

R. M. JONES.
MACHINE FOR CONSTRUCTING POLES, PILES, OR COLUMNS OF PLASTIC MATERIAL.
APPLICATION FILED DEC. 16, 1911.

1,064,740.

Patented June 17, 1913.

5 SHEETS—SHEET 1.

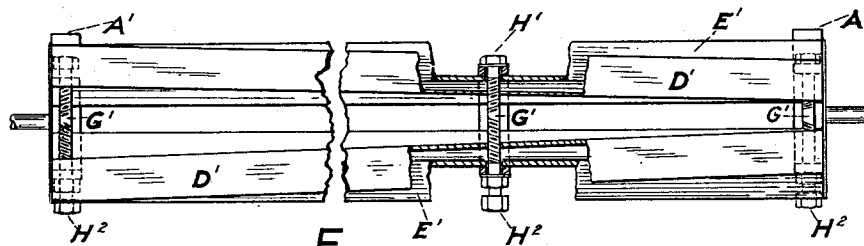


Fig. 6

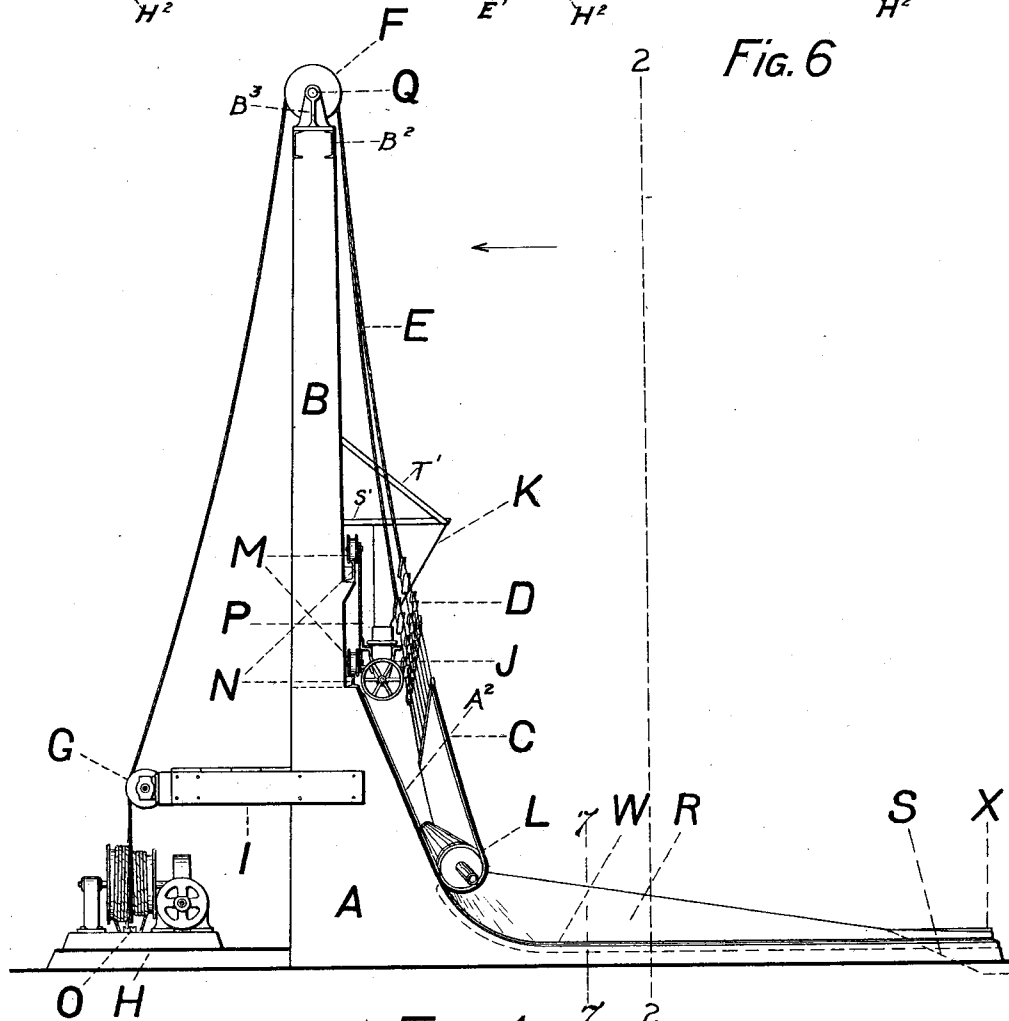


FIG. 1.

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 MACHINE FOR CONSTRUCTING POLES, PILES, OR COLUMNS OF PLASTIC MATERIAL.
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5 SHEETS-SHEET 2.

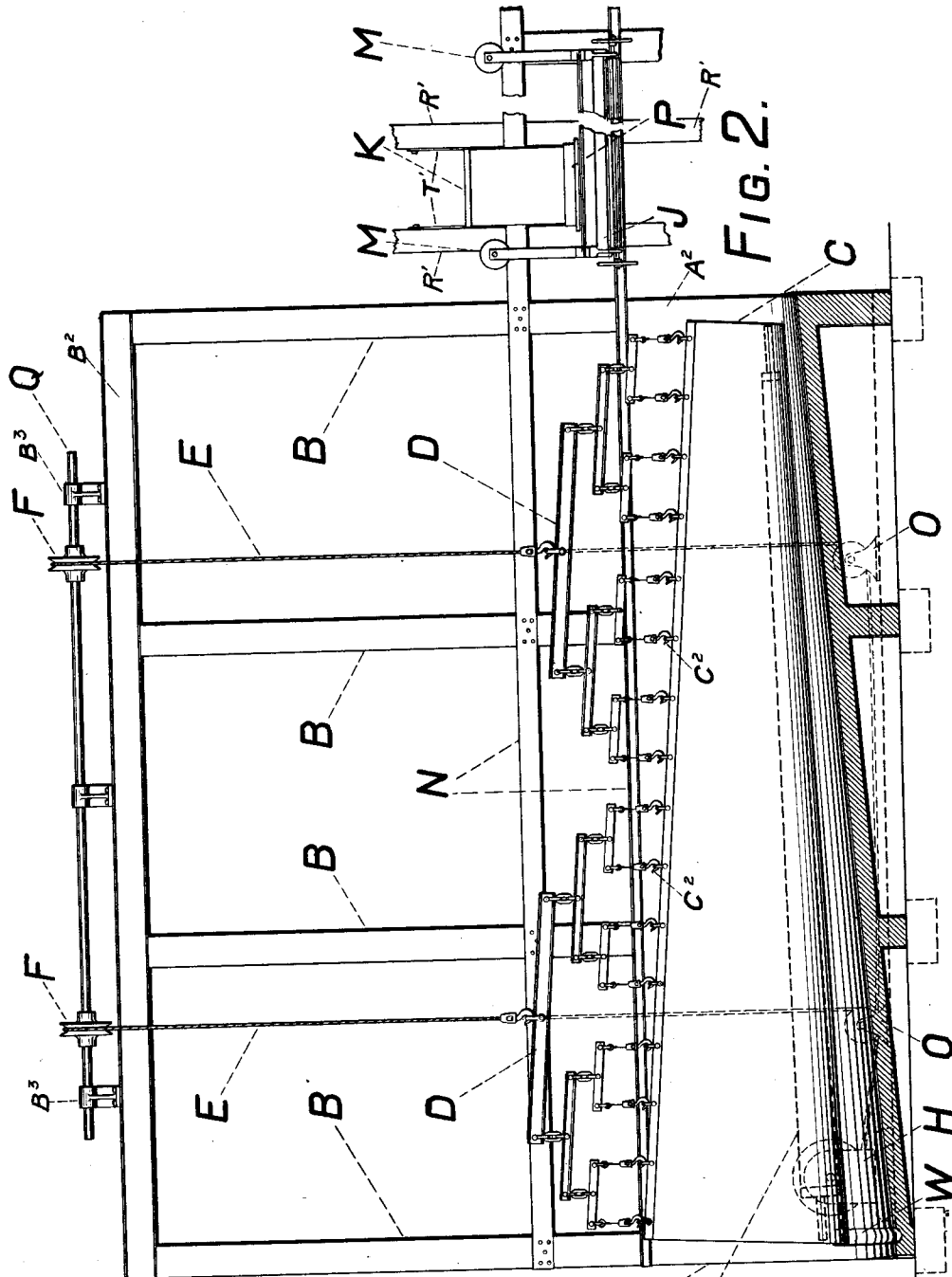


FIG. 2.

WITNESSES:
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6 SHEETS—SHEET 3.

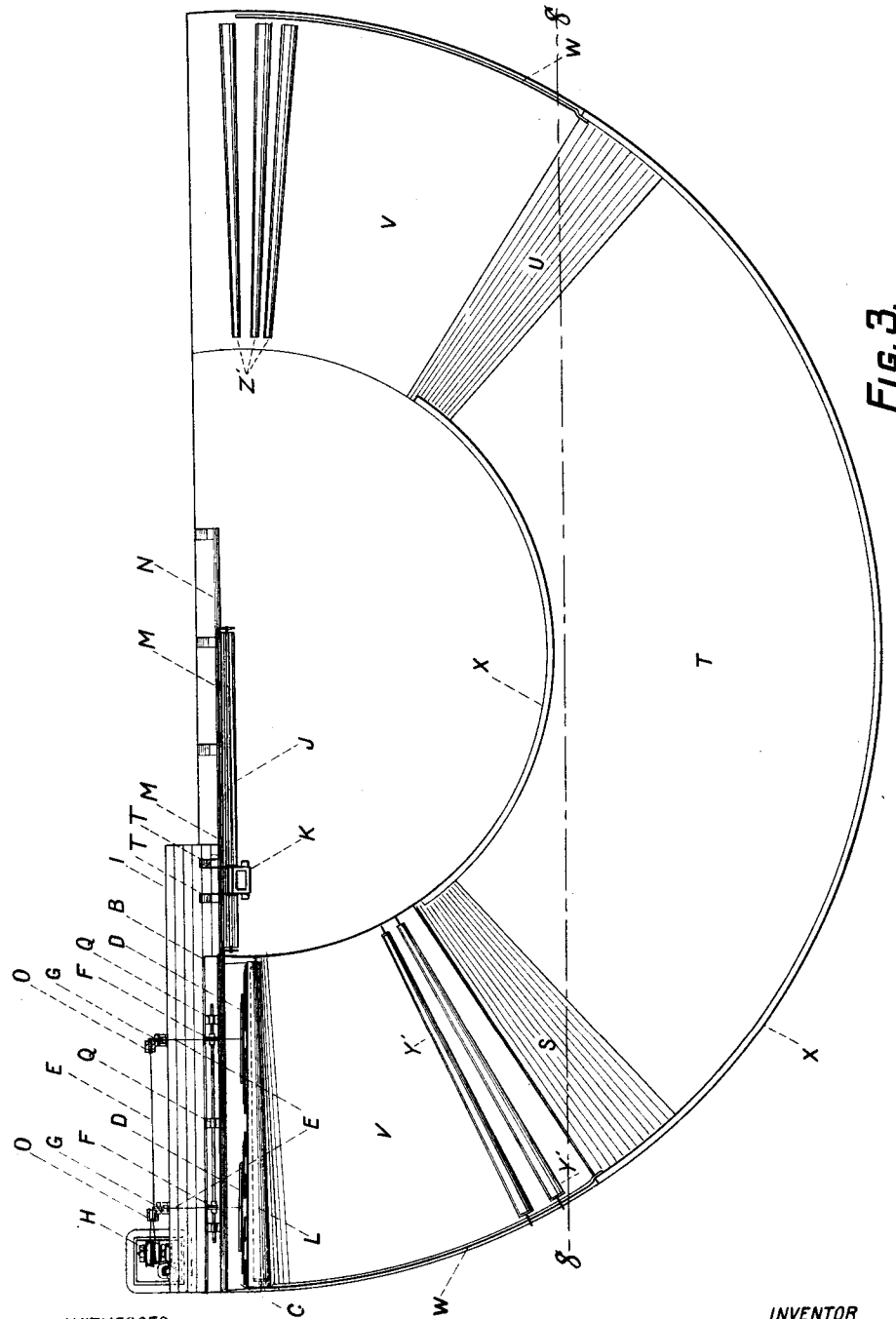


FIG. 3.

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5 SHEETS—SHEET 5.

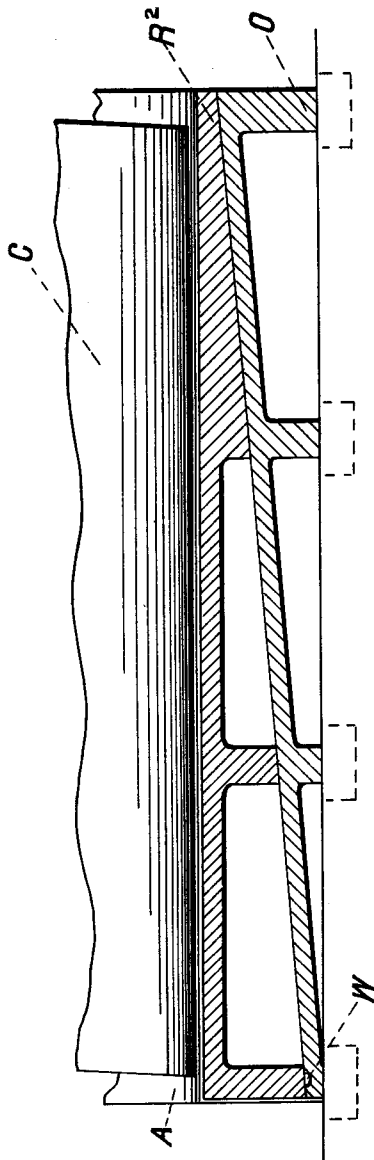


Fig. 7.

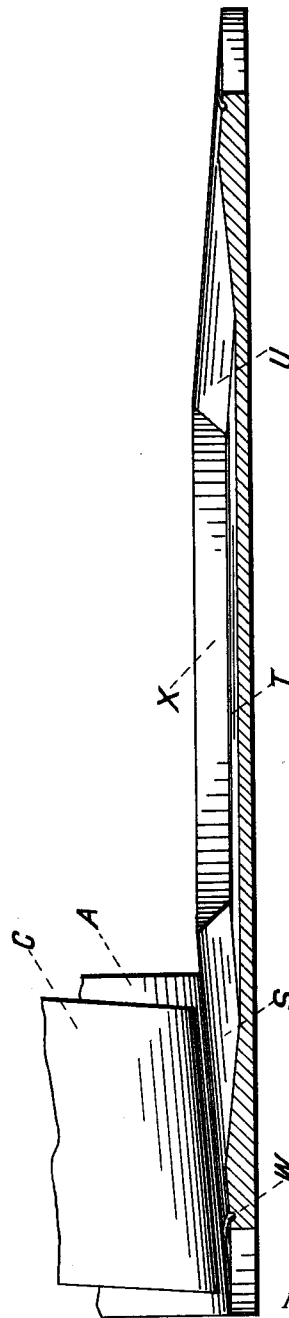


Fig. 8.

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ROBERT M. JONES, OF DENVER, COLORADO.

MACHINE FOR CONSTRUCTING POLES, PILES, OR COLUMNS OF PLASTIC MATERIAL.

1,064,740.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed December 16, 1911. Serial No. 666,233.

To all whom it may concern:

Be it known that I, ROBERT M. JONES, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Machines for Constructing Poles, Piles, or Columns of Plastic Material, of which the following is a specification.

My invention relates to machines for constructing poles, columns, piles and analogous articles of concrete or other plastic material and more particularly to machines adapted for use in the practice of the process described in my application for patent, Serial No. 609,170, filed February 17, 1911.

To provide a machine of the class described, in which simplicity of construction shall be combined with practicability in use, I preferably employ the association of co-operative elements illustrated in the accompanying drawings in the various views of which like parts are similarly designated and in which,

Figure 1, represents an end elevation of a machine of the character described, with the parts adjusted for the formation of tapering bodies of plastic material, Fig. 2, a section taken along the line 2-2, Fig. 1, looking in the direction of the arrow, Fig. 3, a plan view of the machine and the curing table with which it is associated, Fig. 4, a fragmentary front-elevation, partially in section, of the measuring and distributing apparatus included in my invention, drawn to an enlarged scale, Fig. 5, a section taken along the line 5-5, Fig. 4, Fig. 6, a plan view, drawn to a reduced scale, of the measuring trough comprised in the apparatus above referred to. Fig. 7 a transverse section taken through the slanting portion of the curing table at the foot of the supporting structure, along the line 7-7, Fig. 1 with the filler employed in the construction of cylindrical objects of plastic material, in place, and, Fig. 8 a section taken along the line 8-8, Fig. 3.

Referring more specifically to the drawings, the reference character A designates the supporting structure of the machine, including a plurality of uprights B which are erected at one end of a semi-annular curing-table R, which hereinafter will be more fully described. The uprights B are at their

upper extremities connected by a transverse beam B² which provides a support for a number of boxes B³ which carry a shaft Q upon which two sheaves F are rotatably mounted.

A slanting face on the supporting structure at the foot of the uprights B provides an inclined plane A² for the support of a flexible sheet or blanket C which at one of its ends is rigidly connected along the upper edge thereof. The blanket C which may be composed of canvas or other suitable material, is doubled to form a bag in which the plastic material to be formed into a cylindrical or conoidal article, is, in practice, supported and its end opposite to that at which it is secured along the upper edge of the inclined plane, is by means of hooks C², detachably connected with the lower members of two sets of equalizing levers D, the primary members of which are centrally suspended from the ends of ropes or cables E which run over the before-mentioned sheaves F to the winding-drum of an electric hoist H which is installed back of the structure A upon the surface upon which the latter is erected. The ropes which in the operation of the machine are alternately wound upon and unwound from the drum, are in their movement guided by two sets of sheaves, O and G, which are mounted to rotate about axes disposed at right angles to each other, respectively upon the foundation surface of the machine and upon the edge of a platform I which projects rearwardly from the supporting structure A. The arrangement of the guide sheaves with relation to each other and the winding drum is best shown in Fig. 3 of the drawings.

The material of which the articles constructed by the operation of the machine, are formed, is supplied to the blanket C by means of a measuring and distributing apparatus which consists of a traveling trough J whose length is substantially equal to the width of the blanket and which is longitudinally-movably suspended by means of hangers O' and grooved wheels M, from a pair of parallel rails N which are supported upon the structure A. The rails N which are extended beyond one of the ends of the supporting structure, conduct the trough J from a position over the blanket, onto which its contents are discharged, to a position beneath a hopper K through which the plastic

material is supplied. The hopper is by means of brackets S' and braces T' supported upon a frame R' which is erected independent of the main structure A of the machine, and the said hopper has at its lower end a throat K² through which its contents are conducted into the measuring trough J. This trough, the construction of which is best shown in Figs. 4 and 5 of the drawings, includes two metallic side plates I' which are bent along longitudinal lines and secured upon a number of yokes A' which are rigidly mounted upon the before mentioned hangers O'. The parallel upper portions of the side plates I' terminate in outwardly directed, longitudinal flanges E', while the lower portions of said plates converge toward the plane of the longitudinal axis of the trough, their edges being spaced to provide an opening through which the contents of the trough may be discharged.

Mounted in alined bearings at the lower ends of the yokes A', to rotate about an axis lying horizontally in the plane above referred to, is a roll J' provided with a series of outwardly projecting, equidistant radial blades K' which provide an endless series of longitudinally extending receptacles or carriers by which the material discharged from the trough is, in measured quantities, conducted onto the blanket C. Strips N' of flexible material are connected along the lower edges of the side-plates I' so as to be engaged by the ends of the blades K' during rotary movement of the roll and they serve to prevent the discharge of the contents of the trough while the roll is at rest.

When the machine is used to construct articles of tapering form, the spaces between the blades I are partially occupied by fillers L' composed of longitudinally tapering strips which are held in place by wires L² drawn through holes in said blades and which serve to decrease the cross-sectional area of the carriers formed by the blades gradually from one end thereof to the other and to thus cause the material supplied during each partial rotation of the roll, onto the blanket, to be discharged in quantities which gradually diminish from one end of the blanket to the other in proportion to the taper of the article to be produced.

The roll J' is preferably composed of axially alined sections connected by dowel pins P' which provide the journals by which the said roll is supported in the bearings on the yokes A', and gudgeons P² which are secured at the ends of the roll and project through the yokes at opposite ends of the trough, are provided with hand-wheels M' by means of which the roll is intermittently rotated in the operation of the machine.

Slidably supported upon the flanges E' of the side plates I', are two gates D' composed

of rectilinear bars of rectangular section, the lower portions of which extend into the trough so as to engage the perpendicular inner surfaces of the respective sides thereof. Bolts G' (see Fig. 6) which are rotatably mounted in slots at opposite sides of the end-yokes A', are provided at opposite sides of their center with screw threads of opposite pitch, which engage with corresponding female threads formed in axially alined openings in the two gates D'. The bolts are held against longitudinal movement by means of nuts H² and they are provided at one of their ends with a head H' by means of which they may be rotated when it is desired to increase or diminish the distance between the gates at the corresponding ends thereof. By these means the opening through which the material discharged from the hopper K into the trough J, as well as the capacity of the latter, may be regulated to diminish gradually from one of its ends to the other, in accordance with the quantity required to form the tapering article by movement of the blanket.

A flanged collar P which slidably surrounds the throat of the hopper K has a limited vertical movement, the extent of which is determined by slots in the ends of the hopper through which inwardly directed pins B' on the corresponding ends of the collar, loosely project. The collar is provided with a continuous substantially rectangular strip C' of rubber, leather or other flexible material which is secured in a slot formed in the under side of the flange of the collar, to engage the upper surfaces of the two gates D' for the purpose of evening or striking with their end portions the surface of the plastic material contained in the trough, while the latter is being moved along the rails N from its position beneath the hopper to the position in which its contents are discharged onto the blanket C.

In the operation of the machine the plastic material fed into the hopper K, is discharged into the trough, and the surface thereof leveled by the strip C' while the trough is moved along the rails N from beneath the hopper to a position over the blanket C. If the article to be produced by action of the machine is to be of conoidal form, the two gates D' are adjusted to gradually approach each other in ratio to the desired taper of the article, the spaces between the blades K' on the roll are partially occupied by the fillers L' to provide carriers of gradually decreasing cross-sectional area, the free edge of the blanket to which the equalizing levers are attached is slanted in accordance to the desired taper, to provide a slanting "bag" along the line at which it is doubled and the portions of the drum of the hoist H upon which the two ropes E are respectively wound, are made

of different diameters so that the ends of the belt at which said ropes are respectively connected through the medium of the equalizing levers will move at proportionately different rates of speed when the drum is rotated. The end of the blanket supporting the larger end of the article to be formed, is thus moved at a greater velocity than the opposite end of the same with the result that when the end of the blanket has reached the end of its upward movement, the inclination of its "bag" will have been reversed. It will thus be observed that while the article is being moved up and downwardly it oscillates in the plane of its longitudinal axis, and is thereby prevented from moving in the direction of the said axis either one way or the other. When the trough has reached its position over the blanket C, the contents thereof are discharged in quantities which gradually diminish from one end of the blanket to the other, by intermittent rotation of the roller J', and while the plastic material is thus being delivered into the bag of the blanket, a reciprocating movement is imparted to the free end of the latter by rotating the drum of the hoist alternately in opposite directions. As a result of the motion imparted to the blanket, the body of plastic material supported thereon is rolled to and fro along the inclined surface A, and the operation is continued until the plastic material has assumed a true conoidal form, after which the article is discharged onto the curing table R at the foot of the supporting structure by unfastening the end of the blanket from the levers D.

If it is desired to produce a hollow pole or column, a mandrel L of the desired form is placed in the bag of the blanket, as is shown in Figs. 1 and 2, and the plastic material when fed into the blanket from the trough J, will form around the mandrel, which after the material has hardened, is removed thus leaving a hollow article whose wall-thickness is determined by the quantity of material fed onto the blanket.

To produce articles of cylindrical form by the use of my machine, the end of the blanket C connected with the equalizing levers is adjusted to a horizontal position, the differential winding drum of the hoist is replaced by one of uniform diameter, the gates D' on the feed trough J are moved to a parallel position in engagement with the inner surfaces of the vertical portions of the side plates of the trough, the tapering fillers L' on the roller J' are either removed or replaced by fillers of uniform thickness, and a filler R² is placed upon the face of the end of the curing table R adjacent the supporting structure A to present a horizontal surface for the support of the blanket C. (See Fig. 7.) A cylindrical mandrel is em-

ployed to produce a pole or column in the form of a hollow cylinder.

The curing table onto which the formed product of the machine is discharged by unfastening the hooks C² from the edge of the blanket, is, as mentioned hereinbefore, semi-annular in form and it consists of two platforms which are located at its ends, and an interposed sunk portion T which at its sides is closed by means of walls X which extend along the circular edges of the table, to provide a basin which in the operation of my invention is filled with water. After the formed product of the machine has been discharged from the blanket onto the adjacent platform V of the curing table, it is left to dry until the plastic material of which it is composed has hardened, when it is rolled into the basin T to remain submerged in the water contained therein for from two to four days. The article is subsequently moved onto the platform V at the opposite end of the table where it remains until it has thoroughly dried, when after the jacket and the mandrel have been removed, the product of the machine is ready to be used as a column in the erection of building structures, as a pile in the formation of foundations, or as a pole for the support of electrical conductors or other elevated devices.

Grooves W in the platforms V are provided to drain the water which falls from the articles to be dried, onto the platforms, into the basin T.

Having thus described my invention what I claim and desire to secure by Letters-Patent is:

1. A machine of the class described comprising a structure having an inclined surface, a flexible blanket secured thereon along one of its ends, and means for imparting a reciprocating movement to the opposite end of said blanket.

2. A machine of the class described comprising a flexible blanket secured thereto at one of its ends, and means for imparting a reciprocating movement to the opposite end of said blanket.

3. A machine of the class described, comprising a suitable support, a flexible blanket secured thereto at one of its ends, and means for imparting a differential reciprocating movement to the opposite end of the same, by forces applied at unequal velocities at separate points thereof.

4. A machine of the class described comprising a suitable support, a flexible blanket secured thereto at one of its ends, means for imparting a reciprocating movement to the opposite end of said blanket, and equalizing levers interposed between said end and said means.

5. A machine of the class described comprising a suitable support, a flexible blanket

secured thereto at one of its ends, a winding drum, and a cable or rope wound on said drum in connection with the opposite end of said blanket.

5 6. A machine of the class described comprising a suitable support, a flexible blanket secured thereto at one of its ends, a differential winding drum, and cables or ropes wound on said drum, in connection with the
10 opposite end of said blanket.

7. A machine of the class described comprising a suitable support, a flexible blanket secured thereto at one of its ends, a winding drum, equalizing levers attached at the opposite end of said blanket, and ropes or
15 cables wound on said drum in connection with said levers.

8. In a machine of the class described, a support including an inclined surface, a
20 flexible blanket secured at one of its ends along the upper edge of said surface, sheaves on said support above said surface, a winding drum, and ropes wound on said drum, and run over said sheaves in connection with the opposite end of said
25 blanket.

9. A machine of the class described comprising a suitable support, a flexible blanket secured thereto at one of its ends, means
30 for imparting a reciprocating movement to the opposite end of said blanket, and a

traveling feed-trough for supplying material onto said blanket.

10. A machine of the class described comprising a suitable support, a flexible blanket
35 secured thereto at one of its ends, means for imparting a reciprocating movement to the opposite end of said blanket, a track on said support, and a feed trough movably supported on said track for supplying material onto the said blanket. 40

11. In a machine of the class described, a flexible blanket doubled to provide a bag extending obliquely from the horizontal for the support of plastic material, and means
45 for imparting a reciprocating movement to an end of said blanket by unequal forces applied at separate points thereof.

12. In a machine of the class described, a flexible blanket secured at one of its ends,
50 and doubled so as to provide a bag for the support of plastic material, and means for imparting to the opposite end of said blanket a combined reciprocating and oscillatory movement. 55

In testimony whereof I have affixed my signature in presence of two witnesses.

ROBERT M. JONES.

Witnesses:

A. B. JONES,

KIRBY V. JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."