

L. A. THOMAS.

MIXER.

APPLICATION FILED MAY 14, 1907.

Patented Apr. 13, 1909.

3 SHEETS—SHEET 1.

918,394.

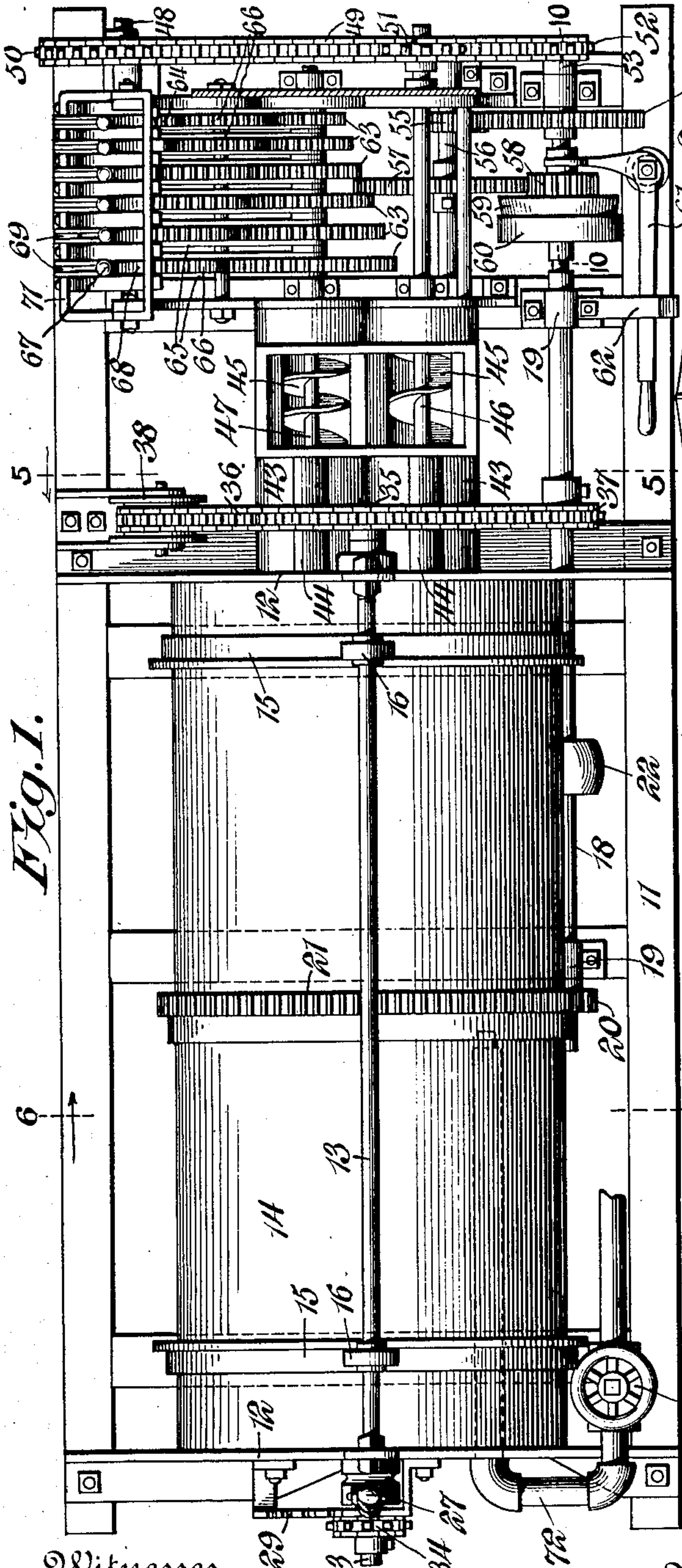


Fig. 1.

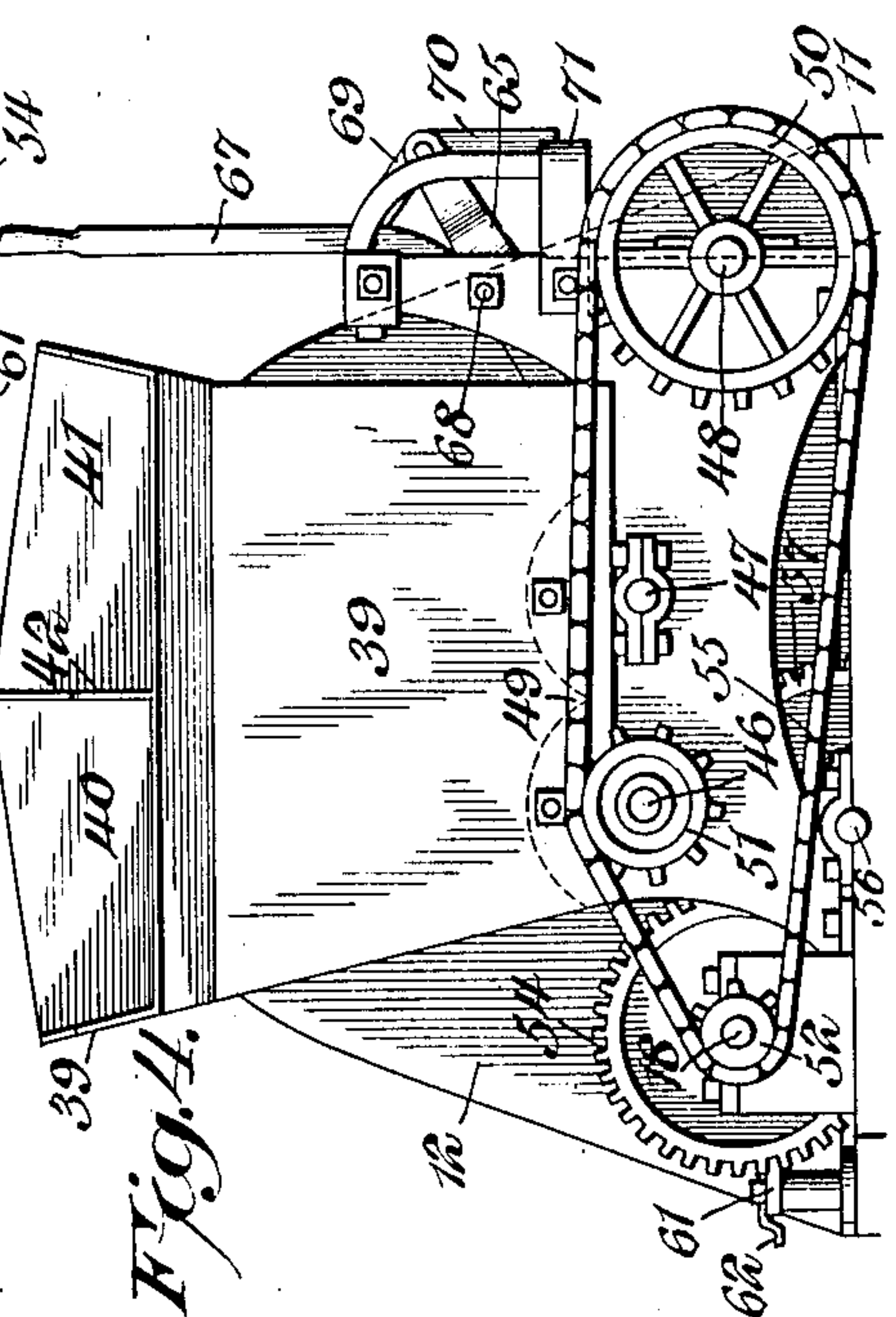


Fig. 4.

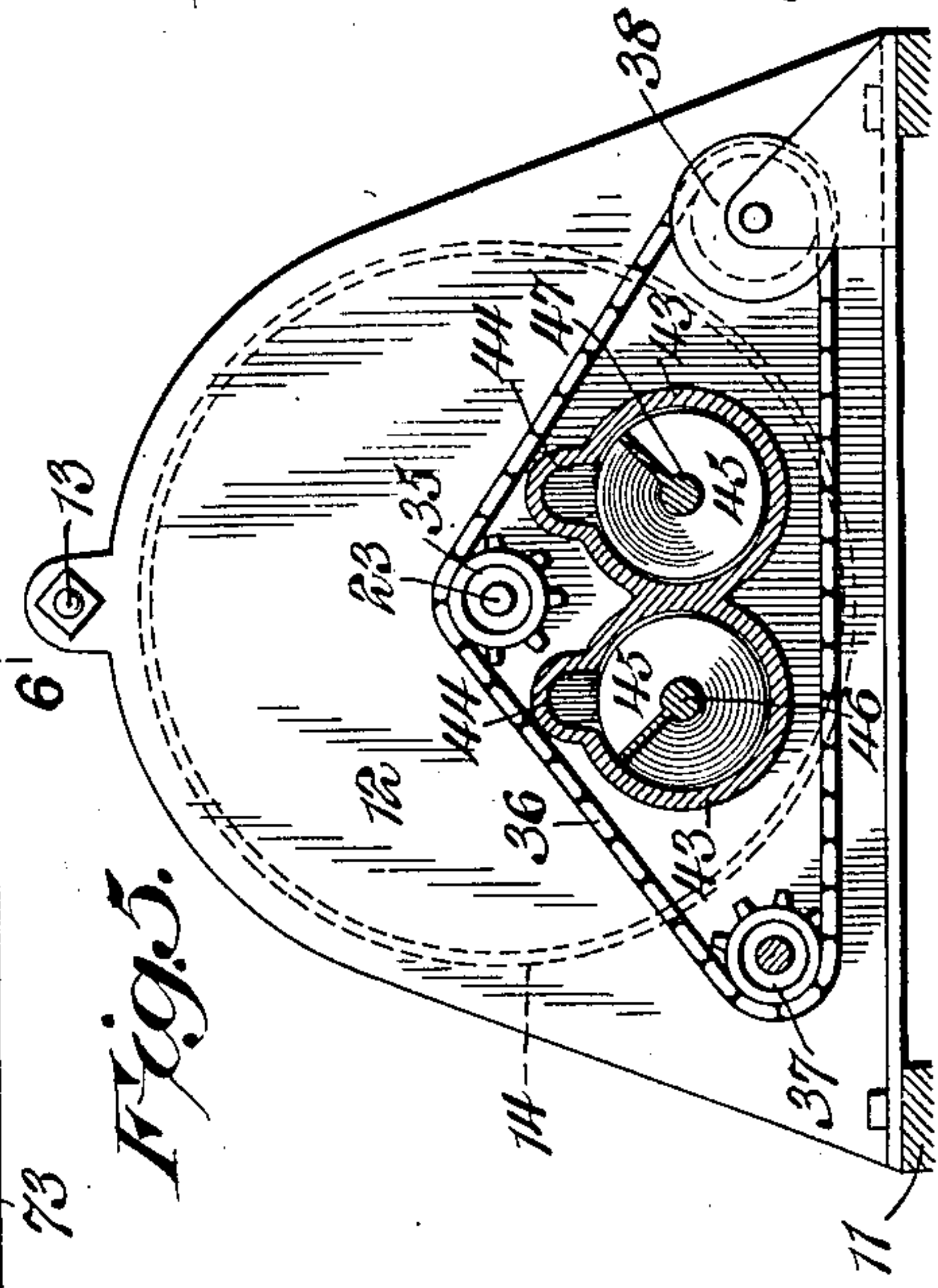


Fig. 5.

Witnesses
Howard D. Carr.
Bl. Fetter.

L. A. Thomas, Inventor,
By C. G. Siggers, Attorney

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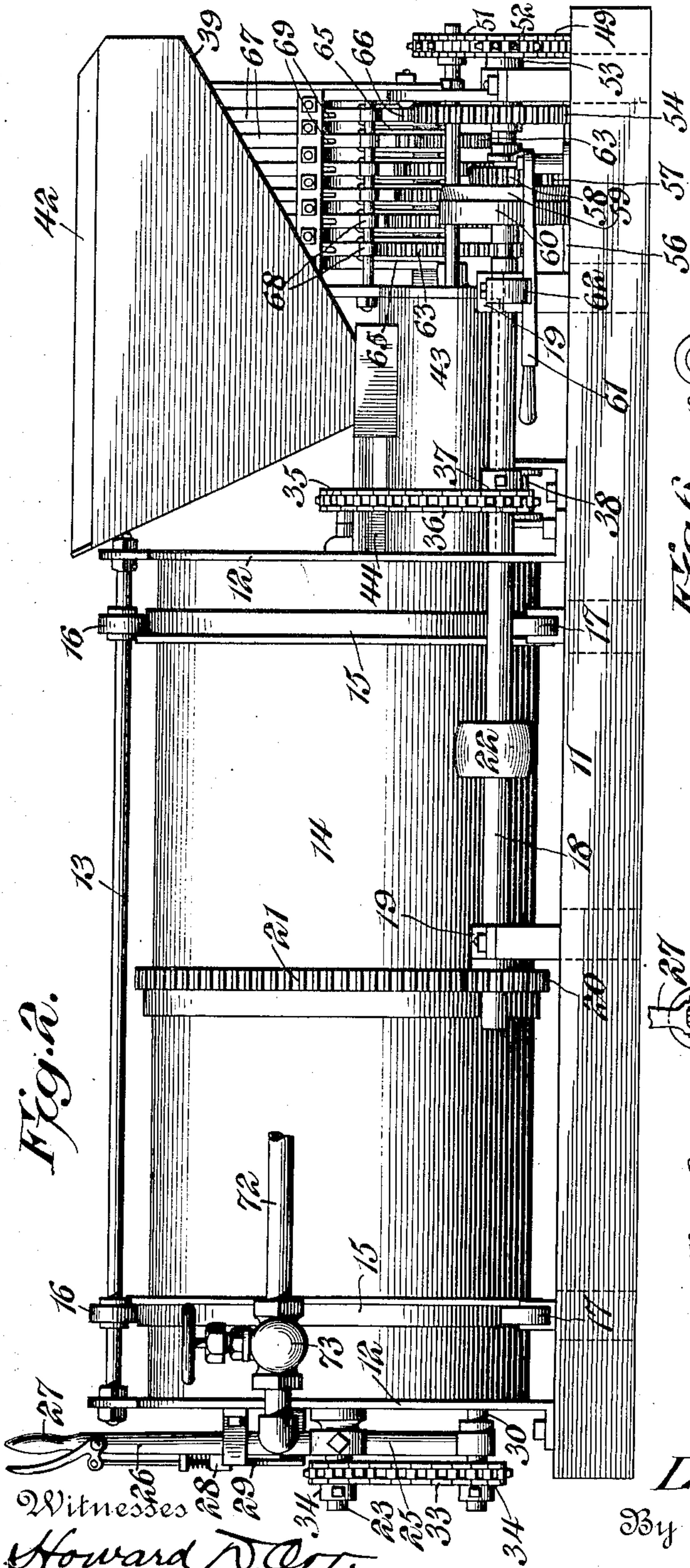


Fig. 2.

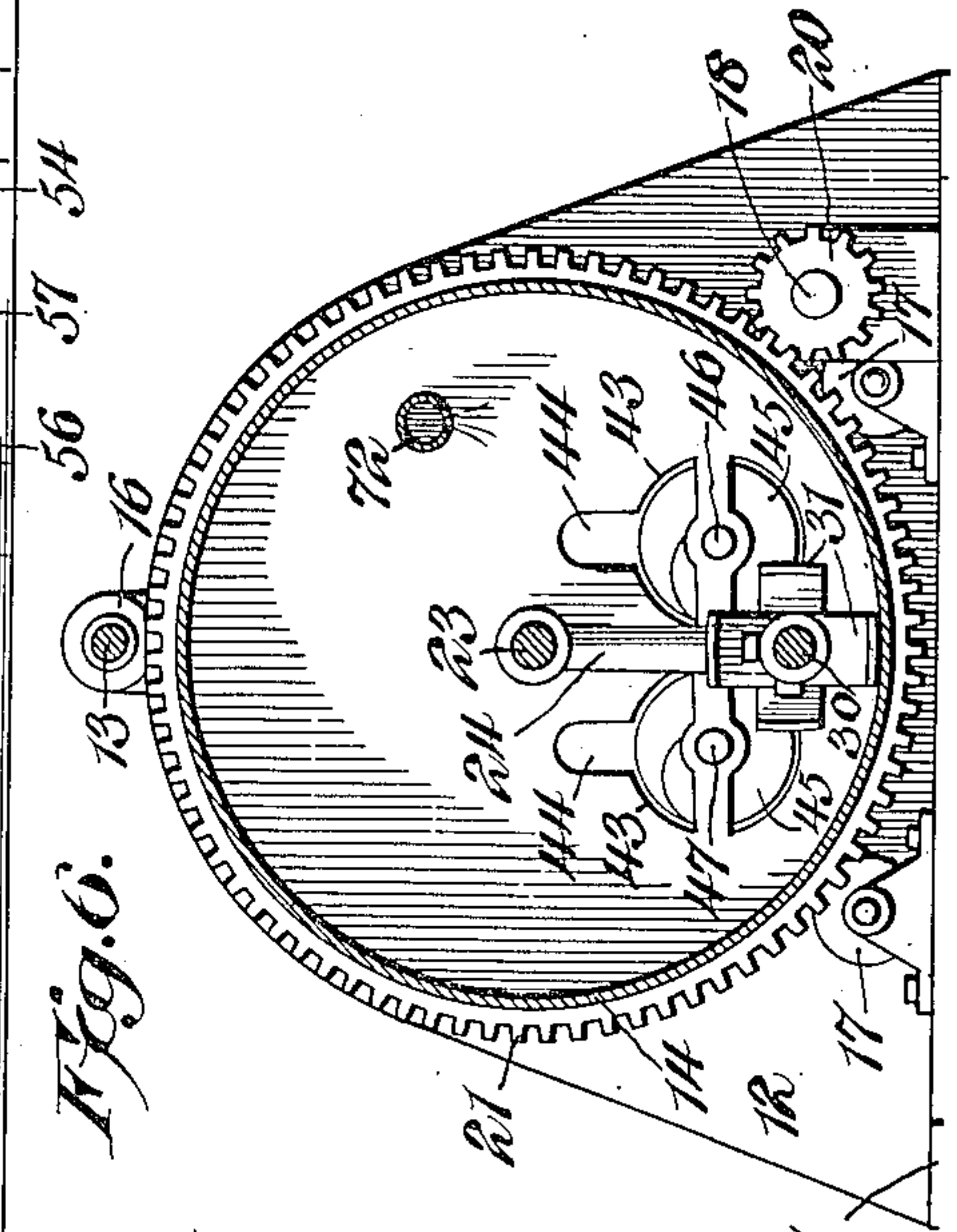


Fig. 3.

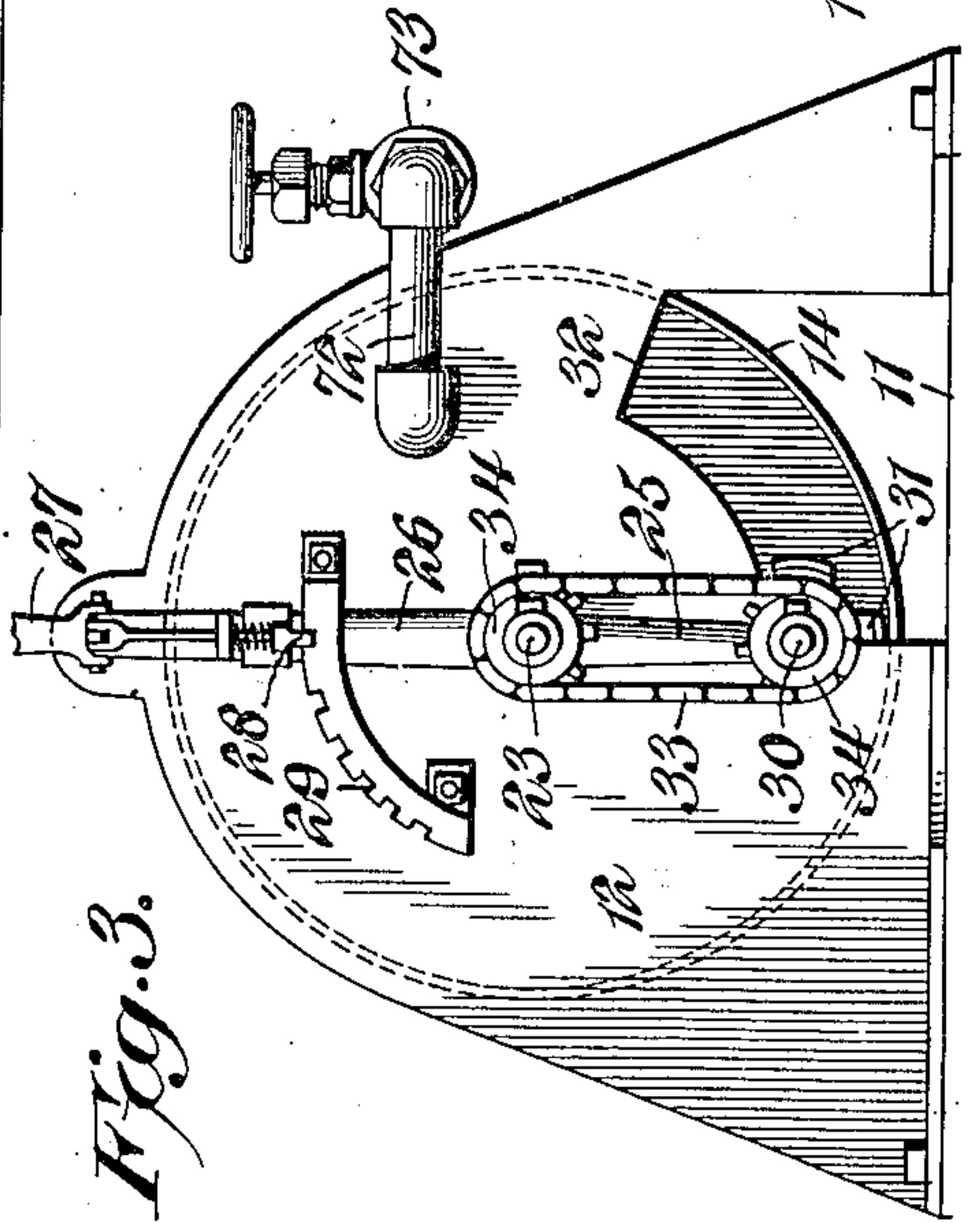


Fig. 4.

Witnesses
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3 SHEETS—SHEET 3.

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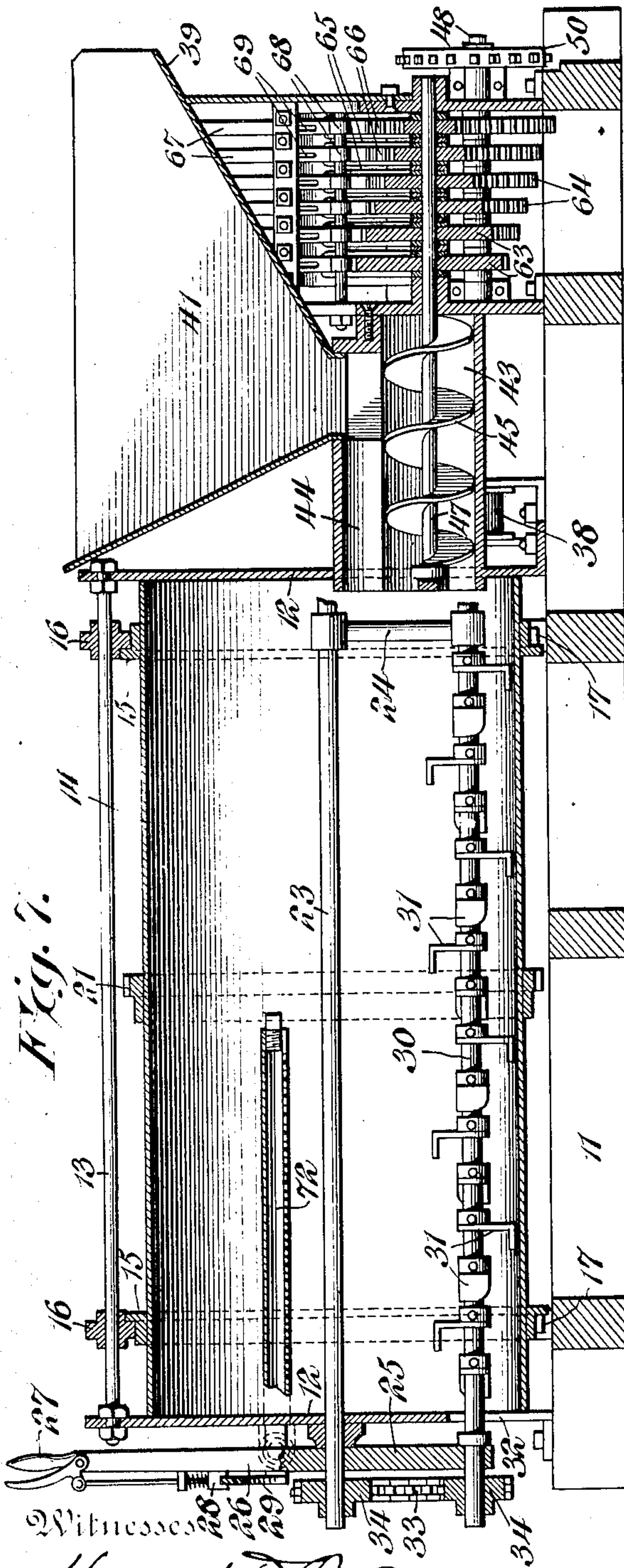


Fig. 7.

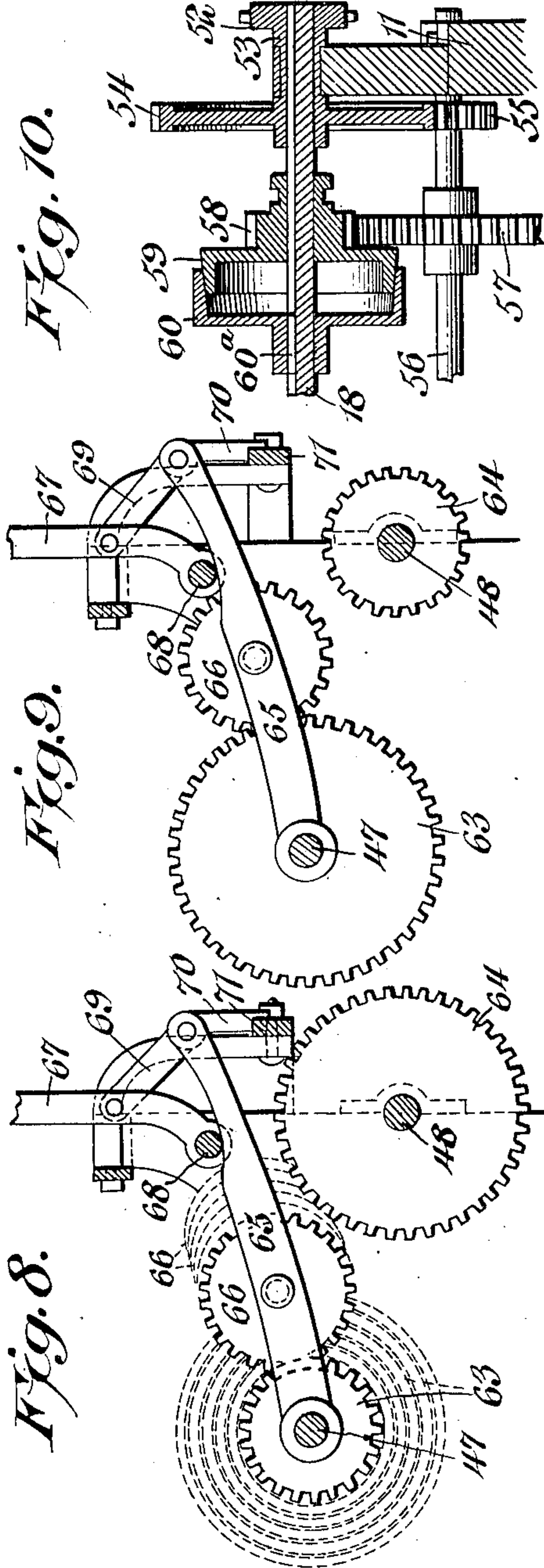


Fig. 10.

Fig. 9.

Fig. 8.

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UNITED STATES PATENT OFFICE.

LOUIE A. THOMAS, OF AURORA, IOWA.

MIXER.

No. 918,394.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed May 14, 1907. Serial No. 373,529.

To all whom it may concern:

Be it known that I, LOUIE A. THOMAS, a citizen of the United States, residing at Aurora, in the county of Buchanan and State of Iowa, have invented a new and useful Mixer, of which the following is a specification.

This invention relates to means for mixing concrete and other cementitious or analogous material.

10 The primary object is to provide simple means of a novel nature, whereby the proportions of the material may be readily altered at any time without stopping or interfering with the operation of the machine.

15 A further and important object is to provide means which will feed the material to the mixing mechanism, and will pass large lumps and masses without injuring or breaking the feeding means.

20 A still further object is to provide novel and effective stirring mechanism, which can be adjusted and held in different positions in order that the highest degree of efficiency can be secured.

25 The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of the machine. Fig. 2 is a side elevation of the same. Fig. 3 is an elevation of the delivery end of the machine. Fig. 4 is an elevation of the intake end. Fig. 5 is a cross sectional view on the line 5—5 of Fig. 1. Fig. 6 is a cross sectional view on the line 6—6 of Fig. 1. Fig. 7 is a longitudinal sectional view through the machine. Fig. 8 is a detail section showing one of the sets of gears of the speed varying mechanism. Fig. 9 is a similar view showing another set of gears. Fig. 10 is a detail sectional view on the line 10—10 of Fig. 1.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a suitable bed-frame 11 is employed, on which are mounted spaced end walls 12 connected by a tie rod 13. Between the end walls is located an open ended rotatable mixing drum 14, the open ends of which are closed by the walls 12. Said drum is provided with peripheral flanged tracks 15; and guide rollers 16, journaled on the tie rods 13, operate on these tracks. Other rollers 17, mounted on the bed of the machine, also engage the tracks 15. A driving shaft 18 is journaled in boxes 19

carried by the bed-frame, and has a pinion 20 in mesh with a gear ring 21 fixed to an intermediate portion of the drum. The shaft 18 is driven from any suitable source of power connected thereto by belting or other gearing, a belt pulley being shown at 22.

A supporting shaft 23, journaled in the end walls 12, passes centrally through the drum, and depending from said shaft, are links 24 and 25, the link 25 constituting one arm of a lever 26. The lever has a suitable handle grip 27 at its upper end, and it is adapted to be held in different positions by a dog 28 carried thereby and engaging with the teeth of a rack 29 suitably fixed to the adjacent end wall. A stirrer shaft 30 is journaled in the lower ends of the links 24—25, and is thus disposed at one side of the axis of rotation of the drum. This stirrer shaft, as shown in Fig. 7, extends longitudinally within the drum, contiguous to the walls thereof, and has secured thereto stirrer blades 31, which cooperate with said walls. The rear end of the shaft extends through a discharge opening 32 formed in the rear end wall 12, and this opening, as shown in Fig. 3, is of considerable extent. It will also be observed by reference to Fig. 3 and to Fig. 7 that the lever is located outside the drum, and that the projecting ends of the shafts 23 and 30 are geared together, by a sprocket chain 33, which passes around sprocket wheels 34 secured to said shafts. The opposite end of the supporting shaft 23 projects through the other end wall 12, and carries a sprocket wheel 35 around which passes a sprocket chain 36, this chain passing around another sprocket wheel 37 fixed to the driving shaft 18. The sprocket chain 36 furthermore passes around a suitable idler 38 located on the opposite side of the machine.

A hopper 39 is located at one end of the mixing mechanism, and is divided into compartments 40 and 41 by an intermediate partition 42. The bottoms of the compartments 40 and 41 communicate with the upper sides of conduits 43, having discharge ends that extend through the adjacent end wall 12, as shown in Fig. 7. These conduits are substantially circular in cross section, but have upstanding portions forming inclosed relief channels 44. Feed screws 45 operate in the conduits, and have shafts 46 and 47 projecting therefrom. A third shaft 48 is disposed alongside the shaft 47.

A driving sprocket chain 49 passes around a wheel 50 fixed to the third shaft 48 and also around a sprocket wheel 51 fixed to the screw shaft 46. This sprocket chain is also engaged with a sprocket wheel 52 fixed to a sleeve 53 that is loosely journaled on the driving shaft 18, and has a gear wheel 54 fixed to it, as shown in Fig. 10. The gear wheel 54 meshes with a pinion 55 on a countershaft 56, and said shaft carries another gear wheel 57 meshing with a pinion 58 that is fixed to a clutch member 59, also loosely journaled on the driving shaft 18. A cooperating clutch member 60 is fixed by a key 60^a to said driving shaft. The clutch member 59 is slidable longitudinally upon the shaft 18, this sliding movement being controlled by a suitable hand lever 61 adapted to be locked by a latch 62. It will thus be evident that the driving chain 49 can be clutched to or unclutched from the driving shaft 18, and its movement thus controlled independently of the mixing mechanism.

The screw shaft 47 is driven from the third shaft 48 by speed varying mechanism, and this mechanism is preferably constructed as follows. A set of gear wheels 63 of different diameters is secured to the shaft 47, and a set of oppositely arranged gear wheels 64 is fixed to the adjacent third shaft 48. Swinging arms 65 are mounted on the shaft 47, and journaled on said arms are idlers 66 that are in mesh with the gears 63. These arms are capable of independent swinging movement, and consequently if one set is moved downwardly, the idler gear 66, carried thereby, will be moved into mesh with the corresponding gear 64 of the shaft 48. On the other hand, when the arms 65 are raised, the idlers 66 will be out of mesh with the gears 64. The movements of the different arms are controlled by levers 67 fulcrumed at their lower ends, as shown at 68 and having link connections 69 with the outer ends of such arms 65. Holding dogs 70, pivoted to the outer ends of the arms and links are arranged to bear upon a rest bar 71, when the arms are elevated, and thus maintain them in their elevated position. At the same time, it will be evident that by swinging any one of the dogs 70 away from the rest bar, the arms supported thereby, can be lowered, thus carrying the idler 66 thereof into mesh with its coacting gear 64.

The operation of the machine briefly described is as follows: The sand and cement or other materials to be mixed are separately placed in the hoppers 40 and 41. If now, power is applied to the shaft 18, it will be evident that the drum 14 and the stirrer will be rotated. Furthermore if the clutch member 59 is thrown into coaction with the clutch member 60, the driving sprocket chain 49 will also be operated. Therefore inasmuch as the shaft 46 is geared thereto,

this shaft with its screw will be rotated. The sand or gravel is preferably placed in the hopper 40, and will be fed by the screw 45 into the mixer. The cement is placed in the hopper 41 and the proportion thereof to the sand, gravel or the like can be readily altered by swinging any one of the levers 67 downwardly. Thus for instance if the first lever 67, as shown in Fig. 8 is swung downwardly, a comparatively large driving gear 64 will operate a small driven gear 63 on the screw shaft 47, and the speed of such screw will be substantially that of the screw 45. On the other hand, if the lever at the opposite end of the set is depressed, then, as shown in Fig. 9, a small driving gear 64 will operate upon a large driven gear 63, and as a consequence, the screw will be rotated at a much slower rate of speed. The material fed through the conduits 43 will be delivered into the drum, and all large masses, such as lumps of cement, stones, and the like, which would be apt to clog and break the screws will be forced into the channels 44 and thus find their way into the mixing drum without injuring such screws. The material in the drum is first subjected to a dry mixing action by the stirrer blades 31 in the adjacent end, but as the material passes along through the drum, water is sprayed thereupon through a pipe 72 that extends longitudinally into the rear end of the drum from any suitable source of supply, the flow being controlled by a valve 73. During its passage through the drum therefore, the material is thoroughly mixed so that when it finally reaches the discharge opening 32, it is in condition to be used. The position of the stirrer it will be observed can be readily altered by swinging the lever 26 and locking it by means of the dog 28 and rack 29. Thus said stirrer can be located at a point where it will operate with the highest degree of efficiency.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In mechanism of the character set forth, the combination with mixing mechanism, of feed screws located side by side and delivering to the mixing mechanism, driving mechanism connected to one feed screw, a gear wheel operated by said driving mechanism, another gear wheel connected to the other feed screw, a swinging arm having its

axis of movement substantially coincident with the axis of one of the gear wheels, an idler journaled on the arm and meshing with said gear wheel, said idler being movable into and out of mesh with the other gear wheel on the movement of the arm, and means for holding the arm in a predetermined position.

2. In mechanism of the character set forth, the combination with a mixing drum, of a hopper located in spaced relation to one end of the drum, of a feed conduit leading from the bottom of the hopper to one end of the drum and being substantially circular in cross section, said conduit having a covered channel in its upper side that is of less width than the conduit and communicates with the hopper and the drum, and a feed screw located in the conduit and having its upper side below the channel.

3. In mechanism of the character described, the combination with spaced stationary end walls, of a tie rod connecting the end walls, a rotary mixing drum located between the end walls, guide rollers for the drum journaled on the tie rod, means for rotating the drum, and means for feeding material into one end of said drum.

4. In mechanism of the character set forth, the combination with a mixing drum, of a rotary stirrer located in the drum at one side of its axis, means for rotating the stirrer, and means for moving the stirrer to different positions in the drum while maintaining said stirrer in coaction with the means for rotating it.

5. In mechanism of the character set forth, the combination with a mixing drum, of a rotary stirrer located in the drum at one side of its axis, means for rotating the stirrer, and means for securing the stirrer at different positions about the axis of the drum while maintaining the stirrer in coaction with the means for rotating it.

6. In mechanism of the character described, the combination with a rotary drum, of a shaft extending longitudinally therein, another shaft hung from the first shaft and having stirring means, said first shaft being freely rotatable in and with respect to the hanging means, means for rotating the drum, and means for rotating said second shaft.

7. In mechanism of the character described, the combination with a rotary drum, of a shaft extending longitudinally therein, another shaft loosely hung from the first shaft and having stirrer blades, gearing connecting the shafts, means for rotating the drum, and means for rotating the first shaft to thereby effect the rotation of the second shaft.

8. In mechanism of the character described, the combination with a rotary drum, of a shaft extending longitudinally therein, another shaft hung from the first shaft and

adjustable with respect thereto, said second shaft having stirring means, and means for rotating the drum and effecting the rotation of the second shaft.

9. In mechanism of the character described, the combination with a rotary drum, of a shaft extending longitudinally therein, rotary stirring mechanism loosely suspended from the shaft and permitting the free rotation of said shaft, and means for rotating the stirring mechanism.

10. In mechanism of the character set forth, the combination with a supporting shaft, of a drum mounted thereon, links depending from the shaft, a stirrer journaled in the links, means for swinging the links, and means for rotating the stirrer.

11. In mechanism of the character set forth, the combination with a supporting shaft, of a rotary drum surrounding the same, swinging links depending from the shaft, a stirrer shaft journaled in the links and located in the drum at one side of its axis of rotation, stirrer blades carried by the stirrer shaft, gearing connecting the supporting shaft and stirrer shaft, and means for rotating the drum and the supporting shaft.

12. In mechanism of the character set forth, the combination with a rotary drum, of a supporting shaft extending centrally therethrough, links depending from the supporting shaft, one of said links constituting a lever, means for holding the lever in different positions, a stirrer shaft journaled in the links and located longitudinally in the drum at one side of its axis of rotation, stirrer blades carried by the stirrer shaft and coacting with the walls of the drum, gearing connecting the supporting shaft and stirrer shaft, a driving shaft, gear connections between the driving shaft and drum, and gear connections between the driving shaft and supporting shaft.

13. In mechanism of the character set forth, the combination with spaced end walls, of tie rods connecting the end walls, a rotary drum located between the end walls, guide rollers for the drum mounted on the tie rods, a supporting shaft extending centrally through the drum, links depending from the supporting shaft, a stirrer located in the links, means for swinging the links and stirrer and holding them in different positions, gearing connecting the stirrer and supporting shafts, a driving shaft, gear connections between the driving shaft and drum, a sprocket chain driven by the driving shaft and connected to the supporting shaft, a hopper having separate compartments, conduits leading from the compartments, and delivering into the drum through one of the end walls, said conduits having longitudinal relief channels, screws operating in the conduits and having shafts projecting therefrom, a driving sprocket chain, a gear connecting

said chain to the driving shaft, said gearing including a clutch, gearing connecting the chain and one of the screws, and gearing connecting the chain and the other screw, said
5 latter gearing including speed varying mechanism.

In testimony, that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

LOUIE A. THOMAS.

Witnesses:

W. L. FRY,
FLORENCE WEEKS.