

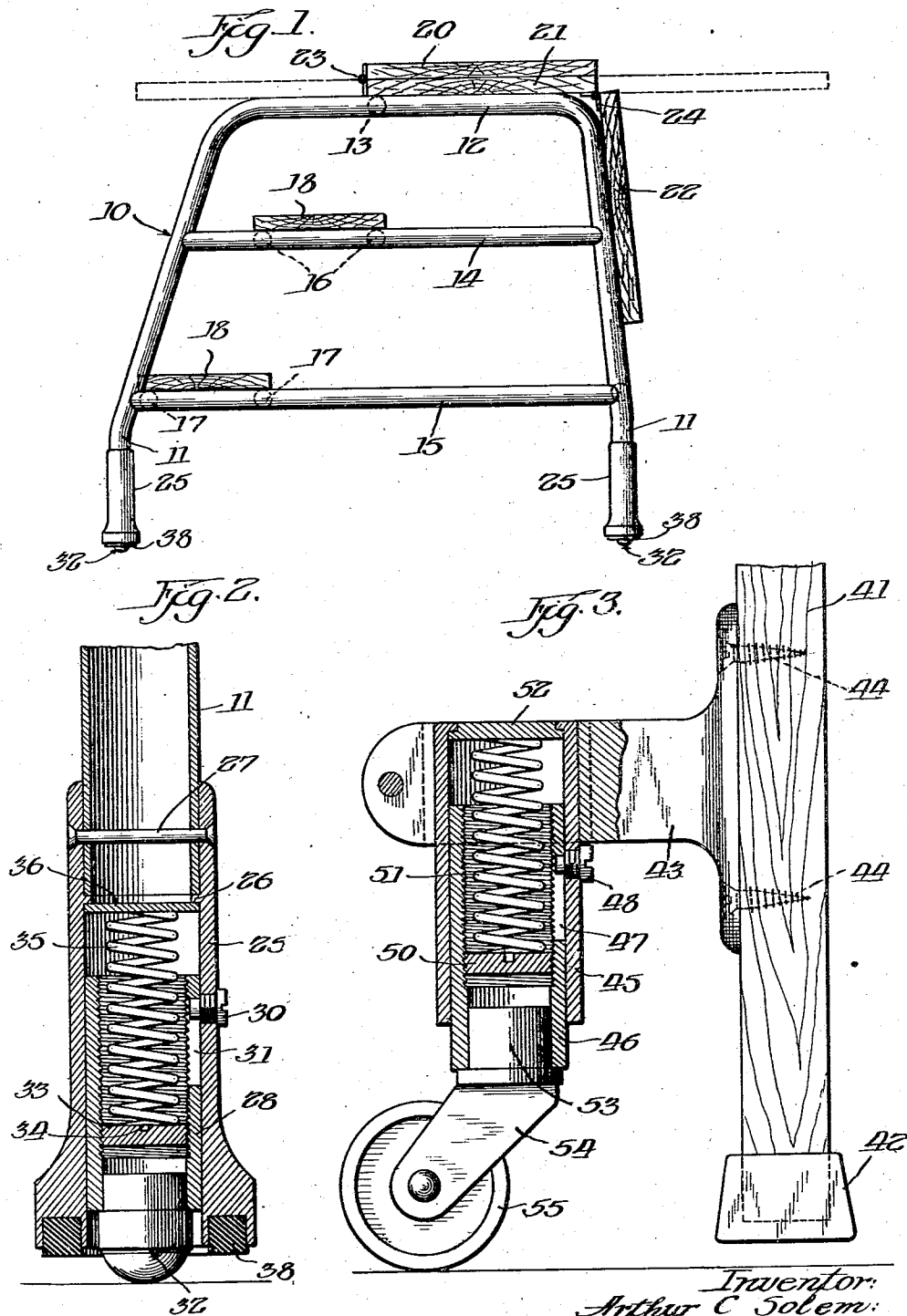
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SAFETY CASTER

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SAFETY CASTER

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1 Claim. (Cl. 16-44)

The invention relates to improvements in casters for use on such articles as step ladders, work stools, portable scaffolds and various types of furniture.

5 An object of the invention is to provide a casted article of furniture which will be freely movable except when supporting an additional weight such as the weight of a person or the like and which as a result of said additional weight
10 will be securely and firmly held to the floor.

Another object of the invention is to provide an improved caster which will normally depend below the leg or supporting element so as to enable free movement of the device such as an
15 article of furniture over the floor but which will be forced within the leg upon the application of weight to the article, whereupon said article will be positioned on the floor so as to make movement of the same practically impossible until
20 the weight is removed.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed
25 out in the specification, drawing and claim appended hereto.

In the drawing which illustrates an embodiment of the invention, and wherein like reference characters are used to designate like parts—

30 Figure 1 is a side elevational view showing a combination step ladder and map stool equipped with the safety casters of the invention;

Figure 2 is a vertical sectional view taken through a leg of the stool shown in Figure 1 and illustrating the interior construction of the
35 caster of the invention; and

Figure 3 is a side elevational view, parts of the caster being shown in section, illustrating a cantilever mounting of the same.

40 Referring to the drawing, particularly Figure 1, the combination step ladder and map stool disclosed is of tubular construction including end frames 10 formed of tubing approximately one inch in diameter and which end frames
45 include depending legs 11 and a horizontal cross piece 12. The end frames are spaced and connected by a horizontal piece of tubing 13. Also each end frame is provided with horizontal pieces 14 and 15, being suitably welded or otherwise
50 secured to the end frame. The identical pieces of the respective end frames are in turn connected by tubular members 16 and 17 which, in addition to connecting the end frames, provide a support for the treads 18.

55 The upper tread of this combination step lad-

der and stool consists of a plurality of boards 20, 21 and 22, having a length somewhat in excess of the width of the frame comprising the tubular members above described. The board 20 is secured to the board 21 by means of one or more
5 hinges 23 and in a somewhat similar manner board 22 is secured to the other side of board 21 by hinge 24. The construction of hinges 23 is such that board 20 may be doubled back so as to rest on board 21. This position of the parts
10 is shown in Figure 1 and in conjunction with the treads 18 a step ladder is provided. To form a map stool the board 20 is rotated with respect to board 21 so that the former will rest on the tubular cross pieces of the end frame. Board 22
15 is swung upwardly and likewise positioned so as to rest on said cross pieces of the framework. A relatively large flat surface is thus provided by the three boards for supporting a map or the like and which may be used for drawing or lay-
20 out work where the sheets are of relatively large size.

The combination step ladder and map stool above described has been selected as a typical article of furniture to which the safety caster
25 of the invention may be applied. The four depending legs 11 are each provided with a cylinder housing 25, as shown in Figure 2. On the interior of the housing an inwardly directed ledge or flange 26 is formed and this provides a
30 stop limiting the insertion within the cylinder housing of the leg 11. The same may be secured to the housing by a press fit and the parts may be joined by means of the rivet pin 27. The inside surface of the cylinder housing 25 is
35 machined for receiving the caster cylinder 28 which is adapted to have free vertical movement with respect to said housing. A set screw 30, threaded in the cylinder housing, projects into the slot 31 formed in and extending vertically
40 of the caster cylinder. The set screw therefore provides a stop limiting movement of the caster cylinder vertically of the housing.

The inside surface of the caster cylinder at its lower end is smooth surfaced and this end,
45 by means of a press fit, receives the ball caster 32. Above said ball caster the inside surface of the cylinder 28 is threaded for receiving the adjusting disc 33 which is formed with a recess 34 in its upper surface so that a screw driver can
50 be used to rotate the disc to vary its position vertically of the caster cylinder. The coil spring 35 is confined between said adjusting disc and a spring buffeting disc 36 which is held by said spring against the inwardly directed ledge 26.
55

As shown in Figure 2, the ball caster depends below the cylinder housing and therefore said ball caster will contact the floor or other support for the combination step ladder and stool. The rubber floor grip 38, fitted to the cylinder housing in its lower end, is accordingly positioned above and out of contact with said floor or other support. The position of the parts above described is secured by adjusting the tension of each spring 35 so that with only the weight of the article to be supported the ball casters will be caused to depend, or, in other words, the floor grips will be lifted out of contact of the floor. The ball in each caster is held so as to freely revolve and thus the combination step ladder and stool when not supporting a person or other additional weight will be freely movable over the floor on the ball casters.

However, when additional weight is placed on the article such as the weight of a person stepping on the treads 18 of the ladder, the spring 35 of each caster will be compressed since the caster cylinder is forced upwardly to assume a retracted position within the cylinder housing. The result of this movement of the caster cylinder is to cause the rubber floor grips 38 to engage with the floor or other support for the stool. The grips are formed of rubber in order to prevent slipping and accordingly the combination ladder and stool by reason of the weight placed thereon will be caused to securely adhere to the floor and will remain unmovable as long as the weight continues.

The structure shown in Figure 3 illustrates a cantilever mounting of a swivel caster embodying the features of the present invention. In this form of the invention the leg 41 is provided at its lower end with a rubber shoe 42. The bracket 43 is suitably secured to the leg by means of the screws 44. Said bracket is provided with an opening within which is securely fitted the cylinder housing 45. The inside surface of said housing is machined to provide a smooth fit for the caster cylinder 46 which is adapted to have movement vertically within the housing, said movement being limited by reason of the vertical slot 47 formed in said caster cylinder and the set screw 48 threaded in the housing.

As explained with respect to the structure of Figure 2, the upper portion of the inside surface of the caster cylinder is threaded for receiving and adjustably positioning the disc 50. Said disc has contact with one end of the coil spring 51 which has contact at its other end with the buffeting disc 52. Accordingly, the spring is confined between said discs but the tension of the same may be varied by varying the position of the disc 50 vertically of the caster cylinder. The cylinder 46 at its lower end receives the plug 53 forming part of the swivel caster which additionally includes the bifurcated arms 54 and caster wheel 55.

When the combination step ladder and stool or other article of furniture to which the structure of Figure 3 may be applied is supporting merely its own weight each caster wheel 55 will be caused

to depend below its rubber shoe 42. In other words, the spring 51 within each caster cylinder has been adjusted as to tension so as to lift the article and thus the rubber shoes 42 are spaced from the floor. Therefore the article of furniture can be easily moved over the floor, said movement being permitted by the caster wheels 55 and being facilitated by the ability of the same to swivel. However, if the weight of a person or the like is applied to the article of furniture the legs 41 will be caused to descend, whereupon the rubber shoes 42 will engage the floor. Since the shoes are of rubber they provide a non-skid support for the article, which is caused to adhere to the floor and which remains unmovable as long as said additional weight continues.

In the structure of the invention each of the coil springs which apply tension to the caster cylinder will have to be adjusted to suit the article of furniture to which the same are applied. For this purpose the set screws 30 or 48 are removed and the caster cylinder withdrawn from its housing. By inserting a screw driver within the same the adjusting disc may be elevated or lowered to suit conditions. If the adjusting disc is elevated the coil springs in assembled relation will apply greater pressure to the caster cylinder so that a heavier weight is required before the non-skid rubber grips will contact the floor. After the necessary spring tension has been determined for a standard article of furniture the adjusting disc can be permanently fixed within its caster cylinder and the threads in the upper portion of said cylinder can be eliminated.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawing, as various forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claim.

What is claimed is:

A caster for articles of furniture and the like, including a cylindrical housing having securement at its upper end to a leg of said article of furniture and providing at its lower end non-skid floor gripping means, a caster cylinder mounted for limited vertical movement within said housing, a caster fixed to the lower end of said cylinder, a buffeting disc positioned by said cylindrical housing above said caster cylinder, an adjusting disc within said caster cylinder, and resilient means confined between said discs for exerting a tension on said caster cylinder, the tension of said resilient means being adjusted by said adjusting disc to cause the caster thereof to depend below said non-skid floor gripping means when the article is supporting merely its own weight, whereby said article may be easily moved over the floor except when an additional weight is applied thereto sufficient to compress said resilient means and cause the non-skid gripping means to contact the floor.

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