

[54] **APPARATUS FOR MANUFACTURING CONCRETE PIPES, PARTICULARLY SHAFT RINGS**

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[51] **Int. Cl.**..... **B28b 21/12**

[58] **Field of Search** ... 425/426, 428, 427, 431, 432, 425/414, 421, 423

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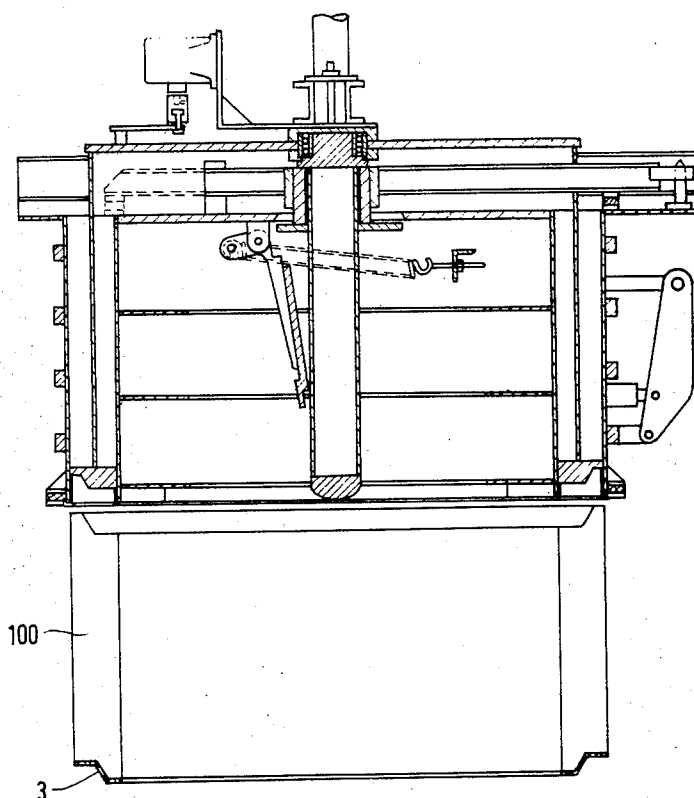
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ABSTRACT

The method and apparatus for manufacturing concrete pipes, especially for lining shaft rings employs a form mantle and a form core with an annular space therebetween, a plunger, coupling means for temporarily connecting form mantle and core, and independent lifting means for the plunger and for the form mantle, the form mantle and core being coupled together and seated at a forming station, are then uncoupled prior to pouring concrete, then the concrete is poured and compacted and the mantle and core are coupled together again and are withdrawn from the formed work piece.

10 Claims, 8 Drawing Figures



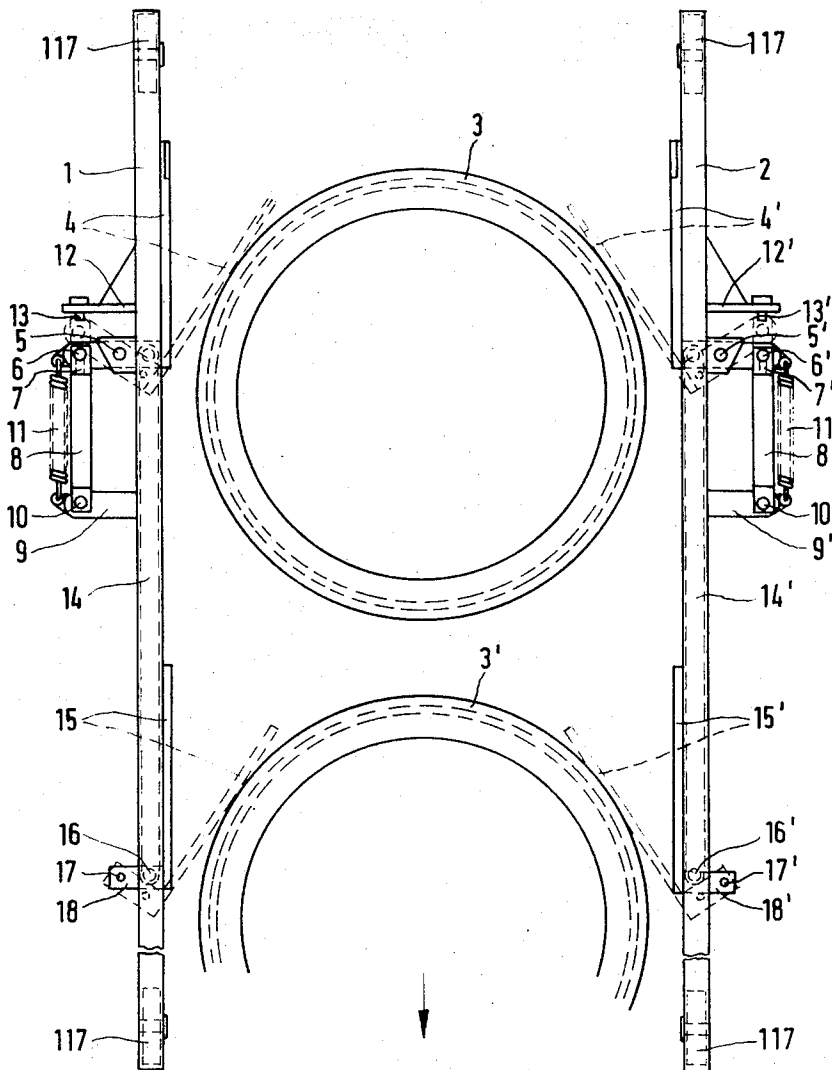


FIG. 1

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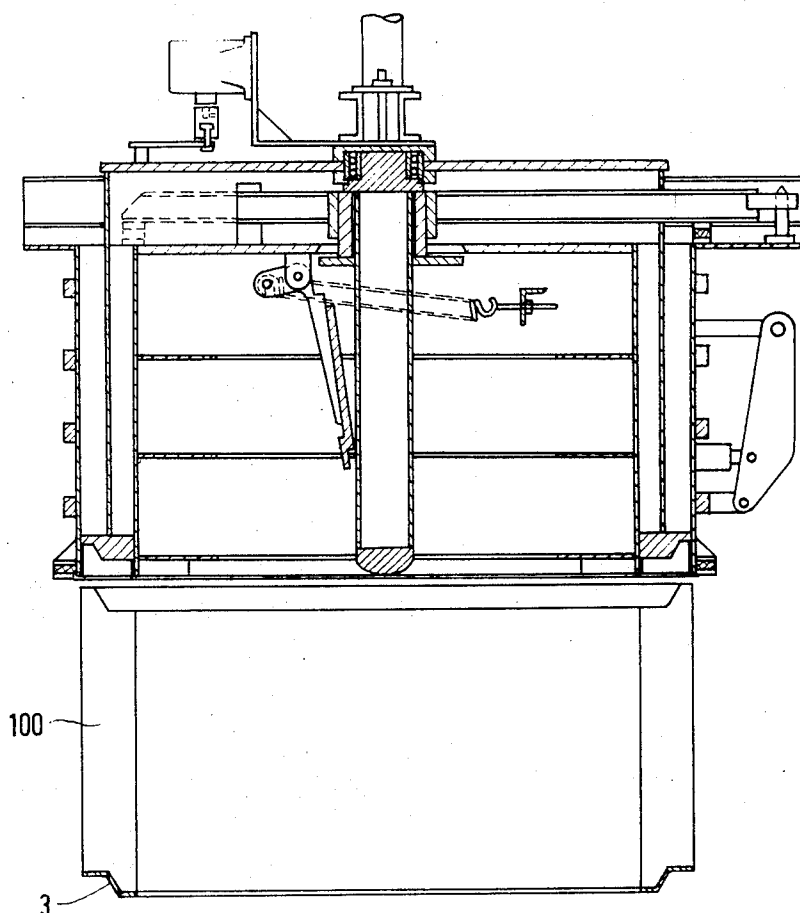


FIG. 2

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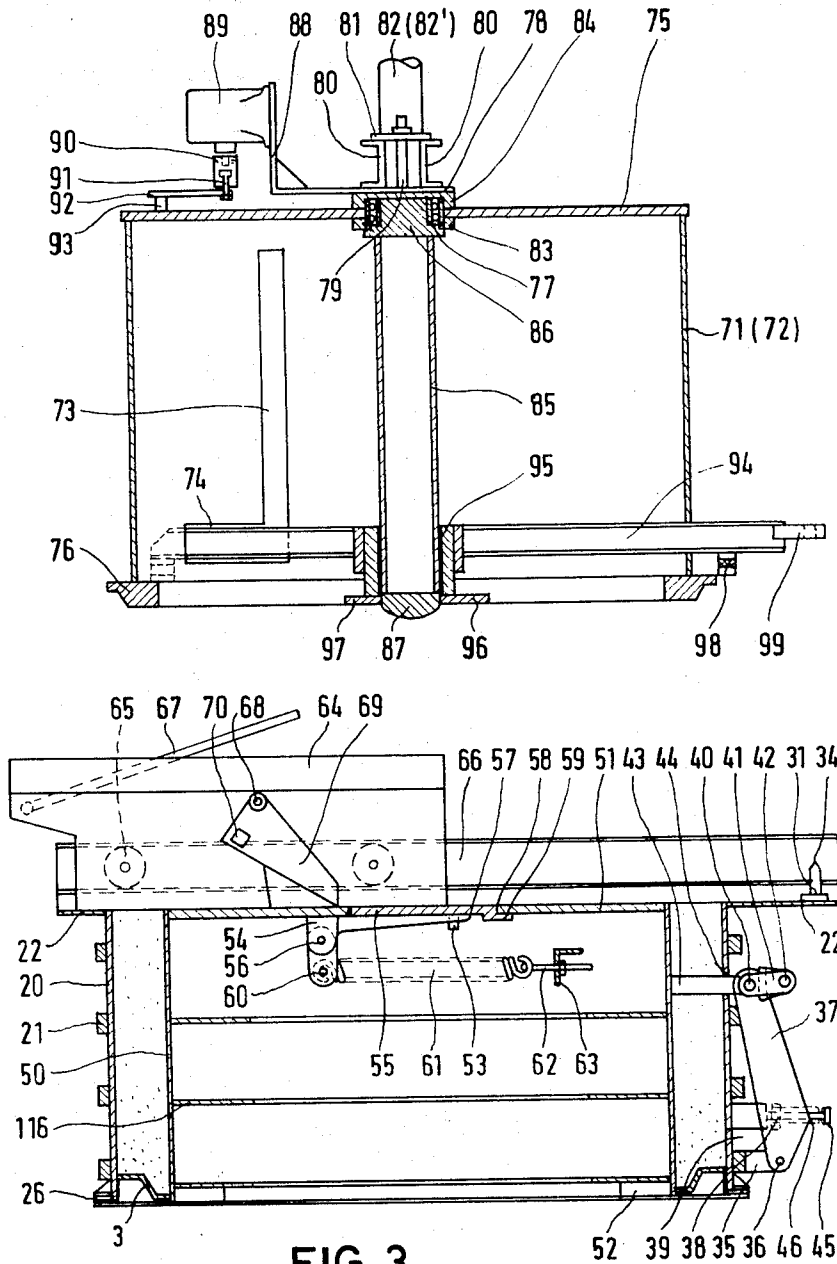


FIG. 3

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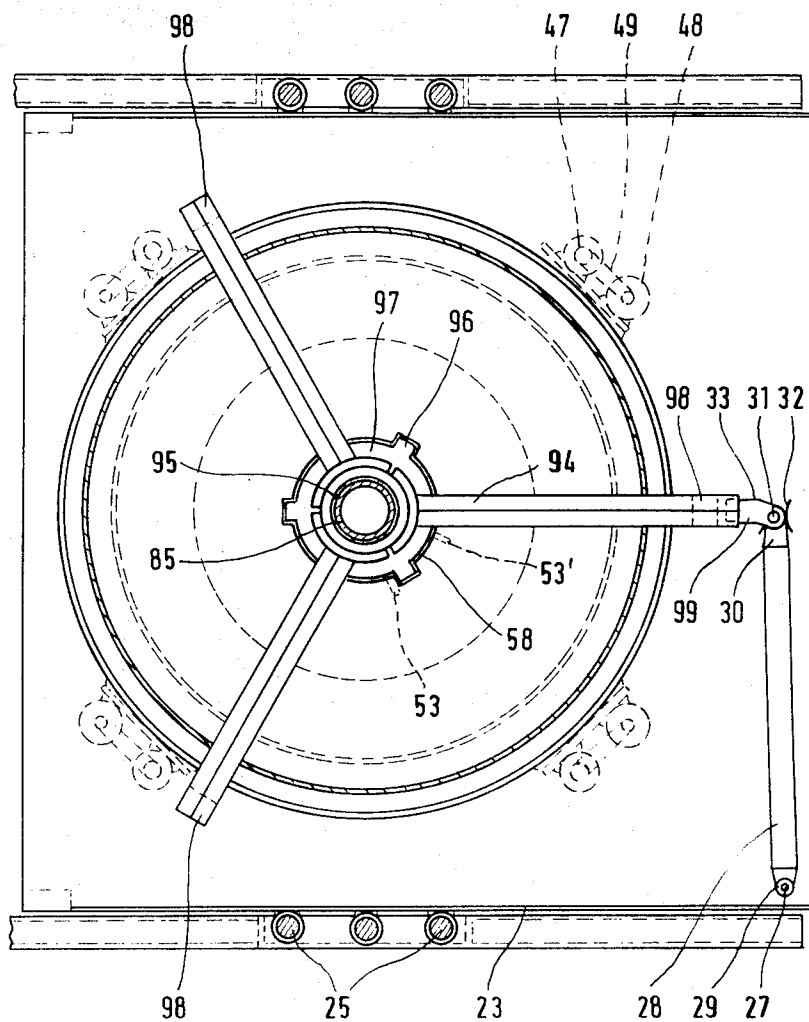


FIG. 4

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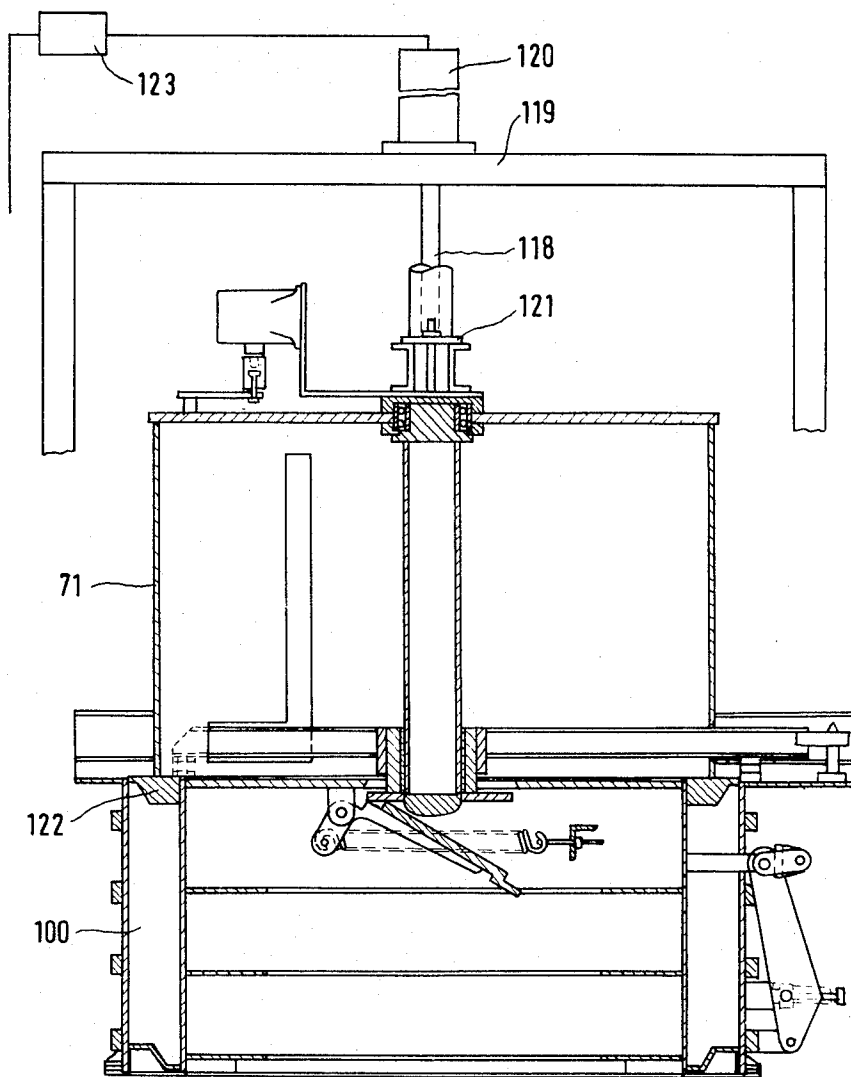


FIG. 5

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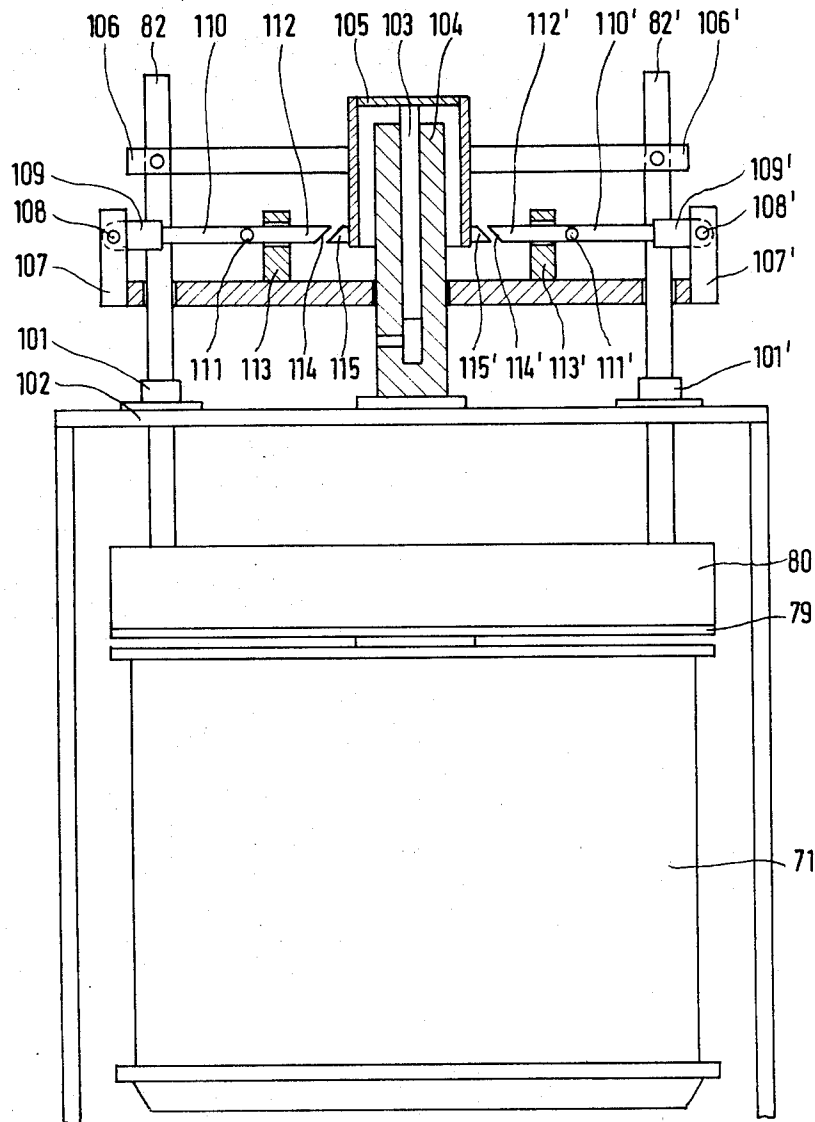


FIG. 6

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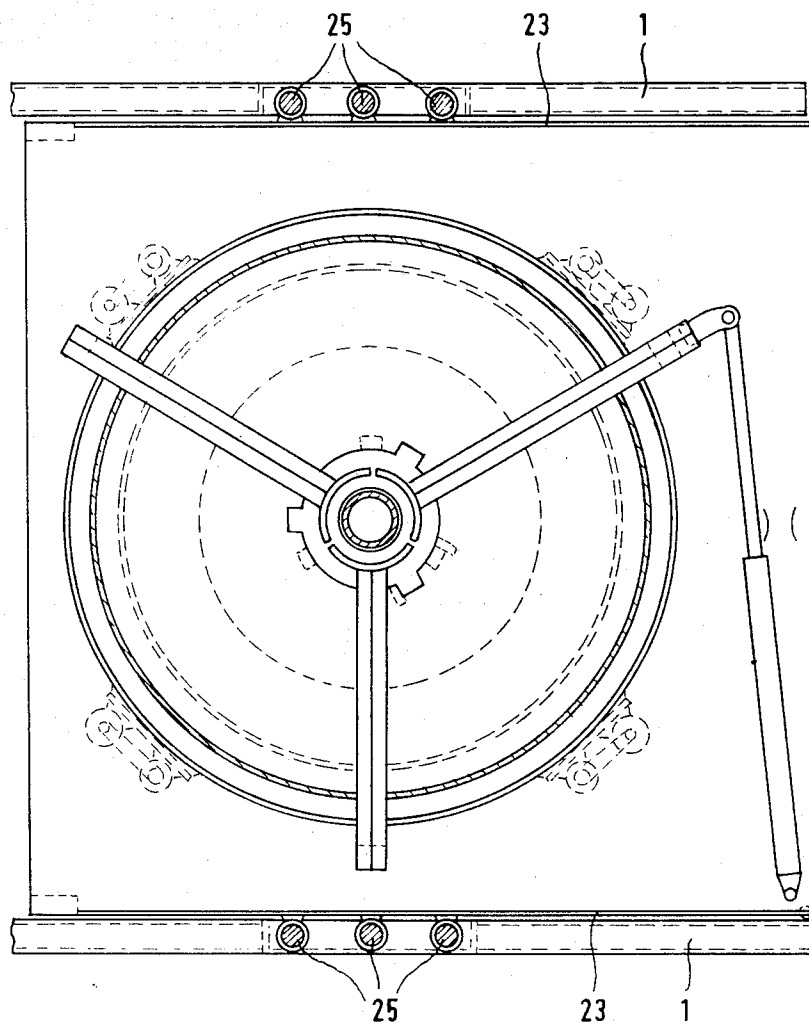


FIG. 7

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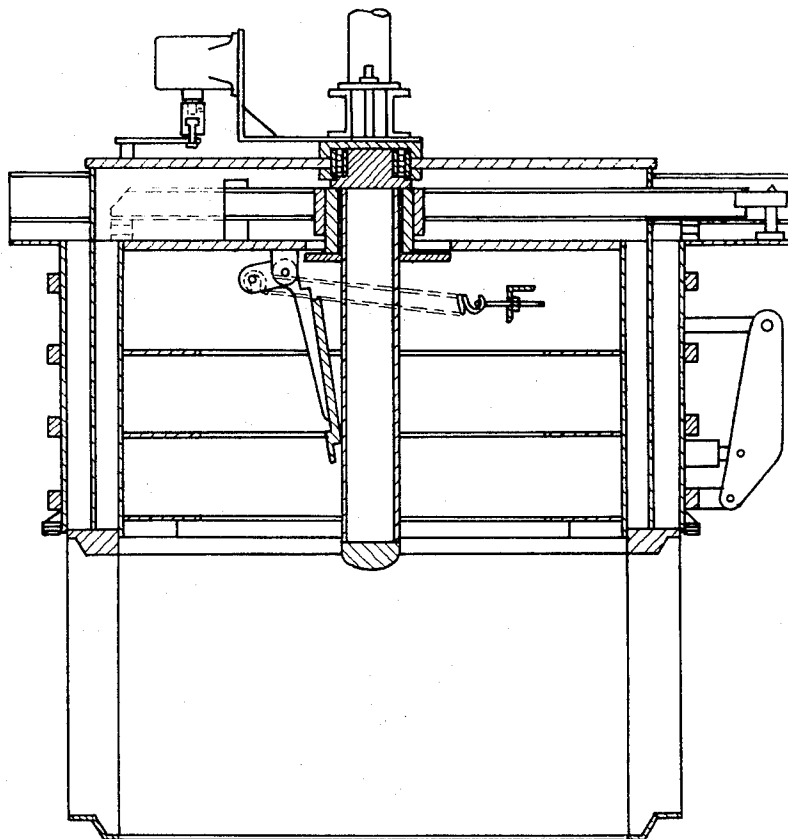


FIG. 8

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APPARATUS FOR MANUFACTURING CONCRETE PIPES, PARTICULARLY SHAFT RINGS

BACKGROUND OF THE INVENTION

The invention relates to the production of concrete pipes for use in lining shafts or the like. More particularly the invention provides a method and apparatus for producing concrete pipes, particularly shaft rings or lining, with or without holes for climbing irons by means of movable or stationary concrete casting machines.

A great variety of structural means are known that serve for the production of concrete pipes. All known equipment has the shortcoming that even with considerable construction expenditure it is not possible to obtain large quantities in mass production.

Different pipe producing apparatuses are known in connection with the vertical withdrawing of the form mantle and core in different planes or at different levels which produce and remove the shell from the casting. Such production equipment is available in a large number of embodiments. Most of them employ means below the floor where either the vertical core drive is provided under the floor and the pipe withdrawal takes place in a plane above the form mantle, or with form rotating means as well as transporting means below the floor for removing concrete castings from which the form mantles have not yet been removed, while further operations have to be performed for pulling up the core and for removing the outer form shells.

Solutions for overcoming special difficulties, such as the production of holes for the climbing irons in shaft rings in a quantitatively and qualitatively continuous pipe producing process, are not reflected by the known methods, and automatic operation or operation not requiring a great deal of labor could not be carried out.

It has also been attempted to rigidly connect the form mantle and core with core irons by way of hydraulically driven pulling columns for raising the form in a manner analogous to concrete block production.

Necessarily this manner of construction involved an excessive increase in height of at least 60mm, which was absolutely necessary for mounting the core irons and for the safe stabilization of the heavy core relative to the form mantle. This excessive heightening resulted in that continuously equal dosing of the concrete charge from one production cycle to the next was not possible either manually or automatically. In order to obtain sufficiently homogeneously compacted pipes and simultaneously pipes that meet the normal tolerances as to height within narrow limits.

SUMMARY OF THE INVENTION

It is an object of the invention to obviate the shortcomings of all known methods and apparatuses and to provide a new manner of operation for producing finished concrete parts, particularly shaft rings, which make possible in mass production compulsory arrangement in sequence of the manually or automatically controlled individual operations. In accordance with the invention the application of the principle of the floor finishing method to the production of such structural components is to be made possible. Further it is an essential part of the present invention to make it possible to produce an evenly compacted concrete casting which after final setting has a predetermined height

within very narrow limits. In this connection an existing mold height is to be used of only a few millimeters to zero, which after one or several pre-fillings and compacting permits the final filling quantity up to the border of the form, and by sinking a stamp or column having a top socket profile makes it possible to achieve safe end compacting of the shaft ring until the predetermined height is attained, without it becoming necessary to further fill in concrete or even remove a part of the mass filled in.

In order to solve this problem, the invention provides a method for producing concrete pipes, particularly shaft rings, primarily by means of floor production where the concrete is filled in between the form mantle and a core, is compacted, and then the forms are withdrawn from the work piece; and essentially this method is characterized in that the form mantle and form core are placed together on the forming location while coupled to one another, are uncoupled prior to the filling and compacting of the concrete after the forming, are anew coupled together after the forming, and then are withdrawn together from the completed product.

In this connection the method in accordance with the invention can preferably be carried out in that the form mantle and form core are coupled and uncoupled depending on the momentary phase of operation (position of thrust) of a plunger that is movable between the form mantle and the core.

With a continuous production the invention may furthermore be improved in that the form mantle and the core are placed together upon socket rings that are laid out and aligned in a row. Preferably the socket rings are aligned as to location and space prior to the placing of the form mantle and cores.

In all cases it is suitable to further arrange the method in accordance with the invention in a manner that the formed work piece is held down as the form and the core are withdrawn by the plunger. This can be effected in accordance with a particularly advantageous embodiment of the invention in the manner that the end of the downward stroke of the plunger is controlled in relation to time, i.e., independently of the thrust of the plunger and height of the work piece. In this manner particularly advantageous cycle or phase times can be obtained, which are of essential significance for high performance. Furthermore, the most variegated designs and developments of a concrete part production machine are the subject of the invention, particularly floor finishers for carrying out the new working operations on which the invention is based. Such a concrete production machine is suitably equipped with a plunger that can be introduced in the annular space between the form mantle and the core, which in accordance with the invention is provided with couplings for the temporary connection of form mantle and core. Plunger and form mantle are advantageously equipped with an independent thrust drive.

Furthermore, in accordance with the invention the working station for filling in the concrete is on the one hand defined by a top cover of the core and, on the other hand, by a flange-like extension of the form mantle, both of which are disposed in the same plane. The cover plate in this connection is provided with a control aperture that can be closed, and the plunger has a central guiding column which can drive into this opening and in which the latching of core and form mantle takes place.

Further, in accordance with the invention one or more latch supports can be centered on the guiding column, which by means of a latch plate engage the central opening of the cover of the core where they can be latched. The fundamentally simultaneous placing and raising in accordance with the invention of the core and form mantle can be made possible either in that the free ends of the latch supports loosely rest upon the working station that can be raised and lowered.

BRIEF DESCRIPTION OF THE DRAWINGS

Further details and features of the method and of the apparatus in accordance with the invention will become apparent from the following description of the drawings which illustrate a preferred embodiment of an apparatus for carrying out the method, and in which

FIG. 1 is a plan view of the base frame of a concrete element producing device with a socket centering arrangement at the beginning of a production cycle,

FIG. 2 is a sectional view of the form, plunger and filling box during a production cycle,

FIG. 3 to which the description refers, is a sectional view of the form mantle, core and plunger during a production cycle,

FIG. 4 is a top view of the form mantle with table in the frame of the machine, core, latch support and plunger section, penetration of the latching noses into the core,

FIG. 5 shows the form mantle, core and plunger in section during a finishing operation,

FIG. 6 shows the variable height latching at the final compression,

FIG. 7, like FIG. 4, shows the core latched to the form mantle, and

FIG. 8 shows the form mantle, core and plunger in section during a finishing operation.

DESCRIPTION OF THE INVENTION

In FIG. 1 the side members 1 and 2 of the base frame of a known floor type forming device, which is not illustrated in detail, are shown. The bottom sockets 3 are placed on the floor over which the floor type forming device rides. The front traverse of the forming device which cannot be seen is enlarged in a manner that the bottom sockets 3 can freely pass.

Let it be assumed that one pipe finishing cycle has just been ended. The forming device is now instructed to move on to the next production location by means of a driving device 117. The switching command "Driving device in" is coupled with the command "Centering arms 4 and 4' move out". This command is carried out in such a manner by means of the delaying relay that the centering arms which in position of rest lie against the side portions of the frame move out only after leaving the zone of the finished pipe. They then constitute tangents of the socket circle and conduct the bottom socket 3 as a unit to the next production cycle and exactly underneath the center of the form. With manually operated machines the operator drives the forming device so far until both centering arms make visible contact with the border of the socket. With automatic machines the drive for the machine is cut off when a circuit is closed by way of the metallic bottom socket.

The centering arms 4 and 4' are rotatably journaled in the stationary points 5 and 5'. The pistons 7 and 7' of the hydraulic cylinders 8 and 8' engage the outer link points 6 and 6' of the centering arms. The cylin-

ders 8 and 8' are pivotally supported in the stationary arms 9 and 9' at the points 10 and 10'. It is the task of the springs 11 and 11' that are secured to the centering arms 4 and 4' as well as to the arms 9, 9' to pull back the centering arms securely into their initial position after the hydraulic pressure has been released. The command "Centering arms move in" is simultaneously given with the command "Form down".

The supports 12 and 12' with the bolts 13, 13' serve as final abutments for the centering arms. They must be adjustably constructed to serve different purposes of the arrangement. Connecting bars 14 and 14' that are pivotally linked thereto lead from the centering arms 4 and 4' to a second pair of centering arms 15 and 15', which swing out synchronously with the centering arms 4 and 4' and serve as pre-storage, in that they keep the bottom socket 3' at a certain safety spacing out of the working zone.

The centering arms 15 and 15' are linked to the points 16 and 16' and are rotatably journaled at the pivot points 17 and 17' of the stationary lugs 18 and 18'.

With reference to FIG. 3, the individual components of the apparatus in accordance with the invention will be explained more in detail. The form mantle is identified by reference numeral 20. It is surrounded by reinforcing rings 21. At its upper edge the form table 22 is welded on as an outer flange. Table 22 is coupled with the raising frame 23 of the form production device (FIG. 4) to which are fastened hydraulically operated pulling columns 25. At the lower end the form mantle has a conical expansion at 76 which is intended to facilitate the central introduction of the form mantle over the bottom socket 3. At the lower end of the form mantle at least three rubber-metal elements are rigidly connected therewith at the circumference of the form so that there is a small projection with respect to the form end. By these means, minor unevenness of the bottom is compensated. In accordance with FIG. 4, the bolt 27 is rigidly secured to the forming table 22. The hydraulic actuating cylinder 28 is pivotally secured around this bolt by means of an eyelet 29. The cylinder 28 loosely receives the collar bolt 31 in its eyelet 30 from the bottom so that it can move together with the plunger over the forming table. Insertion plates 32 and 33 secure its initial position after operation. For the easy introduction of the latch supporting eyelet to be described below, the collar bolt is provided with a conical end 34 (FIG. 3).

On the form mantle 20 one or several drawing or pulling devices for producing recesses for climbing irons are provided in the embodiment illustrated. In accordance with FIG. 3, the fork block 35 with pivot 36 is firmly secured on the form mantle. Lever 37 is rotatably journaled in the pivot point 36 and is connected with the transverse plate 38 by way of which the cylinder 39 which is connected with the form mantle 20 is operated. This rotary movement about point 36 is transposed by way of pivot point 40, coupling 41 and pivot point 42 into straight line movement onto the climbing iron bolt 43, which can be moved inwardly and outwardly through aperture 44 in the form mantle until it engages the core mantle. The disk springs 46 that are disposed around the collar bolt 45 act against the pressure of the hydraulic cylinder 39.

In accordance with FIG. 4, one or more vibrators are fixedly mounted on the form mantle. In the preferred

embodiment four vibrator units are equally distributed around the circumference, but they are disposed at different levels. A vibrating or shaking unit comprises an electromotor 47 and an eccentric vibrator 48, which are connected with one another by way of V-belts 49 in a power transmitting manner. Thus, a high frequency oscillation is introduced in the form which promotes floating of fine concrete particles in the outer surface and imparts a smooth surface to the concrete pipe.

For better withdrawal out of the body being molded the core pipe 50 is made with a slightly conical shape. A cover plate 51 is welded into the core pipe and registers at its upper end with the upper border thereof and forms together with the flange portion the center part of the operating platform in the same plane. The core pipe has conical expansion at its lower end 76 for easier insertion into the lower socket 3. It is seated on the bottom with several pointedly terminating transverse metal sheets 52 provided at its inner circumference. As a result the core is always safely seated on the bottom. Small impurities and stones are pushed aside. Furthermore, what is especially important to perform the operation, the transverse metal sheets secure the core against turning under the action of the vibration.

Abutment members 53 and 53' are firmly mounted below the cover plate 51. Rings 116 that are welded on stiffen the core. The support block 54 is mounted below the cover plate 51. The closure cover 55 is rotatably located in the support block 54. Its plate 57 closes the aperture 58 of the cover plate. At the forward end of the plate 57 a lug 59 is located which so limits the location of the plate 57 that it constitutes a plane surface with the cover plate 51. The aperture in the cover plate is conically expanded toward the bottom in order to avoid the accumulation of any impurities. A bolt 60 is received in the cover 55 onto the outer ends of which strong springs 61 are hooked, the other ends of which are hooked onto adjustable screws 62. The adjustable screws 62 are adjustably retained on the angle iron 63 that is firmly connected with the core tube 50. The springs must be sufficiently spaced from one another as to permit the passage of the cover plate 55 between them.

The charging carriage 64 travels by means of wheels 65 on the rails 66 that are securely fastened to the forming table 22. The charging carriage is pulled over the form and the core by means of hydraulic drive means that engage coupling 67. In the charging carriage a distributing shovel 69 is mounted for movement about pivot point 68. The shape of the distributing shovel is adapted to the special requirements as illustrated. In plan view the shovel is arcuately shaped so that there is a large distribution of concrete towards the side in order to amply fill the laterally disposed larger areas of a ring with concrete. In one corner of the distributor shovel a counter weight 70 is mounted. The plunger 71 comprises the plunger tube 72, which is provided at its circumference with a plurality, preferably three, longitudinal slots 73 having transverse slots 74, the cover plate 75 and the hard chromium plated top socket or sleeve ring 76. The cover plate 75 with the entire plunger 71 is rotatably journaled relative to the plunger yoke plate 78 by means of an oblique double ball bearing 77. Plunger yoke plate 78 is drawn up by means of screws 79 against the plunger yoke 80 by way of plate 81. The pull columns 82 and 82' of the plunger are firmly connected with the plunger yoke. The ob-

lique double ball bearing 77 is held on the cover plate 75 by means of covers 83 and 84. It supports the plunger radially and axially. The journal 86 which is firmly connected with the hard chromium plated guiding column 85 is braced in with cover 84 and plunger yoke plate 78. The guiding column 85 is provided at its lower end with a cap-shaped closure member 87.

The rectangular mounting member 88 firmly secured to the plunger yoke plate 78 supports the gear motor 89. A casing 90 having a T groove that slidably receives a stud 91 is disposed on the output shaft of the gear motor. The stud 91 is rotatably journaled in the arm 92. Arm 92 is rotatably journaled on the stud 93 which is rigidly connected with plunger 71. Thus the plunger 71 can be caused to effect a rocking movement in accordance with the eccentric disposition of stud 91 in the T-groove of the casing 90. A latch support 94 is guided in wear resistant sleeves 95 in the guiding column 85. The latch carrier or support 94 is a three-armed carrier as indicated in FIGS. 3 and 4. It may also be shaped differently, if desired, for example in a preferred embodiment a round box element with short arm stubs extending from the plunger form that extends to the diameter of the top of the upper socket. This embodiment provides the advantage of being resistant to twisting and bending. The latch plate 97 that has lugs 96 is firmly connected with the latch carrier 94. Support members 98 are securely mounted to the outer ends of the arms of the latch supports, whereby the arms of the latch supports support themselves on the surface of the work table 22 as the lifting cylinders 25 are operated. The latching eyelet 99 is secured to one of the arms.

The finished formed element 100 is illustrated in FIG. 2.

In accordance with FIG. 6 the pulling bars 82 and 82', together with yoke 80, yoke plate 78 and suspended plunger 71, are guided in the bearings 101 and 101' of the machine frame 102 and are actuated by way of piston 103 of the hydraulic cylinder 104. The pulling bars are synchronized in a force transmitting manner by way of a bell member 105 having arms 106 and 106'. Stable arms 107 and 107' are firmly mounted on cylinder 104. They also guide the pulling columns 82 and 82'.

Hydraulic cylinders 109 and 109' are supported at pivot joints 108 and 108' on arms 107 and 107'. The piston rods 110 and 110' operate the latching bolts 112 and 112' by way of pivots 111 and 111' that are guided in the bearings 113 and 113' that are moved by arms 107 and 107'. The latching bolts 112 and 112' present key surfaces 114 and 114' at their free ends. Key or wedge members 115 and 115' are rigidly mounted on the bell element 105.

After centering the laid out bottom socket 3, as described above, by way of the center of the form, the elements which are disposed above the plane of the shaft, such as form mantle 20 and form core 50 which are coupled together by way of the latch supports 94, are lowered to the ground (FIG. 7) whereby the form mantle slides with its conical end piece over the bottom socket 3. The execution of the lowering operation with the table 22 takes place by means of the hydraulically charged pulling columns 25 by way of the frame 23.

The form mantle 20 is seated with the rubber metal elements 26 on the ground (FIG. 3) so that smaller unevennesses of the floor are absorbed by these elements and the mold stands correctly on the ground with three

supports. The form core 50 centers also with a conical inlet at the lower end in the inner diameter of the bottom socket 3 while it stands on the floor with at least three transverse blades 52 which are pointed at the lower end and distributed around its inner circumference. This arrangement is of essential significance. By seating the core by way of small and in addition pointed surfaces, the danger is eliminated that the core is tiltedly seated due to impurities on the ground. Any small particles in the area of the transverse blades are pushed aside by them. The transverse blades 52 also solve the problem of securing the core 50 against turning and shifting as the vibrators are turned on. For that reason they were intentionally placed radially with respect to the form center. Upon exit of the form core 50 from the guiding column 85 the core closing lid 55 is drawn up by springs 61 so that the core cover plate 51 constitutes a closed plane surface. After the form mantle and form core have been lowered they are released from the latching by operation of the hydraulic actuating cylinder 28, in that as the latch supports 94 when turned push the lugs 96 of the latch plate 97 under the corresponding recesses of the core cover plate 51 (FIG. 4). The bayonet lock formed by the lugs 96 of the latch plate 97 and the lower side of the core cover plate 51 is thus released.

Subsequently the plunger 71 with the latch support 94 is pulled up hydraulically and thus frees the passage from filling carriages 64 on the working platform 51, 22 (FIG. 3). If need be, the climbing iron bolts 43 are now introduced in the form by means of disk spring pressure after release of the hydraulic pressure. The filling carriage 64 now fills the annular zone between form mantle and core with concrete during repeated to and fro travel. Simultaneously the vibrators 48 are actuated for the intensive pre-compacting.

The pre-compacting is interrupted when the filling carriage 64 drives out of the forming area in order to haul material from the storage silo.

If required, the interruption can be effected simultaneously with the climbing iron operations, in that the upper climbing iron withdraws from the annular zone as the form is partially filled, while the lower one is already in the volume of material and remains in place. This is done in order to introduce armoring rings of steel wire.

After pre-vibrating once or several times, the form is filled, except for a small remaining space. This is subsequently filled from the filling carriage so that the form is filled to the brim up to the plane of the table.

After withdrawal of the filling carriage 64 out of the forming zone the plunger 71 with the latch carrier 94 moves down, and upon a vibrating period predetermined by way of timing switches, produces the upper socket contour of the object 100 that is being formed. As the plunger 71 is lowered by way of the pulling columns 82 and 82', arms 106 and 106', and bell 105 and through the hydraulic cylinder 104 with piston 103, the latter is simultaneously caused to effect oscillations by the driving motor 89 by way of studs 91 and rocker 92, so that the upper plunger socket is slidingly seated upon the upper concrete layer and, consequently, adhesion of the material on the upper socket is prevented. The contour of the upper socket also has thus imparted to it a smooth surface that is bound with fine concrete particles. The two effects mentioned above are still improved by the hard chromium plating of the upper

socket. As the final compacting starts which is initiated by turning on the vibrators 47, 48 (FIG. 4), the piston rods 118 of the cylinders 120 that are on the frame of the machine are lowered onto the plunger yoke plate 121 so that the upper sleeve 122 rests against the work piece 100 under a pressure that still permits unimpeded vibrations of the plunger 71.

Thereupon the shell removal may continue. This operation depends on the set up vibration time and on the speed of the plunger and thus is constant, as compared to a control of the plunger 71 that depends on a path of travel, where the compacting is only terminated after covering a predetermined path depending on the filled-in quantity of material which under certain conditions results in considerable time consumption due to the lengthening of the time of the operating cycles.

On lowering the plunger 71 the guiding column 85 passes through the plane of the core cover 51 and opens the core closure cover 55 with its cap-shaped closure member 87, so that the latching plate 97 can pass through the core cover plate 51 with its lugs 96.

During the final compacting the form mantle and core are introduced by means of the hydraulic cylinder 28, into whose collar bolt 31 the eyelet of the latch carrier 94 enters by means of latch carrier 94 and latch plate 97, in that the lugs 96 slide against the corresponding limiting members of the core cover plate. After the final compacting that is limited as to time and the form core latching, the plunger is latched by actuating the hydraulic cylinders 109 and 109'' on the latching bolts 112 and 112'' against the frame of the machine and thus also against the form pressure, while form mantle 20 and core 50 move upward. This latching is independent of the thrust position of the plunger and of the height of the work piece formed in that the computed tolerance that is permitted by the standards is utilized (for example, with shaft rings 1,000 $\phi \times 500$, ± 6 mm). In this manner very favorable cycle timing is accomplished.

A preferred embodiment of a variable plunger latching means is the moving of the wedge or key surfaces 114 and 114'' against the key members 115 and 115'' against the bell 105, as shown in FIG. 6.

Prior to turning the switching to "Open Form", the climbing iron bolts 43 are, of course, withdrawn. The form mantle 20 is pulled up by a hydraulic cylinder, which is not shown, by way of the raising frame 23 and the pulling columns 25 (FIG. 4). In order to avoid the necessity of overcoming simultaneously the release moment of the form mantle and of the form core that result from the considerable friction pressure of the compacted formed piece against the walls of the form, the form mantle 20 is pulled up by a certain amount before the latch plate 97 comes into engagement below the core cover plate 51 and takes along the core 50 by way of the core cover plate 94 (FIG. 5). In order to make the unshelling easier the core 50 is made with a slightly conical shape.

Form mantle 20 and core 50 are first raised so high that they are with their lower edge safely above the upper edge of the formed piece, as indicated in FIG. 8. In that position the plunger 71 is unlatched from the machine frame and is raised up from the form by such an amount that the upper socket contour of the plunger moves out of the formed piece 100 (FIG. 2). Before the lifting off of the plunger starts, the upper socket of the plunger has again imparted to it vibrations in order to

smoothen the surface of the form being cast during release and to leave without doing damage.

Thus the sequence of cycling terminates with a finishing operation (FIGS. 1 and 2).

All functions described may be controlled manually, as also by means of generally known electrical elements, not described here, that are combined into a fully automatic working operation.

With a shaft ring of dimensions of $1,000 \phi \times 500$ height, the finishing times of $1\frac{1}{2}$ to 2 minutes per unit are obtained with manual control, and with automatic operation these times are even less than $1\frac{1}{2}$ minutes. The production method described above applies also, of course, to stationary concrete element production machines, where merely the lower sockets are introduced in a kinematic reversal and the finished formed pieces are carried away by a conveyor or the like.

An essential and characterizing feature of the method in accordance with the invention resides in that during the phase of the filling carriage entrance there is no connection between the form mantle and core, and the plane of the filling zone is free of any construction elements, especially receptacle devices for connections.

Generally the proposals in accordance with the invention can also be used for the production of other core form pieces made of different materials.

All details illustrated in the drawings and described in the specification are essential for the invention.

Having now described our invention, what we desire to protect by letters patent is set forth in the appended claims.

We claim:

1. Apparatus for producing concrete pipes, particularly shaft rings, comprising, in combination, a form constituted by a form mantle and a form core defining an annular space therebetween for receiving concrete being poured, a plunger movable into said annular space, said form mantle, form core and plunger being vertically movable, means for coupling said form mantle and said form core, and means for seating said form mantle and form core together at the forming place, means for uncoupling said form mantle and form core prior to pouring concrete into said annular space and for coupling said form mantle and form core again after pouring and compacting the concrete in said annular

space, and means for withdrawing form mantle and form core together from the formed workpiece, a top cover for said form core defining a platform for pouring concrete, and an extension at the top end of said form mantle defining a flange, said plunger having a central guiding column and said top cover having a central aperture adapted to receive said guiding column, said guiding column including means for effecting latching between said core and said form mantle.

2. Apparatus in accordance with claim 1, comprising at least one latch carrier pivotally mounted centrally of said guiding column of said plunger, said core cover having a central aperture, a latch plate in said aperture presenting a lug for engagement with a latch on said one said latch carrier.

3. Apparatus in accordance with claim 2, where the outer ends of the latch carriers rest on said operating platform.

4. Apparatus in accordance with claim 3, comprising support elements at the outer ends of said latch carriers.

5. Apparatus in accordance with claim 4, including an actuating cylinder pivotally mounted on said operating platform and pivotally connected to the end of one said latch carrier for turning said latch carrier.

6. Apparatus in accordance with claim 5 where said actuating cylinder has a piston bar having a free end releasably coupled to the outer end of a latch carrier.

7. Apparatus in accordance with claim 2, comprising a spring biased cover having lugs disposed below said central aperture of said core cover.

8. Apparatus in accordance with claim 7 including a biasing spring for said core cover having a fixed support at one end, said cover being pivotally supported proximate said central aperture and having engagement with said guiding column and having a lever arm in engagement with the other end of said spring.

9. Apparatus in accordance with claim 2, where said plunger has a wall provided with vertical and horizontal slots and said latch carriers extend into said slots, and said slots having a width permitting oscillating of said plunger.

10. Apparatus in accordance with claim 1, including plunger latching means and means for adjusting the height of said plunger in relation to time.

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