July 21, 1931. W. F. HEROLD 1,815,062

CASTER

Filed May 4, 1929

Fig. 1.

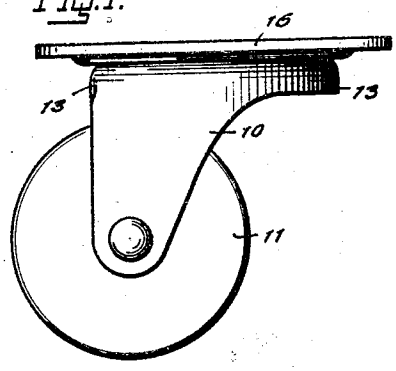


Fig. 2.

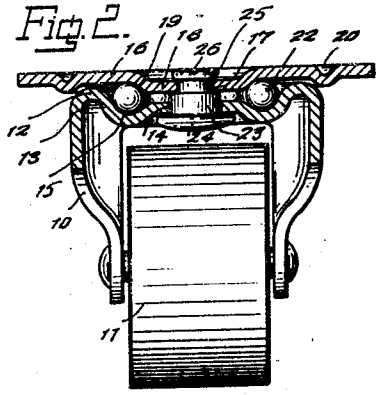


Fig. 3.

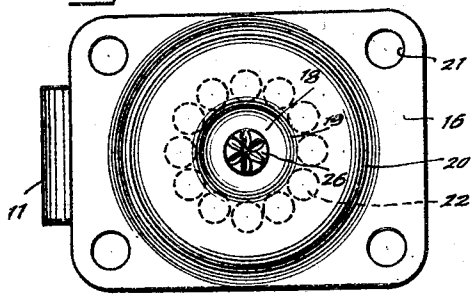


Fig. 4.

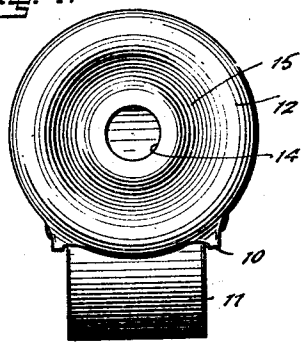
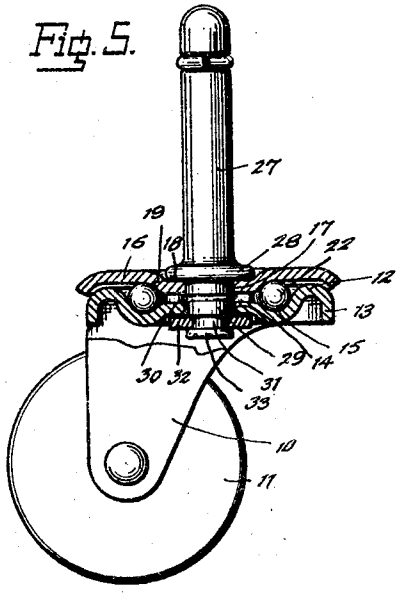


Fig. 5.



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Patented July 21, 1931 1,815,062

UNITED STATES PATENT OFFICE

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CASTER

Application filed May 4, 1929. Serial No. 360,581.

The present invention relates to improvements in casters, particularly of the ball-bearing type, and has for an object to provide a caster having a high degree of efficiency in use, and which at the same time will be relatively inexpensive and simple in construction.

It is particularly proposed to provide a caster in which ball-bearings are provided between the attaching base plate and the caster horn without any substantial increase in the height of the caster, and to this end I provide, in the present embodiment, a sheet metal horn top having a ball-race groove pressed therein and of a depth approximating the diameter of the balls, and I further provide an annular ball retaining and guide formation in the base plate forming a cooperating ball-race with the ball-race of the horn. Another object is to provide a downturned skirt flange on the horn which strengthens it and serves to conceal the pressed ball race formation in the horn. A further object is to provide a construction in which the center pin or stud is rigidly connected to the base plate, and further to provide a construction in which the length of the stud may be shortened to a great extent, so that the leverage strain on the pin and consequent loosening is reduced to a minimum.

With the above and other objects in view, embodiments of the invention are shown in the accompanying drawings, and these embodiments will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claim.

In the drawings:—

Fig. 1 is a side elevation of a caster, according to one embodiment of the invention;

Fig. 2 is a vertical elevation, partly in section;

Fig. 3 is a plan view of the same;

Fig. 4 is a plan view of the top of the horn, before assembly; and

Fig. 5 is a vertical sectional view, partly in elevation of a modified form of the invention, in which the base plate is provided with a pintle.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the caster, according to the embodiment of the invention disclosed in Figs. 1 to 4, comprises a horn 10, formed of sheet metal, and in which the wheel 11 is mounted. The top portion 12 of the horn is preferably of circular plan and is provided with downwardly bent flange or skirt portions 13 in substantial continuation of the horn sides, which are shaped to conform to this circular plan. A central aperture 14 is provided in the top portion 12, and between this aperture and the outer periphery there is provided a circular groove 15, outwardly spaced in concentric relation to the aperture, and inwardly spaced in concentric relation to the periphery. The skirt portion 13 greatly strengthens the horn, and further conceals the depressed ball-race.

The flat portion between the groove and the aperture is depressed with respect to the marginal rim portion surrounding the groove, so that the groove has its outer wall extending upwardly to a greater extent than its inner wall, the outer wall extending substantially above the central plane of the balls while the inner wall and the flat inner portion of the plate are below this plane. In the assembled relation the groove 15 constitutes a lower ball race, as will presently more fully appear.

The attaching plate 16 is provided with a central aperture 17, of smaller diameter than the aperture 14 of the horn top, and is dished, as at 18, in surrounding relation to said aperture and in correspondance to the dishing of the central portion of the horn top to form the inner wall of the groove 15, the under side of the wall of this dished portion 18 constituting an upper ball race portion 19. An annular groove 20 is formed in the plate of slightly larger diameter than the periphery of the horn top, and forms a circular boss at the under side, which in the assembled relation projects downwardly, outwardly of the periphery of the horn, to restrict the spacing of the horn and plate. Holes 21 are provided in the corners of the plate for securing the same by screws to the furniture.

The balls 22 are disposed in the ball-race groove 15 of the horn top in interposed relation between the horn and the plate, the balls engaging the under surface of the plate 16 and the ball race portion 19 thereof.

The plate and horn are assembled by means of a center pin or stud 23 having a head 24 at its lower end, the stud being rotatably engaged in the aperture 14 with the head loosely disposed in the under dished portion of the horn, while a reduced extension 25 at the upper end is engaged in the aperture 17 of the base plate, the latter being seated on the shoulder formed by the extension 25 and secured to the stud by heading the extension over, as at 26.

While the stud holds the parts in assembled relation the balls are so arranged that substantially the entire load and side thrust is upon the balls. The close relation of the horn and base plate provide a compact structure without increase in the height of the caster assembly, and permits of a very short center stud at a point where the leverage strain thereon is reduced to a minimum, and the chances of loosening from this cause thereby greatly diminished.

In Fig. 5 I have shown a modified form, in which the plate 16 is of circular form and has a pintle 27, for insertion in a socket in the furniture, integrally formed with an assembling stud. The pintle is provided with a flange 28 at its base which is seated in the dished portion 18 of the plate, and has a stud extension 29 engaged through the aperture 17 and secured to the plate by swaging over the metal, as at 30. The stud is then rotatably engaged in the aperture 14 of the horn, which is of the same size as the aperture 17 in this embodiment, and a reduced extension 31 of the stud has a washer 32 engaged thereon and secured by heading over the end of the extension, as at 33.

I have illustrated and described preferred and satisfactory embodiments of my invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claim.

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

In a caster, a floor engaging element including a wheel, a sheet metal horn having a top portion, a pair of spaced side portions rotatably carrying said wheel and downturned rim portions continuous with said side portions and extending between them and defining a lateral space at the under side of the horn top, said horn top comprising an annular marginal portion adjacent said rim and side portions, a downwardly pressed circular ball-race portion inwardly of and adjacent said marginal portion and disposed in said lateral space, the upper surface of the ball race portion being of a depth at its outer side adjacent said marginal portion slightly less than the ball diameter, and an upwardly dished centrally apertured annular portion inwardly of the ball race having its upper surface in a plane below the upper surface of said marginal portion and providing a space at the upper side of the horn top inwardly of and defined by said outer side of the ball race, balls disposed in said race, an attaching element including a sheet metal top plate overlying said horn top having a downwardly dished centrally apertured annular portion opposed to said upwardly dished annular portion of the horn top and having its under surface disposed in said space at the upper side of the horn top, said balls being engaged with the under surface of said top plate outwardly of said downwardly dished annular portion, and a center stud rotatably connecting said horn top to said plate.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 20th day of April, 1929.

WALTER F. HEROLD.