Nov. 9, 1937. J. F. HOLM 2,098,686

COMBINATION CLAMP AND GAUGE

Filed Aug. 22, 1932 2 Sheets-Sheet 1

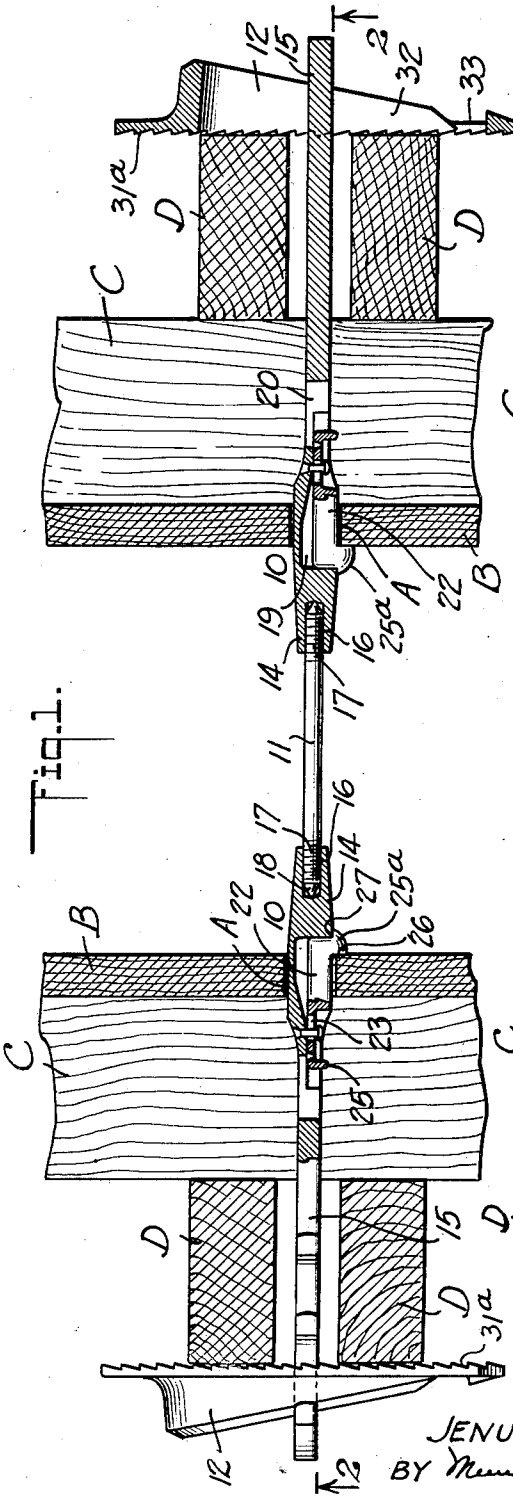


Fig. 1.

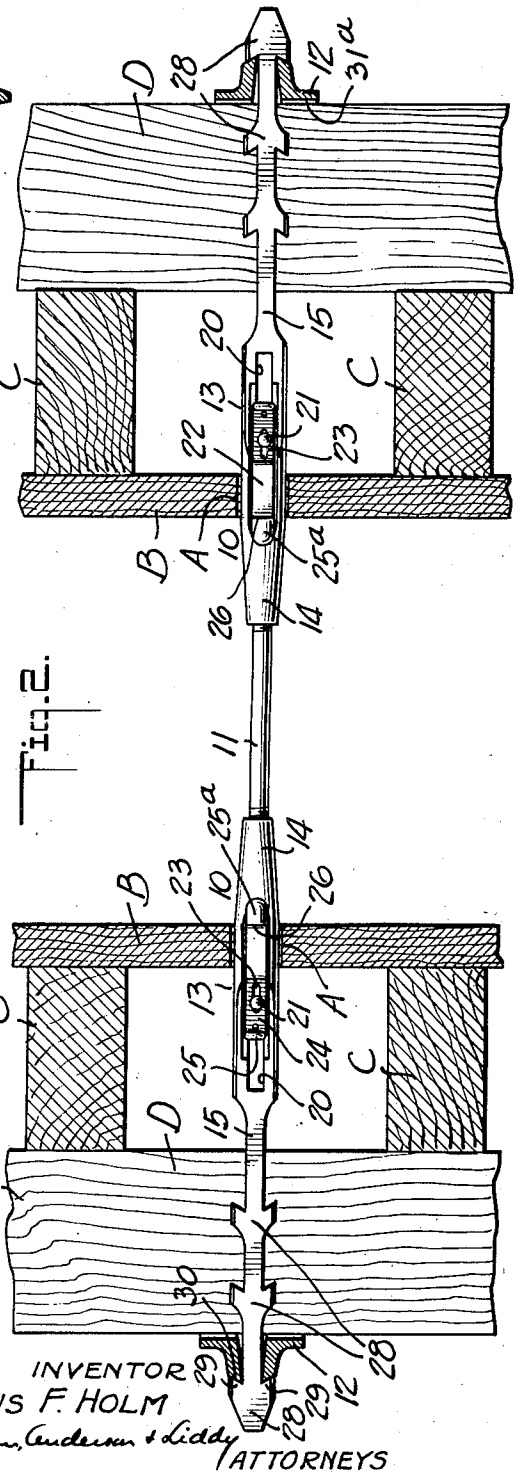


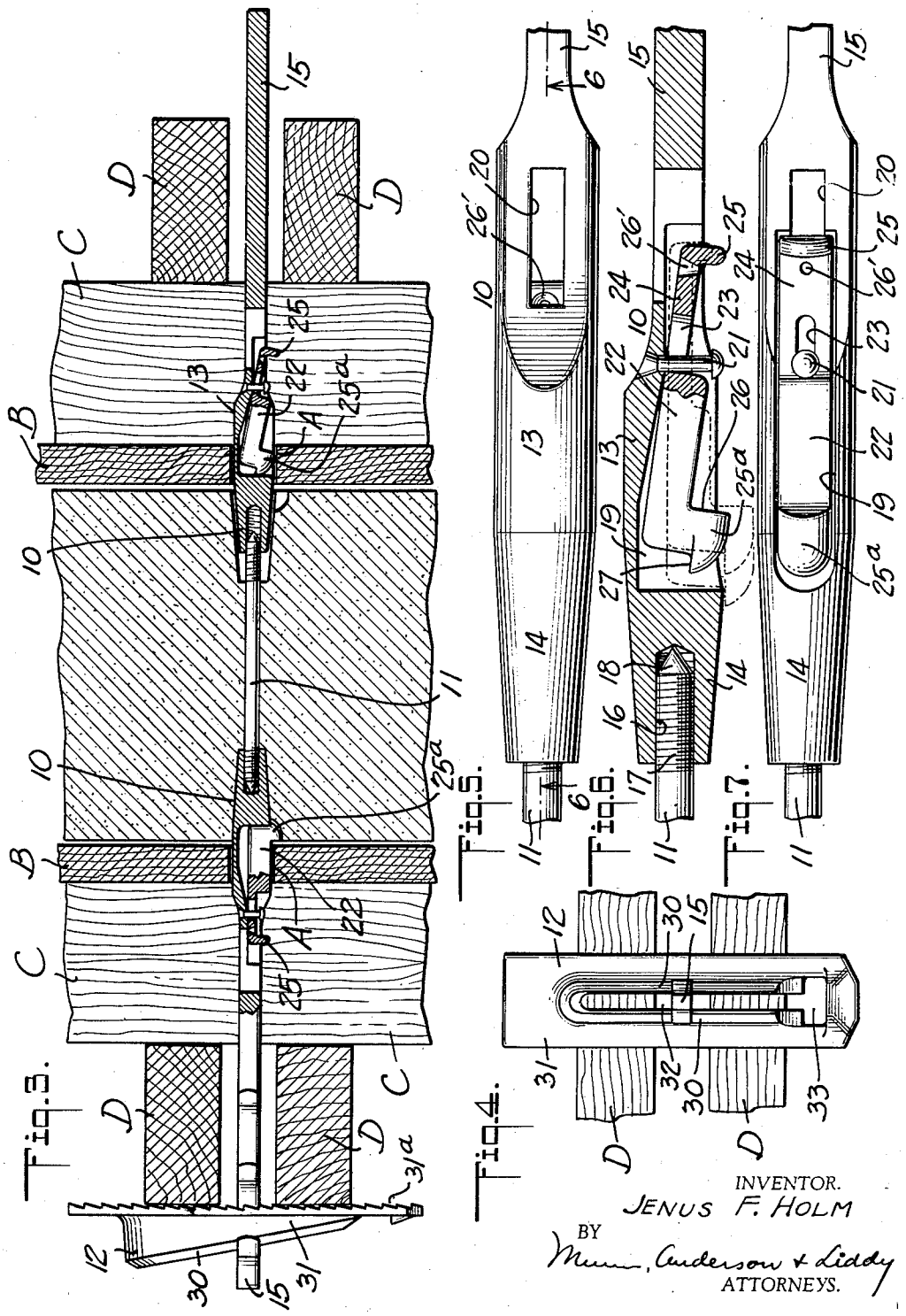
Fig. 2.

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COMBINATION CLAMP AND GAUGE

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7 Claims. (Cl. 25—131)

This invention relates to concrete form clamps and spacing gauges.

An object of the invention is to provide a simple and positively acting clamp and gauge which may be quickly and conveniently applied to or removed from the form, and which has embodied therein means, co-operable with the sheathing or form members, to definitely gauge or determine the relationship of one thereof to the other as may depend upon the thickness of the wall to be formed, and the provision of positively acting means in co-action with the aforesaid gauging means for imposing a clamping force laterally inwardly against the form studs and frame structure, whereby to hold the said sheathing members against relative movement laterally outwardly after the device is fully applied.

Another object of the invention is to provide an exceedingly simple and practical device of the kind stated whose co-operable parts are so designed and constructed as to enable them to be quickly assembled and operatively connected with a concrete form and to enable use thereof in the building of a wall of predetermined thickness, which said device, as the work of pouring the concrete advances, may be removed as a unit from one place and readily reconnected with the form at some other place where the concrete is to be next poured, thus enabling the device to be reused as often as desired during the progressive building of the wall. By reason of most building codes, it is required that after concrete has been poured, the form walls and co-operable clamps or tie rods shall not be removed until after the expiration of a prescribed time or until the concrete has set to an extent that will enable same to carry its own weight. In tie rods and clamps of the prior art, same have always been constructed so as to not enable the entire device to be removed from the wall at the expiration of a prescribed time; hence, such devices in their entirety were not capable of re-use from time to time during the progress of the work. Some part, at least, of such prior art devices was thus necessarily made to become a permanent part of the completed wall. When thus permanently embedded in a wall, said parts had no utility whatsoever, and the resulting loss of such parts is known to have materially added to building costs in the erection of concrete walls. Therefore, and entirely aside from the novel structural details of my device and the many desirable functional advantages flowing therefrom, there is associated with the scheme of things the form of a device in which all of its parts may be removed from a wall and re-used as aforementioned, thus effecting a material saving in the construction of such walls.

Another object is to provide a combined clamp and gauge in which co-acting parts may be operated in a manner to quickly cause a breaking down of any adhesions between same and the wall structure, to thus enable said parts to be quickly withdrawn from the wall.

To enable others skilled in the art to fully comprehend the underlying features of the invention, that they may embody the same in various modifications in structure and relation contemplated, drawings depicting a preferred form have been annexed as a part of this disclosure and in such drawings similar reference characters denote corresponding parts throughout all of the views, of which

Figure 1 is a view taken vertically through a wall form with the combined clamp and gauge fully applied, parts being shown in section and parts in elevation;

Figure 2 is a view taken on the line 2—2 of Figure 1, looking in the direction of the arrow;

Figure 3 is a view similar to Figure 1, with one of the wedges removed, and one of the latch carrying elements partly withdrawn from the mold form;

Figure 4 is a view in elevation of the wedge side of the device showing the device applied to the form;

Figure 5 is a top plan view of the latch carrying element of the device;

Figure 6 is a longitudinal section taken on the line 6—6 of Figure 5, and

Figure 7 is a view in bottom plan of the latch carrying element.

In carrying the invention into practice, use is made of a rigid linear structure embodying identically constructed latch carrying elements 10—10, an intermediate tie element 11, and identical wedges 12—12. These parts, except the wedges, when assembled as shown in Figures 1 to 3 of the drawings, constitute a rigid structure or unit which is so formed and constructed that the device may be easily extended through the alined apertures A in the sheathing or wall forms B. The mold is of the usual form employed in the building of poured concrete walls and it will suffice to say that in the present embodiment of the invention same includes the spaced apart vertical form studs C, and the customary spaced apart whalers D—D at the opposite sides of the mold.

Each of the latch carrying elements 10 consists

of a body section 13 of substantially cylindrical form, the same having an inwardly extending tapered or conical nose 14 and an outwardly extending spear-like shank 15. In the nose of each said element 10 is formed a threaded recess 16, which receives the complementary threaded end 17 of the intermediate element 11. This tie element has its extremities pointed as at 18 to bear axially against the substantially similar closed ends of said recesses 16, whereby to limit the turning movement of the said element in said recesses and thus limit the adjustment of one of the said latch carrying elements with respect to the other. The purpose for so limiting the relative adjustment of the said latch carrying elements will be referred to presently.

Each of said latch carrying elements is additionally characterized by a radially opening recess 19, an elongated slot 20, a fulcrum pin 21 and a tilting and longitudinally sliding latching dog 22. The pin 21 constitutes a mounting for the dog 22 and same passes through an elongated slot 23 in the shank 24 of said dog. Said shank is disposed with respect to the slot 20 to enable the manipulating lug 25 thereof to be reached by the finger in order that the dog may be manually actuated. The said shank of the dog is also provided with a flared passage 26' and same is so situated that a nail or some suitable tool may be passed into the slot 20 and inserted into said passage to also allow for forced manipulation of said dog. The dog is formed with an effective latching lug 25*a* whose shoulder 26 is adapted to engage flatwise against the inner face of the adjacent sheathing or horizontal form member B. The shoulder 27 of the said lug 25 is adapted to engage under the nose 14 of said latching element as shown in Figure 1, as well as in an extreme position shown in dotted lines in Figure 6.

The spear-like shanks 15 of the latch carrying elements are each formed with a longitudinal series of portions 28, each having oppositely beveled faces 29 adapted to engage with the oppositely beveled faces 30 on the clamping wedges 31. The faces 30 are disposed at the opposite sides of vertical slots 32 in said wedges, and, as illustrated, the lower ends of these slots are enlarged as at 33 for the initial threading of the shanks 15 through the wedges after the dog carrying elements have been fully adjusted to the intended positions upon the mold form. The inner vertical faces of the wedges are formed with ratchet-like teeth 31*a* which are designed to maximize the purchase of the wedges against the outer faces of the whalers D.

The operation of the device is as follows:

A tie element 11 of predetermined length is first attached to the respective latch carrying elements 10, care being exercised to make certain that the threaded ends 17 thereof are fully inserted in their receiving recesses 16. The device is then passed from one side of the wall mold into the adjacent passage A and then moved transversely across the space between the sheathing members B and guided into the passage A at the opposite side of the mold. It is intended that the shanks 15 shall be equi-distantly spaced from a line drawn vertically medially of the space between the sheathing members B, so that, in consequence thereof, the latch carrying elements will likewise be equi-distantly spaced apart from said vertical medial line. It is to be assumed that when inserting the device through the mold form as just above set forth, the device shall have been first turned to a position to invert the recesses 19. It is to be further assumed that before inserting said device the latching dogs will have been first adjusted to free their shoulders 27 from the stop faces of the tapered nose portions 14, as shown in full lines in Figure 6. The distance between the inner faces of the sheathing members B having been first determined and an element 11 of appropriate length having been connected with the latching elements, it follows that after the device is adjusted to its approximate transverse position in the mold form it may be turned so as to cause the recesses 19 to face vertically downwards, and in so doing, the dogs 22 will fall by gravity so as to operatively correlate the faces 26 thereof with the adjacent inner faces of said sheathing members B. When this is accomplished, the dogs will be free to move to cause the faces 27 thereof to engage beneath the adjacent external stop surfaces of the nose portions 14 of the latch carrying elements. It is in this manner that I am able to very accurately gauge the spacing distance between the two form members B, and then the dogs 22 are in the positions shown in Figure 1, said members B will be positively held against lateral movement inwardly.

With the latch carrying elements in the positions aforestated, the spear-like shanks thereof will occupy positions between the adjacent spaced apart whalers D and the wedges 12 may then be applied and driven home between the co-acting faces 29 of the shanks 15 and the outer faces of said whalers, whereby to draw the whalers laterally inwardly and thus operatively advance the form studs C against said members B. In so doing, the surfaces 27 of the dogs 22 will engage beneath the co-acting external stop surfaces of said nose portions 14 and thereby be held fixed.

When it is desired to remove the device from the mold, one of the wedges 12 is withdrawn as shown in Figure 3 and the complementary shank 15 is turned so as to allow its dog 22 to take the position shown in said figure. The shank may be further turned about the axis of the element 11 until it is entirely separated therefrom. The wedge at the opposite side of the mold may then be removed from its complementary shank and the latter with its latch carrying element turned and withdrawn from said mold, together with the element 11. It is to be borne in mind that in order that the above operation may be performed satisfactorily, the mold clamps adjacent to the one to be withdrawn should first be slightly loosened to thereby enable the form members B to move laterally outwardly a slight distance sufficient to cause a slight clearance to be formed between the mold members B and the shoulders 27 of said latching dogs. When this is accomplished, it follows that the shoulders 26 may then be manually freed from the external surfaces of the nose portions 14, thus enabling the said dogs to fall into their recesses to assume fully released positions as the shank is rotated. This will be fully appreciated upon reference to Figure 6 of the drawings, wherein the respective or possible positions of the dogs are shown in full and dotted lines. Should difficulty be experienced in extracting the respective elements of the combined gauge and clamp from the mold form after they have been disconnected from each other, the wedges may be actuated in a manner to break down any adhesions between the elements and the wall structure. This may be best ac-

complished by tapping the wedges first in one direction, then another, axially thereof.

Should it be desired to leave the tie elements 11 in the wall, one may of course do so. They are so formed that if left in the wall, the outer extremities thereof will be wholly embedded in the wall so as not to interfere with the work of applying a plaster coat or other covering to the wall.

I claim as my invention:

1. A concrete form clamp comprising a pair of latch carrying elements; an intermediate tie element having detachable connection with said latch carrying elements; and pivoted and slidably mounted latching dogs upon the carrying elements; the tie element being co-operable with the latch carrying elements to definitely space the dogs apart from each other, whereby to enable the dogs to engage against the inner faces of the respective, oppositely disposed members of a mold whose mold space is of a width approximately equal to the distance of one dog to the other.

2. A concrete form clamp comprising a rigid structure adapted to be extended through a mold form to dispose an intermediate portion thereof in the mold space of the form; pivotally and slidably mounted spaced apart dogs on said structure, the same adapted to engage against the inner faces of the respective, oppositely disposed members of the form; means for holding the dogs against pivotal movement, and means co-operable with the structure for sliding the dogs into co-acting engagement with the said holding means.

3. A device of the class described comprising end elements, each having its inner end formed with a substantially conical nose portion; pivoted dogs carried by said elements and disposed in juxtaposition to said nose portions; and means separable from said elements and co-operable therewith for advancing an inward force against the oppositely disposed members of a mold form, as and for the purpose set forth.

4. A device of the class described comprising a pair of longitudinally alined linear elements, each of said elements having a substantially cylindrical portion formed with a laterally opening recess; a dog mounted respectively for pivotal and sliding movement in said recess and adapted to be projected therefrom; and an intermediate tie element having detachable connection with said linear elements.

5. A device of the class described comprising a pair of longitudinally alined linear elements, each of said elements having a substantially cylindrical portion formed with a laterally opening recess; a dog mounted respectively for pivotal and sliding movement in said recess, and adapted to be projected therefrom; and an intermediate rigid element having threaded connection with said elements.

6. In a form tie clamp of the removable rod type, an abutting key provided with a slot attached to the rod of said clamp by a pin set in said slot, said pin being at right angles to the axis of said rod.

7. In a form tie clamp of the removable rod type, in combination, a rod, adjustable clamping means at the outer end of the rod, and a rotatable slotted key attached at a fixed distance along said rod for abutting against the structural members of the form.

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