

No. 639,565.

Patented Dec. 19, 1899.

W. H. HART.
ANTIFRICTION HINGE.
(Application filed May 1, 1899.)

(No Model.)

Fig. 1.

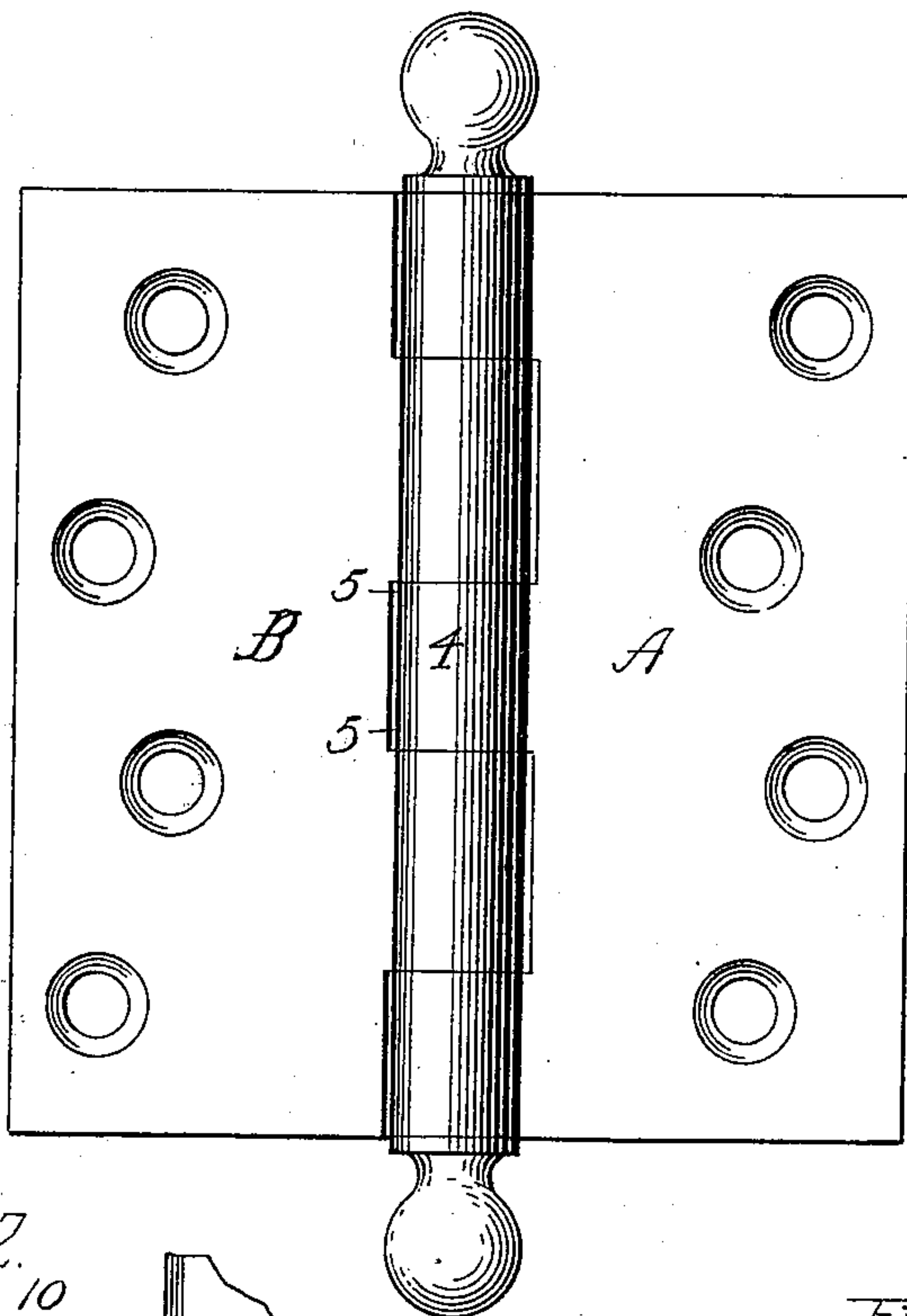


Fig. 2.

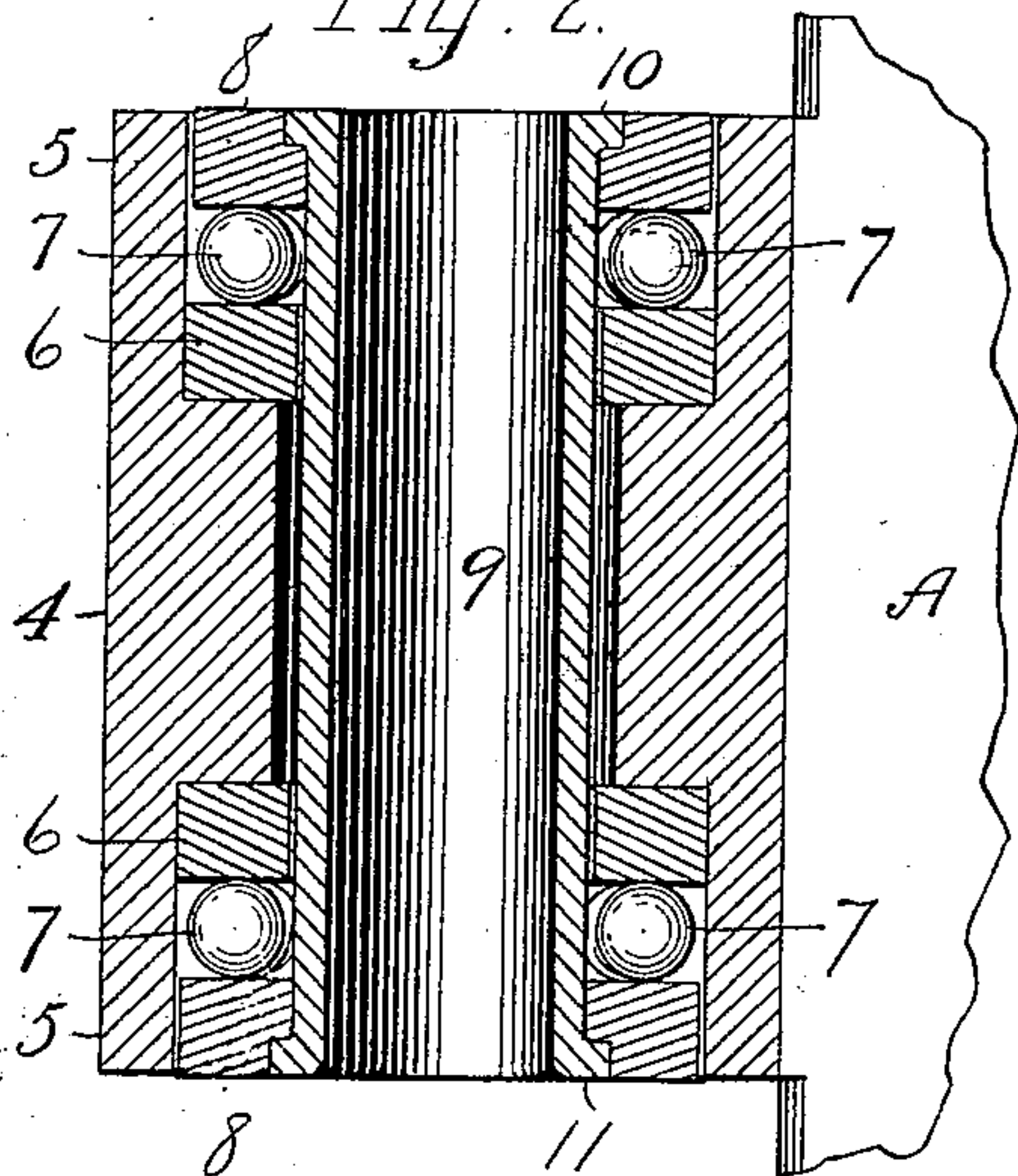
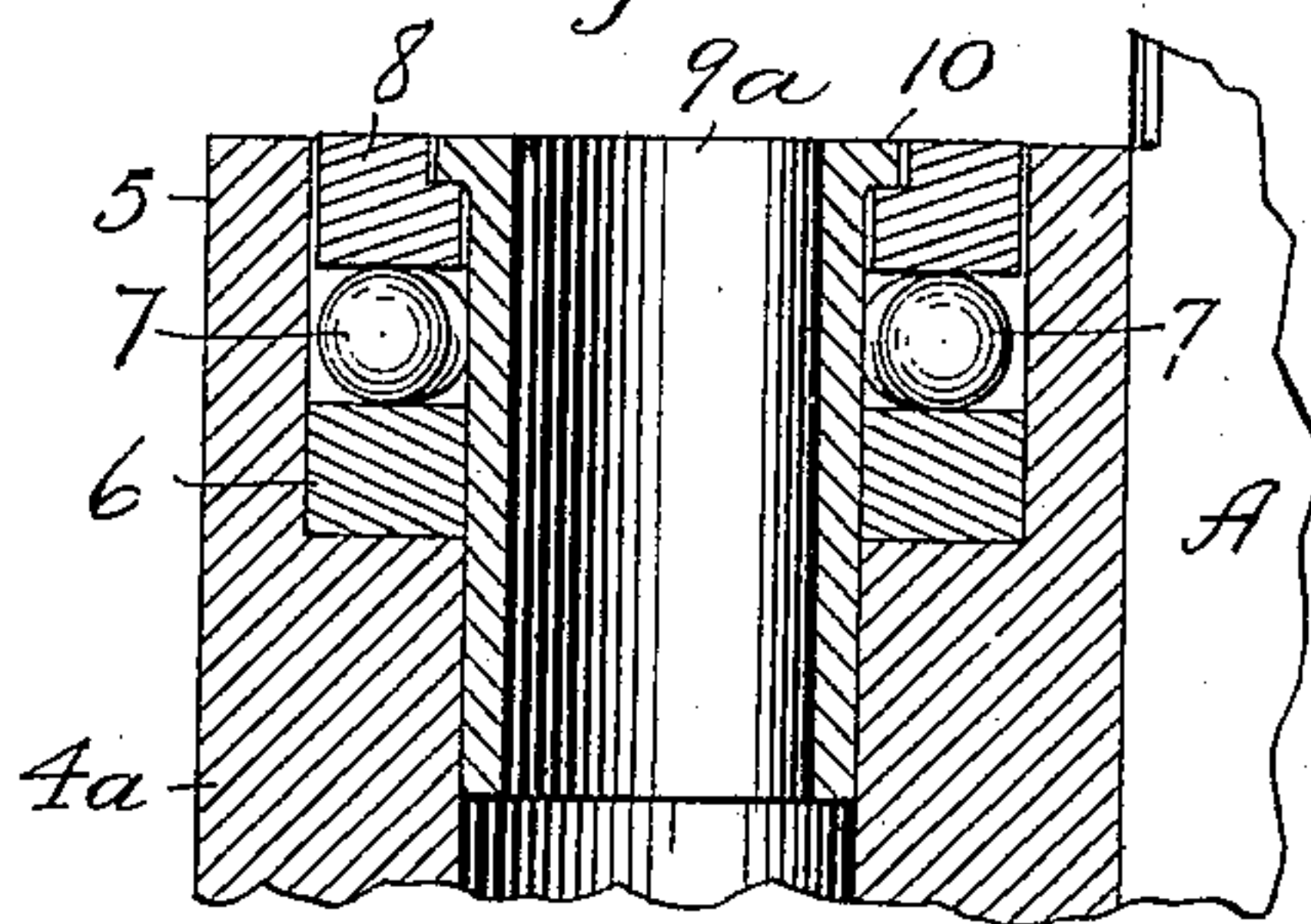


Fig. 3.



WITNESSES

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WILLIAM H. HART, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO
THE STANLEY WORKS, OF SAME PLACE.

ANTIFRICTION-HINGE.

SPECIFICATION forming part of Letters Patent No. 639,565, dated December 19, 1899.

Application filed May 1, 1899. Serial No. 715,254. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HART, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Antifriction-Hinges, of which the following is a specification.

My invention relates to improvements in antifriction-hinges; and the main object of my improvement is to inclose within the knuckles the independent casings in which the balls take their bearings.

In the accompanying drawings, Figure 1 is a front elevation of my hinge with the leaves opened. Fig. 2 is a vertical section of a portion of the right-hand leaf through its axis in a plane parallel to the face of the leaf. Fig. 3 is a similar view showing a modified construction.

The hinge illustrated is of the class which has more than two knuckles, and consequently the leaves are put together by inserting one knuckle between two adjoining knuckles and then inserting the pintle. While this style of hinge is the one to which my invention will generally be applied, some features of my invention are applicable to a loose-joint or two-knuckle hinge, in which one knuckle is slipped endwise into place over the pintle. The hinge shown in Fig. 1 is for both right and left hand doors, the middle knuckle 4 being provided with antifriction devices at each end, whereby when the right-hand leaf A is secured to the casing the weight of the door is transmitted through the leaf B to the antifriction devices at the upper end of the knuckle 4, whereas if the left-hand leaf B should be secured to the casing the weight of the door would be transmitted through the leaf A to the lower end of said knuckle 4. While I prefer to have the two sets of antifriction devices in the opposite ends of one knuckle, it is only essential when two sets are used that they shall be oppositely disposed in the knuckles, so that one set will take the weight of a right-hand door and the other set take the weight of a left-hand door.

The middle knuckle 4, Figs. 1 and 2, is counterbored or recessed at each end, so as

to leave a knuckle-shell 5, giving the knuckle the same exterior appearance as an ordinary knuckle without any antifriction devices. The central hole through this knuckle is considerably larger than the diameter of the pintle of the hinge. In the bottom of each counterbored recess I place a disk 6, which constitutes one-half of the independent casing of the balls 7 to bear upon, which disk should be hardened to prevent undue wear. I prefer to make it with flat faces; but this is not essential. A series of balls 7 are placed on this disk, and a second disk or half-casing 8 is placed over said balls, the said disk 8 having its central hole countersunk, as shown. I then place a sleeve or tube 9 through all the disks in the knuckle 4, one end of the sleeve being previously headed, (preferably as at 10,) and then turn over or head the other end of said sleeve, as at its lower end 11, Fig. 2. In the preferred form and as shown the diameter of the inner bore of the sleeve is large enough to receive the pintle without binding thereon, and the hole in the knuckle is large enough not to bind on the sleeve. The outer disks 8 are slightly smaller than the counter-bore or inner diameter of the knuckle-shell 5, while the hole in the inner disks 6 is slightly larger than the diameter of the sleeve, so as to leave the outer disk 8 and sleeve 9 free to rotate together as the weight is transmitted from the opposing end of a companion knuckle upon either one of said outer disks.

While I prefer to connect the bearing disks or casings of two sets of balls at the opposite ends of two knuckles and to have the connecting-sleeve revolve with the outer disks or casings, I may sometimes employ the construction illustrated in Fig. 3, in which the knuckle 4^a is counterbored the same as before to form the knuckle-shell 5 at one or both ends of the knuckle, the balls 7, together with the inner and outer disks 6 8, being the same as before described. A headed sleeve 9^a is then forced into the central hole of the knuckle with sufficient force to hold it in place. In this construction the hole in the center of the outer disk should be large enough to permit said disks to revolve freely

while the sleeve is stationary. The same construction may, if desired, be applied to the other end of the same knuckle.

By my improvement I connect the bearing-
5 disks or ball-casings at the opposite ends of one knuckle by means of a sleeve, so that they become a permanent part of the hinge. I also house the said disks or ball-casings within the end or ends of the knuckle, where
10 they are protected and concealed.

I claim as my invention—

1. In an antifriction-hinge the combination of one knuckle with a set of balls and a pair of ball-casings at each end of said knuckle,
15 and a sleeve extending through the ball-casings of both sets of said antifriction devices, substantially as described.

2. In an antifriction-hinge, the knuckle counterbored to form a knuckle-shell at one
20 end, in combination with the two disks and set of balls inclosed within said shell, and

means for holding said disks in place and permitting the outer one to rotate, substantially as described.

3. In an antifriction-hinge the knuckle 4 25 having the knuckle-shell 5 at each end thereof, the outer and inner disks and balls within each of said shells and the sleeve connecting the said outer disks, substantially as described.

4. In an antifriction-hinge, the knuckle, counterbored to form a protecting and concealing knuckle-shell at one end, in combination with the two ball-casings and set of balls inclosed thereby, the outer one of the
35 said casings being loosely fitted and lying rotatably within the said protecting and concealing shell, substantially as described.

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Witnesses:

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