Nov. 1, 1966 G. A. PIERCE 3,282,378

SAFETY SCAFFOLD

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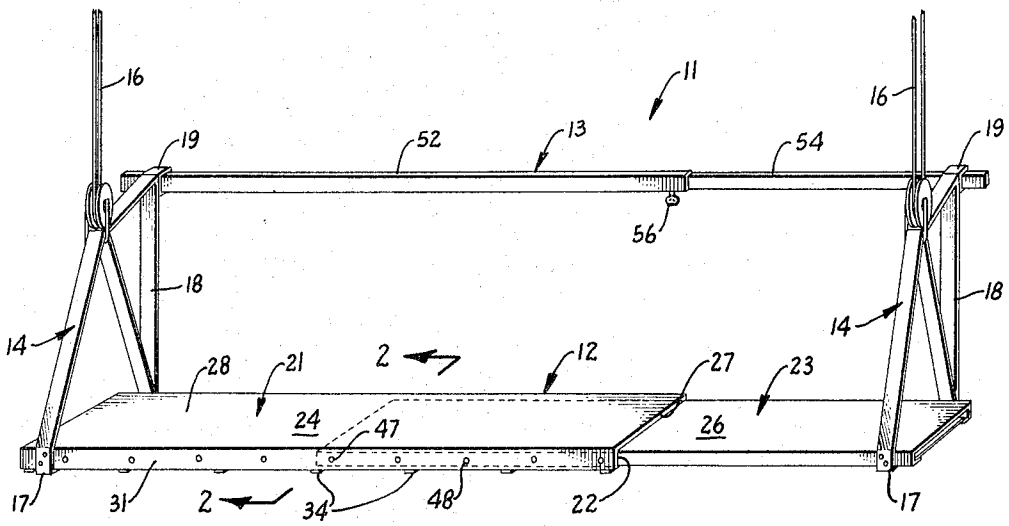


FIG. 1.

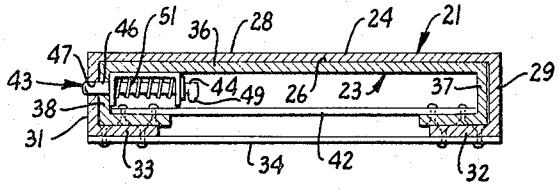


FIG. 2.

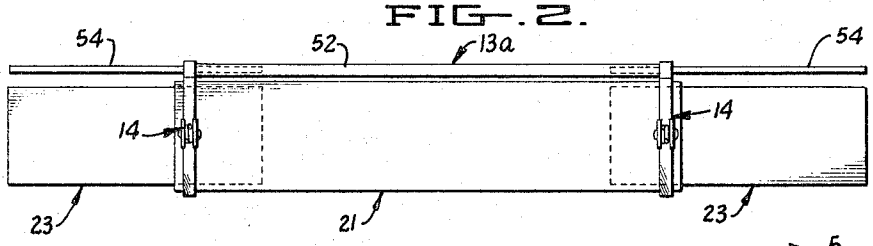


FIG. 3.

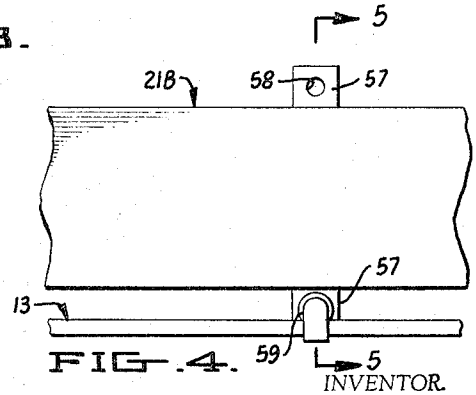


FIG. 4.

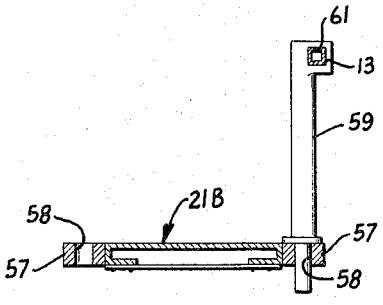


FIG. 5.

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SAFETY SCAFFOLD

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The present invention relates to improvements in a Safety Scaffold, and particularly to a safety scaffold composed of adjustable lightweight members.

It is well known that scaffold structures are utilized for painting the internal and external walls of buildings as well as other uses. In a typical case, the scaffold is suspended from the roof by a pair of falls attached to hooks or other members for securing to the roof at the upper end and attached to the scaffold structure at their lower end through suitable brackets or the like. With this construction, the workmen can pull themselves up or lower themselves by operating the falls so as to cover a complete vertical strip of the wall being serviced.

In a typical structure, the end brackets are constructed in a stirrup shape to carry an elongated sturdy plank on which the workmen are supported, and a back rail serves as a safety rail behind the scaffold so as to give the workmen something to hang on to and help prevent falls from the scaffold which otherwise might take place.

In order to support the weight of the workmen and associated equipment, it is necessary to use rather strong planks, and where the planks are made of wood as in the usual procedure, these planks become quite heavy. In addition, the length of the planks are restricted so that a group of planks of different lengths must be carried by the painter or other workmen in order to provide scaffolds of adjustable lengths, and any change of length requires disassembly and reassembly of the scaffold from the ground position.

It has been proposed to use adjustable planks such as that shown in United States Patent 812,301, but adjustable plank structures of the nature shown therein have been found to wobble in use, and many of the safety codes prohibit their use.

Another problem that has been encountered in scaffolds of this general nature has been in the erecting of multiple scaffolds where corners of building are to be operated upon. In a typical set-up, two scaffolds are often used which are placed at the desired angle from each other and allowed to overlap. However, care must be taken with overlapping scaffolds that the scaffold which is positioned below the other scaffold is not raised to upset the scaffold resting thereupon. In addition, problems are encountered with appropriate safety rail structures with such overlapping scaffolds.

Accordingly, it is a primary objection of the present invention to provide an adjustable safety scaffold which overcomes the above mentioned problems and in addition contains further improvements.

Another object of the invention is to provide an adjustable safety scaffold which is light in weight and easily carried and otherwise maneuvered by the workmen.

Still another object of the invention is to provide a safety scaffold of the character described which contains independently adjustable plank structures and back rail structures to provide versatility in the set-up required and a minimum of equipment needed.

A further object of the invention is to provide a novel telescoping scaffold plank construction which does not wobble, is light and easily handled, and yet strong enough to provide excellent support for workmen and associated equipment.

A still further object of the invention is to provide a novel telescoping scaffold plank and back rail structure in which wings are provided for extending the platform

toward each end and rendering the scaffold particularly suitable for adjustment with neighboring scaffolds for the purpose of operating around irregular angles on buildings.

Yet another object of the invention is to provide a safety scaffold of the character described in which a novel telescoping plank structure is provided which is light in weight, and which contains supports for back rail structures carried integrally with the plank in order to provide further safety.

Further objects and advantages of the invention will be apparent as the specification progresses, and the new and useful features of the Safety Scaffold will be fully defined in the claims attached hereto.

The preferred forms of my invention are illustrated in the accompanying drawings, forming a part of this description, in which:

FIGURE 1 is a perspective view of a typical scaffold structure constructed in accordance with the invention;

FIGURE 2, a cross-sectional view of the scaffold plank structure utilized in the scaffold of FIGURE 1 substantially as seen in the plane of line 2—2 thereof;

FIGURE 3, a top view of an alternate form of scaffold structure constructed in accordance with the invention;

FIGURE 4, a fragmentary top plan view of an alternate plank structure that may be utilized in the scaffold disclosed in either FIGURE 1 or FIGURE 3 to provide a modified support for the safety rail structures thereon; and

FIGURE 5, a cross-sectional view taken substantially in the plane of line 5—5 of FIGURE 4.

While only the preferred forms of the invention are shown, it should be understood that various changes or modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawing in greater detail, there is shown in FIGURE 1 an adjustable safety scaffold **11** comprising a plank structure **12**, a back rail structure **13**, and a pair of end brackets **14**. The end brackets are fastened to falls **16** which in turn are supported from above in conventional manner. The end brackets **14** may be of any conventional structure, and as here shown, each bracket contains a stirrup **17** on which the plank structure **12** is supported, and straps **18** supporting hubs **19** in a desired position for receiving the back rail structure **13**.

The overall combination of supporting structure, back rail structure and plank structure is already known and various methods for combining this structure and operating the falls will be known to those skilled in the art and will not be described herein. However, the beneficial results achieved by the combinaion of applicant's improved plank structure, with applicant's improved back rail structure and devices of this nature is believed to be novel, and particularly the specific structures having the advantages recited in the objectives given above.

Thus, the plank structure **12** contains an outer plank member **21** having a hollow end **22** into which an inner plank member **23** is telescoped. The outer plank member is constructed of sheet metal having a flat upper surface **24** and the inner plank member **23** has a flat upper surface **26** which fits in close relationship to the flat upper surface **24**. This close relationship is important and is obtained by utilizing relatively thin sheet metal for the upper surface of the outer plank member so that the overlapping edge **27** is comparatively thin.

If desired, reinforcements (not shown) may be provided along the plank edge so as to make this surface thinner and yet provide strength for maintaining the inner plank in tight relationship to positively avoid wobble. In this connection, it is important that the inner plank fit snugly within the outer plank member and that both

planks have smooth contacting sliding surfaces. In this way, an extendable plank structure is provided. In addition, by utilizing hollow plank members, it is possible to considerably lighten the weight of the metal planks so that they may give the required strength and yet be no heavier than a fixed length of wooden plank. In fact, with aluminum planks, it is possible to provide even stronger plank structures than obtained with wood with lighter materials.

In order to achieve the desired lightness, the inner plank member is generally in the shape of a hollow elongated rectangular cross-section similar to the inner plank. Both planks are preferably open at the bottom so as to operate locking means provided within the planks as will be explained more fully hereinafter. In addition, lighter weight is achieved by leaving the bottom open with no loss of strength characteristics.

Referring more particularly to FIGURE 2, it is seen that the outer plank member 21 contains a flattened sheet member 28 and perpendicularly depending flanges 29 and 31 along the entire length of each side, with these flanges having internaly extending flanges 32 and 33. In order to maintain the spacing of flanges 32 and 33, straps 34 are preferably provided at spaced distances along the bottom of the plank. These straps may be secured to the flanges by riveting as shown, or by welding or by any other suitable means.

The inner plank structure is made in similar fashion to the outer plank structure except that its outer dimensions are adapted to conform with the inner dimensions of the outer plank structure and made to slide smoothly therein. If desired, the inner plank structure may be made of thicker sheet metal to provide stronger material, if desired. Thus, the inner plank member 23 contains flat upper rectangular sheet member 36 having depending flanges 37 and 38 constructed in similar fashion to that of the outer plank member. In addition, straps 42 are also provided across the inner flange members to reinforce the lower portion of the plank and yet provide access to the hollow portion within.

Carried on the internal portion of an inner plank member 23 is a locking means 43 which carries a spring loaded pin 44 extending through a hole 46 of the inner plank member and adapted to extend through one of the holes in the outer plank members such as hole 47 as hereshown. Preferably a second locking means 43 (not shown) is adapted to fit through outer hole 48 so that a safe overlapping section of plank is provided and further rigidity is obtained through the means of double locks. In operation, the locks are released simply by pulling on handle 49 against the force of spring 51 to withdraw the pin sufficiently to clear the hole 47 or any other hole in which it is in registry and then slide the plank to the position desired. Where two locks are provided, of course, it is necessary to release both of them, but once released, the planks may be slid until the next hole is reached and the locking devices automatically fall into place.

Although a specific locking system is shown for the sake of illustration, it will be appreciated that any other means for holding two planks together such as suitable clamping device for clamping the lower flanges together could be utilized, if desired.

In order to provide lateral extension for the entire scaffold, it is not only important to provide planks of adjustable length, but it is also important to provide the back rail structure of adjustable lengths. Accordingly, I prefer to utilize a back rail composed of two members of the same length as the members of the plank structure and telescoping in similar fashion. Thus, referring again to FIGURE 1, there is shown a back rail structure 13 containing an outer hollow metal member 52 for receiving an inner member 54 fitting in tight slidable relation therein. Clamping is effected when the desired adjustment is realized by means of thumb screw 56 which is threaded through the outer member and adapted to engage threaded sockets on the inner member at spaced positions to correspond with the positions of adjustments set for the corresponding planks. Thus, in a situation where two seven foot planks are provided, and a two foot overlap is assured, it is seen that the scaffold is adjustable between seven and twelve feet. In this way, relatively narrow scaffolds can be provided at any required width adjustment through twelve feet, of course, other sizes could be provided to cover other ranges.

Where particularly large scaffolds are desired, I prefer to utilize the embodiment of FIGURE 3 where extensions are provided at each end of the device. In this form, the outer plank member 21 is constructed similar to plank member 21 of FIGURE 1 and, therefore, given the same number. The inner plank members 23 are also similarly constructed, except that there are two of them and they are preferably each one-half the length of the outer plank member 21. Similarly, the back rail structure 13*a* is composed of an outer rail member 52 having inner rail members 54 fitting within at each end and being similarly constructed to the corresponding members completely described in connection with the embodiment of FIGURES 1 and 2.

Thus, with the embodiment of FIGURE 3, the outer plank member 21 and outer rail member 42 are 14 feet in length and each of the inner plank members 23 and inner rail members 54 are seven feet in length. With these lengths, the entire unit may be folded together to provide a 14 foot length and each wing extended 5 feet to provide an overall structure of 24 feet in length. Since the support brackets 14 and associated walls are provided completely on the outer plank member, it is possible to use these extensions to obtain overlapping relation with adjacent scaffolds. In such a case, it is important to note that the plank may be extended further than the back rail so as to provide a clean corner structure with the back rail spaced exactly where wanted and not causing an obstacle.

In FIGURES 4 and 5, there is shown an alternative form of outer plank structure that may be used in either of the embodiments of FIGURES 1 and 2 or FIGURE 3, and this outer plank member 21B is characterized by having four lugs 57 welded in positions near the ends thereof close to where the support brackets might be positioned. These lugs contain eyes 58 adapted to support conventional stanchions 59, and the stanchions 59 are equipped with openings 61 to carry the back rail structure 13. With this construction front rails may be provided as well as back rails for further safety.

With these stanchions and additional rails, increased safety is provided, and by the use of telescoping rails it is also possible to move them out of the way. Another advantage of the structures of FIGURES 4 and 5 is the elimination of obstructing support brackets where the embodiment of FIGURE 3 is utilized so that the workmen are free to move out onto the wings simply by supporting the falls in a way that they do not unduly obstruct movement.

From the above description, it is seen that I have provided an improved safety scaffold which is characterized by having a high strength to weight ratio in combination with considerable adjustability so as to minimize the number of members required and increase the usefulness of the scaffold.

I claim:

1. A safety scaffold, comprising:

a plank structure, containing an outer plank member constructed of folded sheet metal having a top section including a substantially elongated rectangular top surface with depending flanges extending downward on each side thereof to form a pair of side sections and inner flanges disposed along a bottom to define a substantially flattened rectangular cross-section with a substantially open bottom, said inner flanges being secured in parallel relation by a plu-

rality of straps extending therebetween, an inner plank member constucted in the form of a hollow sheet metal unit of substantially rectangular cross-section and formed with a top section and side sections similar to the outer plank member but sized to fit slidably within said outer member in a sufficiently tight relation to prevent lateral play in any direction, said top section of the outer plank member including a thin edge adapted to fit in close relation to the top of the inner plank member;

a back rail, containing an outer hollow metal back rail member open at one end, and an inner hollow metal back rail member, said outer and inner members having smooth surfaces fitting in tight slidable relation;

and brackets formed for carrying the plank structure and back rail structure in substantial parallel relationship, said back rail structure being mounted for telescoping adjustment independent of the adjustment of the plank structure.

2. The safety scaffold defined in claim **1**, in which lock means are provided on the plank structure for holding the telescoped planks tightly in an adjusted position, and lock means are also provided on the back rail structure to hold the back rails in rigid adjustable position.

3. A safety scaffold, comprising:

a plank structure, containing an outer plank member constructed of folded sheet metal having a top section including a substantially elongated rectangular top surface with depending flanges extending downward on each side thereof to form a pair of side sections and inner flanges disposed along a bottom to define a substantially flattened rectangular cross-section with a substantially open bottom, said inner flanges being secured in parallel relation by a plurality of straps extending therebetween, a pair of inner plank members, each inner plank member being constructed in the form of a hollow sheet metal unit similar to the outer member but sized to fit slidably within an end of said outer member in a sufficiently tight relation to prevent lateral play in any direction, said top section of the outer plank member including a pair of thin edges with each edge adapted to fit in close relation to the top of each of the inner plank members;

a back rail, containing an outer metal back rail member open at both ends, and a pair of inner hollow back rail members, said outer and inner members having smooth surfaces fitting in tight slidable relation;

and brackets formed for carrying the plank structure and back rail structure in substantial parallel relationship, said back rail structure being mounted for telescoping adjustment independent of the adjustment of the plank structure.

4. The safety scaffold defined in claim **3**, in which lock means are provided on the plank structure for holding the telescoped planks tightly in an adjusted position, and lock means are also provided on the back rail structure to hold the back rails in rigid adjustable position.

5. A safety scaffold, comprising:

a plank structure, containing an outer plank member constructed of folded sheet metal having a top section including a substantially elongated rectangular top surface with depending flanges extending downward on each side thereof to form a pair of side sections and inner flanges disposed along a bottom to define a substantially flattened rectangular cross-section with a substantially open bottom, said inner flanges being secured in parallel relation by a plurality of straps extending therebetween, said outer plank member also being equipped with a pair of spaced ears on one side thereof, said ears having eyes

serving as holding sockets, an inner plank member constructed in the form of a hollow sheet metal unit of substantially rectangular cross-section and formed with a top section and side sections similar to the outer plank member but sized to fit slidably within said outer member in a sufficiently tight relation to prevent lateral play in any direction, said top section of the outer plank member including a thin edge adapted to fit in close relation to the top of the inner plank member;

a pair of stanchions fitting in said eyes in an upright position;

and a back rail, containing an outer hollow metal back rail member open at one end, and an inner hollow metal back rail member, said outer and inner members having smooth surfaces fitting in tight slidable relation for telescoping adjustment independent of the adjustment of the plank structure, said back rail being held securely by said stanchions.

6. A safety scaffold, comprising:

a plank structure, containing an outer plank member constructed of folded sheet metal having a top section including a substantially elongated rectangular top surface with depending flanges extending downward on each side thereof to form a pair of side sections and inner flanges disposed along a bottom to define a substantially flattened rectangular cross-section with a substantially open bottom, said inner flanges being secured in parallel relation by a plurality of straps extending therebetween, said outer plank member also being equipped with a first pair of spaced ears on one side thereof, and a second pair of ears on the other side thereof, each of said ears having eyes serving as holding sockets, a pair of inner plank members, each inner plank member constructed in the form of a hollow sheet metal unit of substantially rectangular cross-section and formed with a top section and side sections similar to the outer plank member but sized to fit slidably within said outer member in a sufficiently tight relation to prevent lateral play in any direction;

two pairs of stanchions fitting in said eyes in an upright position;

and a pair of back rails, each of said back rails containing an outer hollow metal back rail member open at one end, and an inner hollow metal back rail member, said outer and inner members having smooth surfaces fitting in tight slidable relation for telescoping adjustment independent of the adjustment of the plank structure, said back rails being held securely by said stanchions.

7. The safety scaffold defined in claim **6**, in which lock means are provided on the plank structure for holding the telescoped planks tightly in an adjusted position, and lock means are also provided on the back rail structure to hold the back rails in rigid adjustable position.

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