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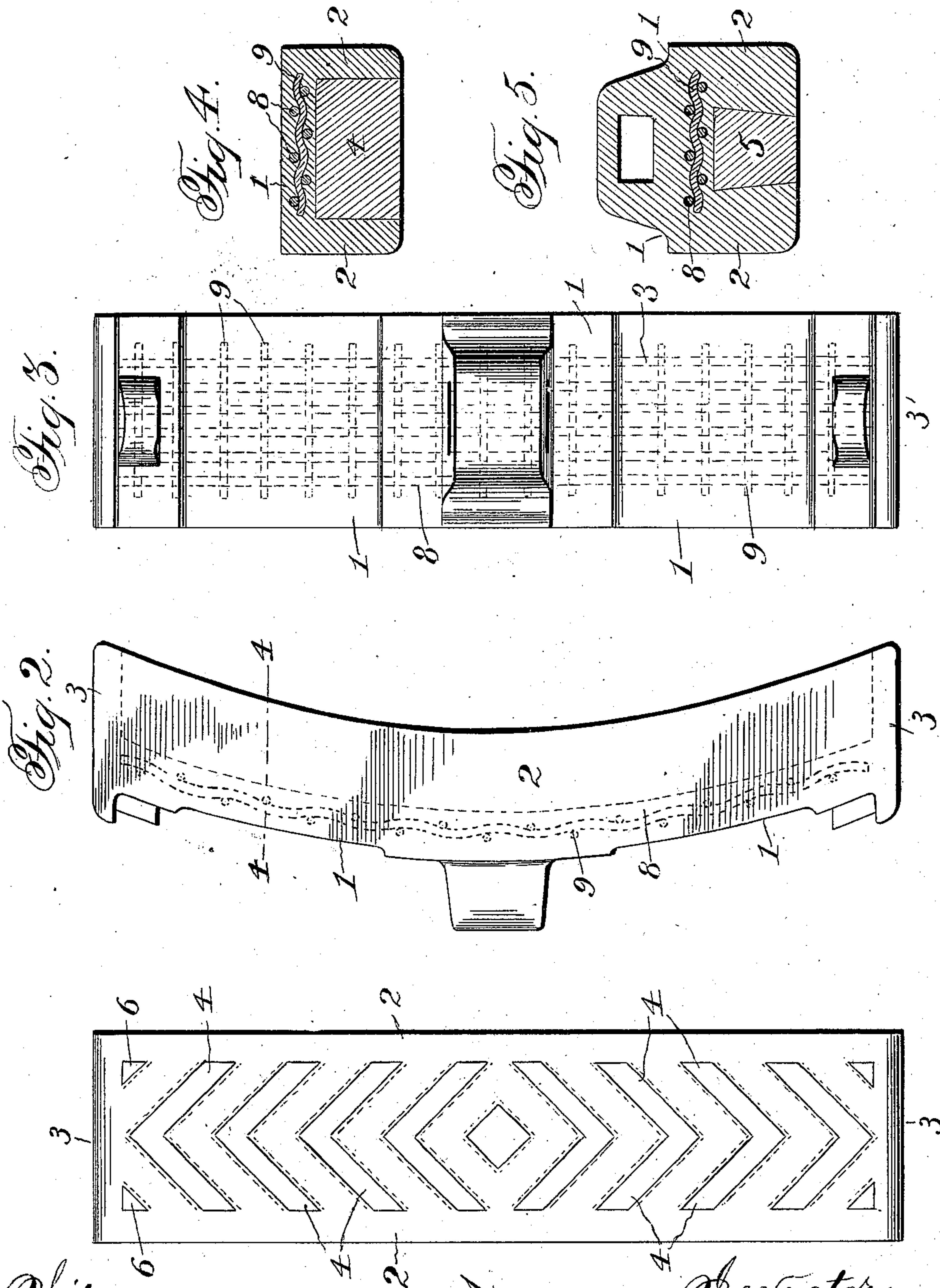
O. M. STIMSON & P. PARKE.

BRAKE SHOE.

APPLICATION FILED NOV. 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
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By James L. Norrie, atty.

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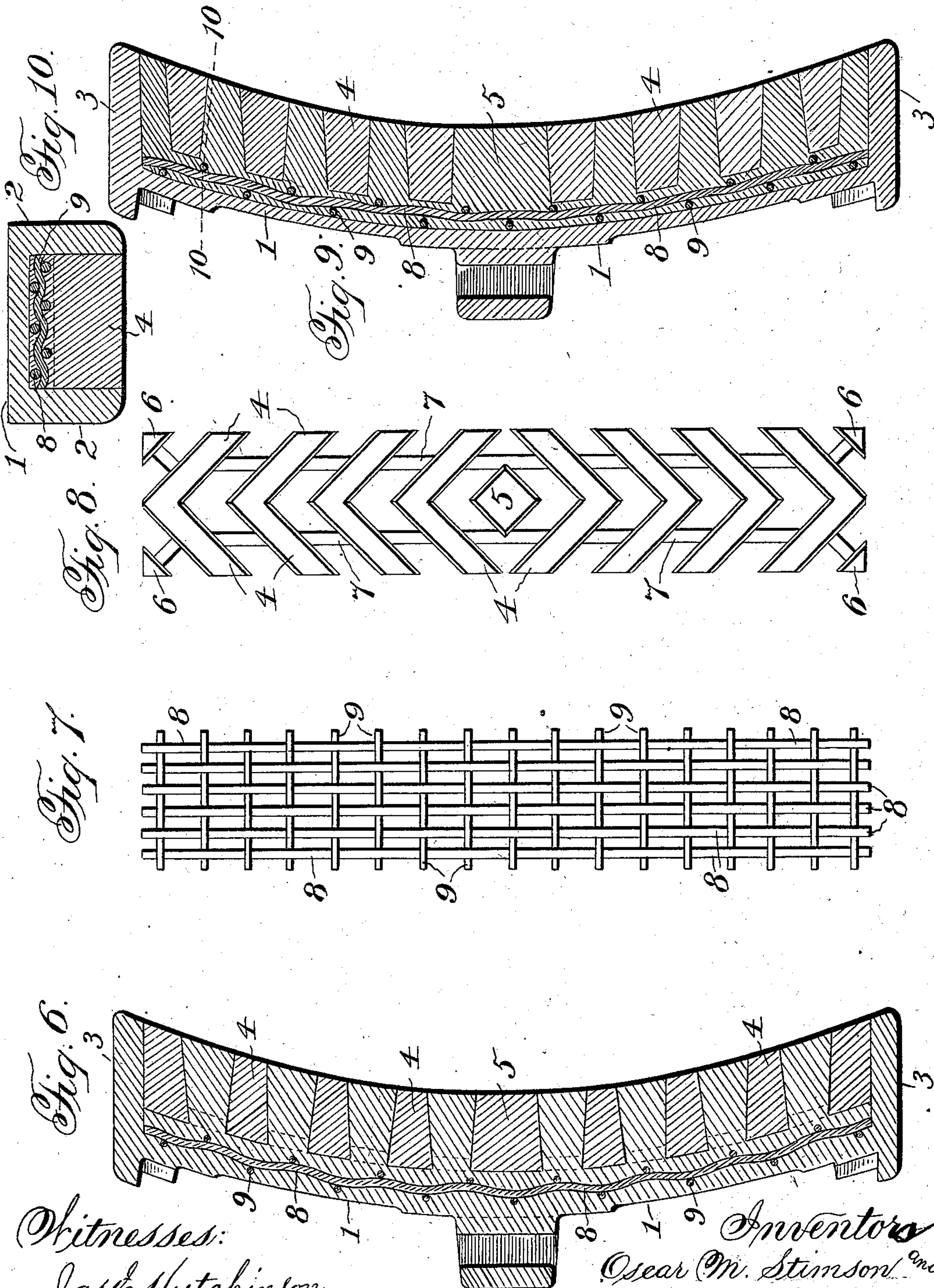
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By James L. Norris,
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UNITED STATES PATENT OFFICE.

OSCAR M. STIMSON AND PETER PARKE, OF CHICAGO, ILLINOIS.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 721,526, dated February 24, 1903.

Application filed November 14, 1902. Serial No. 131,406. (No model.)

To all whom it may concern:

Be it known that we, OSCAR M. STIMSON and PETER PARKE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Brake-Shoes, of which the following is a specification.

This invention relates to certain new and useful improvements in brake-shoes, and more particularly to that type of brake-shoes in which the shoe is formed of two or more metals and the back thereof strengthened to preserve the integrity of the shoe until worn out.

The invention has for its object to provide a brake-shoe with a hard-metal insert exposed on the wearing-surface of the shoe to the action of the wheel, said insert being incorporated in and surrounded by a soft metal composing the body of the shoe, thus presenting a constantly-varying composite wearing-surface uniformly distributed over the operative face of the shoe.

It also has for its object to strengthen the back of the shoe with ductile metal, constructed in such a shape as to be thoroughly incorporated in the cast metal forming the shoe. The insert, body, and ductile-metal strengthener, constructed and assembled in the manner hereinafter described, form a solid homogeneous body which renders it impossible for any part of the shoe becoming separated in case the wearing-surface of the shoe becomes fractured.

Finally, the invention has for its object to construct a brake-shoe which will be extremely simple and inexpensive in construction, strong, durable, and efficient in use, and which will furnish an effective braking power until the braking-surface is entirely worn away.

To these ends the invention consists in the features and in the construction, combination, and arrangement of parts, as hereinafter described, and particularly pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a front elevation of the brake-shoe. Fig. 2 is a side view thereof, showing in dotted lines the ductile metal for strength-

ening the back of the shoe. Fig. 3 is a rear view showing in dotted lines the ductile-metal strengthener. Fig. 4 is a transverse sectional view taken on the line 4 4 of Fig. 2, showing the maximum width of the hard-metal insert and the preferred location of the ductile-metal strengthener. Fig. 5 is a similar view taken transversely through the center of the shoe. Fig. 6 is a longitudinal sectional view of the complete brake-shoe. Fig. 7 is a plan view of the ductile-metal screen for strengthening the back of the shoe. Fig. 8 is a similar view of the hard-metal insert. Fig. 9 is a view similar to Fig. 6, showing the ductile-metal screen cast in the back of the metal insert; and Fig. 10 is a transverse sectional view taken on the line 10 10 of Fig. 9.

Our improved brake-shoe comprises three separately-constructed parts—viz., the body portion of the shoe constructed of relatively soft metal, the hard-metal insert, and the reticulated strengthener formed of ductile metal.

As shown in the drawings, the body of the brake-shoe is segmental in shape and comprises a curved back 1, longitudinal sides 2, and ends 3, the outer edges of the sides and ends of the shoe conforming in contour to the general shape of the back 1 and forming a recess in the front or inner face of the shoe for the reception of the insert.

As shown in Fig. 8 of the drawings, the insert comprises a plurality of substantially V-shaped ribs 4, a center stud 5, and end studs 6. The ribs 4 are formed, preferably, in two series, said series being arranged on either side of the center stud 5, the ribs in each series being disposed parallel to each other and the apices of the ribs comprising the two series being disposed in opposite directions, the ribs being so disposed that the apices of both sections will project toward the ends of the insert. Each of the ribs is of the shape of a truncated cone in cross-section—that is to say, the opposite sides of each rib converge toward each other from their rear toward their front sides. The center stud 5 is preferably square in cross-section and has the cross-sectional shape of the form of a frustum of a pyramid—that is to say, its four sides are inclined from the back toward the front of the stud—the

sides of the stud being preferably arranged parallel to the adjacent sides of the two innermost ribs of the two series. The end studs 6 are preferably triangular-shaped in cross-section and are arranged at the four corners of the insert, the inner sides of the said studs being arranged parallel to the adjacent sides of the outermost ribs of the series, and the inner sides of said studs are formed at an inclination, the base of each of the studs being the widest portion thereof. The ribs and studs comprising the insert are cast at a single operation in the manner hereinafter explained, and in casting the insert suitable provision is made in the mold for casting gates 7, which unite the several ribs and studs and hold them in their proper relative positions.

As shown in Fig. 7 of the drawings, the metallic strengthener consists of a reticulated sheet or plate of approximately the same dimensions as the insert and is formed of a plurality of steel wires 8 and 9, the longitudinal wires 8 forming the warp of the woven-wire fabric and the transverse wires 9 forming the woof thereof. Owing to the greater length of the warp-wires, and consequently owing to the fact that they are subjected to a greater strain, said warp-wires are preferably made of greater diameter than the woof-wires 9. The warp and woof wires are woven together in the manner of plain weaving, and said wires being formed of ductile metal this operation may be readily and economically effected on an ordinary wire-weaving machine.

The body of the shoe may be cast from any relatively soft metal and the insert of any suitable hard metal, the screen or reticulated strengthener being preferably formed of ductile-steel wires.

In constructing our improved shoe a mold is prepared to cast the hard-metal insert and the connecting-gates, and the hard metal is then poured into the mold, making an integral body of hard metal comprising the V-shaped ribs 4 and studs 5 and 6, said ribs and studs being united and held in their relative positions by the gates 7. A mold is then prepared for the body of the shoe, and into this mold is placed the hard-metal insert, and on top of the latter is placed the metallic screen. The soft metal is then poured into the mold to form the body portion of the shoe, comprising the back 1, sides 2, and ends 3. The soft metal flows about and entirely surrounds the reticulated strengthener and flows between the several ribs 4 and between the studs 5 and 6 and the adjacent ribs, the result being that the reticulated strengthener of ductile metal is incorporated in the back of the shoe near the insert, and the insert is incorporated with the soft-metal face, sides, and ends of the body portion of the shoe.

In Figs. 9 and 10 we show a slightly-modified form of shoe wherein the reticulated strengthener instead of being incorporated in the body portion of the shoe is incorporated in the back of the insert; but in all other re-

spects the shoe thus constructed conforms to the preferred construction hereinbefore described. In constructing the shoe shown in said Figs. 9 and 10 a mold is constructed for the insert, in which is placed the metallic screen, and the hard metal is then poured into the mold, whereby the screen is incorporated in the back or rear portion of the insert. A mold is then prepared for the body portion of the shoe, and the insert, having the reticulated strengthener incorporated in its rear portion, is placed within the mold, after which the soft metal is poured into the mold and flows about the insert and between the ribs and studs of the latter, thus completing the shoe in the manner described.

In constructing our improved shoe in the manner described we form a homogeneous body, comprising a soft-metal body and a hard-metal insert, whereby is provided a composite braking-surface, which affords superior advantages for distributing the disintegrated parts of the soft body of the shoe incident to wear over the wearing-surface of the hard metal, thus giving to the shoe the most effective braking qualities and at the same time affording a maximum hard-metal surface possessing superior wearing qualities. The soft-metal portion of the shoe, which is included between the ribs and between the ribs and the studs, thoroughly binds the studs and ends of the body portion of the shoe together, and by making said ribs and studs tapered or approximately wedge-shaped in cross-section, as before described, said hard portions constituting the insert will be effectively held in place within the body portion of the shoe, and should any of the ribs or other portion of the insert become fractured it will be impossible for the fractured portions of the insert to become separated or to drop or to be forced out of place. The screen formed of ductile metal and incorporated in the rear portion of the shoe adds great strength to the latter and permits the shoe to be entirely worn out, with little or no liability of the operative face of the shoe being broken or fractured. It will be evident that by employing the metal screen in connection with the hard-metal insert having wedge-shaped ribs it will be permissible to use a deeper insert without weakening the shoe and will permit the utmost wear before it becomes necessary to discard the shoe on account of its being worn out.

Having described our invention, what we claim is—

1. A brake-shoe comprising a hard-metal insert provided with V-shaped independent ribs formed of two parts extending in opposite directions.

2. A brake-shoe comprising an insert provided with V-shaped ribs, a center stud, and two pairs of end studs.

3. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs, a center stud, and two pairs of end studs.

4. A brake-shoe comprising an insert pro-

vided with ribs extending in opposite directions, a center stud, and two pairs of end studs.

5. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs extending in opposite directions, a center stud, and two pairs of end studs.

6. A brake-shoe comprising an insert provided with V-shaped ribs substantially wedge-shaped in cross-section.

7. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section.

8. A brake-shoe comprising an insert provided with V-shaped ribs extending in opposite directions, and substantially wedge-shaped in cross-section.

9. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs extending in opposite directions, and substantially wedge-shaped in cross-section.

10. A brake-shoe comprising an insert provided with V-shaped ribs, substantially wedge-shaped in cross-section, said insert being provided with a center stud tapering outwardly, and two pairs of end studs each having one side thereof inclined.

11. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, said insert being provided with a center stud tapering outwardly, and two pairs of end studs each having one side thereof inclined.

12. A brake-shoe comprising an insert provided with V-shaped ribs extending in opposite directions and wedge-shaped in cross-section, said insert being provided with a center stud and two pairs of end studs, the sides of said center stud tapering outwardly, and one side of each of said studs being inclined outwardly.

13. A brake-shoe comprising an insert provided with ribs formed of two parts, each of which is substantially wedge-shaped in cross-section, said parts extending in opposite directions to one another.

14. A brake-shoe comprising a hard-metal insert provided with ribs formed of two parts, each of which is substantially wedge-shaped in cross-section, said parts being thicker at their inner ends than their outer ends.

15. A brake-shoe comprising an insert provided with V-shaped ribs substantially wedge-shaped in cross-section, and a metallic strengthening-screen incorporated in the shoe.

16. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, and a ductile metallic strengthening-screen incorporated in said shoe.

17. A brake-shoe comprising an insert provided with V-shaped ribs extending in opposite directions to one another and substantially wedge-shaped in cross-section, and a metallic strengthening-screen incorporated in said shoe.

18. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs extending in opposite directions to one another and substantially wedge-shaped in cross-section, and a ductile metallic strengthening-screen incorporated in said shoe.

19. A brake-shoe comprising an insert provided with V-shaped ribs substantially wedge-shaped in cross-section, and a series of longitudinally and transversely extending wires incorporated in said shoe.

20. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, and longitudinally and transversely extending wires of ductile metal incorporated in said shoe.

21. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, and a soft-metal body surrounding the insert and provided with connecting-ribs extending between the ribs of the insert.

22. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, a soft-metal body surrounding the insert and provided with connecting-ribs extending between the ribs of the insert, and a metallic screen for strengthening the brake-shoe.

23. A brake-shoe consisting of a soft-metal body, a hard-metal insert incorporated in said body and provided with V-shaped ribs formed of two parts, each of which extends in opposite directions to one another, and a metallic screen incorporated in the soft-metal body of the shoe.

24. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, a soft-metal body surrounding the insert, and means for strengthening the back of the body and insert.

25. A brake-shoe comprising a soft-metal body, a hard-metal insert incorporated in said body and provided with V-shaped ribs extending in opposite directions to one another and substantially wedge-shaped in cross-section, and means for strengthening the back of the body and the insert.

26. A brake-shoe consisting of a body comprising a hard-metal insert provided with ribs substantially wedge-shaped in cross-section, a center and end studs, a soft-metal body enclosing said insert and studs, and a metallic strengthening-screen.

27. A brake-shoe consisting of a body comprising a hard-metal insert provided with ribs substantially wedge-shaped in cross-section, a center and end studs, a soft-metal body enclosing the said insert and studs, and a ductile-metal strengthening-screen embedded in said soft-metal body.

28. A brake-shoe comprising a wire screen for strengthening the back thereof, the diameter of the longitudinal wires of said screen being greater than the transverse wires thereof.

29. A brake-shoe comprising a hard-metal insert provided with V-shaped ribs substantially wedge-shaped in cross-section, a soft-metal body surrounding the said insert, and
5 a series of longitudinally and transversely extending wires incorporated in the said body for strengthening the same, said longitudinal wires being of greater diameter than the said transverse wires.
30. A brake-shoe comprising a soft-metal
10 body, a hard-metal insert incorporated in said body and provided with ribs extending in opposite directions to one another, and a plu-

ality of longitudinally and transversely extending wires incorporated in the soft-metal 15 body for strengthening the back thereof, said longitudinal wires being of greater diameter than the transverse wires.

In testimony whereof we have hereunto set our hands in presence of two subscribing wit- 20 nesses.

OSCAR M. STIMSON.
PETER PARKE.

Witnesses:

W. C. COOK,
W. J. GALVIN.