

No. 667,989.

Patented Feb. 12, 1901.

J. E. NORWOOD.  
ANTIFRICTION BEARING.

(Application filed Jan. 25, 1900.)

(No Model.)

Fig. 1.

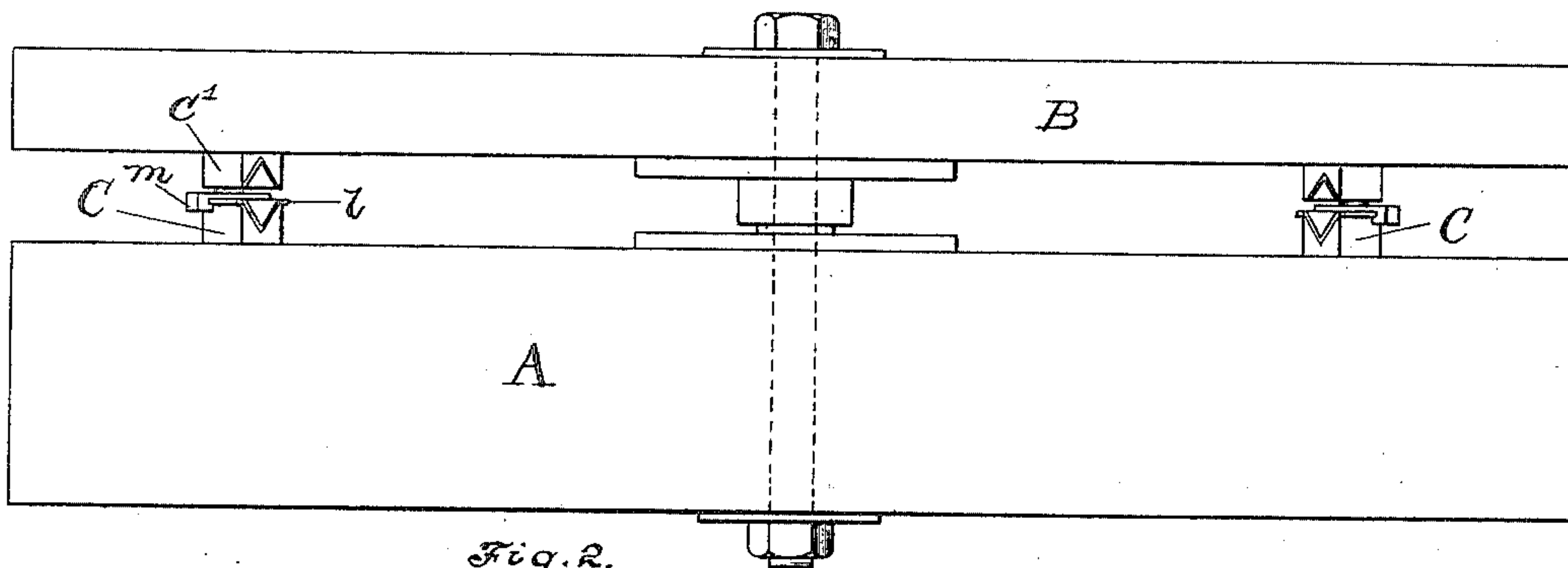


Fig. 2.

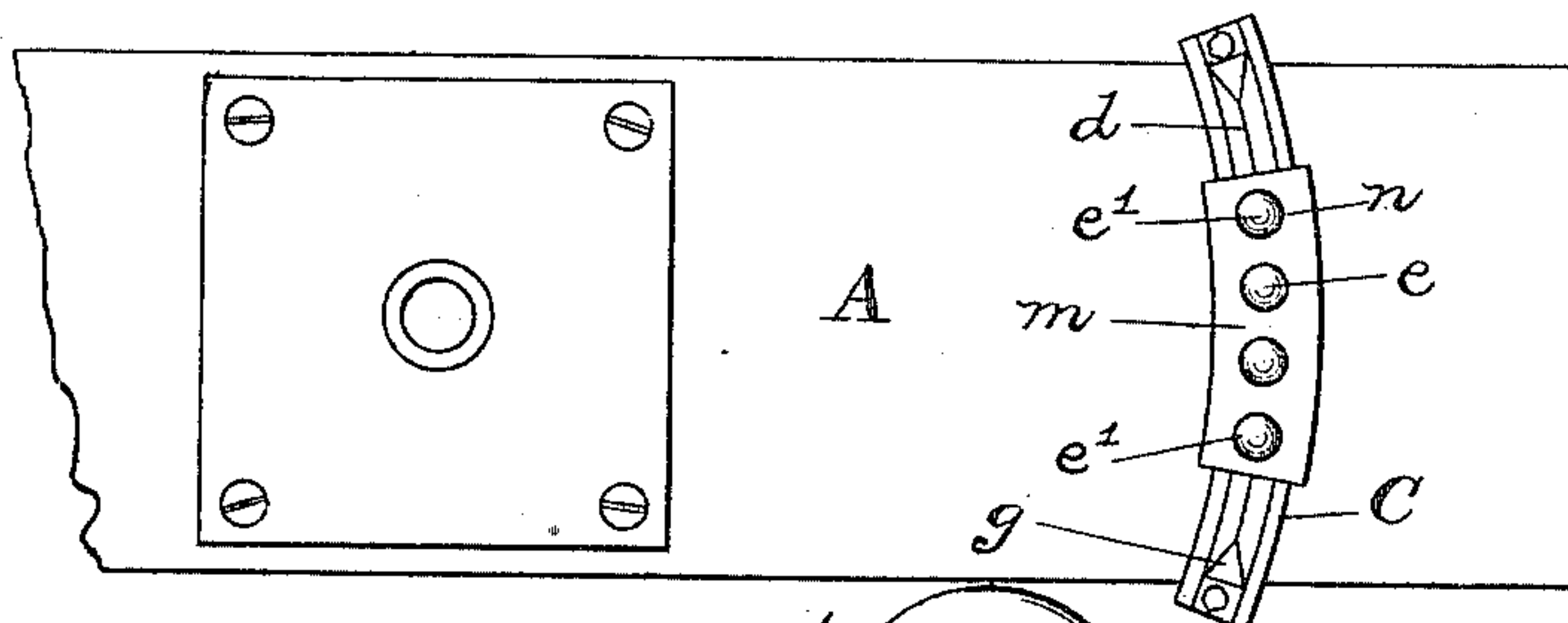


Fig. 3.

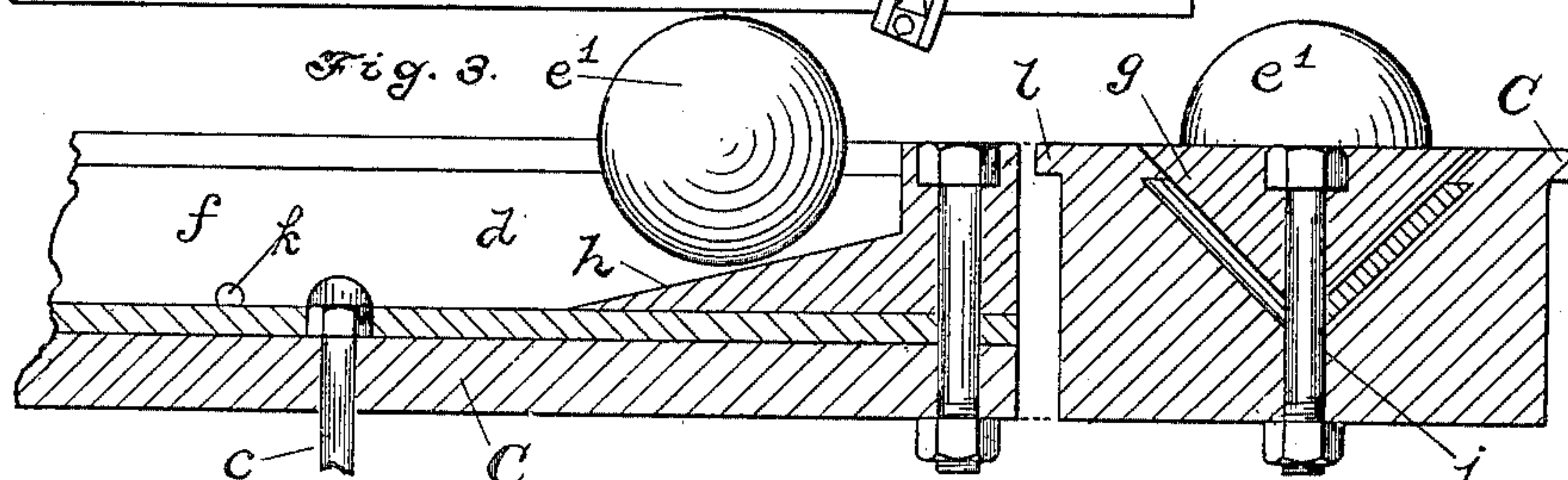
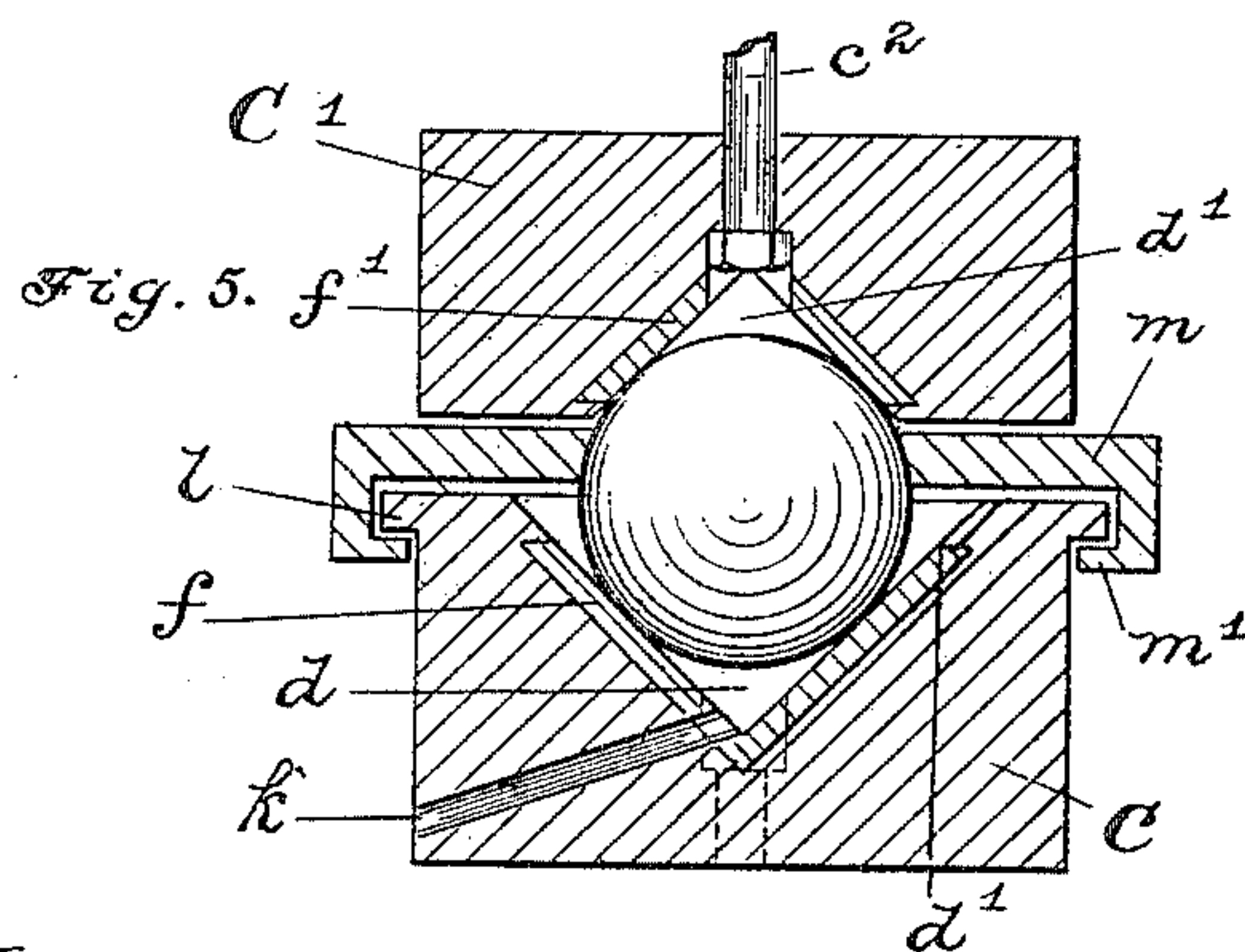


Fig. 4.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

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## ANTIFRICTION-BEARING.

SPECIFICATION forming part of Letters Patent No. 667,989, dated February 12, 1901.

Application filed January 25, 1900. Serial No. 2,744. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. NORWOOD, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Antifriction-Bearings, of which the following is a specification.

This invention relates to an antifriction ball-bearing for cars; and some of the objects of the invention are to reduce friction, to provide a bearing which will prevent side motion of the body when rounding curves, to distribute the load upon the balls with a minimum of friction, and to provide a ball-box which shall free itself of dirt.

With these objects in view the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation of the truck-bolster and body-bolster provided with my improved ball-bearing. Fig. 2 is a plan view of a portion of the truck-bolster and illustrates the ball-box and the ball-separator frame. Fig. 3 is a vertical longitudinal section view of one end of the ball-box. Fig. 4 is a vertical section on the line 4 4 of Fig. 3, and Fig. 5 is a vertical section through the bearing-plate on the car-bolster and the ball-box on the truck-bolster and also through the ball-separator frame.

In the drawings, A designates the truck-bolster, and B the body-bolster. The truck-bolster at or near either end carries a curved metal ball-box C, which in the present instance is secured by bolts c. This ball-box is provided with a curved channel d, V-shaped in cross-section, in which the balls e roll. In the present instance the channel d is provided with a removable steel angle-plate trough f, on which the balls roll, and the ball-box has an undercut or dovetailed channel d', in which the angle-plate f fits and from which it is adapted to be readily removed by sliding when worn and a new one inserted. The V-shaped channel d is closed at each end by a V-shaped stop-block g, which fits in the V-channel or in the angle-plate trough f, and said block on the inner side is provided with an inclined way h, up which the end ball e' rolls when at the extreme end of the channel. The block g may be secured in the end of the channel by a bolt j, which passes through the box C.

A number of passages k extend in an inclination from the bottom of the V-channel d down through the box C and open at one side. These passages are provided to allow any dust or dirt that may accumulate in the said channel to work out and be discharged on the exterior of the box. These passages k are made at intervals along the box for the better discharge of the dirt.

It will be seen that when the balls are in position in the V-shaped channel each ball has two contact-points, each being at an opposite side of said channel and against the angle-plate f, and a space remains open in the channel beneath the balls for the reception of dust or dirt. (See Fig. 5.)

The ball-box C at its upper edges is provided at opposite sides with a flange l, which extends from one end to the other of the box.

A ball-separator frame m comprises a plate and fits over the box C and at each side is provided with an intumed guide-flange m', which takes down and under the flange l on the box, and said frame is thereby secured against vertical displacement. The curved separator-frame m is also provided with a number of cage-holes n, which are smaller in diameter than the balls e, and the top of each ball takes in one of the holes, and thus all the balls are retained in the same relative position with respect to each other. The frame m is thus carried by the balls and moves in a horizontal plane with them, and at the same time the balls are held by the frame and are prevented from either lateral or vertical displacement.

The body-bolster B carries directly over the ball-box C on the truck-bolster at either side a bearing-plate C', which is secured in place by bolts c', and said plates are provided with a curved channel d', inverted-V shaped in cross-section, and removable steel angle-plates f', all constructed and similar to the corresponding parts in the box C. The V-channel d' in the upper bearing-plate is not in the present instance provided with end stop-blocks, as is the lower channel. The plate C' receives the upper portion of the balls e, which protrude up through the holes n in the frame m, and upper protruding parts of the balls contact at opposite sides of said channel d', as lower parts of the balls do on the lower channel. By this construction it



will be seen that the load is supported at four contact-points, and the load is distributed throughout the balls, and a minimum liability to break is the result. Another desirable result obtained by this construction of upper and lower V-channels is that side motion is overcome and strain on the center bearing is thereby avoided.

The inclined way *h* on the stops *g* is provided so that when the ball-frame *m* moves to the end of the channel the end ball *e'* will ride up on said inclined way, and the load will be shifted from the remaining balls onto said end ball, and at the same time the flange *m'* of the ball-frame will bind on the under side of the flanges *l* of the box C, and thereby check further motion of said frame.

It is to be understood that my invention of a four-point ball-bearing is applicable to a center as well as a side bearing, and it is also to be understood that I may provide the upper channel *d'* with end blocks *g* instead of the lower channel *d*.

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

1. An antifriction-bearing having in combination an upper bearing-plate and a lower box each having a channel provided with inclined walls; a ball-separator frame between said plate and box and provided with holes; and balls each of which has its upper part protruding through one of said holes and said balls bearing on opposite sides of said inclined walls above and below said separator-frame.

2. An antifriction-bearing having in combination an upper bearing having inclined walls forming a channel; a lower box also provided with inclined walls and having a flange at each side thereof; a separator-frame between said upper bearing and lower box and provided with circular holes, said frame

also having at each side an intumed guide-flange which engages with the flanges on said box and slides thereon; and balls projecting through said holes both above and below said frame, said balls bearing on opposite sides of said inclined walls.

3. An antifriction-bearing the combination of an upper plate and a lower box each having a channel provided with inclined walls; removable bearing-plates secured to said inclined walls; and balls traveling in said channels and bearing on said removable plates.

4. An antifriction-bearing having in combination an upper and lower channel each having inclined walls; balls traveling in said channel and bearing at opposite sides on said inclined walls; and an inclined stop in the end of said channel up which the ball rolls, for the purpose set forth.

5. An antifriction-bearing having in combination upper and lower bearing-plates each provided with a channel having inclined walls; and balls traveling in said channel and bearing at opposite sides on said inclined walls and leaving a space in the V-point of said channel beneath said balls, said lower bearing-plate being provided at intervals between the ends with passages extending from the bottom of the V-point of said channels and opening at the side of the plate.

6. An antifriction-bearing for railroad-cars, having in combination a V-shaped channel; a removable V-shaped stop fitted in said V-channel and closing the end thereof; and balls movable in said V-channel and bearing on the two inclined walls of said V-channel.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN E. NORWOOD.

Witnesses:

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CHARLES L. VIETSCH.