M. J. SMITH.

CONCRETE PIPE MACHINE.

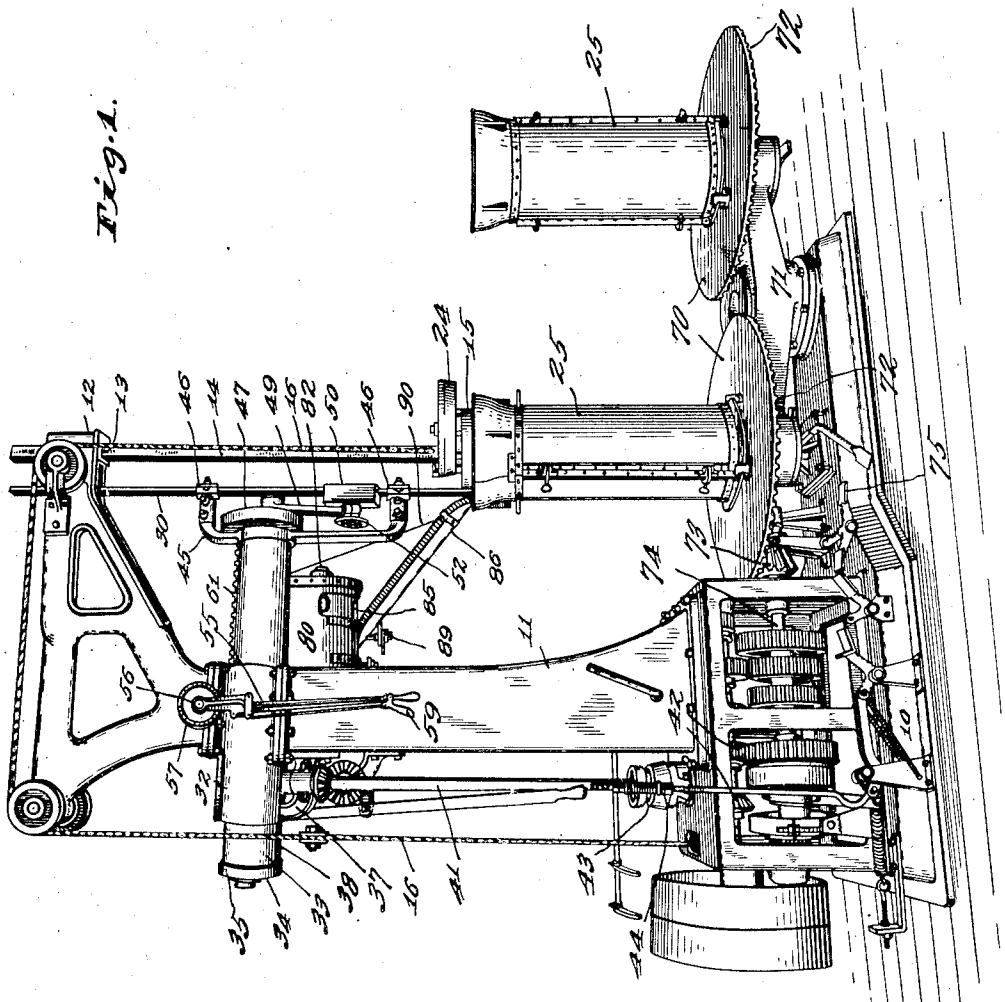
APPLICATION FILED DEC. 2, 1919.

1,359,543.

Patented Nov. 23, 1920.

4 SHEETS—SHEET 1.

Fig. 1.



Witness
Frank A. Fahle

Inventor
Michael J. Smith,

By Hood & Bailey
Attorneys

M. J. SMITH.

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4 SHEETS—SHEET 2.

Fig. 2.

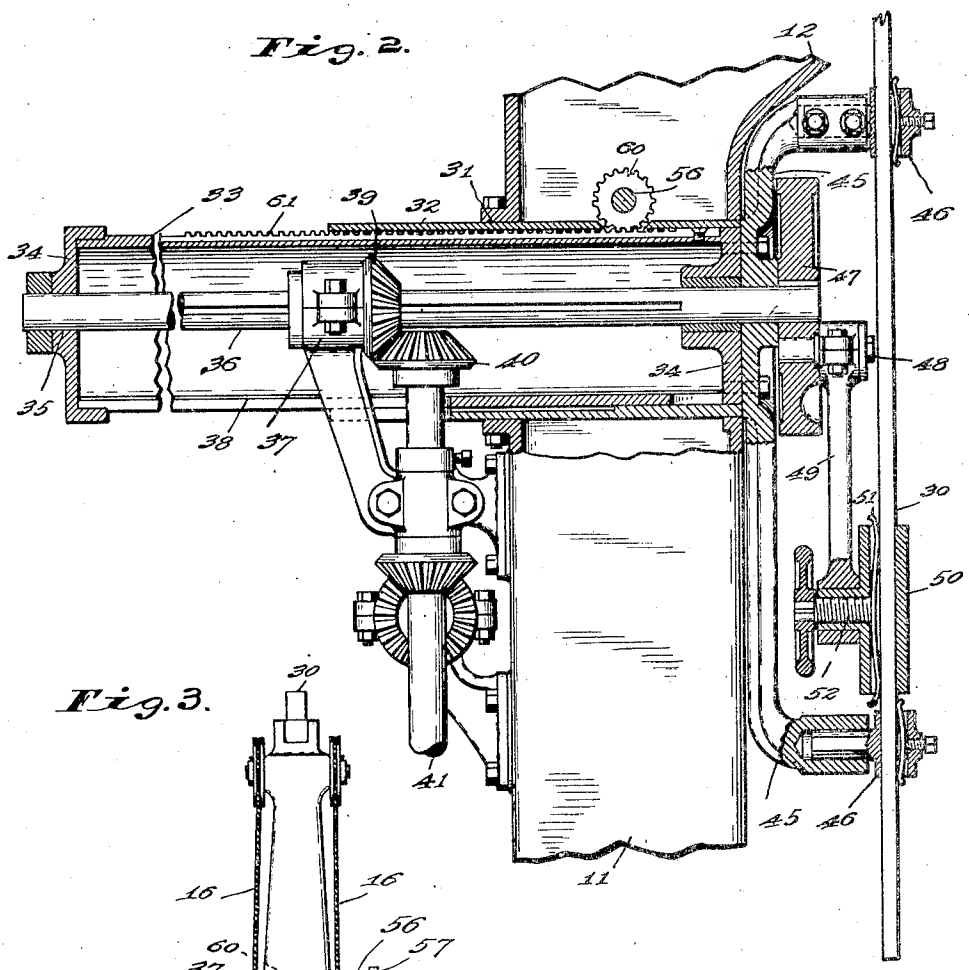
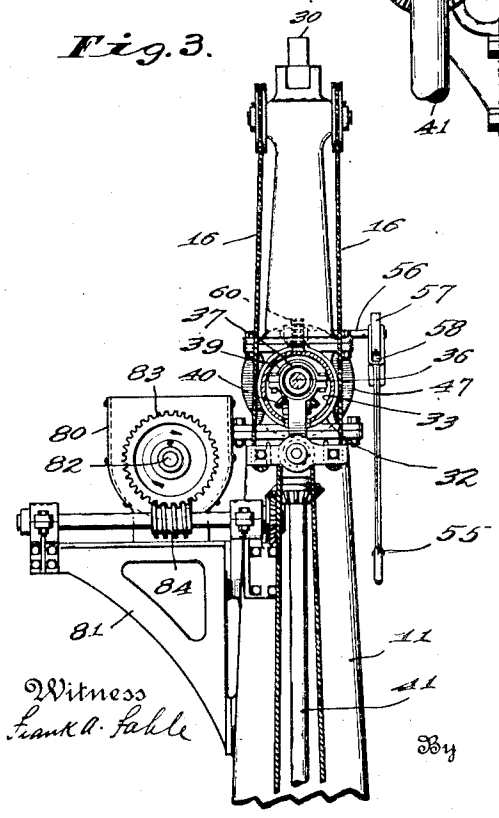


Fig. 3.



Witness
Frank A. Fahle

Inventor
Michael J. Smith,

By Wood & Selby

Attorneys

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4 SHEETS—SHEET 3.

Fig. 4.

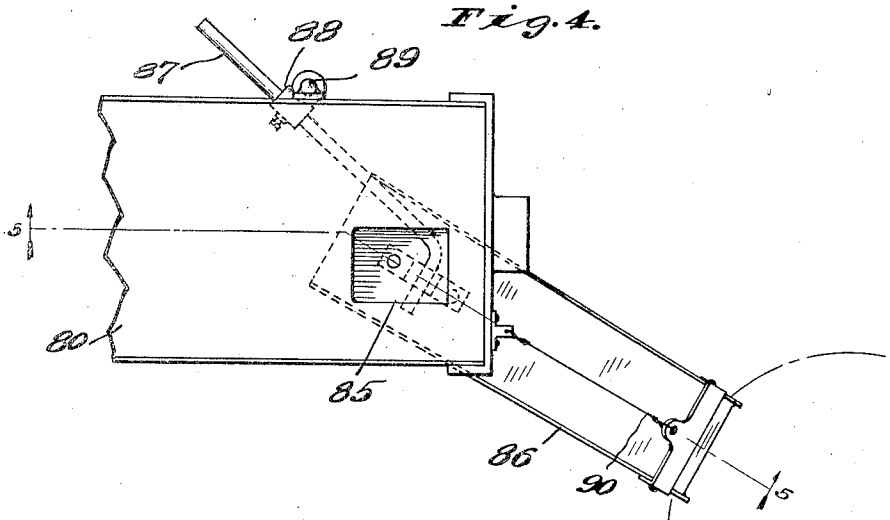
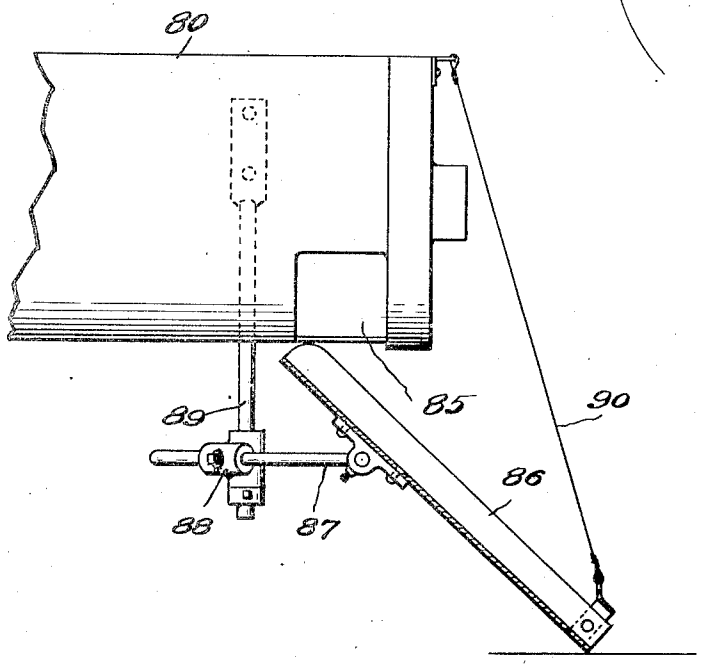


Fig. 5.



Inventor
Michael J. Smith,

By Hood & Schley
Attorneys

M. J. SMITH.

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4 SHEETS—SHEET 4.

Fig. 6.

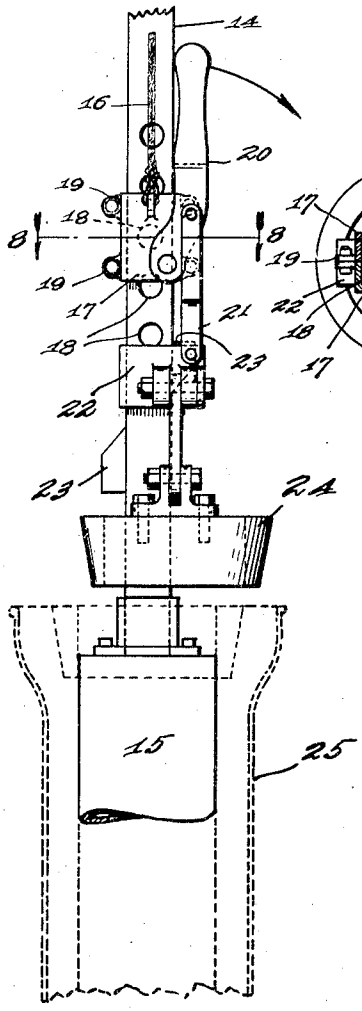


Fig. 8.

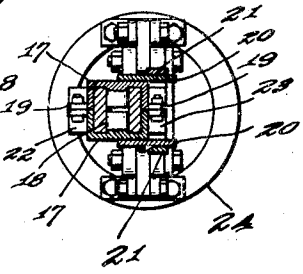
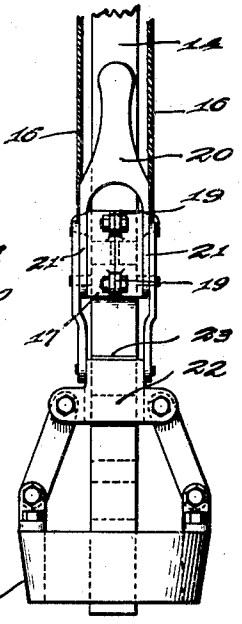


Fig. 7.



Inventor

Michael J. Smith,

By Hood & Selby

Attorneys

UNITED STATES PATENT OFFICE.

MICHAEL J. SMITH, OF ITHACA, NEW YORK, ASSIGNOR TO W. A. CURLESS CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CONCRETE-PIPE MACHINE.

1,359,543. Specification of Letters Patent. Patented Nov. 23, 1920.

Application filed December 2, 1919. Serial No. 341,977.

To all whom it may concern:

Be it known that I, MICHAEL J. SMITH, a citizen of the United States, residing at Ithaca, in the county of Tompkins and State of New York, have invented a new and useful Concrete-Pipe Machine, of which the following is a specification.

The object of my invention is to produce a compact, efficient and easily-operated and maintained machine for producing concrete pipe.

The accompanying drawings illustrate my invention. Figure 1 is a perspective view of a machine embodying my improvements; Fig. 2 a fragmentary vertical section axially of the tamper shaft; Fig. 3 a rear elevation, in partial vertical section, and on a smaller scale, of parts shown in Fig. 2; Fig. 4 a plan of the feed-hopper and chute; Fig. 5 a side elevation of the parts shown in Fig. 4; Fig. 6 a side elevation of a portion of the core, its supporting stem, and my improved bell-core; Fig. 7 an elevation at right angles to Fig. 6; and Fig. 8 a section on line 8—8 of Fig. 6.

In the drawings, 10 indicates a suitable base carrying a pedestal 11, with an overhanging crane-arm 12, provided near its outer end with a vertical guide 13 having a bore (preferably polygonal) in which is mounted the correspondingly formed stem 14, carrying core 15 at its lower end, preferably as described in the Thomas Patent No. 1,211,787.

Stem 14 is raised and lowered by cables 16, the lower ends of which are attached to mating collar-sections 17, 17, each provided with a short stud projectable into any one of a series of holes 18 in the stem. Sections 17, 17 are connected by suitable clamping bolts 19.

Pivoted to members 17 is a lever 20 connected by a link 21 with a sliding collar 22 sleeved upon the stem and fitting the stem in one dimension, while having considerable play thereon in the opposite direction. In this last-mentioned dimension, stem 14 carries two axially separated cams 23, 23 adapted to coöperate with collar 22 and shift it laterally on the stem as it is shifted axially. Suspended from collar 22 is a bell-core 24 of such form as to coöperate with the mold 25 to form the bell end of a concrete pipe of common form. The arrangement is such that, by raising lever 20, core 24 may be readily retracted axially and radially so as to permit the tamping rod 30 to enter the main body of the mold. When the main body of the mold has been filled, the tamper is withdrawn and shifted radially (by means to be described); whereupon, lever 20 is lowered, thus lowering core 24 and, by shifting collar 22 from one cam 23 to the other, shifting the bell-mold 24 so as to centralize it over the upper end of the core 15, and within the bell end of mold 25.

The tamper 30, most conveniently a bar of hard wood, needs to be vertically reciprocated rapidly and with considerable force. It must also be shiftable radially of mold 25. In order to make these movements possible by mechanism which is capable of withstanding the repeated shocks without distortion, I mount in a suitable horizontal cylindrical seat 31, at the upper end of pedestal 11, a cylindrical sleeve 32 of considerable length and projecting from the rear face of the pedestal. Splined in sleeve 32 is a tubular shell 33 of considerable diameter provided with end heads 34 provided with bearings 35 for the tamper shaft 36. An intermediate bearing 37 projects up from pedestal 11 through a slot 38 in shell 33. Within bearing 37 is journaled and held against axial movement, a bevel gear 39 which is splined on shaft 36. Gear 39 is driven by a gear 40 which lies within shell 33 and is carried by shaft 41 journaled on pedestal 11 and driven by a suitable train 42 from a clutch 43 controlled by a lever 44. By this arrangement I am able to produce a light, but very rigid support for the tamper-bar bracket 45, without material overhang from the pedestal on the mold side. Bracket 45 is bolted to one of heads 34 of shell 33 and is provided with two tamper-bar eyes 46 having pressure springs engaging the tamper bar.

Shaft 36 carries a disk 47 just in front of bracket 45 and this disk carries a wrist pin 48 carrying a pitman 49 which, in turn, carries a tamper-bar-eye 50 through which the tamper bar 30 is passed.

Eye 50 is provided with a pressure spring 51 bearing upon the tamper bar and controlled by screw 52.

The tamper may be shifted, radially of the molds, by a lever 55 pivoted upon a shaft 56 provided with a toothed disk 57 formed to be engaged by a detent 58 con-

trolled by a supplemental lever 59 on lever 55. Shaft 56 carries a pinion 60, which meshes with a rack 61 carried by shell 33.

In order to present molds to the tamper without undue loss of time, I provide two independent turn-tables 70, 70 journaled at opposite ends of the horizontally swinging arm 71, each of said tables being preferably journaled upon a central stationary pin projecting up through the table and having a non-rotative engagement with the lower end of the core 15. Each turn-table is formed to detachably receive a mold 24 and on its under side is provided with a gear ring 72 which comes into position for meshing with a driving pinion 73 when the table is in active position. Pinion 73 is splined on a shaft 74 and may be shifted axially into and out of mesh with gear 72 of one of tables 70, by a foot lever 75.

In order to feed the fresh concrete mixture to a mold, I provide the feed hopper or trough 80 supported on suitable brackets 81 from pedestal 11 and containing a feed screw (not shown) of common type carried by shaft 82 and driven by gears 83, 84. Trough 80 is provided with an outlet 85 and below this outlet I arrange an inclined chute 86 which leads to a point immediately above a mold 25 when in active position.

The upper end of chute 86 is supported by a horizontally-adjustable rod 87 supported in an eye 88 carried by a rod 89 depending from trough 80. The outer end of chute 86 is supported, by a light flexible connection 90, from trough 80. By this simple arrangement, I find that the unavoidable vibration of the machine as a whole, when in operation, serves to set the lower, comparatively free, end of chute 86 into a horizontal vibration of short period and that this vibration is exceedingly beneficial in facilitating the flow of concrete mixture through the chute to the mold.

I claim as my invention:

1. In a concrete pipe machine, the combination of main frame column, of a transverse cylindrical bearing formed therethrough, a cylindrical carrier mounted to slide in said bearing and carrying tamper-supporting brackets, a shaft journaled within said carrier, a tamper reciprocably mounted in said brackets, connections between said shaft and tamper, driving means carried by the column and connected to said shaft, and means by which said carrier may be shifted axially in its bearing.

2. In a concrete pipe machine, the combination of main frame column, of a transverse bearing formed therethrough, a carrier mounted to slide in said bearing and carrying tamper-supporting brackets, a shaft journaled within said carrier, a tamper reciprocably mounted in said brackets, connections between said shaft and tamper, driving means carried by the column and connected to said shaft, and means by which said carrier may be shifted axially in its bearing.

3. In a concrete pipe machine, the combination of a main supporting column, of a bearing extending transversely therethrough and having an overhang projecting from the rear face of the column, a hollow carrier slidably mounted in said bearing, a shaft journaled within said carrier, tamper-supporting brackets carried by said carrier at the end projecting from the forward face of the column, a tamper mounted in said brackets, driving connections between said shaft and tamper, a pair of mating gears arranged within said carrier and supported by the column, one of said gears being splined upon the shaft, and means by which the other gear may be driven.

4. In a concrete pipe machine, the combination of a main supporting column, of a bearing extending transversely therethrough, a hollow carrier slidably mounted in said bearing, a shaft journaled within said carrier, tamper-supporting brackets carried by said carrier at the end projecting from the forward face of the column, a tamper mounted in said brackets, driving connections between said shaft and tamper, a pair of mating gears arranged within said carrier and supported by the column, one of said gears being splined upon the shaft, and means by which the other gear may be driven.

5. In a concrete pipe machine, the combination of a mold having an enlarged upper end, a core arranged in the lower part of the mold, a stem for lifting said core from the mold, a ring core sleeved over the stem and coöperating with the core and the upper end of the mold, coöperating members carried by the stem and ring-core for shifting the ring core laterally relative to the stem and mold upon longitudinal movement of the ring-core, and means by which the ring-core may be longitudinally shifted.

6. In a concrete pipe machine, the combination of a mold having an enlarged upper end, a core arranged in the lower part of the mold, a ring-core coöperating with the core and the upper part of the mold, means by which the ring-core may be shifted axially of the mold, and means dependent upon the axial movement of the ring-core operating to shift the ring-core laterally relative to the mold.

7. In a concrete pipe machine, the combination of a mold having an enlarged upper end, a core arranged in the lower part of the mold, a stem extending upwardly from said core, a ring core sleeved over said stem, a support for said ring-core carried by the stem, coöperating cams carried by the stem and ring-core by which axial shifting of the

ring-core will shift said core laterally, and means by which the ring-core may be shifted axially.

8. In a concrete pipe machine, the combination of a mold having an enlarged upper end, a core arranged in the lower part of the mold, a stem extending upwardly from said core, a ring core sleeved over said stem, a support for said ring core carried by the stem, and coöperating cams carried by the stem and ring-core for shifting the ring-core laterally upon axial movement thereof.

9. In a concrete pipe machine, the combination of a rotary mold, a tamper coöperating with the mold, means for rotating the mold, means for reciprocating the tamper, a feed-box, a chute leading from the feed box to the mold, a flexible support for the end of the chute adjacent the feed-box, and a laterally-flexible suspension for the end of the chutes adjacent the mold.

In witness whereof, I have hereunto set my hand at Pottstown, Pennsylvania, this eighteenth day of November, A. D. one thousand nine hundred and nineteen.

MICHAEL J. SMITH.