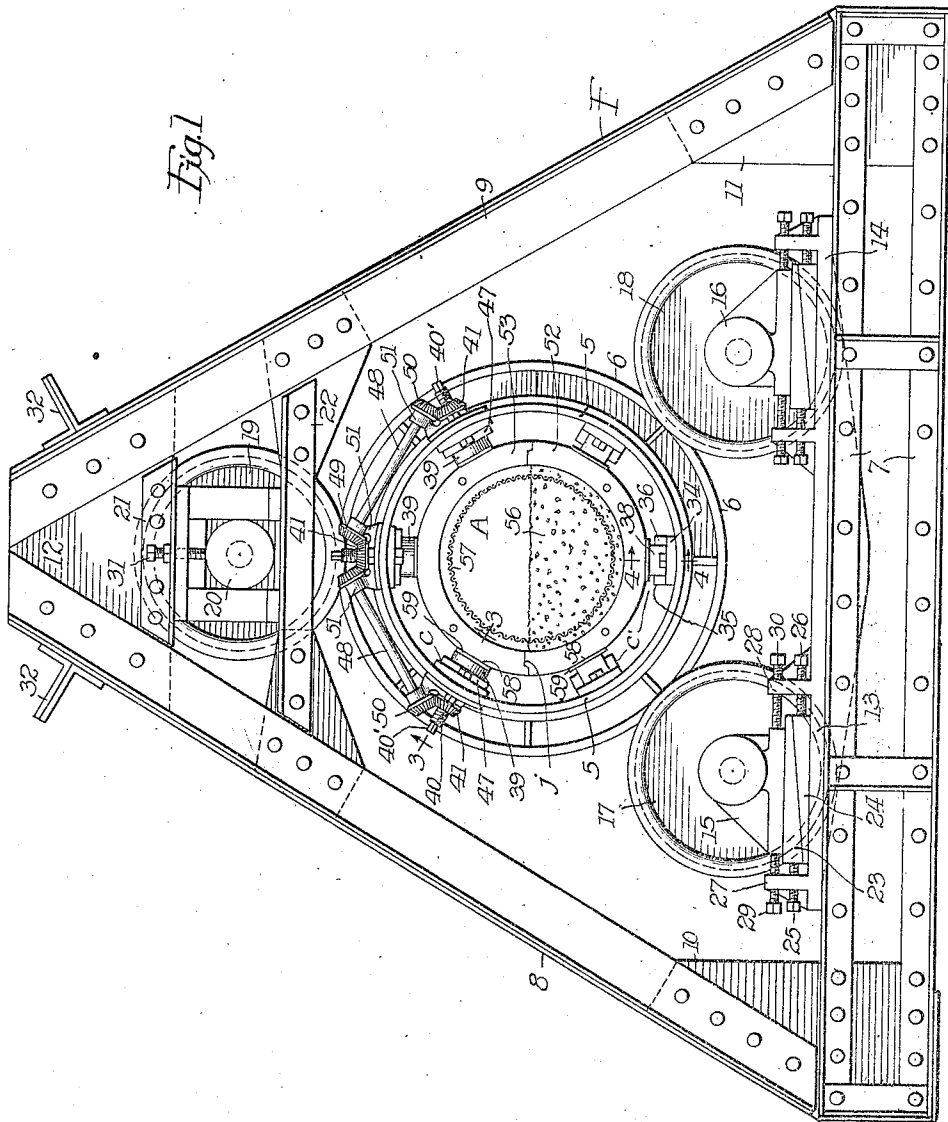


W. H. LIENESCH.
CENTRIFUGAL CONCRETE POLE MACHINE.
APPLICATION FILED JAN. 28, 1916.

1,199,997.

Patented Oct. 3, 1916.
2 SHEETS—SHEET 1.



Witnesses:

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Fig. 4

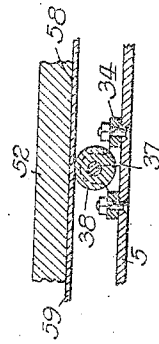


Fig. 3

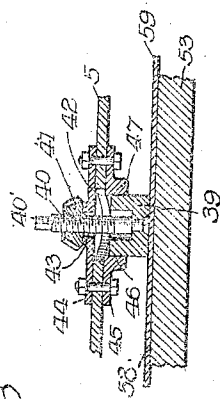
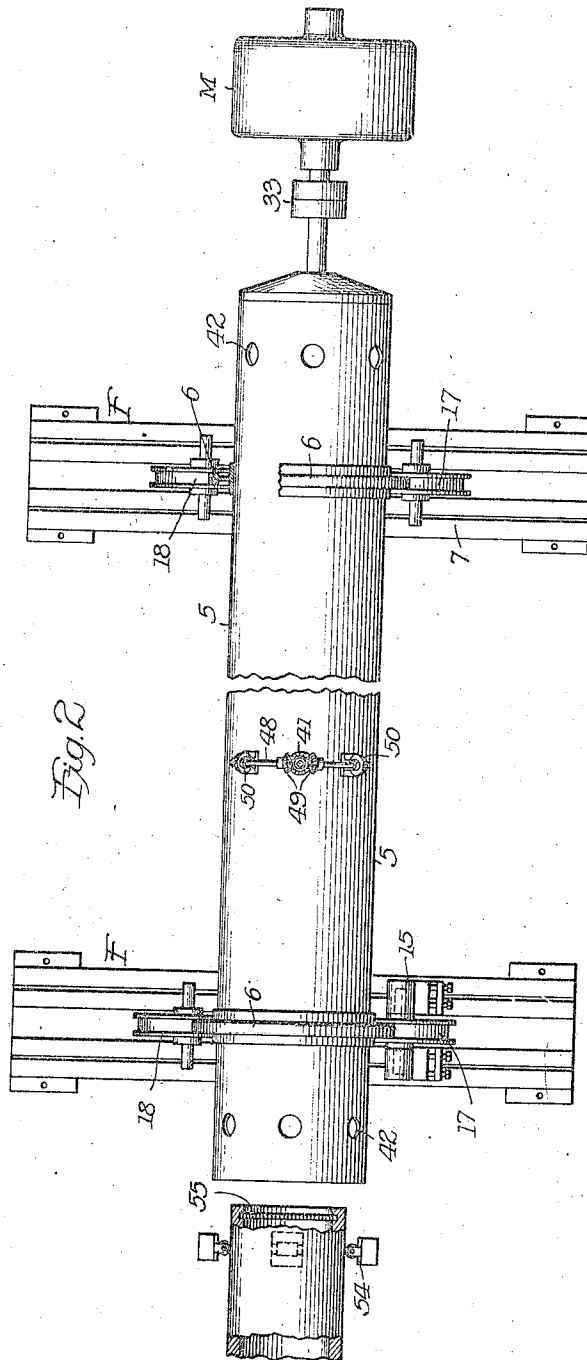


Fig. 2



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UNITED STATES PATENT OFFICE.

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UNIVERSAL CONCRETE PRODUCTS COMPANY, A CORPORATION OF DELAWARE.

CENTRIFUGAL CONCRETE-POLE MACHINE

1,199,997.

Specification of Letters Patent.

Patented Oct. 3, 1916.

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To all whom it may concern:

Be it known that I, WALTER H. LIENESCH, a citizen of the United States and a resident of Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Centrifugal Concrete-Pole Machines, of which the following is a specification.

My invention relates to centrifugal concrete pole machines and contemplates improved construction and arrangement which will make such machines more practical and more efficient.

My invention pertains to that class of machines in which a long mold, usually built up of sections, is inserted in rotatable mold carrier mechanism to be rapidly rotated about its longitudinal axis to cause the contained cementitious material to form the pole. In prior machines of this class special means are necessary to secure the mold sections together before insertion of the mold into the carrier mechanism and special means are necessary for supporting and guiding the mold into the carrier mechanism. On the carrier's locking means are provided for locking and centralizing the mold with reference to the carrier.

One of the important objects of my invention is to provide improved centralizing means for centralizing and locking the mold in a rotatable carrier.

Another object is to eliminate special supporting means for guiding the mold into the carrier and a feature of the invention is to adapt the centralizing means for acting also as supporting and guiding means for guiding the mold into the carrier.

Another important object is to eliminate locking mechanism on the mold sections and the necessity for locking and securing the mold sections together before entrance of the mold into the carrier and another feature of the invention is to adapt the centralizing means for securely locking and holding the mold sections together. In other words, the invention provides common means for guiding the mold into the carrier, for centralizing the mold in the carrier, and for locking the mold sections securely together, such common means greatly simplifying the construction of the machine by the elimination of a great deal of special mechanisms necessary in prior machines.

The invention also concerns improved adjustable supporting mechanism for the carrier for enabling a long carrier to be accurately and readily rotated at high speed to get the desired centrifugal action for efficiently forming the pole in minimum time.

The various features of my invention are embodied in the machine shown on the accompanying drawings, in which drawings—

Figure 1 is an end elevational view of the machine, Fig. 2 is a plan view of the carrier and its supporting and driving mechanism, Fig. 3 is an enlarged sectional view on plane 3—3, Fig. 1, and Fig. 4 is an enlarged sectional view on plane 4—4, Fig. 1.

In my improved machine the carrier 5 is in the form of a pipe of a length suitable for the poles to be formed. At intervals rings 6 are applied to the pipe to strengthen it and such rings are preferably of T section to act as rails. With each rail band is associated a supporting frame structure F suitably built up of structural iron. Each frame comprises a base structure 7 from whose ends side beams 8 and 9 extend upwardly toward each other so that the resulting frames are of triangular shape, tie plates 10, 11 and 12 securely locking the base and side parts of each frame together. On each base structure 7 are mounted bearing bases 13 and 14 for supporting journal boxes 15 and 16 in which track wheels 17 and 18 are journaled to receive the respective track rings on the carrier. To hold the carrier on the various supporting track wheels an upper track wheel 19 is provided on each frame F and journaled in a box 20 supported between the upper and lower cross beams 21 and 22. In order to adjust the various track wheels and to compensate for wear the journal boxes 15 and 16 are adjustable vertically and laterally. Vertical adjustment is obtained by means of wedge blocks 23 and 24 controlled by screws 25 and 26 extending through the upright walls 27 and 28, the journal boxes being mounted on the wedges. Lateral adjustment is obtained by laterally shifting the journal boxes by means of screws 29 and 30 also engaging in the upright walls 27 and 28. The upper track wheels are adjustable downwardly by means of set screws 31 acting against the tops of the journal boxes 20.

In practice the various supporting frames F will be mounted on a foundation and to give greater stability to the frames they could all be connected together by beams 32, as shown in Fig. 1. Any suitable means may be provided for rotating the carrier, an electric motor such as M being particularly adaptable for such driving, and in the connection of the motor with the carrier the flexible coupling or joint 33 is preferably included.

Describing now the centering means for centering a mold A, zones of upper and lower centering devices *c*, *c'* are provided. The devices *c'* are below the horizontal diametral plane of the carrier and are in the form of blocks 34 provided with end walls 35 and 36 for supporting a shaft 37 on which a roller 38 is mounted, the roller axes being at right angles with the carrier axis. There may be any number of such lower centering members *c'*, and as will be explained later, the rollers of the various devices form a track or run way along which the mold is guided into the carrier.

The various upper clamping members of each zone are above the horizontal axial plane of the carrier and the construction and arrangement of each member is clearly shown in Fig. 3. Each clamping member *c* has a clamping plunger 39 carried on the lower end of a radially extending screw 40 whose outer end is threadedly engaged by a bevel gear 41. To accommodate each screw a hole 42 is provided therefor in the carrier pipe 5, the screw extending through this hole and through the passageway 43 in a plate 44 secured to the pipe, such plate forming an abutment for the gear 41. Below each hole 42 is secured another plate 45 having an opening 46 in register with the openings 42 and 43, the flange 47 surrounding the opening 46 offering sufficient guide surface for the plunger or clamping head 39 which is reciprocable in said opening. There may be any number of adjustable clamping members *c*, three being shown in the drawing, and I have shown means for simultaneously actuating all the members of a zone. As shown, shafts 48 provided at their ends with bevel gears 49 and 50 connect the various gears 41 together, extensions 51 on the plates 44 forming bearings for the shafts. The ends 40' of the screws 40 are polygonal for receiving a wrench or other turning tool, and in the arrangement described turning of any one of the screws will be transmitted to the other screws through the gearing trains and the clamping heads or plungers 39 will be radially shifted simultaneously to be brought into clamping engagement with the mold or to be withdrawn therefrom.

The mold may be constructed of metal or other suitable material and may be of any

number of sections. In the drawing it is shown composed of two semi-cylindrical sections 52 and 53 whose respective edges are rabbeted or otherwise shaped to form a suitable joint *j* when the halves are brought together. When a pole is to be formed one of the mold halves is supported on sets of suitable rollers 54 forming a supporting track way leading to the end of the carrier and after end closures 55 are applied to the mold halves the cementitious material 56 is poured into the mold half and the reinforcing cage 57 of suitable construction sunk into place. The upper mold half is then applied and the mold then rolled along the track rollers 54 into the carrier which was previously turned to bring the stationary clamping members *c'* into position below the horizontal axis of the carrier, the rollers 38 of these clamping members receiving the lower sections of the mold and guiding the mold from clamping zone to clamping zone until the mold is entirely within the carrier. The adjustable clamping members *c* are then operated and their clamping heads 39 brought against the upper mold half and the mold sections are then securely locked and clamped together and the mold is accurately centered in the carrier. After such clamping and centering the motor M is started and the carrier rotated at sufficient speed to enable centrifugal force to compactly and with considerable pressure force the cementitious material against the mold sides to form the tubular pole. After the cement has become sufficiently compact the clamping members *c* are released and the mold shifted out of the carrier from the rollers 38 to the track rollers 54. By removing the end closures 55 the water squeezed out of the cement during rotation of the mold can be readily drawn off and then the mold sections separated and the finished pole removed for final drying and hardening.

By using my improved construction and arrangement the mold sections need not be secured together before insertion of the mold into the carrier, the clamping members besides serving to center the mold, serving also to lock the mold sections rigidly and securely together, special clamping lugs or other mechanisms being thus unnecessary and a great deal of labor saved which would otherwise be necessary before insertion of the mold into the carrier and after withdrawal of the mold from the carrier. Furthermore, as the centering members *c'* are provided with rollers, special means for supporting and guiding the mold into the carrier are unnecessary, these rollers serving to support and accurately guide the mold into proper position in the carrier. Thus besides serving to center the mold in the carrier the clamping members *c* and *c'* serve as guiding means for the mold into the carrier and as

locking means for locking the mold sections together.

In the machine shown poles of different and varying dimensions can be formed. The outside diameter of all the molds is the same but the variation and difference of diameters is taken care of by the interior of the mold. For smaller diameter poles the internal diameter of the mold will be correspondingly smaller. Likewise for different shapes of poles the interior of the mold will be made to correspond. For example, if a conical pole is desired the interior of the mold will be correspondingly conical.

As already stated the mold can be of any suitable material. In order to form better engaging surfaces for the rollers 38 and for the clamping heads 39 the mold sections are provided with longitudinally extending flat areas 58 and where the mold is constructed of softer material such as wood metal plates 59 may be applied to such flat areas to be interposed between the mold and the rollers and clamping heads.

I thus produce a centrifugal concrete pole forming machine which is of simple, durable and practical construction and whose operation is highly efficient, a great amount of special mechanism necessary in prior machines being eliminated together with the expense necessary for the operation of such special mechanism. I do not of course desire to be limited to the exact details of construction and arrangement shown and described as modifications are no doubt possible which would still come within the scope of the invention.

I claim as follows:

1. In a centrifugal concrete pole machine, the combination of a long cylindrical carrier, means supporting said carrier for rotation about its longitudinal axis, sets of supporting rollers journaled at intervals in said carrier to receive and convey a mold thereinto, and a set of radially adjustable clamping members associated with each set of rollers for cooperating therewith to clamp and center a mold in the carrier.

2. In a centrifugal concrete pole machine, the combination of a continuous cylindrical carrier, means supporting said carrier for rotation about its longitudinal axis, sets of rollers arranged at intervals in said carrier along which a mold may be conveyed into the carrier, a set of clamping members associated with each set of rollers, a radially adjustable clamping head for each clamping member for engaging with the mold, and means for simultaneously effecting adjustment of said heads.

3. In a centrifugal concrete pole machine, the combination of a continuous cylindrical carrier, means supporting said carrier for rotation about its axis, sets of rollers arranged at intervals on the inside of said carrier, a sectional mold having its lower part supported on said rollers, and a set of radially adjustable clamping members associated with each set of rollers for engaging with the upper part of said mold to rigidly clamp the mold parts together and to center the mold.

4. In a centrifugal concrete pole machine, the combination of a continuous cylindrical carrier, means supporting said carrier for rotation about its axis, sets of rollers journaled on the inside of said carrier on which rollers a mold may be conveyed into the carrier and supported, a set of clamping plungers associated with each set of rollers adapted to be radially shifted into clamping engagement with a mold resting on said rollers whereby to center the mold in the carrier.

5. In a centrifugal concrete pole machine, the combination of a row of transversely extending supporting frames, a pair of track wheels on each frame, a carrier having track bands thereon for engaging the respective track wheels whereby said carrier is mounted for rotation about its axis, and a track wheel at the top of each frame for engaging with the respective track band on the carrier.

6. In a centrifugal concrete pole machine, the combination of a long continuous cylindrical carrier, means supporting said carrier for rotation about its axis, and means within the carrier for clamping a mold centrally therein to be rotated therewith.

7. In a centrifugal concrete pole machine, the combination of a continuous cylindrical carrier, means supporting said carrier for rotation about its axis, rollers within said carrier for supporting a mold and along which the mold may be conveyed into the carrier, and adjustable clamping members on said carrier for locking said mold on the rollers centrally within the carrier.

8. In a centrifugal concrete pole machine, the combination of a carrier rotatable about its longitudinal axis, supports in the carrier for a mold, radially adjustable plungers opposite said supports, and gearing interconnecting said plungers for effecting simultaneous operation thereof to clamp the mold against the supports.

In witness whereof I hereunto set my hand this 24th day of January, A. D. 1916.

WALTER H. LIENESCH.