

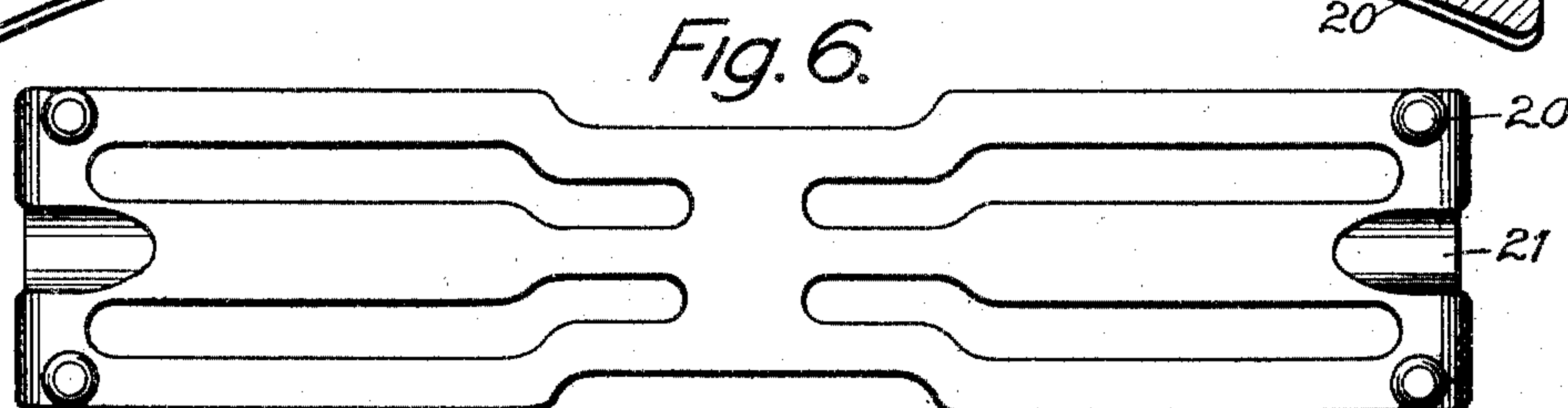
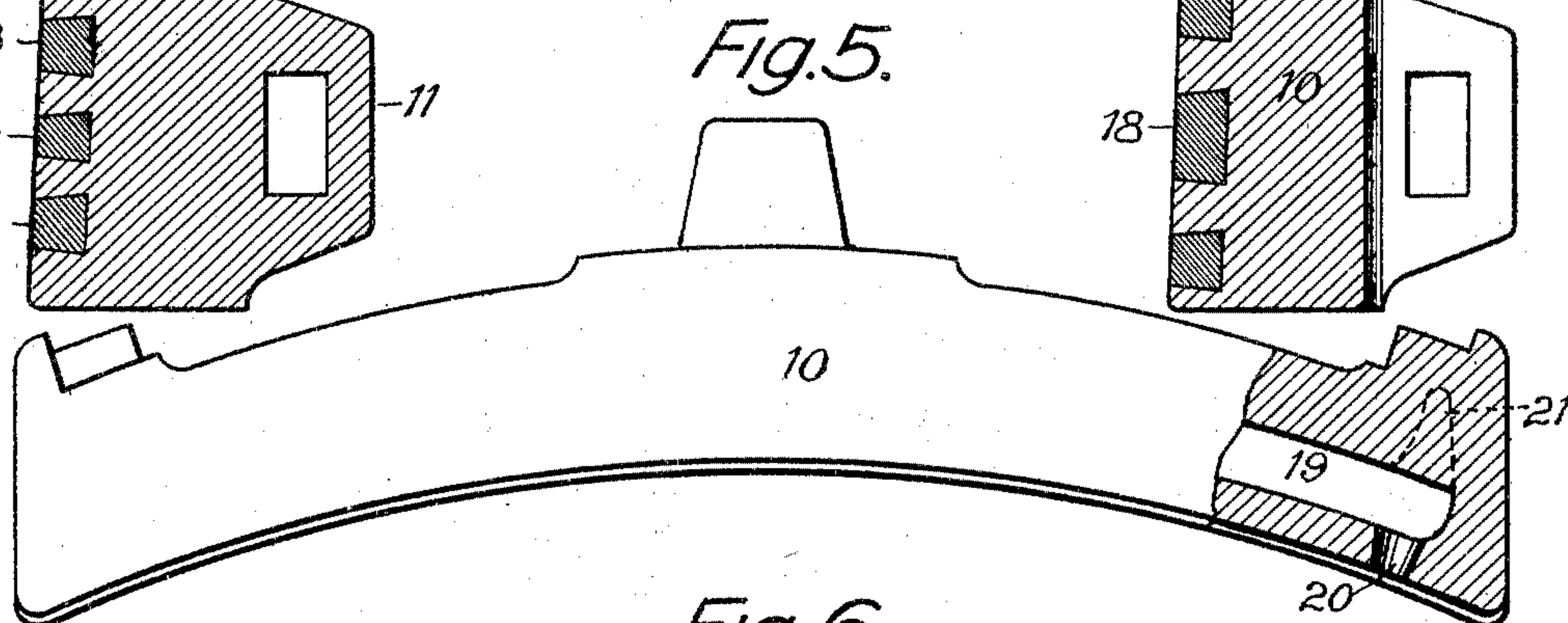
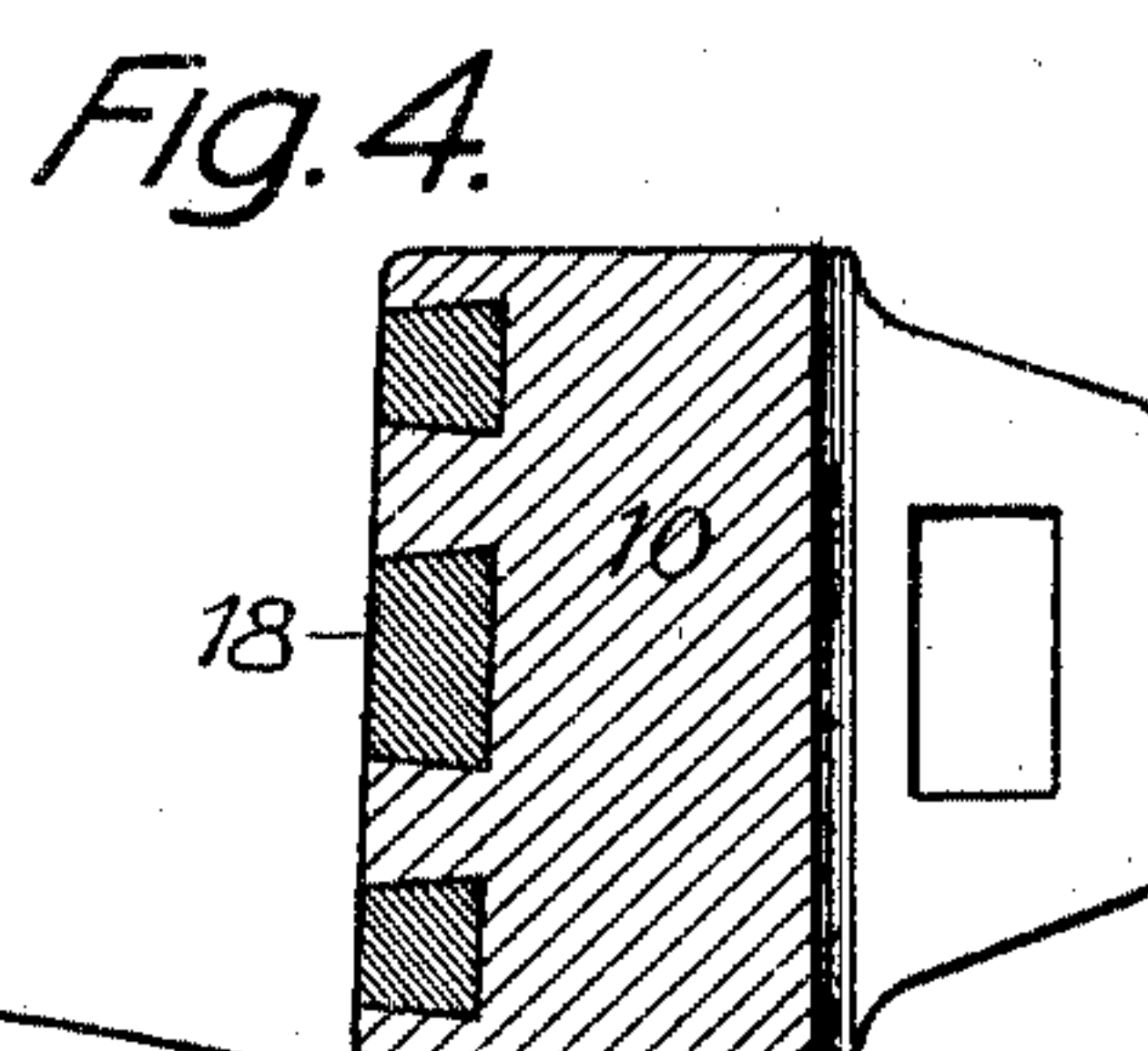
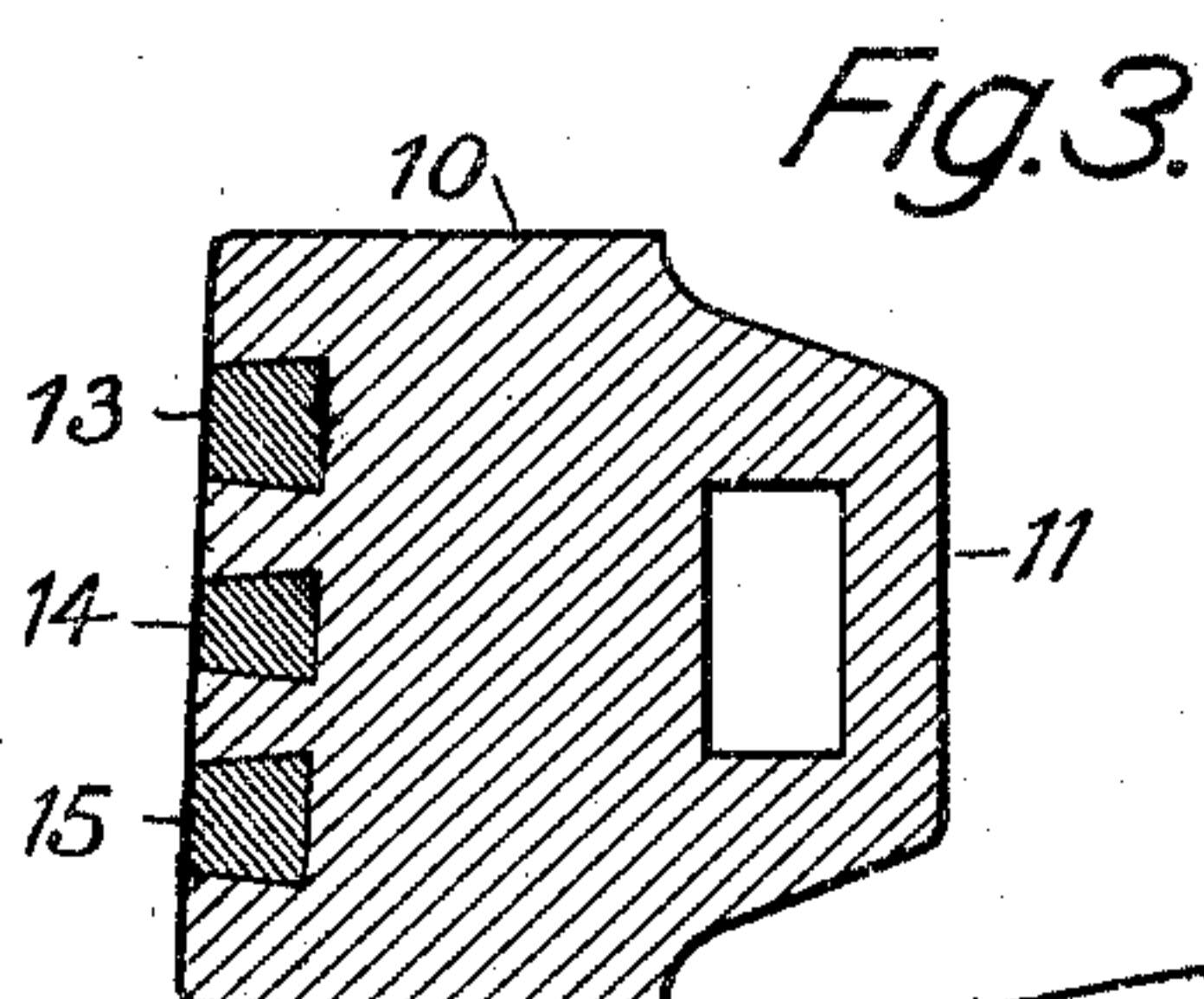
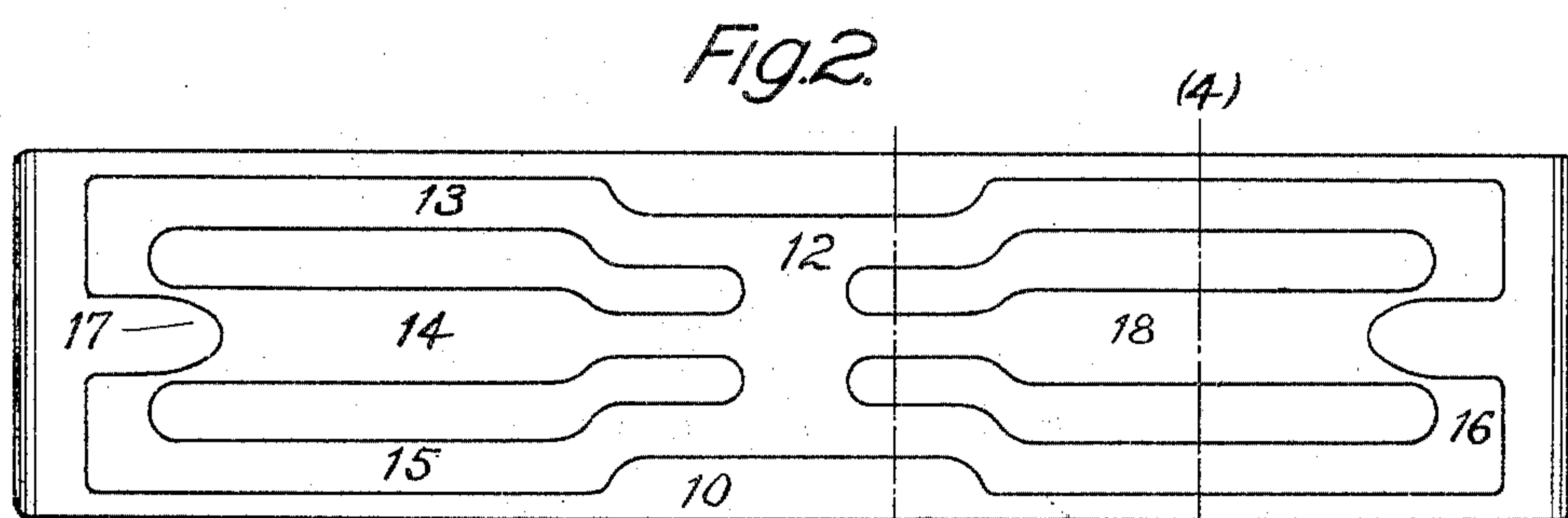
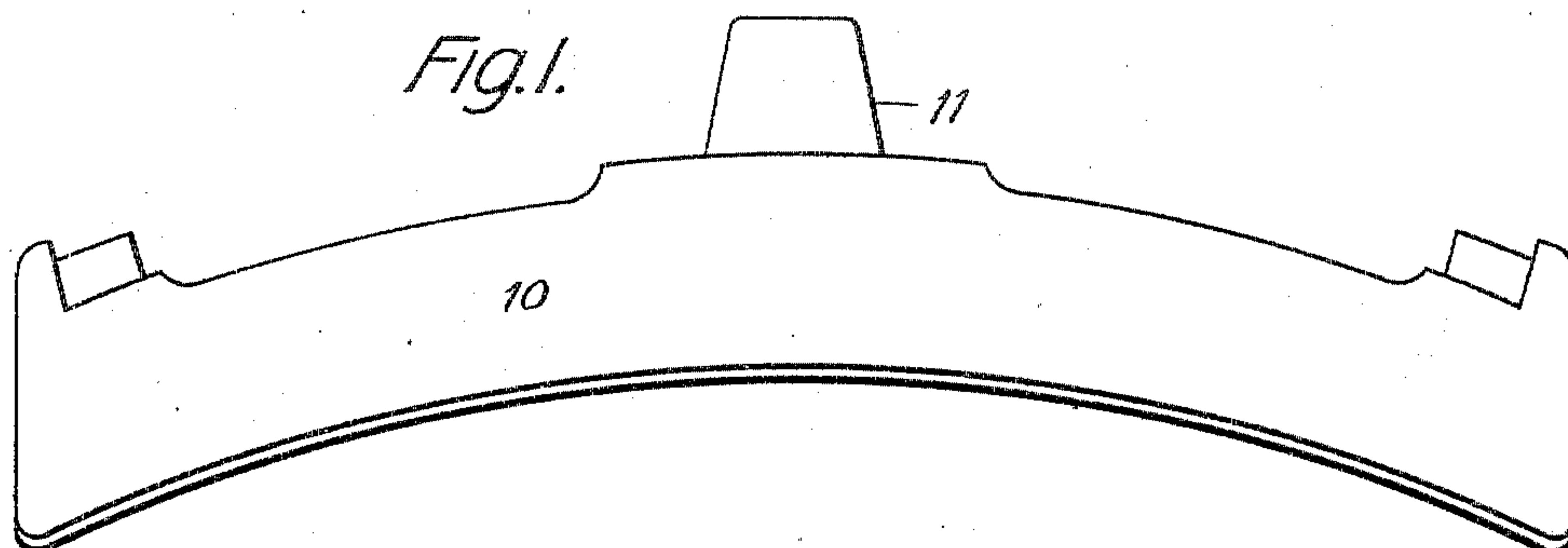
No. 780,072.

PATENTED JAN. 17, 1905.

A. L. STREETER.  
BRAKE SHOE.

APPLICATION FILED MAR. 23, 1903.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 7.

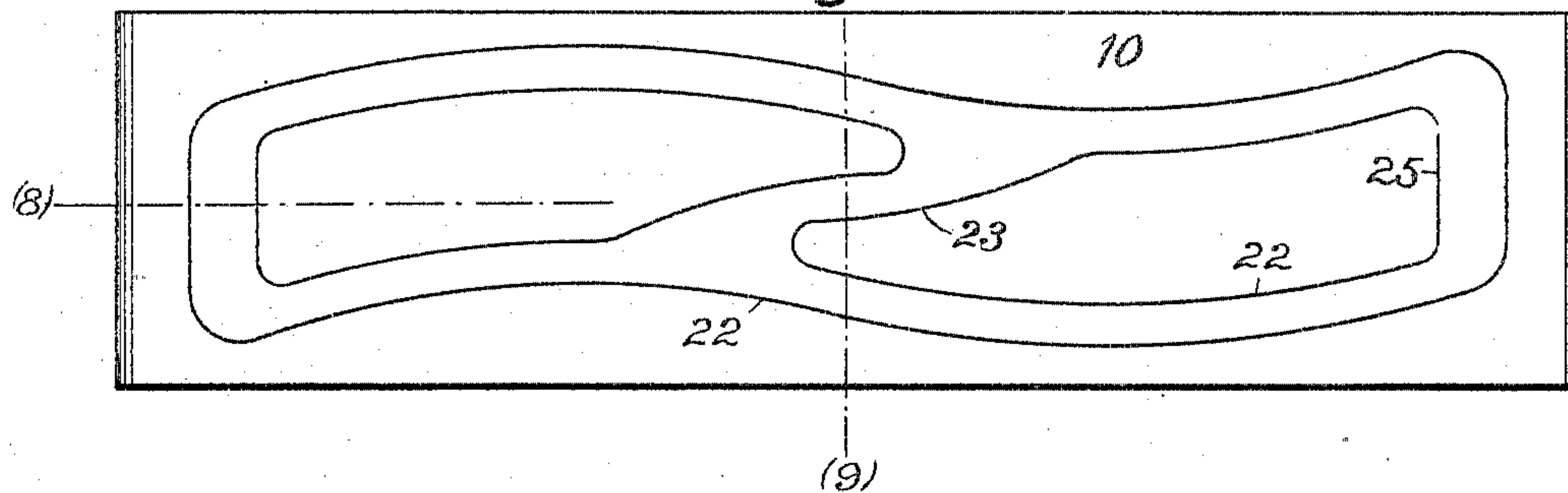


Fig. 8.

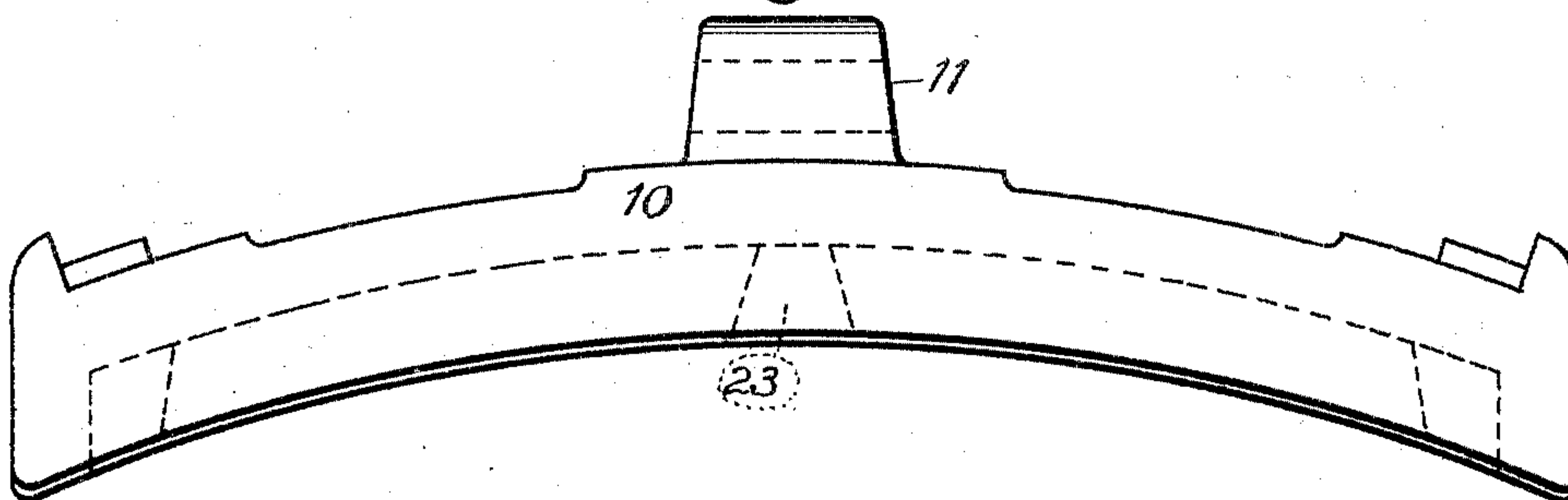
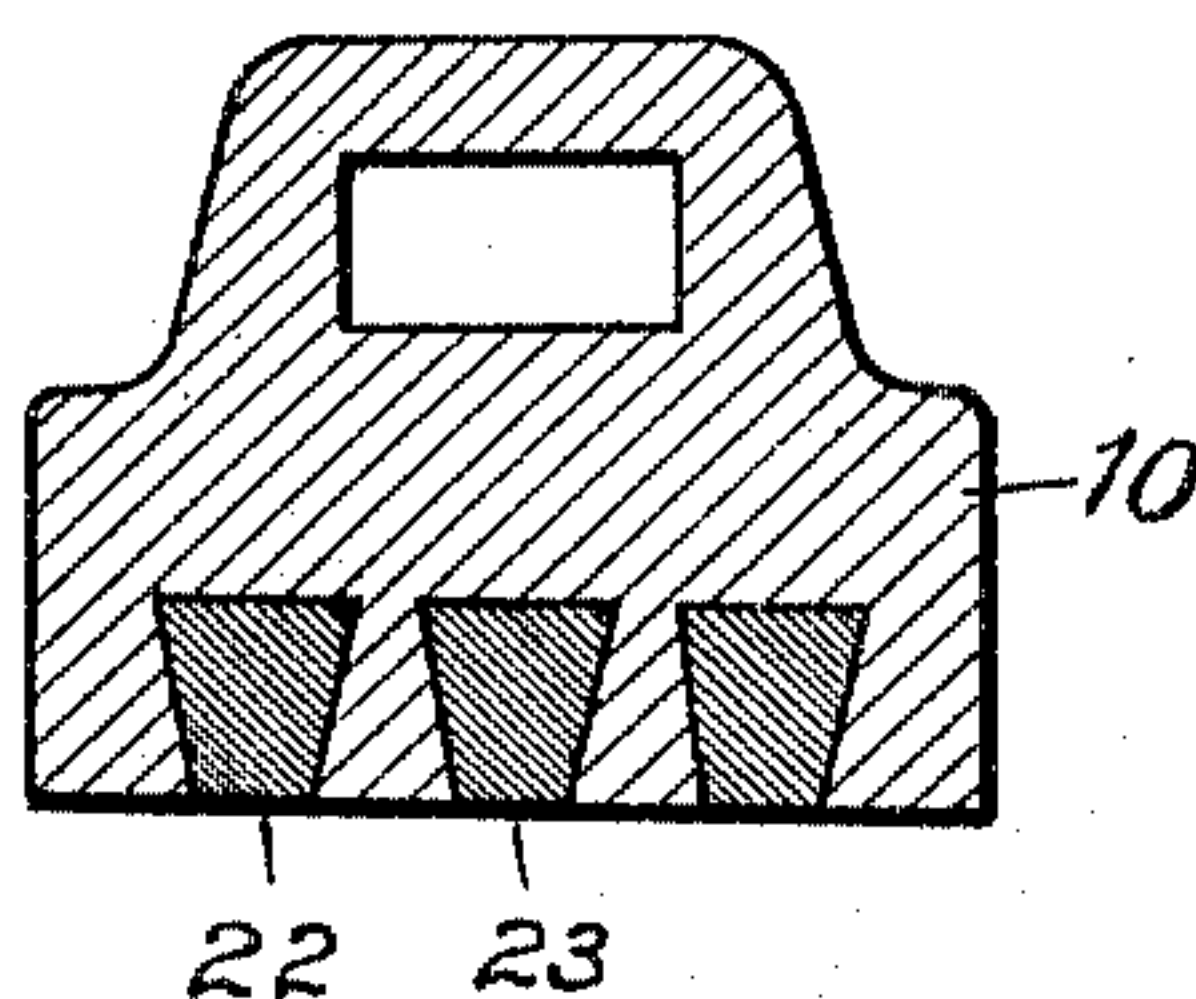


Fig. 9.



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# UNITED STATES PATENT OFFICE.

ALFRED L. STREETER, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN BRAKE SHOE & FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 780,072, dated January 17, 1905.

Application filed March 23, 1903. Serial No. 149,140.

*To all whom it may concern:*

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

My invention relates to the brake blocks or wearing soles of the brakes employed on railway cars, and particularly to that class of brake shoes in which the wearing face is provided with composite metal, generally made of hard and soft metals alternating, in order to attain the benefits of the durability of the hard metal and the increased frictional resistance due to soft metal. The objects of my invention are first, to provide a metal insert for a brake shoe which does not weaken the shoe in which it is embedded; second, to provide a metal insert which is practically uniformly distributed over the wearing face of the shoe; thirdly, to provide an insert of a grid-like form constituting a closed figure so that the frame work of the insert strengthens rather than weakens the body of the shoe; fourthly, to provide an insert for a brake shoe which is self-retaining in place; fifthly, to provide a wearing sole having a face in which the traverse comes in contact with several repetitions of both hard and soft metal therein and the wear is practically the same over the whole face of the wheel; and to generally improve the strength, wearing qualities and safety of metal inserts for brake shoes.

The above objects, together with other advantages which will hereinafter appear, I attain by means of a construction illustrated in preferred forms in the accompanying drawings, wherein—

Figure 1 is a side elevation of a common brake shoe.

Figure 2 is an underplan of the wearing face of the shoe showing one form of the grid insert therein.

Figures 3 and 4 are vertical sections through the shoe taken respectively on lines 3 and 4 in Figure 2.

Figure 5 is a side elevation of a brake shoe partly shown in section exhibiting a grid insert entirely buried in the shoe.

Figure 6 is a plan view of a modified form of the grid insert shown separately.

Figure 7 is an underplan view of a brake shoe showing a different form of grid insert exposed for wear.

Figure 8 is a side elevation of the shoe indicating in dotted lines the position of the insert of Figure 7.

Figure 9 is a central cross section of the shoe shown in Figure 7, the section being taken on line 9 therein.

The well known advantages of combining in the wearing face of a brake shoe the durability of hard metal and the additional frictional resistance of soft metal, has led to various forms of inserts placed in the face of shoes and composed of metal of a different density from that of the body of the shoe. But in all such devices as are now in general use the insertion of the hard or soft metal in the body of the shoe has had the effect of weakening the shoe and presenting easy lines of fracture at the edges of the inserts. In some instances where a continuous insert had been placed along the length of the wearing face there has been difficulty in retaining the same in place and moreover the insert is not a closed figure and therefore does not in reality strengthen the shoe longitudinally of the face as would be desired. Such inserts have moreover generally been made of parallel sides so that they are not retained in place except by the friction of the surrounding metal. Again such inserts generally present to the wheel a wearing surface which is not uniform across the width of the wheel, and where there is more continuous presentation of hard metal to the wheel it eventually wears a groove in the wheel and injures it.

In order to overcome these and other difficulties I provide a brake shoe in which there is an insert of different density formed as a closed figure which presents to the wheel several alternate wearing surfaces of hard and soft metal and the insert being made of a con-



tinuous closed figure strengthens rather than weakens the shoe, while by reason of its sectional form is self-retained in place and presents practically an equal amount of metal of the variety of an insert along any longitudinal line in the face of the shoe.

In Figures 1 to 4 it will be seen that I provide the body of the brake shoe, 10, with a hard metal insert 12, which is of a grid-form comprising a closed figure with longitudinal members 13, 14, 15, and cross members at the end marked 16. The ends of the grid may be notched as at 17 and the notched portion up-turned so as to thoroughly embed and hold it in the shoe. The cross sections of the different members of the grid are preferably made of dove-tailed sections so that the same when buried in the shoe is retained therein by reason of this shape. The grid insert being a continuous closed figure supplies strength both longitudinally and laterally of the face of the shoe, and instead of presenting to the wheel a weak point as is ordinary in such cases it really strengthens the shoe decidedly against breaking strains.

In Figures 5 and 6 I have illustrated essentially the same form of grid inserts provided with projecting tits or legs 20 in order that the same may be cast in position to be entirely embedded in the shoe as shown in Figure 5. In this case the notched end portions 21 may be up-turned and embedded in the outer lug of the shoe as shown in order to additionally strengthen the longitudinal rigidity of the shoe.

In Figures 7, 8 and 9 I have illustrated still another form of grid inserts in which the members are all inclined to the direction of the wear of the wheel and are so designed and distributed that the wheel receives the same amount of wear from each kind of metal throughout the length of the shoe. In this form I attain the additional advantage of avoiding any longitudinally disposed lines of separation between the hard and the soft metal, which as is well known is very advantageous.

This grid is formed of members 22, 23 made of dove-tailed sections so as to be self-retained in the face of the shoe, and the grid extends essentially the entire length of the shoe and also practically the entire width as will be seen from Figure 7. The side members 22 are essentially parallel to each other throughout following the curves, and the ends are joined by cross members 25 and also an oblique cross member 23 is supplied in the middle to strengthen the shoe against breaking sideways and also to add rigidity to the insert and to the shoe itself.

On account of the additional advantage of avoiding longitudinal lines of separation between the two metals I generally prefer the form of grid shown in Figure 7. It presents to the wheel several repetitions of hard and

soft metal and the same amount of each metal during the traverse of the wheel across the longitudinal face of the shoe and furthermore the diagonal form of the lines of separation has additional advantages in avoiding any scratching of the wheel and also in distributing the amount of wear equally across the width of the wheel.

From the constructions illustrated it will be seen that the brake shoe is provided on its wearing face with a hard metal insert which presents an equal amount of such metal distributed throughout the face of the shoe and avoids any weakening points anywhere in the places where a shoe usually breaks and also by reason of its cross section avoids any possibility of its dropping out of place and causing accidents. Also it will be seen that I avoid the possibility of a continuous drag of the hard metal in one line on the wheel which would scratch the same and injure the tire. The proportions of hard and soft metal are easily regulated by varying the width of the inserts in section and they may readily be entirely buried or left free and exposed in the wearing face as shown in Figure 9. The grid may be made of any desired thickness front and back, but I generally prefer to make it of such a thickness as to take up about one-half of the thickness of the shoe, as it is generally wise to discard a brake shoe when it is worn down as thin as half of its original size. In cases where a malleable metal back is used on the shoe of course it will be desirable to make the inserts of greater depth. Other modifications and other advantages of the device will readily occur to those familiar with their use.

Having thus described my invention and illustrated its use, what I claim, and desire to secure by Letters Patent, is the following:

1. A brake shoe provided in the wearing face thereof with a metal insert of different density comprising a closed grid-like figure having parallel bars running longitudinally and also cross-wise of the face of the shoe.

2. A brake shoe provided in the wearing face with a grid-like insert consisting of parallel bars running longitudinally of the shoe and also cross bars connecting said longitudinal bars, the latter bars being in several sets laterally staggered in position and the whole comprising a closed figure.

3. A brake shoe provided with a metal insert comprising a closed figure having longitudinal and cross members all of said members being formed with a cross section diverging toward the back of the shoe, whereby it is retained firmly in place.

4. A brake shoe provided with a metal insert in its face comprising a frame work of metal having parallel side members of curved form and cross members connecting the said side members, the whole distributed practically throughout the face of the shoe and



presenting in any longitudinal line essentially the same amount of metal in the insert, substantially as described.

5 An insert for brake shoes comprising a closed figure composed of two parallel members running longitudinal of the shoe and having the general form of an ogee curve, two end connecting bars therefor and a diagonal disposed central bar connecting the side mem-  
10 bers near the center of the shoe, substantially as described.

6. A brake shoe provided in its wearing face with a grid-like metal insert consisting of bars extending uninterruptedly across the cen-  
15 tral portion of the face of the shoe and through a distance equal to half or more of the length

of the shoe, said bars being formed with cross-wise portions at their ends and some of said bars being obliquely disposed.

7. A brake shoe provided in its front or 20 wearing face with a metal insert consisting of a plurality of longitudinally extending parallel bars across the central portion of the face of the shoe, substantially as described.

In testimony whereof I have hereunder 25 signed my name in the presence of the two subscribed witnesses.

ALFRED L. STREETER,

Witnesses:

PAUL CARPENTER,  
EDWARD C. BURNS.