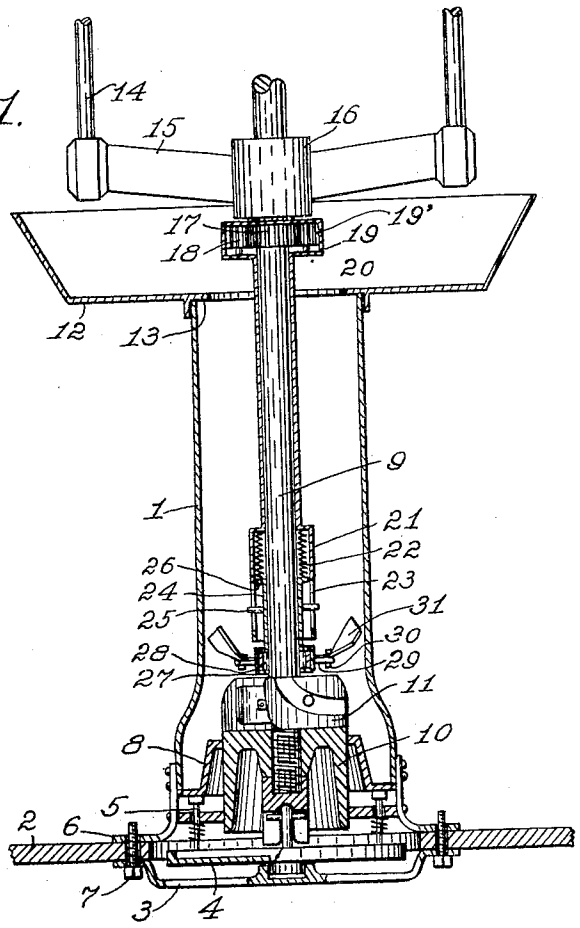
June 14, 1932. A. W. SCHULTZ 1,862,709

MACHINE FOR CONSTRUCTING CONCRETE PIPE

Filed March 24, 1930

Fig. 1.



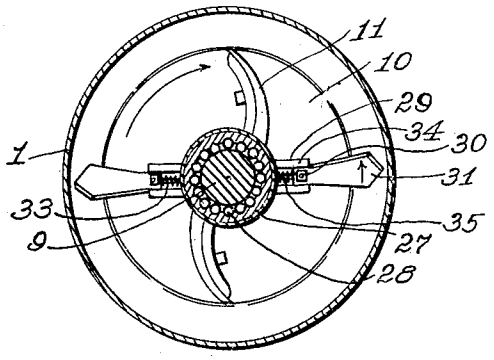


Fig. 2.

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UNITED STATES PATENT OFFICE

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MACHINE FOR CONSTRUCTING CONCRETE PIPE

Application filed March 24, 1930. Serial No. 438,488.

My invention relates to improvements in machines for constructing concrete pipe, and the object of my improvements is to include in such a machine, means for equally distributing to the inner circumferential space of a mold casing, which is to be occupied by a finished tile, concrete material introduced into the casing before the material is acted upon by other agencies in troweling and shaping the tile.

This object I have accomplished by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawing, in which Fig. 1 is a vertical axial section of an open end mold casing, and its inclosed troweling means, with parts in elevation or broken away, and Fig. 2 is a horizontal section of the mold casing, on a larger scale, and taken at a level above the distributing device therein as shown in said Fig. 1.

My invention is not restricted to the precise construction and arrangement of parts herein shown and described, nor to the various details thereof, as the same may be modified or rearranged in various particulars without departing from the spirit and scope of my invention, one practical embodiment of which has been herein illustrated and described without attempting to show all of the various forms and modifications in which my invention might be embodied.

In said drawing, the numeral 1 denotes an open end mold casing with bell end for shaping bell end hollow concrete tile.

The numeral 2 denotes a platform upon which the mold casing 1 is removably supported above and concentric with a circular aperture in said platform or table 2. The platform or table 2 may be relatively fixed, or may be mounted to be swung or otherwise moved to and from the tile machine, the latter not being shown herein. The bell end of the mold casing 1 may have longitudinal projecting feet 6 secured thereto exteriorly and bent outwardly and apertured in alinement with holes in said table 2 and with other holes in the end parts of a bar 3 below, diametrically positioned across the table aperture, with up bent or offset terminations. Headed screws 7 inserted in said alined holes, the latter interiorly threaded, secure all said apertured parts together, separably.

The offset bar 3 includes a medial or central socket or step bearing to receive the depending stub-shaft on a rotatable circular table 4, which has a number of radial ribs upon its upper surface over which ride the lower ends of tappets or headed pins 5 traversing holes in a flat ring secured between the feet 6. This arrangement of cam-disk and tappets whose heads are caused by the said ribs to intermittently tap or rap the bottom of an annular pallet 8 in the basal part of said mold casing, is described and claimed in my pending application for Patent Serial No. 289,682, filed July 2, 1928, hence will not be further dealt with herein.

The numeral 10 denotes a former-head, hollowed downwardly, cylindrical outwardly, and having a short depending and forked attachment to receive a cross-pin on an axial stem projecting upwardly from the table 4, whereby the former-head is rotated in one direction. This former-head fits and is movable longitudinally through the raised central part of the bottom pallet 8, and is mounted on the lower end of an axial shaft 9, upon which immediately above the former-head are detachably secured the curvate troweling devices 11 which extend outwardly no farther than the outer circumferential periphery of the former-head, and to rotate therewith.

The numeral 12 denotes a receiving pan for fresh concrete material and which has a central annular opening with depending annular flange whereby it is seated as an upper pallet upon the upper end of the mold casing 1 concentrically, the inwardly projecting rim part 13 of the pallet providing a top limit-

ing or end shaping means for a tile formed in the mold casing.

Fresh mixed concrete material deposited in the pan 12 is scraped into the pallet aperture to fall within the mold casing. As this material is apt to be unequally distributed to the action of the troweling devices and former head below, I have mounted rotatably upon the shaft 9 and provided to be rotated in an opposite direction to the direction of rotation of the shaft, a distributing means as follows.

Above the mold casing 1, are depending hangers 14 connected by a cross member 15 provided with a medial centrally vertically apertured bearing seat 16 traversed rotatably by said shaft 9, the shaft being rotated in one direction by means not shown. On the lower end of said bearing is a depending fixed ring 19 inwardly flanged concentric with and spaced from shaft 9. On said shaft 9 is secured a spur-gear 17, and several spur pinions 18 of less diameter are grouped around said gear 17 and in mesh therewith, and with their shafts mounted in said ring 19. The inner wall of said ring has circumferential spur teeth 19′ intermeshing with the teeth of said pinions. The ring or chamber 19 is diminished to provide a rotary sleeve 20 coaxial with and around the shaft 9, but rotating oppositely. The lower part of the said sleeve 20 is cylindrically expanded at 21 to receive several helical compression springs 22 to bear at their upper ends upon the interior shoulder of the sleeve. The cylindrical part 21 has one or more vertical slots 23. The numeral 24 denotes another sleeve loosely mounted on the shaft 9 and extending upwardly into the hollow of said sleeve part 23 and has radial pins 25 projecting through the slots 23 outwardly. The upper end of the sleeve 24 is flanged outwardly at 26 to support the lower ends of the springs 22. The lower part of the sleeve 24 is expanded outwardly from the shaft 9 and flanged inwardly at its lower end at 27 to receive therebetween a number of anti-friction rollers 28. On the expanded part of the sleeve 24 are outwardly projecting radial fixed lugs 29 apertured vertically to receive bolts 30 with fastening nuts to secure the inner ends of spirally twisted propeller arms 31 thereon, projecting radially to have their outer terminations close to the inner wall of the mold casing. The lugs have longitudinally spaced ribs 34 thereon, between which the stems of said propeller arms 31 are slidably mounted and held by the ribs against lateral movements. The stems of said arms are longitudinally slotted at 35 to receive said bolts 30 slidably therethrough, to permit the arms to normally be yieldingly projected outwardly radially by the compulsion of springs 33. The blade parts of the arms 31, besides having a spiral twist are widened at their outer ends and have anticlinal end edges for a purpose to be described.

The drawing, Fig. 1, shows the former head 10 with its superposed troweling devices 11 positioned initially at the lower end of the mold casing 1 within the central aperture of the lower pallet 8. When the shaft 9 is rotated in one direction with the said former-head and troweling-devices as indicated by the arrow in Fig. 2, and the shaft is simultaneously progressively elevated through the mold casing, these members shape a tile therein from concrete materials deposited into the upper open end of the mold casing from the upper pan or pallet 12. As the diffuse materials are cast downwardly into the mold casing in inchoate masses the distributing arms 31, which as before stated are by said gearing connections rotated in an opposite direction to the direction of rotation of the shaft 9, contact with and scatter the falling material oppositely to the action of the troweling devices, so that not only is the material propelled toward the inner wall of the mold casing and also downwardly by the spiral blades of the arms, but the opposite action of the arms prevents the drag of the troweling devices from affecting the proper distribution of the material as delivered thereto by said arms.

In case some of the material becomes deposited upon or above the troweling devices, the sleeve part 27 rides thereon upwardly, to cause the sleeve top flanges 26 to compress the springs 22, and the pins 25 ride upwardly in the slots 23, the ends of the slots limiting the up and down movements of the sleeve 24. The former-head, troweling devices, and distributing devices are moved upwardly with the shaft 9 and out of the mold casing. The former head shapes the upper end of the tile against the pan edge or rim 13.

As the blades or arms 31 move upwardly against the rim 13, the anticlinal terminations slide along the rim edge, causing the arms to recede inwardly to clear the rim edge, compressing the springs 33. In moving downwardly again, the arms have their anticlinal ends ride inwardly again on entering the mold casing, the springs reacting to again project them outwardly to abut the mold.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a machine of the character described, a mold casing, a troweling device movable longitudinally through said casing and rotatable in one direction only, and a distributing device movable longitudinally through said casing and rotatable oppositely only relative to said troweling device for distributing purposes only in directing material evenly to the troweling device while neutralizing the dragging action of the latter on the material.

2. In a machine of the character described,

a mold casing, a troweling device movable longitudinally through said casing and rotatable in one direction, and distributing arms movable longitudinally through said casing and rotatable oppositely relatively to said troweling device to evenly distribute entering material and neutralize the drag of the troweling device thereupon.

3. In a machine of the character described, a mold casing, a troweling device movable longitudinally through said casing and also rotatably, and a spirally shaped distributing device movable longitudinally through said casing and also rotatably, independently of the troweler and opposing dragging action thereof upon the entering and distributing material.

4. In a machine of the character described, a mold casing having an open end, a troweling device movable longitudinally through said casing and also rotatably, and a sectional distributing device movable longitudinally through said casing and also rotatably, said latter device having its other elements projectable outwardly and resiliently controlled to neutralize drag of the troweling device on the material distributed to it by said other elements.

5. In a machine of the character described, a mold casing having an open end, a troweling device movable rotatably and also longitudinally through the casing, an apertured pallet positioned upon the open end of the casing to have its inner rim project inwardly therebeyond to determine the thickness of a tile formed below it, and a distributing sectional arm mounted rotatably and for longitudinal movements through said casing, an outer section of said arm being yieldably resiliently slidably connected to an inner section thereof, to yield inwardly on engaging the inner rim of said pallet to pass the pallet when moving longitudinally into and out of the mold casing.

6. In a machine of the character described, an open end mold casing, a troweling device movable rotatably and for longitudinal movements therethrough, an apertured pallet whose aperture is of less diameter than the casing and positioned removably thereon, to shape the end of a tile being formed in the casing, and a sectional distributing device movable longitudinally through said casing and rotatable oppositely relative to the direction of rotation of said troweling device, an outer section of said distributing device being longitudinally slidably mounted upon an inner section thereof, and resilient means bearing against said outer section to yieldingly propel it outwardly toward the inner wall of said casing and beneath the pallet, said outer section of the distributing device being shaped terminally to slide upon the inner edge of the pallet rim inwardly to pass the latter in entering or leaving said casing.

7. In a machine of the character described, an open end mold casing, a troweling device movable rotatably and for longitudinal movements therethrough, an apertured pallet mounted removably upon the open end of said casing, a sectional distributing arm, having a spiral twist, movable longitudinally through said casing and also rotatable oppositely to the direction of rotation of said troweling device, the arm consisting of an inner relatively fixed section having a longitudinal slideway, an outer section having a propelling spiral twist and slidably mounted in said slideway for limited relatively radial movements, resilient means connected between said sections to yieldingly propel the outer section outwardly, and said outer section having an anticlinally shaped outer termination permitting it to yieldingly pass the inner rim of the aperture of said pallet in entering or leaving said mold casing.

8. In a machine of the character described, an open end mold casing, a troweling device movable rotatably and for longitudinal movements therethrough, an apertured pallet mounted removably upon the open end of said casing to project inwardly thereover, and sectional distributing arms rotatable axially in and movable longitudinally through said casing, to rotate in an opposite direction from the direction of rotation of said troweling device, said arms each comprising a section movably mounted limitedly upon an inner section.

9. In a machine of the character described, an open end mold casing, a troweling device movable rotatably and for longitudinal movements therethrough, an apertured pallet mounted removably upon the open end of said casing to project inwardly thereover, sectional distributing arms rotatable in and movable longitudinally in said casing, said arms each having an outer section movable outwardly longitudinally limitedly upon an inner section, resilient means for yieldingly propelling said outer section outwardly, and coacting operating means between said troweling device and said arms adapted to rotate the arms in a direction opposed to the direction of rotation of said troweling device.

10. In a machine of the character described, an open end mold casing, a troweling device movable rotatably and for longitudinal movements therethrough, an apertured pallet mounted removably upon the open end of said casing to project inwardly thereover, sectional distributing arms rotatable in and movable longitudinally through said casing, said arms each having an outer section resiliently controlled and movable outwardly only limitedly upon an inner section, and having an outer termination shaped to yieldingly engage and slide over and move inwardly past the inner rim of said pallet in

entering or leaving the casing, coacting operating devices intermediate the troweling device for rotating them in relatively opposite directions, said operating devices including slidably connected elements, means for connecting said elements for limited relative longitudinal movements of one respectively to the other, and resilient means engaged between said elements adapted to permit yielding displacements of one element relative to the other.

In testimony whereof I affix my signature.

ALFRED W. SCHULTZ.