

No. 621,605.

Patented Mar. 21, 1899.

R. M. GROVE.
BALL CASTER.

(Application filed Dec. 20, 1898.)

(No Model.)

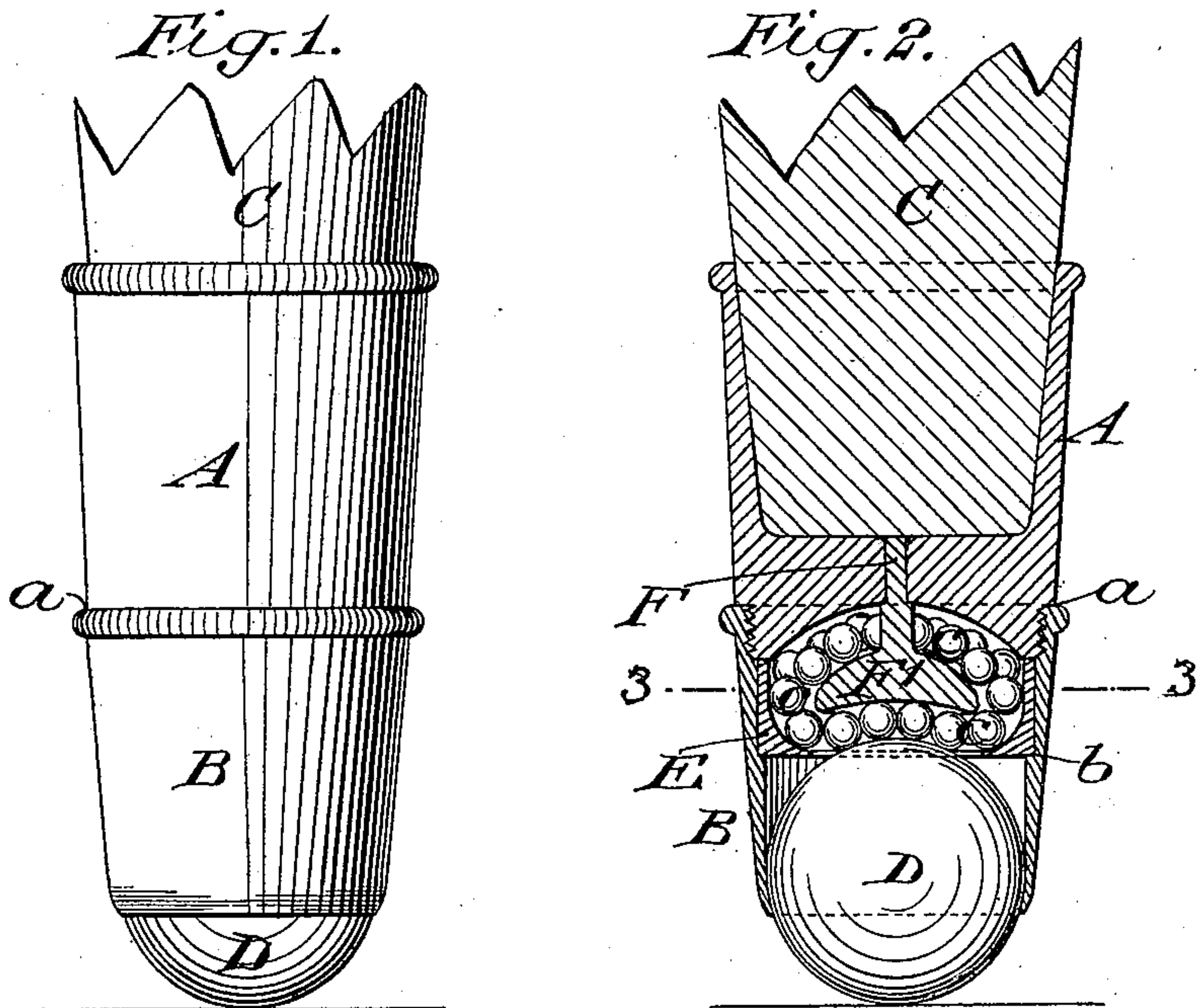


Fig. 3.

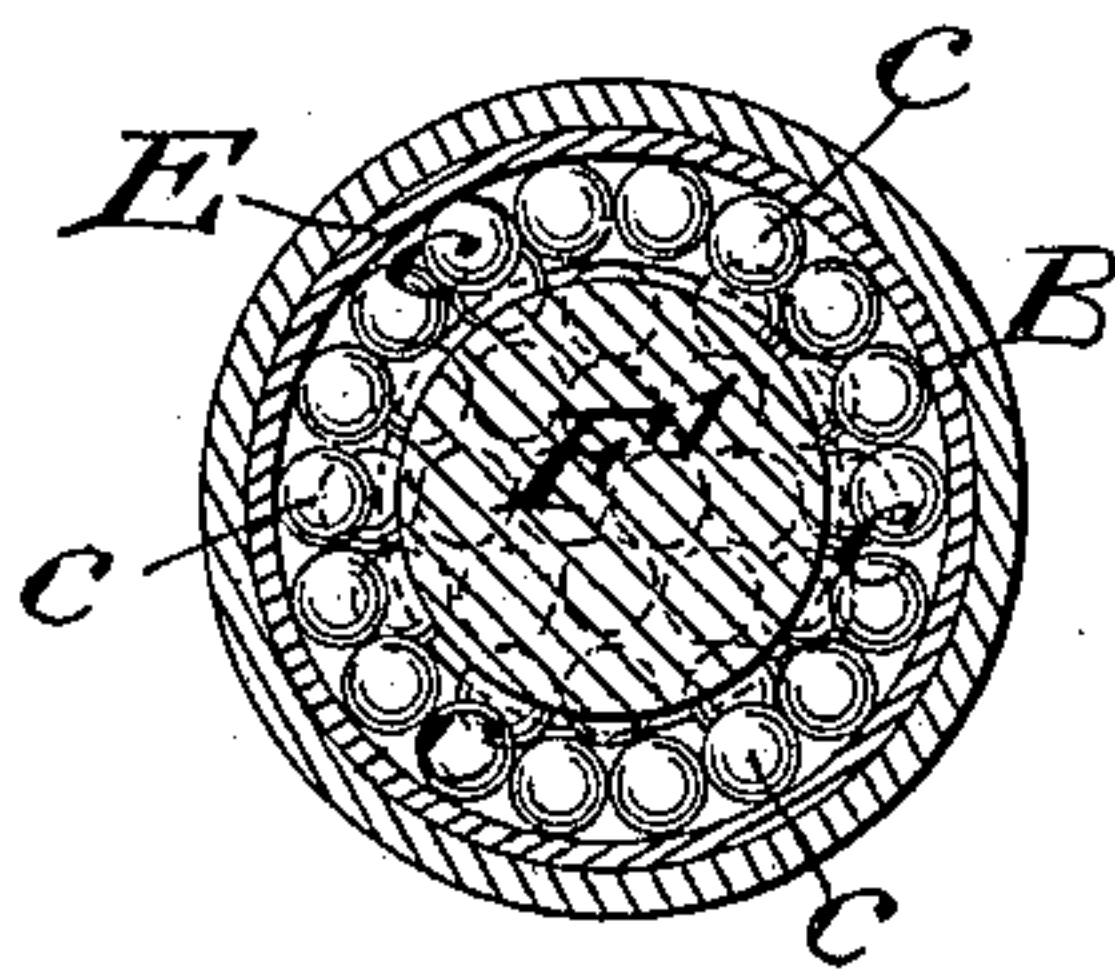


Fig. 4.

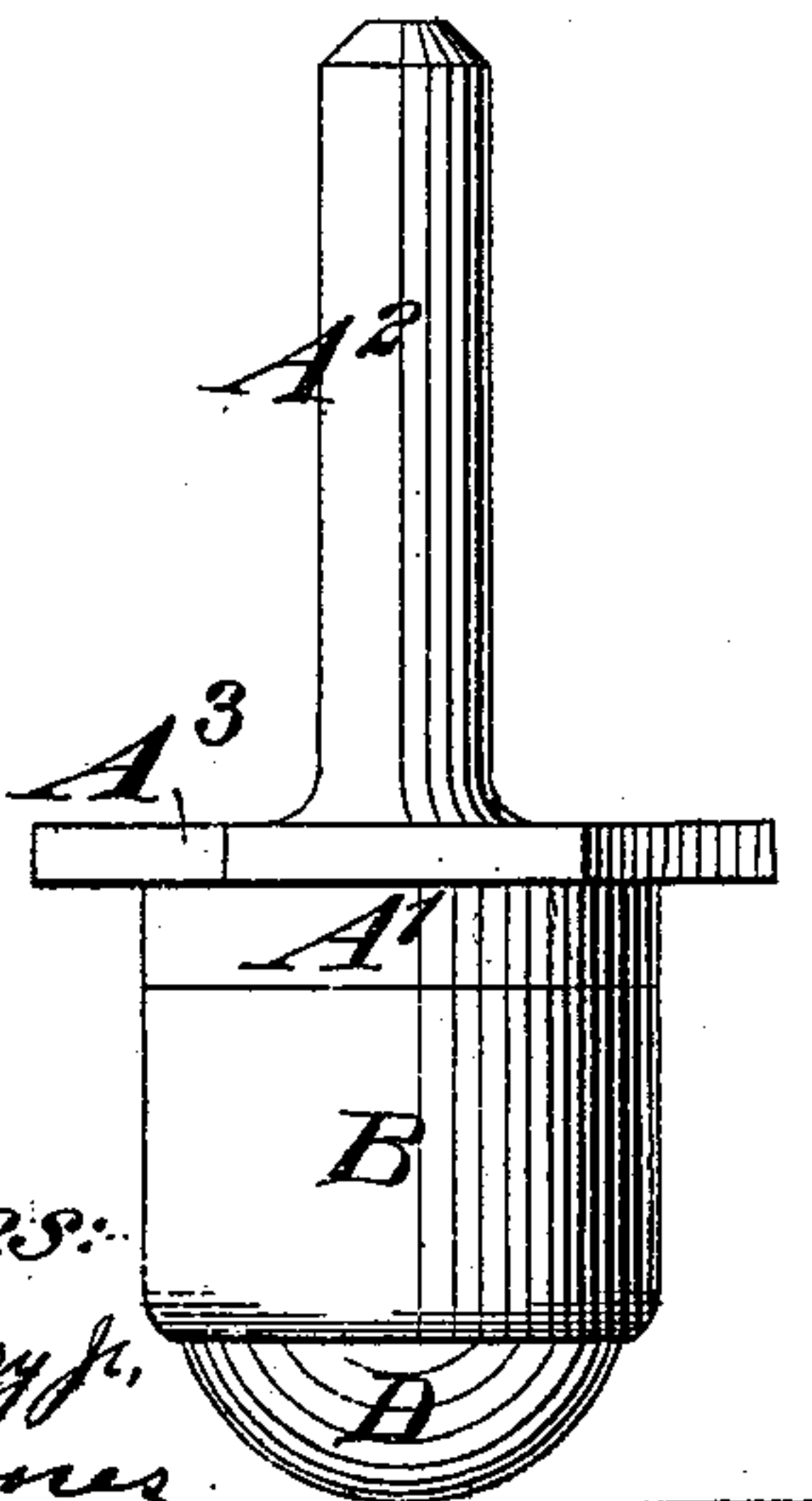
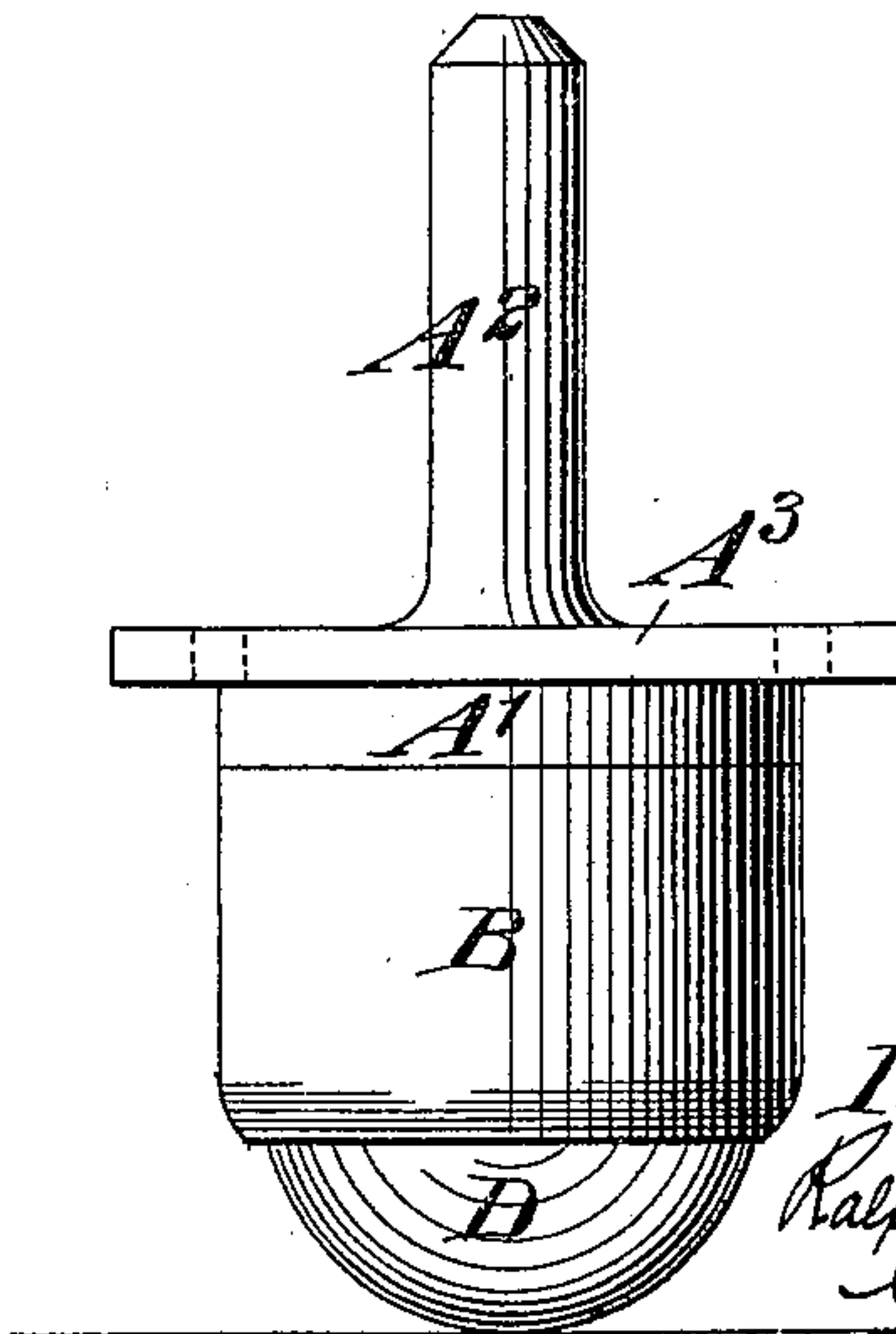


Fig. 5.



Witnesses:

George Barry Jr.
Fred Haynes

Inventor:

Ralph M. Grove
By attorney
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UNITED STATES PATENT OFFICE.

RALPH MARSH GROVE, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE STANDARD BALL BEARING CASTER COMPANY, OF NEWARK, NEW JERSEY.

BALL-CASTER.

SPECIFICATION forming part of Letters Patent No. 621,605, dated March 21, 1899.

Application filed December 20, 1898. Serial No. 699,801. (No model.)

To all whom it may concern:

Be it known that I, RALPH MARSH GROVE, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York and State of New York, have invented a new and useful Improvement in Ball-Casters, of which the following is a specification.

This invention relates to that class of casters known as "ball-casters," in which a larger central ball constituting the foot of the caster supports its load through the intervention of a series of smaller antifriction-balls, and more particularly to that type of ball-casters in which a chamber for reserve balls is provided.

My present invention contemplates a structure in which the larger ball may be inserted from the top of the caster and the smaller bearing-balls may rest upon hardened bearing-surfaces independent of the body of the caster and so supported as to relieve the larger central ball of friction.

In the accompanying drawings, Figure 1 represents an elevation of a portion of a leg of a piece of furniture having applied to it a caster embodying my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a horizontal section in the line 3 3 of Fig. 2; and Figs. 4 and 5 are elevations of casters, illustrating modifications of the invention.

Referring to Figs. 1, 2, and 3, A B designate the body of the caster, which is represented as, for convenience of construction, consisting of an upper member A in the form of a socket for the reception of the furniture-leg C and a lower member B, also in the form of a socket, which receives in its lower part the central main ball or roller D and the open bottom of which is contracted to retain the said ball or roller. These sockets are screwed together at *a*. Above the said ball or roller D there is placed, within the said body upon a shoulder *b* in the lower member B, an internally-flanged ring E, which is held to said shoulder by the lower end of the upper socket A and through which the upper part of the ball D protrudes a little way. This ring is removable for the introduction of the ball D when A and B are separated.

From the upper part of the body there projects downward a rigid stem F, terminating

in a disk F', which has a concave lower face, the said disk being concentric with the ball D.

The space between the ring E and the bottom of the socket A forms a reserve-ball chamber for containing the antifriction-balls *c c*, which are all of uniform size and are placed promiscuously within the said chamber in sufficient number to fill or nearly fill all of the space therein not occupied by the bearing-disk F' and its stem. The depth of the space between the larger ball D and the bearing-disk F' will be determined by the antifriction-balls *c*, which as they roll across the concave face of the disk F' form bearings for the larger ball D and sustain on the top of said larger ball D the weight of the article to which the caster is applied.

The upper face of the disk F', surrounding its stem, is rounded off downward, and the space between it and the top of the ball-chamber is materially deeper than the diameter of a ball in order to permit a line of balls whenever from any cause they become cramped to find relief by the one rolling a short distance up and partially over its neighbor. Between the edge of the disk and the interior of the ring E the space is sufficient for the balls to pass freely, and the edges of the disk and the interior of the ring are rounded to facilitate the rolling of the balls up and down between the portion of the chamber above the disk and the portion below. The number of antifriction-balls in the chamber should be more than sufficient to fill the whole of the space between the disk F' and the bearing-ball and may be many times more, but should not be sufficient to pack the space above the disk.

The balls may be inserted in any convenient way; but the most convenient way in the example represented is to place them in the ring E above the ball D while the upper and lower members A B are separated, then to put the two members together, in doing which the number of balls in excess of what are sufficient to fill the space between the disk F' and the ball D and which may be termed "spare" balls will easily pass into the space above the disk.

The load supported by the caster is transmitted to the bearing-ball D by the disk F'

through the antifriction-balls immediately between the concave of the disk F' and the top of the bearing-ball D. In operation the movement of the bearing-ball D across the floor in
5 any direction will cause the antifriction-balls between the disk and the bearing-ball to roll across the concave face of the disk till they pass the edge thereof and thence they pass freely upward between the disk and the ring
10 E. At the same time some of the spare antifriction-balls pass downward from the reserve-chamber over the opposite side of the disk to the space between the face of the disk and the bearing-ball, which is thus always kept supplied with a sufficient number of bearing-
15 balls.

The modified casters shown in Figs. 4 and 5 differ from that shown in Figs. 1 and 2 only in that the upper member A' of the caster-
20 body instead of being in the form of a socket to receive the furniture-leg is made with a stem A² to enter the leg and with a flange A³ to be fastened to the bottom of the leg.

The feature of making the reserve-ball
25 chamber materially deeper than the diameter of an antifriction-ball is not claimed herein, but forms a part of the subject-matter of another application, Serial No. 706,348, filed February 21, 1899.

What I claim is—

A ball-caster comprising a hollow body composed of separable sections provided with an annular shoulder on its interior face, a central bearing-ball, a removable annular ring resting within the hollow body on the said shoulder, the said ring being separable from the hollow body and forming a marginal support for the antifriction-balls, a bearing-disk having a concave face directed toward the top of the central bearing-ball and spaced from its support and from the inner face of the said ring and a number of antifriction-balls surrounding said bearing-disk and forming, between its face and the top of the bearing-ball, bearings for the central bearing-ball, the structure being such that the central bearing-ball, annular ring and antifriction-balls may be inserted into the hollow body through its top, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 16th day of December, 1898.

RALPH MARSH GROVE.

Witnesses:

FREDK. HAYNES,

GEORGE BARRY, Jr.