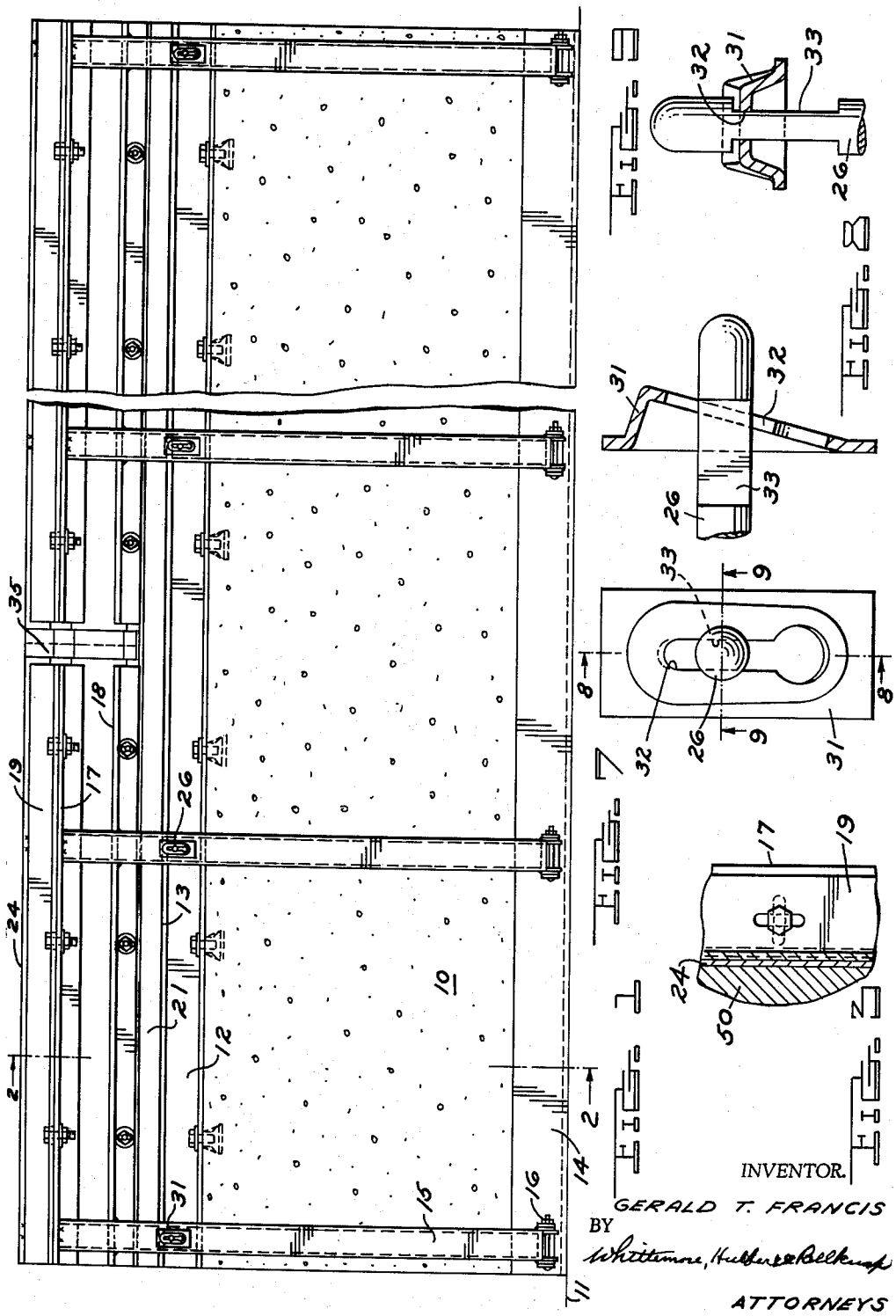
Jan. 7, 1964 G. T. FRANCIS 3,116,530

APPARATUS FOR MAKING STRUCTURAL CONCRETE SLABS

Filed Feb. 26, 1962

5 Sheets-Sheet 1



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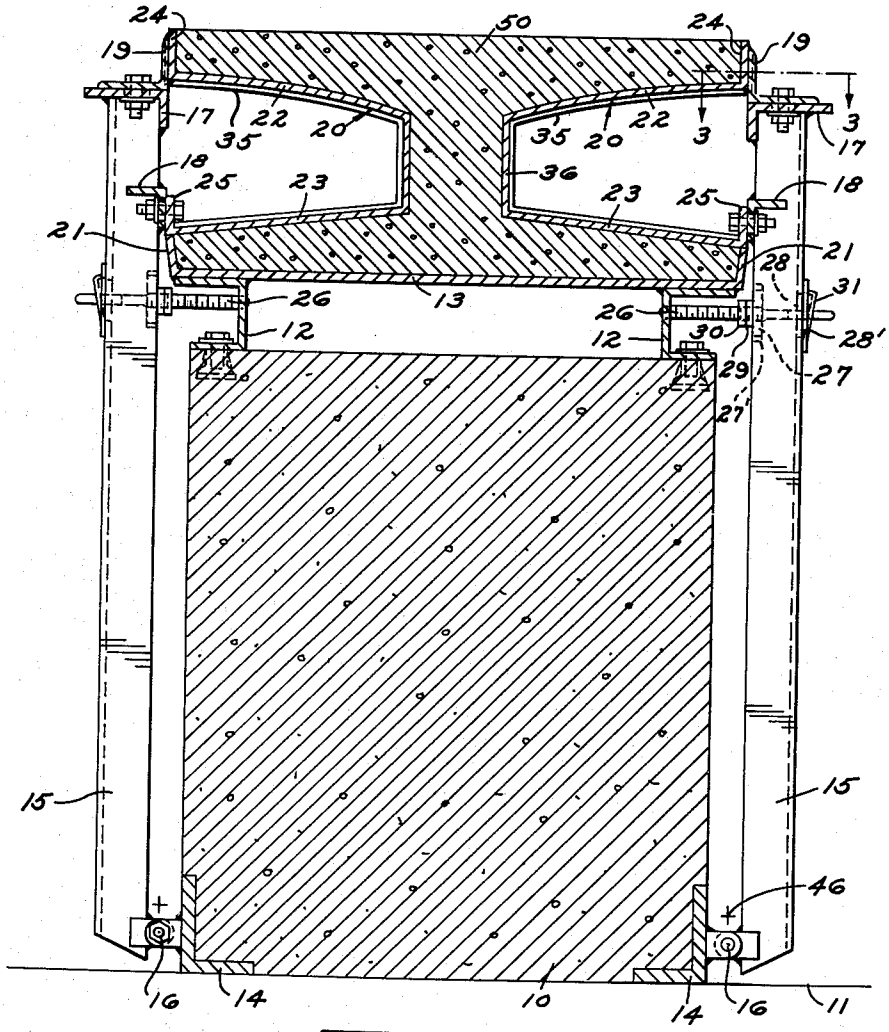


FIG. 2

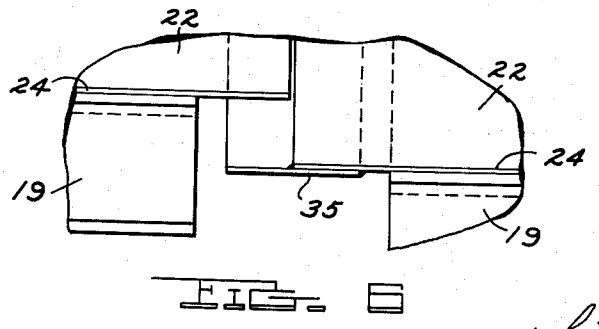


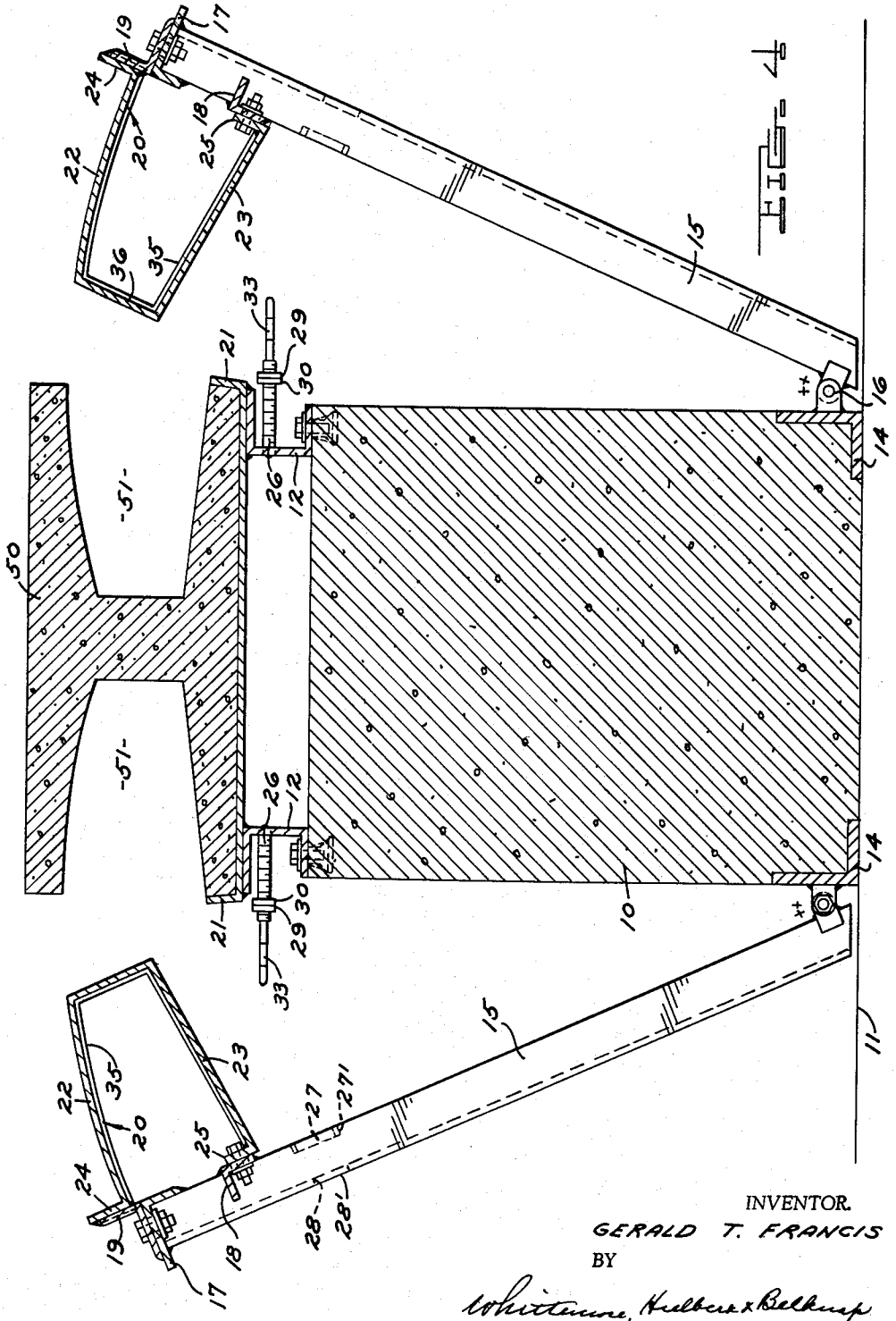
FIG. 6

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FIG. 5

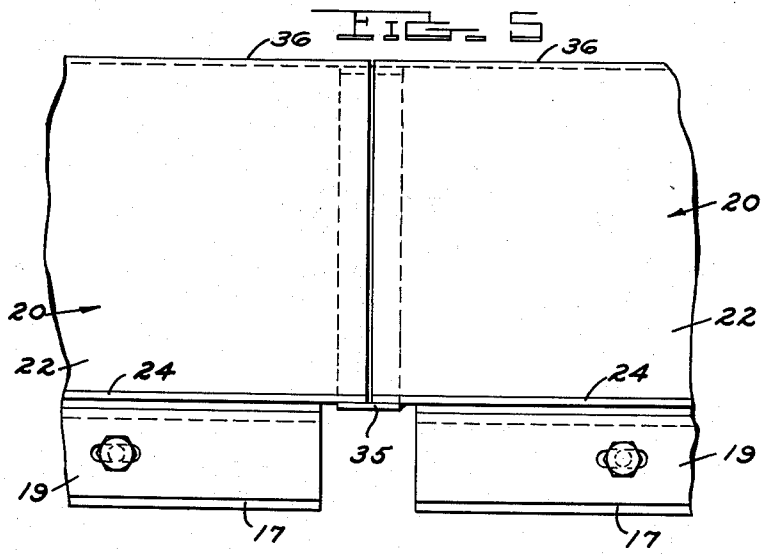


FIG. 12

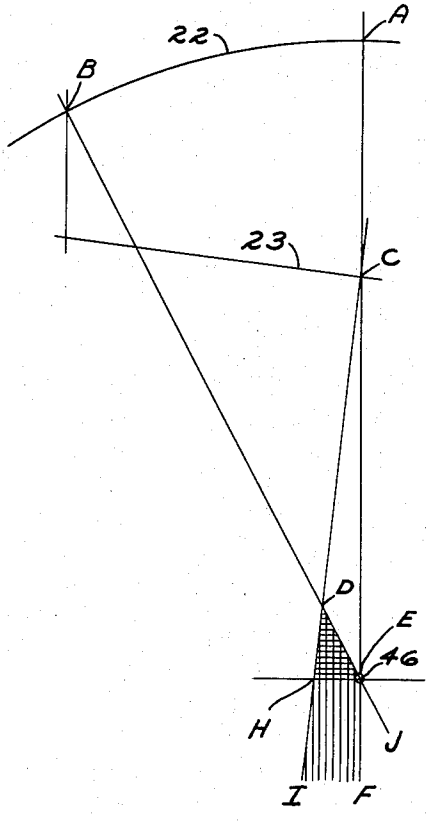
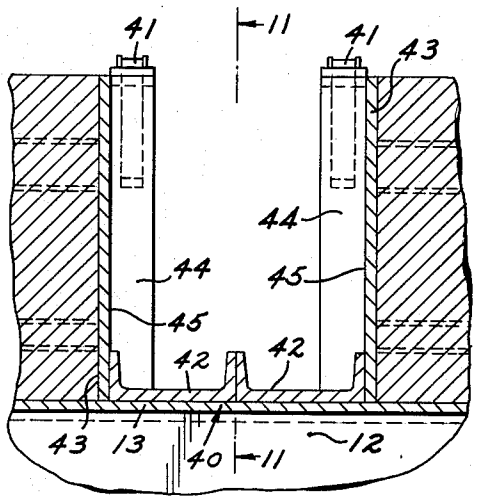


FIG. 10



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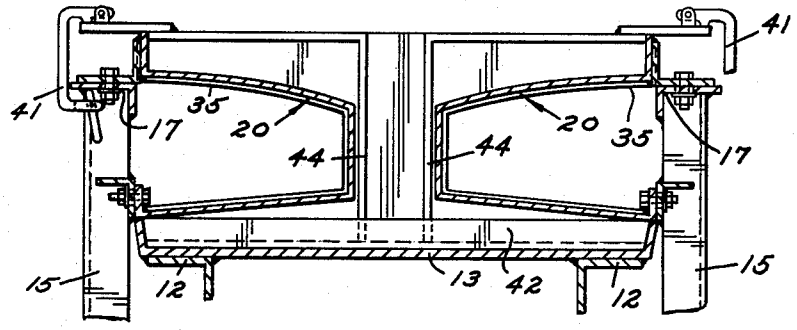


FIG. 11

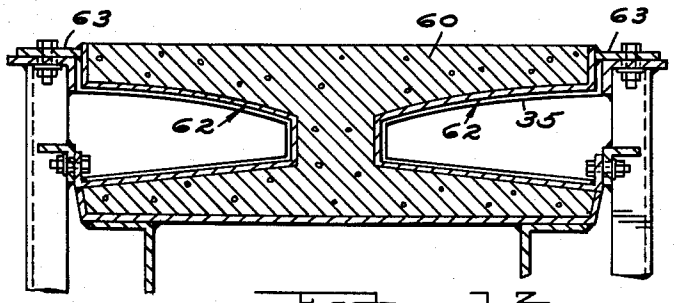


FIG. 13

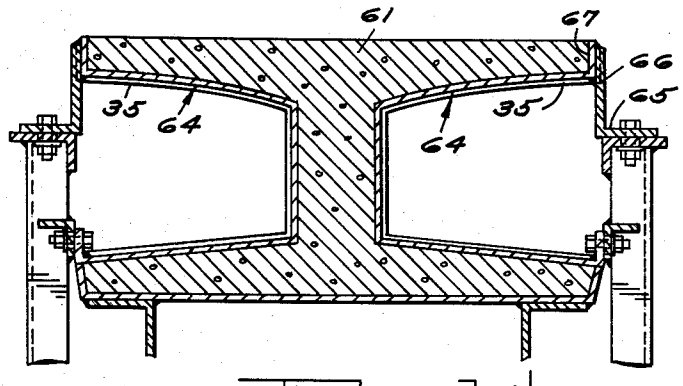


FIG. 14

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3,116,530
APPARATUS FOR MAKING STRUCTURAL CONCRETE SLABS

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Filed Feb. 26, 1962, Ser. No. 175,774
13 Claims. (Cl. 25—121)

This invention relates generally to apparatus for making structural concrete slabs, and refers more particularly to apparatus for making elongated concrete slabs that are substantially H-shape in cross section.

One of the essential objects of the invention is to provide an apparatus having an elongated concrete base block or other suitable mounting structure, outwardly opening metal channels adjustably mounted upon the flat upper surface of the concrete base block, and an upwardly opening elongated pan for concrete upon and fixed to said channels.

Another object is to provide an apparatus having elongated upwardly extending arms pivotally connected at their lower ends to metal angles embedded in the concrete block at opposite lower longitudinal corners or edges thereof and movable from an upright position extending above the base block to an outer inclined position, vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal angles adjustably mounted upon the uppermost of said vertically spaced metal angles, and transversely spaced oppositely opening elongated channel shaped forms extending lengthwise of and engaging the upper edges of opposite side walls of said pan and having at the outer edges of their upper and lower side walls upstanding flanges respectively connected to the adjustably mounted metal angles and to the lowermost of said vertically spaced metal angles.

Another object is to provide an apparatus having horizontal headed rods secured to and extending outwardly from the outwardly opening metal channels on said base block and adapted to extend through suitable openings in said upwardly extending pivoted arms when the latter are in an upright closed position, and removable upright wedges upon the outer sides of said arms and having keyhole slots therein that receive and straddle reduced portions of the rods intermediate the ends thereof to hold the pivoted arms and elongated channel shaped forms carried thereby in closed position.

Another object is to provide an apparatus wherein each channel shaped form, when swinging outwardly on a pivotally mounted arm, has an upper side wall opposite its pivot of arcuate cross section and provided with a radius of curvature slightly less than the radius of the swinging movement of the upper side wall about the pivot of said arm.

Another object is to provide an apparatus wherein the pivot for each pivotally mounted arm is located on the inner side of two imaginary straight lines extending from the extreme ends of the upper side wall of each channel shaped form through its center of curvature, and is located outwardly from an imaginary straight line extending downwardly from the outward edge of the lower side wall of each channel shaped form and perpendicular thereto, so that the upper side wall of each channel shaped form moves away and downwardly from the adjacent surface of said slab and the lower side wall thereof moves away and upwardly from the adjacent surface of said slab when the channel shaped forms move outwardly.

Another object is to provide an apparatus wherein the upstanding flanges on the lower side walls of the channel shaped forms are adjustable vertically on the lower of the metal angles on the pivoted arms to position the lower sides of the channel shaped forms snugly against the upper edges of the opposite side walls of the pan.

Another object is to provide an apparatus wherein the metal angles secured to the upper sides of the channel shaped forms are adjustable horizontally on the metal angles secured to the ends of the supporting arms to position the upstanding flanges of said forms in substantially vertical alignment with the upper edges of the opposite side walls of the pan.

Another object is to provide an apparatus wherein the channels on the concrete block are adjustable horizontally to position the upright side walls of the pan in substantially vertical alignment with the pivots for the arms, and shims may be used under either or both of said channels to adjust the same vertically for true horizontal alignment with each other.

Another object is to provide an apparatus wherein the channel shaped forms are adjustable longitudinally relative to their supporting pivotally mounted arms to insure a proper fit at the joint between adjacent channel shaped forms.

Another object is to provide an apparatus wherein the joint between adjacent elongated channel shaped forms is covered by a lap plate secured to and projecting endwise from the walls of one of said channel shaped forms.

Another object is to provide an apparatus wherein bulkheads are provided at longitudinally spaced points of the pan to provide the proper lengths of concrete slabs to be formed in the pan, and are detachably connected by suitable clamps to the uppermost of the vertically spaced angles fixed to said pivotally mounted arms.

Another object is to provide an apparatus wherein the bulkheads are similar in shape to the H-shape cross section of the concrete slabs, and are within and extend transversely of the upwardly opening elongated pan.

Other objects, advantages and novel details of construction of this invention will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

FIGURE 1 is a fragmentary elevational view of an apparatus embodying my invention, and showing a joint between adjacent elongated channel shaped forms covered by a lap plate secured to and projecting endwise from the walls of one of said channel shaped forms.

FIGURE 2 is a transverse sectional view taken substantially on the line 2—2 of FIGURE 1, and showing the elongated channel shaped forms in closed position.

FIGURE 3 is a sectional view taken substantially on the line 3—3 of FIGURE 2.

FIGURE 4 is a view similar to FIGURE 2, but showing the pivotally mounted arms and elongated channel shaped forms carried thereby in an outwardly inclined open position.

FIGURE 5 is a fragmentary top plan view of a lap plate joint between adjacent elongated channel shaped forms.

FIGURE 6 is an enlarged fragmentary top plan view of the two elongated channel shaped forms illustrated in FIGURE 5, and showing one of said forms and the lap plate carried thereby in partially open position.

FIGURE 7 is an enlarged elevational view of one of the wedges in locked position on one of the horizontal headed rods.

FIGURE 8 is a vertical sectional view taken substantially on the line 8—8 of FIGURE 7.

FIGURE 9 is a horizontal sectional view taken substantially on the line 9—9 of FIGURE 7.

FIGURE 10 is a fragmentary vertical sectional view through two bulkheads and through opposed ends of two concrete slabs.

FIGURE 11 is a sectional view taken substantially on the line 11—11 of FIGURE 10, and showing one of the bulkheads detachably connected by suitable clamps to the upper angles fixed to the pivotally mounted arms.

FIGURE 12 is a diagrammatic view showing the area in which the pivot of the mold form must be located.

FIGURE 13 is a slightly modified cross sectional view through shallow channel shaped forms, and showing metal plates fixed to the upper flanges of the forms and secured to the metal angles rigid with the upper ends of the supporting arms.

FIGURE 14 is another slightly modified cross sectional view through relatively deep channel shaped forms, and showing metal angles secured to the metal angles rigid with the upper ends of the supporting arms and having relatively long upright legs secured to the upper flanges of the forms.

Referring now to the drawings, 10 is an elongated concrete base block or other suitable mounting structure resting upon a floor 11 of a room, 12 are outwardly opening metal channels adjustably mounted upon the flat upper surface of the block, and 13 is an upwardly opening elongated pan for concrete slabs upon and fixed to said channels.

14 are metal angles embedded in the concrete base block at opposite lower longitudinal corners or edges thereof, 15 are elongated upwardly extending channel shaped arms pivotally connected at 16 to the metal angles 14 and movable from an upright position extending above the base block 10 to an outer inclined position, 17 and 18 respectively are vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, 19 are metal angles adjustably mounted upon the uppermost metal angles 17 of said vertically spaced metal angles, and 20 are transversely spaced oppositely opening elongated channel shaped forms extending lengthwise of and engaging the upper edges of opposite side walls 21 of said pan 13 and having at the outer edges of their upper and lower side walls 22 and 23 upstanding flanges 24 and 25 respectively rigidly connected to the adjustably mounted metal angles 19 and adjustably connected to the lowermost metal angles 18 of said vertically spaced metal angles.

26 are horizontal headed rods welded to and extending outwardly from the outwardly opening metal channels 12 on said base block 10 and adapted to extend through aligned openings 27 and 28 respectively in a cross bar 27' secured to said channel shaped upwardly extending pivoted arms 15 and in the base 28' of said arms 15 when the latter are in an upright closed position, 29 and 30 respectively are adjustable nuts on said rods 26 and serving as stops or abutments for the pivoted arms 15, and 31 are removable upright wedges upon the outer sides of said arms 15 and having vertically extending keyhole slots 32 therein that receive and straddle reduced portions 33 of the rods 26 intermediate the ends thereof to hold the pivoted arms 15 and elongated channel shaped forms 20 carried thereby in closed position.

Each channel shaped form 20 on a pivotally mounted arm 15 has an upper side wall 22 opposite its pivot 16 of arcuate cross section and provided with a 35-inch radius of curvature but moves on a 36-inch radius about the pivot 16 for said arm 15, and thus has a radius of curvature smaller than the radius about which it swings. Also, the pivot 16 for each pivotally mounted arm 15 is located on the inner side of two imaginary straight lines extending from the extreme ends of the upper side wall 22 of each channel shaped form through its 35-inch radius of curvature, and is located outwardly from an imaginary straight line extending downwardly from the outward edge of the lower side wall 23 of each channel shaped form and perpendicular thereto. As a result, the upper side wall 22 of each channel shaped form 20 moves away and downwardly from the adjacent surface of said slab and the lower side wall thereof moves away and upwardly from the adjacent surface of said slab when the channel shaped forms move outwardly.

The upstanding flanges 25 on the lower side walls 23 of the channel shaped forms 20 are adjustable vertically on the lower of the metal angles 18 on the pivoted arms 15 to position the lower side walls 23 of the channel shaped forms 20 snugly against the upper edges of the opposite side walls 21 of the pan 13.

The metal angles 19 secured to the upstanding flanges 24 of the channel shaped forms 20 are adjustable horizontally on the metal angles 17 secured to the supporting arms 15 to position the upstanding flanges 24 of said forms 20 in substantially vertical alignment with the opposite side walls 21 of the pan.

The channels 12 on the concrete block 10 are adjustable horizontally to position the upright side walls 21 of the pan 13 in substantially vertical alignment with the pivots 16 for the arms 15, and shims (not shown) may be used under either or both of said channels 12 to adjust the same vertically for true horizontal alignment with each other.

The joint between adjacent elongated channel shaped forms 20 is covered by a lap plate 35 secured to and projecting endwise from one of said channel shaped forms. As shown, the upstanding flanges 24 and the upper, rear and lower walls 22, 36, and 23 respectively of adjacent elongated channel shaped forms 20 substantially abut, while the metal angles 17, 18, 19, and upstanding flange 25 terminate short of the joint between adjacent elongated channel shaped forms. The lap plate 35 is secured in surface-to-surface relation to the outer surface of the upstanding flange 24 and to the inner surfaces of the upper, rear and lower walls 22, 36 and 23 respectively of one channel shaped form 20, and projects laterally outward over the outer surface of the upstanding flange 24 and covers the upper, rear and lower walls 22, 36 and 23 respectively of the adjacent channel shaped form 20 to cover the joint between adjacent elongated channel shaped forms.

The channel shaped forms 20 are adjustable longitudinally relative to their supporting pivotally mounted arms 15 to insure a proper fit at the joint between adjacent channel shaped forms.

Transversely extending bulkheads 40 are provided at longitudinally spaced points of the pan 13 to provide the proper lenghs of concrete slabs to be formed in the pan, and are detachably connected by suitable clamps 41 to the angles 17 fixed to said pivotally mounted arms 15. Preferably each bulkhead 40 has an elongated channel shaped base 42 within and extending transversely of the upwardly opening elongated pan 13, an upright wall 43 secured to the outer side of said channel shaped base 42 and substantially conforming in shape to the H-shaped cross section of the concrete slabs 50, and two inverted oppositely extending substantially L-shaped reinforcing bars 44 spaced laterally apart on said base 42 on the front of said upright wall 43. The lower ends of said inverted L-shaped reinforcing bars 44 are rigidly secured to said base 42, while the rear upright edges 45 of said bars 44 are rigidly secured to the front of said upright wall 43. Such bulkheads would be used at opposite ends of a concrete slab, and as shown in FIGURE 10, the channel shaped bases 42 of two bulkheads for opposed ends of the concrete slabs may be arranged in abutting side-by-side relation within and extending transversely of the pan 13. Such bulkheads could be placed at any desired points in the pan 13 intermediate of the extreme ends of the channel shaped forms 20.

FIGURE 12 is a diagrammatic view showing the area in which the pivot 16 of the mold form must be located to provide for movement of the mold form 20 into clearance with respect to the inner surface of a recess in the slab 50 upon initial outward movement of the arm 15.

The upper mold surface 22 is arcuate in the cross section and is perpendicular to the axis of the pivot 16. In FIGURE 12, the center of curvature 46 of the arcuate surface 22 has the reference character E applied thereto. The straight lines AE and BE have been drawn and extended beyond the point E to the points F and J respec-

tively. It will be apparent that all portions of the upper arcuate surface 22 of the mold form directly adjacent the point A will move into clearance with respect to the recess formed in the slab 50 if the pivot 16 about which the mold form swings is located anywhere to the left of the line AEF. Similarly it will be apparent that the inner end B of the upper arcuate mold surface 22 will move into clearance with respect to the upper surface of the recess formed in the slab 50 if the pivot 16 is located anywhere to the left of the line BEJ. In other words, the entire upper surface 22 of the mold form will move into clearance with respect to the upper surface of the recess formed in the slab 50 if the pivot 16 is located to the left of both of the lines AEF and BEJ.

The lower surface 23 of the mold form 20 is a flat surface, and this entire surface will move into clearance with respect to the bottom surface of the recess formed in the slab 50 if the pivot 16 is located anywhere to the right of the line CDI, which is a straight line extending downwardly from the outer end of the lower mold surface 23 and perpendicular thereto.

Accordingly, if the pivot 16 is located to the left of the lines AEF and BEJ while at the same time it is located to the right of the line CDI, all surface portions of the mold form 20 will move immediately into clearance with respect to the recess in the slab 50 upon initial outward movement of the arm 15 about its pivot 16. This area bounded by the lines DEF and DI is shaded in FIGURE 12, and the pivot 16 on which the arm 15 is mounted may be located anywhere within the shaded area. However, it is preferable to locate the pivot 16 below the horizontal line HE, as a result of which the radius of curvature of the arcuate surface 22 is less than the radius of swinging movement of any portion thereof.

In use, when the arms 15 are detachably held by the wedges 31 in proper upright or vertical position, and proper adjustments have been made between the channel shaped forms 20 and the metal angles 17 and 18 on the arms 15, the lower side walls 23 of the channel shaped forms 20 fit snugly against the upper edges of opposite side walls 21 of the pan 13. In this position, the channel shaped forms 20 are spaced apart horizontally, and the upstanding side flanges 24 of the upper side walls 22 thereof cooperate with said forms and pan 13 to provide an open top enclosure or mold that is substantially H-shape in cross section. The joint between adjacent channel shaped elongated forms 20 is covered by the lap plate 35, and bulkheads 40 are provided at longitudinally spaced points of the pan 13 to provide the proper lengths of concrete slabs to be formed in the pan. Concrete is then poured into the open top enclosure or mold to form a slab 50 of substantially H-shape in cross section.

After the concrete sets and hardens, the wedges 31 may be removed to permit the arms 15 and channel shaped forms 20 to swing outwardly so that such channel shaped forms 20 may be stripped from the formed concrete slab 50. When swinging outwardly, each channel shaped form 20 on a pivotally mounted arm 15 has an upper side wall 22 opposite its pivot 16 of arcuate cross section and provided with a radius of curvature slightly less than the radius of the swinging movement of the upper side wall 22 about the pivot 16 of said arm. Also, the pivot 16 for each pivotally mounted arm 15 is located on the inner side of two imaginary straight lines extending from the extreme ends of the upper side wall 22 of each channel shaped form 20 through its center of curvature, and is located outwardly from an imaginary straight line extending downwardly from the outward edge of the lower side wall 23 of each channel shaped form 20 and perpendicular thereto. As a result, the upper side wall 22 of each channel shaped form moves away and downwardly from the adjacent surface of said slab and the lower side wall thereof moves away and upwardly from the adjacent surface of said slab when the channel shaped forms move outwardly.

The formed slab 50 of concrete may then be removed from the pan to be used as a structural element in a building. For example, a series of such concrete slabs 50 may be arranged edge to edge to form a horizontal floor or a ceiling of a building, in which event the oppositely opening cavities or voids 51 in the meeting edges of adjacent concrete slabs 50 then form elongated openings or passages which extend longitudinally of the slabs and are desirable for many purposes.

In FIGURE 13 I have illustrated a slight modification in which a shallower slab 60 may be formed, and in FIGURE 14 I have illustrated another modification in which a deeper slab 61 is formed. In FIGURE 13, the channel shaped forms 62 are shallower than the channel shaped forms 20, and the metal angles 19 have been replaced by metal plates 63, whereas in FIGURE 14 the channel shaped forms 64 are deeper than the channel shaped forms 20, and the metal angles 65 have longer upright legs 66 for attachment to the upstanding flanges 67 of the channel shaped forms 64.

What I claim as my invention is:

1. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, transversely spaced oppositely opening elongated channel shaped forms connected to the inner sides of said arms and adapted to extend lengthwise of and engage the upper edges of opposite side walls of said pan when said arms are in an upright position, and means for detachably holding said arms in an upright position including members carried by said channels and extending through said arms, and removable means upon the outer sides of said arms detachably engaging said members.

2. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, transversely spaced oppositely opening elongated channel shaped forms connected to the inner sides of said arms and adapted to extend lengthwise of and engage the upper edges of opposite side walls of said pan when said arms are in an upright position, and means for detachably holding said arms in an upright position including horizontal outwardly projecting rods carried by said channels and extending through said arms, said rods being provided intermediate their ends upon the outer sides of said arms with reduced portions, and removable upright wedges upon the outer sides of said arms and having keyhole slots receiving said reduced portions.

3. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, means carried by said channels for detachably holding said arms in an upright position, vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal angles adjustably mounted upon the uppermost of

said vertically spaced metal angles, and transversely spaced oppositely opening elongated channel shaped forms extending lengthwise of and engaging the upper edges of opposite side walls of said pan and having at the outer edges of their upper and lower side walls upstanding flanges respectively connected to the adjustably mounted metal angles and to the lowermost of said vertically spaced metal angles, the upstanding flanges at the outer edges of the lower side walls of said channel shaped forms being adjustable vertically on the lowermost of said metal angles to position the lower side walls of the channel shaped forms snugly against the upper edges of opposite side walls of the pan.

4. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, means for detachably holding said arms in an upright position including horizontal rods carried by said channels and extending through said arms, and removable wedges upon the outer sides of said arms and having vertically extending keyhole slots therein receiving and straddling reduced portions of said rods, vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal angles adjustably mounted upon the uppermost of said vertically spaced metal angles, and transversely spaced oppositely opening elongated channel shaped forms extending lengthwise of and engaging the upper edges of opposite side walls of said pan and having at the outer edges of their upper and lower side walls upstanding flanges respectively connected to the adjustably mounted metal angles and to the lowermost of said vertically spaced metal angles, the upstanding flanges at the outer edges of the lower side walls of said channel shaped forms being adjustable vertically on the lowermost of said metal angles to position the lower side walls of the channel shaped forms snugly against the upper edges of opposite side walls of the pan.

5. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, means carried by said channels for detachably holding said arms in an upright position, vertical spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal angles adjustably mounted upon the uppermost of said vertically spaced metal angles, and transversely spaced oppositely opening elongated channel shaped forms extending lengthwise of said pan and having at the outer edges of their upper and lower side walls upstanding flanges respectively connected to the adjustably mounted metal angles and to the lowermost of said vertically spaced metal angles, the upstanding flanges at the outer edges of the lower side walls of said channel shaped forms being adjustable vertically on the lowermost of said metal angles to position the lower side walls of the channel shaped forms snugly against the upper edges of opposite side walls of the pan.

6. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels upon and extending lengthwise of said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, transversely spaced oppositely opening elongated channel shaped forms connected to the inner sides of said arms and adapted to extend lengthwise of and engage the upper edges of opposite side walls of said pan when said arms are in an upright position, and means for detachably holding said arms in an upright position including members carried by said channels and extending through said arms, adjustable means on said members serving as abutments for said arms, and removable means upon the outer sides of said arms detachably engaging said members.

7. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel elongated members extending lengthwise of and mounted upon said block, an upwardly opening elongated pan extending lengthwise of and mounted upon said elongated members, longitudinally spaced substantially parallel upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the latter to an outer inclined position, vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal members mounted upon the uppermost of said vertically spaced metal angles, transversely spaced outwardly opening elongated channel shaped forms crossing the inner sides of said parallel arms, the upper and lower side walls of said elongated channel-shaped forms being provided at their outer edges with flanges respectively connected to said metal members and to the lowermost of said vertically spaced metal angles, said elongated channel-shaped forms being adapted to extend lengthwise of and engage the upper edges of opposite side walls of said pan when said arms are in an upright position, and means for detachably holding said arms in an upright position, including means carried by and projecting laterally from said parallel elongated members.

8. The structure defined in claim 7, wherein the metal members are adjustably mounted upon the uppermost of said vertically spaced metal angles, and the flanges at the outer edges of the lower side walls of said channel shaped forms are adjustably connected to the lowermost of said vertically spaced metal angles.

9. The structure defined in claim 7, wherein the metal members are adjustable horizontally upon the uppermost of said vertically spaced metal angles to position the upstanding flanges of said channel shaped forms in substantially vertical alignment with the opposite side walls of said pan.

10. The structure defined in claim 7, wherein the flanges on the lower side walls of said channel shaped forms are adjustable vertically on the lower of said vertically spaced metal angles to position the lower side walls of the channel shaped forms against the upper edges of the opposite side walls of the pan.

11. The structure defined in claim 7, wherein transversely extending bulkheads are provided at longitudinally spaced points of the pan, and clamps are connected to said bulkheads and are engageable with the undersides of the uppermost of said vertically spaced metal angles to hold said bulkheads against displacement.

12. The structure defined in claim 7, wherein the upper sides of said channel shaped forms are arcuate in cross section, and the lower sides of said channel shaped forms are flat.

13. Apparatus for making structural concrete slabs of substantially H-shape in cross section, comprising an elongated base block, a pair of substantially parallel channels extending lengthwise of and mounted upon said block, an upwardly opening elongated pan mounted upon and extending lengthwise of said channels, upright arms pivoted adjacent their lower ends to opposite sides of said base block and movable from an upright position extending above the base block to an outer inclined position,

vertically spaced metal angles secured to the inner sides of said arms at the upper ends thereof, metal angles adjustably mounted upon the uppermost of said vertically spaced metal angles, transversely spaced outwardly opening elongated channel shaped forms extending lengthwise of and engaging the upper edges of opposite side walls of said pan and having at the outer edges of their upper and lower side walls upstanding flanges respectively rigidly connected to the inner sides of said adjustably mounted metal angles and adjustably connected to the inner sides of the lowermost of said vertically spaced metal angles, and means for detachably holding said arms in an upright position, including means carried by and projecting from said parallel channels.

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