Aug. 25, 1970 S. T. MELFI 3,525,515

CLAMP FOR CONCRETE COLUMN FORMS

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FIG. 1.

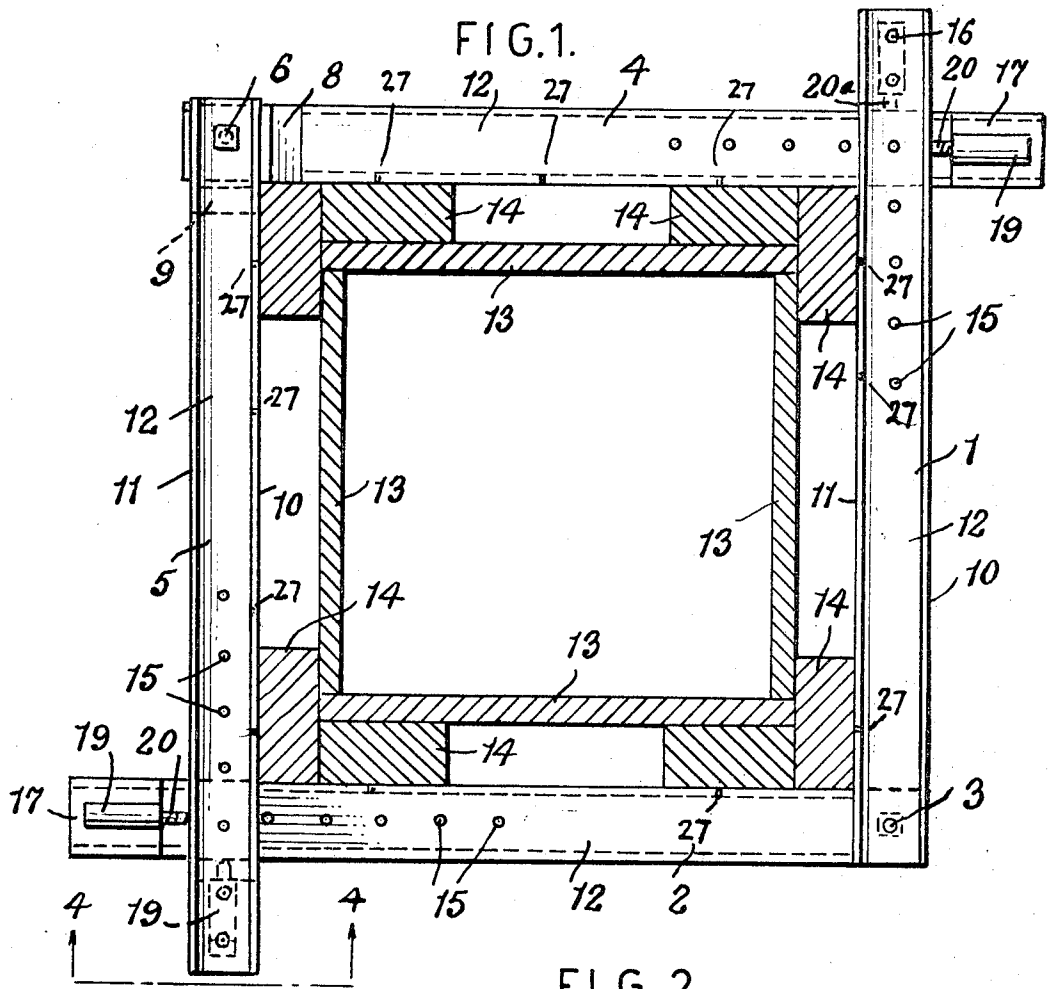


FIG. 2.

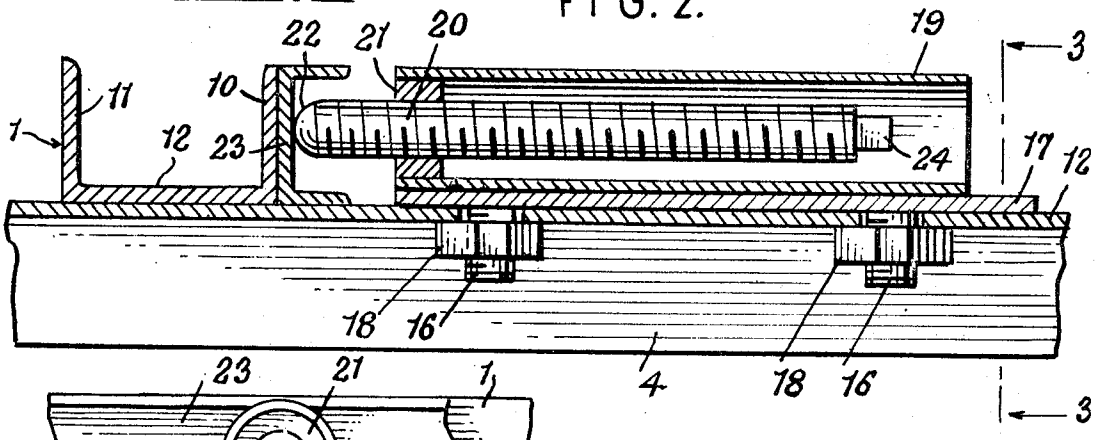
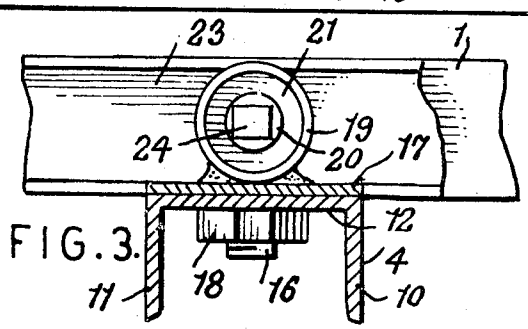


FIG. 3.



INVENTOR.
Samuel T. Melfi
BY Erwin G. Yaeger
Attorney

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FIG. 4.

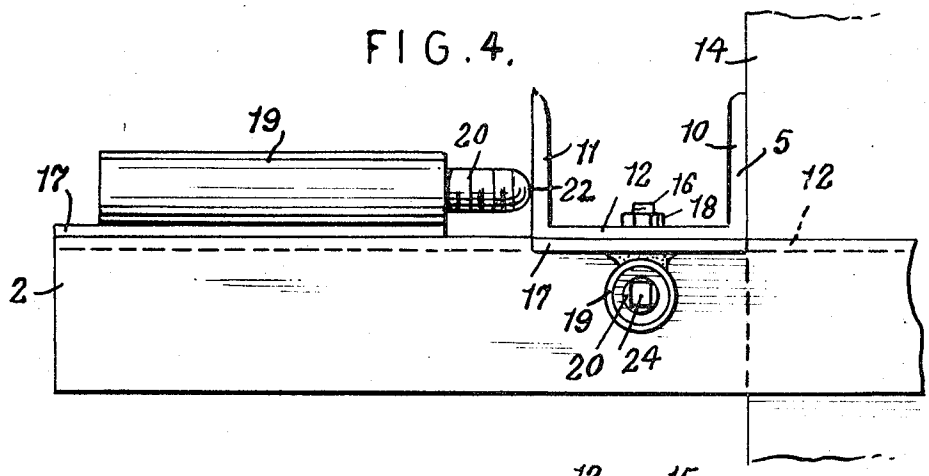
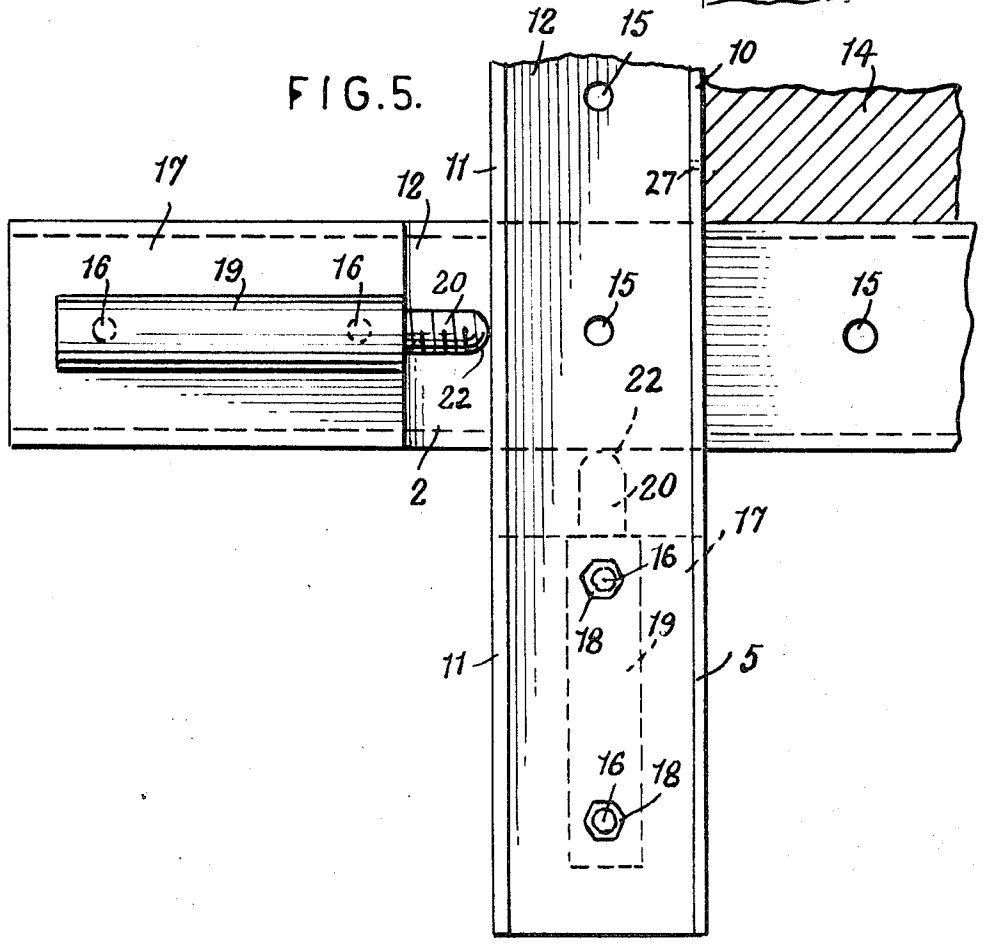


FIG. 5.



INVENTOR.
Samuel T. Melfi
BY Erwin G. Yeager
Attorney

Aug. 25, 1970 S. T. MELFI 3,525,515

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FIG. 6.

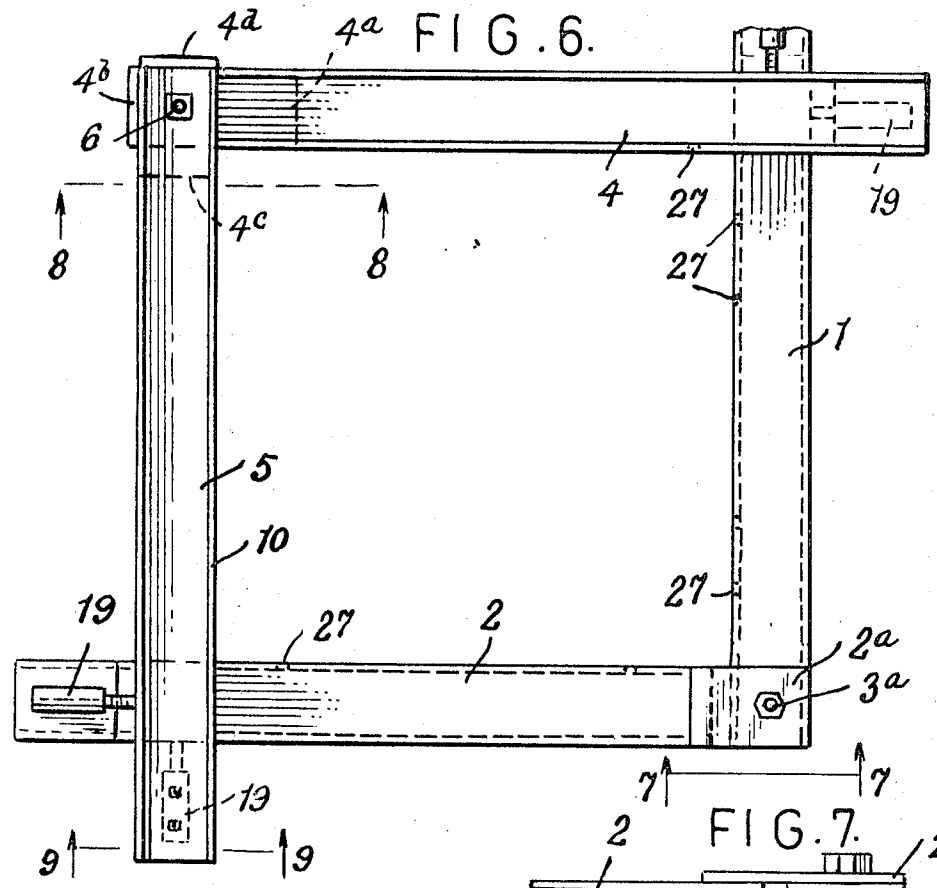


FIG. 7.

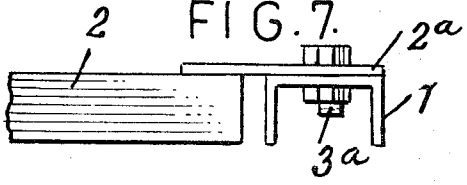


FIG. 8.

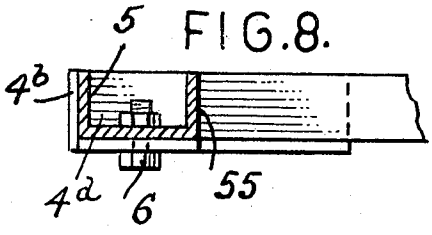


FIG. 9.

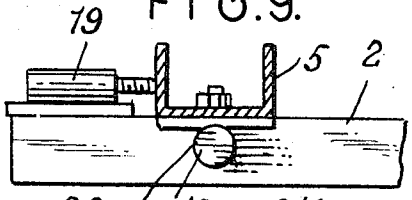
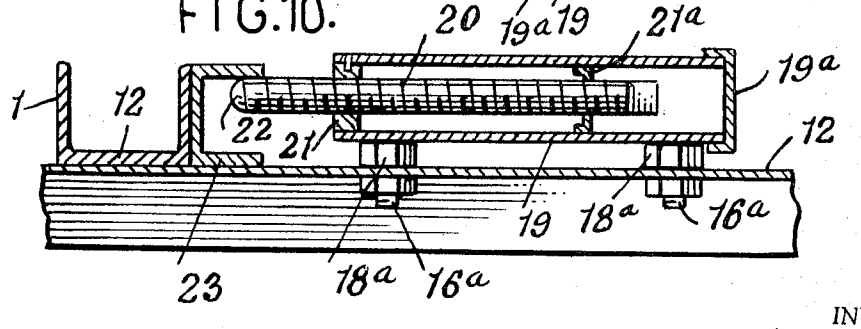


FIG. 10.



INVENTOR.
Samuel T. Melfi
BY Erwin C. Yaeger
Attorney

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3,525,515

CLAMP FOR CONCRETE COLUMN FORMS

Samuel T. Melfi, 1601 NW. 1st Court,
Boca Raton, Fla. 33432

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U.S. Cl. 269—116 9 Claims

ABSTRACT OF THE DISCLOSURE

A clamp for concrete column forms comprising four bars arranged in the form of a frame defining a square or rectangular opening, the bars being clampingly fitted around the form and being provided with adjusting screws by which the bars can be urged into clamping relationship with the form.

BACKGROUND OF THE INVENTION

Column clamps as presently employed in the concrete art are often provided with wedges by means of which they are clampingly urged into firm contact with the form parts. Such clamps have certain disadvantages since they often do not secure the proper clamping fit around the form; the concrete sometimes holds the wedges against easy removal when the removal of the clamp is desired, and the concrete often partially fills the openings in which the wedges are to be located and which requires time and effort to remove in order to place the clamps in satisfactory operating condition. Moreover, the wedges often loosen by vibration.

SUMMARY OF THE DISCLOSURE

It is, therefore, an object of the invention to provide a clamp in which the above drawbacks are eliminated; in which a secure and positive clamping action on the concrete form is attained, and which clamp can be easily demounted and cleaned, if necessary preparatory to reuse.

More particularly, the invention contemplates the provision of a clamp which consists of four side pieces or bars disposed in a certain overlapping relation and forming a frame which defines a square or rectangular opening in which the form pieces are arranged. The bars each carry an adjusting screw mounted on a plate, or otherwise suitably attached, and which is capable of being attached at different selected positions along the length of the bars and by the operation of the adjusting screws the bars can be adjusted to cause them to be brought into the desired clamping position relative to the concrete form.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed,

FIG. 1 is a top plan view of a column clamp constructed in accordance with the invention;

FIG. 2 is an enlarged sectional view taken at the upper right hand end of the clamp;

FIG. 3 is a sectional view, taken substantially on the line 3—3 of FIG. 2, looking in the direction of the arrow;

FIG. 4 is a view of the device as viewed from the line 4—4 in FIG. 1, looking in the direction of the arrows;

FIG. 5 is a top plan view of the structure shown in FIG. 4;

FIG. 6 is a top plan view of another embodiment;

FIG. 7 is a view taken along line 7—7 of FIG. 6;

FIG. 8 is a view taken along line 8—8 of FIG. 6;

FIG. 9 is a view taken along line 9—9 of FIG. 6; and

FIG. 10 is a view similar to FIG. 2 of a modified arrangement.

The device as disclosed in FIGS. 1 to 5, inclusive, primarily consists of four bars, each of which can, if desired, be of channel or U-shape in cross section, and said bars are arranged in a required overlapping relation to cause them to form a frame and to define a square or rectangular opening between them and to clampingly maintain the form pieces between which the concrete is poured to form a column or similar reinforced concrete structure.

One of the bars is shown at **1**, the same in the form illustrated, being in the form of a channel or U-shape and thus having parallel side flanges **10** and **11** connected by the integral web **12**.

Adjacent to one of its ends, the bar **1** is pivotally connected by means of a pivot pin **3** to a similar bar shown at **2**. It will be noted that in the placement of the clamp on a form one of the bars has its channel directed upwardly which as illustrated is the bar **1**, while the bar **2**, pivotally attached to a bar **1**, has its channel directed downwardly. The pivot pin **3** which couples the two bars **1** and **2** together, passes through the web portions **12** of the two bars and permits the pivotal adjustment of the two bars **1** and **2** relative to one another. Similar results are obtained if bars **1** and **2** are placed in the same plane as shown in FIGS. 6 and 7.

The bar shown at **4** is similar to the bars **1** and **2** and it is connected at one end to the fourth bar **5**, by means of a bolt **6** or similar fastening element. This is a nonpivotal connection, the two bars **4** and **5** being maintained at constant right angles to one another not only by means of the bolt **6** but also by means of angle brackets **8** and **9** rigidly fastened to the bars **4** and **5**, respectively, and also by plates **4***a* and **4***b* welded on the web and the end of bar **4**, respectively, and plates **4***c* and **4***d* welded on the web and the end of bar **5**, respectively, as shown in FIG. 6. The bars in the relationship disclosed in FIG. 1 thus form an adjustable frame which fits around and embraces the form parts **13** which are suitably braced and reinforced by the vertical corner pieces **14**.

Each of the bars **1**, **2**, **4** and **5** is provided with a line of spaced holes **15** for the selective reception of studs **16** secured to and projecting rigidly from the under side of a mounting plates **17**, said studs threadably receiving nuts **18** for fastening the plate **17** to the surface of the web **12** on each of the bars **1**, **2**, **4** and **5**. Wing nuts can be employed as an alternative for the hexagonal nuts **18** illustrated in the drawings.

Welded to the upper face of the plate **17** (in FIG. 2) is a tube or sleeve **19** constituting a protective housing for an adjusting screw **20** which is threadable through a nut **21** and supporting washer **21***a* (FIG. 10) fixedly mounted in the sleeve **19**. At its forward end, the adjusting screw is rounded, as shown at **22**, for contact with a flange on one of the bars, or for contact with a channel piece **23** secured along one of the flanges of the bars should it be found desirable or necessary to reinforce the flange on any one or all of the bars. A square lock nut can be used instead of the above-mentioned reinforcing piece. At its opposite end, each adjusting screw is

formed with a square or nonround and part **24** for engagement with a socket of a ratchet wrench or a similar tool by means of which each adjusting screw can be turned to advance or retract it.

From the foregoing, the operation of the clamp will be readily apparent. The manner in which it fits around the form is shown in FIG. 1. It will be there noted that at one end the bar **1** lies transversely across the top of the web **12** of the bar **4** while the bar **5** has one end portion lying across the top of the web **12** on the bar **2**. The plate **17** mounted on the bar **4**, has its adjusting screw **20** so positioned that the screw can be urged against the flange **10** of th ebar **1**, while the adjusting screw **20** carried by a plate **17** fitted on the topside of the web **12** of the bar **4**, is operative against said bar **1**. A similar arrangement is provided at the diagonally opposite corner of the clamp. That is to say, the adjusting screw **20** on the plate **17** that is mounted on the bar **2** is operative against the flange **11** of the bar **5**, while the adjusting screw carried by the plate **17** mounted on the underside of the web of the bar **5** is operative against a flange on the bar **2**. With the arrangement disclosed, the clamp can be securely adjusted and maintained in clamping position about the concrete form. It will also be clear that by the retraction of the adjusting screws, the clamp can be easily and readily detached from the form after the pouring and setting of the concrete.

The pivotal connection **3** between the bars **1** and **2** permits the clamp to adjust itself to inequalities or slight deviations in the form while the maintenance of the bars **4** and **5** in a true right angle insures the securement of true "square" in the form. By means of the holes **15** provided in each of the bars, the plate **17** carrying the adjusting screw **20**, and the sleeve **19** protecting the screw, can be fitted at various positions along the length of each bar, thus enabling the frame formed by the four bars to be regulated according to the size of the column to be poured.

Similar parts of the clamp are interchangeable, with varying length bars to obtain various widths and lengths. The parts of the clamp can be disassembled for storage purposes. The clamp is readily adjustable by means of the screws **20** according to form shapes and variations as will be apparent to those skilled in this art.

While I have shown the bars which constitute the clamp frame as being of channel or U-shape in cross section, it will be apparent that the same may be of other shape and that other variations may be made in the structure without departing from the spirit of the invention.

In the embodiment of the invention shown in FIGS. 6 to 9 inclusive, the fixed 90° angle between the bars **4** and **5** can be obtained by having the web **12** of the bar **5** rested on the plate **4***a* welded to the web of the bar **4** at the corner where the two bars meet as shown in FIGS. 6 and 8. This fixed 90° angle may be obtained by having the bars **4** and **5** on the same plane. In such case the connecting end **55** of the bar **4** abuts against the inside flange **10** of the bar **5**. The bar **4** is provided with a welded-on plate **4***a* attached to the web of the bar **4** and said plate extends under the web of the bar **5** and is pierced to permit the passage of the bolt **6** through it. Plate **4***a* has welded to its end plate **4***b*, which keeps bar **5** in a fixed position. Another plate **4***c* is welded to the web **12** of bar **5** to keep bar **4** in place, eliminating the possibility of bar **4** slipping on bar **5**. Another plate **4***d* is welded to the end of bar **5** projecting to the bottom of plate **4***a*, which is welded to bar **4** as above mentioned.

To maintain bars **1** and **2** in the same plane, bar **2** carries a welded-on plate **2***a* which overlies the web of the bar **1** as shown in FIG. 7 and the bolt **3***a* passes through the plate **2***a* and through the web of the bar **1**.

Nail holes **27** can be provided at various points along the flanges of the several bars **1**, **2**, **4** and **5** and nails driven therethrough can fasten the clamp to the form

pieces **14**, and to which the boards **13** are secured. This makes it possible to remove the forms in two halves after the concrete has been set and facilitates the placement of the forms thereafter for the molding of another column. Thus, one half of the form can remain attached to the connected bars **1** and **2** and the other half remaining attached to the connected bars **4** and **5**. This reduces the amount of nailing required during form erection.

In FIG. 2 the sleeve **19** is shown open at its rear end. If desired, this end may be kept closed by a removable friction fitted cap **19***a*, as shown in FIG. 10. Also, in FIG. 10 the plate **17** is eliminated. In this embodiment the welded-on studs **16***a* having heads **18***a* upon which the sleeve rests, spaces the sleeve from the web of the bar to which it is attached by extending the studs through the holes **15** in the bars.

What I claim is:

1. A column form clamp comprising, a plurality of bars arranged to define an opening between them to accommodate a concrete form, the bars having end portions adapted to overlap to adjust them to define an opening of the required size, each bar carrying an adjusting screw adjacent to the point of overlap of the bars, the screws being operative against sides of the bars to secure adjustment of the bars relatively to one another.

2. A column clamp according to claim **1**, wherein the bars are of channel cross section, the adjusting screws being mounted on plates provided with means by which the plates may be mounted at different selected positions along the length of the bars.

3. A column clamp according to claim **1**, wherein the bars are in pairs, the bars in one pair being pivotally connected together and the bars in another pair being rigidly connected together to thereby dispose the bars in the latter pair at right angles to one another.

4. In a column clamp according to claim **1**, wherein the adjusting screw is contained in a sleeve fixed on a mounting plate, the screw being threadable through the sleeve and being capable of projection therefrom to engage against one of the bars, the plate having projecting studs and the bars having holes in which the studs are insertable to locate the plate at different positions along the length of the bars.

5. A column clamp according to claim **1**, wherein the adjusting screws are carried on plates and the plates have means by which they can be mounted at different points along the length of the bars, said means consisting of cooperating elements on the plates and bars.

6. A column clamp according to claim **1**, wherein the adjusting screw is contained in a sleeve provided with projecting threaded studs which enter through selected holes in the bars to locate the adjusting screw in a selected position.

7. A column clamp according to claim **1**, wherein the bars are in pairs, the bars in one of the pairs being pivotally connected together at one end to dispose them normally at right angles to one another, and the bars in another pair being rigidly connected at one end to dispose them at a fixed 90° angle, the opposite ends of the bars in one of the pairs being overlapped with ends of the bars in the second pair, and adjusting screws carried at the overlapped ends and operative against adjacent bars to adjust the bars to cause them to define a predetermined size opening for column formation.

8. A column clamp for concrete forms comprising, four bars arranged to clamp a form between them, the four bars consisting of two pairs of bars, the bars in one pair being pivotally connected together at one end, the bars in the second pair being rigidly connected together at one end so that the two bars in the latter pair project at right angles to one another, the bars in the two pairs being disposed in overlapping relation so that the bars form a rectangular frame defining an opening for the concrete form, each bar having a free end adjacent to

which an adjusting screw is provided, the screws in each corner of the frame being disposed at right angles to one another, by which means each screw can be fixed at different positions along the length of the bar on which the screw is mounted, each screw being directed into contact with one of the bars other than that on which it is carried.

9. A column clamp according to claim 8, wherein each bar is provided with a row of holes extending longitudinally on it, the adjusting screws being each mounted in a sleeve borne by a plate, and means for fixing each screw on a bar by studs projecting from the plate and entering selected pair of holes in said bar.

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ROBERT C. RIORDON, Primary Examiner

D. R. MELTON, Assistant Examiner

U.S. Cl. X.R.

249—219; 269—287