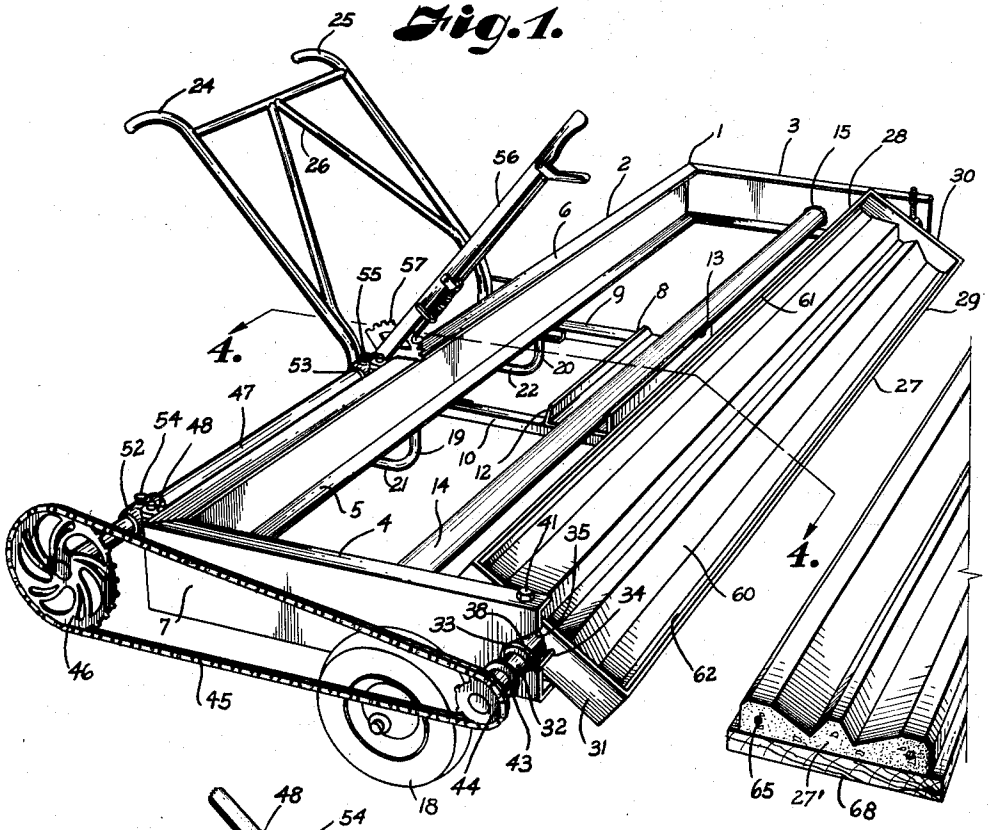
Oct. 4, 1960 A. L. FASSAUER ET AL 2,954,596

APPARATUS FOR FORMING CONCRETE STRUCTURES

Filed June 5, 1957

2 Sheets-Sheet 1

Fig. 1.



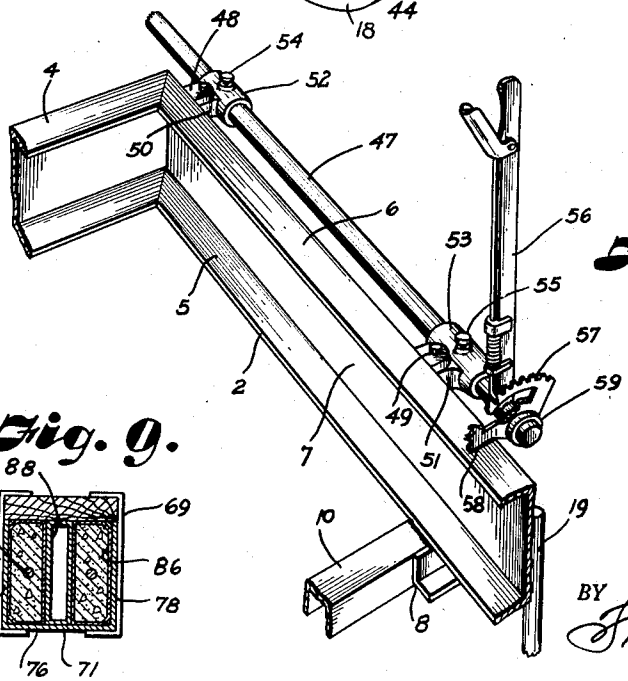


Fig. 2.

Fig. 9.

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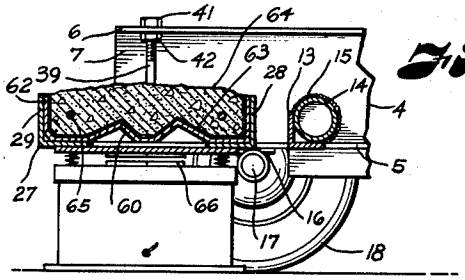


Fig. 3.

Fig. 4.

Fig. 5.

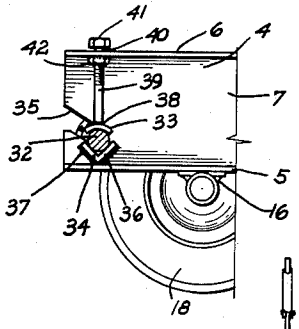


Fig. 7.

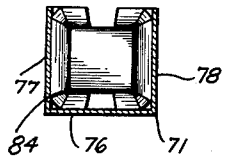


Fig. 8.

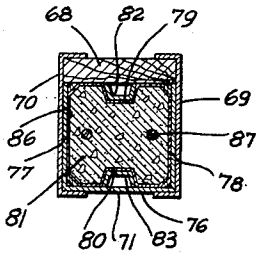
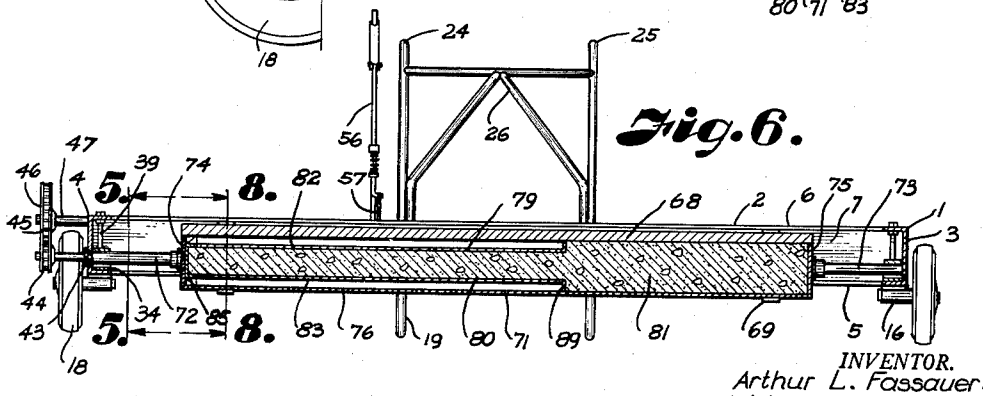


Fig. 6.



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2,954,596

APPARATUS FOR FORMING CONCRETE STRUCTURES

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5 Claims. (Cl. 25—41)

This invention relates to an apparatus for forming concrete structures, and more particularly to the formation of concrete slabs and posts for the construction of fences and the like.

Heretofore, various attempts have been made to form plastic blocks or concrete blocks and the like from cement, sand, aggregate and water which could be formed and molded in quantities but such attempts have resulted in production of such structures which require a considerable length of time for setting before they could be removed from the molds and then be handled.

It is, therefore, the principal object of the present invention to provide an apparatus of forming concrete objects from a relatively dry concrete mixture containing only sufficient moisture to adhere together upon vibration so that the objects may be removed from the forms within a few minutes after being formed.

Other objects of the present invention are to provide a portable apparatus having a container or mold for the concrete blocks or objects wherein the concrete is placed after being mixed; to provide the container with an insert to form the slab of different configurations; to provide means for covering the container while the slab in the container is being rotated; to provide means for vibrating the container with the concrete therein to settle the same in the container; to provide a liner for the container and cover so that the concrete will not adhere to the walls of the container but will be easily removed therefrom; to provide means for rotating the container within the portable frame; to provide for movement of the apparatus to a place of storage of the slab after it is formed; to provide means for holding the cover of the container in place until it is placed on the storage spot; to provide lever means having a chain and sprocket connection with the container pan for rotating the same to an upside down position; to provide means for holding the pan or container in horizontal position while the concrete is being filled; to provide means for mounting the container in the framework wherein it may be readily removed therefrom for cleaning, if desired, and to provide means for lowering the concrete slab to the storage spot.

Further objects of the present invention are to provide reinforcement for the concrete slabs; to provide recesses in the slabs and slots in the posts by inserts in the pan or container, and to provide a device of this character for making concrete slabs simple and economical to manufacture.

In accomplishing these and other objects of the invention, we have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings; wherein:

Fig. 1 is a perspective view showing our apparatus for performing the method of making blocks with the block lowered to storage position after it is formed in a disassembled relation to the structure.

Fig. 2 is an enlarged cross-sectional fragmentary view of the lever mechanism for rotating the container of the apparatus.

Fig. 3 is a cross-sectional fragmentary view of the device particularly illustrating the vibration for the pan.

Fig. 4 is a cross-sectional view taken on a line 4—4, Fig. 1.

Fig. 5 is a sectional view taken on a line 5—5, Fig. 6.

Fig. 6 is a longitudinal cross-sectional view particularly illustrating the container for forming the posts for the fence.

Fig. 7 is a top view of the chamfer for forming the head of a post for the fence.

Fig. 8 is a cross-sectional view taken on a line 8—8, Fig. 6.

Fig. 9 is a view similar to Fig. 8 but illustrating a slot through the post for receiving the slabs for a fence.

Referring more in detail to the drawing:

1 designates the apparatus for performing the method of making concrete structures comprising a frame consisting of a rear channel-shaped member 2 and side members 3 and 4. The channel members 2, 3 and 4 have lower flanges 5 and upper flanges 6 and a vertical web portion 7. The frame is supported at substantially the center thereof with a sub-frame structure 8 comprising frame members 9 and 10 which extend rearwardly from the channel member 2 and are joined by a connection 11 (Fig. 4). The forward ends of the members 9 and 10 are connected by L-shaped bars 12 and 13 and welded to the cross bar 13 is a rod 14 having its ends welded or otherwise suitably secured to the inside of the side members 3 and 4 of the frame as indicated at 15. Rigidly secured on the underneath side of the bottom flanges 5 of the end members are bearing brackets 16 for axles or short shafts 17 for supporting wheels 18 so that the framework is portable and may be transported as desired.

Rigidly mounted on the rear side of the rear frame member 2 by welding or other suitable means are spaced vertical rods 19 and 20 which extend below the frame substantially equal distance to the height of the wheels to hold the forward part of the frame from the floor or other surface so that the frame will be substantially horizontal. The rods 19 and 20 are turned laterally forming horizontal rest portions 21 and 22 and then vertically upwardly and are secured to the cross member 11 of the sub-frame as indicated at 23 to substantially the height of the frame member 2 and then are turned at an angle upwardly forming handles 24 and 25 having bracing as indicated at 26 for transporting of the device as later described.

Rotatably mounted within the forward ends of the side members 3 and 4 is a container or pan 27 consisting of L-shaped side members 28 and 29 and end members 30 and 31, the end members 30 and 31 being welded or otherwise suitably secured to the side members 28 and 29. Rigidly secured to the ends 30 and 31 are shafts 32 mounted in spaced bearing members 33 and 34. At least one of the forward ends of the side members 3 and 4 is slotted as indicated at 35 for inserting the shaft 32 between the bearings which comprise a substantially V-shaped member 36 welded to the lower end of the slot 35 as indicated at 37 (Fig. 5) and a top bearing member 38. The top bearing member 38 is adjustable by a rod or pin 39 having one end threaded and extending through an opening 40 in the flange 6 of the side members and adapted to receive threaded nuts 41 and 42 whereby part of the bearing 38 may be loosened to remove the shaft from the end of the frame for removal of the container therefrom when desired for cleaning or other purpose. Both ends of the container may be provided with adjustable bearings if desired. A

collar 43 is provided on the shaft 32 for engagement on the outside of the end frame 4 and rigidly mounted on said shaft is a sprocket 44 for receiving a chain 45 engaging over a sprocket 46 on a shaft 47 mounted on the rear side of the frame member 2 as illustrated in Fig. 1. The frame 2 is provided with rearwardly extending ears 48 and 49 adapted to receive an arm 50 and 51 of collars 52 and 53 for rotatable mounting of the shaft 47. The shaft 47 is held in place against lateral movements by set screws 54 and 55 which engage in annular grooves in said shaft (not shown).

The shaft 47 extends inwardly from the end 4 of the frame to adjacent the handle member 24 and rigidly mounted thereon by welding or other suitable means is a lever 56 having a quadrant 57 mounted to the flange 6 of the rear frame member 2 by welding or the like 58 and is provided with a collar 59 through which the shaft 47 extends.

In the operation of an apparatus constructed and assembled as described and in performing the method of making the concrete structures, the concrete is first mixed in a relatively dry form or having only sufficient moisture to cause it to adhere upon vibrating and setting in a short time. The concrete is of a mixture that will not be sloppy or readily flow. A form or bottom for the pan 27 is provided as indicated at 60 may be of any suitable form. The form or bottom of the pan is here shown to be substantially two V-shaped configurations and having the side walls 61 and 62 extending along the sides 28 and 29 of the pan 27. In order to prevent adhesion or adhering of the concrete to the form or pan, we line the same with a paper or other suitable lining as indicated at 63. The concrete is then poured in the pan to slightly above level with the sides of the pan as at 64 (Fig. 3), and the reinforcing rods 65 placed therein just underneath the top of the concrete. The frame is then transported or moved to the vibrator as indicated at 66, the pan lowered thereon by raising the handles 24 and 25 and vibrated until the concrete has settled to the substantial level of the pan and the rods have become imbedded therein. If desired the pan may sit on the vibrator while filling with concrete and vibrated from time to time. A paper or other lining is then placed over the top of the concrete slab as indicated at 67 (Fig. 4) and a covering here illustrated to be a plank or board 68 placed over the open top of the container. We have here illustrated a form of Syntron vibrator although any suitable vibrator may be utilized without departing from the spirit of our invention.

In order to hold the plank on the container we provide U-shaped members 69 and 70 spaced on either side thereof as illustrated in Fig. 4. The lever 56 is then moved forwardly as illustrated in Fig. 1 and being rigidly secured to the shaft 47 will rotate the sprockets 46 and 44 respectively through the chain 45 to rotate the pan to turn it in an upside down position. The framework is then moved through raising of the handle slightly to raise the members 21 and 22 from the floor and transport it to a place of storage. The concrete slab in its upside down position is then lowered to the floor by further raising of the handle members. The U-shaped brackets 69 and 70 may then be removed from the container and the concrete slab will remove itself from the container and lie on the floor as illustrated in Fig. 1. This operation requires but a few minutes as, as soon as the concrete is vibrated and the cover placed thereon, it may be moved to the place of storage and removed from the container immediately as it will be set up so that it will maintain its shape. We have found that a slab may be formed and removed from the apparatus in from five to seven minutes by the method and apparatus above described.

In Fig. 6 we show a modified form of pan 71 having shafts 72 and 73 rigidly secured to the ends 74 and 75 and extending outwardly and bearing in the bearing member 34 and 35 as in the preferred form of the invention. The pan 71 is narrower in width than the pan or container 27 and has a bottom 76 and sides 77 and 78. In order to form the grooves 79 and 80 adapted to receive the ends of the fence slabs 27' in a post 81, we provide U-shaped inserts 82 and 83, the insert 83 being placed on the bottom 76 of the pan, or may be an integral part thereof, and then the insert 82 being placed in the top so that it will be imbedded in the concrete when the vibration is finished. We also provide a chamfered cap 84 for placement over the head for the posts. The inserts and pan are then provided with paper lining 86 and the concrete with the reinforcing rods 87 placed therein and the pan 71 vibrated the same as when forming the slabs 27' for the fence. The paper lining is placed over the settled concrete and the plank 68 thereover and held in place by the brackets 69 and 70. The location and placing of the posts on the floor or platform is the same as in the preferred form of the invention.

In Fig. 9 we have shown a further modified form of a post pan wherein a slot 87 is provided through the entire width of the post 81. In this form we provide a box-like insert 88 mounted upon the bottom 76 of the pan. Said insert extends from a point 89 (Fig. 6) to slightly below the end wall 74 or cap 84 thus ending the slot slightly below the upper end of the post (not shown). In this structure the ends of the fence slabs 27' will be inserted in the slot 87 with the ends of said slabs engaging each other. The process of forming this post is the same as previously described.

It will be obvious from the foregoing that we have provided an improved apparatus for forming concrete slabs, posts and the like which will be quick and easy in operation and obviate the necessity for setting any great length of time.

What we claim and desire to secure by Letters Patent is:

1. Apparatus of the character described for making formed structures comprising, a frame having a pair of forwardly extending arms spaced transversely apart defining an unobstructed space therebetween, ground engaging wheels having axles, said frame being swingably mounted on said axles in spaced relation to the ground with the axles being spaced rearwardly of the forward end of said arms substantially the same distance as the arms are normally above the ground, a pan normally having an open top, means rotatably mounting said pan between the forward ends of said arms whereby the normally open top of the pan may be rotated to open downwardly, a cover for said pan, means for releasing said pan from its mounting by said arms and removing the pan from the frame, means having connection with said pan for engaging over said cover to removably secure the cover over said normally open top, means for selectively rotating said pan, and handle means on the rearward portion of said frame for lifting said rearward portion to swing the frame about said axles and bring the forward ends of said arms in close relation to the ground to deposit the structure in the pan on the ground.

2. Apparatus of the character described comprising, a frame having a pair of forwardly extending arms spaced transversely apart defining an unobstructed space therebetween, ground engaging wheels having axles, said frame being swingably mounted on said axles in spaced relation to the ground with the axles being spaced rearwardly of the forward end of said arms substantially the same distance as the arms are normally above the ground, a pan normally having an open top, means rotatably mounting said pan between the forward ends of said arms whereby the normally open top may be rotated to open downwardly, means for releasing said pan from its mounting by said arms and removing the pan from the frame, a form for receiving concrete in said pan and slidable

therein for moving through said open top, a cover for said pan, bracket members for engaging over said cover and the bottom of said pan for removably securing the cover over said normally open top, means for selectively rotating said pan, and handle means on the rearward portion of said frame for lifting said rearward portion to swing the frame about said axles and bring the forward ends of said arms in close relation to the ground whereby the form containing concrete may be placed on the ground with said cover resting on the ground and closing the form.

3. Apparatus of the character described for making formed structures comprising, a U-shaped frame having forwardly extending arms normally in a substantially horizontal position, ground engaging wheels having axles, said frame being swingably mounted on said axles in spaced relation to the ground with the axles being spaced rearwardly of the forward ends of said arms substantially the same distance as the arms are normally above the ground, a pan having bottom and end and side walls and a normally open top, at least one of said arms having a slot opening at the forward end of the arm and terminating rearwardly of said forward end, a bearing member secured in said slot, a second bearing member adjustably mounted on said one arm and relative to said first named bearing member, shafts secured to the ends of said pan and being rotatably mounted in the forward ends of said arms, one said shaft supported by said first named bearing member, said second bearing member being adapted to releasably engage said one shaft to hold it in engagement with the first named bearing member and whereby the shaft may be released to allow said shaft to be moved through the slot to disengage the pan from the frame, means for selectively rotating said pan whereby the pan may be rotated to open downwardly, a removable cover for said pan, means having connection with the pan for engaging over said cover to releasably secure the cover over said normally open top, and means for raising the rearward portion of the frame to swing said frame on the axles and bring the forward ends of the frame and said pan in close relation to the ground to deposit the structure in the pan on the ground.

4. Apparatus of the character described for making concrete structures comprising, a frame having a pair of forwardly extending arms spaced transversely apart defining an unobstructed space therebetween, ground engaging wheels having axles, said frame being swingably mounted on said axles in spaced relation to the ground with the axles being spaced rearwardly of the forward end of said arms substantially the same distance as the arms are normally above the ground, whereby the frame may be swung about the axles to bring said forward ends in close relation to the ground, a pan normally having an open top for containing the concrete for the structures, means including shafts carried by the front end of said arms for rotatably mounting said pan in said forward

ends of the arms, means for releasing said pan from its mounting by said arms and removing the pan from the frame, means for settling said concrete in said pan, removable cover means for the pan, means having connection with said pan for engaging over said cover to releasably secure the cover to the pan means connected to one of said shafts for rotating said pan to an upside down position, and handle means connected to the rearward portion of said frame for rotation of said frame on said axles to deposit said concrete structure on the ground.

5. Apparatus of the character described for making slab structures or the like from concrete having a moisture content sufficient to allow it to set upon vibration comprising, a substantially U-shaped frame having forwardly extending spaced arms defining an unobstructed space therebetween, ground-engaging wheels having axles, said frame being swingably mounted on said axles in spaced relation to the ground with the axles being spaced rearwardly of the forward ends of the arms substantially the same distance as the arms are normally above the ground, a pan for containing the concrete for said structures, means rotatably mounting the pan between the forward ends of said arms including a shaft extending outwardly of one of said arms, a sprocket on said shaft, a shaft rotatably mounted on the rear side of said frame, a sprocket on the outer end of said shaft in alignment with the first named shaft, a chain for said sprockets, handle means secured to said frame for swinging the frame about said axles relative to the ground, means for vibrating said pan, a lever rigidly connected to the inner end of the shaft on the rear of the frame, a cover for said pan, means for removably securing said cover to said pan, and quadrant means for selective operation of said lever whereby movement of lever in one direction will rotate said pan to turn the same to an upside down position and raising of the handle means will swing the frame about said axles and lower the pan to the surface of the ground and removal of said cover securing means will allow the concrete structures to be removed from said pan.

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