

No. 704,491.

Patented July 8, 1902.

G. A. WOODMAN.
BRAKE SHOE.

(Application filed Apr. 5, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 8.

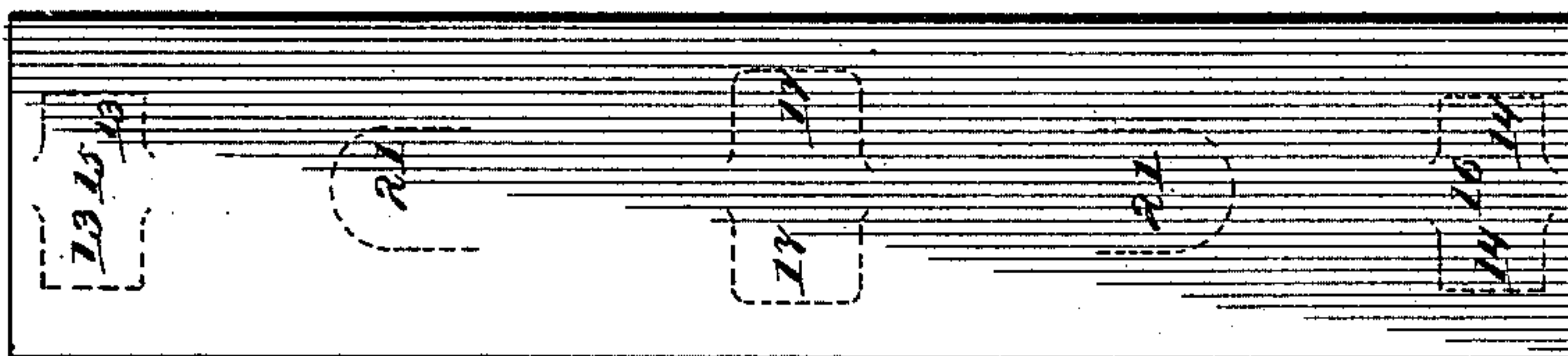


Fig. 3.

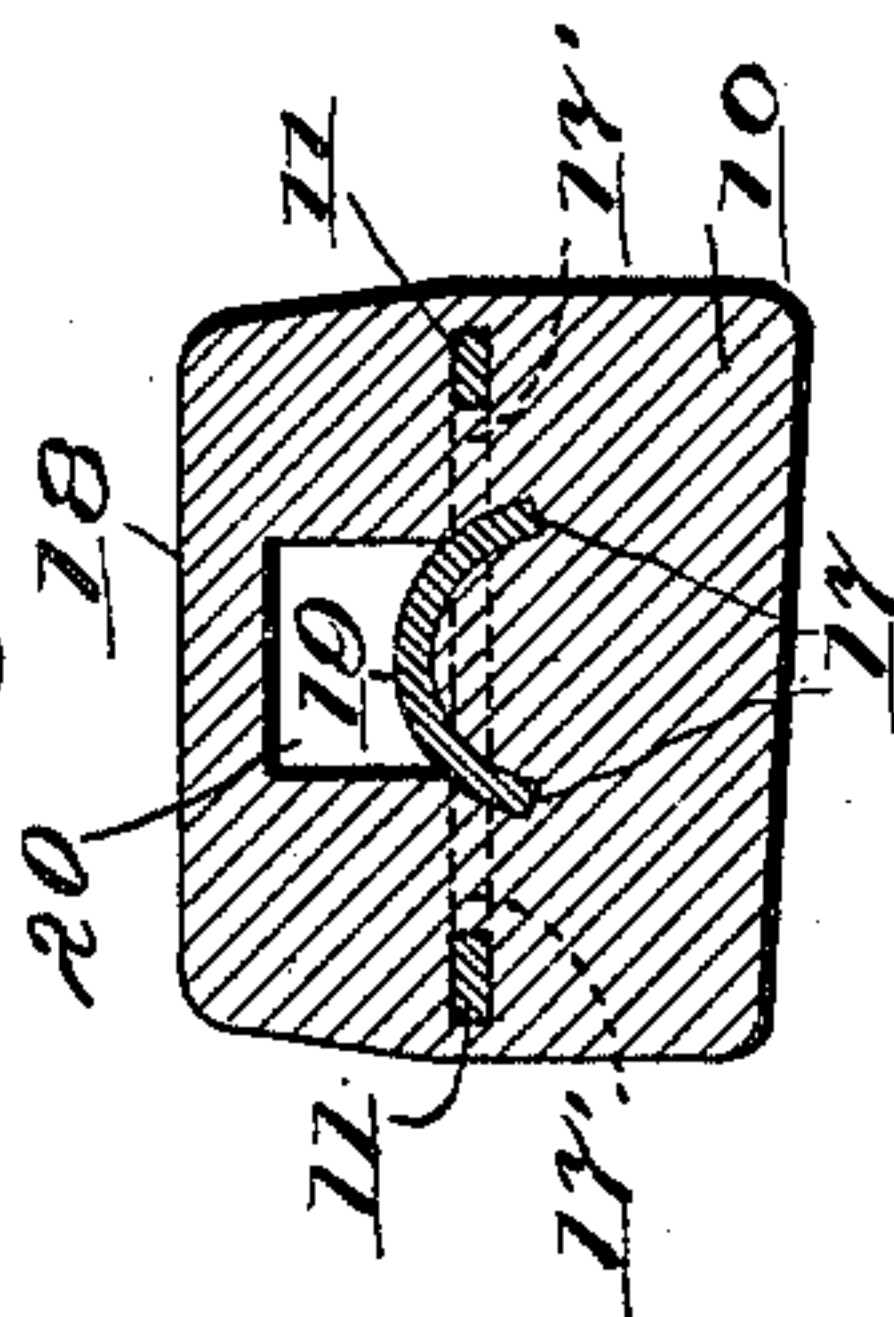


Fig. 4.

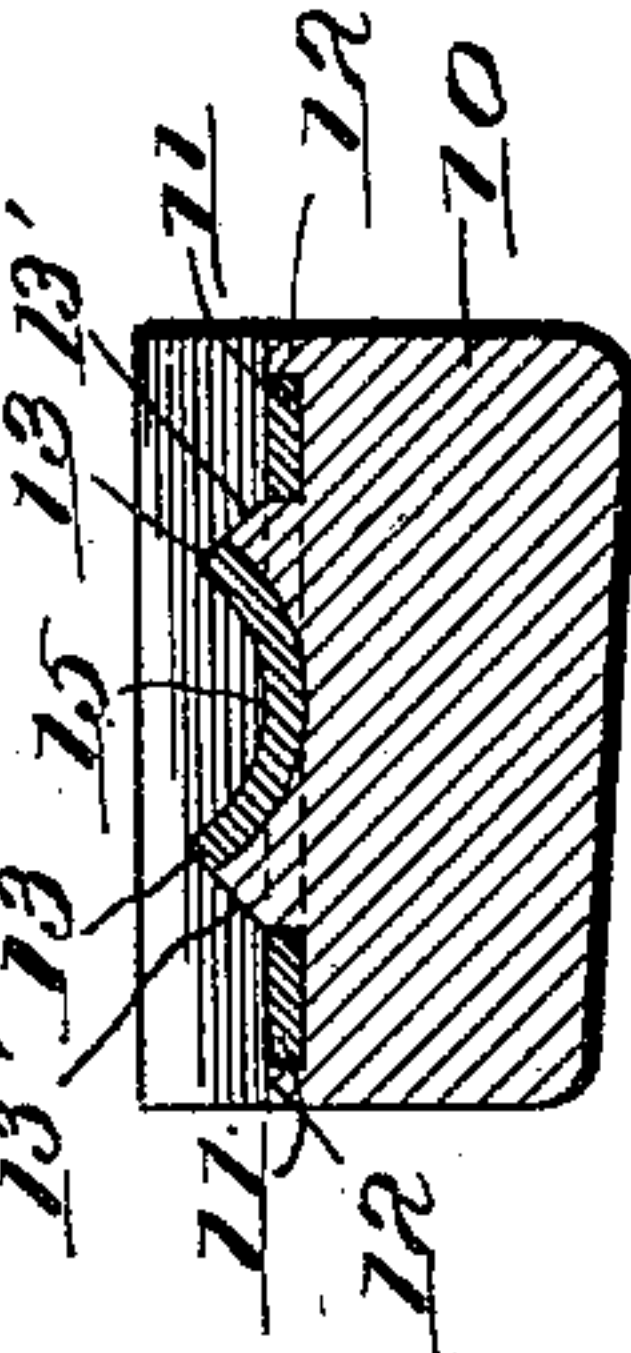


Fig. 5.

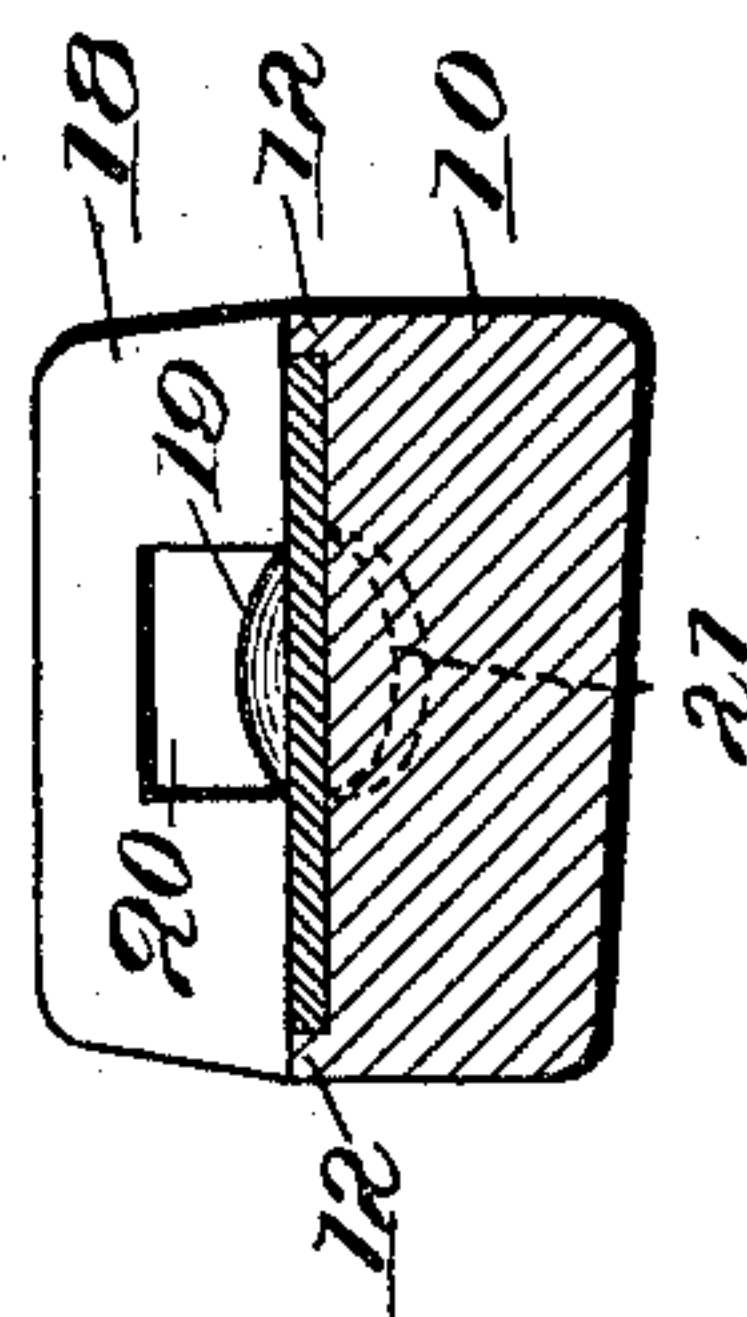


Fig. 2.

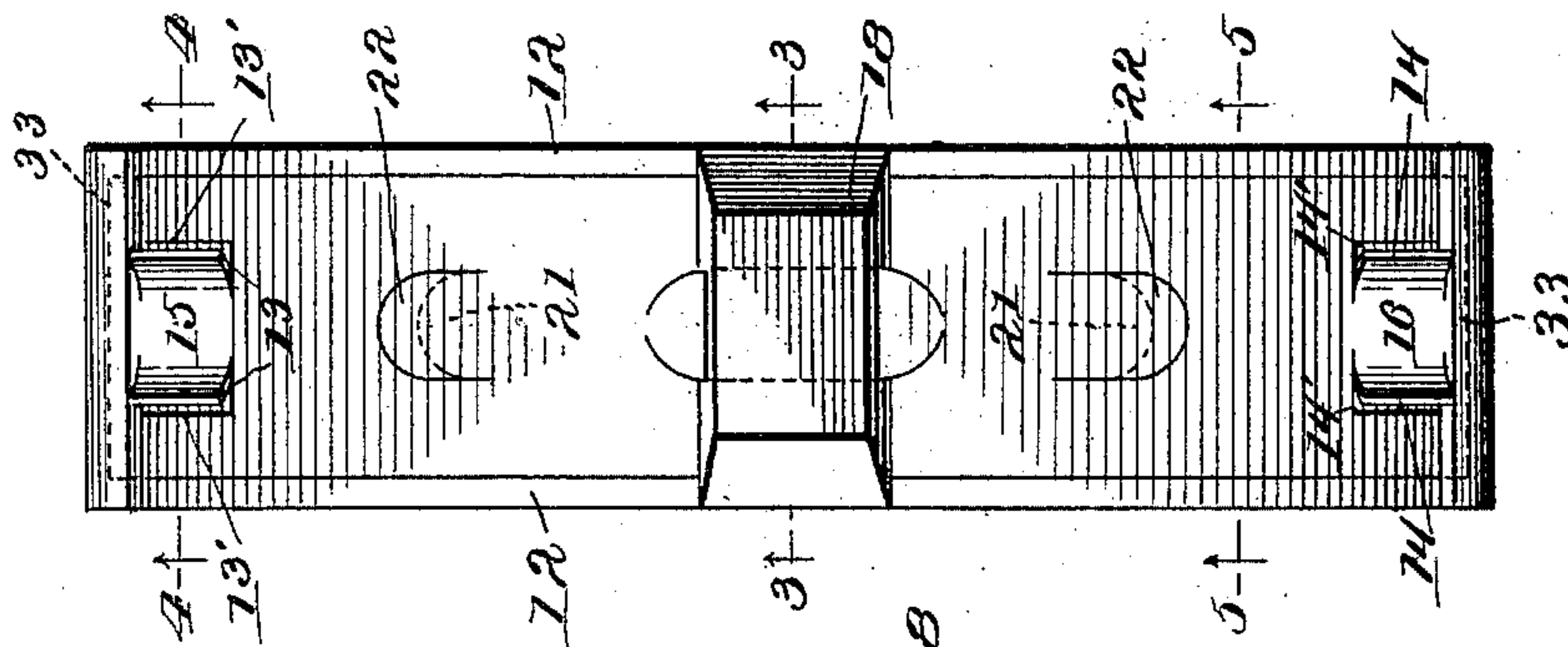
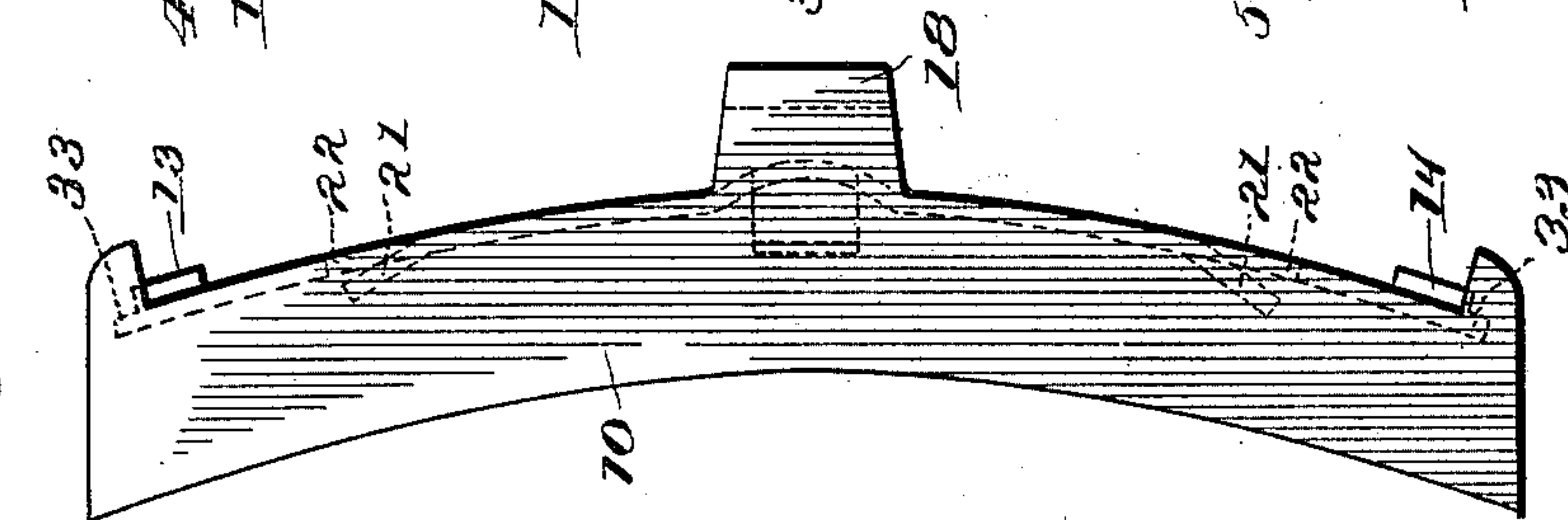


Fig. 1.



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UNITED - STATES - PATENT OFFICE.

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BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 704,491, dated July 8, 1902.

Application filed April 5, 1902. Serial No. 101,552. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. WOODMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Brake-Shoes, of which the following is a specification.

My invention relates to novel improvements in brake-shoes, and has in view particularly to strengthen the body of a cast-metal shoe by employing a ductile metal plate at the back thereof, which will hold the cast-metal body integral until it is worn out.

The practical service life of the ordinary cast-iron brake-shoe, whether it be solid or provided with an insert, is limited by reason of the great danger of the shoe breaking when it is worn comparatively thin. Hence it has been customary heretofore to remove the shoes when worn thin, but before they are worn out, to avoid the possibility of serious accidents by the shoes derailing a train or failing to produce the proper braking effect when required. To avoid the necessity of removing the shoe before it is worn out, for the reasons heretofore set forth, brake-shoes have recently been provided with strengthening-backs of several different constructions, and it is a matter of considerable importance that a rigid and permanent connection be effected between the back and the body of the shoe, so that the back will not become loosened from the body, which would inevitably tend to permit a part of the body to break off when the shoe is worn thin.

It is my primary object, therefore, to improve the construction of the strengthening-back of a brake-shoe and provide for rigidly and permanently connecting the back and the body of the shoe.

Another object is to construct the back to form a smooth back wall for the opening in the attaching-lug to facilitate the insertion and removal of the key, and a further object is to provide the back with the usual guides for the brake-head to maintain the shoe in constant proper relative position to the wheel.

The invention has other objects in view, which will appear fully hereinafter in connection with the detailed description thereof,

reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a shoe embodying my invention and showing the back plate in broken lines. Fig. 2 is a similar view of the back of the shoe. Figs. 3, 4, and 5 are transverse sectional views on the lines 3 3, 4 4, and 5 5, respectively, of Fig. 2. Figs. 6 and 7 are enlarged perspective views of a portion of the back plate and showing the inner and outer faces thereof, respectively. Fig. 8 shows the blank from which the back plate of Fig. 2 is made, with the cutting-lines indicated by broken lines. Figs. 9 to 15, inclusive, show modified constructions.

The reference-numerals indicate corresponding parts in the several figures, and referring thereto 10 designates the body of the shoe, and 11 the back plate thereof, the plate being preferably narrower than the body and inset therein, as shown in Figs. 2 to 5, longitudinal ribs 12 being formed on the body at the side edges of the plate and lying flush with the outer face thereof. The body is made of suitable size and shape out of cast-iron or other material and may or may not be provided with an insert, and the back plate is preferably made of ductile metal—such as steel, wrought-iron, or malleable iron—and of sufficient thickness to afford the necessary strength. At or adjacent to each end of the plate I provide a pair of outwardly-extending projections 13 14, which are preferably cut and stamped up out of the plate itself, leaving openings 13' and 14' and connected by the bridges 15 16. These projections are of a size and character to form the guides for the brake-head, which have heretofore been cast on the body, and the openings left in the plate when the projections are stamped up permit the metal of which the body is made to flow up underneath the projections to form a support therefor and also to lock the plate and body together, thereby materially strengthening the ends of the shoe and forming a secure and permanent connection between the parts. I provide inwardly-extending projections 17 at that part of the back plate which is located beneath the attaching-lug 18 and preferably cut and stamp them up from the plate

itself within the side edges thereof, as shown clearly in Fig. 3. Openings 17' are thus provided in the plate, through which the metal forming the body may flow in the casting operation to form the attaching-lug, and I press up the bridge 19, connecting the projections, to form the inner wall of the opening 20 in the attaching-lug, the ends of the bridge 19 working off into the body of the plate, so as to form a smooth and gradual protuberance constituting the back wall of the lug-opening 20 to support the key. By forming this protuberance on the plate itself in the manner shown and described I provide a smooth inner wall for the opening in the lug, which enables the key to be readily passed through the opening without encountering the obstruction heretofore commonly provided when the inner wall of the lug is cast with the body of the shoe, and thereby greatly facilitate the operation of attaching the shoe to the brake-head. I also prefer to provide additional inward projections 21 between the attaching-lug and the ends of the shoe, these projections being preferably cut and stamped up like the others from the plate itself and leaving openings 22, through which the metal forming the body may flow on to the projections to lock the back and body securely together. The projections 17 and 21 need not extend far into the body of the shoe, as it has been found that the body metal will flow readily through openings of comparatively small area on to the projections and form a secure lock for the body and back plate.

I do not limit myself to the use of a single projection 21 on each side of the attaching-lug, as more may be used if deemed desirable; but I have found that the construction of the plate illustrated in the drawings will enable a rigid and permanent connection between the plate and the body and accomplish all of the results sought for.

Various changes in the form and proportion of parts and details of construction may be made without departing from the spirit or sacrificing the advantages of the invention, and I therefore reserve the right to make such changes as fairly fall within the spirit and scope thereof—for example, the guide-lugs at the ends of the back plate may be formed by stamping up projections 27, as shown in Fig. 10, instead of cutting and stamping the projections, as shown in Fig. 4, and the inward projections 17 (shown in Fig. 3) may be dispensed with, as illustrated in Fig. 9.

The back plate herein described can be struck up in one operation, and the body is cast on it in the usual manner. The plate forms a strong back for the shoe and particularly at those places where the shoe has generally broken. It will be observed that in the preferred embodiment of the invention the plate has a continuous unbroken outer edge, both the projections at the ends of the plate and at the middle thereof being located inside of the edges of the plate.

In Fig. 11 the guide for the brake-head is formed by the projections at the ends of the back, which are designated 28 and directed inwardly instead of outwardly, as shown in Fig. 4, and the cast metal will preferably be molded around the projections 28, as indicated by 29. The guide may also be formed by projections cut and stamped up in the manner shown in Figs. 12 and 12^a, in which they are designated 30 and in which the cast metal is preferably allowed to flow between them, as indicated by 31, or the plate may be cut and stamped up, as shown in Figs. 13 and 13^a, in which the side walls 32 constitute the projections forming the guide. The projections, as shown in Figs. 11, 12, and 13, may be extended through the end edge of the plate in the manner shown in Fig. 13^a, or terminated inside of the end edge, as shown in Figs. 14 and 15, as well as in Figs. 2 and 6. In Fig. 14 the plate is stamped up to form the guide 34 and is cut at its outer edge 35, but left integral with the main portion of the plate at its inner edge 36, but in Fig. 15 the guide is cut at both edges 37 and 38.

It is apparent that the invention is susceptible of a number of modifications, and I reserve the right to embody it in any of the forms illustrated and in any form which comes within the spirit and scope of the invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A brake-shoe, having a back plate provided at its ends with guides for the brake-head.

2. A brake-shoe, having a back plate and guides for the brake-head formed out of the back plate.

3. A brake-shoe, having a back plate and guides for the brake-head formed out of the back plate inside of the end edges thereof.

4. A brake-shoe, having a back plate and outwardly-extending projections cut and stamped up from the plate to form guides for the brake-head, said projections leaving openings to receive the metal of which the body of the shoe is formed.

5. A brake-shoe, having an attaching-lug and a back plate, said plate being struck up beneath the lug to form the inner wall of the opening in the lug.

6. A brake-shoe, having an attaching-lug and a back plate, said plate being provided with a protuberance forming the inner wall of the opening in the lug.

7. A brake-shoe, having an attaching-lug and a back plate, said plate being provided beneath the lug with continuous side edges and inward projections within said side edges.

8. A brake-shoe, having an attaching-lug and a back plate, said plate being provided between its side edges beneath the lug with inward projections and an outward protuberance.

9. A brake-shoe, having an attaching-lug and a back plate, and projections cut and

stamped up from the plate beneath the lug, said projections leaving openings inclosed by the side edges of the plate to receive the metal of which the body of the shoe is formed.

5 10. A brake-shoe, having an attaching-lug and a back plate, said plate being provided with a protuberance to form the inner wall of the opening in the lug and having inward projections at or about its center and out-
10 ward projections at its ends stamped up therefrom and leaving openings to permit the metal of which the body of the shoe is formed to flow thereinto and form locking connection with the projections.

11. A brake-shoe having a back plate pro- 15
vided with oppositely-disposed inwardly-directed angular projections between its center and its ends.

12. A brake-shoe, having a back plate pro-
vided with inwardly-directed angular projec- 20
tions stamped out of the plate and permitting the metal of which the body of the shoe is formed to form locking engagement there-
with.

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