July 7, 1931. A. W. SCHULTZ 1,813,772

MACHINE FOR CONSTRUCTING CONCRETE PIPE

Filed March 24, 1930

Fig. 1.

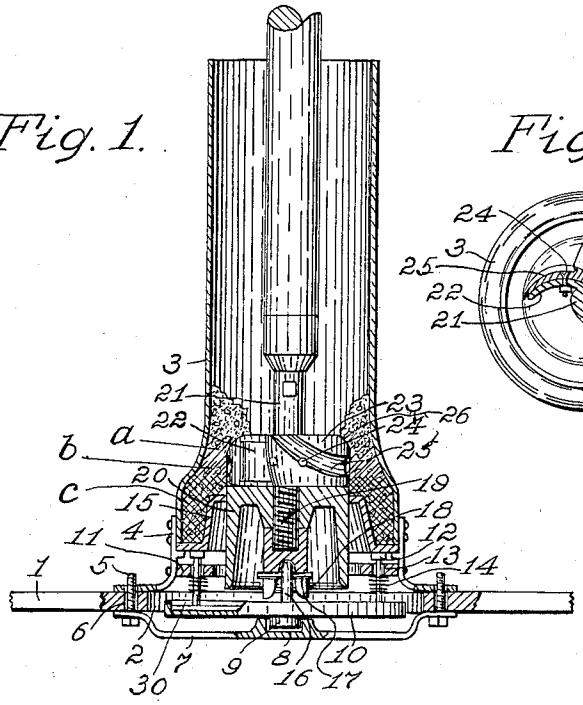


Fig. 2.

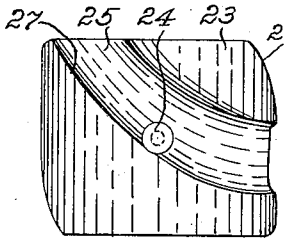


Fig. 3.

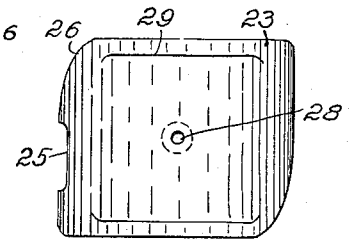


Fig. 4.

INVENTOR
Alfred W. Schultz,
BY
G. C. Kennedy.
ATTORNEY

Patented July 7, 1931 1,813,772

UNITED STATES PATENT OFFICE

ALFRED W. SCHULTZ, OF WATERLOO, IOWA, ASSIGNOR TO ZEIDLER CONCRETE PRODUCTS MACHINERY COMPANY, OF ST. JOSEPH, MISSOURI

MACHINE FOR CONSTRUCTING CONCRETE PIPE

Application filed March 24, 1930. Serial No. 438,487.

My invention relates to improvements in machines for constructing concrete pipe, and the object of my improvement is to provide means in conjunction with such a machine adapted to perfect the delivery and distribution of the concrete or cement materials to the forming elements of the machine, to insure pipe sections, whether headed or unheaded being of even and strong structure.

This object I have achieved by the means and mechanism which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which Fig. 1 is a vertical central longitudinal section of a machine of this class including a mold-casing with which it is operatively associated, and with parts broken away. Fig. 2 is a horizontal cross section of the mold-casing, taken also through the inclosed troweling devices of the former-head. Figs. 3 and 4 are respectively opposite sides of one of the troweling devices, on a larger scale, and as dissociated from the carrying structures therefor.

The machine illustrated herein is the same as shown in my pending application for patent Serial No. 289,682, filed July 2, 1928, the invention herein being a structural improvement in the troweling devices thereof.

I shall therefore allude but briefly to the specific features of said machine. Numeral 1 denotes a tabular support having a circular opening 2 therein. 3 is an open end mold-casing of cylindrical shape having its lower and expanded to shape a bell-end on a length of headed hollow tile. This casing is provided with several depending legs or struts 4 with outturned horizontal radial end parts apertured to register with like apertures 6 in said table 1, and the bars 7 below the table have upcurved terminations also apertured in registration therewith to receive a headed screw 5 at each end to releasably bind the struts 4 fixedly to the table.

The bars 7 at their crossing central union have an upwardly opening step-bearing socket to receive and support a lower shaft end 9 of a horizontally disposed rotatable circular table 10 having a central fixed pin 16. The top of the table 10 is dished and has a number of radial ribs 30, preferably of triangular cross section on its top.

The numeral 15 denotes an annular platen whose inner portion is raised from its outer margin, the latter being supported on lugs on the struts 4. The rotatable table 10 has its upper surfaces dished flatly and has a number of radial ribs 30 of anticlinal section. A number of headed pins 12 have their stems supported loosely on the upper tabular face of the table 10, and as the table rotates these pins ride upon said face and lift upon and across the ribs 30, while tapping with their heads on the bottom of the outer margin of the platen 15, jarring the concrete or cement contents of the bell-end of the mold-casing 3 to cause the finer cement particles to settle in the bell-end to make it of greater structural strength to withstand blows. The mold-casing has its lower bell-end edge supported on the outer margin of the platen. The central pin 16 of the table 10 is transversely apertured to receive a pin 17 therethrough which is seated releasably in transverse grooves of furcations 18 on the lower end of a shaft section removably mounted on a threaded depending shaft part 19 continuous with a shaft part 21 thereabove which is positioned axially in the mold-casing 3. When the said shaft is rotated and the shaft part 18 is in its lowermost position, the pin 17 causes the rotation of the table 10.

The numeral 20 denotes a hollow former-head, closed at the top and open at the bottom, secured removably on the threaded part 19 above the forked part 18, and is movable in and to fit the central opening of the platen 15, while rotating or moving longitudinally therethrough. The outer wall of this former-head thus determines and shapes cylindrically the inner wall of a pipe section 26 to be formed in the mold-casing 3. Immediately above the former-head the shaft 21 has oppositely projecting curvate wings 22.

The numeral 23 denotes a pair of like troweling devices also curvate and whose inner faces fit upon the outer or convex

faces of the wings 22 between parallel ribs 29 of the former, the said devices and wings being apertured at 28 transversely in alinement to receive and be detachably connected by bolts 24. The outer or convex faces of the devices 23 are the troweling faces thereof.

My invention herein consists in forming these devices with an obliquely directed trough across their troweling faces as shown at 25.

The trough or groove 25 is directed from near one end of the following part of the device 23, curvilinearly across the outer face of the device obliquely to a medial part of the advancing vertical edge thereof, providing an advancing shoulder 27, relatively abrupt.

When the shaft 21 is placed in rotation and is moved simultaneously upwardly through the mold-casing 3 together with the former-head 20 and said troweling devices 23, a supply of concrete material being introduced into the mold-casing from above, the former-head and the troweling device coact in the forming of a tile section therein, the former-head smoothing the inner wall of the section, the troweling devices delivering the material into the interspace thereof with the mold-casing and in troweling the material thereagainst by rubbing contact of the troughed outer faces of the devices. The troughs 25 receive portions of the undistributed plastic material, and which passes through the troughs laterally and downwardly pushed by the shoulder 27 as it advances, and thus the delivered material is somewhat compressed and distributed evenly to the interspace of the troweling-devices and the mold-casing in forming a tile section of equal density throughout. As the entrant material falls into such interspace unevenly, the troweling-devices if smooth throughout their troweling faces, would permit of uneven distribution and density as a consequence in the forming of a tile, and it has been found in practice, that the grooves 25 of the form and inclination shown, bring a proper compressive distribution to the material so as to evenly fill the interspace in shaping a tile therein through the operations of the troweling-devices and the former-head 20.

The material delivered through the troughs 25 is in addition to that normally delivered into the interspace of the casing 3 and the former-head 20 and troweling bodies 23, whereby an increase of density is effected in the pipe wall 26 with more even distribution than with the usual smooth devices 23, making a stronger pipe, with fewer weakened places, if any.

The packing of the concrete material as stated above, is effected in successive stages during the upward movement of the rotating and connected troweling bodies 23 with their truncated advancing upper corners in conjunction with said oblique grooves 25 as follows.

In Fig. 1 the concrete material within the casing 3 as first deposited therein is of a loose and unhomogeneous consistency, unpacked. For example, if the zonal interspace *a* between the casing 3 and the upper edge of the truncated upper advancing corner parts 26 of the trowlers 23 is approximately 1¼ inches wide, the zonal space *b* at the lower edge of said corner part at the delivery forward end of the trough 25¾ inch wide, the loose concrete material is gradually packed into said zonal spaces and into the space below at *c* into increasing degrees of density and homogeneously by the troweling action of the said truncated upper corner edges of the parts 23 plus the reinforcing of the amount of the material being thus packed by way of the troughs 25, where the material from above traverses the troughs into the zonal interspace *b*. The cross-hatching areas of said Fig. 1 also at *a*, *b* and *c*, denote the relative increasing densities of the concrete thus in progressive formation into the completed homogeneous mass *c*. A considerable quantity of the concrete material is thus added by way of the troughs 25, as will be evident during the process of packing, so that the finished tile is dense to a required maximum, and the bell-end of the tile is rendered as densely compact as the cylindrical upper body of the tile. The tile will then withstand much harder usage and breaking stresses, than could be the case with the use of troweling devices not having the additional supplying means 25.

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

1. The combination, in a machine for constructing concrete pipe, of an outer mold-casing with a separable bottom platen, a longitudinally reciprocatory and rotatable former-head therein, and troweling wings mounted upon said former-head, each having a convex rubbing face crossed by an oblique trough from its upper edge toward its advancing edge.

2. The combination, in a machine for constructing concrete pipe, of an outer mold-casing, a longitudinally reciprocatory and rotatable former-head therein, and a troweling device mounted upon said former-head and crossed by a curvilinear oblique trough extending from its top near its following end toward and opening at a medial point of its advancing end, the trough having an abrupt shoulder along its following side.

3. The combination, in a machine for constructing concrete pipe, of an outer mold-casing, and a tile-forming and troweling

device therein, rotatable and longitudinally reciprocatory therein, the troweling device being shaped with a rubbing face as a segment of a cylinder, said rubbing face having an inclined trough opening at its top and extending thereacross to its advancing longitudinal edge, and having an angularly truncated advancing upper corner.

4. The combination, in a machine for constructing concrete pipe sections, of an outer mold-casing, a rotatable and reciprocatory former-head therein, troweling oppositely-disposed wings upon the top of the former-head, and troweling devices removably secured upon the advancing faces of said wings, each device having a curvate front face with a curvate trough thereacross leading from its upper edge downwardly and inclinedly to discharge at its advancing longitudinal edge.

In testimony whereof I affix my signature.

ALFRED W. SCHULTZ.