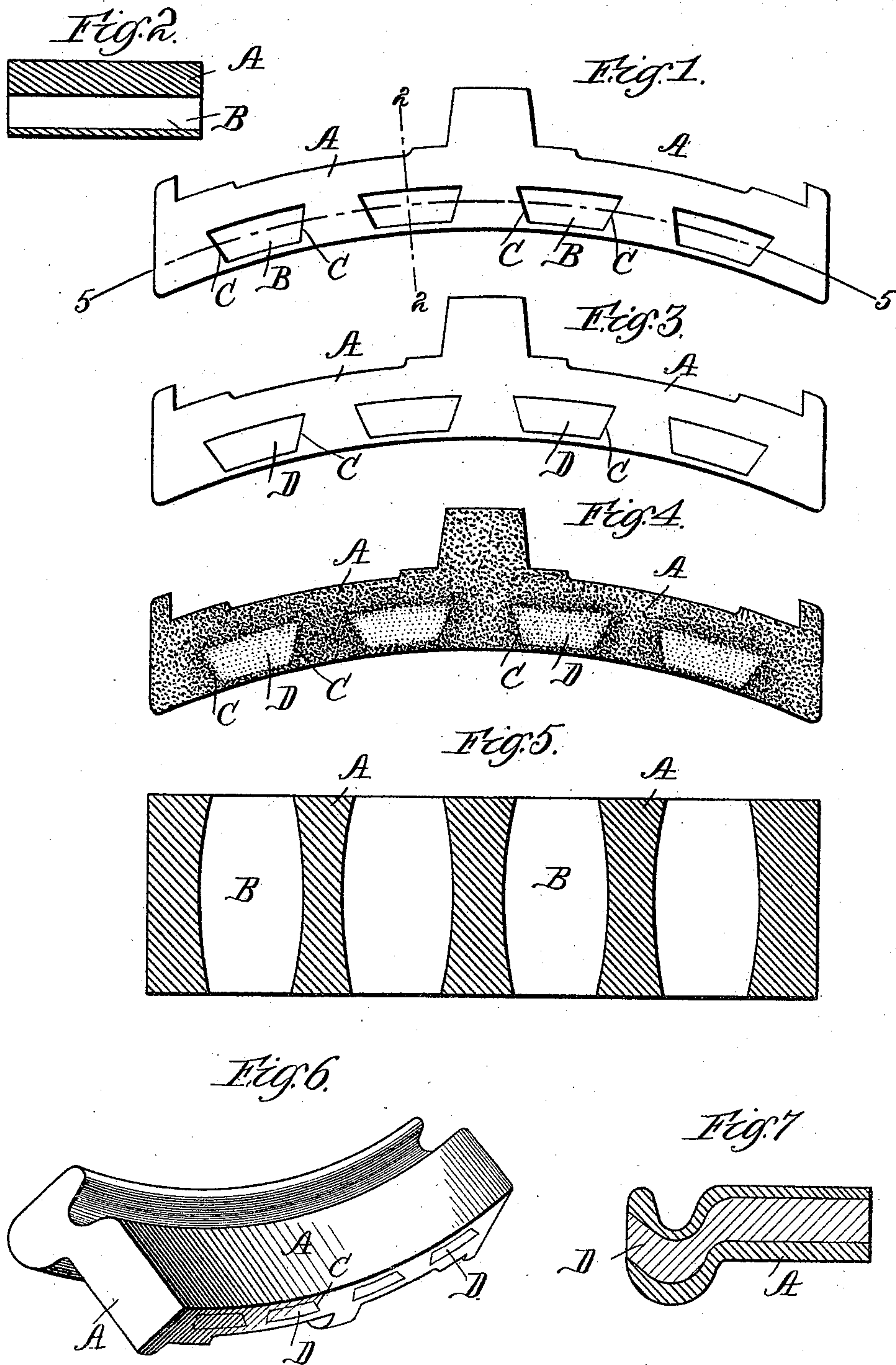


No Model.)

W. D. SARGENT.  
BRAKE SHOE.

No. 516,992.

Patented Mar. 20, 1894.



WITNESSES

Wm. M. Rheem.  
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# UNITED STATES PATENT OFFICE.

WILLIAM DURHAM SARGENT, OF CHICAGO, ILLINOIS.

## BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 516,992, dated March 20, 1894.

Application filed October 28, 1893. Serial No. 489,412. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM DURHAM SARGENT, a citizen of the United States, residing in 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 part of this specification.

This invention relates to brake shoes of that particular class in which the wearing or working face of the shoe is composed of different kinds of metals, or of what are known as relatively hard and soft metals, the purpose of such construction being to promote the longevity of the shoe, to utilize the shoe as a dresser for the wheel, and to promote the braking qualities of the shoe. Prior to my invention this class of shoes has been constructed in various ways, but in all instances known to me, the methods practiced have been objectionable, either by reason of the expense and complication thereof, or because of the lack of uniformity in the wearing surface of the shoe so produced, as well as the liability of the dressing or cutting inserts of hard metal operating to cause premature and unnecessary wear of the car wheels.

The prime object of this invention is to produce a brake shoe having a working or operating face composed of different kinds of metals, which shall be uniform throughout the life of the shoe, and of such character that the shoe shall possess the maximum strength, durability and uniformity of working face while yet simple and economical in the manufacture.

Another object is to provide a brake shoe with alternate hard and soft portions composed of different metals, the character of which is changed by contact with one another in the manufacture of the shoe.

These objects are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of a shoe body made in accordance with my invention; Fig. 2 a transverse vertical section thereof on the line 2—2 of Fig. 1 looking in the direction indicated by the arrows; Fig. 3 an outline elevation of a completed shoe; Fig. 4 a longitudinal section thereof; Fig. 5 a hori-

zontal section on the line 5—5 of Fig. 1; and Figs. 6 and 7 perspective and sectional views respectively of a combined flange and tread brake shoe.

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

In the carrying out of my invention, I first cast the body A of the brake shoe in iron or steel of any suitable form and dimensions, leaving therein any desired number of transverse openings or perforations B arranged at intervals throughout the length of the shoe. These openings may be of any desired shape but preferably have inclined sides C converging toward the inner or working face of the shoe, from which face the openings are separated by a comparatively thin facing of the cast metal. These openings are also preferably enlarged or bellied from the ends to the center of length thereof as will be more readily understood by an inspection of Fig. 3, the purpose of which enlargement of the openings as well as the inclined side walls thereof, being to aid in retaining the chilled plugs D rigidly in position against either accidental or forcible displacements. This shoe-body A is then turned upon its side and the holes B therein are filled with molten iron, steel or any other suitable or desirable kind of metal which becomes chilled or hardened by contact with the cast metal, thereby forming in each of the holes, a transverse plug of hard metal which completely fills the holes, with ends lying flush with the sides of the shoe body. The adhesion between this plug which is cast into the shoe-body may alone be depended on to retain the plugs in position, but it is preferable to so shape the openings in which the plugs are cast, such, for instance, as the shaping shown in the drawings, that the plug cannot be accidentally or forcibly removed without fracture of the shoe. The importance of this will be all the more appreciated when it is understood that in the practical use of the shoe the thin layer of soft metal between the plug and the working face of the shoe, soon becomes worn away and exposes the inner side of the hardened plugs to wear upon the wheels and it is therefore desirable that some means other than adhesion be provided for uniting the plugs to the shoe



body, for, in the operation of casting, the metal of the plug is chilled and its character so changed that there is practically little or no adhesion between the plug and the shoe-body.

As soon as the shoe is worn in use sufficiently to expose the plugs of hard metal, a most effective and durable brake surface is obtained and this surface will remain practically unchanged during the further wear of the shoe until the plugs are completely worn through, by which time the shoe-body is also worn beyond usefulness, as such, and may then be used as scrap for re-melting.

In Figs. 6 and 7 I have shown a different form of brake-shoe having a wearing surface for contact with the wheel flange as well as the tread thereof and in which these plugs may also be formed in the manner previously described and with practically no greater cost, this shoe being of the kind known as "dressing shoes;" and it is within the contemplation of my invention in the forming of the brake-shoe shown in Figs. 1 to 5 as well as those shown in Figs. 6 and 7 to so proportion and arrange the recesses or openings in the body of the brake-shoe that the metal inserts when cast therein will have the effect of wearing the surface of the wheel in different degrees and therefore operating to dress the portions of the wheel less subject to wear in use.

While I have shown in both of these shoes the perforations or holes C as extending transversely and entirely through the brake-shoe body, obviously, pockets or any other form of openings or recesses may be employed without departing from the spirit of my invention so long as the completed brake-shoe has the hard metal plugs therein and at such intervals as to form a wearing face for the shoe composed of alternate hard and soft metal portions.

A shoe constructed in accordance with my invention, possesses durability, strength and

utility in the maximum degree; it is comparatively cheap and simple in its manufacture, does not require that the plugs or inserts be previously formed before attachment to the shoe; and furthermore, in the method of manufacturing the shoe, any kind of metal having the desirable characteristics may be employed in forming the plugs, although iron or steel are preferred and the cast metal shoe-body serves as a chill for the plugs when cast therein, thereby obviating the necessity for and expense of separate chilling devices, and enabling the construction of a soft iron or steel shoe with chilled iron or steel inserts, at the minimum cost of manufacture and yet possessing the maximum longevity and efficiency.

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

1. A brake-shoe comprising a body-portion of cast iron, steel or equivalent metal having recesses or perforations formed therein and plugs of iron, steel or equivalent metal cast in said perforations or recesses, whereby such plugs become chilled or hardened when formed substantially as described.

2. A brake-shoe comprising a body-portion of cast metal having perforations or recesses therein enlarged at a point removed from the surface of the shoe and plugs of a metal differing from the body of said shoe cast in so as to fill said recesses.

3. A brake-shoe comprising a body portion having lateral perforations therein, the walls of which perforations belly toward the center of width of the shoe and converge toward the working face thereof and plugs of metal differing from said body, cast in so as to fill said perforations, substantially as described.

WILLIAM DURHAM SARGENT.

Witnesses:

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