April 4, 1950 W. A. JENNINGS 2,502,849

CLAMP DEVICE

Filed April 27, 1946

Fig. 1

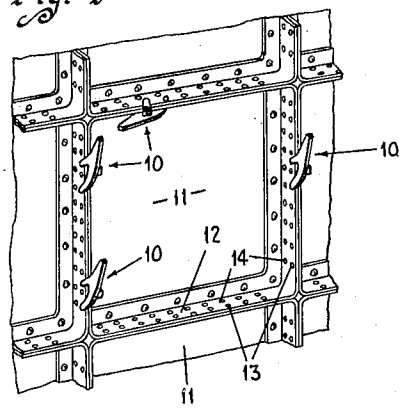


Fig. 2

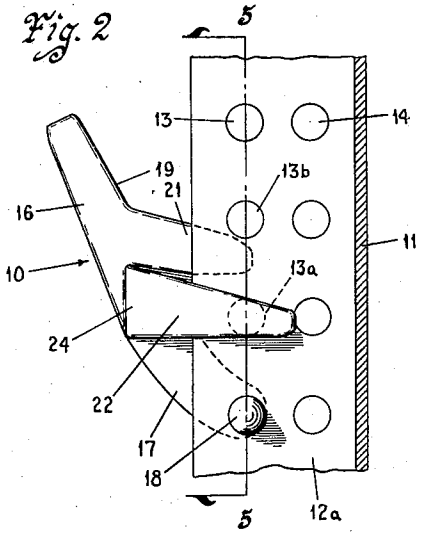


Fig. 3

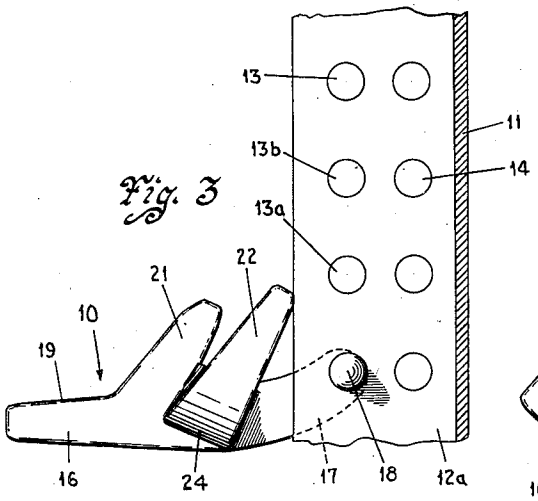
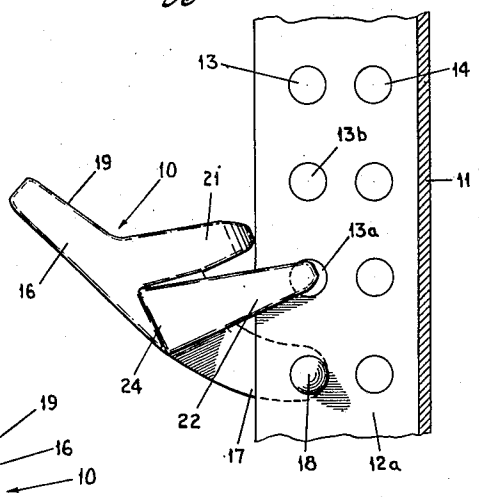


Fig. 4



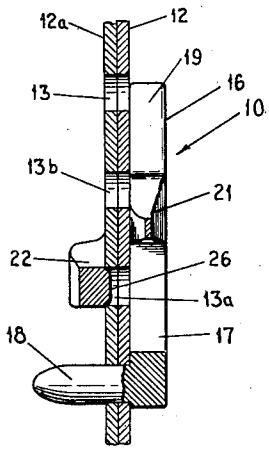


Fig. 5

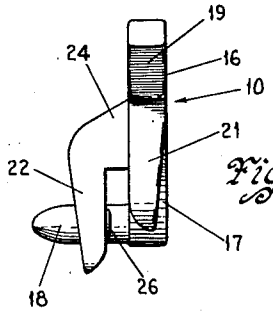


Fig. 6

Inventor
William A. Jennings
By Rudolph L. Powell
Attorney

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CLAMP DEVICE

William A. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa, a corporation of Iowa

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3 Claims. (Cl. 144—291)

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This invention relates generally to clamp devices and in particular to a device for clamping metal forms, for a concrete structure, having outwardly extended marginal flanges through which the clamp device is extended to hold the forms rigidly together.

An object of this invention is to provide an improved clamping device for metal concrete forms.

A further object of this invention is to provide a clamp device for metal concrete forms which is adapted to utilize the spring or resilience in the metal forms to positively clamp the forms together against separation by the usual jars and shocks resulting from a tamping or agitating of the concrete mixture within the forms.

Another object of this invention is to provide a clamp device for metal concrete forms, which is of a construction such that the clamp is releasably locked with the forms concurrently with its movement to a form clamping position.

A still further object of this invention is to provide a clamp for metal concrete forms which is of a simple design, economical to manufacture, efficient in operation, and capable of being easily and quickly positioned on and removed from the forms with a minimum of time and effort.

A feature of this invention is found in the provision of a clamp for metal concrete forms which is integrally formed with a lever having three longitudinally spaced form-gripping jaws. A pair of the jaws are in a common plane, and a third jaw is transversely offset from such pair of jaws at a position intermediate the pair of jaws. The jaws are successively engageable with the forms and coact to spring the engaged portions of the forms therebetween to firmly hold the forms against separation.

Yet another feature of this invention is found in the provision of a clamp device, for metal concrete forms having outwardly extended flanges, which has a lever integrally formed with a plurality of flange-gripping jaws. When the clamp is in a clamped position the lever has a portion inclined outwardly away from the outer edges of the form flanges whereby the clamp is removable from the forms by merely striking against the inner side of the inclined lever portion.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of usual type metal concrete forms having outwardly extended peripheral flanges showing clamp devices of this invention in assembly relation therewith;

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Fig. 2 is a side elevational view of the clamp of this invention in a clamped position with the forms;

Fig. 3 is a view illustrated similarly to Fig. 2 showing the clamp in an initial assembly position on the forms;

Fig. 4 is a view illustrated similarly to Fig. 2 showing the clamp in a partly assembled position on the forms;

Fig. 5 is a sectional view as seen along the line 5—5 in Fig. 2; and

Fig. 6 is an end elevational view of the clamp looking downwardly on the clamp as viewed in Fig. 2.

With reference to the drawings the clamp of this invention, designated generally as 10, is illustrated in Fig. 1 in assembly relation with metal concrete forms, of a substantially square box shape, and composed of a resilient or spring sheet metal material, having a base or bottom 11 and a peripheral flange 12 extended outwardly at substantially right angles to the base 11. The flange is formed with two peripherally extended rows of openings 13 and 14 spaced laterally of the flange and with the openings 13 and 14 arranged oppositely from each other.

The clamping device 10 (Figs. 2 and 6) is integrally formed with a body or lever member 16 having an extension 17 which constitutes a jaw in the clamping device. A fixed pin 18 laterally extended from the free end of the jaw or extension 17 is adapted to be received in an opening 13. As clearly appears in Fig. 2 the jaw 17 is inclined outwardly and away from the side 19 of the lever 16, which side will hereinafter be referred to as the inner side.

A second jaw 21 is extended laterally from the inner side 19 of the lever 16 at a longitudinally spaced position from the jaw 17 and within the plane of the jaw 17. In other words the jaws 17 and 21 and the lever 16 are in a common plane. The second jaw 21 is inclined towards the jaw 17 and the free ends of these two jaws are spaced substantially equal distances laterally from the inner side 19 of the lever so that the jaws are of substantially the same length.

A third jaw 22, longer than the jaws 17 and 21, is positioned intermediate the jaws 17 and 21 but is offset transversely from the lever 16 in a plane parallel with the plane of the lever 16. It is contemplated that the distance between the inner surfaces of the jaws 17 and 21, and the jaw 22, be slightly less than the combined thickness of

a pair of adjacent flanges 12 on the metal forms, when these flanges are in a back to back relation against each other as shown in Figs. 1 and 5.

In the use of the clamp 10 the pin 18 is initially inserted through a pair of aligned openings 13 in a pair of adjacent form flanges 12, while the lever 16 is in a position substantially normal to the form base 11 as illustrated in Fig. 3. At this position of the clamp, the free end of the jaw 22 is adjacent to or in contact with the outer edge of the flange indicated as 12a in Figs. 2 and 5. The pin 18, supported in a pair of aligned openings 13, constitutes a fulcrum for the clamp device to provide for its pivotal movement into a clamping position relative to the flanges 12 and 12a.

On a pivotal movement of the lever 16 in a clockwise direction about the pin 18, as viewed in Fig. 3, the intermediate jaw 22 is moved along one side of the flange 12a so that the flanges 12 and 12a are initially received between the jaws 17 and 22 before the jaw 21 is moved into contact engagement with the outer edge of the flange 12, as illustrated in Fig. 4.

When the lever 16 is pivoted in a clockwise direction from its position in Fig. 4 to its position in Fig. 2, the jaw 21 is moved over the flange 12 until the outer edges of the flanges 12 and 12a are engaged by the under side of the transverse offset portion 24 of the intermediate jaw 22 (Figs. 2 and 6). As the jaw 21 moves over the flange 12, the flanges 12 and 12a are sprung between the three jaws 17, 21 and 22 to provide for a spring holding action of the flanges 12 and 12a by the jaws. The spacing of the three jaws longitudinally of the lever 16 acts to hold the flanges against transverse tipping movement within the jaws. To facilitate the springing of the flanges by the jaws, the jaws 21 and 22 have their free ends of a tapered construction to more readily provide for their passage over the sides of the flanges.

The clamp is releasably locked in a clamping position by the provision of a lug or slightly raised portion 26 (Figs. 5 and 6) extended laterally from the inner side of the intermediate jaw 22 and spaced from the pin 18 a distance substantially equal to the distance between a pair of adjacent openings 13. The raised portion 26 is of a size and shape adapted to be received within an opening, indicated as 13a, next adjacent to the pair of aligned openings 13 through which the pin 18 is inserted. The outer peripheral edge of the raised portion 26 is of a rounded or beveled shape to facilitate the movement of the portion 26 into and out of the opening 13a.

Thus when the clamp is in its position shown in Figs. 2 and 5, the frictional force required to remove the raised portion 26 from the opening 13a provides a frictional lock for releasably maintaining the clamp in a clamped position on the form flanges 12 and 12a. It is apparent, of course, that the jaw 21 could also be relatively arranged on the lever 16 so as to be provided with a locking lug, similar to the lug 26, adapted to be received in an opening 13b next adjacent to the opening 13a for the lug 26.

As best appears in Figs. 1 and 2, the lever 16, when the clamp 10 is in a clamped position, is inclined outwardly from the pivot 18 and away from the outer edges of the flanges 12 and 12a. In order to remove the clamp, therefore, it is only necessary to strike against the inner side 19 of the lever with a hammer or the like to completely free the jaws from the flanges 12 and 12a. When it is considered that a large number of clamps are generally used for holding the metal forms together, the time saved by this removal of the clamps 10 will be appreciated, as contrasted to the present practice of removing clamps by prying the lever away from the flanges.

From a consideration of the above description it is seen that the invention provides a clamping device for metal forms having outwardly extended flanges, which is adapted to positively clamp a pair of adjacent forms together, by springing the flanges on the forms between three jaws, two of which are positioned in a common plane, and with the third jaw being offset from such common plane and positioned intermediate the pair of jaws. The clamping device and at least one of the form flanges have coacting portions for frictionally locking the clamp in a clamped position concurrently with its movement into a clamped position. Further the lever for the clamp is adapted to be inclined outwardly away from the metal forms, so that the clamp is easily freed from the forms by merely striking the clamp lever with a hammer.

Although the invention has been described with respect to a preferred embodiment thereof it is to be understood that it is not to be so limited since changes and modifications can be made therein which are within the full intended scope of this invention as defined by the appended claims.

I claim:

1. A clamp device for metal concrete forms including a lever member having a first jaw member at one end, a fulcrum laterally extended from the free end of said first jaw, a second jaw arranged in a longitudinally spaced relation with and in the plane of said first jaw, and a third jaw offset laterally from said first and second jaws and arranged opposite the space between said first and second jaws, with the width of said third jaw being less than the width of the space between said first and second jaws.

2. A clamp device for metal concrete forms having flanges adapted to be arranged flat against each other having a series of longitudinally spaced aligned openings therein, said clamp comprising a lever member integrally formed with three jaw members, a pair of which are in the plane of said lever member, with the third jaw member being arranged in a longitudinally spaced relation between said pair of jaw members so as to be opposite from and within the confines of said space longitudinally of the clamp device, a laterally extended portion at the inner end of said third jaw member arranged and constructed to provide for said third jaw member being offset laterally from said pair of jaw members a distance substantially equal to the combined thickness of said flanges, a fulcrum laterally extended from one of said pair of jaw members and receivable within a pair of aligned flange openings, said jaw members and lever member being relatively constructed such that upon reception of the fulcrum in said pair of aligned openings, said lever member is pivotally movable in one direction to provide for the successive movement of said three jaw members into frictional engagement with said flanges to a clamping position defined by the engagement of said laterally extended portion with the outer edges of said flanges, with the free end portion of said lever in said clamping position being inclined outwardly from the outer ends of said flanges at an

angle to provide for its pivotal movement in an opposite direction in response to the application of a striking force laterally on said free end portion.

3. A device for clamping together metal concrete forms having resilient flanges adapted to be arranged flat against each other and having series of longitudinally spaced aligned openings therein, said device comprising a lever having one end portion constituting a first jaw, a second jaw projected from said lever in the plane of said first jaw, a third jaw arranged between said first and second jaws so that the distance laterally between said two jaws and said third jaw is substantially equal to the combined thickness of said flanges, and a fulcrum extended laterally from adjacent the free end of said first jaw and across the plane of said third jaw, said fulcrum being adapted to be received in a pair of aligned ones of said flange openings, said jaws being relatively spaced and constructed to successively engage said flanges on pivoted movement of the device about said fulcrum to its clamping position, with said flanges, during said pivotal movement, being reversely sprung between said first and second jaws by said third jaw to provide for their frictional engagement with said jaws at said clamping position.

WILLIAM A. JENNINGS.

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The following references are of record in the file of this patent:

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