Sept. 1, 1953 W. E. MITCHELL 2,650,411

MOLD FOR HEAD WALL CONSTRUCTION

Filed Dec. 5, 1950 3 Sheets-Sheet 1

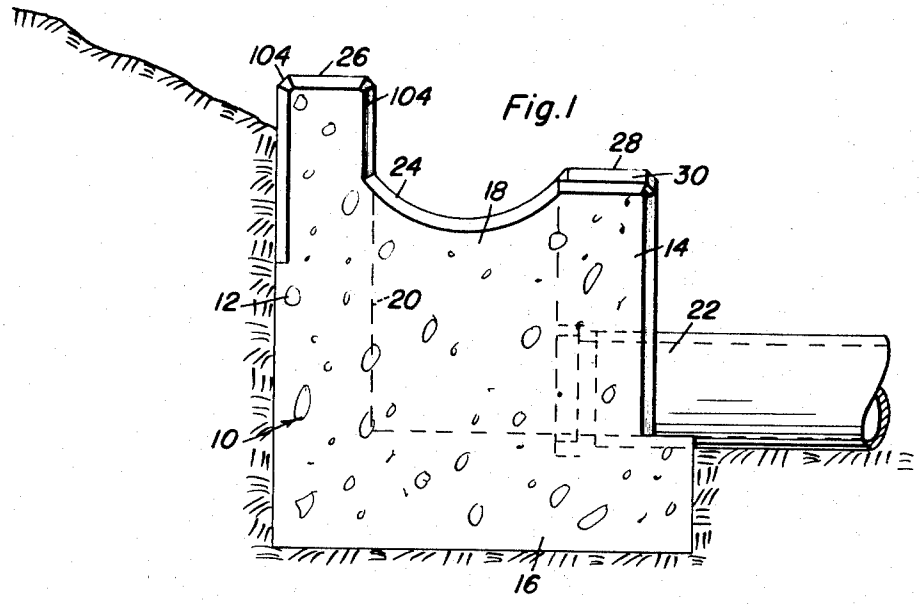


Fig. 1

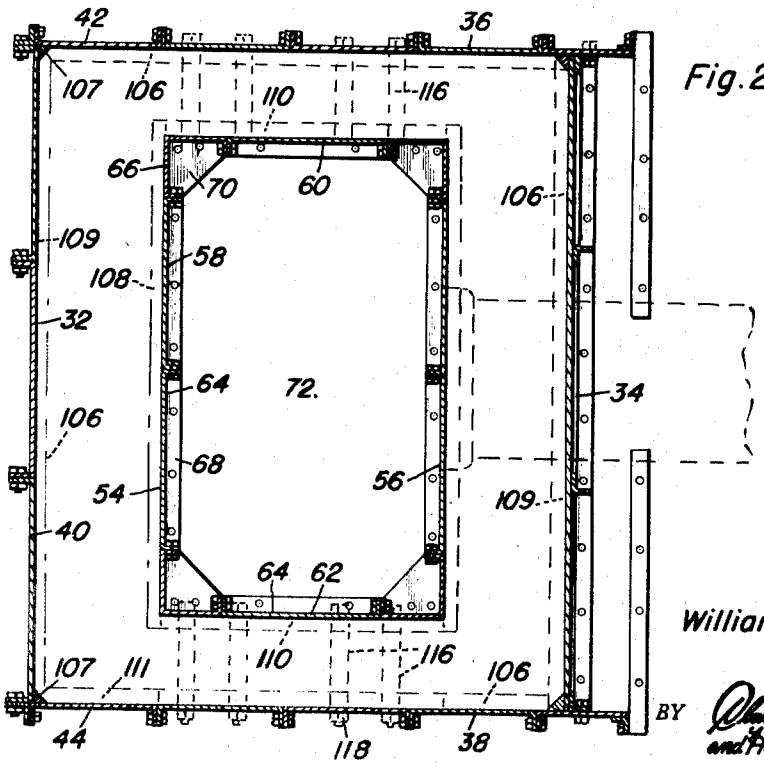


Fig. 2

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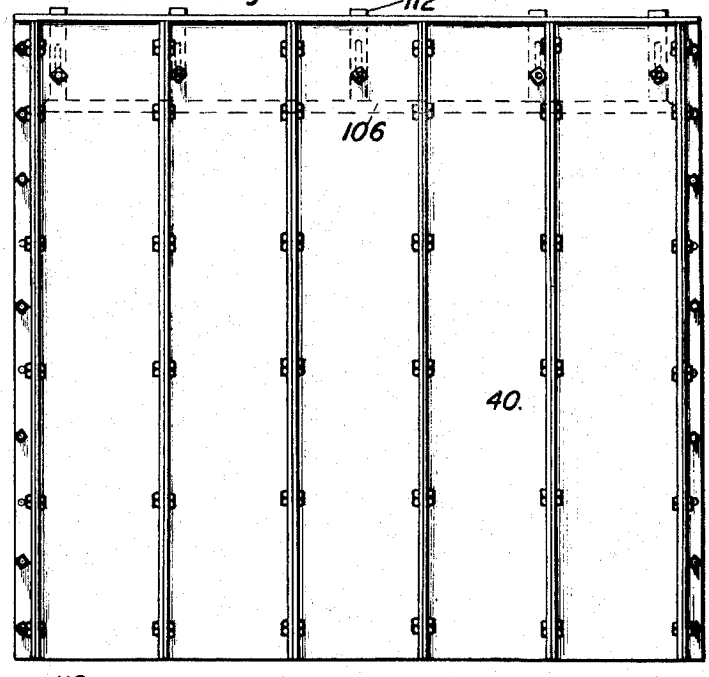
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Fig. 3



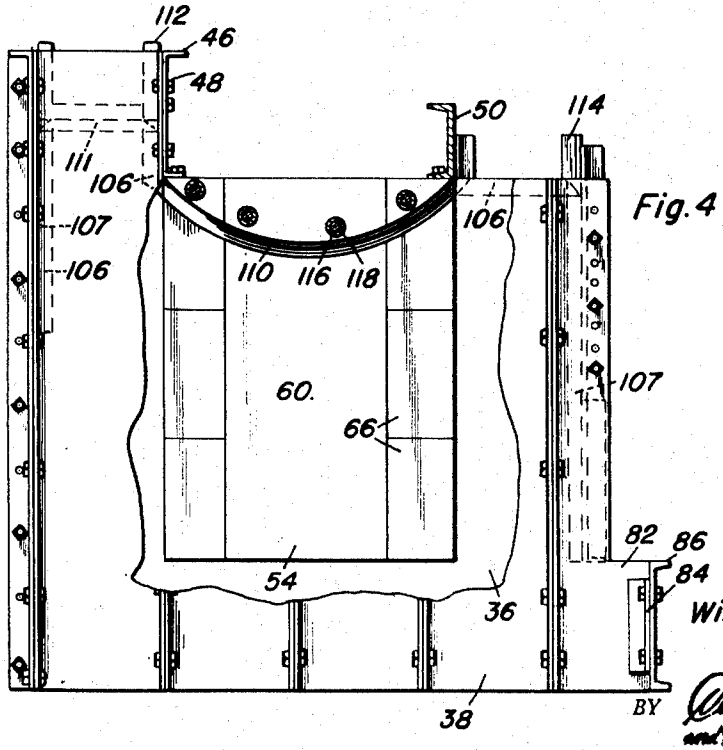


Fig. 4

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Fig.5

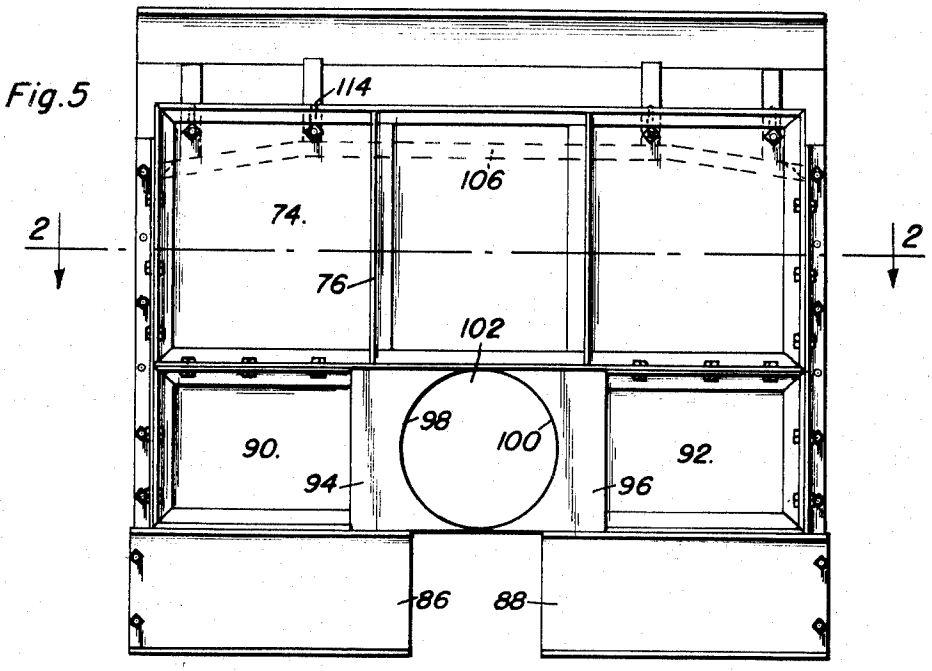
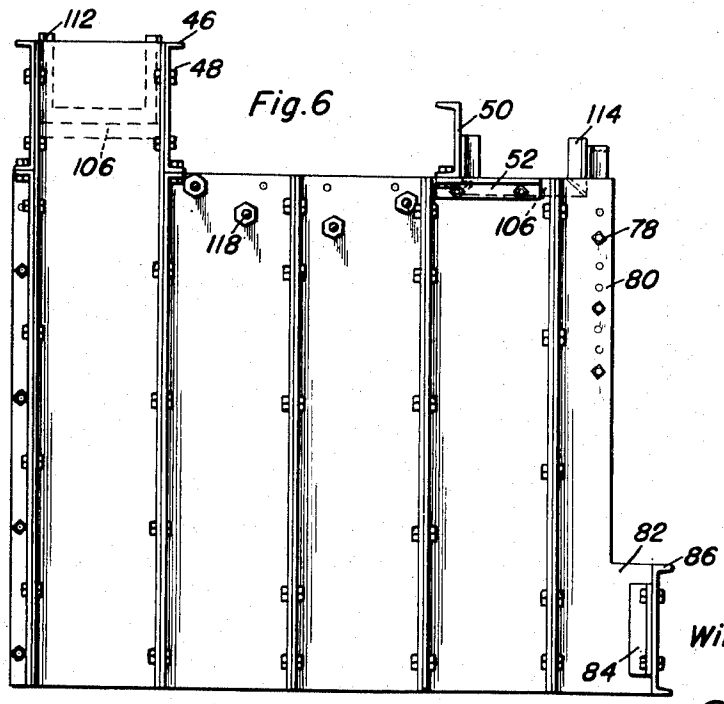


Fig.6



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MOLD FOR HEAD WALL CONSTRUCTION

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5 Claims. (Cl. 25—131)

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This invention relates to highways and the like, and more particularly to a mold for use in a head and end wall construction for use in places where a drainage is necessary through fills and cuts or in any other uneven terrain.

An object of this invention is to provide a mold for building head and end wall constructions which is formed of a plurality of steel plates detachably secured together which may be used time and again for forming a plurality of different types of head and end walls.

A further object of this invention is to provide a mold of the character heretofore described that will enable the formation of a head or end wall having smooth sides and chamfered edges so as to resist cracking, crumbling, and other wear and tear.

Still further objects of the invention reside in the provision of a mold for a head and end wall construction that is strong, durable, capable of being used many times, capable of being readily assembled and easily detached after the head or end wall has been cast, which is inexpensive to use, and which will enable the molding of such walls in a minimum of time by a minimum number of experienced personnel.

These, together with the various ancillary objects of the invention which will become apparent as the following description proceeds, are attained by this head and end wall construction, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a side elevational view of a highway head wall molded in the mold comprising the present invention;

Figure 2 is a horizontal sectional view as taken along the plane of line 2—2 of Figure 5 but showing in phantom certain parts which are above the plane of the section;

Figure 3 is an elevational view of the rear wall of the mold comprising the invention;

Figure 4 is a side elevational view of the invention, parts thereof being broken away to show other parts in section and in greater detail;

Figure 5 is a front elevational view of the invention and showing in detail the construction of the supports for the drain pipe; and

Figure 6 is a side elevational view of the invention.

With continuing reference to the accompanying drawings, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate a head wall which has been molded in

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the molds provided in the present invention. This head wall generally comprises a rear wall 12, a front wall 14, a foundation or base member 16 and a pair of side members 18. These wall members define an opening 20 therein adapted to retain moisture and to direct such through the drain pipe 22 which is positioned in communication with the opening 20. The side walls 18 have a concave or arcuate upper surface 24 thereby allowing access of the drain water to enter the opening 20. Although it will be noted that the rear wall 12 has a flat upper surface 26, it will be noted that the upper surface 28 of the front wall 14 is beveled at its outer ends, as at 30. A further refinement will be noted in Figure 1 in that each of the exposed edges of the head wall has been chamfered or beveled, thereby reducing the tendency of the concrete to crack or crumble under wear and tear.

The mold used in the present invention for forming such a head wall as hereinbefore described, comprises an outer mold portion or frame, generally having a rear wall 32, a front wall 34, and side walls 36 and 38. The rear and side walls 32, 36 and 38 are formed of vertically disposed channel members 40 but depending upon the most preferable conditions, these channel members could likewise be mounted in a vertical position. Considering the rear wall 32 of the mold and the side walls adjacent thereto, it will be realized and therefore noted that these portions extend above the rest of the mold, as noted in Figures 4 and 6, since these portions will comprise that part of the mold forming the rear wall 12 of the head wall. The channel members 42 and 44 have a further channel member 46 bolted to their forward flanges, as seen at 48. This channel 46 is positioned in such a manner as to allow its lower flange to substantially rest upon the upper surface of the side walls of the outer frame of the mold. Suitably spaced toward the front portion of the mold frame is situated another channel member 50 having its lower flange resting on the side walls 36 and 38 of the outer frame of the mold. To insure that the channel member 50 will stand erect in a secure manner, short portions of angle irons, as indicated at 52, are provided for bolting the lower flange of the channel 50 thereto.

Since the channel members 46 and 50 are rigidly secured to the outer mold frame, they provide a rigid support for the inner mold frame, generally indicated at 54.

This inner mold consists generally of front and

rear walls 56 and 58, and side walls 60 and 62. The height of these walls in the inner mold frame is substantially the same as the height of the front wall 14 and include intermediate channel members 64 joined at the corners with angle irons 66. At the lower edge of each of these channel or angle members are flange members 68 and 70 for reinforcement and for securing a base plate to the entire inner mold frame.

Considering once again the outer mold frame, it will be noted that the front portion thereof, as seen most clearly in Figures 2, 5 and 6, generally comprises a plurality of upper frame members 74, each having an outwardly extending peripheral flange 76 thereon. These frame members 74 constitute an entire panel which is bolted along the outer edges, as at 78, to a portion of the side channel members adjacent thereto. More specifically, each of these channel members 80 is constructed in an L-shaped form having a stepped portion 82 at the lower end thereof. The stepped portion 82 has a vertically disposed angle iron 84 mounted on the outer surface thereof for supporting a channel member 86 which further extends in a vertical disposition along a portion of the lower front side of the outer surface of the outer mold. Similarly positioned on the opposite front portion of the outer mold is a channel member 88 extending towards the channel member 86 but defining an opening or space therebetween.

Mounted on the lower flange of the panel of frame member 74 are a pair of similar frame members 90 and 92. Welded to the frames or plates 90 and 92 are plates 94 and 96 which are provided with semi-circular recesses 98 and 100 therein which together form a circular aperture 102 in which the drain pipe 22 may be positioned so as to abut against the inner mold. It is to be understood that the plates 86 and 88 do not extend fully underneath the plates 94 and 96 since, in this manner, the latter plates may be slid into place and furthermore, this will permit some of the concrete from the mold to ooze under the drain pipe 22 and to more accurately and firmly position such throughout a considerable portion of its initial section.

From the foregoing, it will be evident that concrete may be emplaced in the openings between the inner and outer molds and allowed to settle and harden around the drain pipe 22 and in a form generally that of the space defined between these two mold frames. However, as seen in the finished head wall in Figure 1, certain other refinements are necessary in the mold frame to effect the desired result. These features consist generally of members to provide chamfered surfaces or edges, as seen at 104 in Figure 1, and further, some means to limit the upward surface of the front and rear walls 14 and 12, respectively.

Accordingly, as seen in Figures 2–5, the chamfering means employed consist of angle or wedge shaped members 106 generally extending throughout all of the corners wherein the desired chamfering effect is needed. More specifically, in Figure 2, suitable lengths of wedge members 107 are provided in each of the vertical corners of the outer mold frame. Along the front and rear walls and disposed along the upper portions thereof, are horizontal wedge shaped members 106. Similar wedge shaped members 108 are provided along the outer surface of the inner mold, also disposed along the upper portions of that frame. However, along the inner upper edges of the sides of the outer mold frame a slightly different condition as regards the wedge members 104 is concerned. Accordingly, a wedge member, as 111, extends along the inner surface of the channel 44 and at the end thereof extends in an arcuate form along that portion of the side wherein the concrete will mold to form the recess 24. At the end of the arcuate bend, the wedge member 111 extends frontwardly to the front side 34.

It is to be noted that as an important feature of the invention the side walls 60 and 62 are provided with an arcuate concave angle or wedge shaped member 110. These members 110 are provided in order to permit the formation of the recess 24 in the head wall after such has been cast. This arcuate wedge member 110 further provides a chamfered surface along this inner edge and is to be used as a guide when troweling or leveling out the surface 24. However, it is to be understood that the concrete, as poured, is of such consistency and high viscosity that it may be readily shaped during the molding to conform with the shape of the wedge member 110.

To provide for a different height in either the front or rear wall, U-shaped brackets 112 and 114 are provided along the upper portions of the entire mold between the rear sides 32 and 58 and the front sides 34 and 56, respectively. Further, each of these U-shaped members has a vertical slot in either leg thereof, whereby these members may be adjusted vertically by means of bolts placed within the slots. In order that the chamfered edges may be vertically adjusted according to the height of the surfaces 26 and 28, the wedge members 106 have been welded or in some other manner secured to the lower surfaces of the U-shaped members 112.

In order to properly space the inner mold between the side walls of the outer mold, there are provided spacers 116 which extend between the inner and outer molds. Suitable bolts 118 extend through these tubular spacers 116 in order to tie the inner and outer molds together. When the head wall has been cast, it is merely necessary to loosen the bolts and, both the bolts and spacers may be removed above the level of the recessed surface 24.

From the foregoing, it is believed that it will be evident that a mold for forming head or end wall constructions has been provided. This mold consists generally of inner and outer frames, the space defined therebetween being a configuration of the desired construction of head or end wall. Certain refinements have been provided allowing for the adjustability in the level of the front and rear surfaces of the head wall and further, adjustability of the chamfered surfaces to be provided on the edges of the head wall construction. Finally, arcuate members are provided on the outer surfaces of the sides of the inner mold for the purpose of both chamfering the inner edges of the head wall and for guiding the movement of the trowel or smoothing instrument.

It should be further readily apparent that since the construction of both the inner and outer molds have been formed of a plurality of channel members, the size of the mold may be readily adjusted by adding or subtracting median sections to either of the frames thereby providing a head wall which will correspond with highway requirements of the various states to allow varying thicknesses of concrete walls.

Since, from the foregoing, the construction and advantages of this head and end wall con-

struction are readily apparent, a further description is believed to be unnecessary.

However, since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may be resorted to which fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A mold for head and end wall construction comprising a rectangular outer mold having a front and back wall and side walls, said side and back walls being constructed of vertically arranged channel members, the web portions of said channels forming the inner surface of said walls, the flanges of said channel members being detachably secured together to provide a wall panel, angle members detachably secured to the channel flanges at the corners for rigidly connecting said side and back walls, said back wall and the side channel members adjacent the back wall being of greater height than the remaining channel members of the side wall, a transverse channel member having one flange resting on the side walls, the web side of said transverse channel member being detachably connected to the flanges of said side channel members of greater heights, said front wall including a plurality of panels, angle members secured at the edge of said panels, fastening means securing said panels together and to said side walls, an inner mold, having walls substantially parallel to said outer mold walls, sad walls of said inner mold being composed of vertically extending channel members, the flanges of said channels extending inwardly and being secured together to provide wall panels, corner angles secured to said wall panels and rigidly joining said panels together.

2. A mold for head and end wall construction comprising a rectangular outer mold having a front and back wall and side walls, said side and back walls being constructed of vertically arranged channel members, the web portions of said channels forming the inner surface of said walls, the flanges of said channel members being detachably secured together to provide a wall panel, angle members detachably secured to the channel flanges at the corners for rigidly connecting said side and back walls, said back wall and the side channel members adjacent the back wall being of greater height than the remaining channel members of the side wall, a transverse channel member having one flange resting on the side walls, the web side of said transverse channel member being detachably connected to the flanges of said side channel members of greater heights, said front wall including a plurality of panels, angle members secured at the edge of said panels, fastening means securing said panels together and to said side walls, an inner mold, having walls substantially parallel to said outer mold walls, said walls of said inner mold being composed of vertically extending channel members, the flanges of said channels extending inwardly and being secured together to provide wall panels, corner angles secured to said wall panels and rigidly joining said panels together, the rear wall of said inner mold being rigidly secured in parallel relation to said transverse channel to form the front mold of the rear portion of the head wall, said rear wall of said inner mold and said transverse channel forming a continuous mold surface, a second transverse channel member extending across the side walls and detachably secured thereto, the front wall of said inner mold being secured to said second transverse channel.

3. A mold for head and end wall construction comprising a rectangular outer mold having a front and back wall and side walls, said side and back walls being constructed of vertically arranged channel members, the web portions of said channels forming the inner surface of said walls, the flanges of said channel members being detachably secured together to provide a wall panel, angle members detachably secured to the channel flanges at the corners for rigidly connecting said side and back walls, said back wall and the side channel members adjacent the back wall being of greater height than the remaining channel members of the side wall, a transverse channel member having one flange resting on the side walls, the web side of said transverse channel member being detachably connected to said side channel member of greater heights, said front wall including a plurality of panels, angle members secured at the edge of said panels, fastening means securing said panels together and to said side walls, an inner mold, having walls substantially parallel to said outer mold walls, said walls of said inner mold being composed of vertically extending channel members, the flanges of said channels extending inwardly and being secured together to provide wall panels, corner angles secured to said wall panels and rigidly joining said panels together, the rear wall of said inner mold being rigidly secured in parallel relation to said transverse channel to form the front mold of the rear portion of the head wall, a second transverse channel member extending across the side walls and detachably secured thereto, the front wall of said inner mold being secured to said second transverse channel, an arcuate concave guide surface placed between the side walls of the inner and outer molds, spacer members positioned between side walls of said inner and outer molds above said arcuate guide surfaces, and means extending through said spacer members detachably securing said inner and outer molds together.

4. A mold for head and end wall construction comprising a rectangular outer mold having a front and back wall and side walls, said side and back walls being constructed of vertically arranged channel members, the web portions of said channels forming the inner surface of said walls, the flanges of said channel members being detachably secured together to provide a wall panel, angle members detachably secured to the channel flanges at the corners for rigidly connecting said side and back walls, said back wall and the side channel members adjacent the back wall being of greater height than the remaining channel members of the side wall, a transverse channel member having one flange resting on the side walls, the web side of said transverse channel member being detachably connected to said side channel member of greater heights, said front wall including a plurality of panels, angle members secured at the edge of said panels, fastening means securing said panels together and to said side walls, an inner mold, having walls substantially parallel to said outer mold walls, said walls of said inner mold being composed of vertically extending channel members, the flanges of said channels

extending inwardly and being secured together to provide wall panels, corner angles secured to said wall panels and rigidly joining said panels together, the rear wall of said inner mold being rigidly secured in parallel relation to said transverse channel to form the front mold of the rear portion of the head wall, a second transverse channel member extending across the side walls and detachably secured thereto, the front wall of said inner mold being secured to said second transverse channel, an arcuate concave guide surface placed between the side walls of the inner and outer molds, spacer members positioned between side walls of said inner and outer molds above said arcuate guide surfaces, and means extending through said spaced members, detachably securing said inner and outer molds together, said guide surfaces being wedge shaped in cross section and adjustably secured to the surface of said inner and outer molds.

5. A mold for head and end wall construction comprising a rectangular outer mold having a front and back wall and side walls, said side and back walls being constructed of vertically arranged channel members, the web portions of said channels forming the inner surface of said walls, the flanges of said channel members being detachably secured together to provide a wall panel, angle members detachably secured to the channel flanges at the corners for rigidly connecting said side and back walls, said back wall and the side channel members adjacent the back wall being of greater height than the remaining channel members of the side wall, a transverse channel member having one flange resting on the side walls, the web side of said transverse channel member being detachably

connected to said side channel members of greater heights, said front wall including a plurality of panels, angle members secured at the edge of said panels, fastening means securing said panels together and to said side walls, an inner mold, having walls substantially parallel to said outer mold walls, said walls of said inner mold being composed of vertically extending channel members, the flanges of said channels extending inwardly and being secured together to provide wall panels, corner angles secured to said wall panels and rigidly joining said panels together, the rear wall of said inner mold being rigidly secured in parallel relation to said transverse channel to form the front mold of the rear portion of the head wall, a second transverse channel member extending across the side walls and detachably secured thereto, the front wall of said inner mold being secured to said second transverse channel, wedge shaped chamber forming elements adjustably positioned around the inner and outer mold surfaces, said elements forming troweling guides for the top surface of the molded material.

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