No. 689,364. Patented Dec. 17, 1901.

C. McDONNER.

CASTER.

(Application filed May 8, 1901.)

(No Model.)

FIG 1

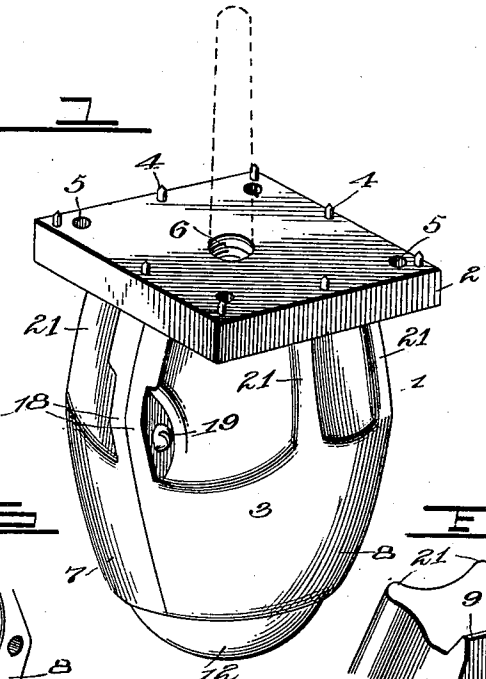


FIG 5

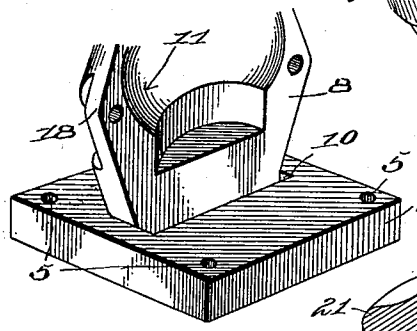


FIG 6

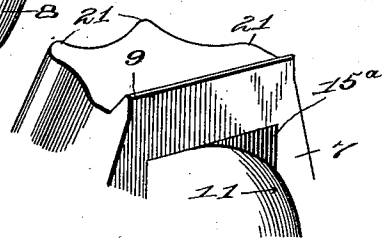


FIG 2

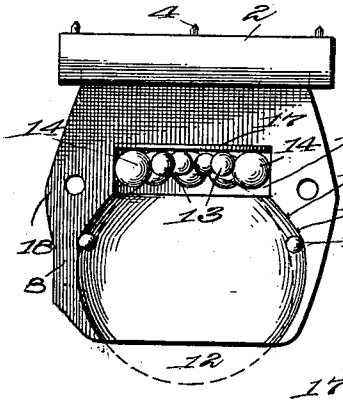


FIG 4

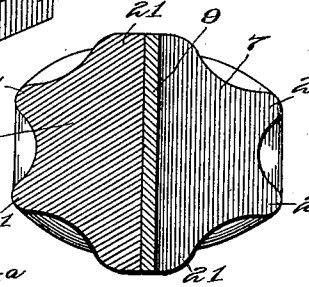


FIG 3

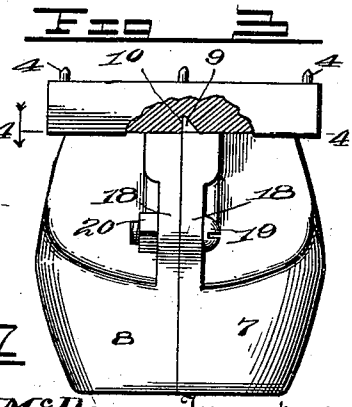
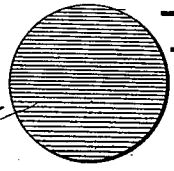


FIG 7



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLEY McDONNER, OF APPLETON, WISCONSIN, ASSIGNOR TO MARK HAGLE, OF SOULE, MICHIGAN.

CASTER.

SPECIFICATION forming part of Letters Patent No. 689,364, dated December 17, 1901.

Application filed May 8, 1901. Serial No. 59,422. (No model.)

To all whom it may concern:

Be it known that I, CHARLEY McDONNER, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and useful Caster, of which the following is a specification.

This invention relates to casters, and more particularly to that class known as "ball-bearing" casters.

The object of the invention is to provide a simply constructed, durable, and thoroughly efficient form of caster for use in connection with furniture or for other purposes in which the caster-ball shall be so positioned with relation to the ball-bearings as to insure perfect freedom of operation under all conditions of use and in which any tendency of the caster-wheel to lock or set will be entirely obviated.

Another object is to construct the shell or casing in such manner as, while not adding to its weight, its strain-resisting powers will be increased.

A further object of the invention is to provide simple and efficient means to prevent any tendency of the balls to set in the shell or casing at the point where the two sections join, so that perfect freedom of movement of the balls will be assured.

A further object of the invention is to provide means by which the caster may be converted from a base-plate caster to a shank-caster, and vice versa.

With these and other objects in view the invention consists in the novel construction and combination of parts of a ball-bearing caster, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, I have illustrated a form of embodiment of my invention capable of performing the functions designed, it being understood, however, that the invention may be carried into effect in other ways and that details of construction and aggroupment of the parts may be changed or varied without departing from the scope of the invention.

In the drawings, Figure 1 is a perspective detail view of the caster embodying my improvements. Fig. 2 is a view in elevation of one of the members, showing the relation existing between the caster-ball and the ball-bearings. Fig. 3 is a view in elevation, partly in section, showing the manner in which the parts of the shell or casing are held assembled. Fig. 4 is a view in sectional plan taken on the line 4 4 of Fig. 3 looking in the direction of the arrow. Fig. 5 is a perspective detail view of a portion of the plate-carrying member of the caster, showing more particularly the groove or recess to be engaged by a shoulder on the other member to assist in holding the two members assembled. Fig. 6 is a perspective detail of a portion of the other member of the socket, showing more particularly the shoulder to engage with the recess in the base-plate. Fig. 7 is a detached detail view of a disk against which the balls within the caster bear.

The caster herein specifically described is generally illustrated and described in a concurrently pending application for an improvement upon house-movers filed April 24, 1901, Serial No. 57,319. In that application the caster is confined for use in connection with a track and with a house to be moved. In the present instance it is to be understood that the caster is to be applied to any use desired, as in connection with moving a house or for furniture or for use in connection with heavy bodies.

Referring to the drawings and to Fig. 1 thereof, 1 designates a caster, the same comprising a base-plate 2 and a shell or casing 3 for housing the ball-bearings and the caster-ball. The base-plate 2 is here shown as a rectangular structure, although it may be of any other desired contour and is provided on its upper face in this instance with a plurality of studs or pins 4, with corner-openings 5 and with a central threaded opening 6. The studs or pins 4 are to hold the plate in position against the body being moved and will be found to be effective for the purpose where the connection between the article and the caster is not to be a permanent one. Should the caster be used for moving a house in the manner illustrated and described in the application referred to, the lugs would sink into

the sill of the house, and thereby hold the plate in position. If, however, there should be danger of the plate becoming detached from the sill or from any other object against which it contacts in use, screws may be passed into the holes 5 and into the object. To convert the caster from a base-plate caster to a shank-caster, a shank will be screwed into the threaded opening 6, as indicated by dotted lines in Fig. 1, or initially the plate may be provided with the shank formed integral therewith.

The shell or casing comprises two members 7 and 8, the member 7 being detachable and the member 8 secured rigidly to or formed integral with the base-plate. The members 7 and 8 are counterparts of each other, except that the member 7 is provided with a flange or shoulder 9 to engage a recess or groove 10, formed in the base-plate in line with the face of the member 8, as shown in Figs. 2 and 3. The shoulder and recess are shown as angular, this being advantageous, as it will permit the shoulder of the member 7 being readily and easily seated in the recess; but it is to be understood that I do not limit myself to the particular form of these parts shown, as it will be obvious that the shoulder and the recess may be of any desired shape, the point being to insure a rigid and stable connection between the base-plate and the removable member of the shell or casing when the two members are assembled.

The shell is provided with an interior chamber (designated generally 11) to receive the caster-ball 12 and three series of ball-bearings 13, 14, and 15, respectively. The series of ball-bearings 13 and 14 occupy the upper portion 15^a of the chamber 11, as shown in Fig. 2, the walls of this portion of the chamber being straight and the top perfectly flat, the outer series of balls 14 being larger than the inner series of balls 13, thus to present a concave depression into which the periphery of the caster-ball will rest, as clearly shown in Fig. 2. From a point slightly below the plane of the under surface of the series 14 the walls of the chamber diverge outward, forming a shoulder 16, which, in conjunction with the periphery of the caster-ball, constitutes a raceway 16^a, in which works the series of balls 15 to receive the lateral thrusts of the caster-ball, so that by this arrangement perfect freedom of action of the caster-ball under all conditions is assured and any danger of the ball locking or setting will be entirely obviated, as there will be no contact between the caster-ball and the side of the casing, the operative surface of the caster-ball within the casing being borne upon or bearing against roller-bearings, as clearly shown in Fig. 2. From the shoulder 16 the walls of the chamber converge slightly outward and then downward and inward, so that at the mouth of the chamber the diameter between the opposed faces of the walls is less than the diameter of the caster-ball, whereby the latter will be securely held in place against being disassociated with the shell or casing. In order that the series of balls 13 and 14 may traverse the top of the chamber freely and without danger of being checked, as by an obstacle presented by the meeting edges of the two members 7 and 8, a plate 17 is placed within the upper portion 15^a of the chamber 11 and bears against the top thereof, and on this plate the two series of balls 13 and 14 work.

Each member of the shell or casing is provided on each side with a perforated ear 18, through which passes a bolt 19, carrying a nut 20, the function of these two bolts and the nuts being firmly to secure the two members together, the shoulder 9 and recess 10 referred to operating to render the juncture of the two parts an extremely stable one.

As before stated, the shell or casing is reinforced to resist lateral strain without any added weight, and to accomplish this result the outer surface of the members adjacent to the bed-plate are fluted or channeled out to present ribs 21, these operating in the well-known manner to render the casing stronger and better able to resist the strain than if the parts of the casing thus treated were solid or plain surfaces.

As before pointed out, the caster herein shown will be adapted for use in house-moving and when so employed will be a large and heavy structure; but the features of construction described will be approximately followed in any case, whether the caster be employed for the purpose named or be used in connection with furniture or the like.

It will be obvious that in addition to having the caster formed as a base-plate caster or a shank-caster the same may be constructed as a socket-caster when it is to be used in connection with furniture, it only being necessary in this event either to cast the socket on the base-plate or secure the same thereto.

In the selection of the balls for the different series I have found that where the series 15 is the smallest, the series 13 next larger, and the series 14 the largest of all the best results are attained, as the contacting surface decreases with the decreased size in the balls, so that the series 15, which will be, say, three-sixteenths of an inch in diameter, will have but a very slight contact with the periphery of the caster-ball, and this series of balls will receive the smallest strain, both lateral and vertical, while the series 14 will receive the heaviest strain, and being the largest will have the greatest contact-surface opposed to the caster-ball. By this arrangement of the balls the friction between the series of balls and the caster-ball is reduced to a minimum.

It will be understood that in constructing casters in accordance with this invention various changes in the construction of the different parts may be departed from and still be within the scope of the invention. It is

also to be understood that, if desired, the lugs or pins 4 may be omitted in some instances.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is—

1. A ball-caster comprising opposite shell or casing members, one of which is provided at its upper end with a base-plate which is projected laterally at the inner side of the member, the other member being fitted flat against the first-mentioned member and also abutted against the inner side of the base-plate, the latter having attaching means, detachable fastenings for the connection of the members, and a ball held between the members.

2. A ball-caster comprising opposite shell or casing members, one of which has a laterally-projected base-plate, a tongue-and-groove connection between the base-plate and the other member, means for detachably connecting the members, and a ball held between said members.

3. A ball-caster, comprising opposite substantially duplicate longitudinal members, which are provided in their inner faces with corresponding substantially semicircular chambers, and smaller corresponding chambers formed above and in communication with the first-mentioned chambers, a bearing-plate fitted snugly in the back of the smaller chamber and covering the joint between the members, a ball rotatably held in the circular chamber, antifriction devices located in the smaller chamber and bearing against the top of the ball and the bearing-plate, detachable fastenings connecting the opposite members, a marginal attaching-plate carried by the upper end of one of the members and lying in contact with and overlapping the upper end of the other member, and a transverse tongue-and-groove connection between the inner edge of said other member and the inner face of the attaching-plate.

4. In a ball-caster, a base-plate carrying a two-part shell or casing, one of which parts is rigid with the plate and the other detachable therefrom, a recess formed in the base-plate adjacent to the rigid part, a shoulder on the detachable part engaging the recess, the coaction between the recess and shoulders acting normally to hold the shell-sections assembled, and bolts passed through ears on the two parts and serving firmly to hold the same assembled.

5. A ball-caster, formed in opposite detachably-connected longitudinal sections having their inner faces provided with corresponding substantially semicircular chambers, a caster-ball rotatably held within the chamber, a bearing-plate fitted in the back of the chamber and covering the joint between the members, and antifriction devices interposed between the top of the caster-ball and the bearing-plate, the latter forming a smooth and unbroken bearing-surface for the antifriction devices.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLEY McDONNER.

Witnesses:
G. T. MOESKES,
JOHN LANSER.