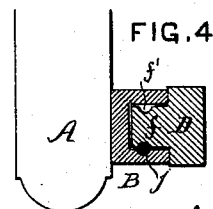
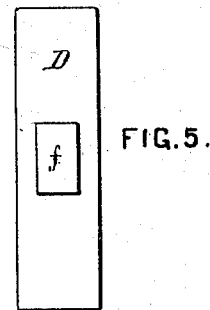
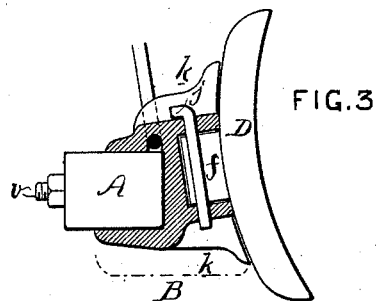
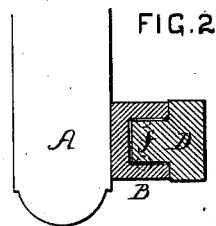
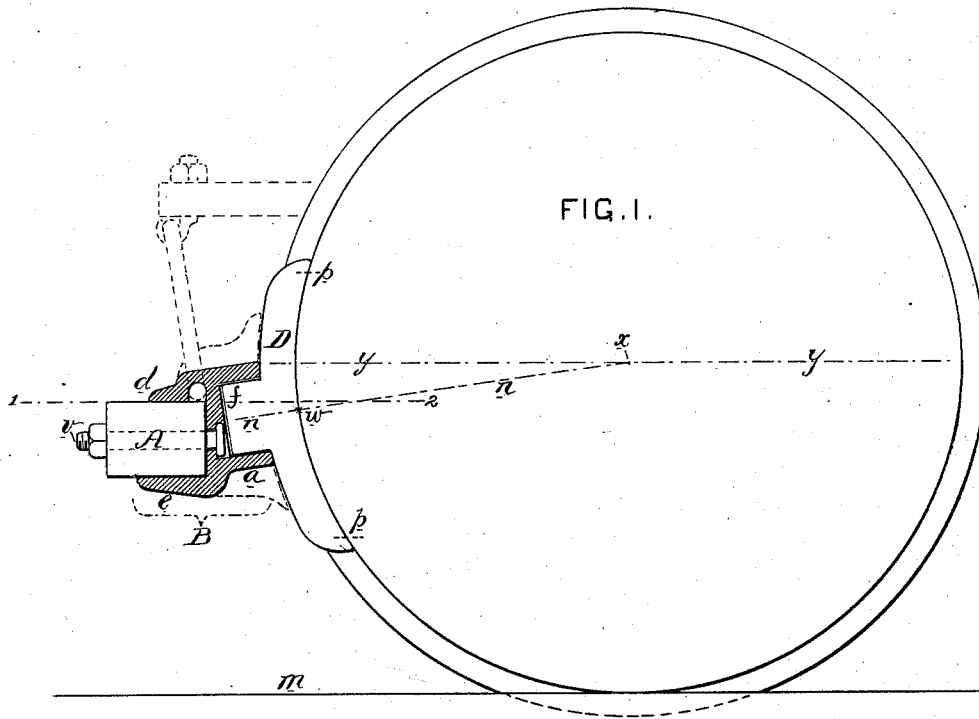


W. CONNER & A. O. DENIO.
Brake-Shoe for Cars.

No. 216,152.

Patented June 3, 1879.



Witnesses *Henry Cowson Jr.*
Harry Smith

Inventors
William Conner
and
Asa O. Denio
by their Attorneys
Cowson and Denio

UNITED STATES PATENT OFFICE.

WILLIAM CONNER AND ASA O. DENIO, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN BRAKE-SHOES FOR CARS.

Specification forming part of Letters Patent No. **216,152**, dated June 3, 1879; application filed April 23, 1879.

To all whom it may concern:

Be it known that we, WILLIAM CONNER and ASA O. DENIO, both of Wilmington, Delaware, have invented a new and useful Improvement in Brake-Shoes for Railway-Cars, of which the following is a specification.

Our invention relates to an improvement in the construction of brake blocks and shoes for railway-cars; and consists of the combination of a block and a quadrangular socket in the same with a shoe having a central tenon adapted to but having a slight play in all directions in the socket, all substantially as described hereinafter, so that the shoe may be entirely dependent for its position on said socket and tenon, and so as to insure simplicity in construction, a ready removal, replacing, or reversal of the shoe, and the self-accommodation of the latter to the wheel.

In the accompanying drawings, Figure 1 is a vertical section of our improved brake block and shoe, showing their relation to a car-wheel; Fig. 2, a sectional plan on the line 1 2; Fig. 3, an exterior view of the block and shoe, partly in section; Fig. 4, a sectional plan of Fig. 3; and Fig. 5, a rear view of the shoe.

In Figs. 1, 2, and 3, A represents the brake-beam; B, the brake-block or bracket, and D the shoe.

We prefer to arrange the brake-beam in the manner shown in Fig. 1 in respect to the center *x* of the wheel and to the top *m* of the rail, the wheel being thirty inches in diameter at the rim in the present instance.

We also prefer to so arrange the shoe that its center *w* shall be below a horizontal line, *y*, drawn through the center of the wheel. This relation of the several parts to each other has been determined by practical tests to be the most satisfactory.

The brake-block or bracket consists, mainly, of the recessed socket *a* and the upper and lower flanges, *d* and *e*, between which the brake-beam is fitted and secured by a bolt, *v*.

The recess in the socket *a* of the block is of quadrangular form. It may, for instance, be square; but we prefer to make it oblong, as shown.

The tenon *f* of the shoe, Fig. 5, should be of the same form as the recess in the socket, but slightly less than the same, so that the shoe

may have a slight play in every direction in the socket of the block. The top and bottom of the tenon should also be parallel, or nearly so, with a radial line, *n n*, drawn through the center of the tenon and through the center of a circle of which the face of the brake-shoe represents a segment, that center being the center *x* of the wheel when the brake-shoe is applied to it, as shown in Fig. 1. By adopting this rule we are enabled to reverse the brake-shoe when the wearing away of one part of the face more than another suggests such reversal.

In order to carry out the above arrangement of parts it will be seen that the recess of the socket must be at an angle in respect to the flanges *d* and *e* of the block where they are fitted to the brake-beam.

Should the center of the brake-beam be in the horizontal line *y*, the recess of the socket may be parallel with the flanges *d* and *e*; but we prefer the arrangement shown and described of the brake-beam, brake-block, and shoe to each other and to the wheel.

The position of the shoe on the block is dependent entirely on the central tenon of the former and the recess in the socket of the latter, and in this respect our invention differs materially from many of the plans heretofore adopted.

In the patent of Stevens, for instance, No. 23,722, April 19, 1859, there is a detachable and reversible shoe secured to the block at or about the points indicated by the dotted lines *p p*, the shoe being as rigid a part of the block as though the whole was cast in one piece, and the same plan has been adopted in more recent patents.

It will be seen that our improved brake block and shoe are simple in construction and can be economically manufactured.

The tenon and recess resist all the strain to which the shoe is subject, when in contact with the wheel, quite as effectually as if the shoe was rigidly secured to the block. At the same time the slight play of the tenon in the recess permits the shoe to accommodate itself circumferentially to the periphery of the wheel.

It is important, moreover, that the shoe should be at liberty to move or turn laterally to a limited extent, and this it can do, owing

to the slight play of the tenon in the socket, the shape of the tenon and recess in the socket preventing undue torsional displacement.

If the shoe is properly made, and is free from the block at all other points excepting the center, a very slight play at this point gives the shoe, unconfined at its upper and lower ends, sufficient liberty.

In Fig. 1 we have shown by dotted lines, and in Fig. 3 by plain lines, light ribs *k*, which serve the twofold purpose of strengthening the socket and of restricting the movement of the shoe when drawn away from the wheel; but these ribs are not essential to our invention.

The tenon of the shoe extends so far into the recess of the socket in the block that a retaining device may be dispensed with, for the brake-block *A* will rarely be moved back far enough to permit the tenon to escape from the socket.

Should a retainer be desired, we make a semicircular recess, *j'*, on each side of the tenon and a similar recess on one side of the socket, the latter recess communicating with holes in the top and bottom of the socket, so that a pin, *j*, may be passed through the said

holes and serve to retain the tenon of the shoe loosely in place, the same pin serving as a retainer when the shoe is reversed. By this arrangement boring of holes in the tenon is obviated.

We claim as our invention—

1. The combination of the brake-block *B*, having a quadrangular socket, with the shoe *D*, having a central tenon conforming with but having a limited play in the socket, and depending solely on the same for its vertical and lateral position, all as set forth.

2. The combination of the shoe and its tenon, having the semicircular recess in each side of the said tenon, with the block *D*, having a socket with semicircular recess on one side communicating with holes in the socket, all as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM CONNER.
ASA O. DENIO.

Witnesses:

H. HOWSON,
JAMES BARKLEY.