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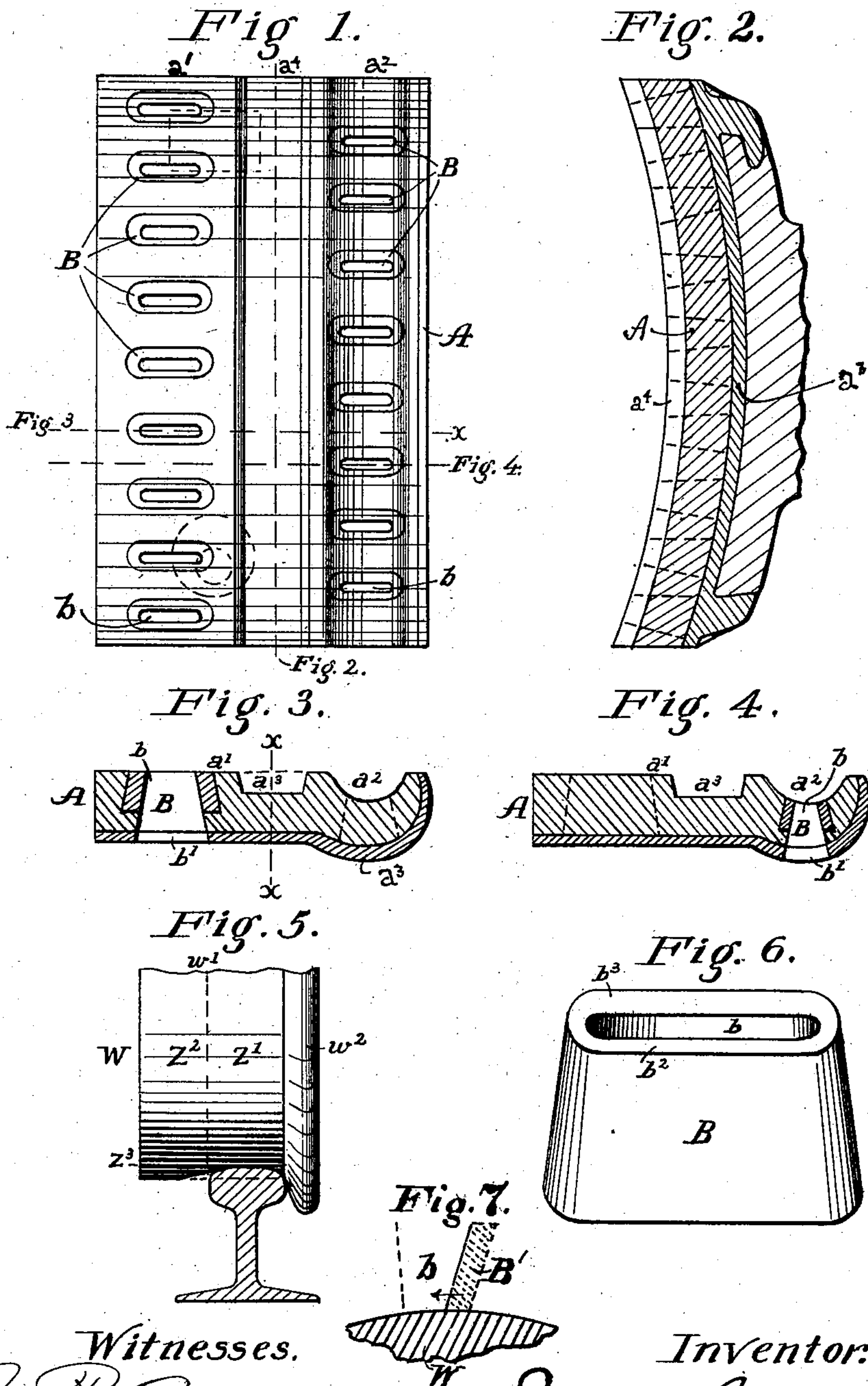
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J. MEEHAN.

BRAKE SHOE FOR RAILWAY BRAKES.

APPLICATION FILED JULY 2, 1902.

NO MODEL.



Witnesses.

Jos. K. Gartner.  
Chas. Herbert Jones

Inventor:

James Meehan  
by L. M. Horea  
att'y



# UNITED STATES PATENT OFFICE.

JAMES MEEHAN, OF COVINGTON, KENTUCKY.

## BRAKE-SHOE FOR RAILWAY-BRAKES.

SPECIFICATION forming part of Letters Patent No. 720,167, dated February 10, 1903.

Application filed July 2, 1902. Serial No. 114,138. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MEEHAN, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented new and useful Improvements in Brake-Shoes for Railway-Brakes, of which the following is a specification.

My invention relates to brake-shoes of railway-brakes, its object being twofold—namely, to produce a shoe that shall wear more particularly upon the portion of the wheel-tread least subject to wear of the rail and also to prevent as far as may be the overheating of wheels and shoes through the friction of brake contact. These two functions are combined in my invention in brakes intended primarily for driving-wheels for locomotives.

In the operation of locomotives, and more particularly the heavy engines so largely in modern use, the rail wear upon the wheel-tread is excessive at the zone of habitual contact adjacent to the flange, which becomes hollowed out and the wheel diameter correspondingly reduced. The disadvantages of this condition are very great, for the reason that the unequal diameter of the wheels at adjacent zones of the tread produces great strains upon the axles, parallel rods, driving-boxes, and the frames, necessitating resurfacing of the wheel-treads and overhauling and repair of portions of the running-gear affected thereby, while other portions of the general mechanism still remain intact and in good condition, whereas if the wear were uniform over the wheel-tread all this extra labor and expense and loss of service would be saved. Part of the difficulty also is attributable to the overheating of the tires, which aggravates the evils indicated and by rendering the tire more susceptible to wear, &c. In car-wheels, where the relative speed of rotation is greater, the overheating becomes a more serious difficulty, as it often leads to breakage of the wheels, and serious accidents are caused thereby.

With reference to the combined functions hereinbefore indicated I construct the shoe with one or more cutting or scraping edges of harder metal than that composing the body of the shoe, in connection with a ventilating and clearance aperture carried through the body of the shoe to the rear adjacent to the scraping edge, the scraping edge or series of

scraping edges being arranged in the contact-face of the shoe opposite the zone of the wheel-tread least subject to the wear of the rail. The cutting edges here referred to are the front terminal edges of the relatively rear walls of hollow oval cones of hardened metal cast in and surrounded by the softer metal of the body of the shoe. The general conical form of the hollow block and the corresponding form of its aperture thus places the said rear wall at an acute angle to the general contour of the contact-face of the shoe, whereby the terminal obtains its cutting power, and also brings the aperture of the block in front of said cutting edge after the manner of the opening in a carpenter's plane for disposal of the scrapings and for ventilation. The opposite wall of the block is made thinner and being disposed in opposite relations to the contact-face serves simply as a resistance to the wear of the shoe, and consequently modifies the rapidity of cutting action.

My invention is illustrated in its preferred and complete form in the accompanying drawings, in which—

Figure 1 is a face view of the brake-shoe provided with cutting or scraping blocks arranged to act both upon the tread and the flange of the wheel; Fig. 2, a longitudinal section on the line  $xx$  of Fig. 3, taken through the space between the inserted blocks; Fig. 3, a cross-section on the line  $xx$  of Fig. 1, taken through one of the inserted blocks of the tread-face of the shoe; and Fig. 4, a cross-section taken through one of the inserted blocks of the flange-face of the shoe; Fig. 5, a partial edge view of a car-wheel resting upon its track and indicating the effect of wear by use; Fig. 6, a perspective view of one of the blocks detached, and Fig. 7 an ideal elevation illustrating the scraping action of the cutting edge.

Referring now to the drawings, A designates the brake-shoe, which is here shown constructed in preferred form to embody all the advantages in one structure. The brake-shoe A, as herein shown, is of the usual form, having a face  $a'$ , adapted to the contour of the tread  $w'$  of the wheel  $w$ , and has in addition a curved face  $a^2$ , adapted to the contour of the flange  $w^2$  of the wheel, so that both faces act at the same time when in operation. This desirable action of the brake-shoe here-



inbefore indicated I obtain by providing the shoe with blocks B of harder metal, set or cast in the body of the shoe and projecting through to the contact-face, and in connection therewith provide air-holes  $b$ , projected entirely through the shoe. In the preferred construction shown both these ends are attained by forming the blocks hollow and of oval cross-section corresponding in internal and external contour and enlarging conically toward the rear end, so that when the metal of the body of the brake-shoe is cast around them they will be firmly held. The blocks B are set in the shoe, as indicated in Figs. 1, 3, and 4, and the aperture  $b$  of the block is continued through the shoe, as at  $b'$ . In view of the weakened condition of the shoe thus perforated when worn thin by wear of use I may use a malleable backing  $a^3$ , upon and in connection with which the shoe is cast to retain the serviceable condition until the shoe is quite worn away. I prefer to form the block B with one of the long sides about double the thickness of the opposite side and to place the blocks in the shoe, so that when applied to the wheel in ordinary forward motion the rotative direction of the wheel will be first across the thin side  $b^2$  and next across the thick side  $b^3$  of the block B. It results that as the thin side  $b^2$  wears most readily the thick side  $b^3$  acts as a cutting-tool at its edge adjacent to the aperture  $b$ , and the blocks being arranged to contact with the wheel at the outer zone  $z^2$  of its tread the wear is increased upon said zone to more nearly correspond with that of the rail upon the zone  $z'$ , so as to maintain a substantially uniform wear, as indicated by the dotted line  $z^3$  in Fig. 5, substantially parallel with the original tread—in other words, maintaining an approximately uniform reduction of wheel diameter over the entire tread. The thin side, however, being of harder metal than the body seems nevertheless to retard the wear of the shoe, and thus in a measure regulates the rapidity of the cutting action. In like manner and to produce a corresponding radial wear upon the flange  $w^2$  a similar line of blocks B' is placed in the curved auxiliary face  $a^2$  of the shoe. The blocks B and B' are preferably set in "staggered" relation to each other. The apertures  $b$   $b'$  serve as air-vents for the currents of air carried between the frictional surfaces, and thus serve a most important purpose in keeping the parts cool, to which end suitable provision is made in the backing or holder of the shoe for the free passage of air to the rear. I also form a longitudinal depression  $a^3$  in the face of the brake-shoe opposite the zone  $z'$  of the wheel, which, together with the grooved zone  $z'$ , (produced by rail wear,) maintains an open channel for circulation of air between the surfaces throughout the entire length of the shoe, besides preventing any wear of the brake-shoe at said zone. The apertures  $b$   $b'$  of the block B serve the further purpose of venting the metal dust produced

by abrasion, and thus contribute to the effective action of the brakes.

The mode of operation is illustrated in Fig. 7, in which the block B', slightly canted to the rear, presents its forward wall at an angle to the wearing-surface of the wheel W, thus forming a cutting edge upon the wheel moving relatively in the direction of the arrow. The metal thus cut or scraped from the wheel by the cutting edge is vented through the clearance-aperture  $b$ , and at the same time air is freely supplied and permitted to circulate between the contact-surfaces.

The perforation of the shoe to secure a free circulation of air is important in the use of the shoe with driving-wheels, for the reason that when the tire becomes worn thin with use it heats more readily, and the consequent expansion renders it necessary to place beneath it a bushing or "shim," which brings it under strain and liable to breakage. The "ventilation" of the shoe in such case prevents the overheating and renders the shim unnecessary, thus prolonging the life of the tire.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. A brake-shoe for railway-wheels consisting of a body of cast metal adapted to the contour of the wheel and having embodied therein a series of perforated blocks of harder metal elongated in one axis of the perforation across the contact-face of the shoe and of corresponding sectional contour internally and externally enlarging rearwardly from said contact-face substantially as and for the purpose specified.

2. A brake-shoe for railway-wheels consisting of a body of cast metal adapted to the contour of the wheel and having embodied therein a series of blocks of harder metal cast hollow, in the form of an oval cone, having the shell at one of its longer sides thicker than the opposite side, as and for the purpose specified.

3. A brake-shoe having embedded therein a series of perforated blocks of harder metal elongated across the perforation and presenting the side walls of the block at acute angles to the contact-face of the shoe thereby presenting the rear wall as a cutting-plane to the surface of the wheel in motion, substantially as and for the purpose specified.

4. A brake-shoe for railway-wheels provided with a series of cutting-blocks of harder metal outside of the wheel zone of rail contact, and with apertures formed relatively in front of said cutting-blocks and extending entirely through the shoe and open at the rear and front, substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES MEEHAN.

Witnesses:

JOS. R. GARTNER,

CHAS. HERBERT JONES.