SCAFFOLD SECUREMENT DEVICE

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ABSTRACT
A locking device, spring loaded, for use for holding scaffolding trusses and their walk board secured to the end frames for the scaffold assembly, a locking device incorporating a pin for locking the scaffolding sleeve to its associated end frame, the pin having integrally formed a closed handle at its inward end, opposite from where the pin locks into the end frame, and there being a slot for accommodating a detent pin or the locking device that prevents its inadvertent disengagement while the scaffold assembly is being used or moved.
SCAFFOLD SECUREMENT DEVICE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This provisional application claims priority to the non-provisional application having Ser. No. 60/934,187, filed on Jun. 12, 2007 which claims priority to the continuation-in-part patent application having Ser. No. 10/884,350, filed Jul. 2, 2004, which claims priority to the continuation application having Ser. No. 10/103,242, which was filed on Mar. 22, 2002, which is a continuation of the application having Ser. No. 09/729,618, filed on Dec. 4, 2000; which is now U.S. Pat. No. 6,533,067, which application is a non-provisional application filed upon the provisional application having Ser. No. 60/169,217, filed on Dec. 6, 1999, which is now U.S. Pat. No. 6,533,067, all said applications owned by a common entity.

BACKGROUND OF THE INVENTION

[0002] This invention relates primarily to scaffolding, and more specifically pertains to means for securing the end frames of scaffolding to its temporarily elevated platform(s) to allow workers to perform various tasks at a convenient elevation that cannot ordinarily be reached from the ground.

[0003] Generally, scaffolding has been around for many years, and primarily to make it convenient for a worker to operate at higher levels, such as elevated upon a wall, or upon a ceiling, and have ample room for movement, upon the scaffolding platform, which cannot otherwise be attained by simply working on these types of projects high up on a ladder.

[0004] Prior art devices, as can be seen in FIG. 1, show horizontal members generally known as the truss, which are secured to a ladder like structure, generally known as the end frame, for use for securing of scaffolding elevated in place. Scaffolding is used mainly to provide a temporary elevated platform for workers to perform various tasks, that can not be reached from the ground. Because most scaffolding is temporary, it must be able to be erected, and dismantled, with little effort, but not to compromise the safety, structural integrity, and the usage of such structures at elevated levels. Most scaffolds incorporating horizontal and vertical members are temporarily fastened together, utilizing a spring loaded pin, as can be seen in FIG. 1, that normally attaches the horizontal truss member in place. The pin engages into prefabricated holes provided upon the vertical end frames, and thereby, temporarily lock the two components together.

[0005] Most spring loaded pins simply rely upon the pressure generated by the spring to hold the pin securely in place, as can be noted in FIG. 1. It is common, on these types of scaffolds, for the pin to become disengaged by either someone accidently pulling outward on the handle, such as the L-shaped configuration as noted, as normally found upon the ends of such pins, or by the pin becoming entangled or caught on a fixed object, as the scaffolding is being moved, or by a worker walking by the scaffolding and which inadvertently catches the handle, or its pin, on his or her clothing, the tool pouch, or by any other item that the worker may be carrying, during usage. Or, the spring of the holding pin itself can simply break. Because scaffolds are manufactured to be assembled and disassembled with facility, the tolerance is found between the truss and the end frame connections can be extreme, causing excessive lateral shifting or movement between the two, after repeated usage. This movement between the members may be heightened by the workers activities, while working aboard the scaffolding. Over time, such repeated movements can force the pin to become disengaged, causing the scaffolding to collapse, sometimes with disastrous results.

[0006] Despite the improvements as shown in earlier patents, such as U.S. Pat. No. 5,390,761, which discloses the use of a threaded nut to secure a pin in place, such as can be noted in the prior art disclosed in FIG. 2, such structure has proven to ineffective because it is difficult to visually confirm that its lock nut is secure and tight, or that the threads upon the pin become worn, damaged, or stripped, or become so covered with foreign matter such as plaster, concrete, construction glue, etc., so as to become rather unusable, and inefficient. Other precautions to overcome these problems can be seen in U.S. Pat. No. 6,823,965, generally as shown prior art in FIG. 3 herein. In this embodiment, the pin is designed to be locked in place by a hook mechanism, being lodged against a metal bracket, after it has been fully engaged into the end frame, but such structure has also proved to be unreliable due to the fact that the locking mechanism also relies exclusively on springs, as can be noted, which can easily break and cause failure to the structure of the scaffolding, much to the detriment of any workers upon the same, or any workers that may be moving the scaffolding, from one workplace to another. A further concern with this prior art locking pin method is that the rear spring that is used to force the pin in place, should it fail or break, such spring normally is used to apply back pressure, thereby locking the pin firmly against the bracket, which could actually push the pin rearwardly, and forcing it to become disengaged.

[0007] Often a worker is required to adjust the platform height with no assistance from others. Thus, while a worker may stand in front of and face an end frame, while reaching both arms around the end frame and placing both of his or her thumbs within the handles, and thereby grasping the gussets with the remaining fore fingers, slippage of the hands or the thumbs can disengage one or both of the shown latch pins, allowing both trusses, with its platform or walk board, to freely move vertically upon the end frame, which can move with some speed, to the detriment of the worker. The worker tries to repeat this process at the opposite end, until the platform becomes level. The problem, though, with current methods is that the worker’s hands must be positioned in the center of the shown handles, in order to distribute equal pressure and easily disengage the attaching latch pins. If the worker positions his thumbs in handles slightly off center, the pins may become bound up and fail to disengage, which prevents the scaffolding from being adjusted, or if disengagement occurs, and the scaffolding has excessive weight upon it, it could quickly descend, which could be hazardous to the worker standing just adjacent the end frames for the scaffolding under adjustment.

SUMMARY OF THE INVENTION

[0008] The current invention consist of a scaffolding assembly having two ladder like vertical structures, commonly referred to as end frames, where the end frames are made up of two vertical columns, and rungs extending transversely therebetween, to form a scaffolding platform supporting structure. The platform, also generally referred to as a walk board, can be fixed in place through the use of attachment means. Truss means is fastened to the end frames, but
can be locked into position by means of detent pins, to assure that the end frames remain in place for supporting their walk board, during sustained usage. But, by removing the locking detent pins, grasping the handles provided locking device, and pushing the handles towards its associated gusset, this allows the user to relocate the position of the truss and its walk board, during adjustment. It is the convenience of the shown handles that allows the worker to place their thumbs into the center of the handles, which cannot easily be disengaged thereby during manipulation, and can remain fixed in position, as the walk board and trusses are being elevated or lowered, during adjustment of the scaffold assembly.

[0009] It is, therefore, the principal object of this invention is to provide scaffolding, capable of being adjusted, a unique handle means that assures to the worker that while adjustment is being performed, there is little chance for support or inadvertent shifting of the walk board and supporting trusses during usage.

[0010] Another object of this invention is to provide a very stable like scaffolding assembly that incorporates safety means which assures permanent locking of the walk board and its trusses to the end frames, and which cannot be disengaged, inadvertently, due to their affixing through the usage of detent safety pins.

[0011] Another object of this invention is to provide a scaffolding assembly that can be quickly and easily assembled, and readily utilized by a single worker, assured of maximum safety.

[0012] These and other objects may become more apparent to those skilled in the art upon review of the summary of the invention as provided herein, and upon undertaking a study of the description of its preferred embodiment, in view of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In referring to the drawings, FIG. 1a shows prior art trusses and end frames held by an L shaped latching pin;
[0014] FIG. 1b shows another latching pin mechanism for holding a scaffolding truss to its end frame;
[0015] FIG. 2 shows the use of a locking nut for holding scaffolding components to the end frames;
[0016] FIG. 3 shows a prior art style of locking and securing device, generally in the manner as shown therein;
[0017] FIG. 4 shows the scaffolding assembly of the current invention, with a combination of its locking device, affixed by detent pins, protected by gussets, for use for locking a walk-board and its trusses to the end frames of the shown scaffoldings;
[0018] FIG. 5 shows a close up view of the locking device with its detent or latch pin in place;
[0019] FIG. 6 shows the locking device with a safety lock secured to prevent inadvertent disengagement of the device; and
[0020] FIG. 7 shows the locking device with its detent pin in place, in full view.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] In FIG. 4 is shown a scaffold assembly consisting of two ladder like vertical structures 1 commonly referred to as end frames. The end frames are made up of two vertical columns 2 with rungs 3 secured horizontally between the vertical column 2. It is common for the vertical column 2 to have holes 4 spaced evenly along one or both sides allowing the horizontal member 5 to be secured to the end frames 1 at various vertical locations. The horizontal member 5 is commonly referred to as a truss and the main function of the truss 5 is to connect both end frames 1 together and provide support for the walk board 6. The truss 5 is fastened to the end frames 1 by a spring loaded locking device 7 and actuated by removing detent pin 8, grasping handle 9, and pulling it towards gusset 10, therefore releasing truss 5 from end frame 1 allowing the user to relocate the position of the truss and walk board. See also FIG. 5.

[0022] The structure of each truss moving locking device 7 includes the gussets 10, at the lower end of which engages with a U or box channel 18, and which engages at its upper end with the truss 5, as can be noted. Thus, when the pin 12 is pulled rearwardly, it frees the channel member 18 to shift vertically upon their associated vertical columns 2 of the end frames 1. Also noted are the arcuate supports 19 that hold all of the operative components of the handles 9, the outer casing 11 of the pin 12, and the arcuate member 19 is secured, at its two ends, with channels 18, as can be readily seen.

[0023] As shown in FIG. 4 the preferred method to adjust to height position of trusses 5 and walk board 6 simultaneously, is to remove all detent pins 8 from the trusses 5. While standing in front of and facing end frame 1, wrap both arms around end frames 1 and place thumbs in the center of both handles 9 and more specifically in grooves 15, shown in FIG. 5. With thumbs placed in grooves 15 and the remaining fingers wrapped around gussets 10, the worker is able to disengage both trusses 5 simultaneously from the end frame 1, with the walk board 6 attached, by compressing or closing his/her first and moving the trusses and walk board assembly vertically to a new location on the end frame. After the desired height location is achieved, the worker may release the tension being placed on the handles 9 allowing springs 14 to push pins 12 into the holes 4 located on column 2. When pins 12 are inserted through the holes 4 the trusses are locked and secure. The worker will repeat the same steps at the opposite end of the scaffold, making the trusses 5 and walk board 6 level. Inserting detent pins 8 through casings 11 and pins 12, ensures pins 12 can not become accidentally disengaged causing the truss to become separated with columns 2 and end frames 1.

[0024] FIG. 5 shows a larger view of the truss 5 with locking device 7 attached. The preferred method to disengage and remove the truss 5 from column 2 is to remove detent pin 8, which passes through the outer casing 11 and through a hole 13 located in locking pin 12, used to secure the pin 12 in place and prevent it from becoming disengaged from column 2. By grasping the handle 9 with the fingers, while wrapping the thumb around gusset 10 and pulling the handle towards gusset 10 by closing ones first, will cause the pin to become disengaged from column 2 allowing the truss to be removed or relocated vertically on the end frame 1. After moving the truss 5 vertically to the desired location on column 2 one can release the handle allowing spring 14 to push pin 12 into the hole 4 located on column 2. When pin 12 is inserted through the hole 4 the truss 5 is locked and secure. Inserting detent pin 8 through casing 11 and pin 12, ensures pin 12 can not become accidentally disengaged causing the truss to become separated with column 2.

[0025] As shown in FIG. 6, a padlock 16 has replaced detent pin 8 as an alternative method to secure lock pin 12 into hole 4 found on column 2. By inserting padlocks 16 through
the casings 11 and pins 12 ensures that the scaffold is locked together and can not be disassembled without unlocking padlocks 16, therefore adding additional safety and preventing the disassembly as to prevent theft.

**FIG. 7** shows the complete locking device held into position by its latch pin which prevents unauthorized removal of locking device once it has been fixed into position for holding the trusses, and a supported platform or walk board to their associated end frames.

Variations or modifications may be considered by those skilled in the art upon review of the invention as described herein. Such variations, within the spirit of this development, are intended to be encompassed within the scope of the invention as defined. The disclosure of the invention in the drawings is set forth for illustrative purposes only.

What is claimed is:

1. A scaffolding securement device including trusses, said trusses supporting a walk board, sleeves connecting to each end of the trusses, end frames, each sleeve provided for sliding vertically upon the end frames, a locking device, the locking device incorporating a pin, one end of the pin capable of locating through the sleeve and the associated end frame, the opposite end of said pin having a handle, and a detent means provided for locking the end frame to the trusses, to prevent their inadvertent disconnection.

2. The scaffolding securement device of claim 1 wherein said detent means comprises a detent pin.

3. The scaffolding securement device of claim 1 wherein said detent means comprises a padlock.

4. The scaffolding securement device of claim 1 wherein a closed handle is integrally formed at the inner end of the detent means, and is capable of being grasped by a worker's hand when adjusting the height of the walk board and its supporting trusses relative to the end frames.

5. The scaffolding securement devise of claim 1 and including a gusset interconnecting between each sleeve and a truss, a support structure provided within the gusset and connecting at each end with a sleeve, said support structure provided for holding the locking devise in place during its manipulation and when applied for locking a truss to its associated end frame.

6. The scaffolding securement devise of claim 5 and including a pair of vertical columns provided within each end frame, and the sleeve provided for sliding engagement upon each vertical column during its support of the trusses and a walk board.

7. The scaffolding securement devise of claim 1 and wherein said sleeve is a "U" shaped sleeve.

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