J. NELSON.

CONCRETE TIE MAKING MACHINE.

APPLICATION FILED MAY 7, 1921.

1,400,969.

Patented Dec. 20, 1921.

3 SHEETS—SHEET 1.

FIG. 1.

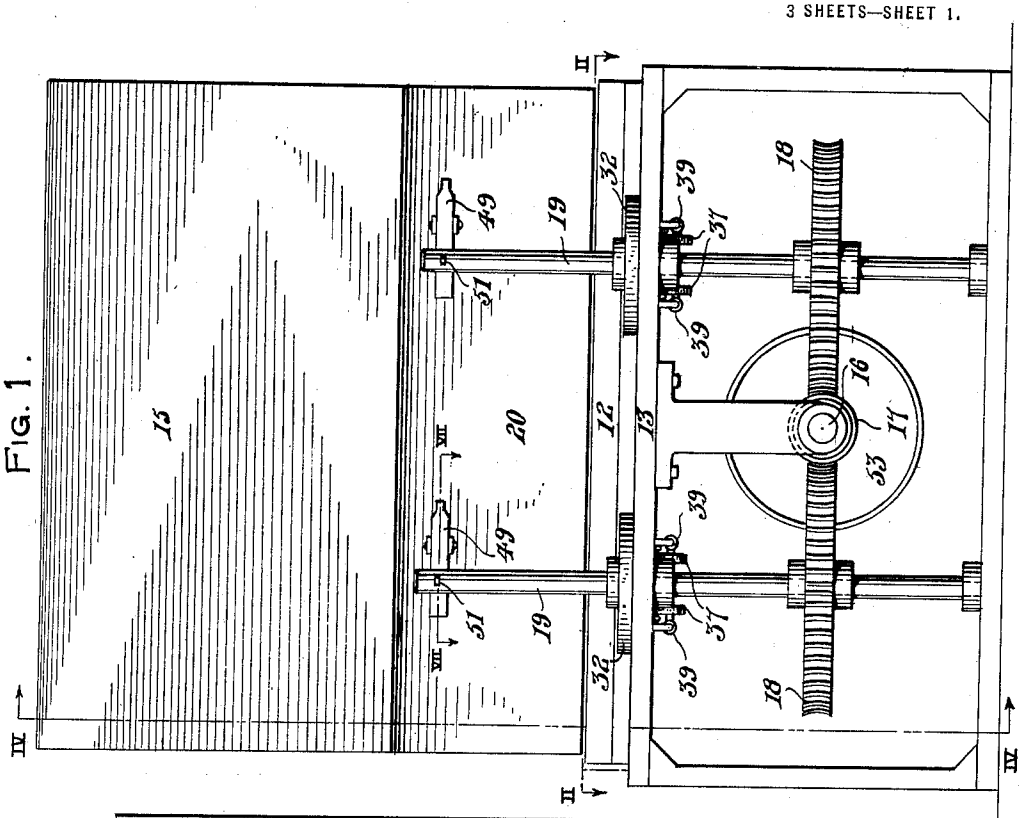
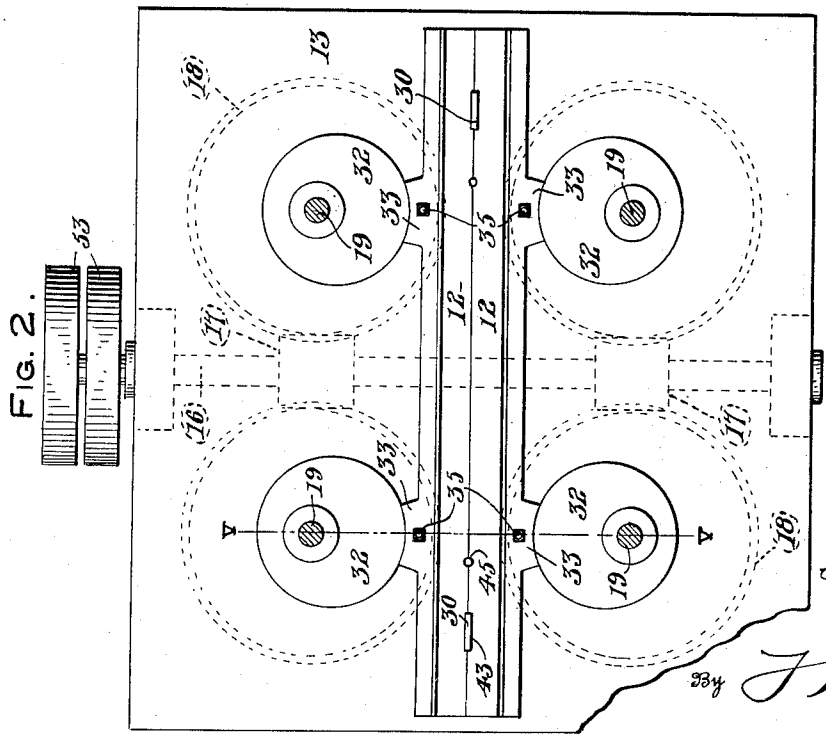


FIG. 2.



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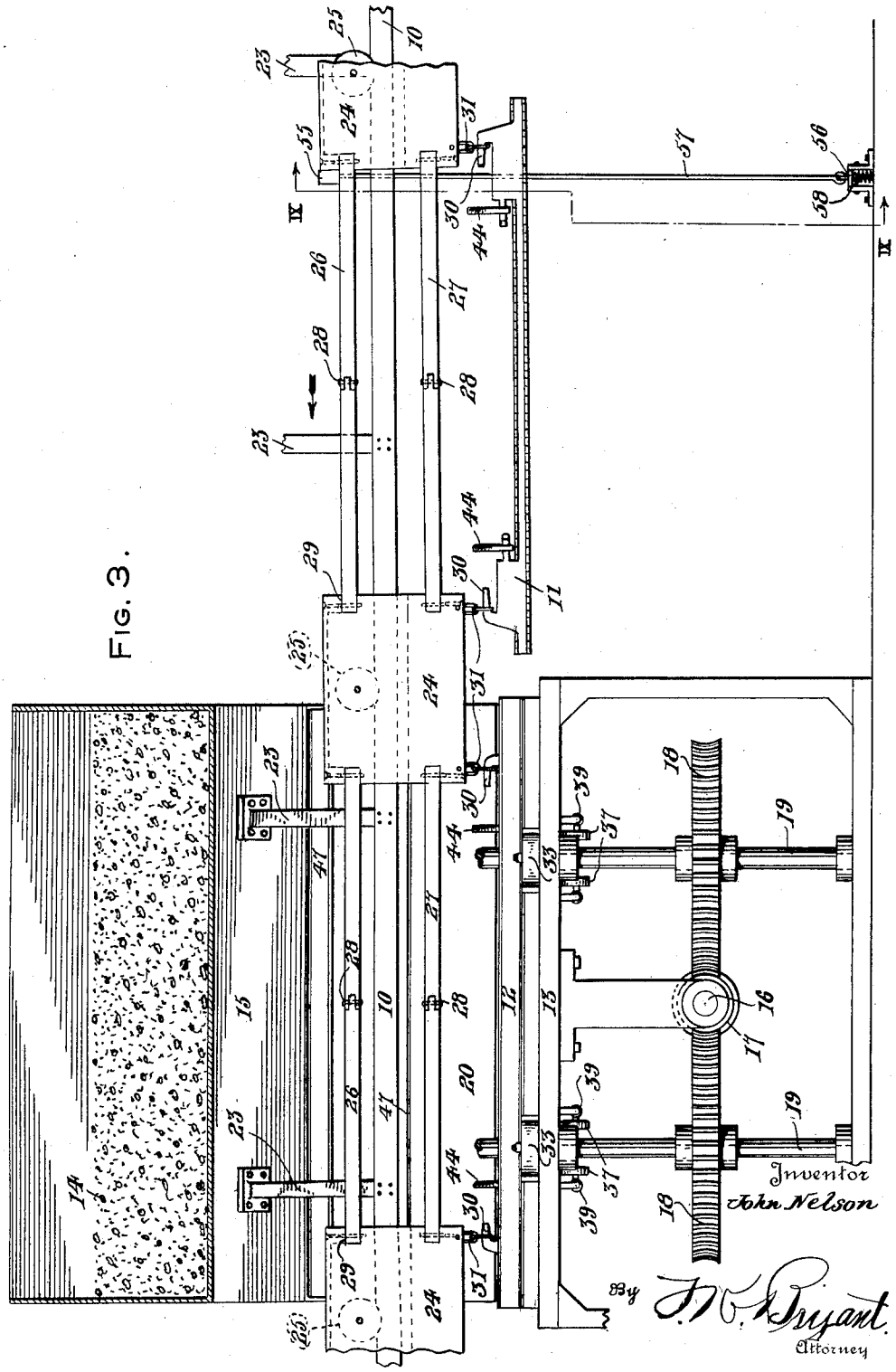
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3 SHEETS—SHEET 2.

FIG. 3.



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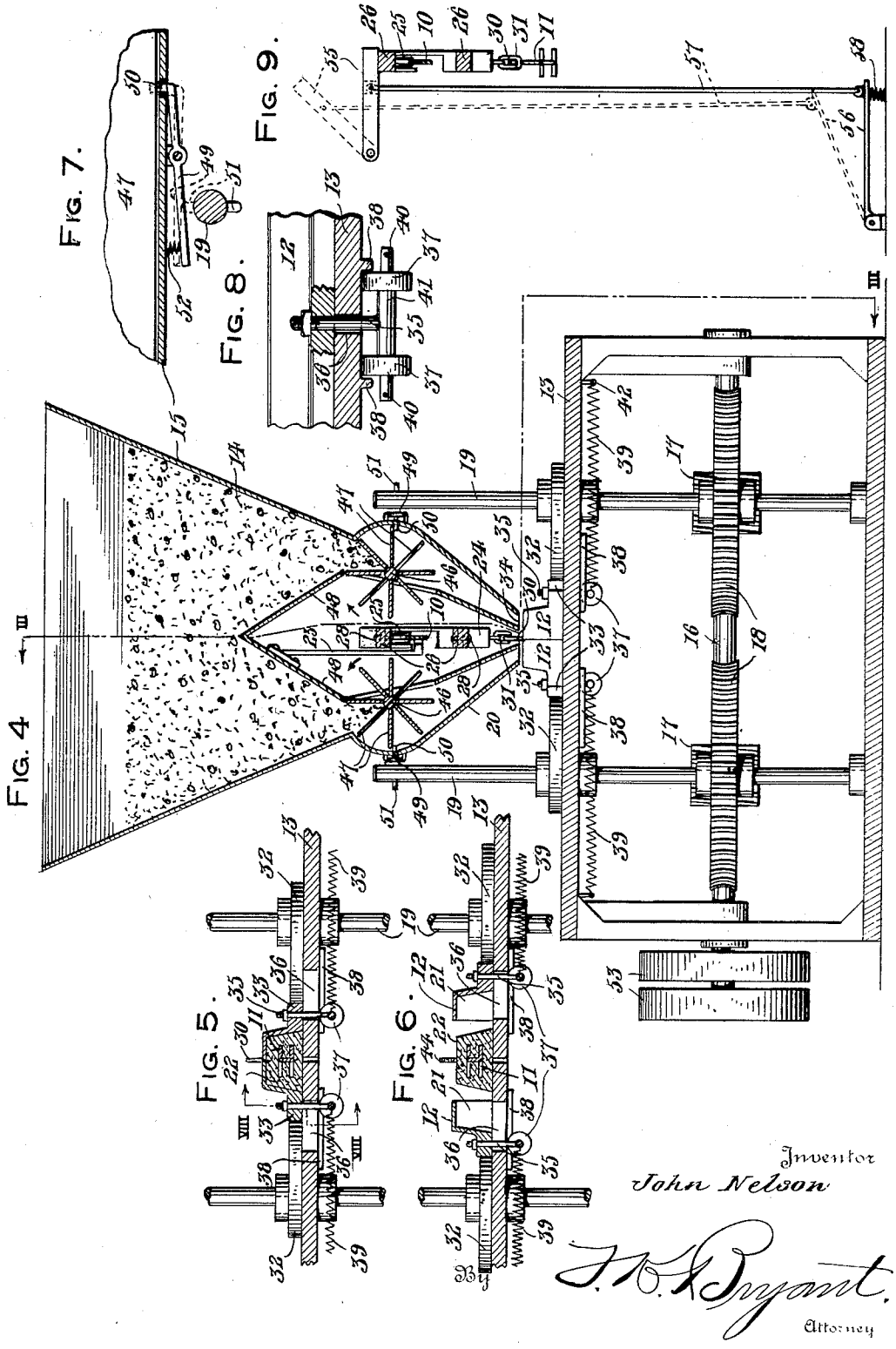
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN NELSON, OF OTTAWA, KANSAS.

CONCRETE-TIE-MAKING MACHINE.

1,400,969. Specification of Letters Patent. **Patented Dec. 20, 1921.**

Application filed May 7, 1921. Serial No. 467,727.

To all whom it may concern:

Be it known that I, JOHN NELSON, a citizen of the United States of America, residing at Ottawa, in the county of Franklin and State of Kansas, have invented certain new and useful Improvements in Concrete-Tie-Making Machines, of which the following is a specification.

My invention relates to a machine that is automatic in its general operation designed for making ties of concrete or cement in a commercial manner and more especially contemplates the easy and inexpensive manufacture of a metal reinforced concrete tie of the type set forth in my Letters Patent No. 1,318,904, dated October 14, 1919.

In the formation of the concrete tie by means of my machine, a metallic reinforcing member is designed for travel upon an endless conveyer for accurately positioning the reinforce for longitudinal embedding in the tie body of concrete during the forming or molding of the tie in a continuous operation.

An object of the invention is to provide for the travel of a metallic reinforcing member for positioning between movable molds in the form of jaws, the supply of concrete to the molds being automatic whereby a reinforced concrete tie is completed at each operation of the machine.

Another object of the invention is to provide a machine for molding a concrete tie structure around a metal reinforcing element at a single operation, the arrangement being such that ties are formed successively during the travel of the reinforcing elements through a predetermined path, the removal of the completed tie being continuously effected by means of the attachment of the reinforce member with the conveyer mechanism.

With these general objects in view the invention consists of the novel combination and arrangement of parts hereinafter more fully described in connection with the accompanying drawings and in which like reference characters designate corresponding parts throughout the several views.

In the drawings,

Figure 1 is a side elevational view of the machine,

Fig. 2 is a horizontal sectional view taken upon line II—II of Fig. 1,

Fig. 3 is a view partly in vertical section and partly in side elevation as indicated by the line III—III of Fig. 4,

Fig. 4 is a vertical transverse sectional view taken upon line IV—IV of Fig. 1,

Fig .5 is a vertical transverse sectional view taken upon line V—V of Fig. 2, showing the mold jaws closed,

Fig. 6 is a similar view with the jaws open,

Fig. 7 is a horizontal detail sectional view showing the trip for the concrete hopper and taken upon line VII—VII of Fig. 1,

Fig. 8 is an enlarged detail sectional view taken upon line VIII—VIII of Fig. 5, and

Fig. 9 is a vertical transverse sectional view taken upon line IX—IX of Fig. 3, showing the brake mechanism employed.

It being understood that my invention is designed for the commercial manufacture of a metal reinforced concrete tie, the invention broadly consists in the provision of an elevated track 10 for carrying the reinforce 11 to a point between movable molds 12 operably mounted upon a table 13 for receiving plastic material 14 automatically discharged by a hopper 15 between the molds 12 during the closing operation and forming a suitably shaped tie around the reinforce 11.

A main power shaft 16 is horizontally journaled beneath the table 13 provided with two worms 17 in constant mesh with pinions 18 upon vertical shafts 19 journaled in pairs vertically through the table 13 at opposite sides of the shaft 16. The hopper 15 is longitudinally positioned above the table 13 with inwardly inclined discharge nozzles 20 between the pairs of shafts 19.

A two-part mold consisting of the mold members 12 mounted upon the table 13 between the pairs of shafts 19 has an inner chamber or form 21 suitable for molding a tie such as 22 from the material 14 discharged at suitably timed intervals between the open jaws 12 upon the table 13. The track 10 suspended in any suitable manner as by supports 23 extends between the nozzles 20 and forms an endless conveyer upon which plates 24 are adapted to travel by means of wheels 25, the said plates 24 being connected together by upper and lower braces 26 and 27 respectively centrally hinged as at 28 for permitting travel upon a curved section of the track, it being understood that the outer ends of the braces 26 are pivotally connected as at 29 to said

plates 24. The metal reinforce 11 has upstanding ears 30 adjacent its opposite ends and over which the links of chains 31 are hooked carried by adjacently positioned plates 24 as illustrated in Fig. 3 of the drawings.

The traveling plates and braces form an endless conveyer upon the track 10 for the reinforce 11 prior to the construction of the tie upon the table 13 and for the completed tie upon leaving the molding table 13.

Operating cams 32 upon the shafts 19 are positioned pivotally above the table 13 operatively engaging the arcuate faces of adjacent lugs 33 upon the outer sides of the mold members 12 and whereby the said mold members are forced inwardly toward and into closing contact with each other during the simultaneous operation of the shafts 19 as illustrated in Figs. 2 and 4 of the drawings. The discharge nozzles 20 are substantially the same length as the chambers 21 of the mold members 12 and the mechanism is timed for discharging the plastic material 14 through the lower discharge ends 34 of the nozzles 20 between the mold members 12 when the latter are separated and the reinforce 11 has been moved suspended in its proper position above the table 13 between the said members 12. The piling of the plastic material around and upon the reinforce 11 between the open molds 12 places the plastic material in position for contact by the mold members 12 upon their inward travel into contact with each other by the operation of the cams 32 and thereby forming the tie body 12 within the chambers 21 of the mold members 12.

A T-bolt 35 is carried by each mold member 12 and extends through a slot 36 in the table 13 with rollers 37 running beneath the table between guides 38. Diverging springs 39 are attached to the opposite end portions 40 of the lower cross piece 41 of the T-bolt 35 with the outer ends of the springs anchored as at 42 adjacent the opposite sides of the table 13 for automatically retracting the mold jaws 12 when released by the turning of the cams 32. The ears 30 of the reinforce 11 project above the top of the finished tie 22 and accommodating notches 43 are provided therefor in the upper inner edges of the mold members 12 while the bolts 44 positioned upright on the reinforce 11 also project above the tie 22 through similar notches 45 in the mold members 12.

Discharge wheels 46 are journaled longitudinally through the nozzles 20 formed like a paddle wheel with blades 47 adapted to receive the weight of the plastic material 14 at the bottom of the hopper 15 which is divided into two diverging portions 48 at the bottom of the hopper and to which the downwardly converging nozzles 20 are attached in communication therewith. A pivoted latch 49 is provided on the outer face of each nozzle 20 with an end or bolt portion 50 normally projecting inwardly of the carrying nozzle within the path of movement of the wheel blades 47, retaining the wheels 46 against turning until the latches 49 are released. Projecting pins 51 adjacent the upper ends of the shafts 19 are adapted to engage the latches 49 when the cams 32 are in their released positions with the mold members 12 separated as shown in Fig. 6 of the drawings. Upon the release of the wheels 46, the weight of the plastic material 14 turns the wheels 46 in the direction indicated by the arrows in Fig. 4, and a suitable quantity of material 14 passes downwardly through the nozzles 20 for discharge upon the table 13 between the open mold members 12. Upon the continued turning of the shafts 19, the pins 15 pass out of contact with the latches 49 whereupon the springs 52 return the bolts 50 inwardly for engagement by the adjacent paddle plate 47 and stopping further rotation of the wheels 46 as well as the feeding of material 14. In this manner, the continued operation of the shaft 16 causes the discharge of the material 14 to its operative position upon the table 13 as well as the closing of the mold members 12 while the opening of said members is automatically accomplished by the springs 39. The continued making of ties such as 22 is therefore possible by furnishing power to the shaft 16 through the belt wheels 53 it being understood that the endless conveyer places the reinforce members 11 in position between the mold members 12 when separated and after the formation of the tie 22 and the opening of the mold members 12, the continued travel of the plates 24 of the endless conveyer slides the completed tie 22 off of the table 13 for continuing its travel upon the conveyer suspended by means of the hooks 30 engaging in the chains 31.

Any suitable means may be provided for starting, stopping and propelling the plates 24 of the endless conveyer this being preferably accomplished by hand and easily controlled by the operator as the track 10 may preferably have an inclined portion after leaving the table 13 permitting the load which consists of the completed ties 22 to move the same along by gravity, the ties being easily removed from the conveyer when desired in a manner that will be evident.

A brake bar is pivoted adjacent the track 10 upon any suitable support, not shown, for manual operation into contact with the upper edges of the braces 26 and by a frictional contact regulating the speed of the endless conveyer. With the conveyer operating in the direction indicated by the arrow in Fig. 3, the bringing of the brake 55 upon the upper brace 26 is adapted to stop

the conveyer by engaging the upper relative corner of the oncoming plate 24 with said brake 55. A usual form of foot lever or pivoted pedal 56 may be provided for lowering the brake 55, a link 57 being pivotally connected between the brake 55 and lever 56 while a spring 58 beneath the pedal normally maintains the latter elevated as well as the brake 55 out of contact with the conveyer as illustrated by dotted lines in Fig. 9 of the drawings.

The complete operation and control of my reinforced concrete tie making machine will be understood from this detailed description thereof. The form of the metal reinforce 11 may be altered at will or dispensed with entirely if found desirable. The form of the invention herein set forth is believed preferable although changes may be made therein as expediency may direct without departing from the spirit and scope of my invention. The general operation of the machine is readily adapted for making other plastic ware articles than railway ties, for instance, building blocks, street curbing and the like, it only being necessary to modify the form of mold chambers 21 in the jaws 12 and to provide mold jaws of suitable size. The notches in the mold jaws would be omitted when no reinforcement is employed in the article being manufactured and in such cases, the endless conveyer may be advantageously utilized for carrying away the completed article such for instance as a building block.

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

1. A tie making machine comprising cement feeding means, movable mold jaws adapted to receive the cement from the feeding means, automatic operating means for the jaws adapted for engaging the cement during operation, and means adapted for positioning a reinforcing member between the jaws for embedding in the finished tie.

2. A concrete tie making machine comprising inwardly movable mold members for a tie, a reinforce positioning member having a path of travel longitudinally between the mold members and automatic means adapted for feeding cement between the mold members during operation.

3. A concrete tie making machine comprising inwardly movable mold members for a tie, a reinforce positioning member having a path of travel longitudinally between the mold members, cement feeding means between the mold members when open and means adapted for closing the mold members upon the cement and simultaneously stopping the cement flow.

4. A tie forming machine comprising a two-part mold having receiving chambers, means adapted for closing the chambers, automatic separating means for the mold parts operable subsequent to closing, cement feeding means adjacent the path of movement of the mold members, automatic means for opening the flow of cement to a point between the mold members when the latter are separated and for stopping the cement flow during the closing movement of the mold members, and conveyer means movable longitudinally of the mold adapted for suspending a reinforce member between the mold parts for embedding in the tie during the formation thereof on the closing of the mold.

5. A molding machine for plastic material comprising a table, pairs of operating shafts vertically journaled therethrough, slidable mold jaws between said shafts, operating cams upon the shafts adapted for engaging the jaws for closing the same during the revolving of the shafts and automatic retracting means for the mold jaws.

6. A molding machine for plastic material comprising a table, pairs of operating shafts vertically journaled therethrough, slidable mold jaws between said shafts, operating cams upon the shafts adapted for engaging the jaws for closing the same during the revolving of the shafts, automatic retracting means for the mold jaws, forming means for plastic material discharging between the jaws when the jaws are open, controlling means for the discharge of plastic material and actuating means for said controlling means carried by said shafts adapted for automatic operation during the running of the machine.

7. A molding machine for plastic material comprising a table, pairs of operating shafts vertically journaled therethrough, slidable mold jaws between said shafts, operating cams upon the shafts adapted for engaging the jaws for closing the same during the revolving of the shafts, automatic retracting means for the mold jaws, feeding means for plastic material having discharge ends between the mold jaws when retracted and simultaneous operating means for said shafts.

8. A molding machine for plastic material comprising a table, pairs of operating shafts vertically journaled therethrough, slidable mold jaws between said shafts, operating cams upon the shafts adapted for engaging the jaws for closing the same during the revolving of the shafts, automatic retracting means for the mold jaws, feeding means for plastic material having discharge ends between the mold jaws when retracted, simultaneous operating means for said shafts, a conveyer having a path of movement in a plane between the mold jaws and a metal reinforce suspended from a conveyer adapted for positioning between and within the closing path of travel of the mold jaws

prior to the discharge of the plastic material feeding means.

9. A molding machine for plastic material comprising a table, pairs of operating shafts vertically journaled therethrough, slidable mold jaws between said shafts, operating cams upon the shafts adapted for engaging the jaws for closing the same during the revolving of the shafts, automatic retracting means for the mold jaws, feeding means for plastic material having discharge ends between the mold jaws when retracted, simultaneous operating means for said shafts, a conveyer having a path of movement in a plane between the mold jaws, a metal reinforce suspended from the conveyer adapted for positioning between and within the closing path of travel of the mold jaws prior to the discharge of the plastic material feeding means, a pivoted brake above the conveyer and means adapted for lowering the brake into the path of movement of the conveyer during the operation of the device.

10. A molding machine for plastic material comprising a support, a material discharge means above the support, a two-part mold upon the support having the parts thereof adapted for travel outwardly and inwardly of said discharge means, operating cams upon the support in constant engagement with the parts of said mold, automatic retracting means for the parts of the mold, controlling means for the discharge means and power means for the cams and controlling means whereby the closing of the parts of the mold is accomplished subsequently to the operation of the discharge means occurring between the parts of the mold when retracted.

In testimony whereof I affix my signature.

JOHN NELSON.