(No Model.) 2 Sheets—Sheet 1.

C. T. SCHOEN.

BRAKE SHOE.

No. 481,973. Patented Sept. 6, 1892.

Fig. 1

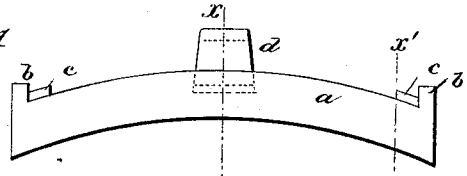


Fig. 2

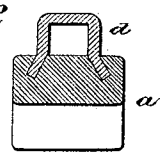


Fig. 3

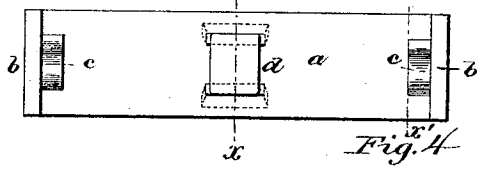


Fig. 2a

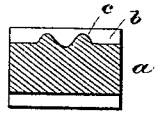


Fig. 4

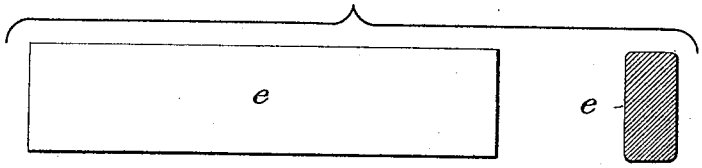


Fig. 5

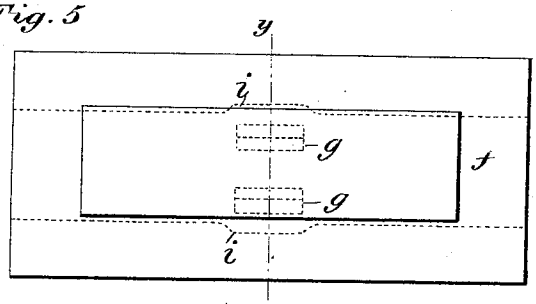


Fig. 6

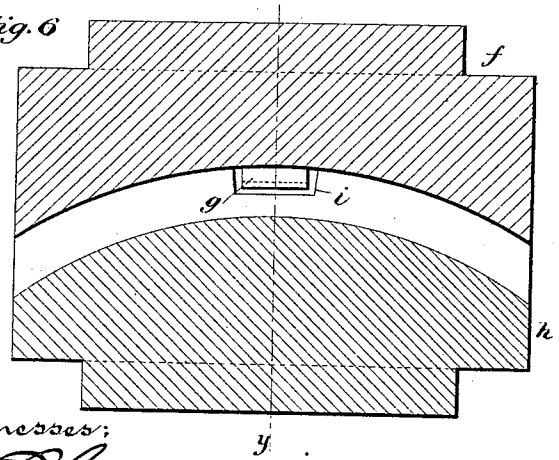
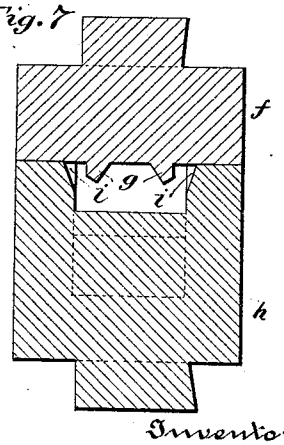


Fig. 7



Witnesses;

J. C. Coleman

E. A. Fincke

Inventor.

Charles T. Schoen.

by Wm. H. Fincke

his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. T. SCHOEN.

BRAKE SHOE.

No. 481,973. Patented Sept. 6, 1892.

Fig. 8

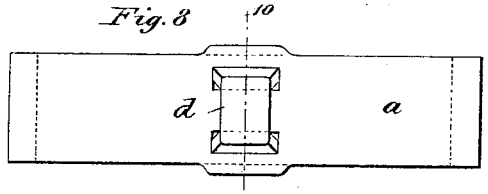


Fig. 9

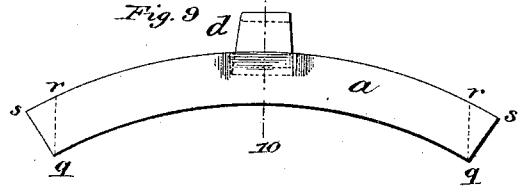


Fig. 10

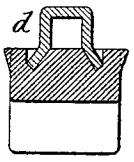


Fig. 11

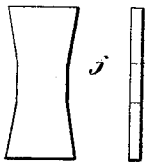


Fig. 13

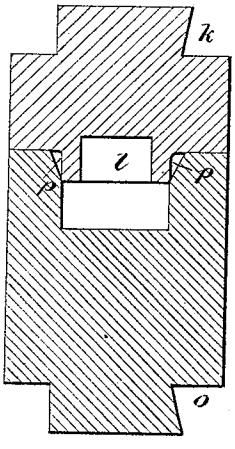


Fig. 12

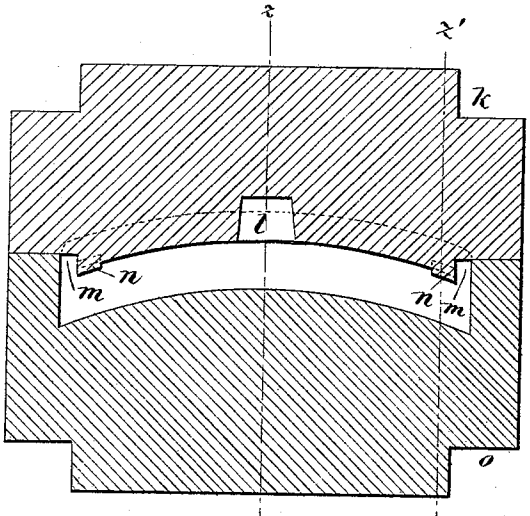


Fig. 14

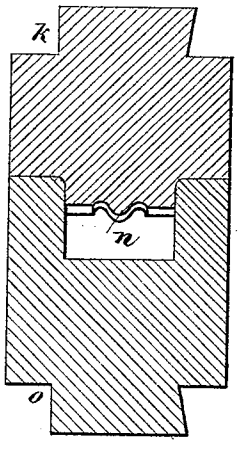
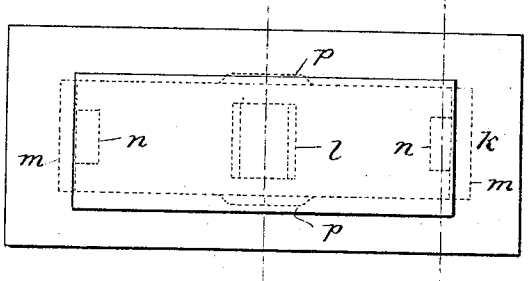


Fig. 15



Witnesses;

J. F. Coleman

E. A. Finney

Inventor

Charles T. Schoen.

by Wm. N. Finney

his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES T. SCHOEN, OF ALLEGHENY, PENNSYLVANIA.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 481,973, dated September 6, 1892.

Application filed April 27, 1892. Serial No. 430,837. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. SCHOEN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Brake-Shoes, of which the following is a full, clear, and exact description.

The object of this invention is to provide a forged-steel brake-shoe for use more especially on railway-cars.

While it has been proposed to forge brake-shoes from merchant shapes, yet the more general and common practice is to cast them, especially to make them of cast-iron. Steel castings have been used, and so, also, it is old to make a cast-iron shoe with steel wearing-pieces in its face.

My invention consists of a brake-shoe constructed of steel shaped and finished by forging, as I will proceed now more particularly to set forth and claim.

A method of and apparatus for making my forged-steel brake-shoe constitute the subject of a companion application of even date herewith.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of my shoe; Fig. 2, a section on line $x\ x$ of Figs. 1 and 3. Fig. 3 is a plan, and Fig. 2^a is a section on line $x'\ x'$ of Figs. 1 and 3. Fig. 4 shows in plan and cross-section a blank. Fig. 5 is a plan, Fig. 6 a longitudinal vertical section, and Fig. 7 a vertical cross-section on line $y\ y$ of Figs. 5 and 6, of the first-operation dies of one apparatus for forging my brake-shoe. Figs. 8 and 9 are respectively a plan and side elevation of the product of the first-operation dies with the clip set in position. Fig. 10 is a section on line 10 10 of Figs. 8 and 9. Fig. 11 shows a plan and edge view of the clip-blank. Fig. 12 is a longitudinal vertical section, Fig. 13 a vertical cross-section on line $z\ z$, Fig. 12, and Fig. 14 a vertical cross-section on line $z'\ z'$, Fig. 12, of the finishing-dies; and Fig. 15 is a plan of the said finishing-dies.

In making a forged-steel shoe in accordance with the master car-builders' standard and of the design shown in Figs. 1, 2, 2^a, and 3 I employ for the body a of the shoe a blank of merchant steel or wrought metal, and by dies, as I will describe, form thereon the lips $b\ b$ and lugs c for holding the shoe in the shoe-head against lateral movement. The clip d, by which the shoe is locked or keyed to or in the shoe-head, is formed of a separate piece of metal, as shown in Figs. 10 and 11, and is embedded or welded in the body a. The blank e, from which the body of the shoe is forged, is longer than the shoe and is heated and then subjected to the action of the first-operation dies, Figs. 5, 6, and 7, of which f is the male die, having the projections g, the outer faces of which are vertical, their inner faces inclined, and their edges also inclined to the outer faces, essentially as represented in Fig. 7. The female die h has its matrix provided with cavities i opposite the projections of the male die. When the male die is brought down upon the blank in the female die, the projections g enter the blank and make two cavities therein, substantially as in Fig. 10, by displacing the metal into the cavities $i\ i$. These dies f and h have their adjacent faces described on an arc of a circle of a different (less) radius than that of the finished shoe and the finishing-dies, so as to allow for a quantity of metal to be condensed by the finishing-dies. The blank as it comes from the first-operation dies is as shown in Figs. 8, 9, and 10. From a blank j—such as shown in Fig. 11—I form the clip d, of the shape shown in Fig. 10 and having its lower ends flared outwardly. This clip has its flared and beveled ends inserted in the cavities made in the blank, and then the blank is removed to the finishing-dies, Figs. 12 to 15. Of these dies k is the male, having the cavity l and surrounding walls to encompass the clip d, the cavities $m\ m$ for forming the lips b, and the projections n for forming the lugs c. The female die o has a matrix of considerably greater depth than the thickness of the blank, and its sides are provided at their upper portions with the cavities p (see Fig. 13) to receive the displaced portions of the blank. This matrix is shorter and narrower in its bottom than the blank, or, in other words, is of the dimensions of the finished shoe. Moreover, the finishing-dies are of a different (greater) radius than the first-operation dies. It follows, therefore, that in the operation of

these finishing-dies the blank will be compressed and condensed crosswise and lengthwise, and so the displaced metal will be returned and pressed around the clip both endwise and sidewise and so securely bind it in place. It will be observed that the metal displaced into the cavities *i* of the first-operation dies is replaced by the blank's passage through the cavities *p* as the blank goes home in the finishing-dies, and hence there is no liability of shearing it. The angles of the blank bounded by the lines *q r s q*, Fig. 9, form the material from which the ends of the shoe are constructed.

By my invention I am enabled to make a forged-steel brake-shoe at less cost than steel castings or composite shoes and from a steel of much softer grade than the steel for casting.

What I claim is—

1. A brake-shoe composed of a body *a* of wrought metal forged with the lips *b* and lugs *c* to hold the shoe in the shoe-head against lateral displacement and having the clip *d* embedded in the body, substantially as described.

2. A brake-shoe of the master car-builders' standard, having the wrought-metal body *a* of a single piece and the clip *d* embedded in said body transversely thereof, substantially as described.

In testimony whereof I have hereunto set my hand this 26th day of April, A. D. 1892.

CHARLES T. SCHOEN.

Witnesses:
C. O. JACQUETTE,
ROUGIER THORNE.