Nov. 15, 1927. 1,649,527

W. F. HEROLD

CASTER

Filed July 6, 1926

Fig. 1.

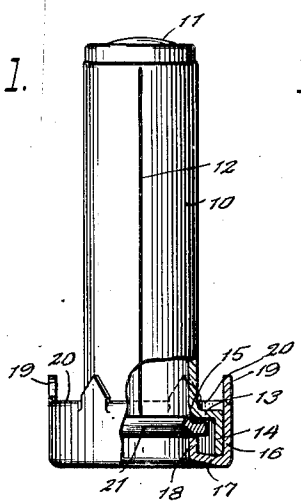


Fig. 2.

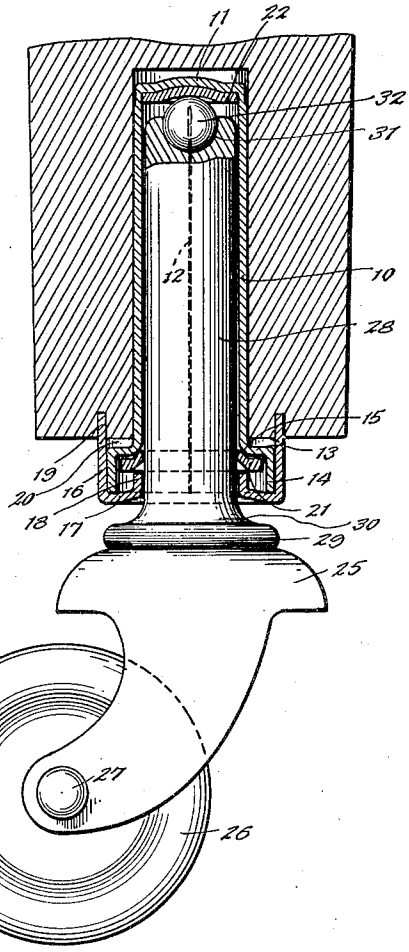


Fig. 3.

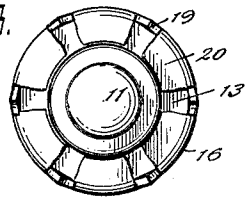


Fig. 4.

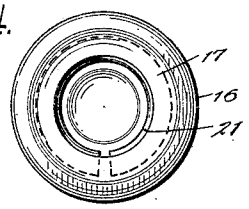
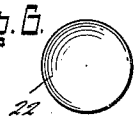
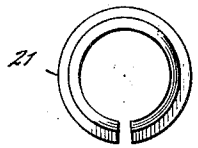


Fig. 5



Fig. 6.





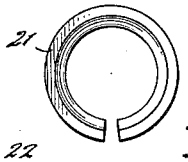


Fig. 7.

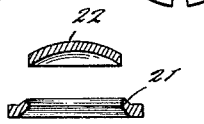


Fig. 8.

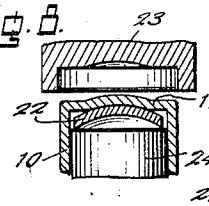
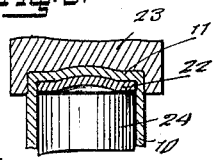
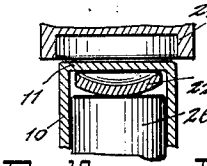


Fig. 9.





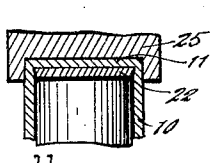


Fig. 10.

Fig. 11.

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Patented Nov. 15, 1927. 1,649,527

UNITED STATES PATENT OFFICE.

WALTER F. HEROLD, OF UPPER MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE BASSICK COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

CASTER.

Application filed July 6, 1926. Serial No. 120,671.

The present invention relates to casters, particularly of the top pintle bearing type. Heretofore it has been necessary to form the socket shell member of relatively heavy metal to provide sufficient strength for the top bearing, so that for a given diameter pintle it was necessary to provide a larger hole in the furniture leg, to take care of the increased metal thickness, than in sockets not provided with a top bearing. With this latter type a relatively thin gauge metal has been employed, and the difference between the diameter of the pintle and that of the hole in the furniture leg was substantially the metal thickness of the socket member. It is proposed in the present invention to provide a top bearing socket which will permit of these same relative diameters of the pintle and the hole in the furniture leg, and in which the top bearing will be so reinforced as to withstand relatively greater loads than would be permitted by the metal thickness employed.

A further object is to provide a construction in which holding means is provided to cooperate with the pintle independently of the pintle receiving socket shell member, so that its structure will not be weakened, or increased in thickness, by the addition of such pintle holding means.

Another object is to provide an improved top bearing construction adapted to produce easy swiveling and positive centralization of the caster pintle, and further to provide holding means cooperating with the pintle independently of the socket member, and which will have no tendency to retard the swiveling action.

A still further object is to provide an improved type of spring ring holding means, formed of sheet metal, and a top bearing reinforcing plate, adapted to be produced to an exact relative size with relation to the ring by being punched therefrom.

With the above and other objects in view, an embodiment of the invention is shown in th accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:—

Fig. 1 is a side elevation, partly in section, of a caster socket, according to the present embodiment of the invention;

Fig. 2 is a vertical sectional view thereof, inserted in a furniture leg, and with the caster mounted therein;

Fig. 3 is a top plan view of the socket;

Fig. 4 is a bottom plan view thereof;

Fig. 5 is a top plan view of the top bearing plate and spring ring;

Fig. 6 is a bottom plan view thereof;

Fig. 7 is a sectional view of the same;

Fig. 8 is a sectional view of the top of the socket, with the bearing plate inserted therein in relation to its assembling dies;

Fig. 9 is a similar view showing the same assembled; and

Figs. 10 and 11 are views similar to Figs. 8 and 9, and showing a slightly modified form of construction.

Referring to the drawings, the socket according to the present embodiment of the invention, comprises a tubular socket shell member 10, formed of sheet metal stock folded upon itself, and providing a centrally domed top portion 11 and cylindrical sides, the meeting edges of the blank providing longitudinal seams 12 at opposed sides of the socket member. At the base of the socket member there is provided an annular outwardly bent shoulder 13 and an annular downwardly bent flange 14, the under surface of the shoulder being filleted, as at 15, to provide a spring ring receiving seat, as will hereinafter more fully appear.

The base member 16, cupped up from sheet metal stock, is provided with an inwardly bent bottom flange 17, beveled inwardly from its point of contact with the flange 14, and an upwardly bent bottom pintle bearing flange 18 having an inside diameter substantially the same as that of the socket member 10. At the upper edge of the base member there are formed spaced upwardly projected prongs 19, and between these are provided lug portions 20 adapted, as shown in Figs. 1 and 3, to be bent inwardly upon the surface of the shoulder 13, to secure the base to the socket member, the pintle retaining spring ring 21 being loosely disposed and retained in the annular space between the shoulder 13 and flange 14 and the bottom pintle bearing flange 18.

The split spring ring is preferably of the type disclosed and claimed, per se, in my copending application Serial Number 120,672, filed July 6, 1926, being formed of sheet metal having a cylindrical outer periphery

and a beveled flanged inner periphery, the latter having the three-fold function of imparting the necessary springiness or tension to the sheet metal, providing an upper seating surface to engage the seat 15 of the socket, and providing a beveled lead surface for guiding the pintle into the socket, without any chance of jamming the ring or pulling it out of its recess. The cylindrical outer periphery and the flat upper and lower adjacent surfaces insure a positive positioning of the ring in relation to the shoulder 13 and flange 14. The inner diameter of the ring in its normal or unsprung relation is smaller than that of the bottom bearing flange 18 and the socket shell, and its outer diameter is smaller than the inner diameter of the flange 14. The annular space between the flanges 14 and 18 is less than the lateral thickness of the ring, so that the latter will not lodge in this space upon lateral shifting against the flange 14, while the beveled surface of the ring is so dimensioned that upon such shifting movement the flat under surface of the ring will not be exposed within the pintle receiving opening of the flange 18, and any possibility of jamming through engagement with such flat surface is prevented.

The top center bearing reinforcing plate 22, as shown in Figs. 5 to 7, is of concavo-convex form, and is preferably cut from the ring 21, thereby utilizing metal that would otherwise be wasted, and which is of a quality particularly suited to the formation of the bearing, being of spring steel or brass. The diameter of the plate thus produced is of an exact size with relation to the spring, smaller than the inner diameter of the socket member 10 to an extent equal to the normal projection of the ring within such diameter, so that the plate may be readily inserted in the socket with its convex side engaging the top 11 thereof, as shown in Fig. 8. The plate is secured by means of suitable dies 23 and 24, which act to compress and expand its marginal portion against the top 11 and the adjacent cylindrical surface of the socket member, as shown in Fig. 9, the central portion remaining concavo-convex to provide a central cupped bearing for the pintle. The structure thus formed is relatively strong and wear resisting, and is of sufficient rigidity to withstand very heavy loads.

The detachable caster consists of the usual horn 25 having a caster wheel 26 rotatably carried therein upon an axle 27, and having a pintle 28 secured in its upper transverse portion, the lower end of the pintle being provided with a flange 29 engaging the upper surface of the horn, a rounded fillet surface 30 being formed between said flange and the cylindrical pintle surface. At the upper end of the pintle there is formed a socket or recess 31, in which a hardened steel ball 32 is secured by swaging or crimping, and is adapted to engage the concave top center bearing portion of the plate 22. The diameter of the pintle is such that it has a free but substantially full fit in the bottom bearing flange 18 and in the socket shell 10, and at the lower portion is adapted to expand the ring 21 and be thus held thereby against dropping out of the socket, the ring being securely held about the pintle and freely rotatable within the recess formed between the socket and base members.

The flanged structure of the socket and base members provides a very strong rigid construction, adapted to withstand heavy side strains, and is sufficiently reinforced, so that, before insertion of the caster pintle, it may be directly engaged with the floor surface, and moved about as a sliding support to a considerable extent, without danger of crumpling or distortion; the reinforcement provided by the flange 14 providing a strong rigid support, while the beveling of the flange 17 inwardly of the flange 14 relieves the flange 18 of any pressure, so that there is no danger of forcing the flange 18 into binding contact with the spring ring. Also the structure is such that it may be hammered into place with relatively hard hammer blows, without danger of crumpling, or of binding the spring ring, the blows being directed upon the base at its annular portion below the flange 14, which latter takes the force of the blows, the flange 18 being protected by the beveling of the flange 17.

In the operative or engaged position of the caster, as shown in Fig. 4, the pintle has thrust bearing upon the top center bearing and is held vertically by the substantial bottom bearing provided by the flange 18. While the spring ring firmly retains the caster against dropping out, its relation is such that there is no tendency to frictionally resist or retard the swiveling action of the caster. The reinforced top bearing permits of the use of relatively thin gauge metal in the socket member, so that the pintle, of a given diameter, may be a substantial full fit therein, without increasing the diameter of the hole drilled in the furniture leg over that heretofore employed with open non-top-bearing sockets.

In Figs. 10 and 11 I have shown a slightly modified construction, in which the plate 22 is inserted with relation to a flat-topped shell with its convex side downwardly, being thereupon flattened out and expanded by the dies 25 and 26 to secure its marginal edge in the shell and provide a reinforced top bearing.

The marginal edge, in its expanded relation, assumes a different shape from that of its original or unexpanded state, Figures 9 and 11, for instance, showing the same as

beveled. The expanded edge may, however, be formed to assume different shapes, and the term "beveled" is therefore intended to be construed as covering the expanded shape.

The invention is adapted not only for the attachment of casters, but of slides and other means adapted to be engaged with a socket by a pintle.

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

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

1. In a socket for casters, or the like, a tubular leg engaging element closed at its top, and adapted to receive a pintle, and a sheet metal reinforcing top bearing plate of non-flat cross section disposed in said tubular element in relation to said closed top and having an expanded periphery providing a retaining fit within the tubular element.

2. In a socket for casters, or the like, a tubular sheet metal leg engaging element adapted to receive a pintle, and a sheet metal top bearing plate having an expanded and bevelled periphery imbedded in and providing a retaining fit within the tubular element.

3. In a socket for casters, or the like, a tubular leg engaging element adapted to receive a pintle, a sheet metal spring ring projected inwardly with relation to the inner surface of said element, and a sheet metal top bearing plate having a diameter substantially equal to the opening of said ring, and being substantially of the same metal thickness, inserted in said element, and secured by expanding against the sides of said tubular element.

4. In a socket for casters, or the like, a tubular leg engaging element adapted to receive a pintle, a pintle retaining spring ring formed of sheet metal and supported in relation to said element, and a sheet metal top bearing reinforcing plate cut from the opening of said ring having a cross-sectional shape adapted upon being flattened to have a diameter larger than said ring opening, said plate being secured in relation to the top of said element by flattening and expanding against the sides thereof.

Signed at Newark, in the county of Essex, and State of New Jersey, this 25th day of June, 1926.

WALTER F. HEROLD.