Nov. 11, 1969 R. T. DAGIEL 3,477,684

CONCRETE FORM PANEL WITH SNAP-IN FACING

Filed Nov. 24, 1967 2 Sheets-Sheet 1

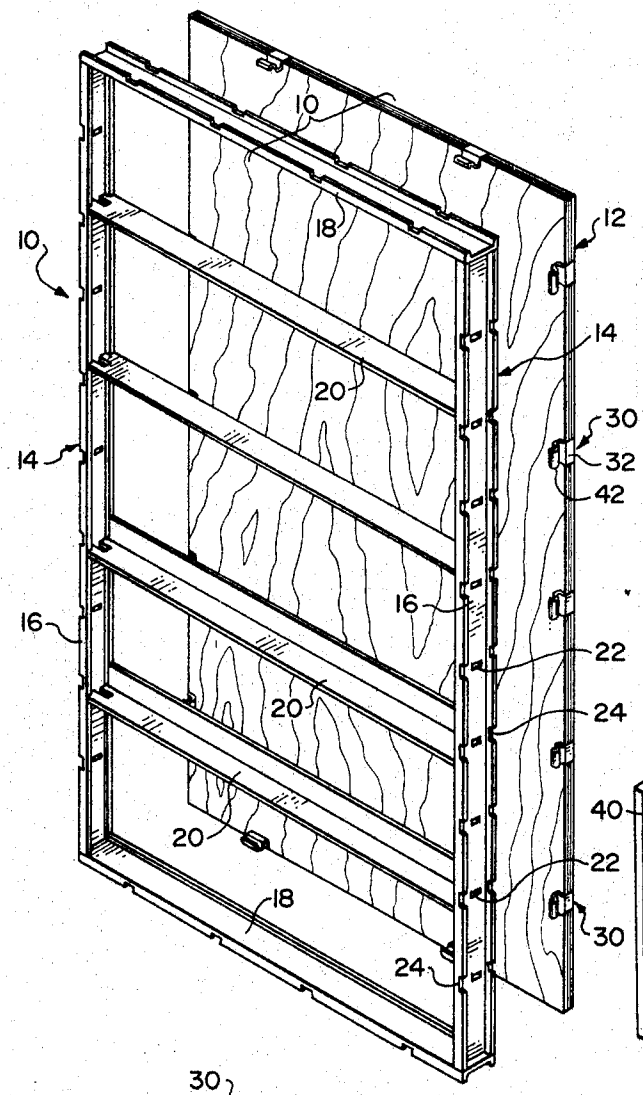


FIG. 1

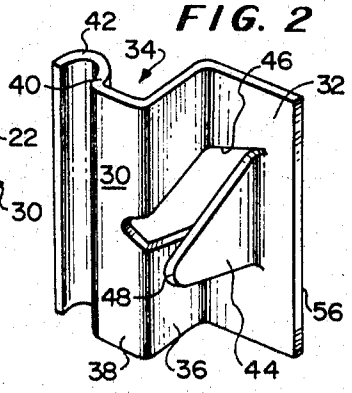


FIG. 2

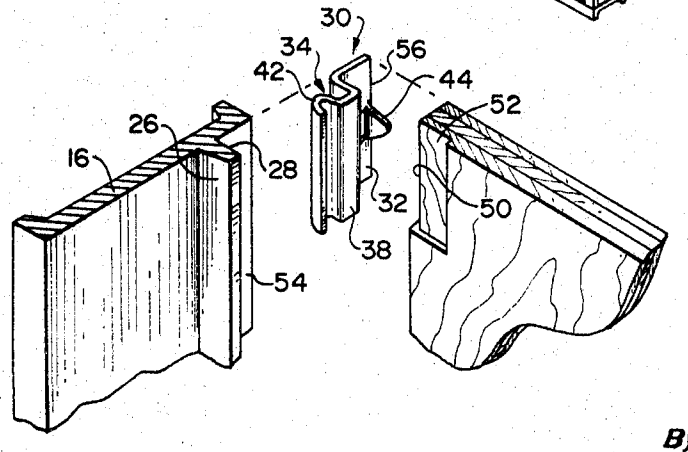


FIG. 3

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Filed Nov. 24, 1967 2 Sheets-Sheet 2

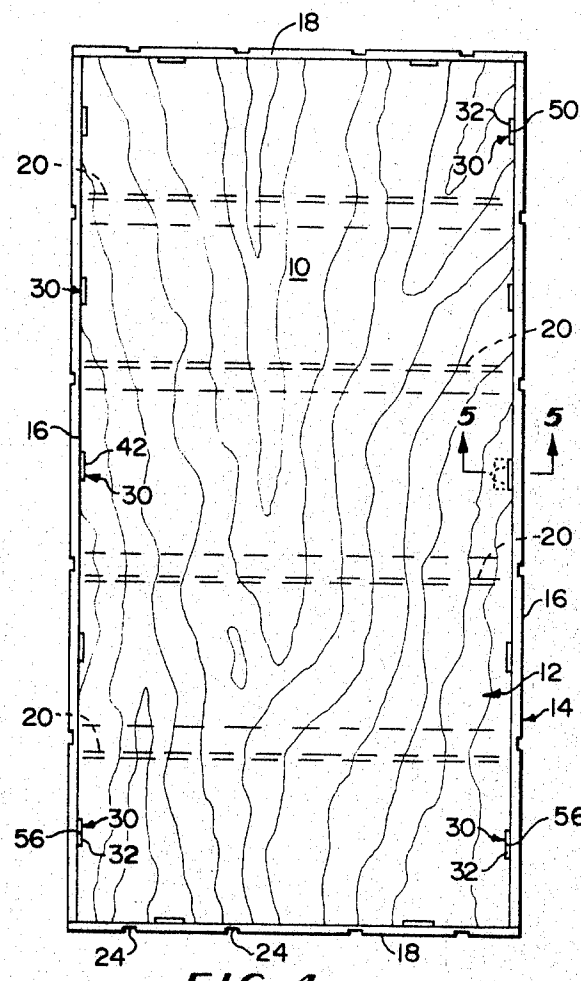


FIG. 4

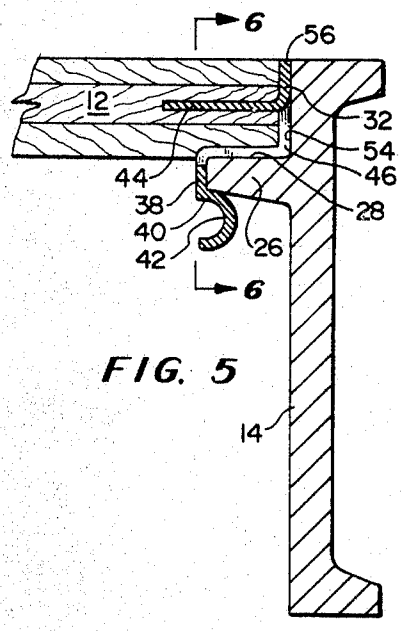


FIG. 5

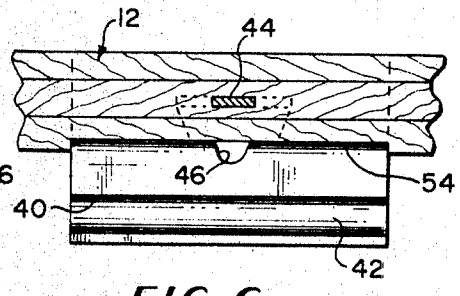


FIG. 6

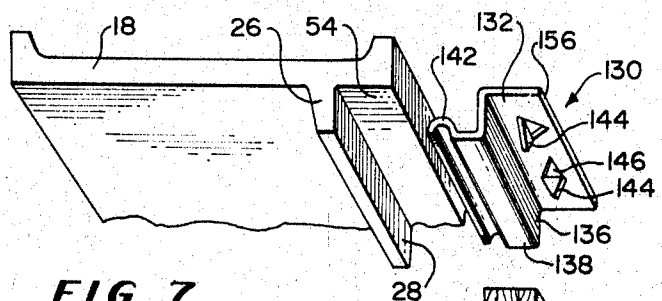
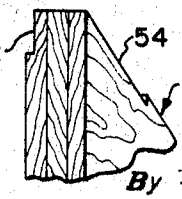


FIG. 7



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United States Patent Office 3,477,684
Patented Nov. 11, 1969

3,477,684

CONCRETE FORM PANEL WITH SNAP-IN FACING

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Filed Nov. 24, 1967, Ser. No. 685,364
Int. Cl. E04g 9/02, 17/04; E04c 2/26
U.S. Cl. 249—189 8 Claims

ABSTRACT OF THE DISCLOSURE

A steel-studded concrete form panel having a plywood facing which is assembled on the metallic reinforcing studding by pushing the same in place. A series of metal latch clips have anchor points which are pressed into the edges of the facing, and when they are all in position, the facing is pushed into its terminal position in the studding and the latch clips interlock with a seating flange upon which the facing rests. The panel facing may be removed for replacement purposes by a reversal of the assembly process.

The present invention relates generally to concrete form panels and has particular reference to that type of panel which is commonly known as a "Steel-Ply" panel, is widely used by building contractors in the erection of a concrete wall, a floor slab, or the like, and is manufactured and sold by Symons Mfg. Company of Des Plaines, Ill.

A "Steel-Ply" concrete form panel is illustrated and described in United States Patent No. 2,640,249, granted on June 2, 1953 and entitled "Wall Form Panel." Such a panel consists essentially of a shallow tray-like structure in the form of a flat rectangular plywood facing the marginal edges of which are completely encased in a rectangular metallic reinforcing frame (usually of steel) comprising longitudinal and transverse frame members. Such a concrete form panel, when used in a concrete wall or floor slab form, is adapted to be arranged in edge-to-edge relationship with similar panels and in such a manner that all the plywood facings lie in a common plane in order that wet concrete may be poured on or against the continuous unbroken concrete-supporting surface that is offered by the plywood facings of the panels.

"Steel-Ply" panels of the aforementioned type are of sturdy construction and, except when the plywood facings thereof are mistreated, they will last indefinitely, many panels being reused in many different concrete installations or structures. However, under certain circumstances, it becomes necessary to apply nails or other fastening devices to these plywood facings or to cut openings therein in order to accommodate the passage of water or steam pipes or electrical conduits. In such instances, the panels obviously are not reuseable without suitable patching or repair. For these reasons, it has been suggested that "Steel-Ply" concrete form panels be provided with removable plywood facings and several such panels have heretofore been devised. Invariably, however, to effect panel facing removability, it has been necessary to make provision for separating at least one of the longitudinal or transverse frame members from the adjacent frame members. In addition, rivet cutting and re-riveting of the new panel facing in place may have to be resorted to, depending upon the particular character of the panel undergoing reconditioning.

The present invention is designed to overcome the above-noted limitations that are attendant upon the substitution of a new plywood facing in the metallic reinforcing studding of a "Steel-Ply" panel and, toward this end, the invention contemplates the provision of a novel

concrete form panel which does not deviate appreciably from the configuration of a standard "Steel-Ply" panel but in which the plywood facing thereof is capable of being snapped into position across the rectangular opening that is provided or formed by the steel or other metal studding. According to the invention, the plywood facing, when in position, is securely retained against the usual inwardly extending, panel-seating flange of the reinforcing studding with such force or pressure that the facing will not be inadvertently dislodged by any of the foreseeable contingencies which arise during normal use and handling of the panel. Retention of plywood facing occurs even when the panel is subjected to extremely rough usage, although it is to be understood that dislodgment of the facing for replacement purposes is a voluntary procedure requiring the use of an appreciable degree of force.

The provision of a concrete form panel such as has briefly been described above constitutes the principal object of the invention and it is a further object to provide such a panel wherein the use of rivets and other permanent facing-retaining devices is eliminated, thus obviating the necessity for perforating the plywood facing and also the deleterious effect which takes place in the use of the panel under conditions of plywood shrinkage or swelling and the consequent loosening of the rivets and the exposure of the rivet countersinks to the poured concrete.

Numerous other objects and advantages of the invention, not at this time enumerated, will readily suggest themselves as the nature of the invention is better understood from a reading of the following detailed description or specification.

In the accompanying two sheets of drawings forming a part of this specification, two illustrative embodiments of the invention are shown.

In these drawings:

FIG. 1 is an exploded outside perspective view of a concrete form panel embodying the principles of the present invention, the plywood facing of the panel being shown in juxtaposition with respect to the metallic reinforcing studding preparatory to being installed therein;

FIG. 2 is an enlarged perspective view of one form of a panel-retaining latch clip which is employed in connection with the invention;

FIG. 3 is an enlarged fragmentary exploded perspective view illustrating the manner in which one of the panel-retaining latch clips is initially applied to the plywood facing, and also illustrating the manner in which the facing, with its installed clip, is subsequently applied to the metallic reinforcing studding.

FIG. 4 is a front elevational view of the assembled panel and clip of FIGS. 1, 2 and 3;

FIG. 5 is an enlarged horizontal sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a sectional view taken on the line 6—6 of FIG. 5; and

FIG. 7 is an exploded perspective view, similar to FIG. 3 but showing a modified form of panel-retaining latch clip.

Referring now to the drawings in detail and in particular to FIGS. 1 and 4, a concrete form panel embodying the present invention is designated in its entirety by the reference numeral **10** and includes a rectangular plywood facing **12** and a prefabricated and assembled composite marginal steel reinforcing frame **14** (studding) for the facing. In the exploded portrayal of the panel **10** as shown in FIG. 1, the panel and frame are shown separated preparatory to assembly thereof, but in FIG. 6 the facing and frame are shown in assembled relation. Both the panel **12** and the frame **14** display the general characteristics of a conventional "Steel-Ply" concrete wall form

panel as illustrated and described in aforementioned Patent No. 2,640,249 and reference may be had to such patent for a full disclosure of such a panel. For purposes of comparison herein, it is deemed sufficient to state that the frame **14** includes two spaced apart side frame members **16** and two spaced apart end frame members **18**, all of which are channel shape in cross section. A series of angle pieces **20**, commonly known as crossbars, have their ends welded to the side frame members **16** and project across the frame at vertically spaced regions, such crossbars constituting reinforcing members which inhibit outward bulging of the plywood panel facing **12** under the outward thrust of the wet poured concrete. The side frame members **16** and the end frame members **18** are provided with slots **22** and notches **24** in order to accommodate certain concrete wall form hardware such as various forms of tie rods and tie rod anchor devices by means of which opposed panels on opposite sides of a wall form may be maintained in their spaced apart relationship and adjacent panels may be maintained in their proper aligned edge-to-edge relationship, all in a manner well known in the art and fully illustrated and described in aforementioned Patent No. 2,640,249. Such tie rods and tie rod anchor devices have not been illustrated herein since they have no direct relation to the present invention. As shown additionally in FIGS. 3 and 7, both the side and end members of the frame **14** are provided with ledge-forming, facing-seating flanges **26** which project inwardly of the included opening of the frame, these flanges, in the assembled reinforcing frame **14**, providing a continuous rectangular ledge surface **28** against which the longitudinal and transverse edge regions of the plywood panel facing **12** are adapted to seat when the plywood facing **12** is installed in the frame. When the facing **12** is thus installed in the frame **14**, the planar front face of the facing and the inner edges, i.e., the rim, of the frame **14** extend in coplanar relationship and, in combination with the corresponding surfaces of adjacent panels, establish a continuous smooth unbroken surface against which wet concrete is adapted to bear when the same is poured between the wall form sides.

The arrangement of parts thus far described is purely conventional and no claim is made herein to any novelty therein, the novelty of the present invention residing rather in the manner in which the plywood facing **12** is removably applied to the metallic reinforcing frame **14** as will now be described in detail.

Removable application of the plywood facing **12** to the frame **14** is effected solely by the provision of a rectangular series of spring steel latch clips **30**, the details of which are best seen in FIGS. 2 and 3. These clips are designed for permanent application to the side edges of the facing and, after such application, they present displaceable detent portions which are adapted to fit behind the adjacent portions of the facing-seating flanges **26** so as to hold the facing **12** in position on the frame **14**.

Each latch clip is in the form of a one-piece spring steel stamping and comprises a flat contact plate **32** along one edge of which there is provided a flange-receiving channel **34**. The latter is defined by a flat channel side **36** which extends at a right angle to the contact plate **32**, a channel bottom **38** which is joined to the adjacent margin of the channel side **36** and extends laterally therefrom, and a short channel side **40** which is in parallel relation to the channel side **36** and merges with a curved and generally semi-cylindrical detent rib **42**. A wood-penetrating prong **44** is struck from the body of the stamping thus leaving a commensurately shaped void **46**. Such prong is generally triangular, has a blunt point **48**, and is disposed at right angles to the contact plate **32**.

Assuming now that the completely assembled reinforcing frame **14** is to have a fresh rectangular plywood facing **12** intsalled therein according to the present invention, the number of latch clips **30** to be employed and their disposition along the rectangular edge of the facing are first ascertained. Generally speaking, the specific number of clips employed is not critical, but obviously a sufficient number must be employed in order securely to hold the plywood facing **12** in position within the reinforcing frame **14**. In addition, the disposition of the clips **30** must be such that a substantially uniform pressure is exerted by the facing on the continuous rectangular ledge surface **28**. It has been found that in connection with a concrete form panel of the "Steel-Ply" type, the side edges of the plywood facing **12** will be adequately captured in the reinforcing frame if two oppositely disposed clips **30** are employed for each included opening between two juxtapositioned crossbars and are positioned mid-way between said two crossbars. With a fairly wide panel, the end edges of the panel will be adequately captured in the frame **14** if two clips **30** are carried or mounted on each end edge, each clip being spaced from an adjacent side frame member **16** by a distance substantially equal to one-third the total or overall width of the adjacent included opening. Where a relatively narrow panel is concerned, a single centrally disposed clip **30** may suffice for each of the two included openings at the opposite ends of the panel. Irrespective, however, of the particular number of clips **30** that are employed, or the specific disposititon of the clips, the essential features of the invention remain substantially the same.

Having ascertained the proper number and disposition of the clips **30**, the clips are installed by forcing the prongs **44** thereof into the edges of the plywood facing **12** at the selected locations, suitable relief areas **50** being provided in the rear surface of the facing so that the channel sides **36** of the clips **30** may nest within these recesses and not form obstructions which, otherwise, would prevent the facing edges from seating squarely on the ledge surface **28** that is formed by the facing-seating flanges **26** of the side and end members of the frame **14**. Additional relief areas **52** also are provided in the edges of the facing so that the contact plates **32** of the clips **30** likewise may nest therein and insure coextensive nesting of the edges of the facing within the confines of the overall rectangular frame opening so that there will be no gaps between the facing edges and the frame surfaces **54** (see FIGS. 3 and 5) which they normally engage when the facing is in assembled relation with the frame **14**. After the prongs **44** have been driven completely into the edges of the plywood facing **12**, the various clips **30** assume the positions in which they are shown in FIG. 1, such positions being more readily visualized by projecting the clip **30** of FIG. 3 toward the facing **12**.

After all of the clips **30** have been thus installed with their contact plates **32** seated in the relief areas **52** and the channel sides **36** seated within the relief areas **50**, the entire facing is bodily and forcibly projected into the rectangular opening that is afforded by the side and end members of the reinforcing frame **14**. During such projection the curved surfaces of the semi-cylindrical detent ribs **42** make camming engagement with the ledge-forming flanges **26** and the ribs are deflected inwardly of the frame until such time as they move past these flanges, after which they will snap into position, so to speak, behind said flanges and, thereafter, the flanges will become projected into the channels **34** with a snug fit. The entire camming action is not entirely dissipated and, after the detent ribs **42** have moved past the flanges **26**, the spring action of the clips will remain effective to draw the edge regions of the facing **12** hard against the rectangular ledge surface **28** so that the facing will not be loose in the reinforcing frame **14**.

It is to be noted that the disposition of the wood-penetrating prongs **44** on the contact plates **32** is such that the prongs overlie at least one of the plywood layers, thus insuring against splitting of the facing and also affording high resistance against lateral shifting of the prongs in the plywood.

Removal of the facing **12** from the frame **14** for replacement purposes may be effected by simply forcing the facing out of the frame against the spring action of the various clips **30**, the curved detent ribs **42** yielding to permit such removal. A relatively high degree of force is required to remove the facing, such force being appreciably in excess of any unassisted manual force that may be applied. One convenient method of removing the facing **12** is to use a crowbar or similar tool such as a lever and utilizing the crossbars **20** as reaction members, the facing may be pried from its operative position within the frame **14**.

In FIG. 7 a slightly modified form of panel-retaining clip **130** is disclosed. Such clip is substantially identical to the previously described clip **30** and, thus, in order to avoid needless repetition of description, similar reference characters but of a higher order are applied to the corresponding parts as between the disclosures of FIGS. 2 and 7. The clip **130**, instead of having a single wood-penetrating prong, is provided with two such prongs **144** and **145**. The prong **144** lies in a plane which is parallel to the channel side **136**, while the prong **145** lies in a plane normal to the channel side **136**. The two prongs **144** and **145** are of smaller magnitude than the prong **44** of the clip **30**. By thus positioning the prongs **144** and **145** in planes which extend at right angles to each other and by spacing the two prongs apart on the conatct plate **132**, one prong may penetrate the wood of the facing in a direction parallel to the wood grain while the other prong may penetrate the wood in a direction counter to the direction of the wood grain. The clip **130** is installed in the same manner as the clip **30** and it serves substantially the same function.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention is particularly pointed out in the accompanying claims is the same to be limited.

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

1. In a concrete form panel, in combination, an open rectangular reinforcing frame presenting a substantially continuous internal seating flange, a rectangular plywood facing having its edge regions confined within said frame and bearing substantially coextensively against said seating flange, and a rectangular series of spring clips removably maintaining the facing in position within the frame and against said seating flange, each of said spring clips being in the form of a metal stamping having a portion thereof overlying at least one of the plywood layers of the panel, said portion including means to removably secure each clip to said panel, and each clip including a detent rib underlying and interlocked with said seating flange.

2. In a concrete form panel, the combination set forth in claim **1** and wherein the means to removably secure each clip embodies a wood-penetrating prong embedded in the facing.

3. In a concrete form panel, the combination set forth in claim **2** and wherein the wood-penetrating prong projects into a side edge of the plywood facing.

4. In a concrete form panel, the combination set forth in claim **3** and wherein each clip includes a contact plate interposed between a marginal edge of the panel and the adjacent portion of the frame and on which contact plate the wood-penetrating prong is formed.

5. In a concrete form panel, the combination set forth in claim **4** and wherein the clip further includes a channel section encompassing said seating flange, one side of the channel section being interposed between the facing and the seating flange, and the other side of the channel section underlying the seating flange and constituting said detent rib.

6. In a concrete form panel, the combination set forth in claim **5** and wherein the marginal edge of the facing is formed with a relief area within which the contact plate is confined.

7. In a concrete form panel, the combination set forth in claim **6** and wherein the edge region of the facing is provided with a second relief area within which the one side of the channel section is confined.

8. In a concrete form panel, the combination set forth in claim **4** and wherein said contact plate is formed with a second wood-penetrating prong which likewise projects into the side edge of the panel facing, each prong being struck laterally out of the general plane of the metal of the stamping, one of said prongs lying in a plane which extends parallel to said one side of the channel section and the other prong lying in a plane which extends perpendicular to said one side.

References Cited

UNITED STATES PATENTS

2,581,843	1/1952	Edwards	287—189.35
2,640,249	6/1953	Symons	249—190 X
3,001,748	9/1961	Austin	248—204 X

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U.S. Cl. X.R.

249—219; 287—189.35