E. S. WOODS.

ANTIFRICTION BEARING FOR RAILWAY CARS AND THE LIKE.

APPLICATION FILED FEB. 24, 1908.

912,519.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

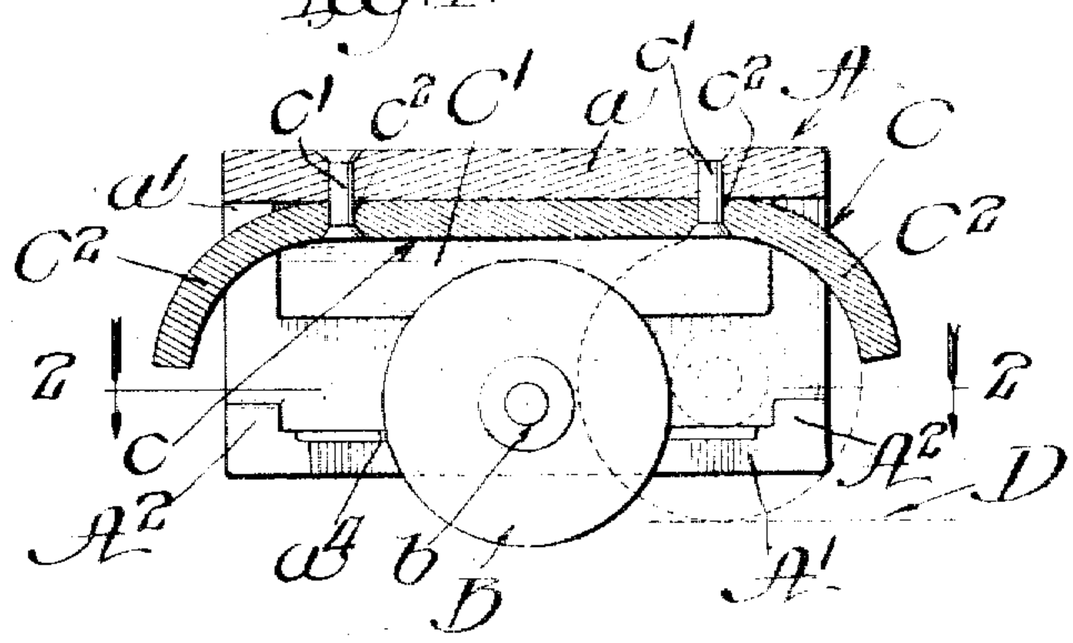

Fig. 2.

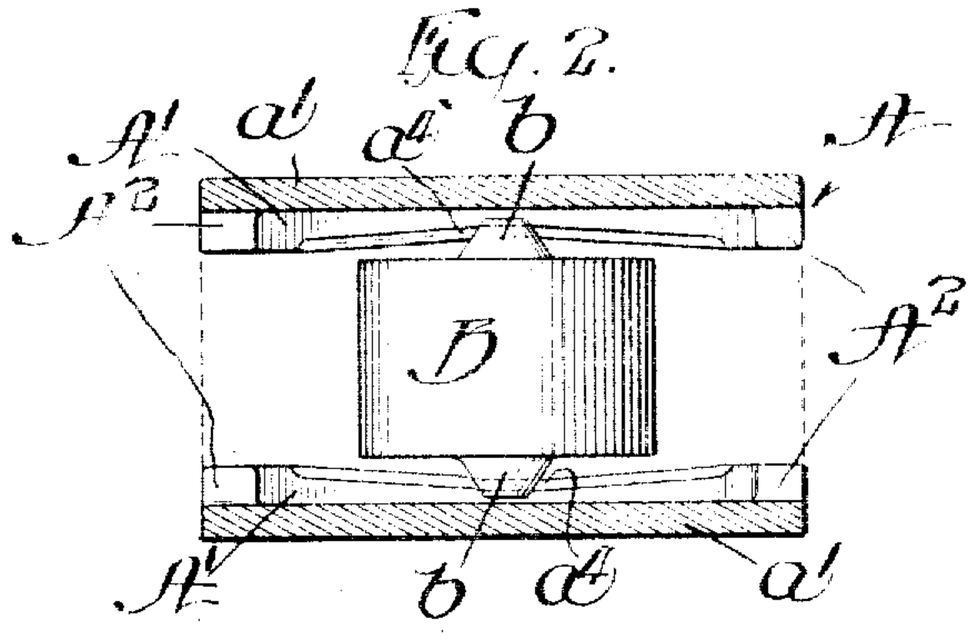

Fig. 3.

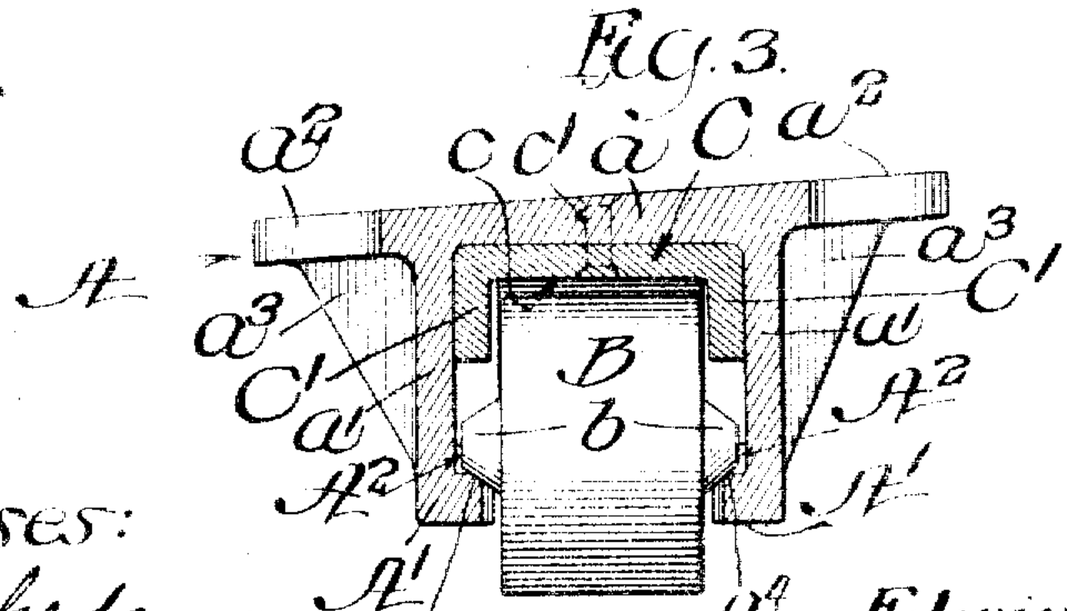

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Fig. 4.

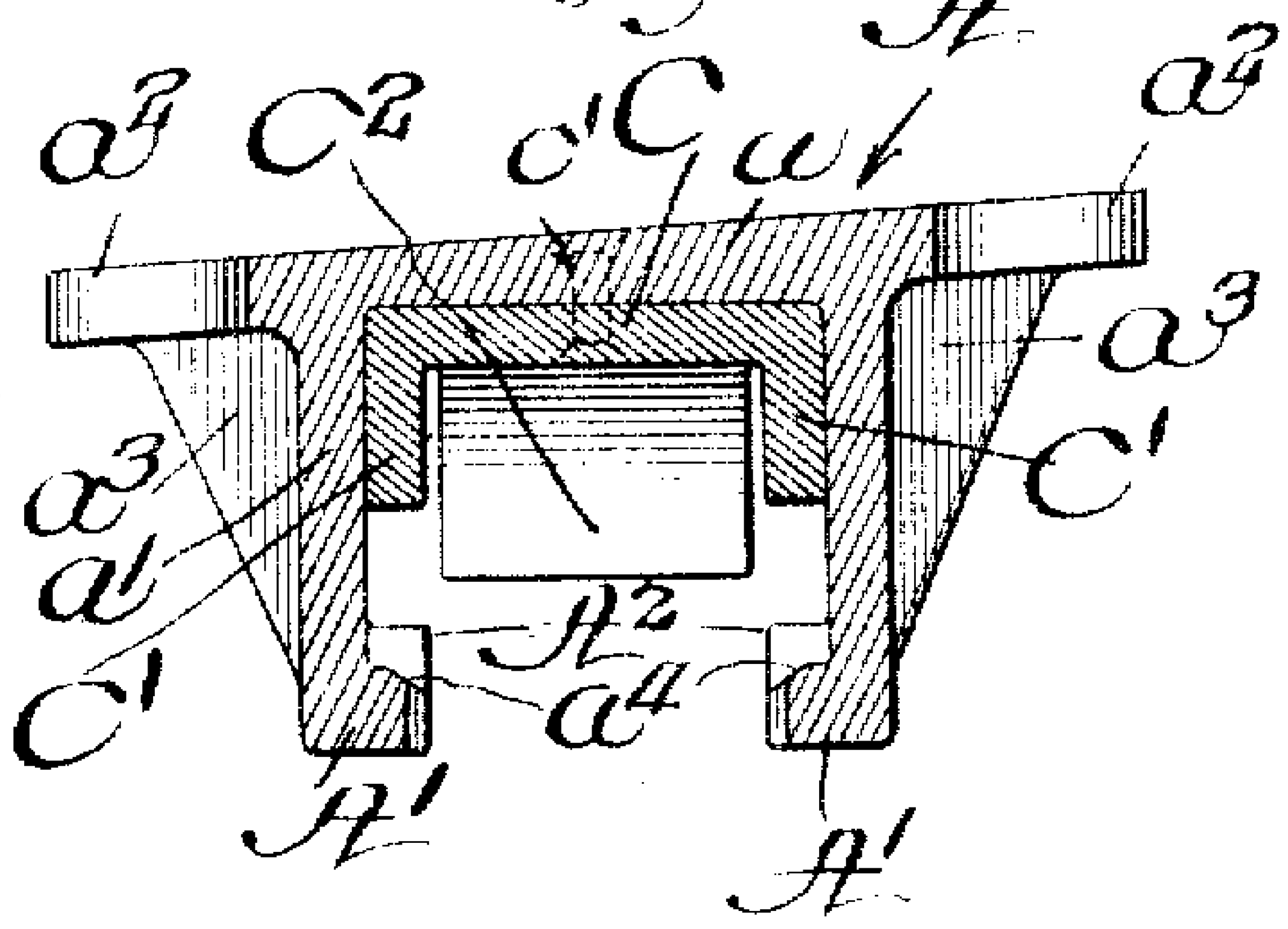


Fig. 5.

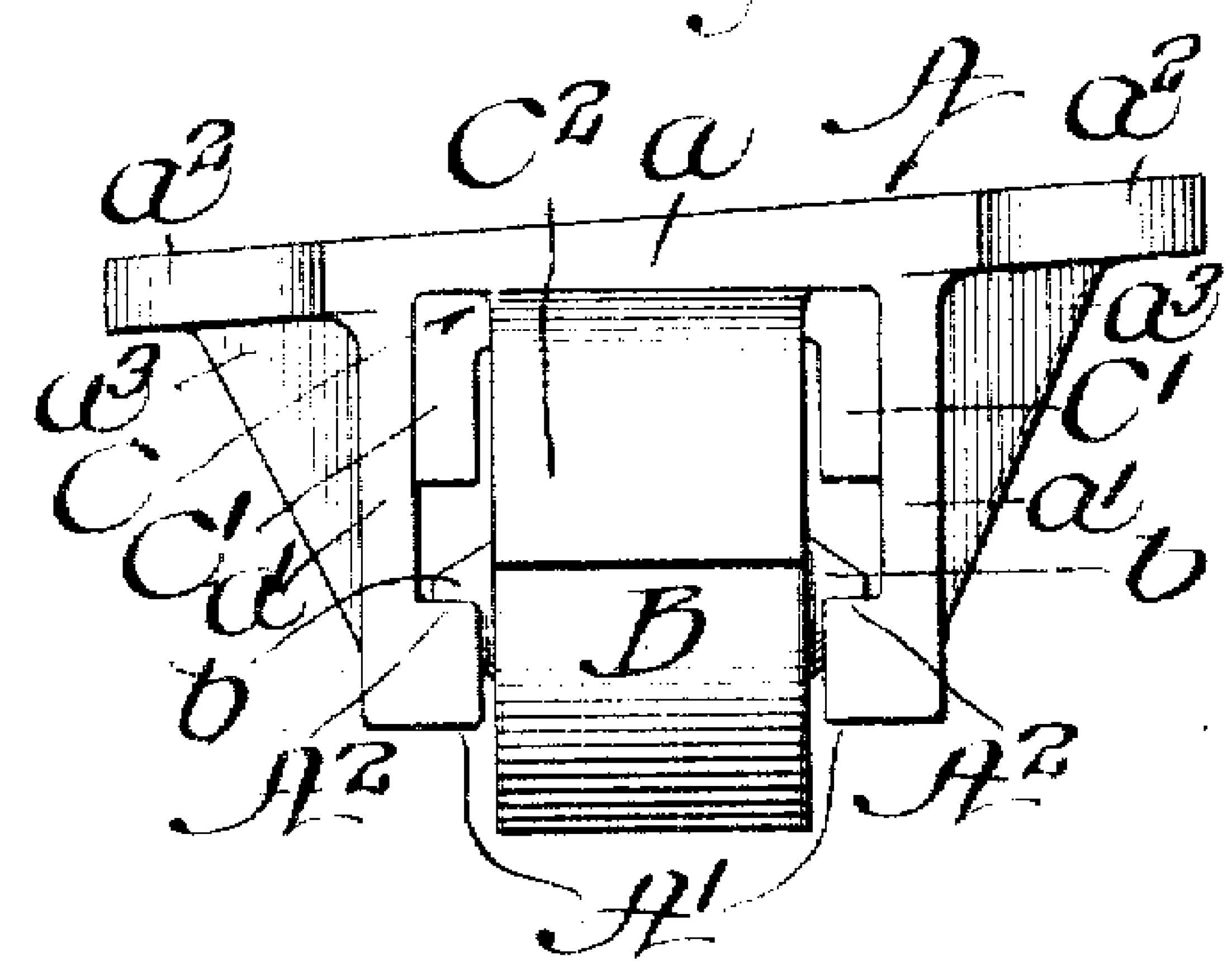


Fig. 6.

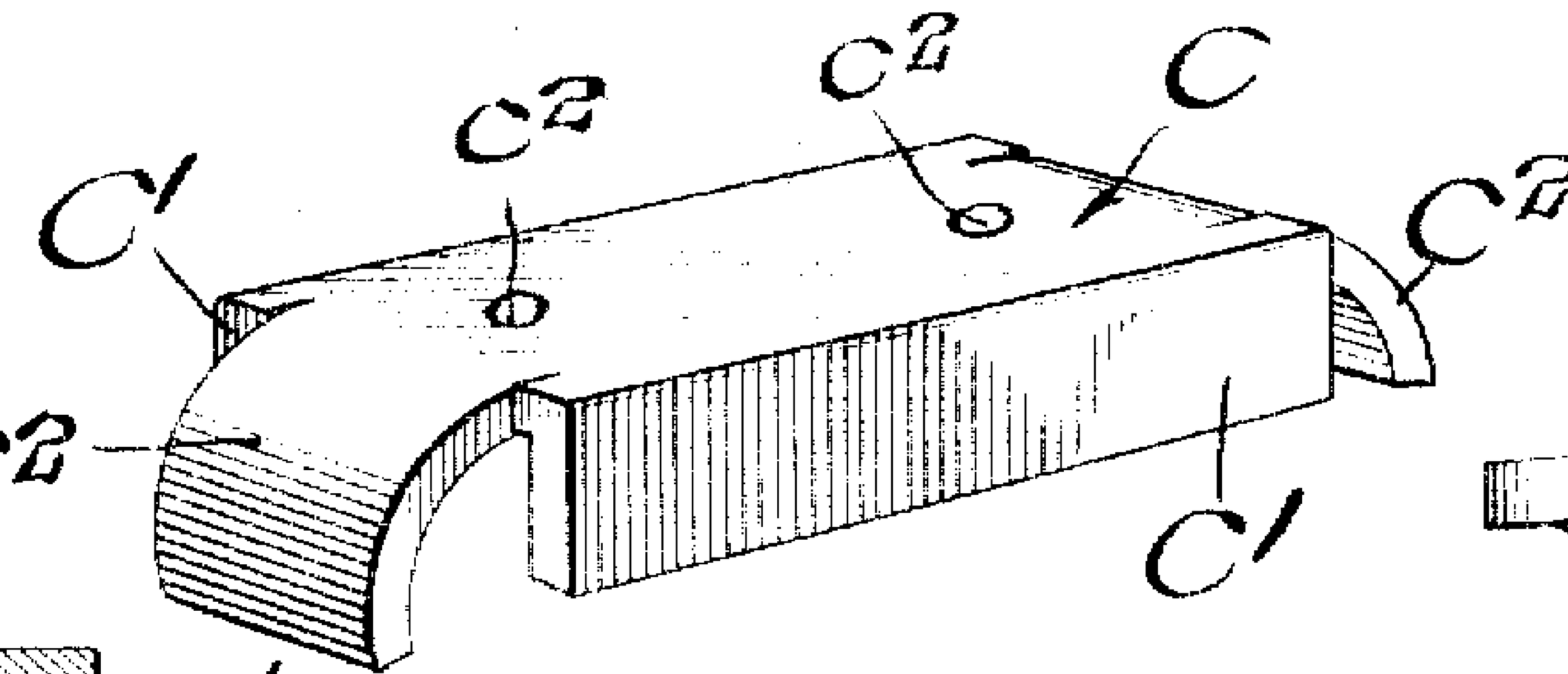


Fig. 8.

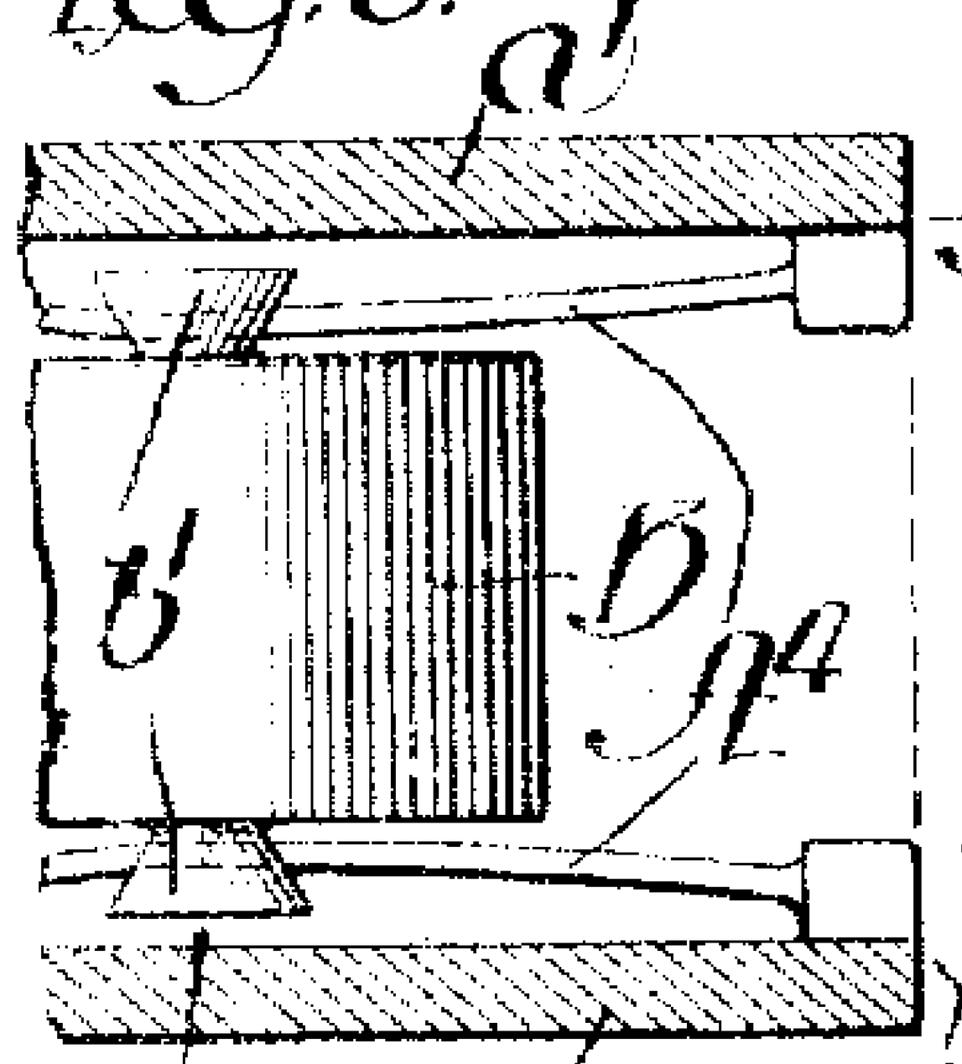


Fig. 9.

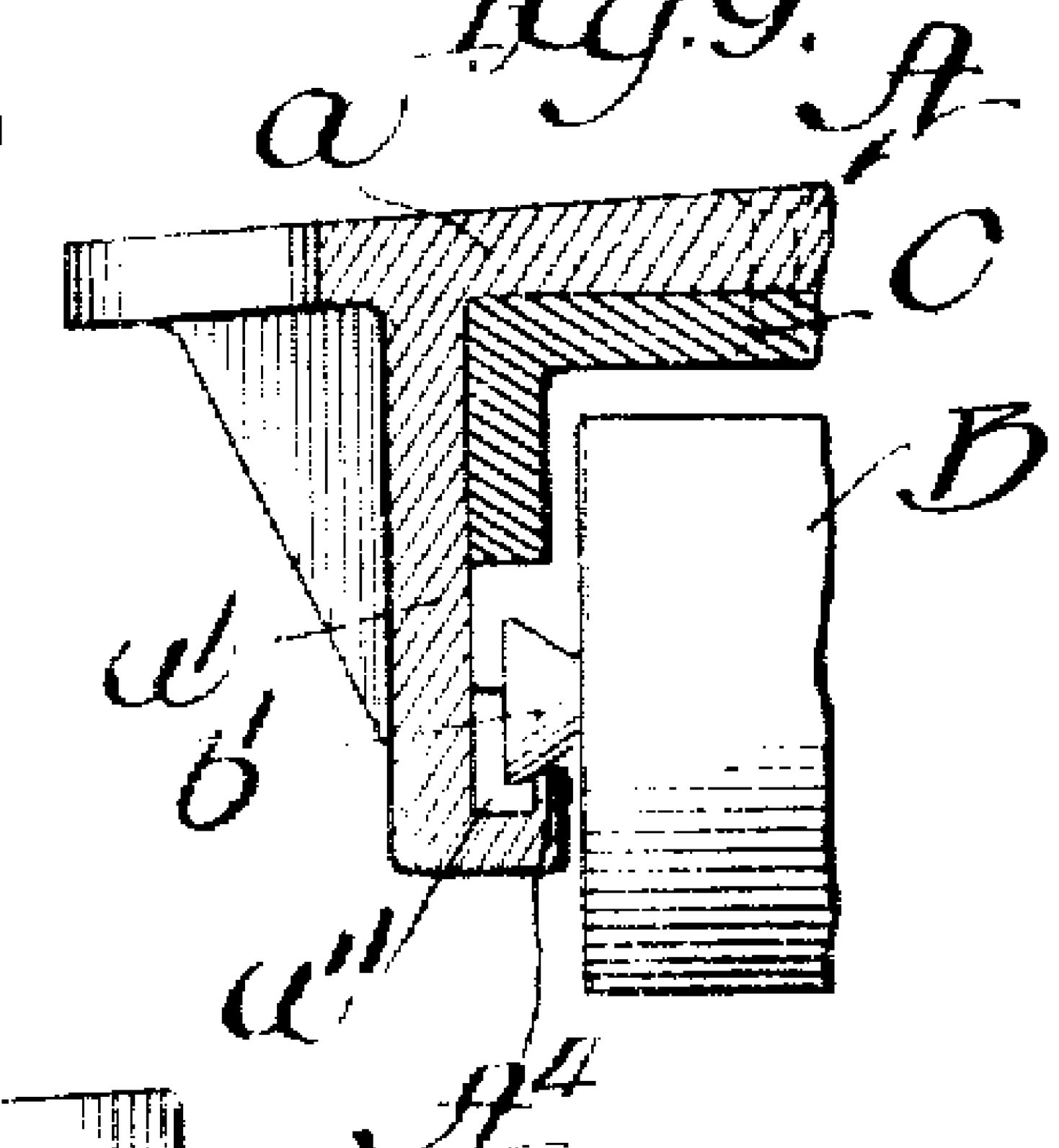
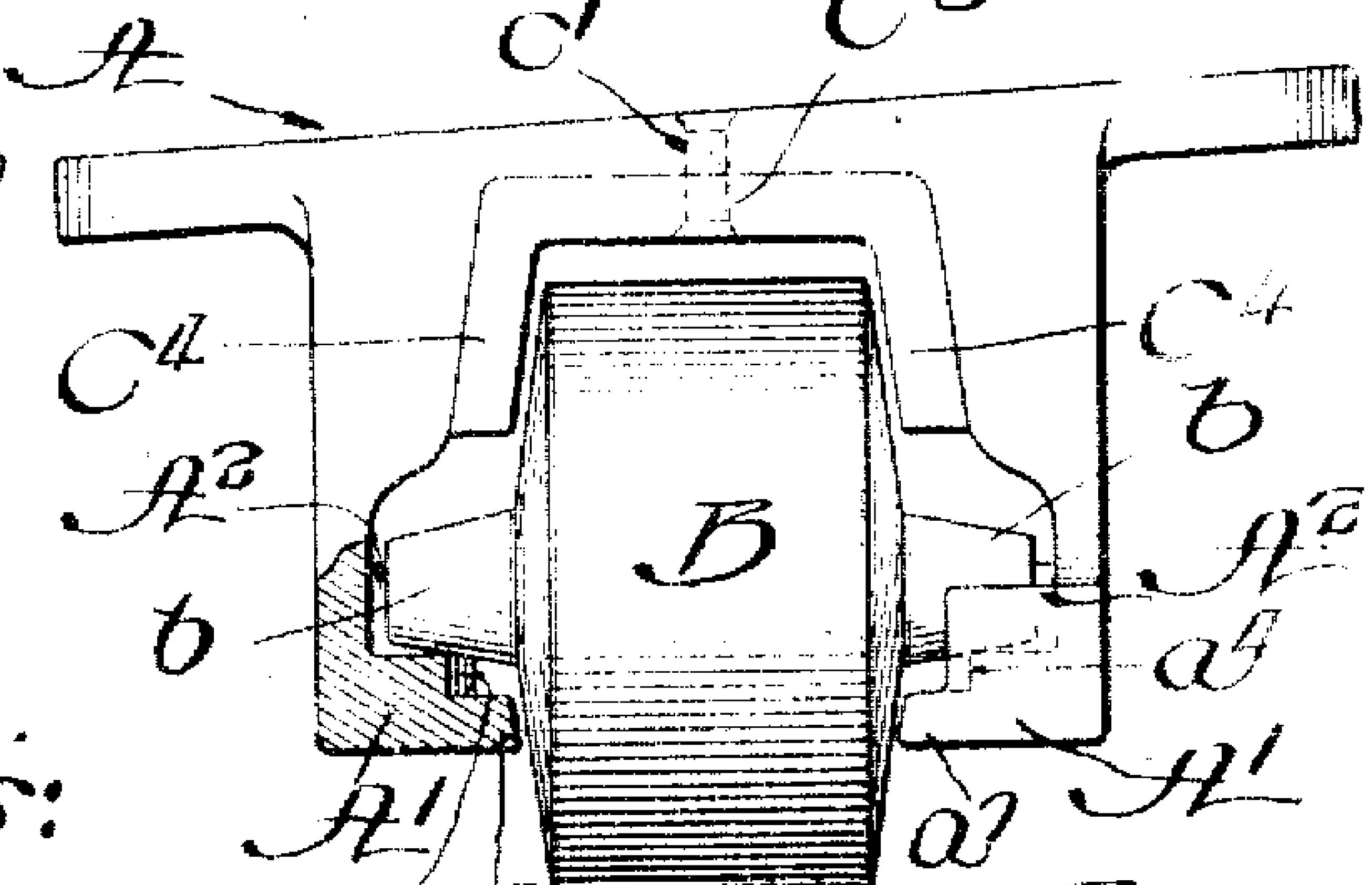


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 10.

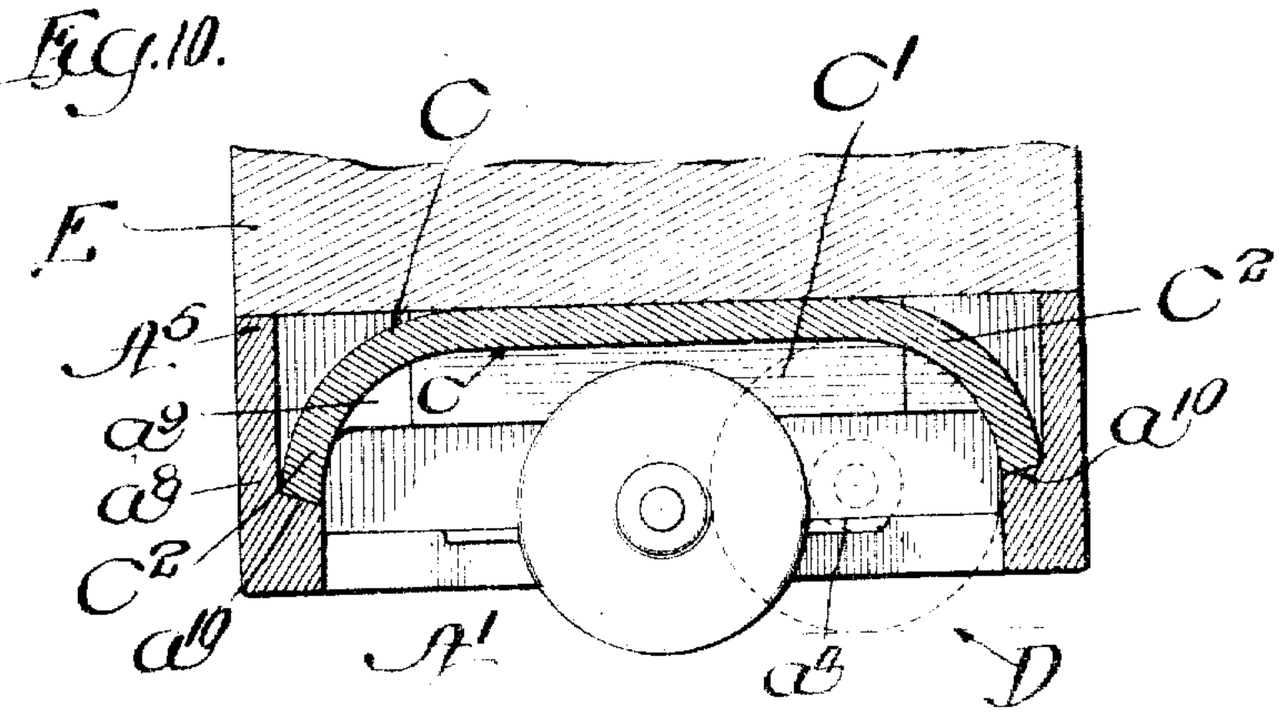


Fig. 11.

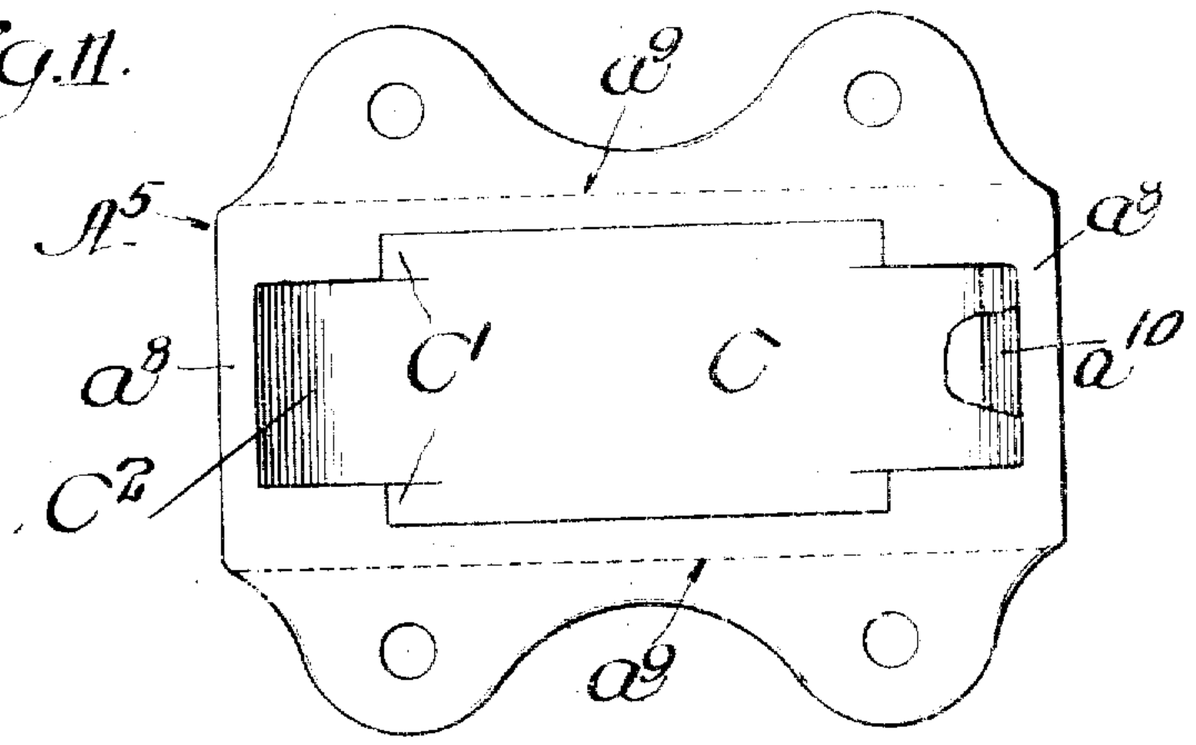
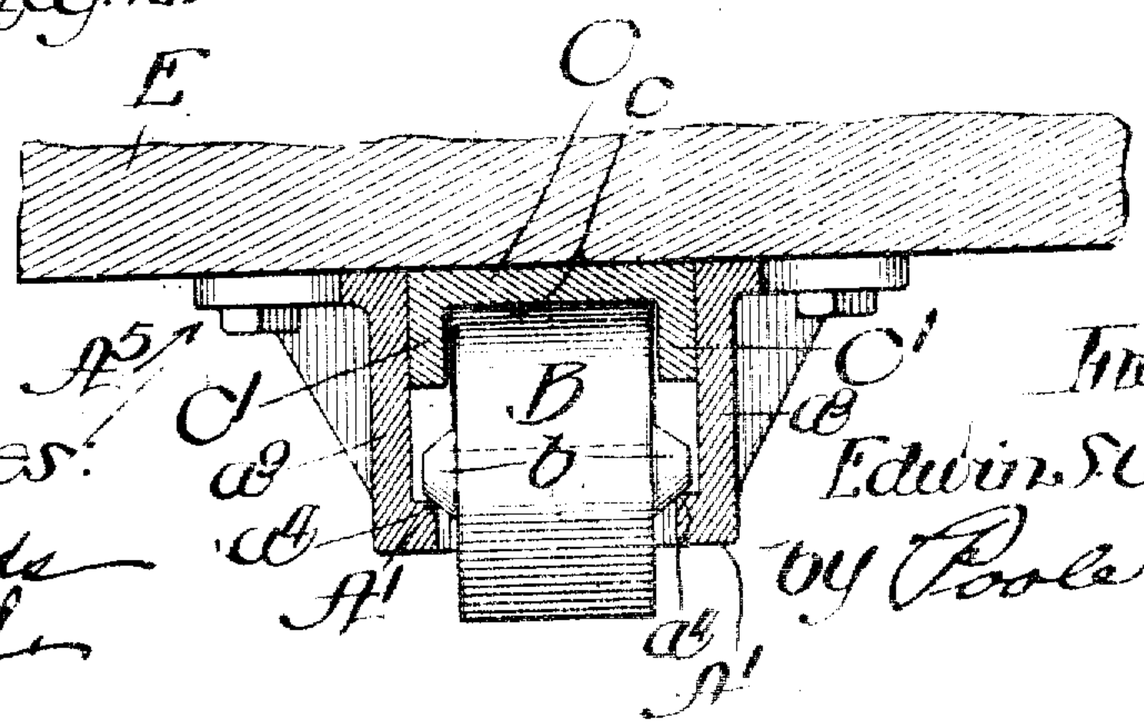


Fig. 12.



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UNITED STATES PATENT OFFICE.

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ANTIFRICTION-BEARING FOR RAILWAY-CARS AND THE LIKE.

No. 912,519. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed February 24, 1908. Serial No. 417,275.

To all whom it may concern:

Be it known that I, EDWIN S. WOODS, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Antifriction-Bearings for Railway-Cars and the Like; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in antifriction bearings for railway cars and the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

My improvements are herein shown as applied to side bearings for railway cars designed to be interposed between the truck and body bolsters of railway cars, but may be applied in other locations where adapted.

The present invention relates to means for returning the antifriction element or roller to a position of rest in the carrier when free from its upper and lower bearings, and to a novel wear plate which is arranged to reinforce the casing or carrier and to also serve as means to lock the antifriction element or roller in place.

In the drawings:—Figure 1 is a longitudinal vertical section of a railway car side bearing embodying my invention. Fig. 2 is a horizontal section of the casing, taken on line 2—2 of Fig. 1, showing the roller in place. Fig. 3 is a transverse vertical section of the casing showing the roller in place. Fig. 4 is a transverse vertical section of the casing with the roller removed. Fig. 5 is an end view of the bearing. Fig. 6 is a perspective view of the wear plate. Fig. 7 is a transverse, vertical view showing a modified form of the casing. Fig. 8 is a fragmentary horizontal view, showing a modification of the arrangement for centering the antifriction member or otherwise returning it to a position of rest. Fig. 9 is a fragmentary transverse, vertical section of the casing shown in Fig. 8, showing the modified form of the antifriction member trunnion. Fig. 10 is a longitudinal vertical section showing another form of casing or carrier. Fig. 11 is a top plan view thereof, partially broken away. Fig. 12 is a transverse vertical section of the bearing shown in Figs. 10 and 11.

First referring to the construction shown in Figs. 1 to 6, inclusive, of the drawings, A designates, as a whole, the bearing casing or carrier comprising an elongated casting having a horizontal top wall a and integral side walls a^1 a^1 between which side walls is formed a bearing chamber, and B designates an antifriction bearing member located in said chamber, said bearing member comprising, as herein shown, a cylindric roller provided with end bearings or trunnions b. The upper wall of the casing is provided with laterally extending lugs a^2 a^2 which are apertured for the passage of bolts by which the bearing piece is fixed to the body bolster of a railway car, and said lugs are joined to the side walls of the casing by strengthening ribs a^3. C designates a wear-plate or upper bearing member which is made separate from and removably fixed in the casing, and is formed with a downwardly facing track or treadway c. Said wear-plate is preferably made of steel while the casing itself may consist of a malleable casting. The wear-plate is of special construction, as will hereinafter appear. The side walls of the casing or carrier are provided at their lower margins with inwardly extending tracks A^1 A^1 which are horizontal or substantially so, and upon which the trunnions b b of the roller are adapted to rest and roll when the roller is out of contact with the upper and lower bearing surfaces c and D, respectively, the latter indicating the usual upwardly facing bearing plate fixed to the car bolster and furnishing the lower treadway for the roller. The said roller is vertically movable relatively to the tracks, as well as longitudinally thereof, as is common in this type of bearing, the parts being so arranged that when the roller is engaged with the upper and lower bearing surfaces the trunnions are lifted off the tracks, but are supported on said tracks when the upper and lower bearing members are separated.

One feature of the invention resides in providing novel means for centering the roller between the limits of its horizontal rolling movement, or otherwise bringing it to rest in a given position in the casing, when

free from the upper and lower bearing surfaces, thus avoiding tendency of unequal wear on the roller and bearing surfaces. This feature of my invention embraces the following construction: The tracks diverge horizontally from each other so as to be spaced at a greater distance from each other in certain parts of their length than at other parts thereof, and the trunnions, which are adapted to rest and roll on said tracks, are made of varying diameter from their outer to their inner ends. As shown in Figs. 1 to 7, inclusive, and in Figs. 10 to 12, inclusive, said tracks diverge from the ends towards the centers thereof, they being spaced a greater distance apart at their centers, as indicated at a^4, than at their ends. When the tracks are so arranged the end bearings or trunnions b of the roller decrease in diameter towards their outer ends, said trunnions being herein shown as made conical. By reason of the horizontal divergence of the tracks and of the reduction in diameter of the end bearings or trunnions from the inner to the outer ends thereof, the tendency of the roller, when free from contact with the upper and lower bearing surfaces, and with the trunnions therefor resting on said tracks, is to roll towards the longitudinal center of the casing under the action of gravity of the roller. This tendency of the roller to center itself in the casing or carrier will be made plain by a consideration of the fact that the points of contact of the trunnions with the tracks gradually approach the smaller diameter of the trunnions as the trunnions roll gradually to the parts of the track flanges which are most widely separated, thus gradually lowering the roller, it being brought to rest in its lowermost position. Thus when the upper and lower bearings separate and the trunnions or end bearings of the roller drop down on the horizontal tracks at one side or the other of the longitudinal centers of said tracks, the roller will automatically center itself in the casing or carrier and remain in such position until the upper and lower bearing surfaces are brought into contact with the roller and thereby lift the trunnions off of said tracks. In this manner new points of contact of the roller are presented to the upper and lower bearing surfaces and unequal wearing of the roller and bearing surfaces is avoided.

The upper faces of the track flanges may be inclined downwardly and inwardly to correspond with the inclination of the conical end bearings or trunnions so as to provide a suitably wide bearing of the trunnions on said flanges, as indicated in Figs. 1, 2, 3 and 4. This inclination of the upper faces of the tracks, however, is not essential to the proper centering of the roller or antifriction member and if desired, the upper faces of said flanges may be made horizontal throughout their width, as indicated in Fig. 7. In this latter construction the contact faces of the trunnions rest on the upper inner corners of said tracks which are parallel throughout their length with the bearing surface c of the wear-plate. Likewise in the constructions where the upper faces of the tracks are transversely inclined, said faces are located the same distance from the upper bearing surface throughout their length.

In the construction shown in Figs. 8 and 9 the roller or antifriction member is centered in the casing by an arrangement of the tracks and trunnions the reverse of that shown in Figs. 1 to 7, inclusive. As shown in said Figs. 8 and 9 the tracks A^4 diverge from their centers toward their outer ends and the trunnions b^1 are made of increasing diameter from their inner to their outer ends. In this arrangement, the roller is brought to rest by gravity with the smaller inner ends thereof engaging the parts of the tracks closest to each other, or at their longitudinal centers. Said tracks A^4 are recessed laterally outside their bearing faces, as shown at a'' in Figs. 8 and 9 to provide space for the larger ends of the trunnions b^1. Obviously, the divergence of the tracks and the corresponding shape of the trunnions may be arranged to bring the rollers to rest at other parts of the casing, as at the end thereof.

The wear-plate C is provided at its sides with vertical flanges C^1 C^1 which lie flat against the inner faces of the side walls a^1 of the casing or carrier and constitute linings for said side walls which protect said side walls from bearing contact with the ends of the roller. By reason of the provision of the depending side flanges of the wear-plate I am enabled to greatly increase the strength of the casing, as a whole, while making the cast portion thereof relatively light. The said wear-plate may be fastened to the casing in any suitable manner and, as herein shown, is fixed in place by means of countersunk rivets c^1 which extend vertically through apertures c^2 in the wear-plate and through registering apertures in the top wall of the casing or carriage.

In addition to the depending side flanges of the wear-plate I may provide said plate with curved end portions C^2 which are so shaped and located as to serve as stops to limit the travel of the roller and thus avoid throwing the work of arresting said roller on the trunnions. The said curved stop portions may be omitted, as shown in Fig. 7, the ends of the wear-plates terminating in that construction at the ends of the top wall a of the casing. In such construction the roller is arrested at the end of its travel by lugs A^2 extending upwardly from and integral with the ends of the tracks. Such lugs A^2 are also provided in the construction shown in

Figs. 1 to 5, inclusive, and may serve as end stops for the roller if a flat wear-plate be employed.

I may omit the end walls of the casing or carrier, usually provided, and arrange the parts so that the roller or bearing member may be inserted into said casing through the open end thereof before the wear plate is inserted into the casing, and I may also arrange said wear plate and casing in such manner that when the wear plate is inserted in place serves as a means for locking the roller in the casing.

In the construction shown in Figs. 1 to 5, inclusive, the roller is free to be inserted into the roller chamber through the open end of the casing when the wear plate is removed. After the roller has been inserted into the casing and is dropped down with its trunnions resting on the tracks it is moved to one end of the casing and the wear plate is inserted into place between the roller and the upper wall of the casing and fastened in place by the rivets c^1 or other suitable fastening devices. When the parts are thus assembled the wear plate prevents removal of the roller so long as the wear plate is in place, the curved end stop portions C^2 of the plate closing the end of the casing against removal of the roller.

In the construction shown in Fig. 7, the distance between the upper sides of said lugs A^2 and the lower face of the upper wall of the casing or carrier, when the wear plate C^3, therein shown, is removed, is such that the roller may be inserted into the open end of the casing, the trunnions or end bearings at this time passing over the tops of said lugs. When said trunnions or end bearings pass the lugs they drop downwardly into contact with the tracks below the level of said upper ends of the lugs. Thereafter the wear plate is inserted into the casing and fixed therein by means of rivets c^1 or other suitable fastening devices. When said wear plate is thus fixed in place, the distance between the lower or bearing face c of the wear plate and the upper faces of the lugs A^2 is less than the distance between the upper side of the roller and the lower sides of the trunnions or end bearings, so that at this time the roller can not be removed.

The arrangement described affords a simple and effective means for locking the roller or antifriction member in place and avoids the necessity of providing the tracks or other parts of the casing with recesses through which the trunnions may pass as the roller is inserted into the casing. Moreover, this arrangement makes it possible to omit the end walls of the casing which lightens the casing, as a whole, and cheapens the cost of construction by reason of the omission of the metal otherwise required to produce such end walls. The construction whereby the anti-friction element is introduced through the open end of the carrier and whereby it is locked from displacement in the casing or carrier is not herein claimed, but is claimed in my application filed on the 6th day of January, 1909, Serial No. 470,982.

In the construction shown in Fig. 7 the track flanges A^1 are provided at their lower inner corners with longitudinally arranged flanges or ribs a^7 which extend inwardly beyond said flanges toward the ends of the roller, but terminate short thereof. Said extensions a^7, lying closely adjacent, as they do, to the ends of the roller, avoid twisting of the roller in the casing about an axis transverse to its axis of rotation, thus avoiding binding or wedging of the roller in the casing. In this construction the end faces of the roller incline toward each other from the center to the circumference of the roller, and the side flanges C^4 of the wear plate C^3 are correspondingly inclined and are located closely adjacent to the ends of the roller.

In Figs. 10, 11 and 12 I have shown the wear plate C applied to a form of casing or carrier A^5 which is provided with end walls a^8 and side walls a^9 and in which the top wall of the casing is omitted. The tracks A^1 of said casing and the roller B are made like the same parts of the construction shown in Figs. 1 to 5, inclusive, and bear like reference characters. In the construction shown in said Figs. 10, 11 and 12 the roller and wear plate are inserted into the casing through the open top thereof. The distance between the side walls of the casing A^5 is such as to permit the roller to be inserted into the casing without the necessity of providing vertical notches in said walls for the passage of said trunnions, as clearly indicated in Fig. 12. The wear plate C is held in said casing in this instance between the bolster E, to which the casing is attached, and upwardly facing shoulders a^{10} on the inner sides of the end walls of the casing, said shoulders engaging the lower ends of the curved stop portions C^2 of the wear plate.

In each of the forms of bearing shown the casing or carrier is made of a width greater than the distance between the ends of the trunnions so that the roller or antifriction member may be inserted into the casing without the necessity of providing notches or recesses through which the trunnions may pass when inserted into the casing or carrier. It will also be observed that the side flanges of the wear-plate are fitted so closely to the ends of the roller or antifriction member above said trunnions as to prevent said roller twisting in the casing or carrier in a manner to bind or become locked therein. This arrangement of the parts also greatly simplifies the casting of the casing or carrier as compared to a construction wherein the casing or carrier is thickened in its side

walls above the tracks in a manner to provide between said thickened portions and the tracks, channels to receive said trunnions of the antifriction member.

I claim as my invention:—

1. In an antifriction bearing a carrier provided with tracks which diverge from each other and an antifriction element having trunnions of variable diameter from their inner to their outer ends and adapted for engagement with said tracks.

2. An anitfriction bearing comprising a carrier provided with tracks and an antifriction roller in said carrier provided with trunnions adapted to engage said tracks, said tracks diverging from each other, and the trunnions being made of variable diameter from their inner to their outer ends.

3. An antifriction bearing comprising a carrier, having an upper track and lower tracks which diverge from each other, and a roller in said carrier provided with trunnions having variable diameter from their inner to their outer ends and adapted to engage said lower tracks.

4. An antifriction bearing comprising a carrier provided with tracks which diverge from each other, and an antifriction roller in said carrier provided with conical trunnions adapted to engage said tracks.

5. An antifriction bearing comprising a carrier provided with tracks which diverge from each other, and an antifriction roller in said carrier provided with conical trun nions adapted to engage said tracks, said tracks being transversely inclined on their upper faces to engage the conical trunnions.

6. An antifriction bearing comprising a carrier having an upper bearing surface and provided with horizontally separated tracks located at the same distance from said upper bearing surface throughout their length and laterally diverging from each other, and an antifriction roller in said carrier provided with conical trunnions adapted to engage said tracks.

7. An antifriction bearing comprising upper and lower members and an antifriction element interposed between the same and provided with oppositely extending trunnions made of variable diameter from their inner to their outer ends, there being tracks on one of said bearing members adapted to be engaged by said trunnions, said tracks diverging from each other for the purpose set forth.

8. An antifriction bearing comprising a carrier provided with tracks, and an antifriction roller in said carrier provided with conical trunnions adapted to engage said tracks, said tracks diverging from each other, there being longitudinal flanges extending horizontally inwardly from said tracks and terminating short of the end faces of said roller.

9. An antifriction bearing comprising a carrier provided with tracks, an antifriction member in said carrier provided with trunnions which engage said tracks, and a wear-plate in the carrier comprising a horizontal tread portion provided with side flanges lying against the inner faces of the side walls of the carrier.

10. An antifriction bearing comprising a carrier provided with tracks, an antifriction member in said carrier provided with trunnions which engage said tracks, and a wear-plate in the carrier comprising a tread portion provided with side flanges and provided also with curved end portions adapted for contact with said antifriction member to limit its movement endwise of the casing or carrier.

11. An antifriction bearing comprising a carrier having side walls and provided on its side walls with tracks, an antifriction element in said carrier provided with trunnions adapted to engage said tracks, said side walls being spaced apart a distance greater than the distance between the ends of said trunnions and a wear-plate in the carrier comprising a tread portion and side flange portions which fit against the side walls above said trunnions, said flanges preventing twisting of the antifriction member in the carrier.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 17th day of February A. D. 1908.

EDWIN S. WOODS.

Witnesses:

WILLIAM L. HALL,

GEORGE R. WILKINS.