April 10, 1934. E. C. WINTER 1,954,112

STEPLADDER AND SAFETY LOCK THEREFOR

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Fig 1

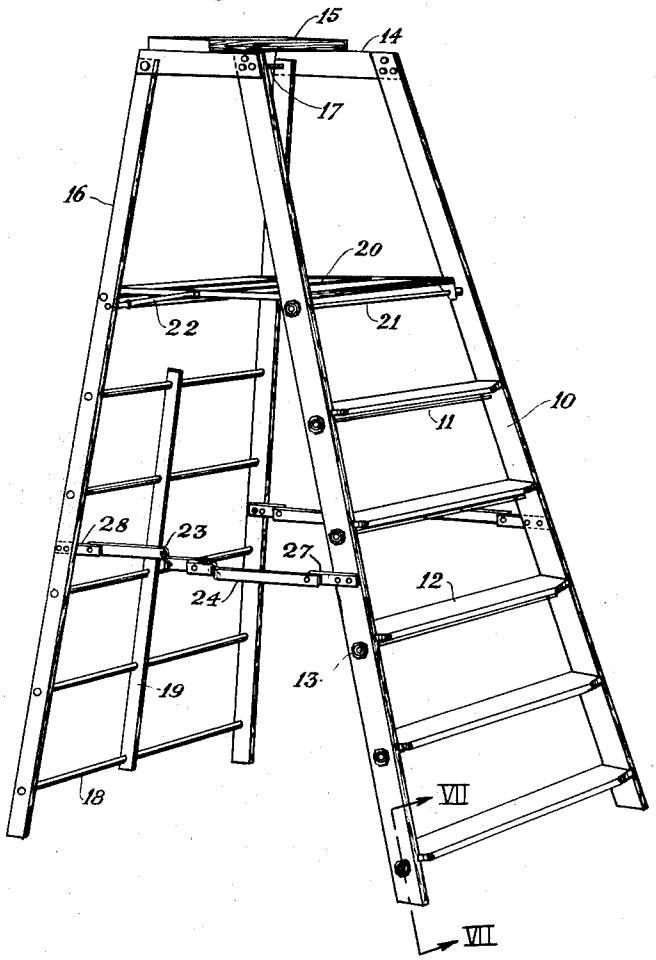


Fig 2

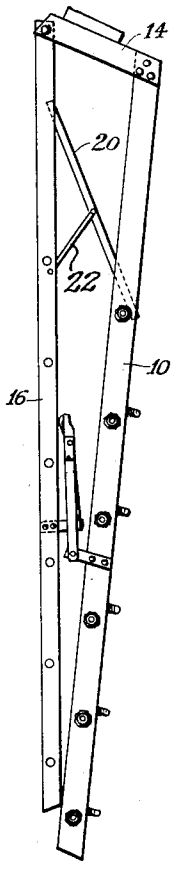
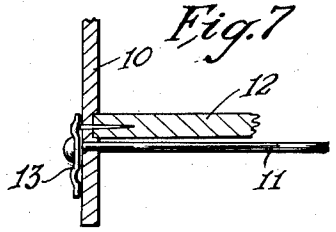


Fig. 7



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Fig 3

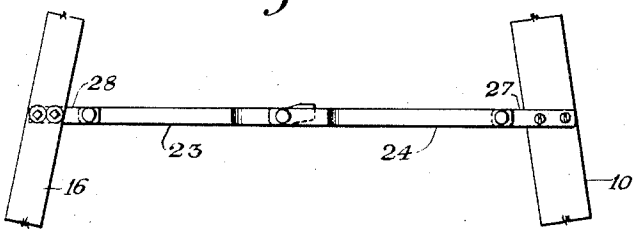


Fig 4

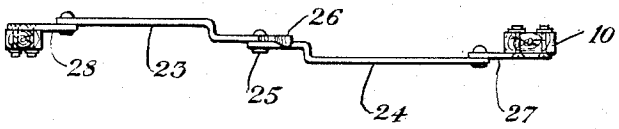


Fig 5

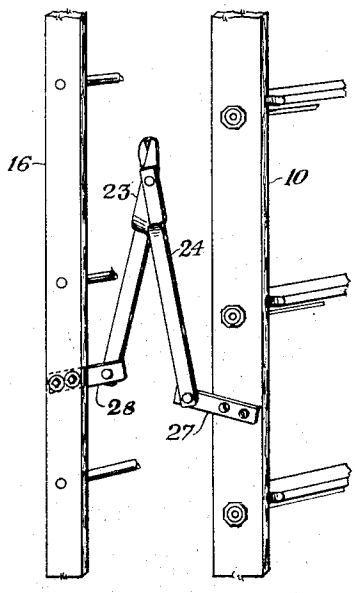
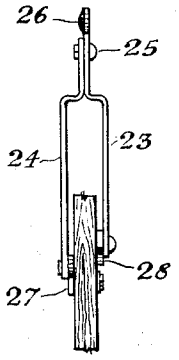


Fig 6



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UNITED STATES PATENT OFFICE

1,954,112

STEPLADDER AND SAFETY LOCK THEREFOR

Edward C. Winter, Chicago, Ill.

Application October 12, 1931, Serial No. 568,247

1 Claim. (Cl. 228—33)

This invention relates to a safety step ladder and particularly to a safety lock therefor and which forms a part thereof. It is well known that in use of step ladders of the type having a back brace or second ladder portion pivoted to the main ladder portion and having ordinary locks comprising two hinged straps, the operator's fingers or hands are frequently injured by the shearing action of such locks or by striking of the back brace thereagainst when the ladder is folded to be moved away. Such injury occurs particularly when the user stands facing the ladder, grips the ladder standards and pulls the ladder toward his body and trips the lock, thereby raising the back brace or second step portion from the floor to permit it to swing adjacent the main ladder portion. My invention is adapted to provide a safety ladder and safety lock which will obviate the possibility of injury to the user's hands whether they are on the ladder uprights or on the lever lock.

An important object of my invention is the provision of a lock for a step ladder which is so constructed that it will not shear the user's hands or fingers either in opening, folding or moving the same.

A further important object of my invention is the provision of a step ladder having a safety lock which has one main supporting section thereof so pivoted to the main ladder portion that it will not shear or strike a user's hands when holding the main ladder portion when the ladder is being folded.

A further important object of my invention is the provision of a step ladder having one section thereof hingedly connected with respect to the main section in such a manner that the user's hand holding the ladder cannot be struck or injured when the ladder is being folded, and further, having a tiltable platform which will be in inclined position when the ladder is folded and which will be horizontal when the ladder is in working position.

On the drawings:

Fig. 1 shows a perspective elevational view of my step ladder and safety lock in open and working position.

Fig. 2 is a side view showing the step ladder and safety lock thereon in closed position.

Fig. 3 is an enlarged fragmentary view taken from the side showing the safety lock in extended position.

Fig. 4 is a view taken from above of Fig. 3 showing the upper edge of the safety lock.

Fig. 5 shows an enlarged fragmentary view showing portions of the step ladder sections and the safety lock therebetween in partially closed position.

Fig. 6 is a view taken from the right of Fig. 5 showing the hinge lock in substantially closed position with the main portions thereof in different planes.

Fig. 7 is an enlarged detail view of the manner in which the rungs are attached to the stiles of the ladder.

As shown on the drawings:

As shown in Fig. 1, the reference numeral 10 indicates a step ladder section comprising a pair of vertical uprights between which are secured by nails, grooved joints and connecting rods 11 a plurality of horizontal steps 12 which are equidistant from each other. Grooved washers 13 are placed beneath the head and nut of each of the connecting rods 11 to provide greater strength and durability of the ladder section 10 as well as covering the nails supporting the steps, thereby preventing same from becoming loose and working out. A horizontal cross piece 14 is connected at an obtuse angled position to the upper end of each of the upright standards of the section 10 by means of suitable rivets as shown in Fig. 1. A horizontal step 15 is secured on the upper edges of the cross pieces 14.

A ladder section 16 comprising a pair of upright standards and having a plurality of equidistant rungs 18 secured in said standards in a well known manner, is hinged to said cross pieces 14 by means of a long pivot bolt 17 which passes through apertures in the upper ends of ladder section 16 and cross pieces 14 as shown in Fig. 1. Each of the rungs 18 pass through apertures in a central vertical reinforcing bar 19, thereby uniting said rungs at their centers to give greater strength and preventing breakage of any single rung.

A platform 20 having downwardly extending apertured ears at two adjacent corners thereof is pivoted between the uprights of the ladder section 10 by means of a connecting rod 21 as shown in Fig. 1. The platform is tiltable and the free end thereof is adapted to normally rest on the uppermost horizontal rung 18 of ladder section 16. A short lever 22 is pivotally attached in inclined position on each side of the platform 20, one end of each of said levers being pivoted to a side edge of said platform and the other end being pivoted to the standards of ladder 16 at a point slightly below the uppermost rung 18.

It will be apparent that when the ladder sections are folded together the free end of the platform 20 will be raised upwardly until said plat-

form is in the upwardly inclined position shown in Fig. 2. When the ladder sections are separated, said platform will be lowered to horizontal position.

My novel hinged lock, which is adapted to limit the distance which the two ladder sections may be separated from each other, comprises two metal straps 23 and 24, each of which has offset ends as clearly shown in Fig. 4, said offset ends being pivoted together by a pivot bolt 25 so that the opposite surfaces of said offset ends will be adjacent each other and the main portions of the straps 23 and 24 will be in substantially different planes. The offset end of the metal strap 23 extends a short distance beyond the pivot bolt 25 and has formed on the upper end thereof an abutment 26 which forms a stop to prevent pivotal action of said straps in a downward direction. Said abutment 26 maintains the lock in horizontal position when the ladder is being used, as clearly shown in Fig. 3.

Securely bolted to each of the upright standards of the ladder section 10 and preferably on the outer sides thereof is a relatively short metal strap 27 which projects toward the opposite ladder section and has an apertured end whereby the end of the strap 24 is pivoted thereto. A similar metal strap 28 is securely bolted to each of the upright standards of the ladder section 16 and extends toward the strap 27. The apertured end of the metal strap 23 is pivoted to the end of strap 28 by means of a pivot bolt as clearly shown in Figs. 3 and 4. Each of the straps 27 and 28 extend from the ladder section standards a sufficient distance so that when the ladder is folded, there will be adequate space for a worker's fingers or hands between either of the offset metal straps 23 and 24 and the uprights of the respective ladder sections, thereby permitting a worker to grip the upright standards when facing the ladder, tripping the lock and permitting the opposite ladder section to be folded to the position shown in Fig. 2.

A highly important feature of my invention is the novel result accomplished in the construction of my hinged lock. The operator, when facing the ladder, may merely reach over with both hands and pull the respective straps 24 upwardly to trip the hinge lock on each side, and he may continue to pull said straps toward himself and the main ladder section 10 until the opposite section 16 is folded as closely as possible against the main ladder section 10. Due to the offset construction of my hinge lock the operator's hands will not be sheared, pinched or otherwise injured even though he holds his hands on the respective straps 24 during complete folding of the ladder. As afore-stated, he may also place his hands about the standards of the ladder sections after the hinge lock is tripped and permit the weight of the opposite ladder section to complete folding of the ladder to the position shown in Fig. 2.

I am aware that many changes may be made and numerous details of the invention and construction thereof may be varied through a wide range without departing from the principles of this invention, and I therefore do not desire to limit the patent granted thereon otherwise than necessitated by the prior art.

I claim as my invention:

In a step ladder device of the hinged type, spreaders therefor, each comprising two elements having their adjacent ends offset laterally in opposite directions and pivotally connected together so as to present the major portion of said elements laterally spaced, and their opposite ends pivotally mounted on supporting elements which space said last named ends from their respective hinged ladder sections.

EDWARD C. WINTER.