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APPARATUS FOR PRODUCING WALL BLOCK FORMS
Carl W. Hutch and Carl W. Hutch, Jr., McCandless Township, Allegheny County, Pa. (Both of 118 Venango Place, Pittsburgh 37, Pa.)
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This invention relates generally to molds and more particularly to a mold for making a plurality of concrete units.

The principal object of this invention is the provision of an upwardly open mold having a flat base plate with dividing means that defines the adjacent sides of concrete units and includes removable sides for the purpose of discharging solidified concrete units from the base.

Another object is the provision of a dividing means in the form of a web on the flat mold base having on its opposite sides a series of lateral sections with a transverse section at each end. This mold dividing means may or may not be secured to the surface of the flat base in spaced positions along the transverse section.

Another object is the provision of a dividing web means having its lateral sections formed with a batter for the purpose of providing a despite the mold cavity after the removal of the mold sides.

Another object is the provision of a mold dividing means made up of a series of sections each having a uniformly smooth center portion with oppositely diverging ends laid alternately relative to each other and secured at their ends to provide a zig-zag web that is laterally open and that opens laterally upon the removal of the mold sides.

Another object is the provision of a dividing means on a base plate wherein the alternate lateral sections are V-shaped in the opposite direction and are interconnected by thin web sections which form alternately positioned mold cavities with their apexes adjacent the inner ends of the V-shaped sections and their sides formed by the sides of said thin web sections and said V-shaped sections.

Another object is the provision of movable mold sides having an inner face formed to simulate a selected design which face is supported by a reinforced tubular structure.

Another object is the provision of an upwardly open mold for concrete units having a flat base with dividing means that extend longitudinally and laterally of the base plate and are enclosed by exposed sides which are secured in place by circular bands embracing the sides and passing under the base plate of the mold.

Another object is the provision of a cradle pivoted to rock on its longitudinal axis and having an upwardly open socket to receive the mold and provided with a stop means to lock the cradle for loosening the concrete units in the mold and sliding them laterally thereafter with a cushion to receive the laterally discharged concrete mold units.

Another object is the provision of mold sections interlocking with each other and with mold sides on a flat base plate with dowels to retain the mold parts in fixed relation during the loading and tamping the same with concrete.

Other objects and advantages appear hereinafter in the following description and claims.

The accompanying drawings show for the purpose of exemplification without limiting this invention the claims thereto certain practical embodiments illustrating the principles of this invention wherein:

FIG. 1 is a perspective view showing a flat base plate with a divider extending longitudinally and with its outer edges lying in contact with opposite mold sides which are detachably secured to the divider and the base.

FIG. 2 is a plan view of the structure as illustrated in FIG. 1.

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2.

FIG. 4 is an end view of the structure shown in FIG. 1.

FIG. 5 is a perspective view illustrating the dismantled mold of FIG. 1 positioned on a cradle for loosening and discharging the molded concrete units from the mold.

FIG. 6 is a top plan view of a mold for concrete units having rounded corners.

FIG. 7 is a top plan view of another form of mold of another type for rounded corners.

FIG. 8 is the top plan view of a mold for rectangular shapes having two face molds.

FIG. 9 is a top plan view of a mold for rectangular shapes having two face molds with a different orientation than that shown in FIG. 8.

FIG. 10 is an enlarged sectional view of the handle and embedded rail.

Referring to the drawings FIGS. 1 to 4, the upwardly open molds for concrete units are formed on the flat base plate member 1 having a smooth top surface 2 and being made of steel plate material formed with downwardly extending angular sides and end portions indicated at 3 and 4. This flat base plate is provided with a dividing means indicated at 5 which is composed of a series of thin steel members 6 having intermediate substantially straight web sections 7 with laterally diverging sections 8. When the members 6 are placed alternately inverted they form a web of zig-zag pattern as illustrated in FIGS. 1 and 2 and the laterally diverging ends 8 are V-shaped being welded along their apexes 10 and along the inside portion 11. Thus the sections 8 form a small V and provide a batter toward the outer edges of the mold for aiding in the removal of the concrete units laterally therefrom. As well as being welded together with the wide weld 11 and the narrow or sharp weld 10, these lateral sections of the divider are also preferably welded in the inside only to the top surface 2 of the flat base plate or pallet as indicated at 12. The thin flat sections 7 are preferably loose from the surface 2 of the base. However, these welds are thus hidden so as to provide a smooth surface that will not move or interfere with the shrinking or removal of the concrete units which they form.

The angle 13 between the diverging sides 8 and the straight smooth centerpart 7 is shown as an obtuse angle but may be made with a fillet to provide a round or a curved surface at this position. The dividing means 5 are constructed so that the welded ends 10 of the lateral sections are in line with each other and are embraced by the mold sides 14 which present an inner plastic mold face 15 having the configuration simulating cut stone the plastic being backed by a reinforcing Fiberglas formed integrally therewith. This side or wall is considerably heavier than the balance of the sides which are made hollow and are preferably constructed from a Fiberglas reinforced plastic material having the top and bottom walls 16 and 17 and the outer wall 18 of all of plastic material and enclosing the light tubular members 20 which extend longitudinally of the rails or mold sides for substantially the full length thereof and which are closed at the ends as indicated at 21. A metal strap 22 is molded in the outer wall 18 of the mold side rail and has welded thereto the rods 23 that extend outwardly through the back 18 and are connected together by the straps 24 to form the handles for the purpose of manipulating these mold sides as shown in FIG. 10.

The divider as shown in FIGS. 1 to 5 is provided with the ends 25 which extend transversely and make half
blocks as indicated by the mold cavity 26. This mold end or transverse section 25 is preferably welded to the surface 2 of the flat base plate 2 and against the welded edges 19 of the dividing means. Only three straps 27 are found to be necessary to securely hold this mold in assembled relation while being filled and vibrated with the concrete. It will be noted that the metal straps 27 pass under the depending flanges 3 of the base plate, however, if it is necessary to provide a completely open under side aligned bases such as illustrated at 28 in FIG. 1, may be provided in the flanges 3 for the reception of the strap 27 which keeps the strap tight against the under surface of the base plate which would permit any vibrator to engage the under surface of the base plate for the full length thereof to vibrate the same and thereby settle the concrete in the molds.

If the vibrators are in two units spaced from each other, one for each portion of the base plate, then the straps 27 may completely encircle the base plate as illustrated in FIG. 1 as they would not interfere with a vibrator engaging the under surface of the base plate between the adjacent strap members.

After the concrete has been poured into the mold cavities as illustrated in FIGS. 1 to 4, each of the mold cavities is preferably vibrated by an immersion rotary vibrator as well as vibrated the base of the whole mold structure. When the concrete has been properly settled, the top surface of the mold is wiped transversely and the mold is then heated to set the concrete in a relatively short time after which the bands 27 are cut and the mold sides are removed and the molds are placed in a kiln for curing the concrete units for a materially longer period of time. When the concrete units are sufficiently cured, the mold base 1 is placed on the cradle as illustrated in FIG. 5. This cradle is provided with an upwardly open socket 30 and 31 positioned at opposite ends of the cradle which sockets are pivoted as indicated at 32 on the A-frame 33 made by the legs 34, the triangular plate 35 and the cross angle iron member 36. Each of the sockets is provided with a firmly extending plate 38 secured thereto. This tube is normal to the plate 37 and welded thereto for the purpose of receiving the control handle 40 which extends therethrough and which is provided with a shoulder 41 for engaging the top of the tube 38 and thus limiting the extent that the tube 40 will drop downwardly therethrough. The angle iron 36 is provided with a hole 32 for receiving the tube 40 when the cradle member is in its horizontal position and the tube 40 thus locks the cradle from any oscillatory movement on the pivots 32.

The sides of the A-frames 33 are provided with shelf members 43, the upper surface of which is provided with a rubber mat as indicated at 44. The inner face of the legs 34 forming the A-frame 33 are provided with a stop member 45 which is engaged by the cradle member 39 when rocked by the control handle 40. Thus when the mold with its molded concrete units is placed in the cradle socket 30, 31 and the handle is moved in either direction so that the cradle engages the stops 45 suddenly jarring the cradle and the mold carried thereby the plate 2 of the mold end together with the dividing means transmitting the jar to the molded sections and they slide laterally off the flat base plate 2 and rest against the rubber mat 44 after which they are picked up and stacked on a pallet and stored for a predetermined period of time until they are fully cured.

With the batter formed by the diverging ends 8 and the flexible sides 7, the concrete units are readily jarred from position and will slide off the surface of the base plate. The surface 2 of the base plate and the dividing members together with the molded faces of the rails 14 are all covered with oil which oil coating aids in preventing the concrete from adhering to the metal and plastic mold faces.

The mold as shown in FIG. 6 is provided with the same base plate 1 having the surface 2 and the sides 4 and the ends 3 to make a substantial mold base. However, the dividing means is in the form of the long central member 59 which is preferably free of the base plate and has transverse dividing sections 51 in the center thereof. Each of the mold sections are constructed by right angular plastic mold sections 52 which provide a circular mold face 53 and the flat right angular faces 54 and 55 with the opposite ends 56 and 57. The ends 56 and 57 of each mold section 52 is provided with dowel pins 58 and 59 which passes through the divider 50 and in the adjacent mold section 52 to lock the same in position relative to each other. The opposite end 56 of the mold has its dowel pin 59 entering a mating socket in the adjacent mold section 52 which is provided in the pin 59.

Each mold section 52 is provided with a corresponding dowel pin 58 and 59 and a corresponding dowel hole. However, selected of the sections 52 have their dowel pins one above the other so that each mold section may be properly interlocked with the adjacent mold section. After these molds are properly positioned on the base plate they are secured in the same manner by the straps 27 and are then filled with concrete and treated in the same manner as to provide the long rectangular units with a rounded corner. In the structure of FIG. 7, the concrete units are likewise rectangular and have one rounded corner but they extend for substantially the full width of the base plate 1 and there is no central divider means other than the transverse sections of the mold parts 60, each of which is provided with an arcuate molded surface 61 that terminates into a straight molded surface 62 and the outer faces indicated at 63 and 64 are disposed at right angles to each other and provide a blank divider transversely of the base plate. A single rail member 14 or side plate is provided on one side of the unit 60 to provide a blank face for the concrete units. Each of the mold sections are provided with dowel pins 65 and 66 at their opposite ends for entering the adjacent mold section 60 at the corner of the mold base which has the mold side 14 which is also preferably doweled to the base plate 1 for the purpose of holding the bottom of the mold side closely adjacent to the ends of the mold sections 60.

This mold structure is also secured by encircling the same with the metal straps and tightly clamping the mold sections and the side plate 14 to the base plate 1. After the concrete units are given their preliminary accelerated curing the side plates 14 are removed together with the order and section 67 and the mold is then placed in the kiln for extended curing after which the mold sections 60 are removed and the concrete units are stacked on pallets for further curing under atmospheric conditions.

The mold as shown in FIGS. 8 and 9 provides for rectangular concrete units having two mold faces at right angles to each other and the opposite faces of each rectangular unit are blank. Here again the mold of FIG. 8 is provided with longitudinal divider plate 70 which is connected by movable transverse mold sections 71 having a mold face 72 on one side and a blank face 73 on the other. These transverse mold dividers have dowel pins on the ends thereof that pass through the central divider plate 70 and into the ends of each other. The side mold members 14 may likewise be doweled vertically through the surface of the plate 2 of the base 1 so as to hold them in tight relation with the ends of the di-
This mold is likewise secured to the base plate by means of the metal straps encircling the same in the same manner as that described with reference to FIGS. 1 and 6. The molds are filled and treated in the same manner and after the initial accelerated curing the base mold sections 14 are removed and the assembly is continued through the balance of the process in the same manner as that previously described.

Whereas, the structure of FIG. 7 is secured in some respects to the structure of FIG. 6, the structure of FIG. 9 is correspondingly similar to the structure of FIG. 7 wherein the rectangular concrete units extend laterally for substantially the full width of the base plate 1 and for the mold sides 14 which are preferably dowelled into the base plate to hold the lower edges tightly against the transverse dividing members 74. One face 75 of each dividing member 74 is a mold face and the opposite face 76 is blank. Then too, the inner face of one side mold 14 provides a mold face as indicated at 77, whereas the opposite mold side 14 has a blank face 78.

The transverse divider sections 74 are likewise dowelled into the mold sides 14 as indicated so as to completely interlock these mold parts with one another and the mold assembly is likewise secured together in the same manner by the encircling bands 27 as illustrated in FIG. 7.

Thus each of the molds are provided with a flat base plate and a dividing means in each instance provides opposite sides defining the adjacent sides of concrete units. The outer edges of the dividing means lie in longitudinal planes which are engaged by the mold sides and thus complete each mold unit. This mold assembly is then secured relatively to the flat base by means of the encircling metal bands 27 which together with the interlocking dowels form a strong mold for making a plurality of concrete units wherein the parts are readily dissembled for removing the molded concrete units and each of the parts are readily cleaned and re-rolled before being re-assembled for re-use in molding the concrete units.

We claim:

1. An upwardly open mold for a plurality of concrete units comprising a flat base plate, dividing means on said base plate including a series of directly interconnected sections having their opposite sides defining the adjacent sides of concrete units, said dividing means having outer edges lying in longitudinal planes along the longitudinal sides of said base plate, opposed removable mold sides extending longitudinally of said base plate and connecting said outer edges on said dividing means to said sides, means securing said mold sides to said dividing means and to said base plate to hold the concrete mix in said mold until it sets sufficiently for removal, and a cradle pivoted to rock on its longitudinal axis and having upwardly open means to receive said base plate of said mold, and stop means to check the oscillation of said cradle on said longitudinal axis when said securing means and said sides are removed, and means on said cradle to rock the same to strike said stop means and loosen the concrete units.

2. A concrete molding apparatus comprising a mold having a flat base plate, dividing means on said base plate including a metal strip of directly interconnected sections having their opposite sides defining the adjacent sides of concrete units, said dividing means having outer edges lying in longitudinal planes along the longitudinal sides of said base plate, opposed removable mold sides extending longitudinally of said base plate and connecting said outer edges on said dividing means to said sides, means securing said mold sides to said dividing means and to said base plate to hold the concrete mix in said mold until it sets sufficiently for removal, and said cradle pivoted to rock on its longitudinal axis and having upwardly open means to receive said base plate of said mold, and stop means to check the oscillation of said cradle on said longitudinal axis when said securing means and said sides are removed, and means on said cradle to rock the same to strike said stop means and loosen the concrete units.

3. A mold structure of claim 7 characterized by a cushion means to receive said concrete units when jarred freely laterally of said mold on said cradle.

4. A concrete molding apparatus comprising a mold having a flat base plate, dividing means on said base plate including a series of directly interconnected sections having their opposite sides defining the adjacent sides of concrete units, said dividing means having outer edges lying in longitudinal planes along the longitudinal sides of said base plate, opposed removable mold sides extending longitudinally of said base plate and connecting said outer edges on said dividing means to said sides, means securing said mold sides to said dividing means and to said base plate to hold the concrete mix in said mold until it sets sufficiently for removal, said sides having an inner plastic face of configuration simulating cut stone, a Fiberglass reinforced plastic backing up said inner face and formed integral therewith, tubular reinforcing members and a metal strip at the back of said sides enclosed by said Fiberglass reinforced plastic to form a hollow body, Fiberglass reinforced plastic ends on said tube to completely close the same, and handles secured to said metal strip and extending to the exterior of said sides.

5. An upwardly open concrete mold having a smooth base with closed ends and removable sides engaged by a dividing means, characterized in that said dividing means includes a series of pieces connected at their ends to form a unitary structure with a series of alternate apices and disposed in a zig zag pattern longitudinally of the base, a lateral section for each of the alternate apices of said dividing means made by two pieces forming a small sharp triangle with the base of the triangle secured to and extending from each apex of said dividing means and the apices of each triangle extending to said sides to
complete the mold for each concrete part to form a laterally open mold in which each face has a projected area on the removable sides of said mold, and means to secure each triangle to said base leaving the intermediate dividing means free of said base.

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