To all whom it may concern:

Be it known that I, FRIEDRICH ZOLLINGER, a citizen of the German Empire, residing at Merseburg, Germany, have invented certain new and useful Improvements in Boarding for Building Houses from Cast Material, of which the following is a specification.

This invention has for its object to facilitate the manufacture of buildings from cast material by means of certain definite types of boardings or casing for such cast material, of which a supply may be made on a manufacturing scale by composing them from several individual equivalent parts by means of a restricted number of individual connecting members. By means of such boardings I am enabled to manufacture cast buildings and models in a short time also in accordance with new building plans. Thus, among other uses, the invention is intended to facilitate the erection of comparatively inexpensive cast buildings without the aid of skilled architectural experts, inasmuch as by this means the manufacture of a home becomes possible by proceeding according to instructions. In accordance with a preferred form of construction of this invention the several sections of the boarding may be detachably connected to each other without the use of nails or screws, and a boarding, casing or facing according to this invention after having been used once, may be again connected and put up in the order in which the parts have been taken apart upon a fresh building ground in the vicinity or otherwise in view of the corresponding formation of the upper and lower frame standards, and the new boarding is, therefore, particularly adapted for the rapid erection of series of dwellings of cast buildings in settlers colonies and the like. The readily detachable attachment of the panels to the standards of the boarding is preferably and advantageously effected by means of clamping or collar beams that are adapted to be inverted or turned. In view of the great reduction of wear and waste produced by the improved construction and mode of employment of boardings or facings the same may be used a great number of times in succession so that this structure is highly economical.

The invention will be understood from the accompanying drawings illustrating embodiments of the invention by way of example.

Figure 1 is an elevation of the casting mould.—Figure 1a shows a wall panel of the boarding in longitudinal section.—Fig. 1c illustrates the junction of the clamping beam of the wall panel in transverse section.—Figure 2 is a longitudinal section through the mould on the line A—B of Figure 1.—Figure 2a is a side view of one of the standards.—Figure 3 is a transverse section through a part of the boarding on the line C—D of Figure 1.—Figure 4 is a transverse section through a corner of the mould.—Figure 5 illustrates the mounting of the lower part of the mould upon the wall and the ceiling.—Figures 6, 6a and 6b illustrate respectively an insertion piece of the moulding for a window in front view, side view and plan view respectively.—In Figures 7—7c I have shown several views of the binding pieces or posts for connecting the upper and the lower frame standards of the boarding, and on which the thickness of the wall of such cast walls depends.

As is apparent from Figures 1 to 3 each section of the boarding or facing is made up of four main parts. It possesses the frame posts 1 which are mounted on both sides of the boarding; they are of identical shape on the upper and lower sides of the boarding, and are provided with end-to-end openings 6, and are connected to binding pieces 3 (Figure 7c) having dovetail ends 8, engaging with corresponding recesses 7 of the frame posts, and determining the thickness of the wall. Standards 4 are inserted in the end-to-end openings 6 of the upper and lower frame posts. The section also comprises the wall panel 2 with the longitudinal stiffening stays 9, and the central transverse stiffening 10, to which the turning or pivotal bolt 16 of the clamping and collar beam 5 is secured.

The entire boarding is assembled from these four elements, and only at the corners some supplementary plates may eventually be attached.

The setting up of the boarding or facing is effected by first assembling the lower frame posts 1 by means of the binding pieces 3 corresponding to the desired outlines of the plan; then, upon the support obtained the foundation, wall or ceiling, is mounted. After inserting the standards 4 with their
tenons into the holes 6 of the frame posts 1, and after connecting the upper frame posts and parts in the same manner the pannels 2 which are laterally engageable between the standards 4, and which have groove-and-tenon connection with the boards, so as to prevent displacement thereof are secured to the standards 4 by means of the wooden beams or cross bars 5. The ends of the cross bars 5 are preferably provided with the projections or tenons 11 having inwardly shouldered inclined sides (Figure 19). By means of the arrangement of the long cross bar 5 which is somewhat spring acting between its ends, and which is mounted in the center of the board 10 (Figure 3) connecting the center parts of the longitudinal standards 3, the wall plates 2 are securely clamped in the boarding, even in case the boarding or the plates or pannels should have become somewhat warped after repeated use. By means of this arrangement of cross bars the entire boarding is, moreover, stiffened and tightly secured in position.

35 The binding pieces 3 having reduced and preferably dove-tailed ends are engageable with correspondingly shaped recesses 7 of the frame posts 1, and make it possible to erect the boardings for the several stories of the building on top of the already finished lower cast walls, and upon ceilings in a most simple manner, as shown for instance in Figure 5. By means of the reduction of the dove-tailed ends from the full thickness of the wood at the thinnest part the binding pieces 3 may be easily inserted and removed from the recesses 7 of the frame posts 1. The lower binding pieces 3 remain in the cast wall. After the dove-tails 8 have been cut off, the binding pieces 3 may preferably be used as dowel pins, thus for instance for the fastening of the lower skirting or bottom boards. In erecting the boardings no special provision is made in the first place for the position of the windows and doors which may be mounted in any suitable place. The boarding is first made as a continuous structure, and the openings for the doors and windows may be provided by applying lining boards 12 of a thickness corresponding to the intended thickness of the cast wall to the window frames 17 (Figures 1, 2 and 6) or outer door frames and the like which are to be permanently secured in the walls, the frames being thus inserted in the correct position in the boarding. These insertion frames are secured in the vertical and horizontal positions by means of locking pins 13 which may be detachably inserted in holes provided in the walls 2 of the boarding according to requirements. Stiffening ribs 15 (Figure 2 and Figs. 6 to 69) of laths may be nailed to the outer surface of the boarding for more securely retaining the boarding around the openings in the casting-in wall, and for reinforcing the same against the pressure of the filling material, until the material of the cast wall has sufficiently set. The outer boardings 12 are also permanently retained in the wall; they constitute the flanging of the openings, and at the same time prevent any contact between the wooden parts 17 of the windows, and window and door frames which are very sensitive to the action of moisture, with the moist and preferably thinly liquid casting material. By the subsequent provision of covering bars or boards the joints between the wood and the filling are covered up. These covering bars or boards may be nailed or screwed to the outer boards 12 in a very convenient and unobjectionable manner similar to the mounting of the window boards or the like.

45 By means of this manner of mounting doors and windows, it becomes possible to provide the corresponding openings at any suitable parts of the continuous boardings, and to directly and permanently connect the windows, doors and the like with the filling material. The otherwise very difficult boarding of the window flanging, and the subsequent insertion of the framing for the openings and the securing of the same to the openings is thereby avoided, and there is no further necessity of additional subsequent adjusting and other work, and a perfectly tight connection of the boarding for the openings with the filling is thereby obtained.

When the improved wooden boarding is employed for buildings from cast material as indicated the removal of the boarding may be effected immediately after the solidification of the filling material without any disturbance of the parts of the cast wall. After removing the upper parts 1 of the frame the standards 4 and the plates 2 are detached, and then the bottom frame posts 1 are withdrawn from the dove tails of the lower binding pieces 3. The entire boarding may be immediately assembled and used over again at some other place. The upper frame posts 1 which have been detached in the first place, may be mounted as bottom pieces upon the new building ground, inasmuch as the upper and lower frame posts employed are perfectly identical, so that there is no necessity of waiting for the removal of the lower frame posts, when the wooden boarding is to be used over again. By this means a great saving in time and labor is effected, inasmuch as the several parts of the boarding need not be uselessly laid away and handled when disassembling the same, but they may be again assembled in the inverse order and re-erected immediately. The entire construction is thus inverted, so to speak.

In a building erected from cast material
in the manner described the finishing of the walls will only necessitate smoothing with a thin coat of plaster or the like, the mounting of the covering bars or boards above referred to, and of the window boards at the boarding for the openings. Nor is there any necessity of inserting dowels for the mounting of the bottom or squirming boards and of the window boards, inasmuch as the lower binding pieces which remain in the walls by the cutting-off of the dove tails serve as very tightly secured dowels, while the boardings for the openings serve as a means of mounting the window boards.

The assembling of the boarding with the inclusion of the mounting of the boarding for the openings, and the entire construction may be effected in a comparatively short time, and in a very convenient manner by means of the improved construction of boarding even by unskilled labor without difficulty.

It is obvious that the manner of erecting and assembling the boarding may be modified or changed according to local requirements within the meaning of the claims hereinafter appended. Thus for instance, the spring acting cross bars or collar beams of the walls may be locked in position upon the upper and lower frame posts instead of on the longitudinal posts. In this case the bars or beams referred to would have to be comparatively longer and would have to constitute special standards or posts adapted to be rotated.

No claim is made in this specification to the window frame as this is claimed in my copending application for Letters Patent of the United States, Ser. No. 328,450, filed January 11, 1922.

What I claim is:

1. False frame or scaffold for buildings to be erected by pouring and which is to be erected in the complete height of a story, comprising uprights which are inserted into lowermost and uppermost horizontal frame bars, boarding arranged between said uprights and forming mold walls, characterized in this that the boarding is pressed against the uprights from the inner surface by means of locking members which are rotatably mounted on that boarding.

2. Scaffolding, as set forth in claim 1, and including spacers provided at their ends with tapering dove-tailed tenons and which are inserted by means of these tenons into suitable mortises or recesses of the frame bars.

3. Detachable framing for the erection of buildings from cast and filling material, comprising in combination detachably and substantially quadrangularly connected open frames arranged in pairs and in spaced relation to each other, binding pieces connecting said pairs, panels detachably engaging said pairs of open frames, spring acting bars in contact with said binding pieces and detachably connected to said open frames, said bars being held in place by frictional engagement.

4. Detachable framing for the erection of buildings from cast and filling material, comprising in combination detachably and substantially quadrangularly connected open frames arranged in pairs and in spaced relation to each other, binding pieces detachably connecting said pairs, panels detachably engaging with and filling said open frames, spring acting means in contact with said binding pieces and detachably connected to said open frames, said bars being held in place by frictional engagement, open framings intermediate said binding pieces and between the first mentioned open frames, and means for retaining the intermediate open framings.

5. False scaffolding, as set forth in claim 1, characterized in this that the frame bars at the top and at the bottom are provided with openings into which the uprights are to be inserted and, also with mortises, and spacers having their ends arranged is said mortises.

6. Detachable and disjointable boarding for building purposes, comprising in combination upper and lower substantially rectangular disjoingatable open frames of substantially identical shape, vertical standards detachably connecting said frames, panels engageable between said standards, open framings intermediate said rectangular upper and lower frames, and means for detachably locking said intermediate framings in position.

7. Detachable and disjoingatable framing, comprising upper and lower frame posts respectively rectangularly connected, vertical standards detachably connecting said frame posts, the said frame posts being of substantially identical shape and adapted to be inverted so as to allow of using the otherwise upper dismounted frame posts as lower frame posts in re-mounting, and window and door framings between said frame posts and means for detachably locking said window and door framings in position, and panels detachably engageable with the first mentioned frame posts, and means for retaining said panels in position.

In testimony whereof I affix my signature in presence of two witnesses.

FRIEDRICH ZOLLINGER.

Witnesses:

HELADE VON WESTRUM,
EMORY H. LORD.