

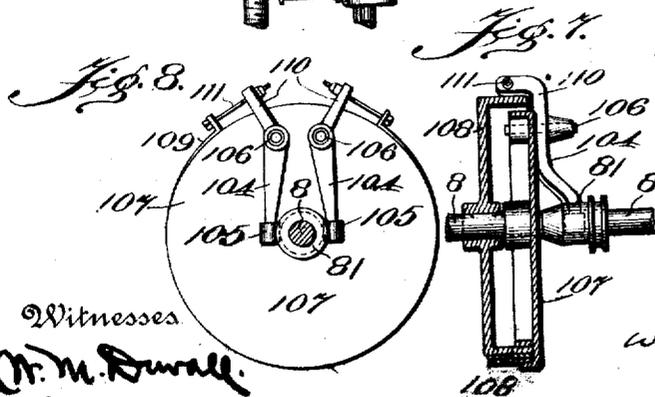
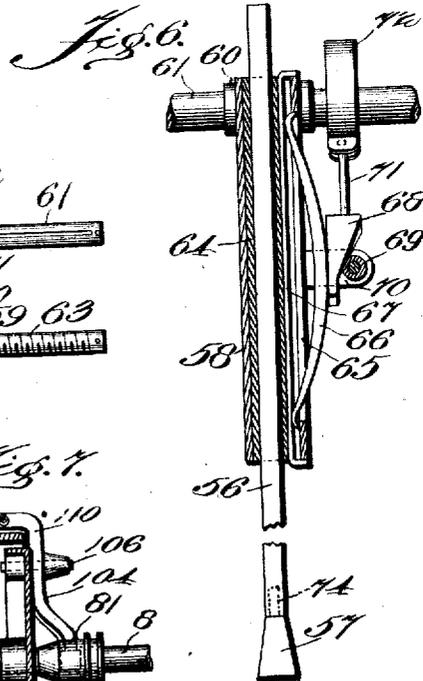
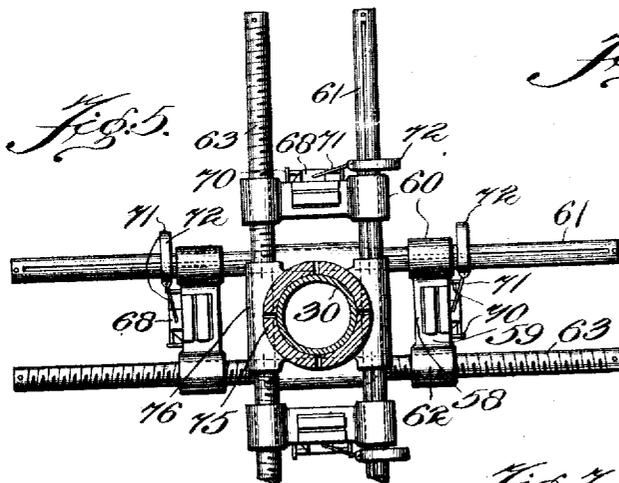
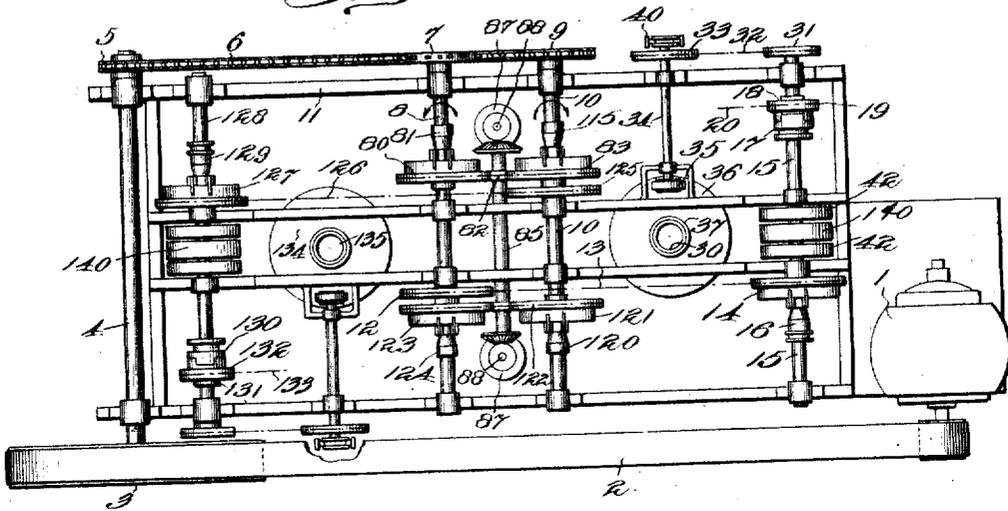
A. C. TUNISON.
 PIPE MAKING MACHINE.
 APPLICATION FILED APR. 5, 1911.

1,025,035.

Patented Apr. 30, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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Stumpson

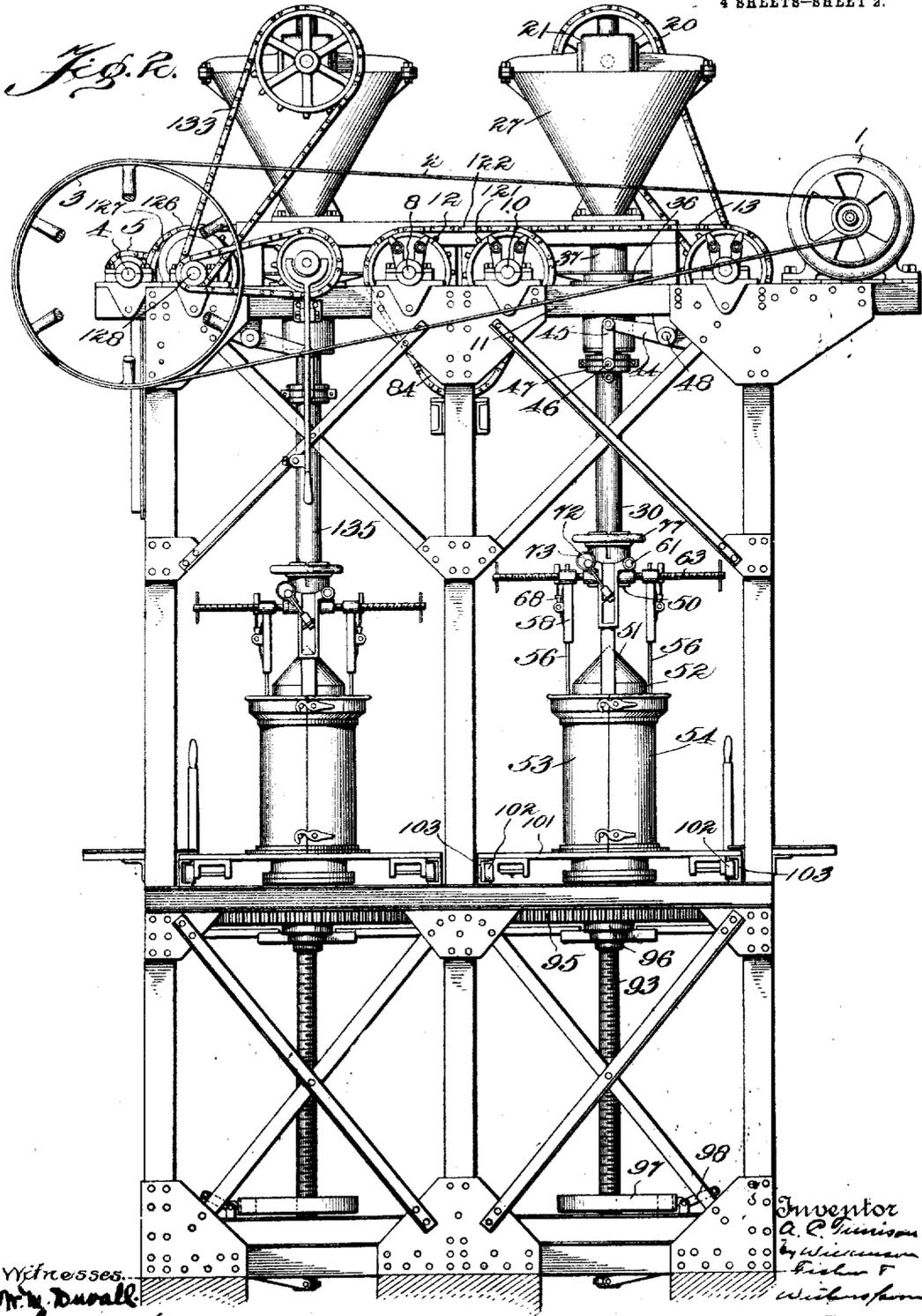
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4 SHEETS-SHEET 2.



Witnesses
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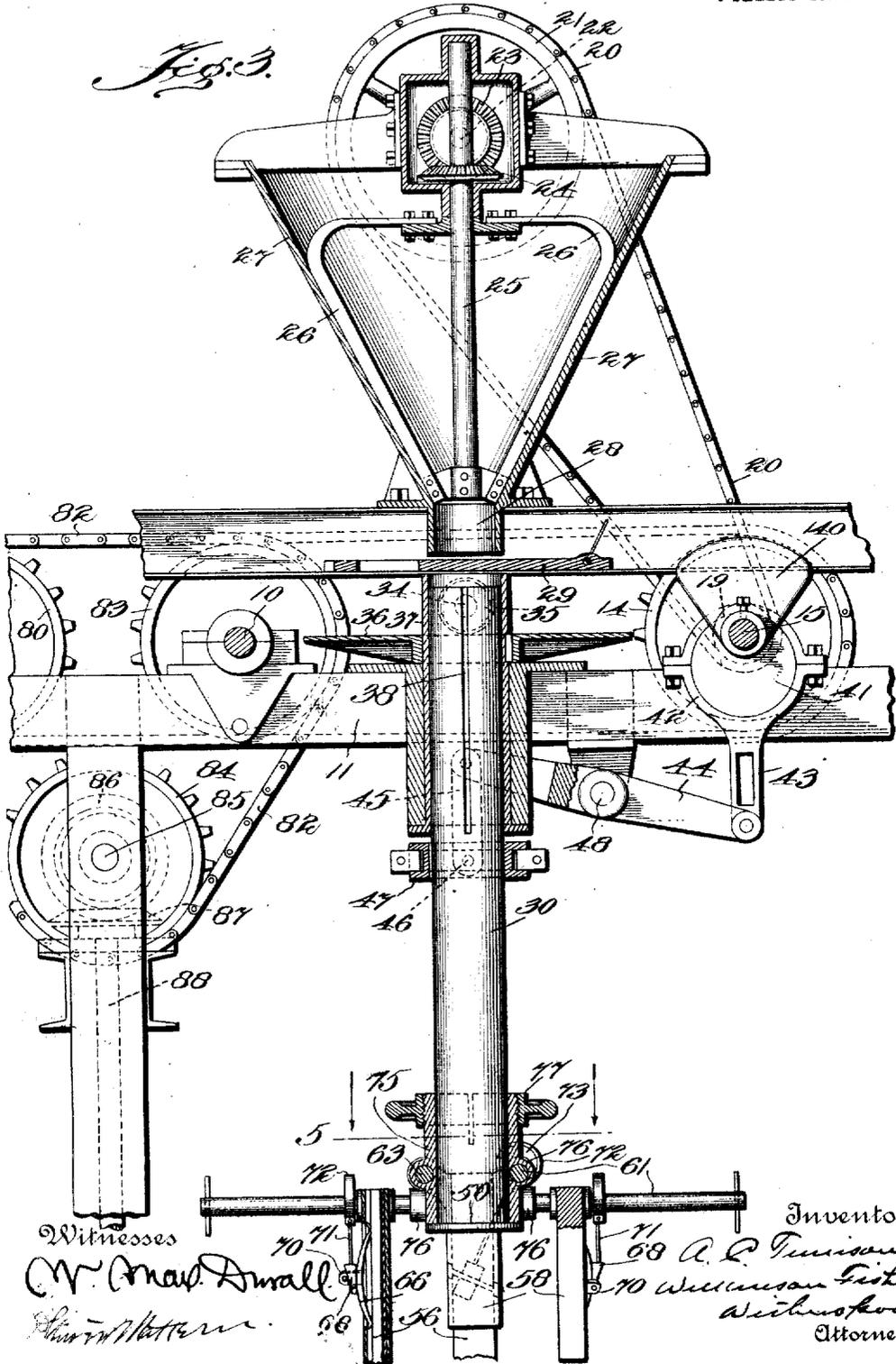
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4 SHEETS—SHEET 3.

Fig. 3.



Witnesses
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John W. Moore

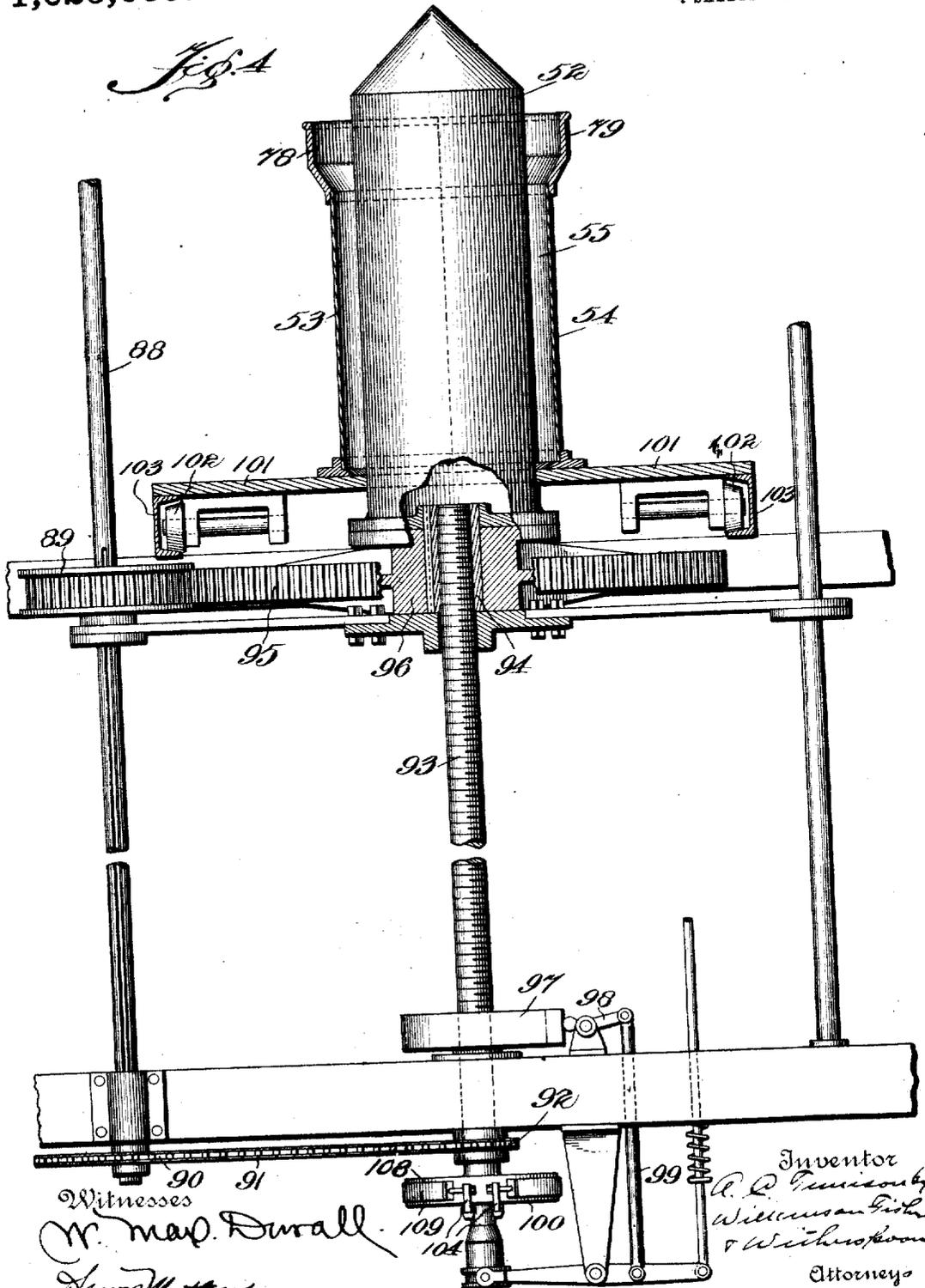
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4 SHEETS-SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

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PIPE-MAKING MACHINE.

1,025,035.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed April 5, 1911. Serial No. 619,146.

To all whom it may concern:

Be it known that I, ARTHUR C. TUNISON, a citizen of the United States, residing at Boise, in the county of Ada and State of Idaho, have invented certain new and useful Improvements in Pipe-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for making concrete or other plastic pipes or drains such as are employed in the construction of sewers, culverts, pipe lines and the like, and has for its object to provide a machine which will be more efficient in action, and less costly to construct, than like machines heretofore proposed.

To these ends the invention consists in a mechanism providing an even feed of the material from the hopper and capable of distributing the same evenly in the mold beneath the tampers so that the pipe will be of a uniform density.

The invention further consists in a mechanism comprising a plurality of tampers which can be regulated to tamp the material to any desired density, and which enables the speed of manufacture to be increased. Further, the shoes employed on the tampers can be readily changed according to the thickness of the shell of the pipe it is desired to manufacture.

The invention still further consists in a mechanism comprising a core that may be revolved when desired, and that may be withdrawn without injury to the pipe. This core is preferably withdrawn from the pipe in a downward direction, and therefore will tend to increase the density of the material instead of tending to injure the pipe as would be the case if the core should be withdrawn in an upward direction.

The invention still further consists in a machine which will manufacture various sizes of pipes, the cores of which can be speedily removed from the finished pipe no matter how densely the shell of the pipe may be tamped around the core, and the invention further consists in certain novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings

forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a diagrammatic plan view of a machine built in accordance with my invention with the mixing hoppers removed; Fig. 2 is a side elevational view of the parts shown in Fig. 1 with the mixing hoppers in place; Fig. 3 is an elevational sectional view of a portion of the machine showing a mixing hopper and a feed pipe, together with their connecting mechanisms; Fig. 4 is a view similar to Fig. 3, but showing the pipe mold, core, and their connecting mechanisms; Fig. 5 is a plan view taken on the line 5—5 of Fig. 3, of the holding and adjusting rods for the tamping mechanism, and showing the feed pipe in section; Fig. 6 is an enlarged detail view in section showing the friction means for holding the tamp rods in position; Fig. 7 is a sectional view of one of the clutch mechanisms employed in my machine; and, Fig. 8 is a side elevational view of the parts shown in Fig. 7.

Referring first to Fig. 1 the numeral 1 designates any suitable motor or other source of power adapted to drive the belt 2 passing over the pulley 3 fast with the shaft 4, having the pulley or other means 5 also fast thereon over which passes the belt 6 passing under the pulley or sprocket 7 fast on the shaft 8 and over a smaller pulley or sprocket 9, fast to the shaft 10. The shafts 4, 8 and 10, as well as the other shafts about to be mentioned, are suitably journaled in bearings carried by the frame-work 11, supporting the other parts of the machine. The shaft 8 carries a driving member 12 connected by the belt 13, as indicated in dotted lines, to the driving member 14 loose on the shaft 15, but adapted to be connected thereto by the clutch member 16. On the shaft 15 is also mounted the clutch members 17 and 18 rigid with the latter of which is a driving member or sprocket 19, adapted to rotate the belt 20, as best illustrated in Fig. 3. The belt 20 passes over a sprocket 21 mounted upon the shaft 22 carrying beveled gear 23 engaging with the beveled gear 24, rigid with the shaft 25 on which is mounted the stirring or mixing members 26 contained in the mixing hopper 27, having a delivery at 28 controlled by the hand operated valve or gate 29, registering with the hollow feed pipe 30, as will be clear from

Fig. 3. The pipe 30 has a reciprocating motion in order to move the tampers up and down, and it has a rotating motion in order to revolve said tampers while compressing the material, as will be now disclosed.

Referring again to Fig. 1, rigid with the clutch member 18 is a power member 31 connected by the belt 32 to the power member 33, rigid with the shaft 34 carrying the friction disk 35 adapted to drive the friction disk 36 mounted upon the sleeve 37, which is keyed to the feed pipe 30 by means of the slot 38, Fig. 3. 40 represents any suitable means for moving the disk 35 in and out radially of the disk 36, so as to change the speed of rotation of the sleeve 37, and therefore of the feed pipe 30. It therefore follows that the same power which drives the mixing members 26 also rotates the feed pipe 30. Also mounted on the shaft 15 and rigid therewith are a plurality of eccentrics 41 having the eccentric straps 42 carrying the arms 43 and connected as by the lever 44 to the links 45, which are connected as at 46 to the sleeve 47 rigid with the feed pipe 30. The levers 44 are pivoted at 48 to the frame-work 11, and it is clear that as the shaft 15 revolves the said levers 44 will impart to the said feed pipe 30 and tampers, the reciprocating motion above mentioned.

From the mechanism so far disclosed, it is evident that material such as cement, clay, or other suitable pipe making material, which is placed in the feed hopper 27 will be thoroughly mixed by the members 26, and will be fed down through the delivery 28 into the feed pipe 30, and through its open end 50 on to the tapered upper end 51 of the core 52, which is surrounded by the mold members 53 and 54 of the flask, as will be clear from Fig. 2.

Entering the space 55, Fig. 4, between the core 52 and the flask members 53 and 54, are the tampers 56 provided with the shoes 57. The stems 56 of these tampers pass up through a sleeve 58, Fig. 6, provided with a cross arm 59 having at one end a sleeve 60 through which passes the splined rod 61, and having at its other end a screw-threaded sleeve 62 through which passes the screw-threaded rod 63. The sleeve 58 is lined with the packing 64, which may be of leather, and on one side it is provided with a slot 65 through which passes the spring 66 taking against the bearing plate 67 and controlled by the wedge 68, taking against the roller 69 carried by the lugs 70, rigid with said sleeve 58. The wedge 68 is connected as by the rod 71 to the eccentric strap 72 surrounded by an eccentric 73, see Fig. 2, carried by the shaft 61.

From the mechanism thus far described, it is evident that as the material is fed down into the space 55 and the tamp rods 56 are

reciprocated by the mechanism disclosed, the said tamp rods may slide upwardly through the sleeve 58 and packing 64, so as to accommodate the increasing height of the pipe being formed. In order to increase the friction between the packing 64 and the stems 56 of the packing rods, it is only necessary whereupon the rods 61 by any suitable means more firmly against the spring 66, or they may be withdrawn as is desired. It is further evident that if it is desired to increase or to decrease the radius of the pipe, it is only necessary to turn the screw rods 63 in the proper direction when the said tampers will be brought to operate in the particular circle desired. Should it be desired to increase the thickness or to decrease the thickness of the walls of the pipe, it is only necessary to remove the feet 57 of the tampers and to put on additional feet, and for this purpose said feet 57 are made readily detachable from the rods 56 as by a screw-threaded joint 74. The said tampers and rods 61 and 63 are supported from the extreme lower end of the feed pipe 30 by means of a casting 75, see Fig. 3, provided with enlargements 76 through which the two rods 61 and the two rods 63 pass. Said casting is slitted and screw-threaded at its top end and is made slightly tapered so that the screw-threaded wheel nut 77 may firmly bind the casting to the pipe 30. This particular connection between the casting 75 and the pipe 30 enables the tampers to be readily withdrawn from the mold cavity, and to be slid along the pipe 30 out of the way.

After the material forming the pipe has been filled into the cavity 55 up to the top of the mold members 53 and 54, the bell sections 78 and 79 are placed in position, whereupon the tampers may be adjusted outwardly, and by hand, or if desired, new feet 57 may be placed thereon, and the bell portion of the said pipe is thereupon thoroughly tamped. After the body portion as well as the bell portion of the pipe has been thus completed, the core 52 may be rotated by the means now to be described, in order to give a finished smooth or glazed surface on the interior of the pipe and which may be also lowered out of the way at the same time, so as to tend to further compress the material rather than to injure the same as would be the case if the said core 52 were raised instead of lowered.

The mechanism for rotating and lowering the core 52 is as follows, reference being had first to Fig. 1 of the drawings—Loose on the shaft 8 is a sprocket wheel 80 co-acting with the clutch member 81 on said shaft 8, and passing over said sprocket wheel is a belt 82, indicated by dotted lines in Fig. 1 and by full lines in Fig. 3, and

this belt passes over a similar sprocket wheel 83 loose on the shaft 10, and also over a third sprocket wheel 81 mounted on the shaft 85, as best shown in Fig. 3. The said shaft 85 carries a beveled gear 86 meshing with the bevel 87 mounted on the shaft 88, Figs. 3 and 4, having splined thereon the gear 89 and carrying at its lower end the sprocket 90 over which passes the chain 91 engaging the sprocket 92 carried by the screw-threaded shaft 93, passing through the threaded sleeve 94 and into the hollow of the core 52. The gear 89 also meshes with the gear 95 rigid with the hub 96 on which the core 52 is mounted, and to which is splined the sleeve 91, as indicated. It is, therefore, evident if the clutch member 81 is made to engage the clutch member carrying wheel 86, that power will be applied to rotate the shaft 88 and that the connections just described will rotate as well as lower the core 52. A brake mechanism 97 operated by a lever 98 and a link 99 is provided in connection with the clutch mechanism 100. The clutch mechanism is adapted to throw the sprocket 92 in and out of connection with the shaft 93, and the brake mechanism is adapted to cause a greater or less slip in the clutch mechanism, so that the power applied through the sprocket chain 91 to the screw 93 may be regulated. When full power is imparted through both the sprocket 91 and the gear 89, the core 52 is given its maximum motion, but when the sprocket 91 is not delivering full power, the downward motion imparted to the core 52 will be slow owing to the reducing gearing shown. In other words, by cutting out the sprocket 91 a great deal of internal polishing may be given to the pipe owing to the slow downward motion that will then be imparted to the said core. The mold members 53 and 54 are mounted upon a platform 101 carrying the rollers 102, working on the tracks 103, and when the core 52 is lowered out of the pipe, the said pipe and mold members 53 and 54 may be rolled away along the tracks 103 out of the way, whereupon the pipe may be discharged, or a new platform and mold members may be brought into place.

The clutch members used in this machine may be of the general type shown in Figs. 7 and 8 in which a shaft 8 is provided with the splined cone-shaped member 81 operating between a pair of arms 104 carrying the rollers 105 and pivoted as at 106 to the disk shaped member 107, rigid with said shaft 8, fitting the flange disk member 108, loosely mounted on the shaft 8. The said arms 104 carry a strap 109 which is also adjustably connected to the ends 110 of the said arms 104 as by the screw bolts 111, as shown. From the structure now disclosed, it is evident that upon sliding the cone-shaped mem-

ber 81 along the shaft 8, the friction between the strap 109 and the disk member 108 will be varied, and therefore a greater or less power will be transmitted from the said shaft 8 to the said flanged disk 108.

When it is desired to raise the core 52 into the position shown in Fig. 4, it is only necessary to reverse the motion above disclosed, which may be readily done by throwing the clutch member 115 carried by the shaft 10, Fig. 1, into connection with the clutch member carrying the sprocket 83, loosely mounted on said shaft, when the belt 82 and connections to the said screw 93 will be reversed, as will be readily understood.

I find it desirable in order to increase the speed of output to provide a plurality of machines such as that just described, and in Fig. 1, I have indicated two of such machines driven by the same source of power. That is to say, the shafts 8 and 10 carry duplicates of the parts 81, 80, 82 and 83 in the parts 120, 121, 122 and 123 respectively. The part 115 is also duplicated in the part 124. Further the parts 12, 13, and 14 are duplicated in the parts 125, 126 and 127 respectively. The parts 15 and 16 are duplicated in the parts 128, and 129 respectively. The parts 17, 18 and 19 are respectively duplicated in the parts 130, 131 and 132, and the belt 20 is duplicated in the belt 133. The friction disk 26 and connections are duplicated in the friction disk 134 and its connections. The feed pipe 30 is duplicated in the feed pipe 135. It, therefore, follows that a double set of pipes may simultaneously be made upon the machine shown, and a further description of the duplicate parts need not be given. In order that the eccentrics 41 and their connections may be counterbalanced, there is preferably located on the shafts 15 and 128 the balancing weights 140, as shown.

It is obvious that those skilled in the art may vary the arrangement of parts as well as the details of construction without departing from the spirit of my invention, and it is further obvious that instead of a pair of machines as here illustrated, any suitable number of machines may be further joined up and driven from the same source of power. I therefore do not wish to be limited to the disclosure above, except as may be required by the claims.

What I claim is:—

1. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; clutch and sprocket connections between said shaft and member for rotating the latter; a feed pipe registering with said hopper; a valve located between said pipe and hopper; connections between said shaft and feed pipe adapted to rotate said pipe; connections comprising a lever between said shaft and pipe adapted to re-

reciprocate said pipe; and a tamping mechanism adapted to be rotated and reciprocated by said pipe, substantially as described.

2. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; chain and sprocket connections between said shaft and member for rotating the latter; a feed pipe registering with said hopper; frictionally engaging connections between said shaft and feed pipe adapted to rotate said pipe; connections comprising eccentrics carried by said shaft between said shaft and pipe adapted to reciprocate said pipe; and a tamping mechanism adapted to be rotated and reciprocated by said pipe, substantially as described.

3. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; chain and sprocket connections between said shaft and member for rotating the latter; a feed pipe registering with said hopper; connections between said shaft and feed pipe adapted to rotate said pipe; connections between said shaft and pipe adapted to reciprocate said pipe; a tamping mechanism adapted to be rotated and reciprocated by said pipe; and a mold having a cavity located below and adapted to receive material from said feed pipe and in which said tamping means are adapted to operate, substantially as described.

4. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; chain and sprocket connections between said shaft and member for rotating the latter; a feed pipe registering with said hopper; connections between said shaft and feed pipe adapted to rotate said pipe; eccentric and lever connections between said shaft and pipe adapted to reciprocate said pipe; a tamping mechanism adapted to be rotated and reciprocated by said pipe; and a mold casing and core forming a mold cavity located below adapted to receive material from said pipe and in which said tamping means are located, substantially as described.

5. In a pipe molding machine, the combination of a mixing means; a feed pipe adapted to receive the mixed material from said means; mechanism for rotating said pipe; means comprising an eccentric for reciprocating said pipe; tamping means provided with a frictional connection with said pipe; a mold having a core associated with said tamping means; and means for continuously rotating said core after said pipe is formed, substantially as described.

6. In a pipe molding machine, the combination of a mixing means; a feed pipe adapted to receive the mixed material from said means; frictional mechanism for rotating said pipe; means comprising an eccentric for reciprocating said pipe; tamping members; an arm supporting said members

and provided with a frictional connection with the same; a mold having a core associated with said tamping means; means for continuously rotating said core after said pipe is formed; means comprising a screw for lowering said core out of said formed pipe; and means for controlling the speed at which said screw lowers said core, substantially as described.

7. In a pipe molding machine, the combination of a mixing means; a feed pipe adapted to receive the mixed material from said means; frictional mechanism for rotating said pipe; an eccentric and lever connections for reciprocating said pipe; tamping members; oppositely disposed screw threaded arms for supporting said members; adjustable frictional connections between said arms and said members; a mold having a core associated with said tamping members; means for rotating said core after said pipe is formed; means for lowering said core; and means for controlling the speed of said core lowering means, substantially as described.

8. In a pipe molding machine, the combination of a mixing means; a feed pipe adapted to receive the mixed material from said means; a valve located between said pipe and mixing means; frictional mechanism for rotating said pipe; an eccentric and lever connections for reciprocating said pipe; tamping members; oppositely disposed screw threaded arms for supporting said members; adjustable frictional connections between said arms and said members; a mold having a core associated with said tamping members; means for rotating said core after said pipe is formed; means for lowering said core; and means for controlling the speed of said core lowering means, substantially as described.

9. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; clutch and sprocket connections between said shaft and member for rotating the latter; a feed pipe registering with said hopper; a valve located between said pipe and hopper; connections between said shaft and feed pipe adapted to rotate said pipe; connections comprising a lever between said shaft and pipe adapted to reciprocate said pipe; a tamping mechanism adapted to be rotated and reciprocated by said pipe; oppositely disposed screw threaded arms for supporting said tamping mechanism; adjustable frictional connections between said arms and said tamping mechanism, and a mold having a core associated with said tamping means, substantially as described.

10. In a pipe molding machine, the combination of a power shaft; a feed hopper and a mixing member; chain and sprocket connections between said shaft and member

for rotating the latter; a feed pipe registering with said hopper; frictionally engaging connections between said shaft and feed pipe adapted to rotate said pipe; connections comprising eccentrics carried by said shaft between said shaft and pipe adapted to reciprocate said pipe; a tamping mechanism adapted to be rotated and reciprocated by said pipe comprising oppositely disposed screw threaded arms, frictional telescoping supports for said tamping mechanism carried by said arms; and a mold having a removable core associated with said tamping mechanism, substantially as described.

11. In a pipe making machine, the combination of a motor; a shaft driven by said motor; a plurality of secondary shafts driven by said first named shaft; a fourth shaft driven by one of said secondary shafts; a fifth shaft driven by another of said secondary shafts; a clutch carried by each of said secondary shafts; a vertical shaft driven by each of said clutches; a mixing means and a feed pipe rotated by each of said fourth and fifth shafts; tamping means carried by each of said pipes; a mold having a core associated with each of said tamping means; and connections for withdrawing said cores driven by each of said vertical shafts, substantially as described.

drawing said cores driven by each of said vertical shafts, substantially as described. 30

12. In a pipe making machine, the combination of a motor; a primary shaft driven by said motor; a plurality of secondary shafts driven by said primary shaft; a fourth shaft driven by one of said secondary shafts; a fifth shaft driven by another of said secondary shafts; a clutch carried by each of said secondary shafts; a vertical shaft driven by each of said clutches; a mixing means and a feed pipe rotated by each of said fourth and fifth shafts; tamping means carried by each of said pipes; means driven by each of said fourth and fifth shafts for reciprocating said feed pipes and tamping means; a mold having a core associated with each of said tamping means; and connections for withdrawing said cores driven by each of said vertical shafts, substantially as described. 35 40 45

In testimony whereof, I affix my signature, in presence of two witnesses. 50

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Witnesses:

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