

No. 642,921.

Patented Feb. 6, 1900.

H. D. REED.
BALL CASTER.

(Application filed Mar. 31, 1899.)

(No Model.)

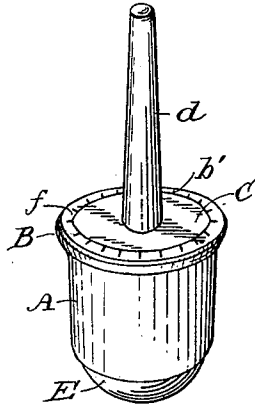


Fig. 1.

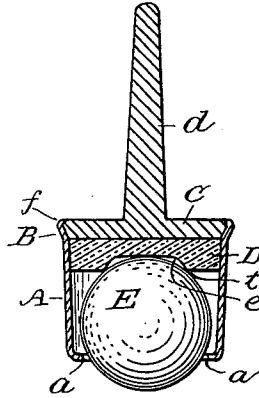


Fig. 2.

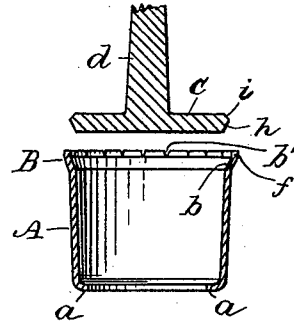


Fig. 3.

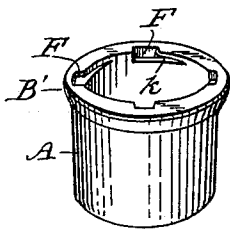


Fig. 4.

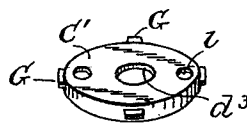


Fig. 5.



Fig. 6.

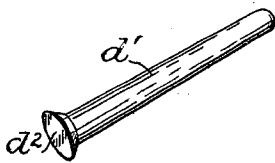


Fig. 7.

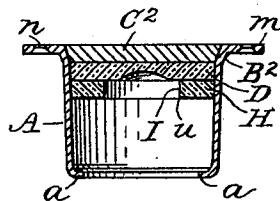


Fig. 8.

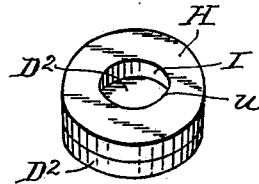


Fig. 9.

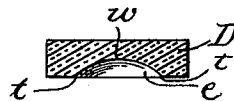


Fig. 10.

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UNITED STATES PATENT OFFICE.

HARRY D. REED, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO WILLIAM L. ELDER, OF SAME PLACE.

BALL-CASTER.

SPECIFICATION forming part of Letters Patent No. 642,921, dated February 6, 1900.

Application filed March 31, 1899. Serial No. 711,214. (No model.)

To all whom it may concern:

Be it known that I, HARRY D. REED, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Ball-Casters for Furniture; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to the class of casters that are applicable to household and other furniture and pianos and similar instruments; and it consists, essentially, in an improved non-metallic or non-resonant antifrictional or self-lubricating socket-bearing applied between the top of a ball or spherical roller and the bottom of the furniture, whereby a sliding ball-and-socket bearing is provided; and the invention consists, further, in the parts and combination and arrangement of parts hereinafter fully described and claimed.

One object of this invention is to improve the type of ball-casters so as to be of simple design and inexpensive to manufacture, to the end that such may be within the means of users generally, the more complicated ball-casters having ball-bearings at the top being too expensive for practical use by the masses.

Another object is to provide a caster in which the ball may move in its socket noiselessly and smoothly without being accompanied by the harsh grating sound produced by casters of this class in which the ball slides against a rigidly-hard substance at the top and sides thereof, such as metal or glass.

A further object of this invention is to provide such a caster as may be applied to various types of furniture or cabinet-ware and which may be either detachable or fixed thereto.

The above objects are fully attained in my invention, which, furthermore, is adapted to be made in various fanciful and elaborate designs without detracting from its utility, and it is withal durable and economical in use.

Referring to the accompanying drawings, Figure 1 represents a perspective view of a

ball-caster embodying my invention; Fig. 2, a vertical central sectional view showing my invention as applied to the ball; Fig. 3, a detail sectional view showing the case and cap-plate separated as in the act of being connected; Fig. 4, a perspective view of a case having a modified form of top wherein a detachable cap-plate may be applied; Fig. 5, a perspective view of my detachable cap-plate wherein a detachable shank may be applied; Fig. 6, a vertical central sectional view of the detachable cap-plate; Fig. 7, a perspective view of a detachable shank; Fig. 8, a vertical central sectional view of a modified form of case; Fig. 9, a perspective view of a modified form of socket-bearing constructed of two parts, and Fig. 10 a vertical central sectional view of my socket-bearing.

In the drawings, A designates the case, having various styles of top; C, the cap, which may be modified to conform to differences in the top of the case; D, the socket-bearing, subject to modifications in construction; E, the ball; *d*, the shank.

Similar letters of reference designate corresponding parts in the several figures.

The case A is suitably made of malleable iron where cheapness is desired; but either cast or pressed brass or other metal may be employed. It is cylindrical, preferably slightly conical, and but slightly larger diametrically than the ball or sphere E with which it is to be used, the bottom end being the smaller and having an internal annular flange *a*, as is common in this type of caster, to prevent the ball from dropping out when the furniture is raised. The top B may be variously formed, as desired. When a fixed shank *d* of any type is preferred, I provide a flared portion *b*, having a short parallel portion *f*, the latter preferably having its top edge provided with notches *b'*, so as to be more easily turned over the metallic cap-plate C, which, having the integral shank *d*, is in circular form of suitable thickness to provide a foundation for the socket-bearing and has a lower beveled edge *h*, fitting into the flared mouth *b*, and an upper beveled edge *i*, over which the top edge *f* is tightly pressed after the plate is placed in position, the socket-bearing being first inserted in the case to remain permanently.

The modifications shown in Figs. 4, 5, and 6 provide a removable cap to permit of applying any of the various styles of shanks desired or to suit such shank-sockets as may be found in furniture. The case has a top B' similar in exterior appearance to the top B, and the inner periphery thereof may be either straight or flared, but is provided with recesses F and communicating grooves *k*, extending a short distance around the inner side of the case at one side of each of such recesses. The cap C' is metallic, of disk form, having lugs G projecting radially from the periphery thereof and adapted to enter the recesses F and grooves *k*, whereby the case is retained by the cap. A central shank-socket *d*³ is provided to receive the head *d*² of an interchangeable shank *d*¹, and this may be made to suit any style of shank-socket, or it may be a simple wood-screw to be forced directly into the piece of furniture for retaining the caster permanently. Key-sockets *l* are provided in which to insert a suitable key-wrench for manipulating the cap.

Another modification is shown in Fig. 8 in which the top B² of the case has an exterior annular flange *m* provided with a suitable number of screw-holes *n*, in which wood-screws may be inserted for securing the case to furniture. The cap-plate C² is a plain disk of suitable metal and is adapted to fit neatly into the mouth of the case whether the latter is flared or straight.

The ball E is obviously spherical and may be made either of cast-iron, steel, or other suitable metal that is of sufficient density that may be highly polished, or of glass. It has a diameter slightly greater than the opening in the flange *a* and less than that of the body of the case internally.

The socket-bearing D, which, together with the spherical roller E, constitutes the ball-and-socket joint, is adapted to enter and fit neatly into the upper portion of the case, whether circular, as shown, or of other contour, and is of suitable thickness to provide ample strength. It may be made of a single continuous piece provided with a cavity *e*, or it may be made in sections, as shown in Figs. 8 and 9, in which D represents a disk having the cavity and D² represents a disk having parallel plane surfaces top and bottom, and H represents the companion part in the form of an annular ring or washer having a central circular aperture I. This latter form may be preferable in some cases, and the two parts may be cemented together, if desired. Whether in the form as D, as D H, or as D² H the socket-bearing is composed of such material of a porous or absorptive character as may best suit the purpose of providing a self-lubricated and noiseless ball-and-socket sliding joint bearing upon the spherical roller or ball E. Preferably I employ either leather, which is first specially prepared by infusing therein a suitable lubricant and then subjecting it to a great pressure, or vulcanized

fiber which has been thus suitably prepared by similar process. In either case the material is rendered exceedingly compact and dense, yet not invincibly rigid, but so that it may not be crushed out of form by the contact with the ball and the sustained weights. The cavity *e* is substantially semicircular to conform to the ball upon which it is designed to rest; but it is only essential that the ball has actual constant contact both at the center of the cavity and at the edges *t* or *u*, the edges being the lateral guides and the center *w* the bearing proper. Obviously the case retains the several parts and carries the ball should the same not have a bearing upon an uneven floor. When loaded, the edge of the cavity bears closely against the sides of the ball, preventing the latter from contacting with the case, so that in operation the ball is forced to slide without resonant effects in the smooth self-lubricating cavity, which offers so little resistance as to be inappreciable compared to the resistance at the under side of the ball upon a floor.

I am aware that a caster has been made which is provided with a glass bearing-piece having a hemispherical cavity of greater radius than that of the ball, so that the ball has a limited bearing against the center of the cavity when at rest and against the spherical side of the cavity when moving, and I am aware of the caster having a hard bearing-plate without a cavity and having metallic lateral bearings to guide the ball. Such casters are obviously imperfect and do not embody the advantages embraced in my invention.

It should be noted that while I state that my socket-bearing is compressed so as to be hard it must be understood that it is not of metallic hardness, but only of that degree which may be necessary to support the load and avoid distortion—such density as may be given to fibrous material by compression—as it is reinforced by the cap and is in effect but a lining therefor.

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

1. In a caster, the combination of the ball, the bearing of non-resonant yielding material, the case comprising the cylindrical body having the restricted lower end and enlarged top, the cap comprising the disk-formed plate locked in the top of said case and provided with the key-sockets and the central aperture, and the shank, substantially as set forth.

2. In a caster, the combination of the case provided with the recesses and lateral grooves, the cap provided with the radial projections adapted to enter the recesses and lock in the grooves, the shank, the ball, and the non-resonant or yielding bearing inserted between the ball and said cap, substantially as set forth.

3. In a caster, the combination of the ball, the case, the cap locked in the case and supporting the same, and the non-resonant bear-

ing comprising the annular ring of yielding material bearing at its outer periphery against the case and at its inner periphery against the ball and the companion part also of yielding material bearing upon the ball between the annular ring and the cap and at its periphery against the case, substantially as set forth.

5 4. In a caster, the combination of the case provided with the recesses and lateral grooves, the cap provided with the radial projections adapted to enter the recesses and lock in the grooves, the ball, and the non-resonant or yielding bearing inserted between the ball and said cap, substantially as set forth.

15 5. In a caster, the combination of the ball,

the case, the cap locked in the case, the shank, and the non-resonant bearing comprising the annular ring of yielding material bearing at its outer periphery against the case and at its inner periphery against the ball and the companion part also of yielding material bearing upon the ball between the annular ring and the cap and at its periphery against the case, substantially as set forth.

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

HARRY D. REED.

Witnesses:

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E. T. SILVIUS.