C. H. SCHUB.

CLAMP.

APPLICATION FILED NOV. 13, 1917. RENEWED FEB. 19, 1920.

1,350,084.

Patented Aug. 17, 1920.

2 SHEETS—SHEET 1.

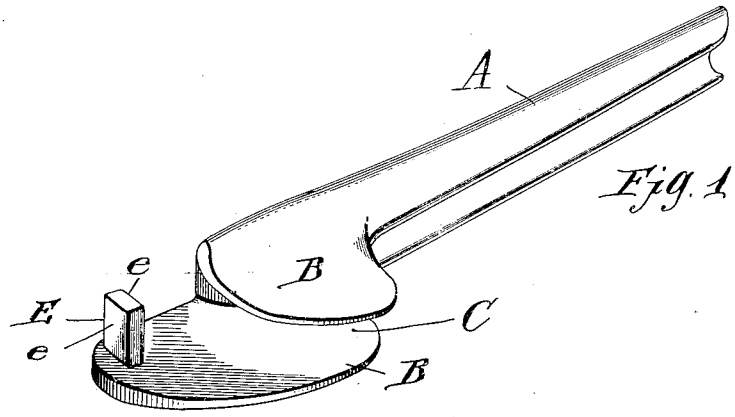


Fig. 1.

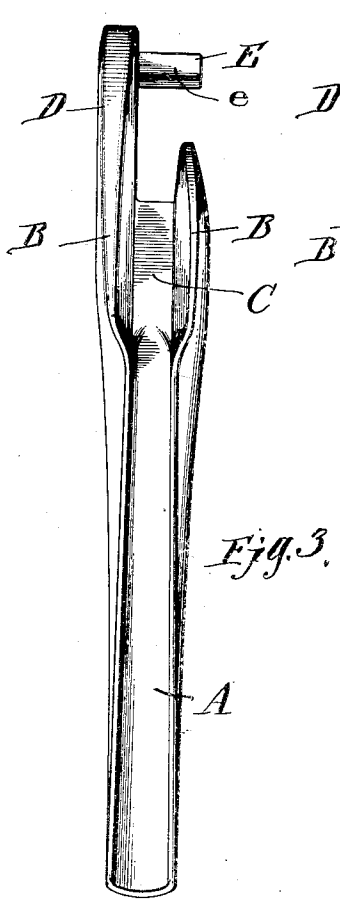


Fig. 3.

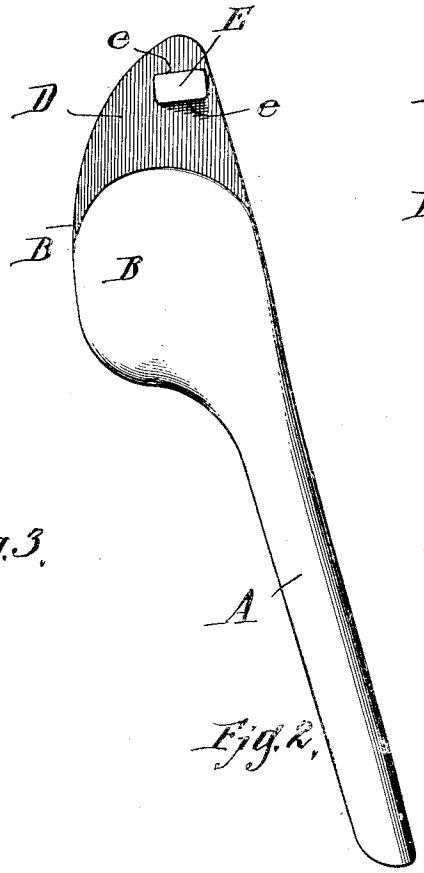
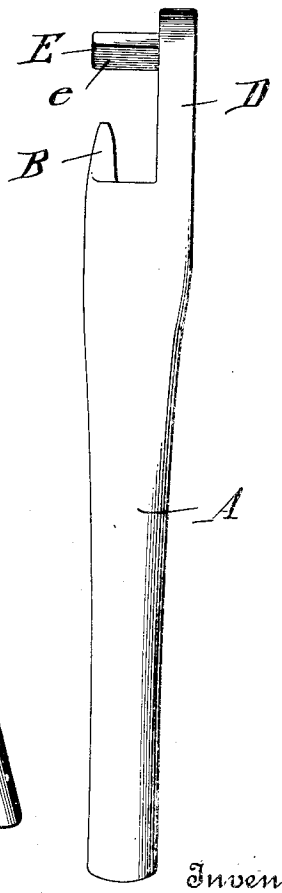


Fig. 2.

Fig. 4.



Inventor

Charles H. Schub.

By his Attorney

Jas. H. Griffin

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2 SHEETS—SHEET 2.

Fig. 5

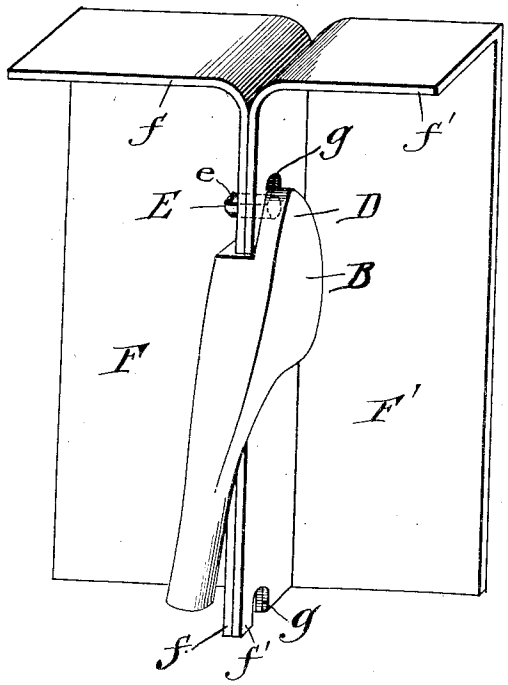
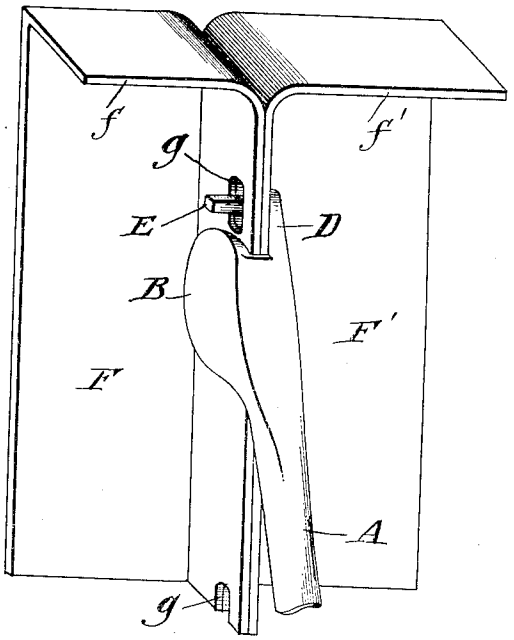


Fig. 6.



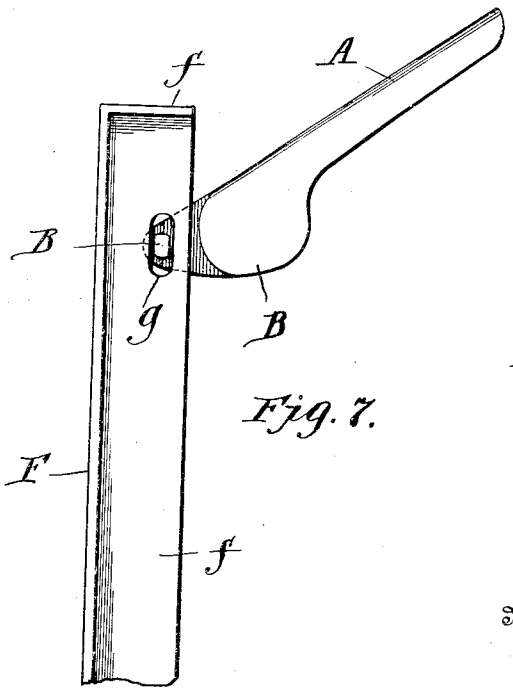


Fig. 7.

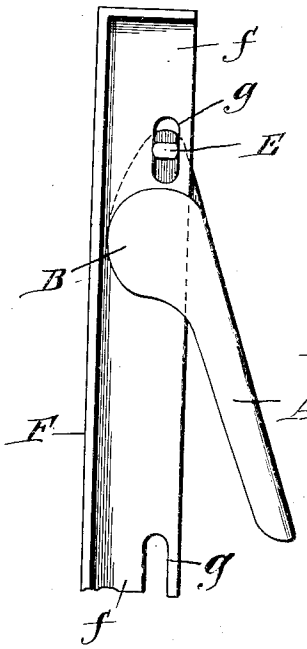


Fig. 8.

Inventor

Charles H. Schub.

By his Attorney

Jas. H. Griffin

UNITED STATES PATENT OFFICE.

CHARLES H. SCHUB, OF NEW YORK, N. Y.

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Application filed November 13, 1917, Serial No. 201,806. Renewed February 19, 1920. Serial No. 359,850.

To all whom it may concern:

Be it known that I, CHARLES H. SCHUB, a citizen of the United States, residing in the city of New York, borough of Manhattan, county and State of New York, have invented a certain new and useful Clamp, of which the following is a specification.

This invention is an improved clamp adapted for general application, but primarily intended for use in detachably securing together the sectional units of the metallic molds employed in the molding of concrete structures.

In the formation of concrete structures, both plain and reinforced, metallic mold sections have been employed, which mold sections are separate and independent of one another and form units adapted to be detachably secured together in various combinations, with reference to both the shape and size of the units, to form retaining walls within which the concrete is introduced. After the concrete has set, the molds are removed and the walls of the structure properly faced. In the formation of concrete structures in the manner described, it is desirable, if not essential, that the faces of adjacent units which come into contact with the finished work lie in the same plane, or at least be flush with one another, so that the wall of said finished work will be continuous except, of course, at corners or offsets. It is, moreover, necessary in the employment of sectional metallic molds that the several mold elements be so assembled as to be readily detachable, in order to expeditiously prepare and position them for the reception of the concrete and, after the concrete has solidified, to quickly dismantle them.

With the foregoing considerations in mind, the principal object of the present invention is to provide a clamp, by means of which metallic mold sections may be detachably secured together in assembled relation in a simple, expeditions and economical manner, and in such position relative to one another that the inner walls of adjacent sections, except at corners or off-sets, will come flush with one another and will be held in assembled position with intermediate tight or impervious joints.

A salient feature of the invention is to provide a clamp which may be brought into engagement with two adjacent sections and forced into clamping position to draw the sections tightly into registration through the manipulation of said clamp by one hand only, thereby rendering the other hand of the workman available for positioning one or both of said sections and steadying them during the application of the clamp.

A further object of the invention is to provide a clamp which is of unitary structure; that is to say, a clamp wherein all the parts thereof are rigid and preferably integral, so that no part of the clamp is free to become detached and lost, all of the parts constituting one integral, rigid element adapted to operate on the work to be done without lost motion and with precision and despatch.

In its preferred form, the clamp of this invention embodies an integral cast or drop-forged element provided with a fulcrum pin adapted to be inserted into, or passed through, the registering apertures with which mold plates are provided, when two of said plates are brought into abutting relation. A handle is provided by means of which the clamp may be oscillated on its fulcrum pin, and, intermediate the handle portion and fulcrum pin, the clamp has formed therein a converging slot positioned between a pair of beveled lips which are adapted to straddle the flanges of adjacent mold sections when the clamp is pivoted to bring said flanges between the beveled lips. Because of the beveled character of the lips and the constricted base of the slot, the forcing of the clamp into this position will cause the flanges to be forced together into tight, face-abutting relation, resulting in a tight joint between the adjacent mold sections. By retrograde pivotal movement of the clamp, the flanges of the mold sections are freed from the embrace of said lips to allow of the ready detachment of the clamp.

The fulcrum pin is preferably non-circular in cross-section so as to allow it to be freely inserted into the substantially registering apertures of the mold sections, but, when the clamp is moved into clamping position, the pin is rotated within said apertures to present the broadest dimension transversely of the apertures, whereby, by virtue of the cam action exerted, a perfect alinement of the apertures is effected. This results in the accurate alinement of the inner faces of the mold sections, for the rea-

son that said apertures are spaced at a fixed distance from the faces to be alined. It is thus apparent that the one-piece rigid clamp of this invention may be easily and effectively manipulated by one hand to simultaneously and automatically bring the faces of adjacent mold sections flush, clamp them rigidly together, and form a tight joint between them.

Features of the invention, other than those specified, as well as the advantages thereof, will be apparent from the hereinafter detailed description taken in conjunction with the accompanying drawings.

In the accompanying drawings I have illustrated one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a perspective view of a clamp embodying the present invention.

Fig. 2 is a side elevation of said clamp.

Fig. 3 is a front elevation of the clamp.

Fig. 4 is a rear elevation thereof.

Figs. 5 and 6 are perspective views showing fragmental portions of adjacent mold sections with the clamp of the present invention in clamping position thereon, and illustrating the clamp as it appears from opposite sides thereof.

Fig. 7 shows the method of initially applying the clamp.

Fig. 8 shows the clamp after having been moved to clamping position.

The clamp, which is shown in detail in Figs. 1 to 4, inclusive, is preferably made in the form of a casting or forging. It embodies a handle portion A of any suitable shape or configuration, immediately adjacent one end of which the casting is broadened out and bifurcated longitudinally to form a pair of substantially parallel lips B. The outer faces of said lips may be flat and parallel as shown, or may be rounded over, without particularly affecting the operation of the clamp. The inner or adjacent faces, however, are beveled as shown, so as to provide, intermediate said faces, a tapering slot C having a relatively wide mouth and a comparatively constricted base.

One of the lips projects beyond the end of the other, as at D, and carries thereon a post or pin E, hereinafter termed the fulcrum pin because of the particular function which it performs. It will be noted that pin E is provided with flattened sides *e*, so that it is non-circular in cross-section. When considering the clamp as a whole, it may be said that the handle portion A extends off at an angle from the remainder of the clamp, and the clamp is so constructed for economy in material, strength and ease of manipulation, as will clearly appear from Figs. 5 to 8, inclusive.

In said figures, F and F′ designate two adjacent metallic mold sections which are shown as provided with peripheral flanges *f f′*. These flanges may be made either integral with the section F F′, or may be in the form of angle-irons riveted or welded thereto, this forming no part of the present invention. The mold sections, which are stock units, are each provided with apertures *g* correspondingly positioned in their flanges, and the apertures in the flanges of all sections are so placed that, when two sections are brought into edge-abutting relation, the apertures *g* of said sections will register. It is with flanges *f f′* and the apertures *g* therein that the clamp of this invention is adapted to coöperate for the purpose of securing adjacent sections rigidly and tightly together.

The manner of applying the clamp is shown best in Figs. 7 and 8. After two sections have been placed in face-abutting relation, with their apertures *g* in registration, a clamp is picked up and carried to the position shown in Fig. 7. This positioning of the clamp having been accomplished, bodily lateral movement is imparted thereto for the purpose of projecting the fulcrum pin E through the alined apertures *g*. This operation is facilitated by the flat sides *e* of said pin, which, by virtue of their presence, render the dimensions of the pin considerably less than the width of said apertures, as clearly illustrated in Fig. 7, where marked clearance is shown. This having been accomplished, the clamp is forced downwardly, oscillating on the pivot pin E, to partake of the position shown in Fig. 8. During this operation, the lips B have been caused to embrace flanges *f f′*, at first loosely because of the relatively large, open mouth of the intermediate slot, and then tightly due to the tapering character of the slot and its constricted base. By this operation, the flanges are wedged tightly between the lips B and are pressed together with great force. Simultaneously with this operation, fulcrum pin E is rotated in the apertures *g* to the position of Fig. 8, wherein its greatest dimension extends transversely of said apertures. The pin and apertures are so proportioned that the transverse diameter of the apertures and the transverse diameter of the pin, when in this position, will be substantially equal so that the lateral edges of the apertures are in absolute registration at the conclusion of the clamping operation. Thus, even though the faces of the plates were not absolutely flush at the beginning of the clamping operation, the rotation of the pin E as described will cause a relative shifting between them to bring said faces absolutely flush.

The clamp shown in side elevation in Fig. 8, in its clamping position, is shown in per-

spective in Figs. 5 and 6, as viewed from the opposite sides thereof. From this showing, the reason for forming the handle portion A at an angle to the remainder of the clamp will be obvious, since, when in clamping position, the handle will project outwardly and away from the front edge of the flanges, so as to allow the same to be readily grasped to rotate the clamp, in a retrograde direction, to the position of Fig. 7, for the purpose of allowing of the removal thereof at the conclusion of the molding operation.

Throughout the foregoing detailed description of the clamp of this invention, it has been specifically set forth as particularly adapted for employment or use in securing together metallic mold sections used in the construction of concrete buildings or other structures. It will be understood, however, that the clamp is adapted for general application and is not restricted to the art of concrete molding. The clamp of the present invention is of great utility in securing together metallic molds of all kinds, such, for example, as are employed in the casting of soap or other commodities which are poured hot, and in liquid state, and are thereafter allowed to cool or solidify in molds. It will, of course, be manifest that, in adapting the invention to various environments, slight modifications of the specific structure illustrated will be made from time to time, and it is, therefore, to be understood that the invention is not limited to the specific structure shown and described, but that the same is as broadly novel as is commensurate with the appended claims.

Of great importance in this invention is the fact that the clamp is so constituted that, when forced into clamping position, it serves to clamp the flanges of the mold sections or plates tightly together and simultaneously brings about perfect alinement between the plates. That is to say, the lips B force the flanges together to form a tight joint between successive mold sections, while the non-circular configuration of the pin E effects the alinement specified, so that the faces of the plates are absolutely flush. This saves considerable time which has heretofore been wasted, since such alinement has generally been effected by the use of a hammer which is employed to tap one plate and then the other until the correct alinement is accomplished.

In the foregoing description of the preferred form of clamp of this invention, fulcrum pin E has been described as non-circular in cross-section. When formed in this manner, the best results are, manifestly, obtainable. It will be understood, however, that pin E may be made of different cross-sections from that shown and may, in effect, be made circular without departing from the spirit of the invention. With a circular pin, many of the advantages of the invention are obtained, though the alining of the mold sections is not so efficiently accomplished. It will, therefore, be understood that, while it is preferred to make the pin non-circular as described, the invention is not specifically limited in this respect.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a device of the character described, a pair of face-abutting flanges each of which is provided with a slot positioned to substantially register with the other, in combination with a clamp embodying a pair of rigid spaced lips providing an intermediate tapered, open-mouthed slot, and a pin of non-circular cross section, rigid with said lips, whereby the pin may be inserted into the substantially registering apertures and provide a fulcrum about which the clamp may be pivoted to a position wherein the lips will embrace the flanges for the purpose of clamping them tightly together, the rotation of the non-circular pin in said apertures serving to simultaneously and automatically bring the slots into perfect registration.

2. In a device of the character described, a pair of face-abutting flanges each of which is provided with a slot positioned to substantially register with the other, in combination with a rigid one piece integral clamp embodying a pair of spaced lips providing an intermediate tapered, reëntrant mouth, a pin of non-circular cross section extending transversely of the mouth, and in spaced relation thereto, and a handle for manipulating the clamp.

3. An integral one piece clamp embodying a pair of rigid lips spaced apart to provide an intermediate tapered, open-mouthed slot, and a pin of non-circular cross section integral with said lips and providing a fulcrum about which the clamp may be pivoted.

4. A one piece clamp embodying an integral casting formed at one end into a handle portion, provided at the other end with a laterally extending pin of non-circular cross section, and having formed intermediate thereof a pair of spaced, tapered lips providing an intermediate reëntrant tapered mouth.

5. An integral one piece clamp embodying a pair of rigid lips spaced apart to provide an intermediate tapered open-mouthed slot, and a pin integral with said lips and providing a fulcrum about which the clamp may be pivoted.

6. A one piece clamp embodying an integral casting formed at one end into a handle portion, provided at the other end with a laterally extending pin, and having

formed intermediate thereof a pair of spaced, tapered lips providing an intermediate reëntrant tapered mouth.

7. A device of the character described embodying a pair of face abutting flanges, each of which is provided with a slot positioned to substantially register with the other, in combination with a clamp associated with the flanges and coöperating with the slots for automatically clamping the flanges tightly together and simultaneously bringing the slots into perfect registration.

8. A device of the character described embodying a pair of face abutting flanges, each of which is provided with a slot positioned to substantially register with the other, in combination with a one piece clamp associated with the flanges and coöperating with the slots for automatically clamping the flanges tightly together and simultaneously bringing the slots into perfect registration.

9. In a device of the character described, a pair of face abutting flanges and a clamp for clamping the flanges together and simultaneously shifting said flanges into correct registration with one another.

In testimony whereof I have signed my name to this specification.

CHARLES H. SCHUB.