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SELF LOCKING CASTER STEP LADDER

Filed Oct. 21, 1940
The invention relates to means for preventing accidental movement of ladders which are mounted on casters, while the ladders are in use, and particularly to a means which may be applied to any ordinary step ladder or the like, or to scaling ladders or single ladders of various kinds, which will operate automatically to permit movement of the ladder upon a caster. When the ladder is in use it will automatically contact the floor or other supporting surface with a braking action to prevent movement of the ladder while a person is standing upon the ladder.

It is an especially important aim of the invention to present such a device in an extremely simple and low cost form as an attachable device which may be fastened by ordinary screw-threaded fastenings to the foot portion of any usual ladder, to obtain the advantages above indicated.

It is well known that there are many situations in which caster-mounted ladders might be used if some means were provided for locking the foot of the ladder to the supporting floor, but on account of the high cost of such devices as have been heretofore provided for effecting a braking action of casters, or of connecting the ladder to the floor independently of the casters, it has not been found practicable to use caster mounted ladders in a great many situations. Particularly in this true when used on pavements or on small ladders where the operator may exert pressure on a wall or other structure, because of the liability of moving the ladder from its proper position, with liability of serious accident to the user, as well as interfering with the proper performance of the work in hand.

It is therefore an aim of my invention to present a device which will place the advantages of a locking device within the reach of users where the cost of prior devices would have been prohibitive, and in addition to obtaining its automatic operation.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will be more readily understood from the following description and accompanying drawing, wherein

Figure 1 is a side elevation of a ladder embodying my invention.

Figure 2 is a horizontal section through the caster element at the left, of Figure 1, looking downward.

There is illustrated a conventional form of step-ladder 10, including the ladder portion 11 having the usual steps 12, and a top table piece 13, all conforming to usual practice. Pivoted upon the structure there are easel legs 14, one of which is shown in Figure 1, which may be of usual construction in step-ladders, these being connected to the ladder 11 by stop-links 15 of a familiar kind, constructed to limit the opening movement of the easel portion 14. The links are also connected to limit the parallel movement of the links, so as to prevent return of the links to collapsed position except by manual direct pressure thereon, as is familiar in such devices.

In the ordinary use of my invention, a set of four casters are employed, one for each foot end of the ladder 11 and easel 14, two only of the devices being illustrated in the present instance. The caster elements of the foot portions of the easel are shown at the right in Figure 1, and comprise a saddle piece 16 formed in any approved shape, to receive the lower end of an easel leg therein, and to be secured to the leg by means of a screw, or bolt 17. This saddle piece has mounted thereon in conventional fashion a caster 18, which may be of any usual construction, of which numerous forms are available in the trade, and therefore its details are not specifically shown. It includes a usual fork element 19, the head portion of which is usually pivoted upon a base plate 20 in such devices, the fork having two depending arms between which a roller 21 is revoluely mounted in the usual way. The base plate or any other suitable pivotal mounting for the caster element may be secured to the saddle piece 16 by welding or otherwise, and it is understood that any other equivalent mounting of the device may be used.

For the foot portions of the ladder proper, I provide two casters, one of which is shown in Figures 1 and 2. This comprises a bracket mounting 22 including means to attach the device to the foot of the ladder, and also a mounting for the caster proper, in the present instance shown in the form adapted to be stamped integrally in one piece from resilient sheet metal. This bracket includes an upper, substantially U-shaped yoke portion 23, having parallel arms 24 adapted to fit closely and snugly against the opposite sides of the lower portion of the member 11. The yoke portion 23 is centrally apertured to receive a bolt 25 therethrough. The bolt is extended through the ladder member 11, and secured with a nut 26, preferably at the inner side of the ladder. This yoke includes a right portion 27 of planiform shape, adapted to lie flat.
against the inner edge of the ladder member 11, and extended integrally downward therefrom there is a tongue 28 curved outwardly at an angle of approximately sixty degrees or more, but less than ninety degrees, as shown, although the particular angle at which this arm 28 is disposed with respect to the bight portion 22 is not material within limits of between fifty and one hundred and twenty-five degrees, approximately. The arm 28 is bent with a curve of suitable arc at its junction with the bight 22, as indicated at 30, adapting the device to flexure, as a spring, as will subsequently appear. Beyond the curved part the arm 28 is extended as a planiform rectilinear member of a length to permit the mounting of a caster element thereon at a suitable distance from the curved part 28, so that the flexing of the arm adjacent the junction may extend over a suitable range to limit liability of fatigue of the metal. A caster 30 is mounted upon the outer end portion of the arm 28, and this caster may be substantially identical with the one shown at 18, or may be otherwise constructed to adapt it to its special manner of functioning, if discretion so dictates. In the present instance it is shown as having a base plate 30’ similar to the one in the first described caster, which plate is shown as circular in form in order to provide a proper bearing or race for the caster element, which may be of the ball-bearing type, or otherwise constructed, in accordance with familiar practice, these details not being illustrated as comprising no novel part of the present invention.

While I have described the invention with sufficient particularity to enable those conversant with the ladder and caster trades to embody the invention, it will be understood that this is purely exemplary, and that various modifications, both in construction, arrangement and utilization of equivalents may be carried out, in addition to those indicated, without departing from the spirit of the invention, as more particularly set forth in the claim here following.

In the production of the casters for the ladder foot, they are made with bracket portions of suitable strength in the spring portion 18 to support the weight of the particular ladder for which they are intended to be used. In use of ladders after attachment of my casters thereto as described, the foot portions of the ladder part 11, as well as those of the easel, are supported off the ground or floor upon which the casters rest. The ladder may be rolled from place to place, as required. As soon as a person steps upon one of the steps 12, however, the foot portions of the ladder 11 are depressed into engagement with the floor or pavement, or other surface thereunder, and immediately any subsequent horizontal movement of the ladder is prevented, as long as the person is resting his weight thereon.

I claim:

In a ladder, a bracket having a yoke portion adapted to receive a foot portion of the ladder therebetween and being secured thereto, said bracket having a bight portion and a resilient tongue integrally formed therewith extended downwardly and curved so as to lie at an angle to the yoke portion of the bracket and extended a substantial distance outwards therefrom, and a caster fixed on the outer end of the tongue, said bracket being mounted upon the foot portion of the ladder at a height to normally hold the foot portion clear of a supporting surface.

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