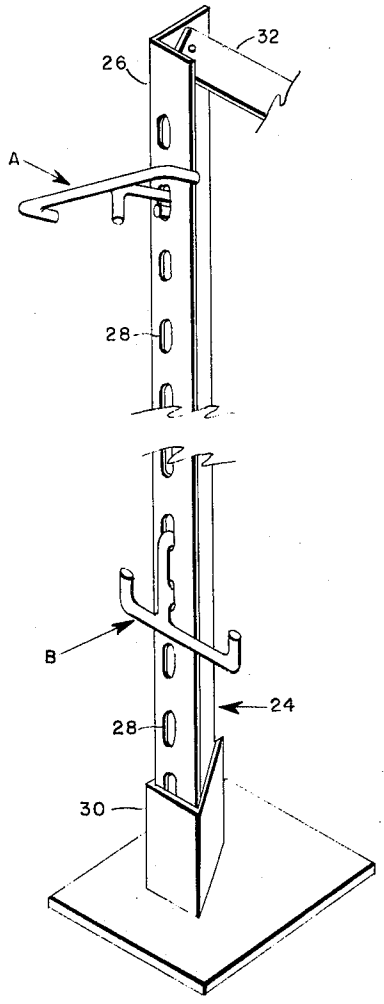
July 5, 1966 C. C. BROWN 3,259,209

LADDER

Filed May 7, 1964

FIG. 2



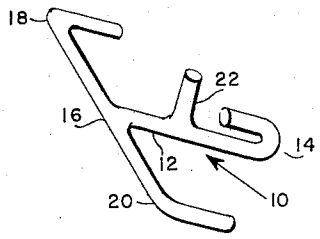




FIG. 1

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# LADDER

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This invention relates to an apparatus having special utility as a portable ladder. The ladder of this invention has detachable and movable step means permitting adjustability of the distance between adjacent steps. The ladder assembly is capable of rapid disassembly following use as well as easy and rapid reassembly. The structure of the apparatus of this invention is set forth in the following description which refers to the accompanying drawing in which

FIGURE 1 shows an individual detachable step element of this invention, and

FIGURE 2 illustrates an integrated ladder assembly and indicates the method of assembling the same.

FIGURE 1 shows a detachable and movable step **10** having a shank **12**. One end of shank **12** is provided with a suitable U-bend, hook or open loop **14**, which serves as hanger means, while the other end of shank **12** is attached perpendicularly to the mid-point of a crossbar **16**. Each detachable step has only a single, unitary hanger means, as indicated at **14**. Crossbar **16** is comprised of an arm **18** and an oppositely extending arm **20**. A stud **22** is attached to shank **12** at an intermediate position along the length of shank **12** and projects perpendicularly from shank **12** on the same side of shank **12** as U-bend **14** and on the same plane as U-bend **14**. U-bend **14** and stud **22** lie on a common plane which is substantially perpendicular with respect to crossbar **16**.

FIGURE 2 illustrates an integrated ladder assembly **24** which includes detachable step **10**. Ladder assembly **24** comprises a relatively narrow, elongated, upright perforate member **26**, which may be an angle iron as shown, having a plurality of oblong perforations or openings **28** extending completely therethrough and spaced apart from each other in a vertical row. Angle iron **26** is supported and maintained in a vertical position by any suitable means such as base stand **30** or scaffolding members **32**, or both.

The rear of each oblong opening **28** is unobstructed and the vertical spacing between adjacent pairs of oblong openings is determined by the distance between U-bend **14** and stud **22**. If desired, all oblong openings **28** can be spaced equidistantly. The elongated dimension of each oblong opening **28** is slightly larger than the width of U-bend **14**, as indicated at A in FIGURE 2, but need not be as large as the length of U-bend **14**.

The apparatus is assembled as follows. Step **10** is joined with perforate member **26** by inserting U-bend hanger **14** into an oblong opening **28**. Step **10** is mounted on perforate member **26** by directing the arcuate rim of U-bend **14** into an oblong opening **28**, as indicated at A in FIGURE 2. Thereupon, step **10** is rotated downwardly so that the adjacent lower oblong opening **28** receives stud **22**. Finally, step **10** drops into final position so that it is suspended at the arcuate rim of U-bend **14** and shank **12** abuts against the flat outer surface of perforate member **26**, as indicated at B in FIGURE 2. Step **10** is free of any inwardly directed protuberance which can prevent it from abutting squarely against the surface of perforate member **26**.

When in the position as shown at B, step **10** can support a vertical load by means of hanger **14**. If the load upon step **10** is unbalanced, as occurs when either arm **18** or arm **20** receives a greater weight than the other, lateral or rotational movement of step **10** is prevented by means of stud **22**. In this manner, even though step **10** is provided with only single, unitary hanger means **14** it is locked or secured against rotation due to an unbalanced load and can advantageously receive a weight on either arm **18** or arm **20**, while the other arm remains unload. As shown in FIGURE 2, angle iron **26** is relatively narrow whereby arms **18** and **20** project laterally outwardly from the periphery of angle iron **26** on opposite sides. Arms **18** and **20** are thereby adapted to receive the shoes of a person ascending a ladder assembly as shown in FIGURE 2.



It is noted that the apparatus of this invention can be adapted for uses other than a ladder. For example, it can be utilized as a hanger apparatus in which case the detachable step means can constitute a load supporting means. If the apparatus is not utilized as a ladder, vertical perforate member **26** can be appreciably wider, if desired, since for utility other than as a ladder, it might not necessarily be required that arms **18** and **20** project laterally beyond the periphery of vertical member **26**.

I claim:

**1.** An apparatus having only a single hanger means in the form of a U-bend and adapted for supporting an unbalanced load substantially without rotational movement comprising shank means having a U-bend at one end thereof and load receiving means at the other end thereof for receiving an unbalanced load, stud means extending from said shank means at an intermediate position along the length thereof, said stud means projecting from said shank means on the same side of said shank means as said U-bend and on the same plane as said U-bend, said plane being substantially perpendicular with respect to said load receiving means.

**2.** An apparatus having only a single hanger means in the form of a U-bend and adapted for supporting an unbalanced load substantially without rotational movement comprising shank means having a U-bend at one end thereof and crossbar means at the other end thereof, stud means extending from said shank means at an intermediate position along the length thereof, said stud means projecting from said shank means on the same side of said shank means as said U-bend and on the same plane as said U-bend, said plane being substantially perpendicular with respect to said crossbar means.

**3.** A detachable step for use in a ladder assembly, said step having only a single hanger means in the form of a U-bend and adapted for supporting an unbalanced load substantially without rotational movement comprising shank means having a U-bend at one end thereof and load receiving means at the other end thereof for receiving an unbalanced load, stud means extending from said shank means at an intermediate position along the length thereof, said stud means projecting from said shank means on the same side of said shank means as said U-bend and on the same plane as said U-bend, said plane being substantially perpendicular with respect to said load receiving means.

**4.** A detachable step for use in a scaffolding member having oblong perforations spaced apart in a vertical row, said step having only a single hanger means in the form of a U-bend and adapted for supporting an unbalanced load substantially without rotation, comprising shank means having a U-bend at one end thereof and crossbar means at the other end thereof, stud means extending from said shank means at an intermediate position along the length thereof, said stud means projecting from said shank means on the same side of said shank means as said U-bend and on the same plane as said U-bend, said plane being substantially perpendicular with respect to said crossbar means.

5. A ladder assembly comprising an upright member having a plurality of oblong perforations spaced vertically apart from each other and detachable step means, said step means having only a single hanger means in the form of a U-bend, said step means comprising shank means having a U-bend at one end thereof and crossbar means at the other end thereof, stud means attached to said shank means at an intermediate position along the length thereof, said stud means projecting from said shank means on the same side of said shank means as said U-bend and on the same plane as said U-bend, said plane being substantially perpendicular with respect to said crossbar means, the distance between adjacent oblong perforations in said upright member being related to the distance between said U-bend and said stud means so that said step means is mounted on said upright member by directing the arcuate rim of said U-bend into an oblong perforation followed by rotation of said step means downwardly so that the adjacent lower oblong perforation receives said stud means and then dropping said step means into final position.

6. The ladder assembly of claim 5 wherein said crossbar means projects laterally beyond the periphery of said upright member.

7. The ladder assembly of claim 5 including means for supporting said upright member.



8. The ladder assembly of claim 5 wherein the elongated dimension of said oblong perforations is slightly larger than the width of said U-bend but smaller than the length of said U-bend.


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