Dec. 19 1922. 1,439,388

B. E. WILLETT.
STEPLADDER.
FILED JUNE 6 1921.

3 SHEETS-SHEET 1

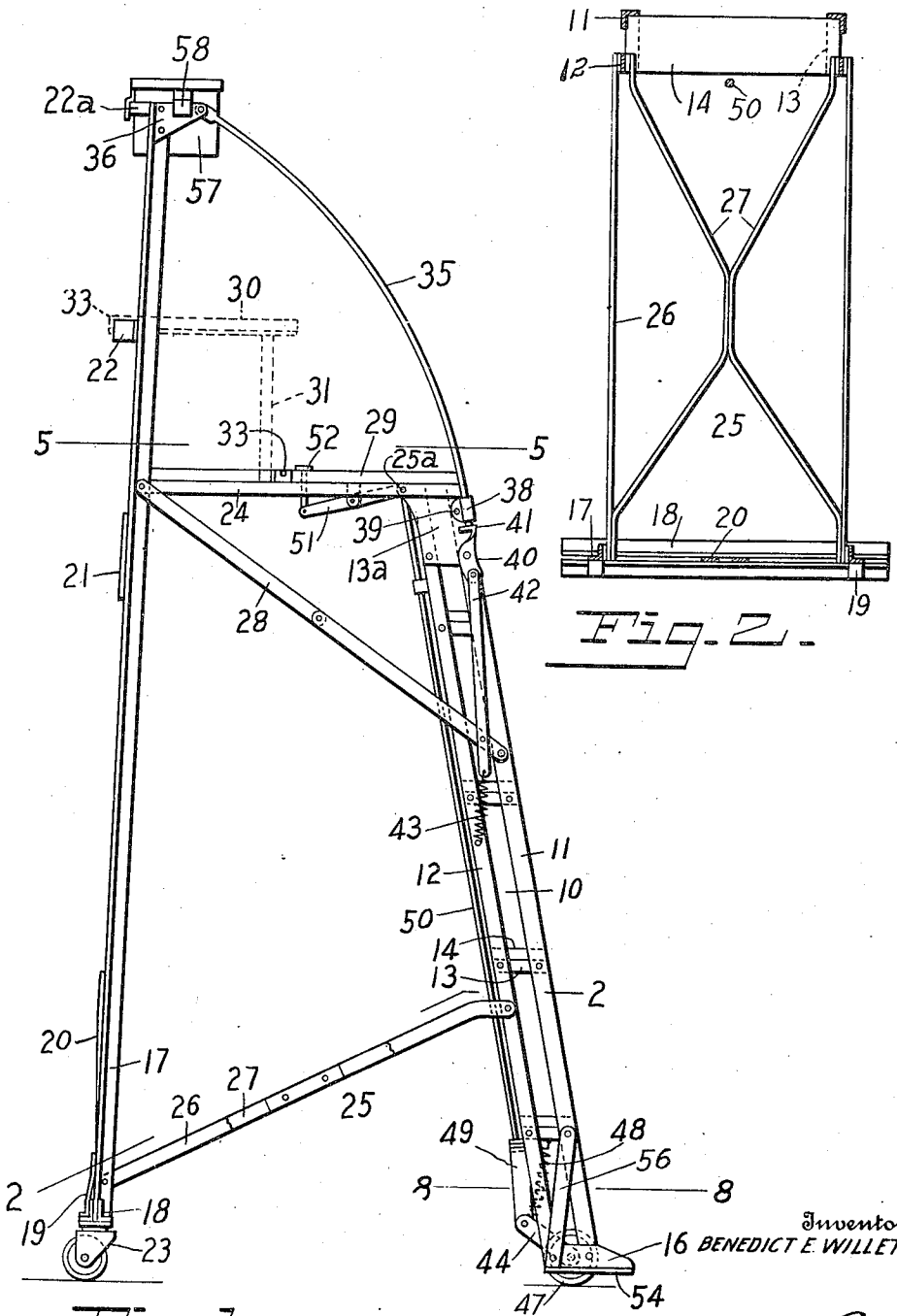


Fig. 1.

Fig. 2.

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3 SHEETS-SHEET 2

Fig. 3.

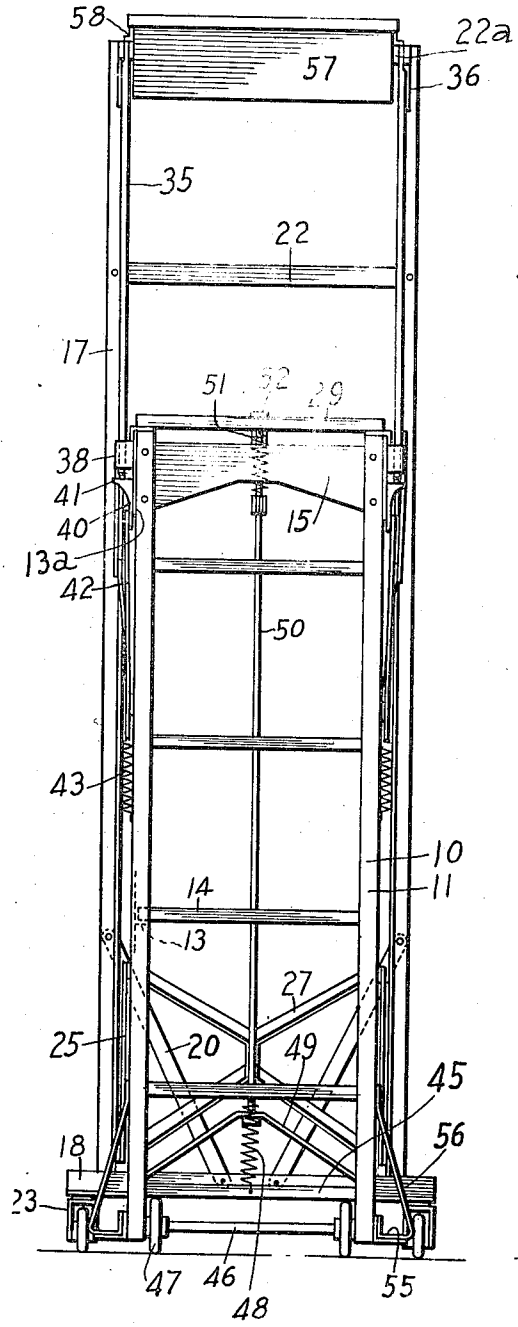
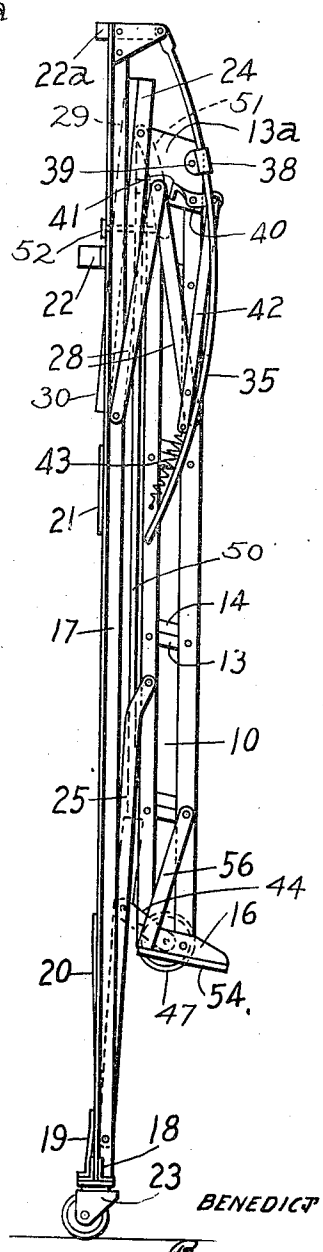


Fig. 4.



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3 SHEETS-SHEET 3

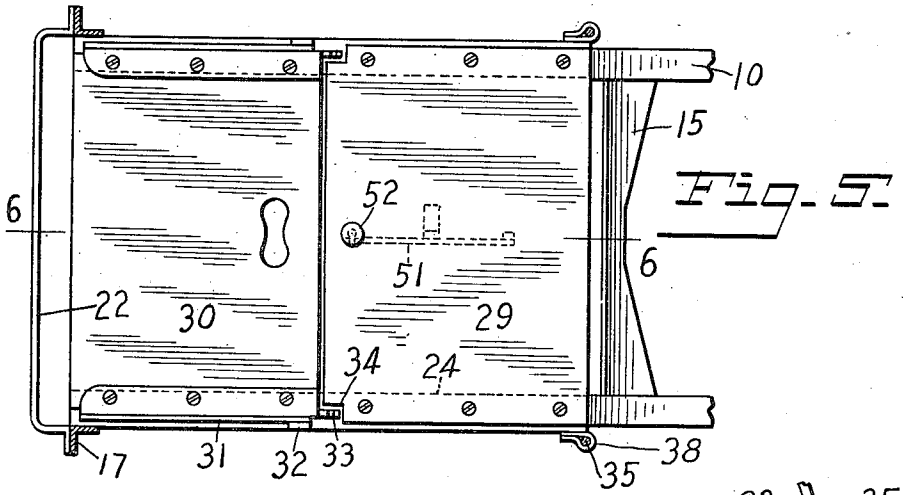


Fig. 5.

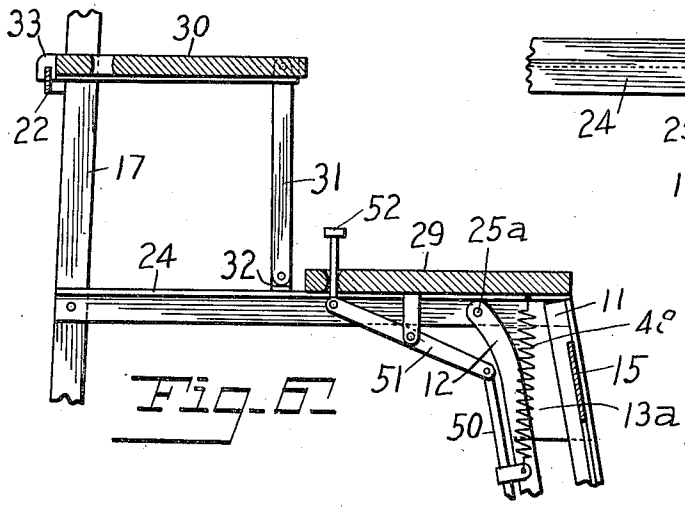


Fig. 6.

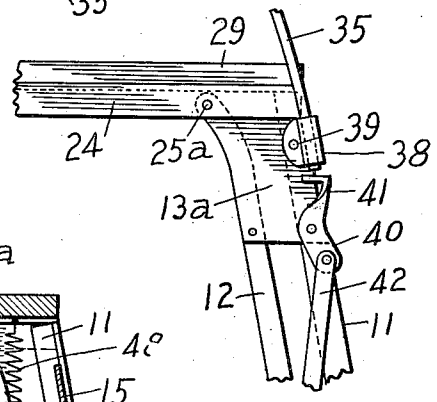


Fig. 7.

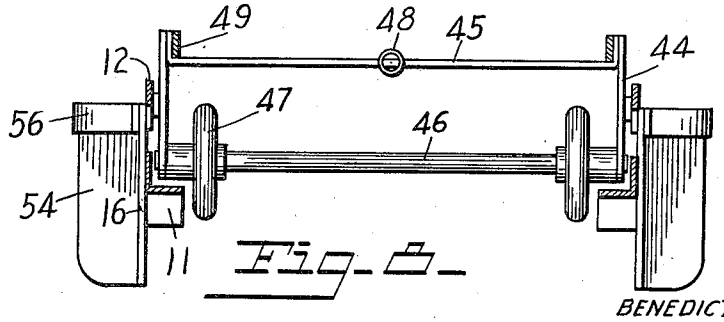


Fig. 8.

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Attorney

Patented Dec. 19, 1922. 1,439,388

UNITED STATES PATENT OFFICE.

BENEDICT E. WILLETT, OF DAYTON, OHIO.

STEPLADDER.

Application filed June 6, 1921. Serial No. 475,299.

To all whom it may concern:

Be it known that I, BENEDICT E. WILLETT, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Stepladders, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to step ladders and the like.

One object of the invention is to provide a structure of this kind which will have a relatively large work platform; which can be readily folded into compact form; and which, when in its extended or operative position, will be very strong and rigid.

A further object of the invention is to provide the work platform with guards, to prevent the workman from falling and which will be of such a character that they will not interfere with the folding of the structure into compact form.

A further object of the invention is to provide means for locking the structure in its extended position; and, further, to provide such locking means which will operate automatically when the structure is moved to its extended position.

A further object of the invention is to provide such a structure having castors which will be normally inoperative when the structure is subjected to the weight of the workman, but which may be rendered operative by the workman when he is on said structure.

Other objects of the invention will appear as the structure is described in detail.

In the accompanying drawings Fig. 1 is a side elevation of a step ladder embodying my invention; Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1; Fig. 3 is a front elevation of the structure of Fig. 1; Fig. 4 is a side elevation of said structure in its folded or collapsed position; Fig. 5 is a section taken on the line 5—5 of Fig. 1; Fig. 6 is a sectional view of a portion of the ladder taken on the line 6—6 of Fig. 5 and showing the rear portion of the platform elevated; Fig. 7 is a detail view of one of the locking devices; and Fig. 8 is a section taken on the line 8—8 of Fig. 1.

In these drawings I have illustrated one embodiment of my invention and have shown the same as comprising a rear frame and a front frame provided with steps and of less length than the rear frame. The front frame extends upwardly at a slight inclination to the rear frame and has its rear end spaced therefrom a distance sufficient to permit a relatively large work platform to be interposed between the same and the rear frame. The two frames are connected one to the other by suitable spacing devices which are of such a character and so connected with the frames that they will permit the frames to move one toward the other, to collapse or fold the structure into a compact form, and the work platform is so mounted on the frame that when the structure is collapsed, or folded, this platform will occupy a position substantially parallel with the frames. Guard rails extend downwardly and forwardly from the upper end of the rear frame to the upper end of the front frame and are so connected with the frames that they will fold alongside of the same when the two frames are moved one toward the other. It will be understood that these features may be embodied in structures of various kinds, such for example, as step ladders, scaffolds, and the like, and that the structures themselves may be constructed in various ways without departing from the spirit of the invention, the present structure having been chosen for the purpose of illustration only.

In that form of the invention here illustrated the front frame consists of two side members, indicated as a whole by the reference numeral 10 and each consisting of an angle bar 11 and a flat bar 12 arranged in the rear of the angle bar and connected therewith by connecting bars, or cleats, 13 which also serve as supports for steps 14. The bars 11 and 12 are, preferably, also connected at their upper ends by a reinforcing plate 13ª. The side frames are connected one to the other near their upper ends by a transverse bar, or plate 15 which is rigidly secured to the respective angle bars 11. The side frames are further connected and rigidly braced one against the other by the steps 14 which are rigidly secured to the cleats. The lower ends of the bars 11 and 12 of the respective side members are rigidly connected one

to the other by tie plates 16 and I prefer to provide the lower end of each side member with a base, or foot extending laterally and forwardly therefrom to resist any tendency on the part of the structure to tilt. To this end each tie plate 16 has a horizontal floor engaging portion 54 which extends laterally and forwardly from the side member a distance sufficient to brace the frame against any tendency to tilt. Each tie plate 16 is provided with a brace, preferably consisting of a bar having a horizontal portion 55 resting on and secured to the plate and an inclined portion 56 extending upwardly from the outer edge of the horizontal portion and rigidly secured to the angle bar 11 at a point above the tie plate. By thus constructing the frame members a very strong, rigid structure is provided and a maximum of strength is had with a minimum of weight.

The rear frame, in the form here shown, consists of two angle bars 17 spaced apart, preferably a distance slightly greater than the width of the front frame, and secured at their lower ends to a base 18 which may consist of two angle bars having their vertical flanges arranged back to back and rigidly connected one to the other, that flange of each vertical angle bar 17 which is parallel with the base extending between and being rigidly secured to the two vertical flanges of the base. The connection is reinforced by a brace 19 which is secured to the angle bar 17 and has its lower end secured to the base 18 and resting upon the rear flange thereof. The angle bars 17 are braced against the base by means of diagonal brace bars 20, and the upper portions of the bars are rigidly connected one to the other by transverse bars, or plates, 21 22 and 22a. The rear frame is preferably supported by swivelled casters 23 upon which the base 18 is mounted and which facilitate the movement of the structure from one position to another.

The front frame is of considerably less height than the rear frame and the two frames are connected one to the other by spacing members 24 and 25 which are of such a character and are so connected with the two frames that they will permit the latter to be moved one toward the other and thus be folded into a compact form. In the present construction the connecting devices are so arranged that the front frame member may be moved upwardly and rearwardly toward the rear frame and to this end the upper connecting device consists of two bars 24 pivotally connected at their rear ends to the respective angle bars 17 of the rear frame and pivotally connected at their forward ends with the respective side members of the front frame. In the present instance the two members of the upper connecting device are pivotally connected at 25a with the upper ends of the bars 12 of the respective side members of the front frame. The lower connecting device 25 is pivotally connected at its rear end with the respective angle bars of the rear frame near the lower ends thereof and is pivotally connected at its front end with the respective side members of the front frame at points some distance above the lower ends thereof so that the connecting device extends diagonally of the structure. This lower connecting device may be of any suitable character but, as here shown, it consists of side members, or bars, 26 and diagonal brace bars 27 having their central portions rigidly connected and diverging forwardly and rearwardly. The front and rear frames are further connected by toggles 28 which, when the frames are in their extended positions, serve to retain the same in such positions but which will collapse when the two parts thereof are moved out of alinement one with the other to permit of the movement of the frames one toward the other.

A platform 29 is mounted upon the upper spacing device 24, which in effect forms a part thereof, and extends between the two frames, thus providing a relatively large work platform which will fold against the rear frame, between the same and the front frame, when the front frame is moved upwardly and rearwardly toward the rear frame. If desired, the platform may be formed in two parts one of which may be supported in an elevated position to form a supplemental work platform of a greater height than the main platform. As here shown, the rear portion 30 of the platform is connected with the members of the spacing device 24 by links 31 which are connected with the ends of the part 30 of the platform near what is the rear edge thereof when the platform is in its normal position, and which are connected at their opposite ends with the side members of the spacing device near the rear edge of the fixed forward part of the platform, as shown at 32. When the platform is in its normal position, in which it constitutes one large platform, the links 31 lie parallel with and in the same plane with the rear portion 30 thereof, as shown in Fig. 5. When it is desired to utilize the supplemental platform the part 30 is elevated and turned over so that what formerly constituted the forward edge thereof becomes the rearward edge, as shown in Fig. 6, thus moving the links 31 into a vertical position and causing the normal front edge of the part 30 to extend between the angle bars 17 of the rear frame where it is connected with and supported by the upper transverse bar 22 of the rear frame, the part 30 being preferably provided at its edge with hooks 33

to engage the bar 22, which hooks may be formed in the ends of the bars which are secured to the respective edges of the platform member 30. When the part 30 is in its normal or lowermost position the hook-shaped ends of the bars lie in recesses 34 in the forward portion of the platform so that they do not project above the main platform or form any obstruction thereon.

Connected with the upper portion of the rear frame and extending downwardly and forwardly therefrom are side rails 35 which, together with that portion of the rear frame above the platform, constitute a guard extending about three sides of the platform to prevent the workman from falling. The side rails are of such a character that they will fold alongside of the structure when the two frames are moved one toward the other. To this end, the side rails are pivotally connected at their upper ends with the rear frame, the connection preferably being made between the upper ends of the rails and forwardly extending arms 36, rigidly secured to the respective bars 17 and in the present instance, triangular in shape. These bars are curved downwardly and are slidably mounted at their lower ends in apertured lugs 38 which are pivotally mounted at 39 on the respective side members of the front frame, the curvature of the rails 35 being such that as the front frame is moved upwardly and rearwardly toward the rear frame the apertured lugs will move along the respective rails and will cause these rails to move about their pivotal connections with the rear frame and to fold alongside of the collapsed structure. It is desirable that some means be provided, other than the toggles 28, to positively lock the structure in its extended position to prevent any possibility of its being inadvertently collapsed while in use, and I prefer that such a locking device should be automatic so that it will assume its locking position, without action on the part of the workman, when the structure is moved into its extended position. This locking device may take various forms but I have accomplished the desired result in a very simple way by locking the front frame and the side rails 35 of the guard against relative movement and in this way preventing the front frame from being moved toward the rear frame so long as the locking device is in its operative position. To accomplish this I have pivotally mounted on the respective side members of the front frame locking levers 40, the upper ends of which are preferably bent laterally, as shown at 41, and are adapted to be moved into and out of a position adjacent to and in line with the lower ends of the side rails 35. The lower portions of the levers 40 are pivotally connected with levers 42 which extend downwardly along the side members of the front frame and are pivotally mounted on the adjacent arms of the toggles 28. The arrangement is such that when the toggles are broken to permit the frames to be moved one toward the other the locking levers will be moved into inoperative positions, or when the levers 42 are directly actuated to move the locking levers to inoperative positions the toggles will be broken. In either case a single operation releases both devices so that the frames are in a condition for folding. Likewise, when the frames are moved to their extended positions the straightening of the toggles will move the locking levers into their operative positions after the side rails have completed their movement, so that the parts 41 will not engage the rails themselves but will move beneath the same. A spring 43 connected with each lever 42 below its point of connection with the toggle, may, if desired, be employed to assist in moving the locking lever to its operative position.

With the rear frame mounted on castors the structure may be moved from one position to another, without great difficulty, by lifting the front frame and allowing the device to travel on the rear castors, but I prefer to provide the front frame with castors, or rollers, to render the movement of the structure more easily accomplished. However, it is not desirable that the structure should be supported wholly on the castors when it is in use. I have therefore, mounted on the lower portion of the front frame an auxiliary frame 44 comprising side arms pivotally mounted on the bars 12 of the front frame and connected at their rear ends by a transverse bar 45. Those portions of the frame 44 lying in front of its axis have mounted therein a shaft 46 on which are mounted rollers, or castors, 47 which rest normally on the floor, the arrangement being such that the front frame may be moved into and out of operative engagement with the floor by the movement of the frame 44 about its axis. Connected with the transverse bar 45 of the frame 44 is a spring 48, the upper end of which is connected with a suitable part of the front frame and the tension of which is sufficient to overcome the weight of the structure and lift the front frame out of engagement with the floor, thus causing the front frame to be supported on the castors. The strength of the spring, however, is only slightly greater than that necessary to lift the front frame when the structure is unoccupied and as soon as the structure is subjected to the weight of the workman the spring will yield and the front frame will be moved into engagement with the floor, thus providing a firm, solid support for the front frame. Under some conditions of work it is desirable that the structure should be movable while the workman is on the same

and to permit this to be done I have provided means under the control of the workman for forcing the rollers, or castors, 47 into engagement with the floor and lifting the front frame out of engagement therewith. To this end I have connected with the rear portion of the supplemental frame 44, a yoke 49, with the central portion of which is connected a rod 50 which extends upwardly along the rear side of the front frame and is pivotally connected at its upper end with the forward end of a lever 51 which is pivotally mounted between its ends beneath the platform 29. The rear end of the lever 51 has connected therewith a plunger 52 which extends through an opening in the platform and projects above the same into a position in which it may be readily actuated by the workman. As the workman th.ows his weight on the plunger 52 it will be apparent that the lever will operate to lift the rear portion of the supplemental frame 44 and thus lift the front frame out of engagement with the floor and to retain the same out of engagement therewith so long as the weight of the operator is on the plunger.

I have also shown the structure as provided with a tool box 57 arranged in a convenient position with relation to the platform 29. As here shown, thi tool box extends between the upper ends of the angle bars 17 of the rear frame and serves to connect these bars one to the other. If desired, the tool box may be removable and, as here shown, it is provided at its ends with depending lugs 58 spaced from the ends thereof and forming hooks to engage over the respective arms 36 and connecting bar 22^a, thus firmly attaching the tool box to the rear frame.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a structure of the character described, a front frame, a rear frame to support said front frame, said rear frame being spaced from the upper end of said front frame, a spacing device pivotally connected at its ends with the respective frames and arranged to permit said frames to move one toward the other, and a platform carried by said spacing device and arranged to be folded between said frames when the latter are moved one toward the other.

2. In a structure of the character described, a front frame, a rear frame to support said front frame, said rear frame being spaced from the upper end of said front frame, a spacing device connecting said frames one to the other and movable relatively thereto to permit said frames to move one toward the other, a platform movably mounted on said frames, and adapted to be moved into a position alongside thereof when said frames are moved one toward the other, said rear frame having a part extending above said platform, and guard rails extending from said part of said rear frame to the upper end of said front frame, said rails being pivotally connected with said parts to permit them to fold along with said structure when said frames are moved one toward the other.

3. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, spacing devices to brace said frames one against the other and so arranged that one frame may be moved upwardly and toward the other frame to collapse the structure, the uppermost spacing device constituting a support for a platform and being pivotally connected at its ends with said frames and arranged to fold against the upper portion of said rear frame between the same and said front frame.

4. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, and a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames, to permit one of said frames to move upwardly toward the other frame and a spacing device extending upwardly and rearwardly from said front frame toward said rear frame.

5. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames to permit said front frame to move upwardly and rearwardly toward the rear frame, and side rails extending downwardly and forwardly from the upper end of said rear frame and slidably connected with said front frame to permit the relative movement of the two frames.

6. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame,

a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames to permit said front frame to move upwardly and rearwardly toward the rear frame, apertured lugs pivotally mounted at the respective sides of said front frame near the upper end thereof, side rails pivotally connected with the upper end of said rear frame at the respective sides thereof and curved downwardly and forwardly and slidably mounted in the respective apertured lugs on said front frame.

7. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames to permit said front frame to move upwardly and rearwardly toward the rear frame, side rails extending downwardly and forwardly from the upper end of said rear frame and slidably connected with said front frame to permit the relative movement of the two frames, and means to lock said rails against movement relatively to said front frame.

8. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames to permit said front frame to move upwardly and rearwardly toward the rear frame, side rails extending downwardly and forwardly from the upper end of said rear frame and slidably connected with said front frame to permit the relative movement of the two frames, and locking devices mounted on said front frame for movement into and out of the paths of said rails to lock said front frame and said rails against relative movement.

9. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, a platform supporting device extending from the upper portion of said front frame to said rear frame and pivotally connected with the respective frames to permit said front frame to move upwardly and rearwardly toward the rear frame, side rails extending downwardly and forwardly from the upper end of said rear frame and slidably connected with said front frame to permit the relative movement of the two frames, locking devices mounted on said front frame for movement into and out of the paths of said rails to lock said front frame and said rails against relative movement, and means controlled by the movement of said frames one from the other for moving said locking devices into line with said rails.

10. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, spacing devices connecting said frames one to the other and arranged to permit the front frame to move upwardly and rearwardly toward the rear frame, toggles extending between said frames to hold the same in their extended positions, a work platform extending between said frames and foldable against said rear frame when the front frame is moved toward the latter, and a device controlled by the movement of said frames to their extended positions to positively lock the same in those positions.

11. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, spacing devices connecting said frames one to the other and arranged to permit the front frame to move upwardly and rearwardly toward the rear frame, toggles extending between said frames to hold the same in their extended positions, a work platform extending between said frames and foldable against said rear frame when the front frame is moved toward the latter, a device mounted on said front frame and actuated by said toggles to positively lock said front frame against movement toward said rear frame.

12. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, spacing devices connecting said frames one to the other and arranged to permit the front frame to move upwardly and rearwardly toward the rear frame, toggles extending between said frames to hold the same in their extended positions, a work platform extending between said frames and foldable against said rear frame when the front frame is moved toward the latter, guides carried by the upper end of said front frame, side rails pivotally connected at their upper ends with said rear frame and extending through the respective guides on the front frame, whereby the lower ends of said rails will be moved toward said rear frame along with said front frame, and a locking device mounted on said front frame

and arranged to be actuated by said toggles to lock said side rails and said front frame against relative movement.

13. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, spacing devices connecting said frames one to the other and arranged to permit the front frame to move upwardly and rearwardly toward the rear frame, toggles extending between said frames to hold the same in their extended positions, a work platform extending between said frames and foldable against said rear frame when the front frame is moved toward the latter, guides carried by the upper end of said front frame, side rails pivotally connected at their upper ends with said rear frame and extending through the respective guides on the front frame, whereby the lower ends of said rails will be moved toward said rear frame along with said front frame, a locking lever mounted upon each side of said front frame and having a portion arranged to be moved into line with the end of the adjacent side rail when said structure is moved to its extended position and means for connecting said lever with one of said toggles to move the locking part into line with said rail.

14. In a structure of the character described, a rear frame, a front frame provided with steps and of less length than said rear frame, said front frame being spaced throughout its length from said rear frame, spacing devices connecting said frames one to the other and arranged to permit the front frame to move upwardly and rearwardly toward the rear frame, toggles extending between said frames to hold the same in their extended positions, a work platform extending between said frames and foldable against said rear frame when the front frame is moved toward the latter, guides carried by the upper end of said front frame, side rails pivotally connected at their upper ends with said rear frame and extending through the respective guides on the front frame, whereby the lower ends of said rails will be moved toward said rear frame along with said front frame, a locking lever mounted upon each side of said front frame and having a portion arranged to be moved into line with the end of the adjacent side rail when said structure is moved to its extended position, and a second lever pivotally connected at one end with said locking lever and at its other end with one of said toggles, whereby the movement of said toggle will move said locking lever into and out of line with said rail.

15. In a structure of the character described, a rear frame, a front frame having its upper end spaced from the rear frame, spacing members connecting said frames one to the other and movable relatively thereto to permit said frames to move one toward the other, and a platform extending between said frames and connected thereto for movement into a position alongside thereof when said frames are moved one toward the other, said platform comprising a movable portion, and means for supporting said movable portion in an elevated position relatively to the main platform.

16. In a structure of the character described, a front frame, a rear frame of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, spacing devices so connected with said frames that the latter may be moved one toward the other, a platform mounted on said frames and movable into a position alongside thereof when said frames are moved one toward the other, said platform comprising a portion movable into an elevated position, means connected with said movable portion for supporting the forward edge thereof, and other means for connecting the rear edge of said movable portion with said rear frame.

17. In a structure of the character described, a front frame, a rear frame of greater height than said front frame, both the upper and lower ends of the front frame being spaced from said rear frame, and spacing devices so connected with said frames that the latter may be moved one toward the other, the uppermost spacing member constituting a support for a platform and being arranged to fold alongside of said frame members when the latter are moved one toward the other, said platform comprising a portion movable into an elevated position relatively thereto, links connected at one end with said movable portion of said platform and at the other end with the spacing device on which said platform is supported, said links being arranged to extend parallel with the edges of said movable portion when it is in its normal position and to form supporting members therefor when it is in its elevated position, and means for connecting the rear edge of said movable portion of said platform with said rear frame.

18. In a structure of the character described, a rear frame, and a front frame connected thereto for movement toward and from the same, means for holding said frames in spaced relation, castors for said frames, the castors for one frame being movably connected therewith to permit said frame to be moved into and out of contact with the floor and a spring interposed between said frame

and said castors to hold the same normally out of engagement with the floor, said spring being of such strength that it will yield to the weight of a workman on said structure and permit said frame to engage the floor.

19. In a structure of the character described, a rear frame, a front frame connected thereto for movement toward and from the same, means for holding said frames in spaced relation, castors for said frames, the castors for one frame being movably connected therewith to permit said frame to be moved into and out of contact with the floor, and means under the control of the workman on said structure to cause said frame to be moved out of engagement with the floor.

20. In a structure of the character described, a rear frame, a front frame spaced from said rear frame and movable toward and from the same, a platform carried by said frames, castors for said frames, the castors for one of said frames being movably connected therewith to permit the frame to move into and out of contact with the floor, and an operating device arranged adjacent to said platform and connected with said frame and said castors to cause the frame to be moved out of contact with the floor.

21. In a structure of the character described, a rear frame, a front frame spaced from said rear frame and movable toward and from the same, a platform carried by said frames, castors for said frames, a supplemental frame pivotally mounted on said front frame and carrying the castors thereof, an operating device mounted adjacent the said platform, and an operative connection between said operating device and said supplemental frame to cause the front frame to be lifted out of contact with the floor.

22. In a structure of the character described, a rear frame, a front frame spaced from said rear frame and movable toward and from the same, a platform carried by said frames, castors for said frames, a supplemental frame pivotally mounted on said front frame and carrying the castors therefor, a spring interposed between said supplemental frame and said front frame to hold the latter normally out of contact with the floor, said spring being of such strength that it will yield under the weight of the workman on said structure to permit said front frame to move into contact with the floor, an operating device mounted adjacent to said platform, and a connection between said operating device and said supplemental frame to cause said front frame to be moved out of contact with the floor.

23. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, and a spacing device pivotally connected at its ends with said frames to enable one frame to be moved upward and toward the other frame to collapse said structure and fold said spacing device between said frames, and a platform carried by said spacing device.

24. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, and a spacing device pivotally connected with said frames to permit one frame to be moved upwardly and toward the other frame to collapse said structure, and a platform extending between and pivotally connected with the upper portion of the front frame and the rear frame and movable into a position between said frames when said structure is collapsed.

25. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, and a spacing member so connected with said frames that one frame may be moved upwardly and toward the other frame to collapse said structure, a platform extending between and pivotally connected with the upper portion of the front frame and with the rear frame and movable into a position substantially parallel with said frames when said structure is collapsed, guard rails arranged at the respective sides of said platform, pivotally connected at their ends with the respective frames near the upper ends thereof and movable into positions extending lengthwise of said frame when said structure is collapsed.

26. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, spacing devices to brace said frames one against the other, said spacing devices being pivotally mounted at each end to enable one frame to be moved toward the other frame to collapse said structure, one of said spacing devices constituting a support for a platform and being so arranged that said platform will be folded between the frames when said structure is collapsed.

27. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of a greater height than said front frame, both the upper and lower ends of said front frame being spaced from said

rear frame, a platform extending between the upper portion of said front frame and the rear frame, and movable into a position substantially parallel with said frames when said frames are moved one toward the other, and guard rails arranged at the respective sides of said platform, and so connected with the respective frames that they will be moved into positions in which they extend lengthwise of said frames when said frames are moved one toward the other.

28. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of a greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, a platform extending between the upper portion of said front frame and the rear frame, and movable into a position substantially parallel with said frames when said frames are moved one toward the other, and guard rails arranged at the respective sides of said platform, and pivotally connected with the respective frames so that they will be moved into positions in which they extend lengthwise of said frames when said frames are moved one toward the other.

29. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, a spacing member so connected with said frames that one frame may be moved upwardly and toward the other frame to collapse said structure, a platform extending between the upper portion of the front frame and the rear frame and movable into a position substantially parallel with said frames when said structure is collapsed, and guard rails arranged at the respective sides of said platform and connected at their ends with the respective frames near the upper ends thereof, the connections between one of said frames and said guard rails being slidable.

30. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from the rear frame, a spacing member so connected with said frames that one frame may be moved upwardly and toward the other frame to collapse said structure, a platform extending between the upper portion of the front frame and the rear frame and movable into a position substantially parallel with said frames when said structure is collapsed, guard rails arranged at the respective sides of said platform and connected at their ends with the respective frames near the upper ends thereof, the connections between one of said frames and said guard rails being slidable, and means to lock said slidable connections against movement when said structure is in an extended position.

31. In a structure of the character described, a front frame having steps, a rear frame to support said front frame, said rear frame being of greater height than said front frame, both the upper and lower ends of said front frame being spaced from said rear frame, spacing devices so connected with said frames that they may be moved one toward the other, a platform arranged between and supported by said frames and adapted to fold between the same, guard rails extending between said frames at each side of and above said platform and pivotally connected with the respective frames to enable them to be moved into positions in which they extend lengthwise of said frames when the latter have been folded one against the other.

In testimony whereof, I affix my signature hereto.

BENEDICT E. WILLETT.