

D. RAWSTRON.  
BRAKE SHOE WITH INSERT.  
APPLICATION FILED APR. 15, 1910.

999,258.

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Fig. 1.

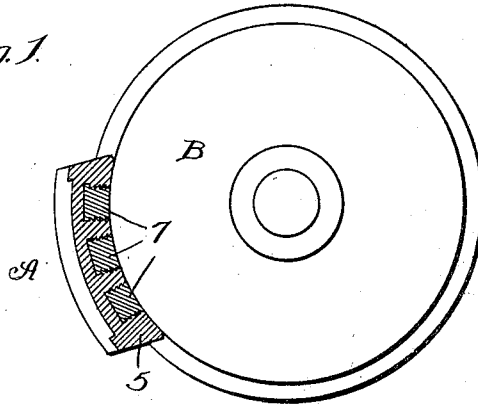


Fig. 2.

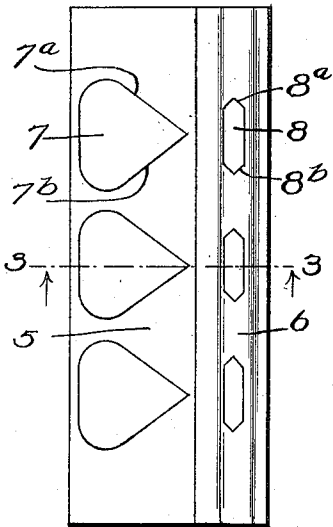


Fig. 3.

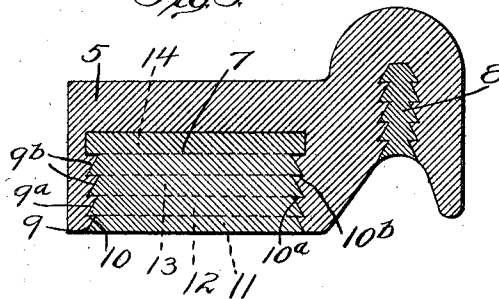
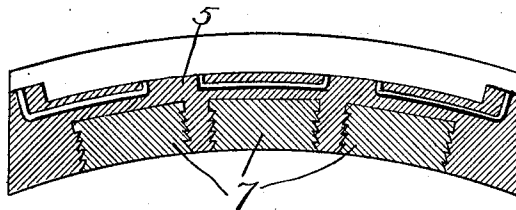


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## BRAKE-SHOE WITH INSERT.

999,258.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed April 15, 1910. Serial No. 555,558.

*To all whom it may concern:*

Be it known that I, DONALD RAWSTRON, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Brake-Shoes with Inserts, of which the following is a specification.

My invention relates to improvements in brake shoes, and has for its object the production of a shoe having an improved form of insert that will at all times maintain a cutting edge with respect to the wheel, with a maximum of material.

A further object is the production of a device that tends to keep the wear on the wheel uniform.

A further object is the production of a device that is cheap and effective and not liable to breakage.

These and such other objects as may hereinafter appear are attained by my device, an embodiment of which is illustrated in the accompanying drawings, in which—

Figure 1 represent a diagrammatical longitudinal section of a shoe in position on a car wheel. Fig. 2 represents a plan view of a shoe embodying my invention. Fig. 3 represents a sectional view on the line 3—3 of Fig. 2, looking in the direction indicated by the arrow. Fig. 4 represents a sectional view of a shoe embodying my invention and provided with a reinforced back.

Like numerals of reference indicate like parts in the several figures of the drawings.

Referring now to the drawings, A represents a shoe adapted to press against the face or wheel B, as shown in Fig. 1. The shoe shown is one adapted for use on flanged wheels, such, for example, the ordinary car wheel. The body of the shoe may be made from soft cast-iron or steel, and in the face of the tread 5 and in the flanged groove 6 are cast hard metal inserts 7 and 8. It will be noted that the inserts 7 are preferably of a substantially triangular shape and so positioned that the least amount of metal is placed nearest the grooved flange and where the greatest wear on the wheel occurs. Thus the greater surface of hard metal serves to dress the face of the wheel where it is least

worn and at the same time prevent the too rapid wear on the brake shoe. The larger inserts 7 in the face of the shoe are so placed that the opposite edges 7<sup>a</sup>, 7<sup>b</sup>, are placed at an acute angle to the direction of travel of the wheel, thus permitting a shearing action between the sharp edges of the insert and the face of the wheel when the brakes are set. The same result may be attained by extending the ends of the inserts triangularly, as shown at 8<sup>a</sup>, 8<sup>b</sup>, in the case of the inserts in the flange groove.

In order to give greater efficiency to the insert, it is essential that the operative sides of the inserts extend backwardly at an acute angle to the wearing face. One difficulty, however, which impairs the efficiency of shoes having this form of insert is the fact that as the face of the shoe wears down the area of the wearing face of the insert constantly diminishes, with a consequent serious loss in efficiency. In order to overcome this difficulty and to provide for a substantially uniform area of insert face, I form the operative side of the insert from a series of inclined faces having a serrated cross-section, as shown in Figs. 3 and 4. The faces comprise a series of acute-angled portions extending upwardly and inwardly, the upper and lower edges of adjacent faces being connected by substantially horizontal or slightly reëntrant bases 10. By this construction it is clear that as the insert wears down a shearing and cutting edge is always maintained, and the area of the face of the insert is maintained substantially uniform, for as soon as the lower portion or section 11 of the insert is worn away to the reëntrant face 10, the lower edge of the face 9<sup>a</sup> becomes the cutting and shearing edge, and so continues until the section 12 is worn away, and then the edge 9<sup>b</sup> becomes effective as the section 13 is being worn away.

I have shown the upper section 14, but this is not essential, as the serrated or ratchet-like faces of the insert will hold the insert rigidly in place within the metal of the shoe. The inserts may be extended backwardly about two thirds or three fourths of the thickness of the shoe without weakening

it, but I have illustrated in Fig. 4 a modification in which a plurality of U-bars or bars having their ends turned upwardly are embedded in the shoe in staggered relation to each other, near the back face thereby preventing the weakening of the shoe and at the same time making it impossible for the shoe to fall apart in the event that a fracture occurs.

I have shown triangular-shaped inserts in the face and lozenge-shaped inserts in the flanged groove, but, of course, it is understood that I do not limit myself to any particular shape or size so far as the inserts or bars are concerned, neither do I limit myself to any angle with respect to the operative side of the sections of the inserts, as these may be varied to suit the conditions in individual cases as they arise. In the use of shoes for wheels of large diameter, the comparative length of the faces  $10-10^a$  are so short that the moment the cutting edge of one section is worn away the cutting edge of the next section would become operative. It might, however, be desirable in some instances to have the faces  $10-10^a$  conform to the periphery of the wheel in order to attain the best results.

By the use of my improved insert, an exceptionally long life is assured for the shoe, with a uniform efficiency during the entire period of its use.

I claim:

1. A cast-metal brake shoe having a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face, and so formed as to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

2. A cast-metal brake shoe having a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face, and formed with a ratchet face to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

3. A cast-metal brake shoe having a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face set diagonally across the shoe, and so formed as to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

4. A cast-metal brake shoe having a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face set diagonally across the shoe, and formed with a ratchet face to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

5. A cast-metal brake shoe having a substantially triangular-faced hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing

face, and so formed as to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

6. A cast-metal brake shoe having a substantially triangular-faced hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face, and formed with a ratchet face to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

7. A cast-metal brake shoe having a substantially triangular-faced hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face set diagonally across the shoe, and so formed as to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

8. A cast-metal brake shoe having a substantially triangular-faced hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face set diagonally across the shoe, and formed with a ratchet face to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

9. A cast-metal brake shoe having a hard metal insert molded in its face, said insert being so shaped that the metal of the body of the shoe retains it in place, and also having an operative side formed at an acute angle to its wearing surface so as to present an efficient cutting edge to act on a wheel, said insert being so shaped as to maintain a substantially uniform wearing surface throughout the effective life of the shoe.

10. A cast-metal brake shoe having a hard metal insert molded in its face, said insert being so shaped that the metal of the body of the shoe retains it in place, and also having an operative side formed at an acute angle to its wearing surface so as to present an efficient cutting edge to act on a wheel, the operative sides of said inserts having a ratchet-like formation the teeth of which are so inclined as to maintain a substantially uniform wearing surface throughout the effective life of the shoe.

11. A cast-metal brake shoe having a reinforced back and a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face, and so formed as to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

12. A cast-metal brake shoe having a reinforced back and a hard metal insert molded in its face, having an operative side presenting an acute angle to its wearing face, and formed with a ratchet face to maintain a substantially uniform area of wearing surface during the entire life of the shoe.

13. A cast-metal brake shoe having a re-

inforced back and a hard metal insert  
molded in its face, said insert being so  
shaped that the metal of the body of the  
shoe retains it in place, and also having an  
operative side formed at an acute angle to  
its wearing surface so as to present an effi-  
cient cutting edge to act on a wheel, said in-  
sert being so shaped as to maintain a sub-

stantially uniform wearing surface through-  
out the effective life of the shoe.

Signed by me at Chicago, Illinois, this 1st  
day of April, 1910.

DONALD RAWSTRON.

Witnesses:

E. H. CLEGG,  
S. LEWIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."