

G. M. HOADLEY.

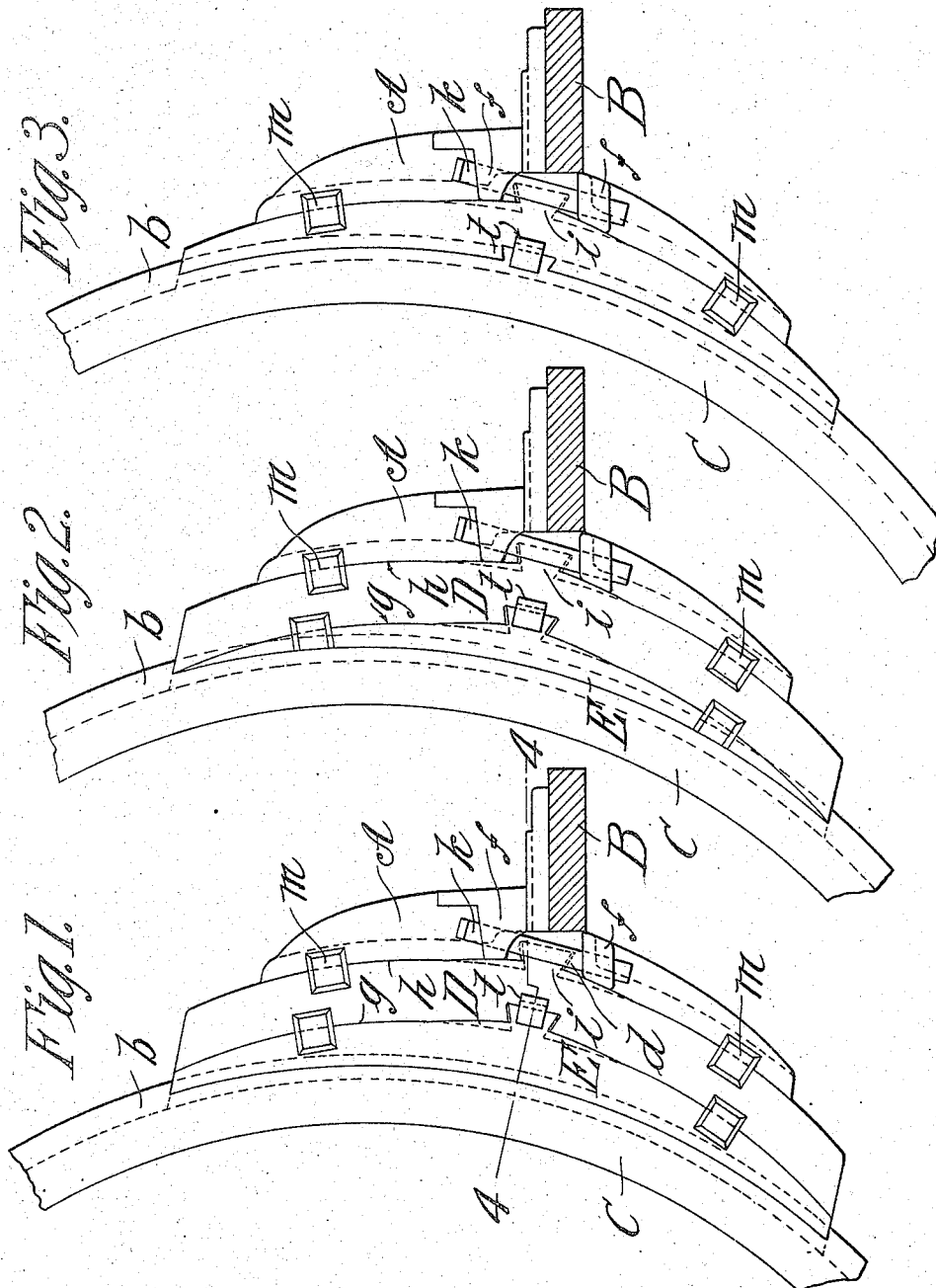
CAR BRAKE.

APPLICATION FILED OCT. 22, 1908.

937,068.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

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Fig. 6.

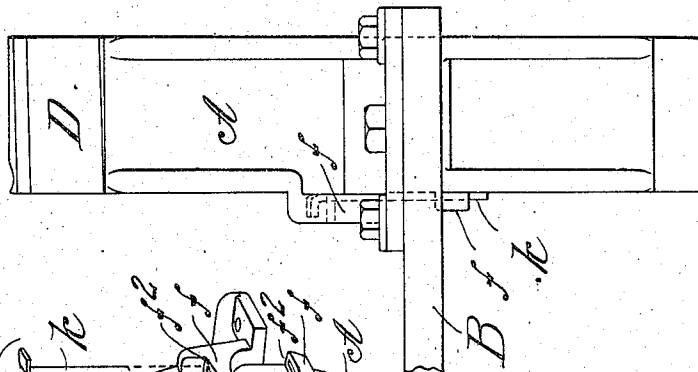


Fig. 5.

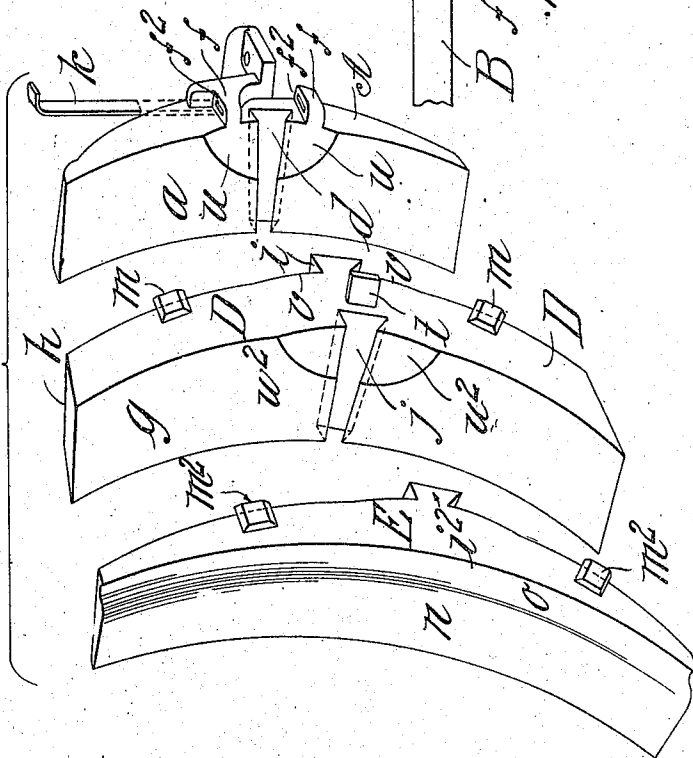
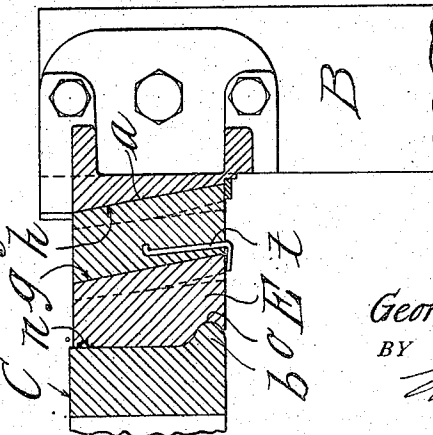


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE M. HOADLEY, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HOADLEY BRAKE SHOE COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CAR-BRAKE.

937,068.

Specification of Letters Patent.

Patented Oct. 19, 1909.

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To all whom it may concern:

Be it known that I, GEORGE M. HOADLEY, a citizen of the United States of America, and resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Car-Brakes, of which the following is a full, clear, and exact description.

This invention relates to improvements in car brake devices having for their principal object the capability of acquiring, by the employment of interchangeable brake shoes of peculiar formations in conjunction with a suitable head or brake shoe carrying back, the complete using up of each shoe or section in consequence of its braking action on the car wheel, so that there is no remnant to become inoperative, and having to be thrown away or "scrapped" to make a loss, as has commonly heretofore been the case, of from 30 to 60 per cent. of the bulk of the shoe.

Another important object is to so construct the shoes which are interchangeable one with another, and with the carrying back, that during protracted use the car-wheel with which the brake is used will cut or wear into the rear shoe section the groove or channel for the car wheel flange, and so that after the front shoe has been completely and absolutely worn away, the one which was formerly the rear shoe may be carried as a working shoe at the front of a newly interposed rear shoe.

Other objects are for the attainment of advantages as will be hereinafter rendered apparent.

The invention consists in the combination and arrangement of peculiarly constructed brake shoes or sections one with another and with a carrying head or back, and in the construction of the individual brake shoes all substantially as hereinafter fully described in conjunction with the accompanying drawings, and as set forth in the claims.

In the drawings:—Figure 1 is a side elevation of a carrying back, and front and rear shoes, the front one being shown as in its initial or substantially unworn aspect; Figs. 2 and 3 are similar side elevations, the former showing the front shoe as about half worn away, and the rear shoe as commencing to be subjected to wear, while the latter view shows the extent of wear and reduction to

which the rear shoe is subjected at about the time when the front shoe is almost entirely worn away; Fig. 4 is a horizontal cross section on line 4—4, Fig. 1; Fig. 5 is a perspective view of the front and rear shoes and carrying back in separated relations; Fig. 6 is a rear view of Fig. 1.

In the drawings, A represents a head or brake shoe carrying back of a suitable design and capability for attachment to a brake beam B, and made with a front curved from end to end on an arc of a circle, having a shorter radius than that of the truly or approximately cylindrical tread bearing face of the car wheel represented at C in Figs. 1 to 3.

The front face *a* of the back A is transversely inclined on a straight line at all places in its length whereby to be more forwardly prominent at its outer than its inner edge, that is it is the most "full" at its edge opposite and farthest from the location of the car wheel flange *b*. The back has, for example, midway between its ends, a transverse dovetail recess *d* opening to its front face, said recess longitudinally tapered or having its opposite walls convergent from the inner toward the outer edge of the shoe. The back, moreover, has at its edge or side at which the larger end of the recess *d* opens, and above and below such recess laterally projecting lugs *f f* having apertures *f*² in line with the edge of the back for the reception and engagement therein of a bar or key for the confinement of the rear shoe D in its interlocked engagement with the head.

The rear shoe D, which in time and after use is interchanged and replaced by a new rear shoe, and is utilized as the front shoe, has its front and rear faces *g* and *h* curved from end to end on an arc corresponding to that of the front face of the carrying back and which as aforesaid is generated by a shorter radius than that of the tread face of the car wheel in conjunction with which the brake is to be used; and this shoe D is transversely inclined, its front and rear faces being in parallelism so that such faces at and toward the outer edge of the shoe are more forwardly located and more prominent than that portion of the face at and toward the inner edge. The shoe D is provided with a transverse dovetail and longitudinally

tapered rib *i* at and projecting rearwardly beyond its rear face for a comparatively free fit in the aforementioned correspondingly shaped recess *d* of the back; and this same shoe D has within its front face and directly forwardly from its rib *i* a transverse dovetail and tapered recess of exactly the same form as the rib *i* and the recess *d* of the back. The shoe D having an interlocking engagement by its rib *i* in the recess *d* of the back it is retained in such engagement by the metallic bar or key *k* which is forced with a driving fit through the apertured lugs *f f* so that its intermediate portion constitutes a stop against the lateral or transverse displacement of the shoe D relatively to the back.

Although the dovetail and tapered rib *i* is to have a reasonably close fit in the groove or recess *d* of the back, inasmuch as these appliances are to be produced and provided as rough castings with no finishing or machine work, and as the engagement of the tapering rib in the tapering recess may not always be relied upon for limiting the shoe D in its proper positioning on the head, the shoe D is provided at its inner edge with one or more edgewise located and rearwardly projecting lugs *m m* which overlap and edgewise engage the back and maintain the shoe against any tendency to crosswise slide farther than is proper.

E represents a front shoe which in Figs. 4 and 5 is shown as of the form in which it is to be provided for the initial use of the brake device; that is,—it is made with a curved front face *n* having a curvature corresponding to that of the car wheel tread or periphery, and originally cast with a flange receiving groove *o*, while its rear face is made to fit the front face of the rear shoe D by being curved from end to end on the arc of smaller radius than that of the car wheel and is also transversely inclined from edge to edge. This front shoe, exactly like the rear shoe has at its rear face the transversely extended dovetailed and tapered rib *i*² to engage in the correspondingly shaped recess *j*; and it moreover has the edgewise located and rearwardly projecting lug *m*², *m*² to overlap and engage the side of the shoe D in the same manner that the lugs *m* of the latter shoe engage the side of the back. It is to be borne in mind, however, that the front shoe E made with the working face formation thereof described and shown at the left hand portion of Fig. 5 is only to be once furnished, and that is at the time when the brake device is first put into use on a car, for thereafter as the shoes become used up or worn out the replacements will be successively and always by shoes having the construction or formations shown for the one D.

As a means for the confinement of the forward shoe in its rib and groove engagement

with the interposed or rear shoe, I cast within the body of each shoe D between the base of its recess *j* and the location of its rib *i* directly behind such recess a strip *t* of annealed ductile, non-tempered and easily bendable metal, with a portion of such strip projecting beyond the edge of the shoe, this projecting extremity being bent at right angles to the length of the anchored portion of the strip as shown in Figs. 1 to 4 of the drawings, to have a position across and act as a stop relatively to the front shoe rib.

In the use of the brake there will be a time when the car wheel will wear through the thickness of the front shoe at its end portions and will commence to wear the front face of the rear shoe at its opposite end portions and firstly at the outer side or corner areas of such face, the partially worn front shoe being wedge shaped from its middle toward its opposite end and also being wedge shaped from its thicker inner to its thinner outer edges. Then after still further wear the front shoe will become completely worn away even to its rear rib, as will be the case when the tread face of the car wheel has worked on the shoe to reduce it in a manner to carry away the boundaries of its front recess *j* whereupon it will have the groove, like the one *o*, worn into it near its inner edge and it will be wedge like from its middle toward its ends and also wedge like transversely; and it is now opportune for this so worn shoe to be replaced by a new unworn rear shoe D interlocked and confined on the back, and this much worn, formerly rear shoe is interlocked and confined on the newly provided rear shoe and is made to serve as the front shoe, until it in turn is entirely and absolutely worn out concurrently with a partial wearing out of the rear shoe, which latter is then likewise replaced.

Inasmuch as there may be times when the relation of the shoe carrying back or head on the car may be so positioned, non-concentrically relatively to the car wheel, that the wear on the front shoe will be greater at one end portion of its face than at the other and this relative wear continued throughout usage so that one end would be entirely worn out to result in the carrying away of the interlocking rib at the rear of the front shoe before the other endwise portion of the front shoe is appreciably worn, whereby in consequence the unworn or the partially worn end portion of the front shoe would become cut off and separated from its rib and lost from the brake,—I have provided further special and peculiar formations to insure against the above referred to possibility of loss of any part of the full wearing capability of the shoes, viz: The back of the head A at its front face at either side of and leading to its dovetail recess *d* has a depression *u* to accommodate a correspondingly swelled for-

mation or thickening of the shoe D as shown at *v*,—this swelling or thickening being in the greatest extent at its junction with the opposite sides of the dovetailed rib *i*; and the shoe D also has a depression as shown at *u*² adjacent and leading to its dovetail recess *j* for the accommodation therein of a like swelled or thickened portion *l* of every other brake shoe section which is to be combined as a front shoe therewith. And thus, in case of use of two shoes having the formations last pointed out, even if the brake is presented to the tread face of the car wheel, so angular or in an inclined position that for instance only the upper end portion of the shoe face has any braking bearing for a considerable time and the front shoe finally assumes the shape of a curved wedge convergent from its thick lower end to its sliver-like upper end, there will still remain as fin-like remnants of the swelled portions *v v* at the back of the shoe being worn, sufficient metal to tie or connect the wearing portion of the shoe with its rear retention rib.

Of this brake device it may be truly said that every portion of each and every shoe, as successively employed, will become worn away or used up, and in such usage efficiently and economically fulfil its braking function at the face of the car wheel, leaving it requisite to cast away as old junk, or "scrap" no parts or remnants of any of the shoes D or of the shoes provided when newly using the brake having the form shown at E.

I claim:—

1. The combination of a brake-shoe-back, or carrying-head, having a curved front, and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other, of a rear shoe having a correspondingly curved and transversely inclined rear face and a curved and similarly transversely inclined forward face, a front shoe having a curved wheel engaging face and a curved and transversely inclined rear face, means for detachably connecting the rear shoe to the back, and means for detachably connecting the front shoe to the rear shoe.

2. The combination of a brake-shoe-back, or carrying-head, having a curved front, and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other, of a rear shoe having a correspondingly curved and transversely inclined rear face and a curved and similarly transversely inclined forward face, a front shoe having a curved wheel engaging face and a curved and transversely inclined rear face, the lines transversely across the inclined front and rear faces of the rear shoe, and across the inclined rear face of the front shoe at substantially all points in the lengths thereof being straight, means for detachably connecting

the rear shoe to the back, and means for detachably connecting the front shoe to the rear shoe.

3. The combination of a brake-shoe-back or carrying-head having a curved front, of a rear shoe having correspondingly curved front and rear faces, said curvatures being on practically similar arcs of shorter radius than that of the face of the car wheel with which the brake is to coact, a front shoe having a curved wheel engaging face and a rear face, said rear face having a curvature substantially corresponding to that of the shoe-carrying-back and the faces of the rear shoe, means for detachably connecting the rear shoe to the back, and means for detachably connecting the front shoe to the rear shoe.

4. The combination of a brake-shoe-back, or carrying-head, having a curved front, and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other, of a rear shoe having a correspondingly curved and transversely inclined forward face, the brake shoe back and said brake shoe each having a dove-tail recess across and opening to its front, and also open at the sides, and the said brake shoe having a transverse dovetail rib at its rear side to engage in such similarly shaped recess of said back, a front shoe having a curved wheel engaging face and a curved and transversely inclined rear face, and having a similar dove-tail transverse rib at its rear side for engagement in the similarly shaped recess of the first named and relatively intermediate shoe, means for detachably confining the rear shoe in its engagement with the back, and means for detachably confining the front shoe in its engagement with the other shoe.

5. The combination of a brake-shoe-back, or carrying-head, having a curved front, and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other, of a rear shoe having a correspondingly curved and transversely inclined forward face, the brake shoe back and said brake shoe each having a dove-tail recess across and opening to its front, and also open at the sides, and tapered in its length, and the said brake shoe having a transverse tapered dovetail rib at its rear side to engage in such similarly shaped recess of said back, a front shoe having a curved wheel engaging face and a curved and transversely inclined rear face, and having a similar dove-tail transverse and tapered rib at its rear side for engagement in the similarly shaped recess of the first named and relatively intermediate shoe, means for detachably confining the rear shoe in its engagement with the back, and means for detachably confining the front shoe in its engagement with the other shoe.

6. The combination with a brake-shoe-back having a curved front and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other and having a transverse dove-tail recess opening to its forward face and also at its side, and provided at its side adjacent and oppositely related to the open end of such recess with apertured lugs, of a brake shoe having correspondingly curved and transversely inclined faces and provided at its rear with a transverse dove-tail rib to engage in the recess of the back, and a key adapted to be engaged through the apertures of said lugs and to engage, by an intermediate portion thereof, the end of such dove-tail rib of the shoe.
7. The combination with a brake-shoe-back having a curved front and the surface thereof inclined from one side to the other whereby to be more forwardly prominent at one side than the other and having a transverse dove-tail recess, tapered in its length, opening to its forward face and also at its side and provided at its side adjacent and located relatively to the open end of such recess with apertured lugs, of a brake-shoe having correspondingly curved and transversely inclined faces and provided at its rear with a transverse dove-tail rib, tapered in its length to engage in the recess of the back, and a key adapted to be inserted through the apertures of said lugs and to engage, by an intermediate portion thereof, the end of said dove-tail rib of the shoe.
8. The combination with a brake shoe having a curved face and having cast therein a strip of non-tempered metal, a portion of which projects beyond a side of the shoe, of a companion shoe to fit and have an engagement with the first named shoe, and to be held in such interlocked relation by the bending across its edge, of the projecting portion of said metallic strip.
9. The combination with a brake shoe having a curved face, a transversely extending dovetail recess opening to its front face, and also opening to its side, and having cast therein a strip of non-tempered metal, between said recess and its rear face, a portion of which projects beyond a side of the shoe, of a companion shoe curved to fit the front of the first named shoe, and having a dovetail rib to interlock in said recess of such shoe, and to be held in such interlocked relation by the bending across its edge of the projecting portion of said metallic strip.
10. The combination with a brake-shoe-back having a curved front, of a rear shoe having correspondingly curved front and rear faces, the curvatures thereof being of similar arcs, having a shorter radius than that of the tread face of the car wheel with which the brake is to coact, the back and shoe having transverse dove-tail recesses opening to their front faces and also open at the sides and having depressions adjacent and leading to the margins of such recesses, and the shoe having at its rear side a transverse dove-tail rib and having its rear surface swelled or rearwardly thickened adjoining opposite portions of said ribs.
11. The combination with a brake-shoe-back having a curved front, of a rear shoe and a front having correspondingly curved rear faces, and the rear shoe having a correspondingly curved front face, the curvatures being of similar arcs, having a shorter radius than that of the tread face of the car wheel with which the brake is to coact, the back and rear shoe having transverse dove-tail recesses opening to their front faces and also open at the sides and having depressions adjacent and leading to the margins of such recesses and both shoes having at their rear sides transverse dove-tail ribs and having rear surfaces swelled or rearwardly thickened adjoining opposite portions of said ribs.
12. The combination with a brake-shoe-back having a curved front, of a rear shoe having correspondingly curved front and rear faces, the curvatures thereof being of practically similar arcs, having a shorter radius than that of the tread face of the car wheel with which the brake is to coact, and the surfaces of the back, and said shoe being transversely inclined and more prominent at one side than the other, the back and shoe having transverse dove-tail recesses opening to their front faces and also sidewise opening and having depressions adjacent and leading to the margins of such recesses, and the shoe having at its rear side a transverse dove-tail rib and having its rear surface swelled or rearwardly thickened adjoining opposite portions of said ribs.
13. The combination with a brake-shoe-back having a curved front and a dove-tail recess opening to such curved front and also open at the sides and tapered in its length, of a shoe having curved front and rear faces, having at its rear a transverse dove-tail rib tapered in its length and having at one of its edges a lug extending beyond its rear curved face and adapted for an engagement with the edge of the shoe carrying back.
14. The combination with a brake-shoe-back having a curved front and a dove-tail recess opening to such curved front and also open at the sides and tapered in its length, of rear and front shoes having curved front and rear faces, having on their faces transverse dove-tail ribs tapered in their lengths, the rear shoe having across its front a dove-tail recess, tapered in its length and sidewise opening, and both said shoes having, at their edges at one side, lugs extending be-

yond their rear curved face and adapted for engagements respectively with the edges of the shoe carrying back and of the rear shoe.

15. The combination with a brake-shoe-
5 back or carrying head having a curved front, the surface thereof being transversely inclined whereby to be more forwardly prominent at one side than the other, of a rear shoe having a correspondingly curved and
10 transversely inclined rear face and a curved and transverse and similarly inclined forward face, the curvatures of the front face of the back and the front and rear faces of the rear shoe being of a similar arc having
15 a shorter radius than that of the tread face of the car wheel with which the brake is designed to coast, and a front shoe for initial use, having a curved and transversely inclined rear face, and having a front face ap-
20 proximately corresponding to the tread face of the car wheel in connection with which the brake is to be used, means for detachably connecting the rear back shoe to the back, and means for detachably connecting the
25 front shoe to the rear shoe.

16. A brake-shoe for interchangeable use, arc-shaped as to the length of its front and rear faces, having its front and rear faces transversely inclined whereby to be more
30 forwardly prominent at one side of the shoe than the other.

17. A brake-shoe for interchangeable use, having its front and rear faces of arc shape in their lengths, having such front and rear
35 faces transversely inclined whereby to be more forwardly prominent at one side of the shoe than at the other, and having a transverse dove-tail recess across and opening to its front and also edgewise opening, and
40 having a transverse dove-tail rib projecting from its rear face behind said recess.

18. A brake-shoe for interchangeable use, having its front and rear faces of arc shape in their lengths, having such front and rear
45 faces transversely inclined whereby to be more forwardly prominent at one side of the shoe than at the other, and having a transverse longitudinally tapered dove tail recess across and opening to its longitudinally
50 tapered front and also open at the sides, and having a transverse longitudinally tapered dove-tail rib projecting from its rear face behind said recess.

19. A brake-shoe for interchangeable use
55 having its front and rear faces curved from end to end, having across its front a dove-tail recess, having at its rear, and directly

behind such recess, a rearwardly projecting transverse dovetail rib, and having one or more edgewise located and rearwardly pro- 60
jecting lugs.

20. A brake-shoe for interchangeable use having its front and rear faces curved from end to end, having across its front a dovetail recess, having at its rear, and directly behind 65
such recess, a rearwardly projecting transverse dovetail rib, and having cast within its thickness behind the base of its transverse recess a strip of bendable metal, the extremity of which projects beyond the edge of the 70
shoe.

21. A brake-shoe for interchangeable use having its front and rear faces formed with arc curvatures from end to end, having a transverse recess, of dovetail shape, opening 75
to its forward face and also edgewise opening, and said forward face having depressions at opposite sides of and leading to said recess, and said shoe having at its rear and adjacent said recess a transverse lug, the rear 80
surfaces of the shoe adjacent said lug being thickened or swelled.

22. A brake-shoe for interchangeable use having its front and rear faces formed with arc curvatures from end to end, and trans- 85
versely inclined whereby to be more forwardly prominent at one side of the shoe than the other, said shoe having a transverse recess, of dovetail shape, opening to its forward face and also edgewise opening, and 90
said forward face having depressions at opposite sides of and leading to said recess, and said shoe having at its rear and adjacent said recess a transverse lug, the rear surfaces of the shoe adjacent said lug being thickened 95
or swelled.

23. A shoe for initial employment in a car brake of the character described, having its forward face made with a curvature to conform to a substantially cylindrical tread sur- 100
face of a car wheel and having along one side thereof a flange receiving groove, said shoe having its rear surface formed with a curvature from end to end of sharper pitch than its face and also transversely inclined 105
whereby to be more rearwardly prominent at one edge portion than at its opposite portion.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

GEORGE M. HOADLEY.

Witnesses:

W. M. S. BELLOWES,
G. R. DRISCOLL.