

(No Model.)

2 Sheets—Sheet 1.

E. W. APPLGATE.
BRAKE SHOE.

No. 568,226.

Patented Sept. 22, 1896.

Fig. 1.

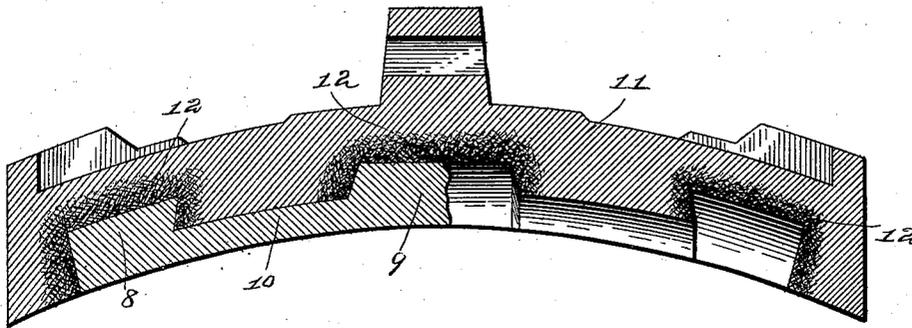


Fig. 2.

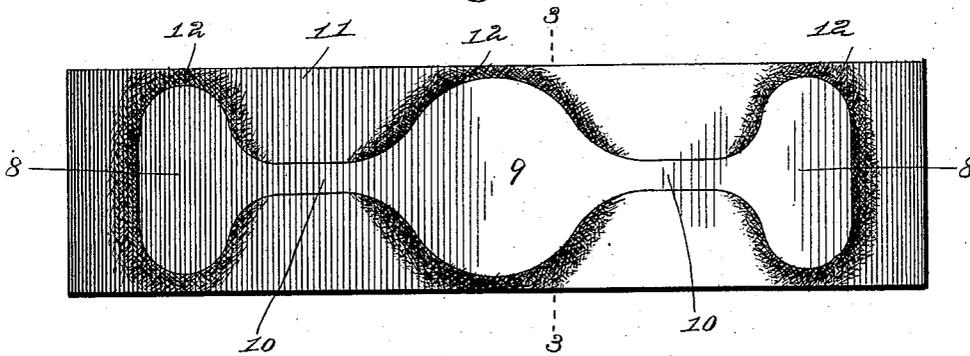
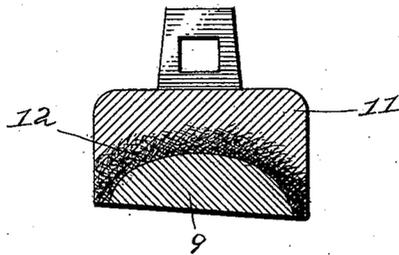


Fig. 3.



Witnesses:

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Fig. 4.

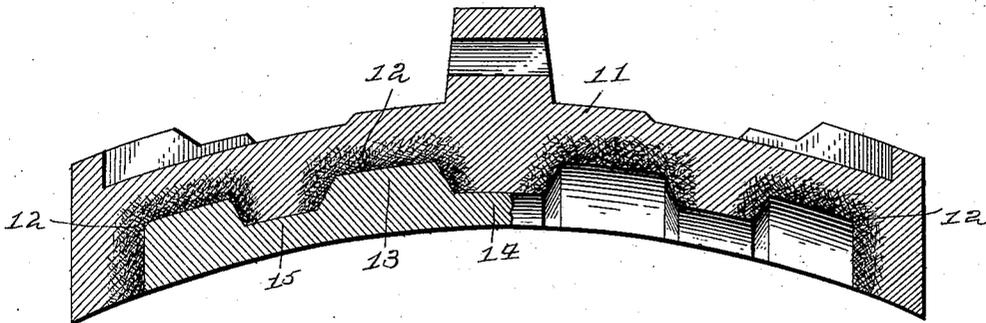


Fig. 5.

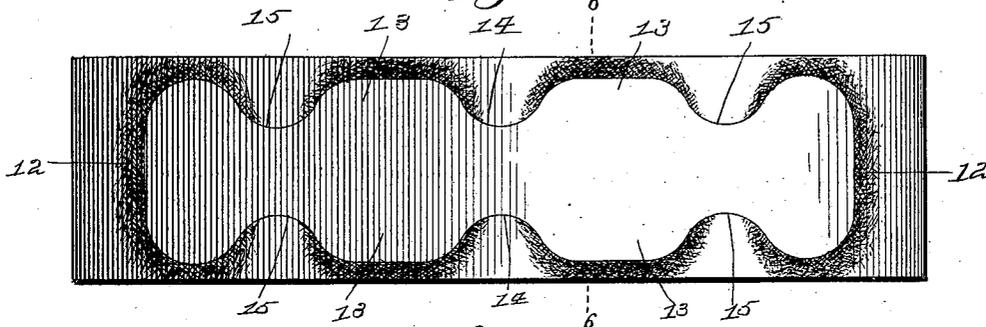


Fig. 6.

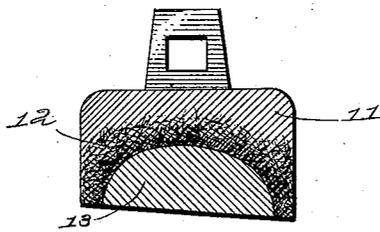
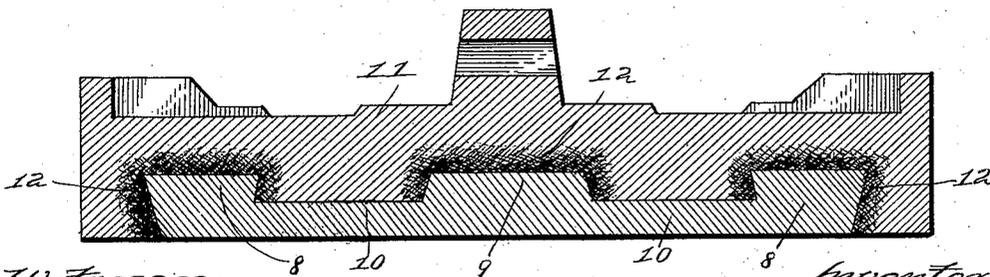


Fig. 7.



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UNITED STATES PATENT OFFICE.

EUGENE W. APPLIGATE, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPHUS B. TERBELL, OF CORNING, NEW YORK.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 568,226, dated September 22, 1896.

Application filed June 8, 1896. Serial No. 594,776. (No model.)

To all whom it may concern:

Be it known that I, EUGENE W. APPLIGATE, of New York, N. Y., have invented certain new and useful Improvements in Brake-Shoes, of which the following is a specification.

The object of my invention is to so improve the construction of brake-shoes—such, for example, as those ordinarily used to arrest the motion of car-wheels—as to secure in the same shoe economy of construction and durability and strength with a capacity for exerting great friction upon the surfaces with which the brake-shoe is brought in contact.

In carrying out my invention I make a shoe of a composite construction, the principal portion of the body of the shoe being formed of charcoal-iron and having a centrally-disposed core inclosed by the casing or body and presenting a durable wearing-surface, while the inclosing mass of iron gives to the shoe the necessary strength to withstand the tremendous pressure under which the brakes are applied. The core is preferably composed of No. 2 foundry coke-iron, and the casing or body is cast upon the core, thus effecting the chilling of the casing or body, which chilling effect will extend into the mass of the body proportional to the thickness of the mass of the core. The core is irregular in its outline, presenting varying transverse widths and depths, the central and end portions of the core being massive, and these massive or heavier portions being connected by thinner webs, and from this it results that the chill of the casing or body extends adjacent to these thickened portions of the core throughout a considerable portion of the casing or body—say, to an inch or more—while along the thinner or narrower portions of the core the metal of the casing or body is chilled very slightly, if any.

In the accompanying drawings, Figures 1, 2, and 3 show the preferred construction of that type of brake-shoes which are intended to be applied to curved surfaces, as, for example, the periphery or rim of a car-wheel, Fig. 1 being a longitudinal elevation sectional through the casing or body and through a part of the core; Fig. 2, a plan or face view, and Fig. 3 a transverse section on the line 3 3

of Fig. 2. Figs. 4, 5, and 6 are similar views showing a modification of the construction of shoe of the class shown in the preceding figures, while Fig. 7 illustrates another modification, such as is embodied in a brake-shoe applied to a flat surface, as, for example, a railway-track rail.

In carrying out my invention I first form by casting a core, using, preferably, for that purpose a grade of iron known as "soft gray iron," and this core is preferably composed of the rounded heads or ends 8, the thickened central portion 9 being joined by the thinner webs 10 to the heads.

The core when intended for use in a brake-shoe of the form shown in Figs. 1, 2, and 3 will have its outer face of proper curve, and the back or rear portion of the core is preferably rounded, as clearly shown in the sectional view, Fig. 3. The proportional size of the core may be varied, but I have found that proportions substantially as indicated in the drawings afford the desired results. After this core is formed it is placed in proper position in the sand, and the body or casing is cast thereon, preferably from that quality of iron known as "charcoal-iron." The casting of this metal upon the core results adjacent to the thicker masses of the core—namely, the heads and central portion—in chilling the casing or body, the chilling being indicated at 12 and extending radially in all directions from these massive portions and practically throughout the body transversely, the chilling extending into the surrounding masses in varying distances proportional to the thickness of the massive portions of the core.

The webs 10 are not of sufficient thickness to impart any appreciable chill to the metal of the casing or body, and hence those portions of the body adjacent to the webs retain the full strength of the metal and enable the brake-shoe to withstand the strains which are always exerted at points between the ends and the middle of the shoe.

In Figs. 4 to 6, inclusive, I have shown a modification, the principal change consisting in the contour or outlines of the core and in the provision of two thickened portions, indicated at 13 and connected to each other by a web 14 and to the end sections by webs 15,

the unshaded portions indicating those parts of the body or casing which are not chilled.)

In Fig. 7 I have shown a brake-shoe of the type which is intended for application to a plane surface, such as the head of a railway-rail, and such modification requires no particular description, the core and body being marked the same as in the corresponding parts in the preferred construction.

The area of the unchilled portions greatly exceeds the area of the chilled portions, and therefore the maximum frictional capacity is secured. In practice I have constructed these shoes so that eighty-five per cent. of the total area of the face of the shoe was of soft iron or friction-surface, the remaining fifteen per cent. being chilled, and therefore without any appreciable friction-surface, but having a wearing capacity which makes the shoe durable or long lived. The chilled portions are so disposed or distributed as not to structurally weaken the shoe, while they are equally effective in preventing too rapid wear.

The form of the core enables it to be placed in the sand and the metal cast thereon without anchoring the core in place, and the core being of only slightly less length than the body of the shoe it serves as a means for effecting the chill at desired points without weakening the body or impairing its frictional qualities.

The sectional form of the core enables it to withstand endwise pressure produced by the moving wheel, which pressure always tends to dislodge or force the inset or core blocks out of the casing or body. The protuberances or shoulders of the heads and central portion of the core furnish bearing-points upon the inclosing masses of metal of the body, and thus a core of this form is adequate to withstand endwise dislodging pressure produced in service. The ordinary inset blocks having straight sides are frequently dislodged and break out the end of the shoe. This difficulty my form of construction entirely obviates.

The rounding of the back of the core causes the chilling of the surrounding mass in radial instead of vertical or transverse lines, and this graduated or radiated chilling is important, because it distributes the wear upon the tire and tends to cause the tire or rim to wear true.

I am aware that it is not new to provide a brake-shoe with inset wearing or friction blocks intended to prolong the serviceability of the shoe, but these blocks are usually only embedded in the body of the shoe to a sufficient depth to retain them in place and are usually detached from each other and do not constitute an integral core extending practically from end to end of the face of the shoe or providing for distributing and graduating the chill, as in my construction.

A great variety of these devices, such as above indicated, have been employed, but

none of them, so far as I am aware, afford a brake-shoe having the combined qualities of strength, frictional power, and durability.

My composite shoe possesses characteristics which make it of great practical advantage in use—namely, that it is equally adapted for use upon all kinds of car-wheels, whether the common chilled wheel or the high-priced steel-tire wheel. This adaptability to general use is secured in my improved brake-shoe by the particular form and proportions of the respective parts of the shoe and to the absence of a multiplicity of cutting edges, such as present themselves in a shoe having a series of inset blocks.

I claim—

1. A composite brake-shoe having a single core with a continuous exposed working face having laterally-thickened portions and a casing or body cast thereon and inclosing the sides and back of the core, substantially as described.

2. A composite brake-shoe having a core approximating the length of the face of the shoe and having thickened portions at its middle and ends connected by thinner webs and a casing or body cast thereon whereby said casing or body is chilled adjacent to said thickened portions, substantially as described.

3. A composite brake-shoe comprising a cast-metal body and an embedded core provided with thickened central and end portions rounded upon their embedded faces and a casing or body cast thereon, substantially as described.

4. A composite brake-shoe having a core formed with continuous working faces of varying width and a body cast thereon whereby is provided the maximum frictional surfaces and requisite strength and durability, substantially as described.

5. A composite brake-shoe having a casing or body cast upon a core and inclosing said core except the face thereof and said core having portions thereof thickened both laterally and transversely to the wearing-face and said thickened portions being connected by webs or necks of less lateral and transverse thickness, substantially as described.

6. A composite brake-shoe having a body or casing and a core upon which said body or casing is cast, said core being increased in transverse dimensions adjacent to strong parts of the shoe whereby increased chilling of the body may be effected to provide durability while in such parts of the shoe as are by its construction weak, said core is restricted in transverse dimension so that said portions of the shoe remain unchilled and provide a maximum frictional surface and supply the necessary strength in the shoe, substantially as described.

EUGENE W. APPELEGATE.

In presence of—

WILLIAM J. TULLY,
E. D. MULS.