

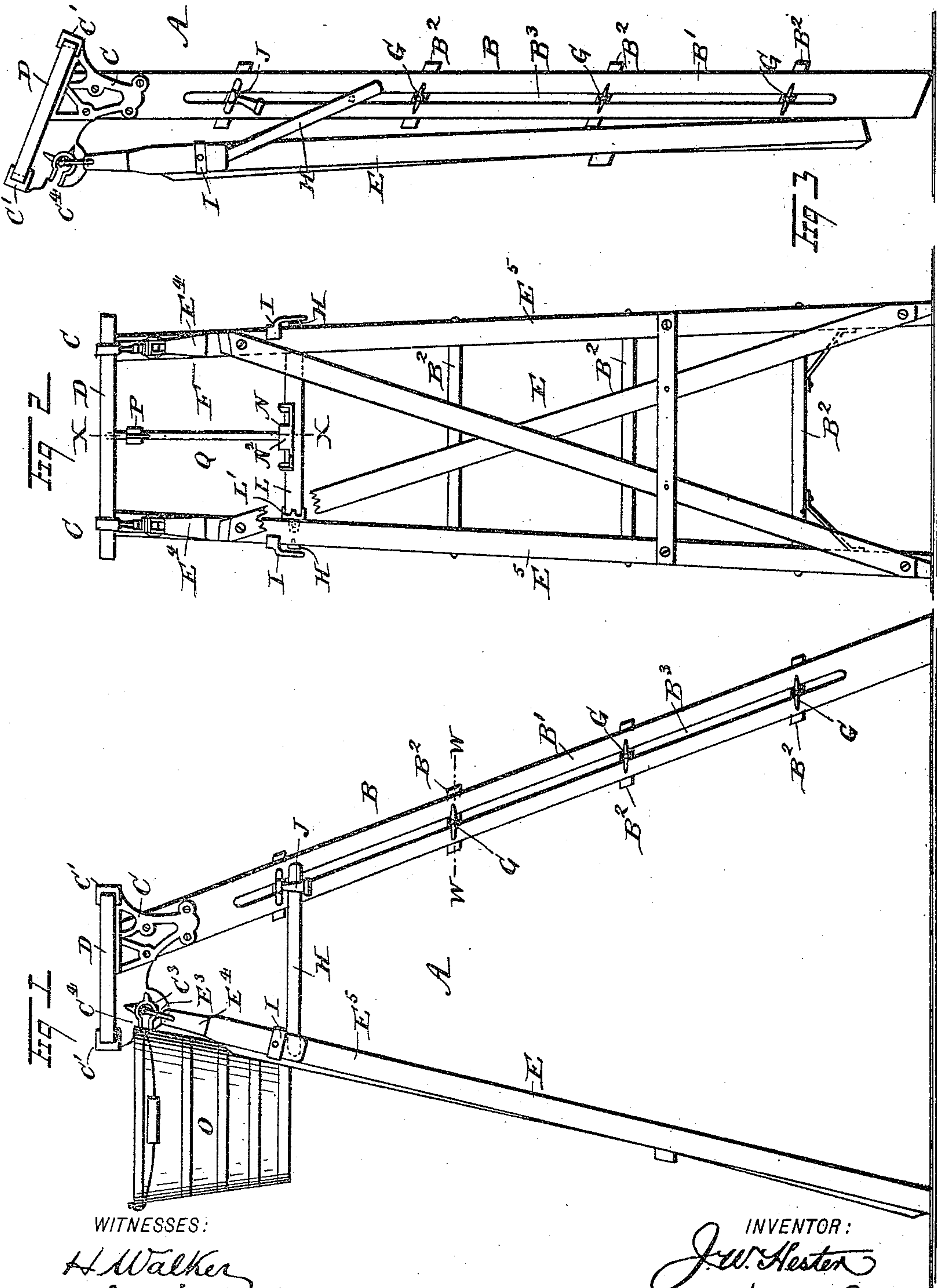
(No Model.)

2 Sheets—Sheet 1.

J. W. HESTER.
STEP LADDER.

No. 438,157.

Patented Oct. 14, 1890.



WITNESSES:

H. Walker
C. Sedgwick

INVENTOR:

J. W. Hester
BY Munn & Co.

ATTORNEYS

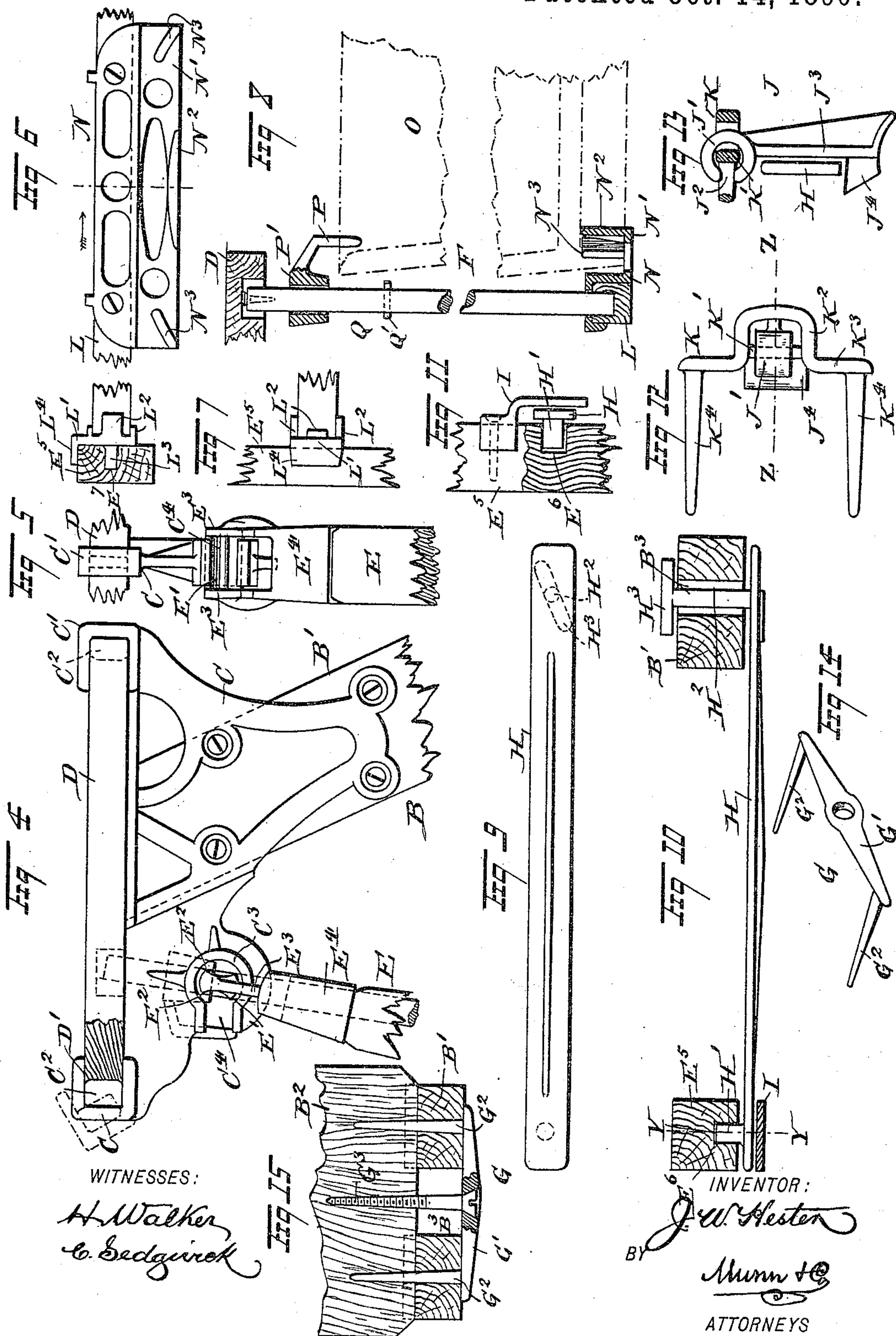
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UNITED STATES PATENT OFFICE.

JOHN W. HESTER, OF BROOKLYN, NEW YORK.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 438,157, dated October 14, 1890.

Application filed December 26, 1889. Serial No. 335,021. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HESTER, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Step-Ladder, of which the following is full, clear, and exact description.

The object of the invention is to provide a new and improved step-ladder which is simple and durable in construction, possesses great stability when extended, prevents spreading of the ladder, and which also forms a convenient support for a pail.

The invention consists in certain parts and details and combinations of the same, as will be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement as extended. Fig. 2 is a rear end elevation of the same with parts broken out. Fig. 3 is a side elevation of the improvement as folded up. Fig. 4 is an enlarged side elevation of the upper end of the improvement with parts in section. Fig. 5 is a rear end elevation of the same. Fig. 6 is an enlarged plan view of the pail-holder with parts in section. Fig. 7 is an enlarged side elevation of the bracket for supporting the cross-bar of the pail-holder. Fig. 8 is an enlarged sectional side elevation of the pail-holder on the line $x x$ of Fig. 2. Fig. 9 is a side elevation of one of the rods for holding the leg extended from the ladder. Fig. 10 is a plan view of the same as applied, showing the leg and ladder in section. Fig. 11 is a transverse section of the same on the line $y y$ of Fig. 10. Fig. 12 is an enlarged plan view of the locking device for the rod to hold the leg extended. Fig. 13 is a transverse section of the same on the line $z z$ of Fig. 12. Fig. 14 is a perspective view of the staple for fastening the steps to the sides of the ladder, and Fig. 15 is an enlarged sectional plan view of the same as applied.

The improved step-ladder A is provided with the ladder proper B, supporting at its upper end the rearwardly-extending side bracket C, on which is secured the top plate or platform D, and on the said brackets is also pivoted the upper end of the leg E, extending down-

ward and supporting in conjunction with the platform D a pail-holder F. The ladder proper B is provided with the usual two sides B', between which are held the steps B², secured in place by staples G, each of which is preferably of the construction shown in Figs. 14 and 15. Each staple G is provided with the front plate G', from which extend the pins G², arranged at the outer ends of the front plate and parallel with each other and adapted to be driven through the sides B' into the ends of the step B². In the middle of the plate G' is arranged an aperture for the passage of a screw G³, passing through a slot B³ in the side B' and screwing into the end of the respective step B², as is plainly shown in Fig. 15. By thus fastening the steps B² to the sides of the ladder the steps are securely held in place and can be raised or lowered whenever desired by removing the staples G and then moving the steps to the desired place and again driving the staples into place, as above described.

The platform D is held in place on the bracket C in the following manner: Each of the brackets is provided at its front and rear ends with a U-shaped clip C', between the ends of which is arranged a projection or lug C², adapted to engage a slot D', extending transversely at each side of the platform D. One of the U-shaped clips C', before the platform is secured, is bent outward, as shown in dotted lines in Fig. 4, so that when the platform D is placed on the respective bracket C it engages with one of its slots the U-shaped clip C', which is straight, and then the operator bends the other clip C' inward to engage its lug C² with the other slot D'. The ends of the clip C' pass over the top and bottom of the platform D, while the middle part rests against the side of the platform, as is plainly shown in Fig. 4. By this means the platform D is securely held on the bracket C without any screws or other means, and the platform is prevented from shifting laterally by the projection C² and sidewise by the clip C'.

At the rear lower end of each bracket C is formed a circular recess C³, terminating at the rear in the slot C⁴, somewhat narrower than the diameter of the circular recess C³. The latter is engaged by a transversely-extending pivot E', having flattened sides E², adapted to pass through the slot C⁴ in order to place the

pivot in the circular recess C^3 . The pivot E' is secured at its ends to the downwardly-extending arms E^3 , formed on a socket E^4 , secured to the upper end of each side piece E^5 of the leg E . In order to place the leg E in position on the bracket C , the leg has to be placed in a horizontal position, so as to bring the flattened sides E^2 of the pivot in line with the top and bottom of the slot C^4 , so as to permit of pushing the pivot-pin E' into the circular recess C^3 . When the leg E is then swung downward, the pivot is free to turn in the circular recess C^3 , but is prevented from being disengaged from the same, as the diameter of the pin is somewhat greater than the width of the slot C^4 , and only when the leg E is again moved into a horizontal position can it be removed or disconnected from the brackets C .

In order to hold the leg E and the ladder B apart when the step-ladder is to be used, two rods H are provided, each of which is provided at one end with a pin H' , adapted to engage a correspondingly-shaped recess E^6 , formed in each side piece E^5 of the leg E . In order to hold this end of the rod H in place, a keeper I is secured to the respective legs E^5 and extends over the front of the rod H , opposite the pin H' , so that the latter cannot be displaced from its recess in the side piece E^5 . On the front end of each rod H is secured a pin H^2 , passing through the slot B^3 of each side B' of the ladder B , and on the inner end of the pin H^2 is arranged a head H^3 , passing over the inside of the respective side B' , as is plainly shown in Fig. 10, so that the pin H^2 can be displaced from the side B' . The head H^3 is arranged in such a manner that when the ladder B is used and the leg E is extended, as shown in Fig. 1, the said head H^3 stands at right angles to the slot B^3 . In order to place the rods H in position, each rod is held downward, so as to permit the head H^3 to engage a slot B^3 , and pass through the same to the inner side of the side B' , after which the rod H is swung upward, the pin H^2 being in place in the slot B^3 . Then the pin H' on the other end of the rod is placed in the recess E^6 , and then the keeper I is fastened over this rear end of the rod, as and for the purpose previously described.

In order to lock the front end of each rod H in place, the locking device J is used, which is provided with a staple K , which takes the place of the staple G for the last step B^2 of the ladder B , the screw G^3 being omitted in this staple to hold the step in place, the latter resting only on the pins of the said staple K . This staple K is provided with a longitudinally-extending flattened pin K' , secured to the U-shaped metal part K^2 of the plate K^3 , from the ends of which plate extend the pins K^4 , adapted to engage the ends of the step in a manner similar to that shown and described in reference to the staple G . The flattened pin K' is adapted to be engaged by the circular eye J' of the locking device J , the said eye being provided at its inner end

with an opening J^2 , which is somewhat narrower than the width of the flattened pin K' , but about as wide as the thickness of the said pin, so that when the lock J is placed in a horizontal position it can disengage the pin K' , while when it hangs vertically it is free to swing on the said pin K' , but cannot disengage said pin. The body part J^3 of the lock J extends downward from the eye J' , and is provided at the inside of the lower end with a projection J^4 , beveled at its inner end and adapted to support the front end of the rod H . It is understood that the lock J hangs downward in a vertical position by gravity and rests with its lug J^4 against the outside of the side B' until the ladder B and the leg E are extended, so that the front ends of the rods H slide upward and come in contact with the beveled inner ends of the lugs J^4 , thus swinging the body part J^3 to permit the front ends of the rods H to snap over the lugs J^4 , which then move inward by gravity to support the free ends of the rods H , thus locking the latter in place in nearly a horizontal position, as is plainly shown in Fig. 1.

When the operator desires to fold up the ladder, he has to swing both locks J outward to free the front ends of the rods H , so that the latter can be swung downward, traveling with their pins H^2 in the slots B^3 and moving the leg E toward the ladder B , as shown in Fig. 3.

On the leg E , between its side pieces E^5 , is arranged a transversely-extending rod L , held in place at each end on a plate L' by means of lugs L^2 , engaging the four sides of the rod L . A pin L^3 extends from each plate L' and engages a corresponding recess E^7 , formed in the side piece of the leg E , so that the said plate L' is held in place on the side pieces, so as to support the rod L . In order to prevent each plate L' from turning, one end is provided with a lug L^4 , engaging one of the sides of the respective side piece E^5 .

In the middle of the transversely-extending rod L is secured a U-shaped plate N , provided with a rearwardly-extending projection N' , on the top of which is arranged a segmental lug N^2 near the middle of the said projection N' , and segmental lugs N^3 are arranged near the ends of the projection N' and are concentric with the segmental lug N^2 . On this plate N' are adapted to be set the lower ends of the staves of the pail O , the insides of the staves resting against the segmental lug N^2 , while the outsides of the staves are engaged by the segmental lugs N^3 , as is plainly shown in dotted lines in Fig. 8, thus preventing displacement of the pail O on the plate N .

In order to hold the upper part of the pail O in place, the latter is engaged by a hook P , adapted to pass over the insides of the staves and secured on a sleeve P' , mounted to slide vertically on a rod Q , arranged vertically and resting at its lower end in a recess in the rod L and held in place at its upper end in a circular recess in the under side of the platform

D. A pin Q' limits the downward sliding movement of the sleeve P', so that the operator, when placing the pail on the holder F, only raises the sleeve P' a short distance, so that the hook P can pass over the staves of the pail O, and then when the operator releases the sleeve P' the latter slides down on the rod Q and engages with its hook P the inside of the pail O. The latter is then locked and securely held in place on the holder F.

It will be seen that a step-ladder constructed in this manner is very simple and durable in construction, not liable to get out of order, and when the leg E is extended the connecting-rods H are securely locked in place, thus giving considerable stability to the ladder and preventing its upsetting.

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

1. In a step-ladder, the combination, with the ladder and a leg pivoted thereon, of a rod or rods pivoted to the said leg and held to slide in the said ladder and a gravity-latch held on the said ladder and adapted to engage the said rod, substantially as shown and described.

2. In a step-ladder, the combination, with slotted side bars having steps secured between them and legs pivotally connected to the said bars, of rods pivoted to the legs and provided with headed pins working in the slot of the said side bars and a latch pivoted to the side bars and adapted to engage the said rods, substantially as and for the purpose set forth.

3. In a step-ladder, the combination, with slotted side bars having steps secured between them and legs pivotally connected to the side bars, of a rod pivoted to the legs and provided with a headed pin working in the slot of one of the side bars and the pivoted latch J, provided with the projection J⁴ at its lower end for supporting the said rod, substantially as described.

4. In a step-ladder, a bracket provided at each end with a U-shaped clip and a lug arranged between the free ends of the said U-shaped clip, substantially as shown and described.

5. In a step-ladder, the combination, with the brackets C, each having the circular socket C³ and the narrow slot C⁴ leading thereto, of

flattened pivot-pins E', adapted to engage the said slots and sockets, arms E³, for supporting the said pivot-pin E', sockets E⁴, carrying the said arms E³, and the leg E, having the side pieces E⁵, on which the said sockets are secured, substantially as shown and described.

6. In a step-ladder, the combination, with the pivoted arm H, of the gravity-latch J, provided with the lug J⁴, having a beveled inner end and adapted to be engaged by the free end of the said rod H, substantially as shown and described.

7. In a step-ladder, the combination, with the pivoted arm H, of the gravity-latch J, provided with the lug J⁴, having a beveled inner end and adapted to be engaged by the free end of the said rod H, and the staple K, forming the pivot for the said latch, substantially as shown and described.

8. In a step-ladder, the combination, with the ladder B and the leg E, of the rods H, pivoted on the said legs E, and each provided on its free end with a pin and a head on the said pin, the latter engaging a slot in the sides of the ladder, and keepers secured to the said leg and passing over the pivoted ends of the said rods, substantially as shown and described.

9. In a step-ladder, the combination, with a plate adapted to support the pail, of a rod arranged vertically, or nearly so, on said plate, and a hook held to slide on the said rod and adapted to engage the pail at its upper edge, substantially as described.

10. In a step-ladder, the combination, with the platform and the pivoted legs, of a support carried by the legs, constructed to receive and support a pail, and a sliding hook for engaging the upper edge of the pail, substantially as described.

11. In a step-ladder, the combination, with the platform and pivoted legs, of the plate N, secured to a cross-bar of the legs and provided with the projection N', having the lugs N² N³, the rod Q, supported upon the cross-bar of the legs, and the sleeve P', fitting on the rod and provided with the hook P, substantially as herein shown and described.

JOHN W. HESTER.

Witnesses:

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C. SEDGWICK.