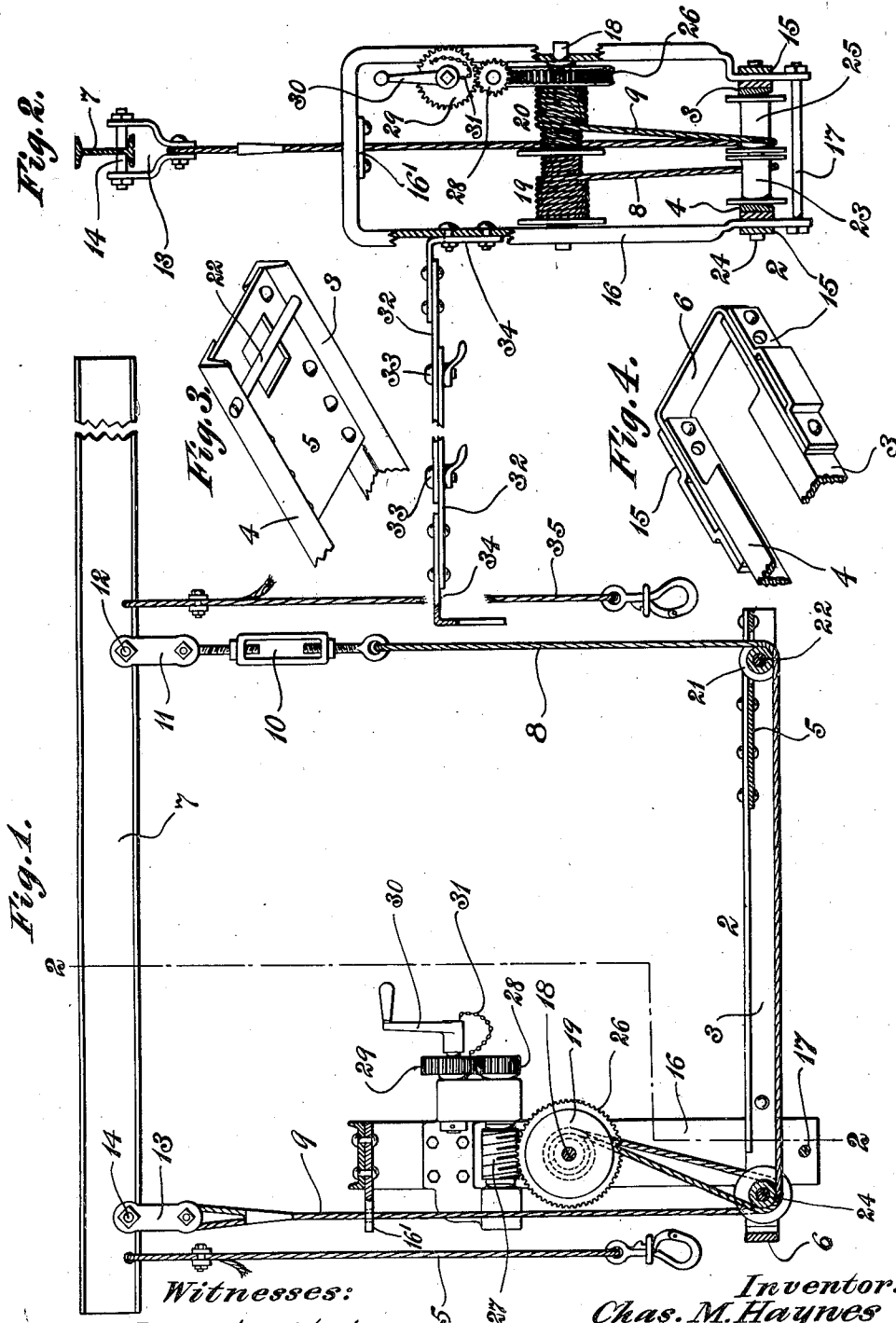


1,031,646.

Patented July 2, 1912.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES M. HAYNES, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO JOHN O'NEIL, OF NEW YORK, N. Y.

HANGING SCAFFOLD.

1,031,646.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed December 24, 1909. Serial No. 534,786.

To all whom it may concern:

Be it known that I, CHARLES M. HAYNES, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hanging Scaffolds, of which the following is a specification.

This invention relates to hanging scaffolds the primary object of the invention being to provide a device of this character having simple and effective means for raising and lowering the same.

The device possesses other features of improvement and advantage which with that already mentioned will be fully set forth in the following description where I outline in detail that form of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. I do not restrict myself to the disclosure made by said drawings and description for I may depart from said disclosure in divers ways within the scope of the claim succeeding said description the latter and the drawings being provided so that those skilled in the building and allied arts can practise the invention.

Referring to said drawings, Figure 1 is a side elevation of a portion of the scaffold with a part of the framework removed. Fig. 2 is a sectional elevation, the section being on the line 2-2 of Fig. 1, and, Figs. 3 and 4 are detail views in perspective hereinafter more particularly described.

Like characters refer to like parts throughout the several figures.

There are many uses to which an overhead or hanging scaffold embodying my invention can be put with advantage and said scaffold comprises several base or platform-supporting members or as they are usually termed "foot-locks", although only one of them is illustrated in the drawings being denoted in a general way by 2. As a matter of fact it is conceivable that I might employ a scaffold wherein there is only one foot-lock or base member 2 and in connection with the same I employ as will hereinafter appear, raising and lowering mechanism therefor carried thereby, said mech-

anism being of such nature that both ends of the foot-lock or base member can be raised or lowered together an equal extent 55 although, as will also hereinafter appear, I prefer to provide means for insuring the leveling of said foot-lock after an adjustment of the same.

The foot-lock or base member is shown 60 as including two side and parallel bars 3 and 4 generally made of angle iron connected at one end by a plate 5 and straddled at the other by a yoke or approximately U-shaped member 6, the said plate and yoke 65 being suitably rigidly connected with the sides 3 and 4 as by means of rivets. In the present instance the scaffold is formed in part of several of these foot-locks or base members 2, although only one is shown, and 70 in practice I lay upon the horizontally-aligned foot-locks, planks, boards or other supporting means so that workmen can pass from one foot-lock onto another by means of the bridging planks or boards. The foot-lock or base member 2 is flexibly suspended 75 from an overhead outrigger, generally consisting of a beam or girder, which in some cases will extend out over the upper portion of a building in course of erection while in 80 others the support for the said foot-lock may be within the building. As a means for supporting the foot-lock 2, I have shown a beam or girder 7 while an adjacent and parallel girder will similarly support the 85 next adjacent foot-lock neither of which latter, however, is illustrated.

As a suitable means for flexibly suspending the foot-lock 2, I may provide a pair of cables as 8 and 9 and I use the term "cables" in its broad sense to include thereby equivalent devices such as ropes or chains, a suitable device being connected to one of the cables, for instance the cable 8, as will hereinafter appear, for accurately 95 leveling the said foot-lock. Under ordinary circumstances the two cables will raise and lower opposite ends of the foot-lock 2 equally but there may be instances where one or both of the cables may be laid more 100 or less unequally on the reel mechanism, whether the same includes one or more reels, and in such an event as this the foot-lock will not be precisely level so that recourse

will be had to the leveling means to secure the desired object. Any suitable leveling means may be provided and of course the same may be situated at any desirable place but that indicated is advantageous. It is possible also that I could dispense altogether with said leveling means.

To the upper end of the cable 8 a turn-buckle 10 is connected and to the upper section of said turn-buckle a yoke 11 is united the branches of said yoke being perforated to receive a bolt 12 which projects through an opening in the web of the beam or girder 7, the bolt providing a simple means for detachably connecting the yoke or bifurcated member 11 and hence the cable 8 with the girder or beam 7 near one end thereof. The cable 9 has a yoke or bifurcated member 13 practically a duplicate of the part 11, connected to its upper end and detachably connected to the girder or outrigger by a bolt 14. The inner or lower ends of the two cables are connected with the foot-lock 2, the latter being provided with suitable reel mechanism to receive said cables, as will hereinafter appear.

On the sides of the foot-pieces 2 are fastened brackets 15 which are shown as fastened to the lateral branches of the yoke 6, which constitute in effect parts of said sides and these brackets have offset portions to removably receive the lower end portions of the sides of the substantially inverted U-shaped frame or standard 16, said sides being bent inward near their lower ends to rest on the sides 3 and 4 and being connected at their lower ends by a tie bolt 17 by removing which said frame or standard 16 can be lifted from place.

There is shown as supported for rotation by the sides of said standard or upright 16, a shaft 18 and to said shaft are fixed the spools or drums 19 and 20 which constitute in effect a sectional reel; that is to say these two spools or drums turn as one on the rotation of the shaft 18 either to wind the cables 8 and 9 respectively thereon or to pay off the same so as to raise or lower the foot-lock or base member 2.

The cable 8 below the outrigger or beam 7 passes around a roller or guide-sheave 21 loose on the shaft 22 which is supported by the sides 3 and 4 and which may as shown consist of a tie-bolt, said shaft being situated in vertical alinement with the place of suspension of said cable 8. The plate 5 is slotted for the passage of said cable 8 and also for the turning of said guide-sheave 21. In the present instance said sectional reel made up of said spools or drums 19 and 20 rotates about an axis disposed transversely of the platform supporting member 2. Said cable after it leaves the guide-sheave 21 extends under the foot-lock 2 and around a second guide-sheave or roller 23 loose on the shaft

24 and then to and around the drum or spool 19.

The cable 9 passes around the guide-sheave or roller 25 also loose on said shaft 24 and is wound around the drum or spool 20. From this it will be clear that when the two drums or spools 19 and 20 are turned to the right they will simultaneously wind the respective cables 8 and 9 thereon so that both ends of the foot-lock will be elevated at the same time. By turning said reels or spools to the left the opposite result will be secured. I prefer that the roller or guide sheave 21 be in horizontal alinement or substantially so with the pair of rollers or sheaves 23 and 25, and by the construction described, there are only two points of suspension of the scaffold structure, and these points are virtually in horizontal alinement.

The shaft 18 may be turned in any desirable manner although worm-gearing is preferable for the purpose in that the same automatically locks itself against retractive movement, and said shaft 18 is shown as having fastened thereto a worm-gear 26 in mesh with a worm 27 the shaft of which is rotatively supported by a suitable bearing on said upright 16 and which fixedly carries a pinion 28 in mesh with a spur-gear 29 the shaft of which is provided with a removable hand-crank 30. By turning this hand crank the foot-lock 2 may be raised and lowered through the intermediate described mechanism. Said hand-crank being connected with the spur-gear by a chain or equivalent connection 31 so that there is no possibility of the crank falling onto the ground when not in use. The means described for operating the spools or drums 19 and 20 is a simple one although other means might be used instead thereof. The axis of rotation of the shaft to which said hand crank 30 is connected is at right angles to the axis of rotation of the two spools 19 and 20, said first mentioned axis extending longitudinally of the platform-supporting member 2. Owing to this construction the reel mechanism which is located at one end of said member 2 is adapted to evenly pay off or reel up the several cables or ropes and at the same time the operator can effect the raising or lowering of the said member 2 without bending around the structure or framework 16 which sustains the reel mechanism and coöperative parts.

As already indicated it is conceivable that I could employ a single foot-lock or base member and the parts already described as associated therewith, as a scaffold the necessary planking or other means being laid across the sides 3 and 4 although I prefer to employ several horizontally alined foot-locks and in such a case as this prefer to employ a guard rail which extends between

adjacent foot locks and which is preferably connected with the standards or frames 16. Such a guard rail is shown comprising several intermediate strips or rods as 32 adj-
 5 justably connected so that the guard rail can be lengthened or shortened as may be demanded. As a suitable means for connecting these strips or rods pin and longitudinal slot means may be provided the
 10 overlapping portions of said strips having longitudinal slots to slidably receive binding screws 33 which present a convenient means for maintaining the longitudinal ad-
 15 justment of said guard-rail. In addition to said intermediate strips 33, the guard rail has terminal and substantially L-shaped strips 34, the vertical branches or arms of which have open slots or forked portions to removably fit bolts or other suitable means
 20 on the sides of the standards 16 of which only one is shown. From this it will be evident that the guard rail can be removably clamped to said standards.

In use the foot-lock 2 is progressively
 25 elevated by turning the spools 19 and 20 in the manner above described and when said foot-lock has been raised to the maximum extent it will be suspended by two relieving cables as 35 connected with and hanging
 30 from the outrigger 7 said cables 35 having hooks at their lower ends to engage the opposite ends of the foot-lock 2. When the foot-lock 2 is supported by these two relieving cables 35 the yokes 11 and 13 will be
 35 disconnected from the outrigger 7 and connected with a previously placed outrigger located above that shown. When the cables 8 and 9 are connected with the upper out-
 40 rigger the relieving or auxiliary cables 35 will be disconnected from the foot-lock or base member 2 and the outrigger 7 will be dismounted at which time the foot lock can be elevated as before.

In winding the cables 8 and 9 on the
 45 drums or spools 19 and 20 the coils may be laid unevenly thereon which is natural and in this case it might happen that one end of the foot-lock would be higher than the other, the difference in any event, however,
 50 being very slight. To accurately level the foot lock recourse will be had to the turn-buckle 10 by manipulating which the foot-lock can be quickly leveled.

I do not restrict the use of the device to
 55 any particular connection although it is of particular advantage during the construction of buildings the mason work of which is built around a skeleton structure and in such a use as this I of course employ sev-
 60 eral foot-locks such as that hereinbefore described. In putting up a building of the kind mentioned it is usual to erect from four to six stories of the skeleton steel structure before the mason work commences
 65 and in such a case the outriggers are set at

the top story of the said steel structure and from which the several foot-locks can be hung; said foot-locks being elevated step by step as the masonry progresses. When the outriggers are reached the skeleton
 70 work will have been further built up so as to provide a support for a second series of outriggers and to which the said foot-locks can be connected by the hoisting cables as distinguished from the relieving cables, the
 75 latter being employed simply to uphold the foot-locks while the hoisting cables are being disconnected from a lower set of outriggers and transferred to a higher set thereof, and during this operation the men
 80 on the scaffold can continue their work. When the suspending cables are disconnected from a lower and connected with a higher set of outriggers, the lower outriggers can be removed. Each foot-lock has
 85 its individual hoisting mechanism and in view of this condition I can make the same comparatively light and the same applies also to the outriggers. I have referred to a guard-rail. This device
 90 provides a means of safety for the workmen and it also acts as a brace between adjacent foot-locks and owing to its adjustability the interval between the foot-locks can be regulated without impairing the
 95 effect of said guard-rail.

I wish in closing to make it clear that I do not limit myself to the construction hereinbefore described as many variations may be made within the scope of my invention
 100 as expressed in the claim thereto.

In connection with the reel mechanism I provide means for preventing the foot-lock from toppling over and said means preferably coöperates with the cable 9, said cable
 105 being shown as passed through an eye or perforation in the bracket 16' extending outward from the standard or frame 16. The cable 9 is threaded through said eye or perforation and when the foot lock is sus-
 110 pended it will not be possible owing to the presence of said means, for the foot-lock to topple over.

What I claim is:

A hanging scaffold comprising a plat-
 115 form supporting member, a transversely extending shaft supported approximately at one end of said platform supporting member, a pair of guide sheaves loosely
 120 supported by said shaft for independent rotation thereon, a single sheave rotatively carried by said platform supporting member approximately at the other end thereof and rotative about an axis substantially in the same horizontal plane as the axes of
 125 said pair of sheaves, a pair of rigidly connected reels supported over said pair of sheaves and the axes of motion of which are substantially in parallelism with the axes of motion of said sheaves, the two reels be-
 130

ing separated from each other by a flange
or head common to the two, gearing con-
nected to one of the reels for rotating said
reels, and a pair of suspending cables for
5 said platform supporting member, one ca-
ble passing under said single sheave, also
under and around one of said pair of
sheaves and also around one of said reels,
the other cable passing around the other of

said pair of sheaves and also around the 10
other of said reels.

In testimony whereof I affix my signa-
ture in presence of two witnesses.

CHARLES M. HAYNES.

Witnesses:

KATHERINE A. WHELAN,
SAMUEL P. WATSON.