Feb. 15, 1949. J. R. O'DONNELL 2,461,762

SCAFFOLD AND SCAFFOLD CONSTRUCTION ELEMENT

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Fig. 1.

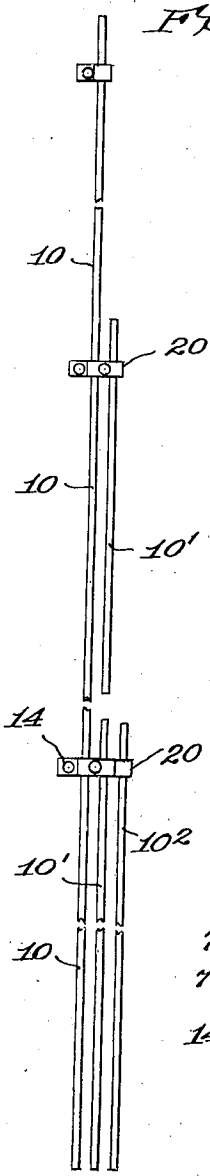


Fig. 2.

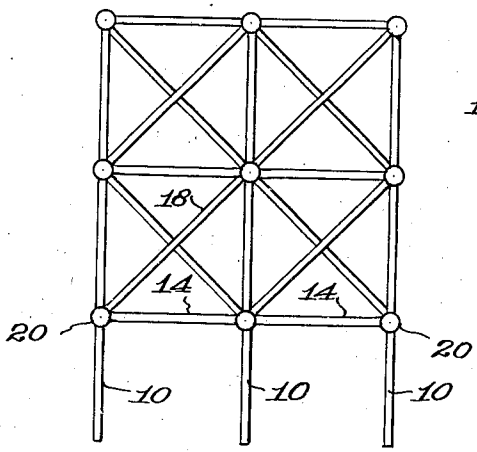


Fig. 3.

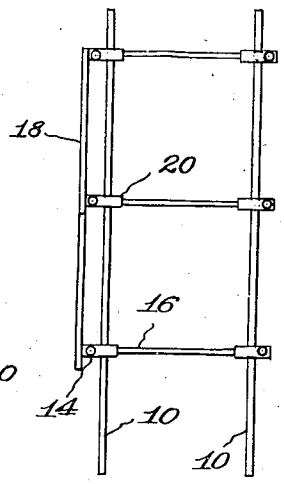


Fig. 4.

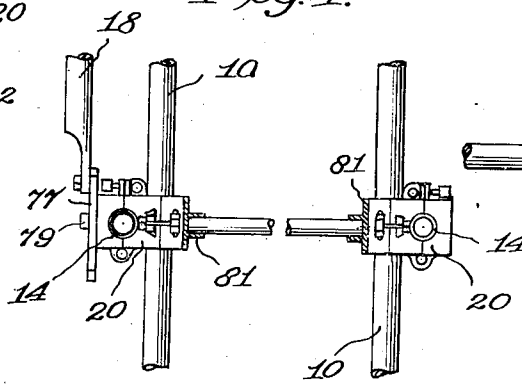
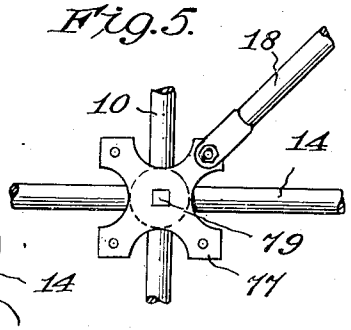


Fig. 5.



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Fig. 6.

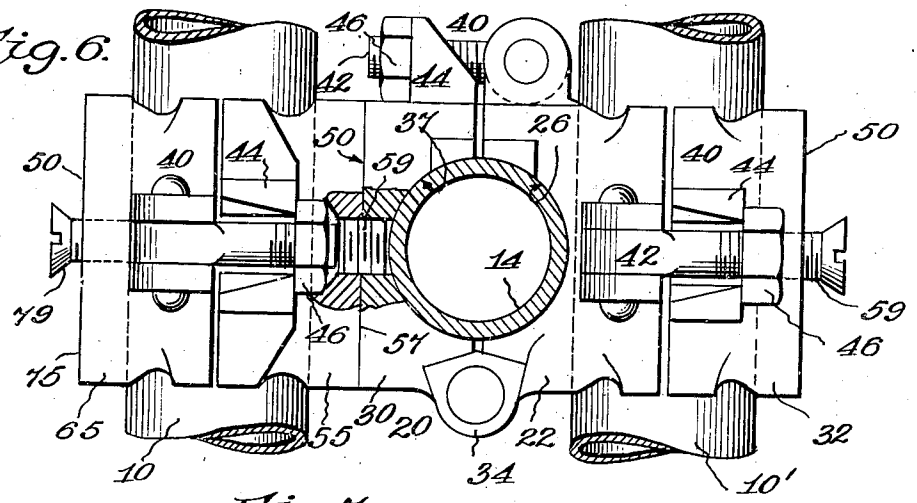


Fig. 7.

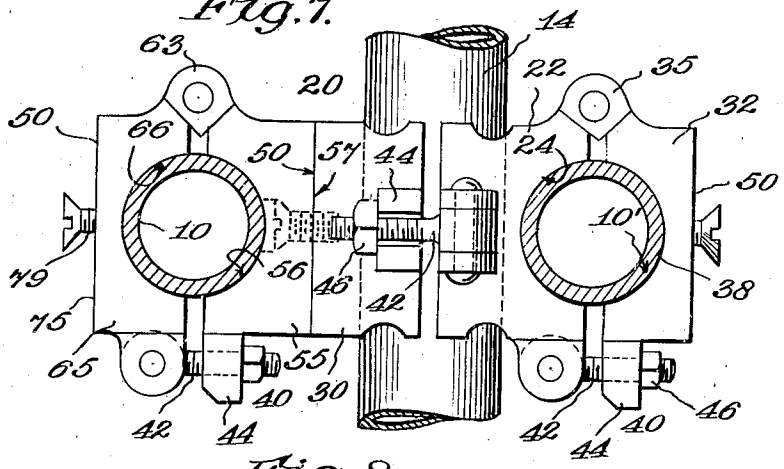
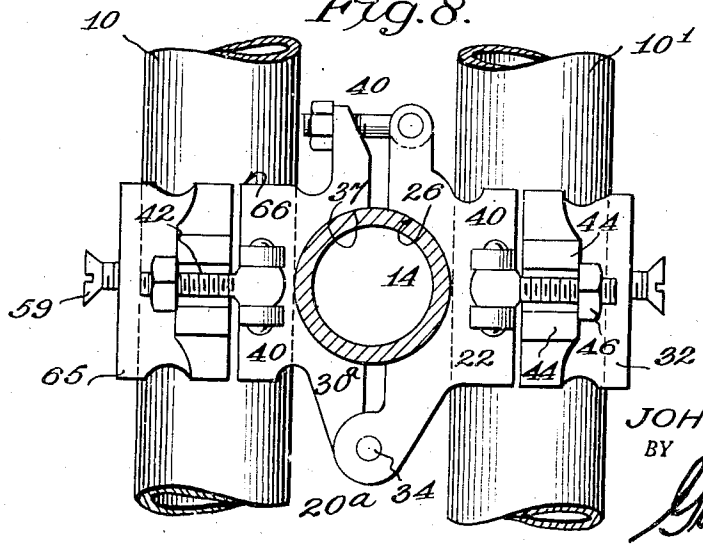


Fig. 8.



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SCAFFOLD AND SCAFFOLD CONSTRUCTION ELEMENT

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Application February 14, 1946, Serial No. 647,614

11 Claims. (Cl. 304—2)

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This invention relates to scaffolds and to elements for use in constructing scaffolds, and provides improvements therein.

The invention relates to the type of scaffold comprising vertical columns and lateral elements or stringers joined by clamping elements, the columns and stringers usually having the form of pipes, and provides a stronger and better braced scaffold of this type. The invention provides scaffolds in which columns of different strength, required for different heights, are constituted by pipe all of one diameter, and in which one size of clamp is used, thus simplifying or eliminating variety of pipe and clamps to be stocked by the scaffold erector and simplifying the engineering or logistical work in preparing for the job of erecting a scaffold. The invention provides improved strength and bracing in eliminating a cantilever bearing of loads on the columns, and enables diagonal bracing rods or pipe to be fastened at the point or line of intersection between the columns and the lateral elements, or stringers; and it furthermore enables lateral elements or stringers running at right angles to other lateral elements or stringers to be fastened at the same level or line of intersection. The invention further enables a scaffold having the usual columns, laterals and diagonals to be constructed with a less number of clamping elements than are used with scaffolds commonly in use, and this in turn reduces the dead-weight load on the columns.

The invention further provides novel clamping elements, having structural features by which, in combination with the columns and laterals, or columns, laterals and diagonals, the hereinbefore mentioned advantages are obtained in a scaffold.

Embodiments of the invention are illustrated in the accompanying drawings.

Fig. 1 illustrates a column constructed according to the present invention.

Fig. 2 illustrates a scaffold in front elevation.

Fig. 3 is a view in side elevation of the scaffold shown in Fig. 2.

Fig. 4 is a view in side elevation showing in greater detail the scaffold and clamping elements at the junction point or line between the columns, laterals and diagonals.

Fig. 5 is a view in front elevation of the parts shown in Fig. 4.

Fig. 6 is a side view of a clamp in association with a column and a lateral.

Fig. 7 is a top plan view of the parts shown in Fig. 6.

Fig. 8 is a view similar to Fig. 6 showing another embodiment of the clamp.

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Referring to said drawings, numerals 10, 10^1, 10^2 designate column elements, ordinarily in the form of pipe. In the description which follows and in the claims, the word "pipe" comprehends other suitable forms of rod-like elements. Numeral 14 designates a longitudinal lateral element. Numeral 16 designates a transverse lateral element and numeral 18 designates a diagonal element, these lateral and diagonal elements also usually being in the form of pipe.

Numeral 20 designates a clamping element and numeral 20*a* designates another embodiment thereof. The clamp comprises a double recessed jaw 22 having a recess 24, which may be semi-circular as shown, to receive about half the circumference of a pipe 14, and a second recess 26, running at right angles to recess 24, and this also may be of semi-circular shape, to receive half the circumference of a pipe. Hinged to the double recessed jaw are two single recessed jaws 30 and 32, the hinges being indicated by the numerals 34 and 35. The recess in jaw 30, designated by numeral 37 and the recess in jaw 32 designated by the numeral 38 are similar to the recesses 24 and 26 of double recessed jaw 22, and the recesses 24 and 37, and 26 and 38 together substantially embrace a pipe positioned within the closed jaws. Suitable means 40 are provided for holding the jaws in close position and drawing them together around a pipe, so as to firmly clamp the pipe between the jaws. The fastening means 40 may be the usual type comprising a threaded bolt 42 pivotally attached to one jaw, extending through a bifurcated ear 44 on the opposite jaw, and having a nut 46 at the end which projects through the ear 44. One or both of the jaws 30, 32 are provided with a plinth or base 50, and attached to one or both of the jaws 30, 32, seated on the base or plinth 50, is a jaw 55. The jaw 55 has a base or plinth 57 similar to the base or plinth 50, and the two bases or plinths 50, 57 are parallel with one another. The jaws 30 and 55 are joined by suitable means of a character which enables the jaw 55 to be angularly adjusted with relation to the jaw 30, and may also be of a character to bind the two jaws 30 and 55 firmly together in any one of the angularly adjusted positions of the jaw 55. Such a means may be a threaded stud 59 fitting in a counter-sunk hole in one of the jaws, and engaging threads in the opposite jaw. Hinged to the jaw 55, as indicated at 63, is another recessed jaw 65. The recesses 56, 66 in the jaws 55 and 65 are similar to the recesses in the other jaws, recesses 24 and 37 for example, and the jaws 55, 65 may be held together and clamped against a pipe seated

within the recesses, by a fastening means **40** similar to that previously described. The jaw **65** may be provided with a base or plinth **75** against which may be fastened a plate or a spider **77** to which may be fastened the ends of diagonals **18**, as illustrated in Fig. 5. A threaded stud **79**, similar to the threaded stud **59** may be provided for fastening the spider **77** against the base or plinth **75** on the jaw **65**.

The construction of the clamp **20***a* shown in Fig. 8 is similar to that shown in Fig. 6, and described in reference thereto, except that the jaws **30** and **55** are made integrally, and formed as a double recessed part **30***a*, the two recesses **37** and **56** being ordinarily disposed at right angles to one another. The recesses **37** and **56** may be disposed at any other angle.

In constructing a high scaffold, greater strength of column is required at the bottom than at the top. According to the present invention, in constructing a high column, instead of using a larger diameter pipe, two (or more) pipes of a uniform diameter used throughout the job, are associated. In the case, for example, of two pipes being used for the lower part of the column, the two pipes **10**, **10**^{1}, are fastened together by a clamp **40**, one pipe being clamped by the jaws **22**, **32** and the other pipe being clamped by the jaws **55**, **65** (or **30***a*, **65**). A longitudinal lateral (of the same size as the column pipes **10**, **10**^{1}) is fastened between the column pipes **10**, **10**^{1}, being clamped by the jaws **22**, **30** (or **22**, **30***a*). In this way the longitudinal laterals **14** are supported between and by each of the column pipes **10**, **10**^{1}, and thereby a cantilever support from one column pipe is avoided. Moreover, the column stability of a column composed of two pipes **10**, **10**^{1} held together by clamps **40** is greater than that in a column made up of one pipe of a strength equal to the two pipes **10**, **10**^{1}. The invention also provides for the transverse laterals **16** being attached to the columns in line with the intersection of the columns and longitudinal laterals **14**. To this end the transverse laterals **16** are provided with flange plates **81**, and these flange plates are attached to the bases or plinths **50** of clamps **40** fastened to the columns at front and back of the scaffold. The flange plates **81** may be fastened to the bases or plinths **50** of the jaws **32** (or it may be the jaw **65**) by threaded stud **79** joining the jaw and the flange plate **81**. By this means of attaching the transverse laterals to the columns through a clamp already used for attaching the column to a longitudinal lateral, greater stability of the scaffold is obtained, and there is also a saving of clamps, inasmuch as in ordinary practice, a second clamp is used for attaching the transverse lateral to the column, the point on the column being somewhat below or above the clamp used for attaching the longitudinal lateral to the column.

Where diagonal bracing elements are used, as is generally the case, these may be fastened by the jaws **55**, **65** where the column consists of a single pipe, and in this way, an attachment to the column in the line of intersection between the column and the longitudinal lateral is obtained, and thereby also is obtained a firmer and better braced structure. Where the jaws **55**, **65** of clamp **40** are used for clamping together two pipes **10**, **10**^{1} for forming the column, the diagonals may be attached to a spider **77**, which latter spider is fastened on the base or plinth **75** of the jaw **65**, by fastening means such as a

threaded stud **79**, and thereby is also secured an attachment of the diagonals to the column at the line of intersection between the column and the longitudinal laterals. Moreover, the spider **77** may be fastened to the jaw part **30**, replacing the jaw parts **55**, **65** attached to the jaw part **30**.

From the foregoing it will be seen that the diagonals, longitudinal laterals and transverse laterals may be attached to the column by means of a single clamping element, whereas according to usual practice three or more clamps would be required to accomplish the same purpose. Moreover, the pipes used for columns, laterals and diagonals may be all of the same diameter, and the clamps may all be of the same diameter, and the clamps may all be of the same size and construction, thereby very greatly simplifying the stocking of materials and the supply of materials for scaffold erection. The transverse lateral **16** and two clamps **20**, one at each end, may be constructed, or pre-assembled, as a unit, and assembling time thereby saved.

What is claimed is:

1. A scaffold comprising columns, laterals and clamps, said columns being constituted by pipes all of the same diameter, the lower part of the column being of greater strength than the upper part and being constituted by a plurality of said pipes which are parallel and adjacent, clamps fastening the plural column pipe together, a lateral fastened between two of the parallel adjacent column pipes fastened by the clamp which also fastens together the column pipes and another lateral fastened at each end to the same clamps of opposite columns which fasten the other lateral and two parallel adjacent pipes of a column.

2. A scaffold comprising columns, laterals and clamps, said columns being constituted by pipes all of the same diameter, the lower part of the column being of greater strength than the upper part and being constituted by a plurality of said pipes which are parallel and adjacent, clamps fastening the plural column pipe together, a lateral fastened between two of the column pipes fastened by the clamp which also fastens together the parallel adjacent column pipes, and another lateral fastened at each end to the same clamps of opposite columns which fasten the other lateral and two parallel adjacent pipes of a column, and diagonals fastened to said clamps which fasten together two parallel adjacent pipes of a column, and the laterals.

3. A clamp for scaffold construction, comprising a recessed jaw and two recessed single jaws hinged to said double jaw for clamping two pipes, one of said recessed single jaws being hinged at a right angle to the other, means for fastening the jaws together in clamping engagement with pipes and means on one of the single jaws for fastening a lateral thereto in line with a line passing perpendicularly through the axes of the recesses in each of said jaws.

4. A clamp for scaffold construction, comprising a plurality of hinged recessed jaws for clamping pipes, two of said recessed jaws being hinged at a right angle to one another and one being a single jaw, means for fastening the jaws together in clamping engagement with pipes, means on the single jaw for fastening a lateral thereto in line with a line passing perpendicularly through the axes of the recesses in each of said jaws.

5. A clamp for scaffold construction, comprising a plurality of hinged recessed jaws for clamping pipes, two of said recessed jaws being single

jaws hinged at a right angle to one another, means for fastening the jaws together in clamping engagement with pipes, means on one of the single jaws for fastening a lateral thereto in line with a line passing perpendicularly through the axes of the recesses in each of said jaws, and means on another of said jaws for fastening diagonals thereto.

6. A clamp for scaffold construction comprising a recessed intermediate double jaw and two recessed single jaws hinged thereto, one of said single jaws having a plinth or base, a recessed jaw, with a complementary jaw, attached to said plinth, and movable to position the recess therein at any desired angle to the recesses in the other pairs of jaws, and means for fastening the jaws together in clamping engagement with pipe.

7. A clamp according to claim 6, wherein said other single jaw has a plinth or base, and means for fastening an attaching element thereto.

8. A clamp for scaffold construction comprising two hinged recessed intermediate solid double jaws with the pipe recesses of each double jaw at right angles to one another and closely adjacent, and two recessed single jaws, one hinged to each of said double jaws with pipe recesses parallel to the adjacent recesses of a double jaw, and means for fastening the jaws together in clamping engagement with pipe.

9. A clamp for scaffold construction comprising two hinged recessed intermediate solid double jaws with the pipe recesses of each double jaw at right angles to one another and closely adjacent, and two recessed single jaws, one hinged to each of said double jaws with pipe recesses parallel to the adjacent recesses of a double jaw, and means for fastening the jaws together in clamping engagement with pipe, said single jaws having plinths or bases thereon, and means for fastening attaching elements on said plinths.

10. A plank supporting lateral having clamps attached to each end thereof, each clamp consisting of one double jaw having recesses therein at right angles to one another, and two single jaws having recesses parallel to the recesses adjacent thereto in the double jaw, said lateral at each end being attached to one single jaw of each clamp at right angles to the axis of the recesses in the jaws to which it is attached, the single jaws to which said lateral is attached, being adapted to embrace a column, and means for fastening said jaws to which said lateral is attached, together with the complementary jaws, around columns at opposite ends of said lateral, to clamp and plumb the columns.

11. A clamp for scaffold construction, for clamping three pipes, said clamp comprising a double jaw having recesses therein at right angles to one another, and two single jaws hinged to said double jaw at right angles to one another and having recesses in each parallel to the recess of the double jaw adjacent thereto, and two recessed single jaws, one of which is connected to one of the single jaws connected to the double jaw.

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