No. 888,198.

PATENTED MAY 19, 1908.

G. J. STAFFORD.

CONCRETE MIXER.

APPLICATION FILED AUG. 3, 1907.

8 SHEETS—SHEET 1.

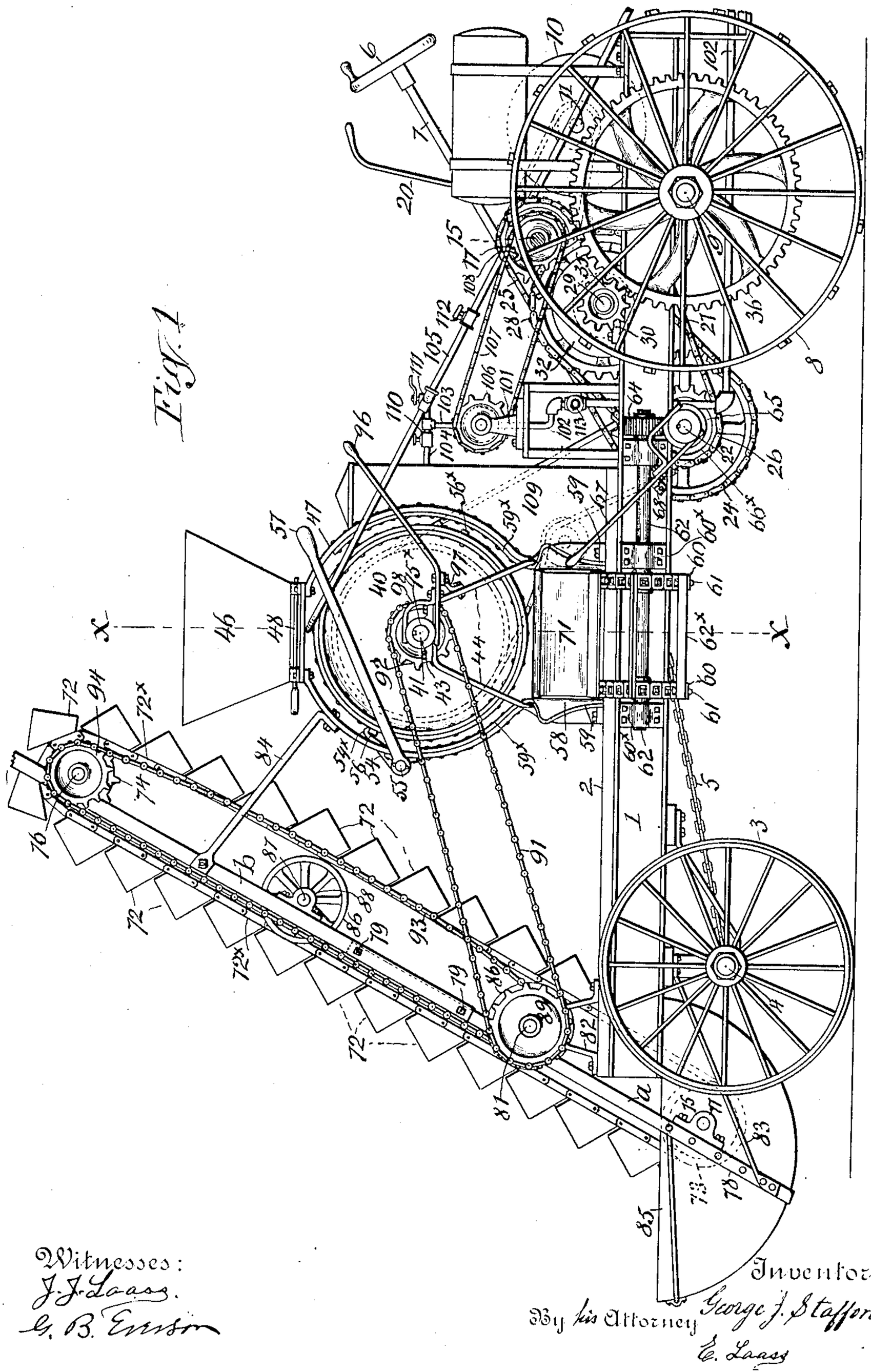


Fig. 1.

Witnesses:
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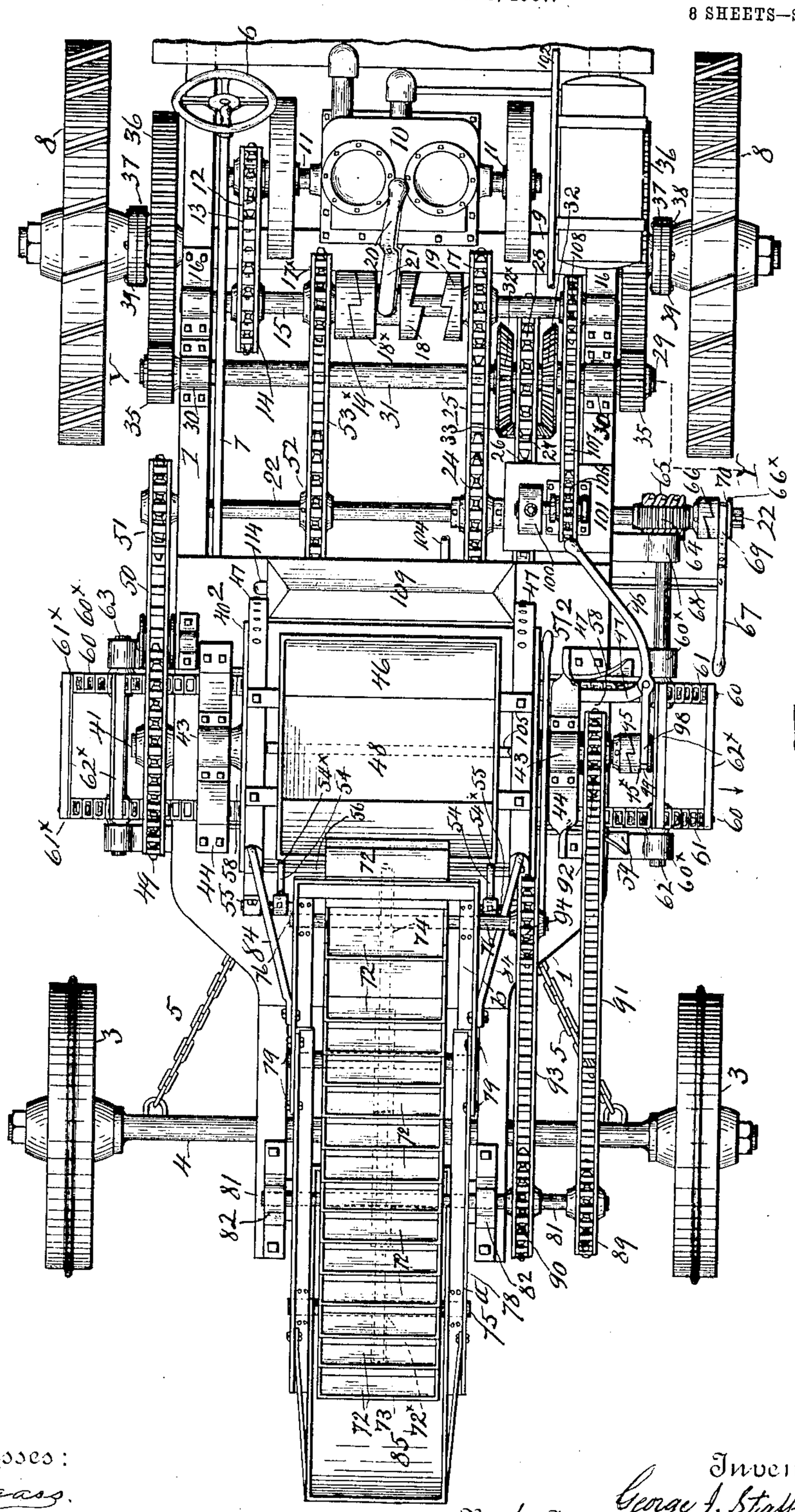


Fig. 2

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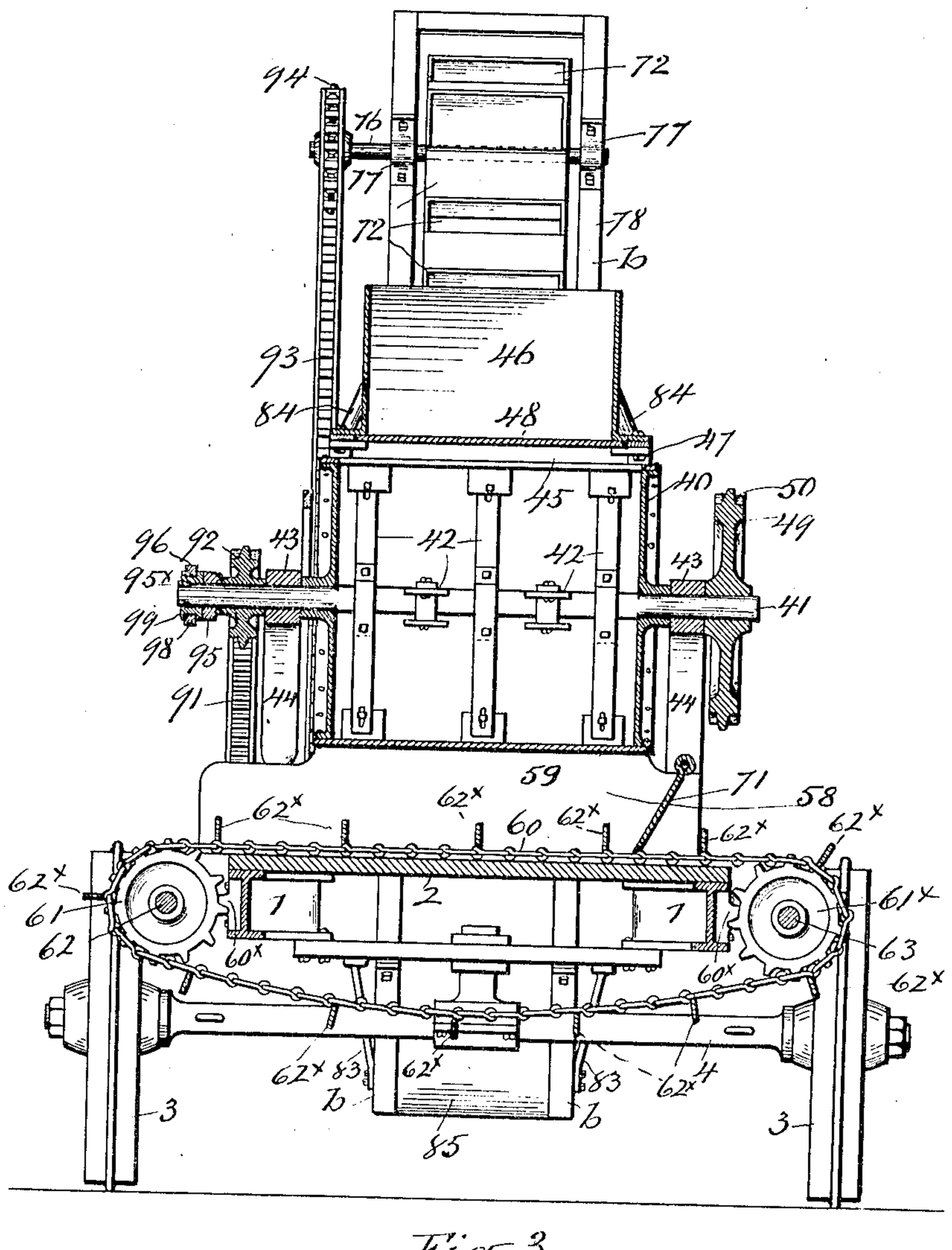


Fig. 3

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8 SHEETS—SHEET 4.

Fig. 4.

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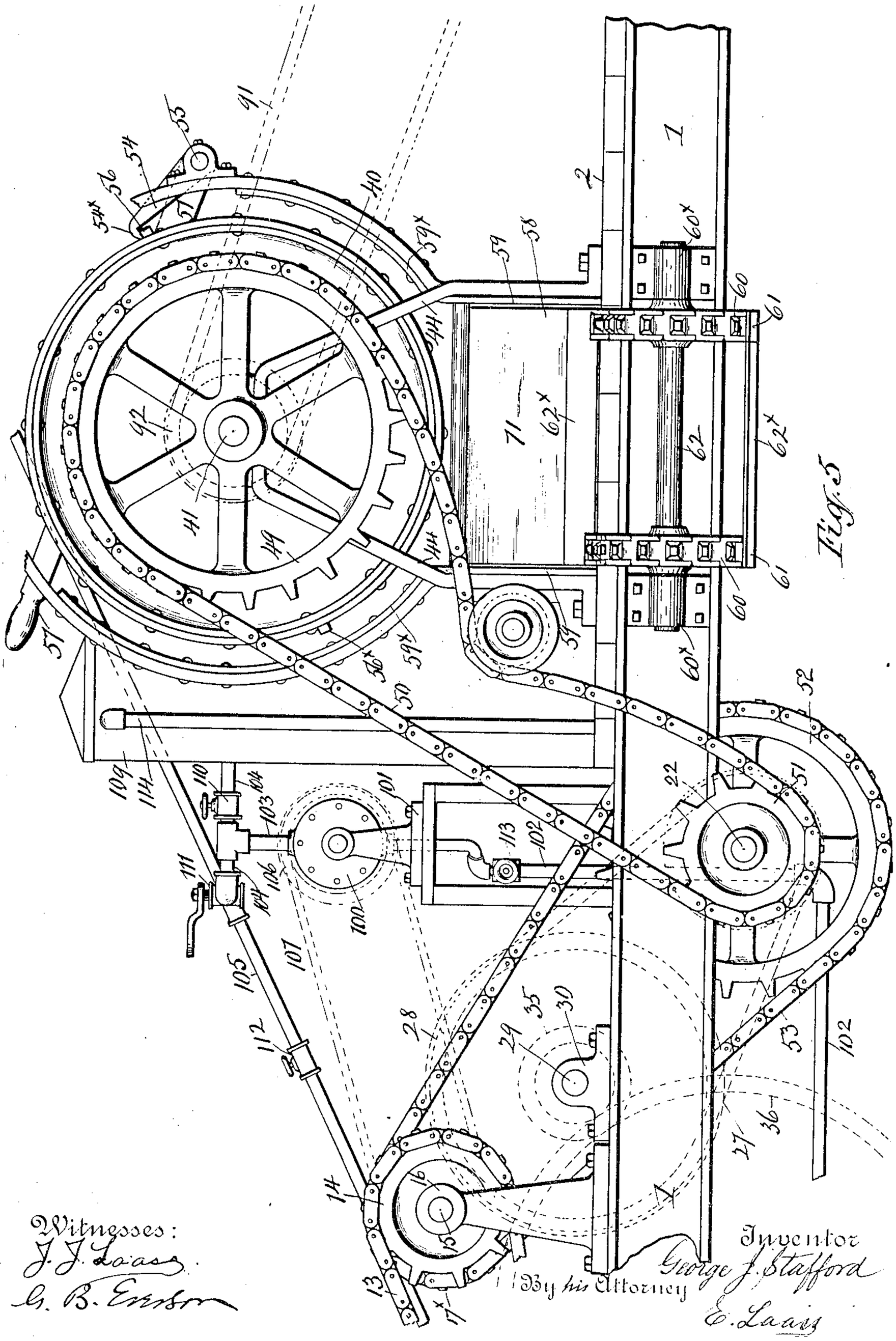


Fig. 5

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8 SHEETS—SHEET 6.

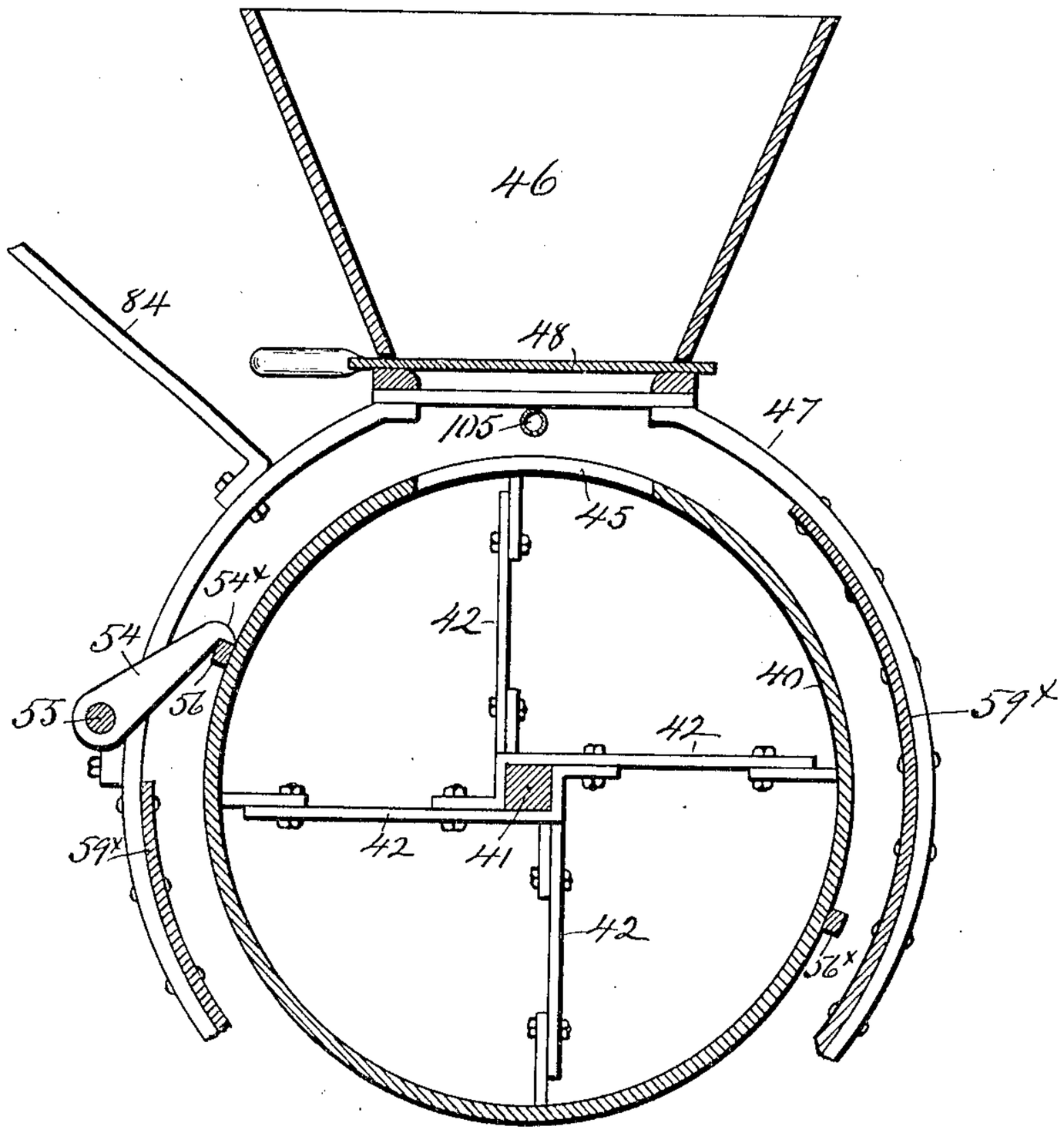


Fig. 6

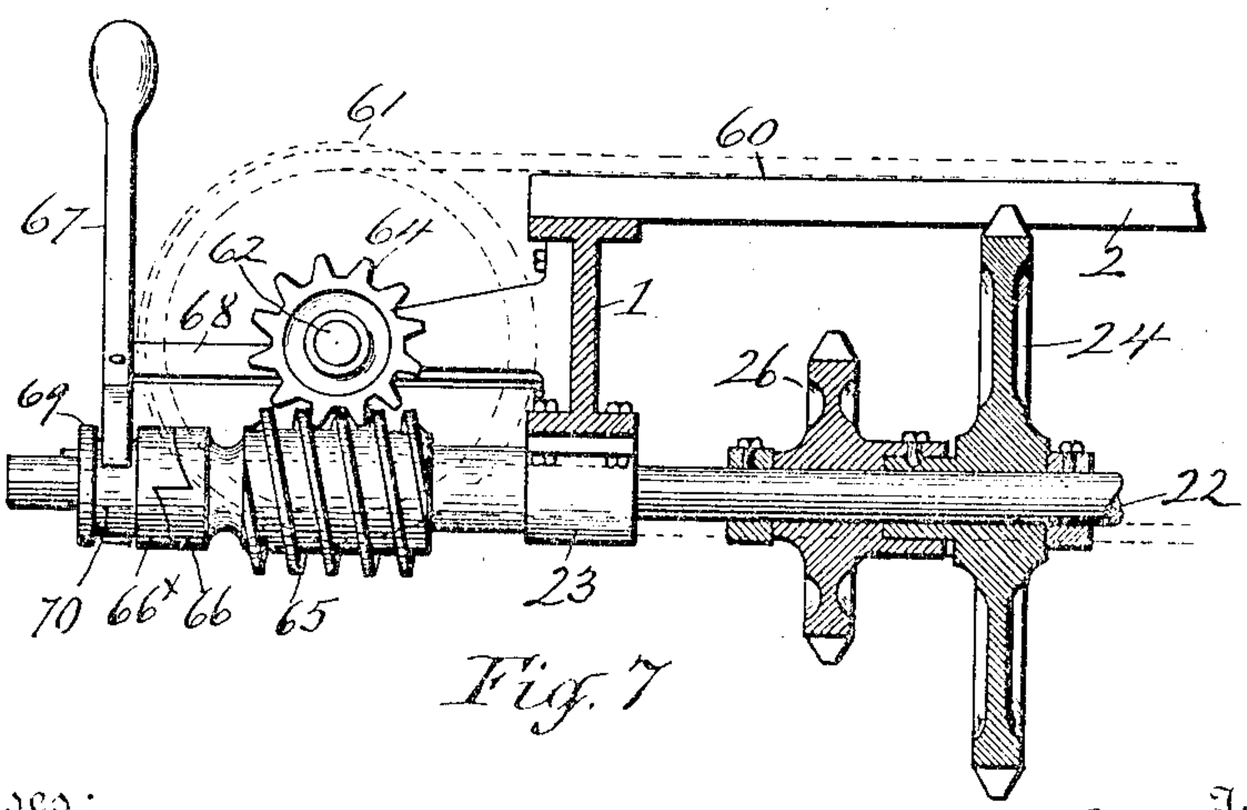


Fig. 7

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8 SHEETS—SHEET 7.

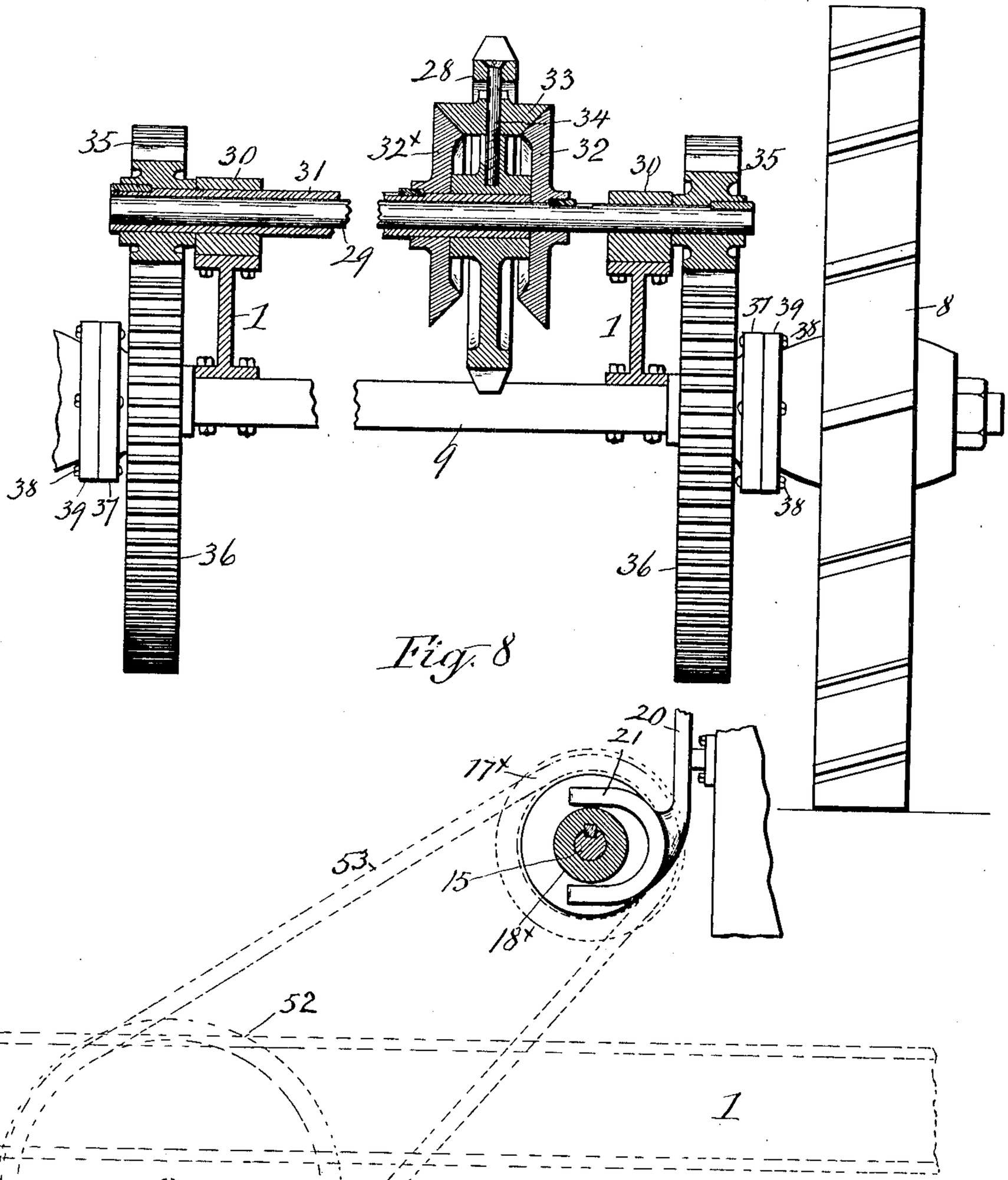


Fig. 8

Fig. 9

Witnesses:
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APPLICATION FILED AUG. 3, 1907.

8 SHEETS—SHEET 8.

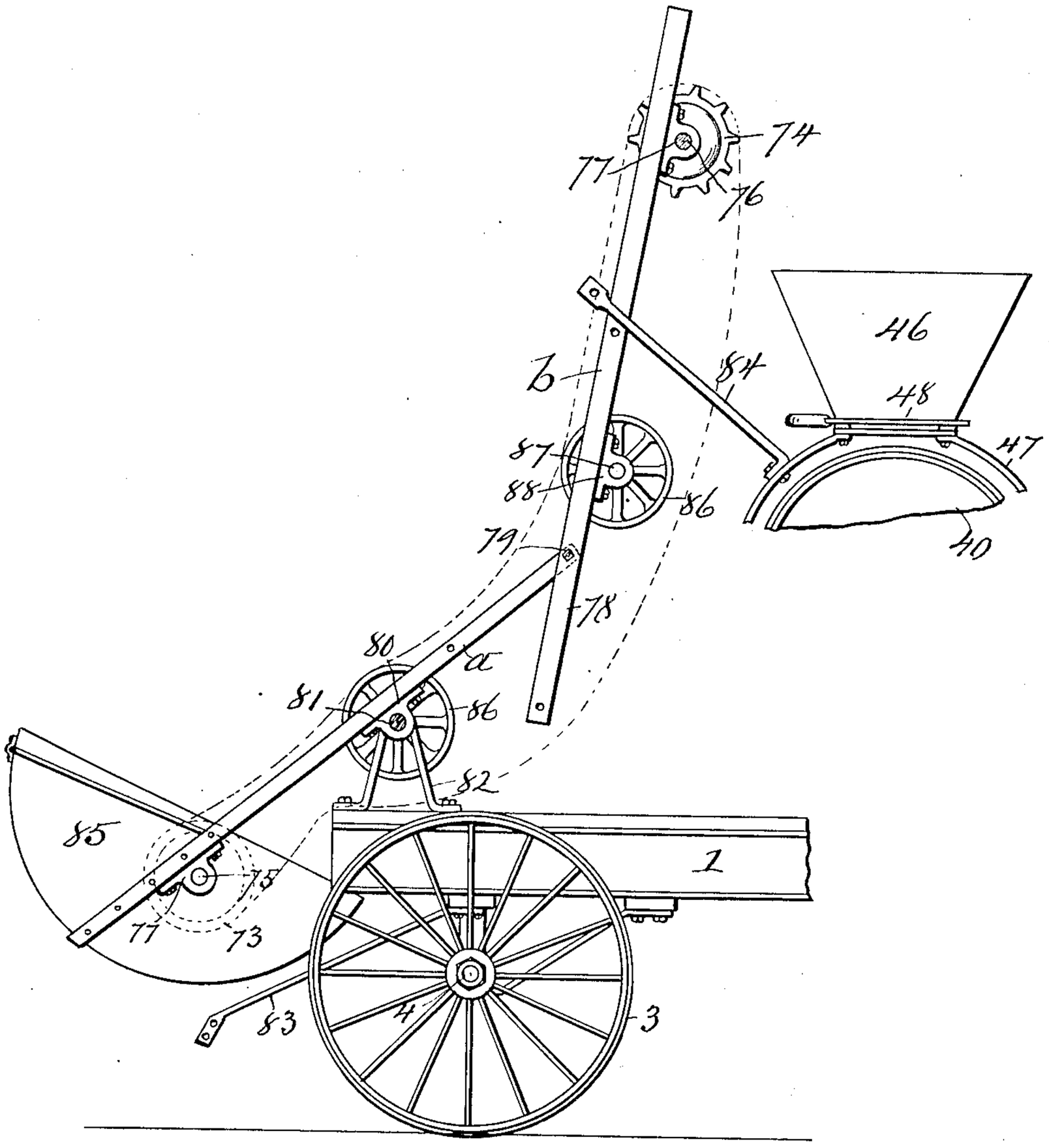


Fig. 10

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE J. STAFFORD, OF McGRAW, NEW YORK.

CONCRETE-MIXER.

No. 888,198. Specification of Letters Patent. Patented May 19, 1908.

Application filed August 3, 1907. Serial No. 386,879.

To all whom it may concern:

Be it known that I, GEORGE J. STAFFORD, a citizen of the United States, and resident of McGraw, in the county of Cortland, in the State of New York, have invented new and useful Improvements in Concrete-Mixers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to portable concrete-mixing machines.

The chief object of the invention is to produce a machine which shall be strong and durable in construction, efficient and reliable in its operation, and at the same time can be easily and conveniently controlled.

Other objects will be apparent from the novel arrangement and combination of the component parts of the machine hereinafter fully described and set forth in the claims.

In the accompanying drawings Figure 1 is a side elevation of a traction concrete-mixing machine embodying my invention; Fig. 2 is a plan view of the same; Fig. 3 is a vertical section on the line —X—X— in Fig. 1; Fig. 4 is an enlarged detail side view showing the mechanism which transmits motion to the rear carrying-wheels of the truck and also showing the mechanism which operates the discharge conveyer; Fig. 5 is an enlarged view of a portion of the machine taken at the opposite side and showing the mechanism which rotates the shaft of the mixing-blades; Fig. 6 is an enlarged vertical sectional view of the mixing-drum and hopper; Fig. 7 is an enlarged detail view of the worm and pinion forming part of the mechanism which drives the discharge-conveyer, and showing the clutch for throwing the same into and out of operation; Fig. 8 is an enlarged transverse section on the line —Y—Y— in Fig. 2 and illustrating the differential gear forming part of the mechanism which drives the rear carrying-wheels; Fig. 9 is an enlarged transverse section of the clutch employed for throwing in and out of operation the mechanisms which drive the mixing-apparatus and carrying-wheels of the truck; and, Fig. 10 is a detail side-view of the front end portion of the machine and illustrating the collapsible frame of the loading conveyer.

Referring to the drawings, —1— denotes the frame of the truck, which frame preferably comprises a pair of metal I-beams and is provided throughout a portion of its length with a platform —2—.

—3—3— denotes the front or steering-wheels of the truck, the axle —4— thereof being connected to the frame in any convenient manner. The steering may be effected by any suitable mechanism, said mechanism preferably comprising the usual chains —5—5— connected at one end to the opposite end portions of the axle, the other ends of the chain being connected to the usual transverse shaft (not shown) and oppositely wound thereon. This shaft is rotated by a hand-wheel —6— and shaft —7— commonly employed in traction-machines.

—8—8— denote the rear wheels, the axle —9— of which is secured to the undersides of the beams of the frame as shown in Fig. 8.

—10— denotes an engine of any suitable type and which may be mounted on the frame in any convenient manner. The engine is placed with its shaft —11— extending transversely in relation to the frame, and to said shaft is secured a sprocket-wheel —12— connected by a chain —13— to a sprocket-wheel —14— secured to a counter-shaft —15— journaled in boxes —16—16— mounted upon the frame —1—. On the counter-shaft —15— are loosely mounted two sprocket-wheels —17—17$^{\times}$—, the former being included in the mechanism for driving the rear or traction-wheels —8—8—, and the other forming a part of the mechanism for operating the mixing-apparatus as will be shortly explained. Between the sprocket-wheels —17—17$^{\times}$— is disposed a clutch employed for throwing the same into and out of operative connection with the shaft —15—. This clutch may be of any suitable construction, but preferably comprises a pair of integrally formed collars —18—18$^{\times}$— having a spline and groove-connection with the shaft and adapted to be shifted into and out of engagement with the collars —19—19$^{\times}$— secured respectively to the sprocket-wheels —17—17$^{\times}$—. This shifting of the collars —18—18$^{\times}$— is effected by means of a suitably supported hand-lever —20— which is provided with a yoke —21— embracing the hub of the collars and disposed between the said collars as clearly shown in Figs. 2 and 9.

Disposed parallel with and in front of the counter-shaft —15— is a shaft —22— journaled in suitable boxes —23—23— secured to the bottom of the frame —1— and on this latter shaft is loosely mounted a sprocket-wheel —24— connected by a chain —25— to the aforesaid sprocket-wheel —17— on the

shaft —15—. Upon the shaft —22— is also loosely mounted a sprocket-wheel —26— which is suitably fastened to the sprocket-wheel —24—, the former being connected by a chain —27— to a sprocket-wheel —28— mounted upon a shaft —29— disposed between the shafts —15— —22— and journaled in boxes —30—30— secured on top of the frame —1—. The shaft —29— is employed for transmitting power to the rear-wheels —8—8— of the truck and therefore, I provide the same with a differential-gear which may be of any suitable construction and arranged in various ways. In the present instance the shaft —29— is provided with a loose sleeve —31— extending from one end thereof for a portion of its length, and upon the inner end of the sleeve is loosely mounted the aforesaid sprocket-wheel —28—.

The differential-gear comprises two bevel-gears —32—32ˣ— which are keyed respectively to the shaft —29— and its sleeve —31—, and a beveled-pinion —33— journaled on a shaft —34— extending radially from the hub of the sprocket-wheel —28— as shown in Fig. 8. This shaft —34— may be fastened in any convenient manner to the sprocket-wheel.

To opposite ends of the shaft —29— and sleeve —31— are secured respectively pinions —35—35— which mesh with gears —36—36— mounted on the rear axle —9—, said gears having their hubs formed with flanges —37—37— which are secured by means of bolts —38—38— to similar flanges —39—39— formed on the hubs of the rear or traction-wheels —8—8— as clearly shown in Fig. 8.

The concrete-mixing apparatus comprises a horizontally disposed cylindrical drum —40— mounted on a revoluble shaft —41— and a set of blades or paddles —42—42— which are secured rigidly to said shaft and extend radially therefrom. This shaft is journaled at its ends in boxes —43—43— supported upon brackets —44—44— mounted upon the platform —2— of the frame —1—, each of which brackets consists preferably of a pair of upwardly converging arms suitably united at their upper ends and having their lower ends bolted or otherwise fastened to the aforesaid platform.

The drum —40— is provided in its upper portion with an opening —45— and above the drum is disposed a hopper —46— for receiving the various well known materials to be used for the concrete. This hopper is mounted upon a suitable frame —47— which may be supported upon the platform —2— in any convenient manner. The hopper has an open bottom and is provided thereat with a manually operated gate —48— which is normally closed and is operative for depositing the materials into the drum to subject the said materials to the action of the mixing-blades —42—42—. These blades may be of various constructions and may be secured to the revoluble shaft —41— in any suitable manner. The mechanism which rotates the shaft —41— comprises a sprocket-wheel —49— secured to the shaft at the right-hand side of the machine and connected by a chain —50— to a smaller sprocket-wheel —51— secured to the shaft —22—, said shaft —22— having secured to it another spocket-wheel —52— connected by a chain —53— to the sprocket-wheel —17ˣ— which is loosely mounted upon the shaft —15— as hereinbefore stated.

To prevent the drum from normally rotating with the mixing-blades, I provide a manually controlled lock therefor, which may be of any suitable and convenient style, however, this lock preferably consists of an arm —54— which is secured to a transverse rock-shaft —55— and is formed with a hook —54ˣ— adapted to engage a projection —56— secured to the outer periphery of the drum as clearly shown in Figs. 1 and 5. The arm —54— is actuated to disengage its hook —54ˣ— from the projection —56— by means of a lever —57— fastened to the shaft —55— for rocking the latter. The lever is arranged so as to allow it to be conveniently operated by an attendant standing upon the platform —2—, and by its gravity the hook is held in locking position as illustrated in Fig. 1.

It will be understood that when the drum is unlocked, the friction revolving blades —42—42— and concrete on the inner periphery of the drum will cause the latter to be rotated with the said blades. In order to impart a one-half revolution to the drum, I provide the outer periphery of the drum with a projection —56ˣ— disposed diametrically opposite the aforesaid projection —56— and serving to engage the hook —54ˣ— of the arm —54— to limit the rotation of the drum. It is obvious that by thus rotating the drum, the concrete will be discharged through its opening —45—.

Below the drum is disposed a trough —58— extending across the platform —2— and into which the concrete is discharged. This trough is formed by providing two parallel plates —59—59— having upward extensions —59ˣ—59ˣ— by which they are secured to the hopper-supporting frame —47— as clearly shown in Figs. 1 and 5. Through the trough —58— travels an endless conveyer which is employed for delivering the concrete at one side of the truck. This conveyer preferably comprises a pair of parallel chains —60—60— each running over a pair of sprocket-wheels —61—61ˣ— secured respectively to longitudinal shafts —62—63— journaled in suitable boxes —60ˣ—60ˣ— mounted on opposite sides of the truck frame

—1— to which chains are secured a series of bars —62ˣ—62ˣ— which are adapted to scrape along the platform —2—. The said conveyer is driven by means of a pinion —64 —secured to the shaft —62— and meshing with a worm-gear —65— on the aforesaid shaft —22— as clearly illustrated in Figs. 4 and 7.

In order to allow the discharge-conveyer to be stopped and started independently over the mixing-apparatus, I mount the worm-gear loosely on the shaft —22— and provide a clutch for throwing the said gear into and out of operative connection with the shaft. This clutch consists of two members —66—66ˣ— of well known construction, the member —66— being rigidly secured to the worm-gear, and the other member adapted to slide longitudinally on the shaft so as to engage and discharge the other member. The clutch-member —66ˣ— has a spline and groove connection with the shaft —22— to permit the same to slide for the purpose stated and this sliding movement is effected by means of a hand-lever —67— which is pivoted to a suitable bracket —68— fastened to the frame —1—, said lever being preferably provided with a fork or yoke —69— engaging a circumferential groove —70— in the clutch-member as clearly shown in Fig. 7.

—71— denotes a guard disposed at the rear end of the trough —58— and consisting of an outwardly inclined plate hinged to the plates —59—59— and having its free edge resting upon the discharge-conveyer. This guard serves to prevent the concrete from falling out through the rear end of the trough.

At the front end of the truck is provided an elevated conveyer which is employed for loading the hopper. This loading-conveyer is of well known construction and comprises a set of the usual buckets —72—72— suitably fastened to an endless chain —72ˣ— traveling on a pair of sprocket-wheels —73——74— which are secured respectively to shafts —75—76— journaled in boxes —77—77— mounted on opposite ends of a rearwardly inclined frame —78—. The conveyer-frame —78— is preferably of rectangular shape and has its members composed of angle-bars, and it may be supported upon the truck in any suitable manner.

I prefer to form the frame of lower and upper sections —*a*—*b*— detachably united by means of bolts —79—79— and support the same in the manner shown in Fig. 10, in which it will be seen that the longitudinal members of the lower section —*a*— are provided with journal-boxes —80—80— by which the section is pivotally connected to a transverse shaft —81— mounted upon brackets —82—82— fastened to the top of the truck-frame —1—.

The bottom portion of the frame —78— is sustained by means of a pair of braces —83—83— extending from the side members of the lower section —*a*— to the underside of the truck-frame —1—. The top portion of the frame is sustained by a pair of braces —84—84— extending from the side-members of the upper section to the hopper-supporting frame —47— as clearly shown in Fig. 1.

By removing the lower bolt —79— of the conveyer-frame and disconnecting the braces —83—83—84—84—, the said frame is rendered collapsible as shown in Fig. 10, the conveyer being indicated by dotted lines. The collapsing of the frame is desirable in transporting the machine over rough roads for the reason that it guards against racking the frame and conveyer.

—85— denotes a box suitably supported on the lower end of the conveyer-frame for receiving the various materials to be used for the concrete, through which box the conveyer-buckets travel and thereby deliver the said materials to the hopper —46—.

Between the sprocket-wheels —73—74— are provided two pairs of wheels —86—86— upon which the buckets ride. The lower pair of wheels is mounted on the shaft —81— and the upper pair is mounted on a shaft —87—supported in journal-boxes—88—88— secured to the side-members of the upper frame-section —*b*—.

To transmit motion to the conveyer, I provide the shaft —81— with two sprocket-wheels —89— and —90—, the former being connected by a chain —91— to a sprocket-wheel —92— secured to the shaft —41— of the mixing-blades, and the other sprocket-wheel —90— is connected by a chain —93— to a sprocket-wheel —94— secured to the upper shaft —76— of the conveyer.

To control the operation of the loading conveyer, I provide a clutch for throwing the sprocket-wheel —92— into and out of connection with the shaft —41— of the mixing-blades. This clutch comprises two members —95—95ˣ—, the member —95— being rigidly fastened to the said sprocket-wheel and the member —95ˣ— being adapted to slide longitudinally upon the shaft —41— so as to engage and disengage the member —95—. To effect this sliding of the clutch-member —95ˣ— on the shaft, I employ the well known spline and groove-connection for said parts, and provide a hand-lever —96— pivoted to an arm —97— secured to one of the aforesaid brackets —44—, which lever is provided with a fork or yoke —98— engaging a circumferential groove —99— in the said clutch-member.

—100— denotes a rotary pump which is mounted upon a suitable support —101— and has connected to it a water-pipe —102— leading from any convenient supply-tank

(not necessary to be shown). From the said pump extends a pipe —103— connected to a pipe —104— communicating with a pipe —105— which extends upwardly and thence horizontally over the opening —45— of the drum—40—. This horizontal portion of the pipe —105— is perforated throughout its length so as to spray the water onto the materials during the mixing-operation. The pump may be operated by any suitable and convenient means driven by the engine, however I prefer to provide the shaft of the pump with a sprocket-wheel —106— which is connected by a chain —107— to a sprocket-wheel —108— secured to the counter-shaft —15— as shown in Figs. 1, 2 and 5.

—109— denotes a tank which is supported upon the platform —2— of the truck and has connected to it the pipe —104— whereby water may be pumped into said tank for storing. This pipe is provided with two valves —110—111—, the valve —110— being normally closed and the other valve being open when the water is pumped from the regular supply. The pipe —105— is provided with a normally closed valve —112— and the pipe —102— is provided with a normally open valve —113—. If it is found in operating the mixing-machine in some locations, that water can be obtained from a source under pressure, the pump may be disconnected, and a hose attached to the rear end of the pipe —105—. In this instance the valve —112— is opened and the valve —111— closed. It is obvious that the valve —110— is to be opened and the valve —111— closed during the filling of the tank. The said tank is provided with a conveniently arranged overflow pipe —114—. When it is necessary to pump water from the tank for supplying the mixing-drum, one end of a hose is inserted into the tank and the other end of the same is connected to the pipe —102—. In this instance the valve —110— in the pipe —104— is closed and likewise the valve —112— in the pipe —105—, while the valve —111— is open.

I do not limit myself to the specific forms and arrangements of the several mechanisms for transmitting the power from the engine to the mixing-apparatus, conveyers and traction-wheels, nor the various clutch-devices shown and described, as the same are subject to various modifications without departing from the spirit of the invention.

The construction of the machine having been fully described, the following is a clear explanation of the operation thereof: The main clutch, comprising the rigidly united collars —18—18$^{\times}$— is normally out of engagement with the collars —19—19$^{\times}$—. When it is desired to drive the truck, the operator actuates the lever —20— to throw the clutch to the left, to cause its collar —18— to engage the collar —19— fastened to the sprocket-wheel —17— mounted loosely on the counter-shaft —15—. The operator then starts the engine —10— whereby motion is transmitted by the sprocket-wheels —12— —14— and chain —13— to the counter-shaft —15— to rotate the clutch-collars—18—18$^{\times}$—. The collar —18— being in engagement with the collar —19—, causes the sprocket-wheel —17— to impart motion to the chain —25— and the sprocket-wheel —24— which is mounted loosely on the supplemental-shaft —22— and has fastened to it the sprocket-wheel —26—, from which latter, motion is transmitted by the chain —27— to the sprocket-wheel —28— connected to the differential gears on the shaft —29—, whereby the pinions —35—35— and gears —36—36— impart motion to the rear or traction-wheels —8—8— of the truck. When the machine has been moved to the location in which it is desired to mix the concrete, the operator actuates the lever —20— to throw the clutch to the right to disconnect the power-transmitting mechanism from the counter-shaft —15—. The operator now throws the clutch a greater distance to the right to cause the clutch-collar —18$^{\times}$— to engage the collar —19$^{\times}$— which is fastened to the sprocket-wheel —17$^{\times}$— loosely mounted on the counter-shaft —15—, whereby the chain —53— and sprocket-wheel —52— impart a rearward rotation to the shaft —22—. Motion is transmitted from this latter shaft to the drum-supporting shaft —41— by means of the sprocket-wheels —49—51— and chain —50— to operate the mixing-blades —42—42— secured to the shaft —41—. An attendant standing upon the platform —2— of the truck then operates the lever —96— to throw the clutch-member —95$^{\times}$— connected to the shaft —41—, into engagement with the clutch-member —95— which is fastened to the sprocket-wheel —92— mounted loosely on the latter shaft, whereby the sprocket-wheels —92—88— and chain —91— are caused to impart rearward rotation to the shaft —81— on which is supported the elevated frame —78— of the conveyer employed for delivering the concrete-materials to the hopper —46—. This conveyer comprises the usual brackets —72—72— and the endless chain —72$^{\times}$— traveling on the sprocket-wheels —73—74— journaled on the frame —78— as hereinbefore described.

By setting the sprocket-wheels —92—88— and chain —91— in motion through the engagement of the clutch-members —95——95$^{\times}$— as above stated, the sprocket-wheels —90—94— and chain —93— are caused to drive the conveyer. When the said conveyer is set in operation, the materials are thrown into the box —85— through which the conveyer-buckets —72—72— travel,

whereby the said materials are delivered into the hopper. When the said hopper is sufficiently loaded, an attendant opens the sliding gate —48— to deposit the materials through the opening —45— of the drum, whereby the said materials are subjected to the action of the revoluble blades —42—42—.

During the mixing-operation, the requisite amount of water is supplied to the drum by the pipe —105— which extends over the drum-opening —45— and is connected to a suitable source as before stated, the water being forced through said pipe by the rotary-pump —100— which is operated by the sprocket-wheels —106— 108 and chain —107— driven by the counter-shaft —15—. When the mixing of the concrete is completed, the attendant raises the lever —57— to carry the hook —54×— of the arm —54— out of engagement with the projection—56— on the outer periphery of the drum, whereby the drum is unlocked. By thus unlocking the drum, the latter is free to rotate with the blades. After unlocking the drum, the lever —57— is released so as to carry the hook —54×— back to its normal position to engage a like projection —56×— on the drum. This projection —56×— being diametrically opposite the projection —56— obviously allows the drum to receive a half-revolution whereby its opening —45— is carried to the bottom to discharge the concrete into the transversely disposed trough —58—. After the concrete is discharged from the drum, the lever is lifted to disengage the hook from the projection —56×— to allow the drum to rotate so as to carry its opening back to its normal location, whereupon the projection —56×— again engages the hook. Upon discharging the concrete from the drum, the attendant operates the lever —67— to throw the clutch-member —66×— into engagement with the clutch-member —66— whereby the worm-gear —65— and pinion —64— are caused to transmit motion from the shaft —22— to the shaft —62— so as to drive the conveyer which travels through the trough —58—. This conveyer comprising chains —60—60— and a series of bars —62×— —62×— which scrape across the platform, effectually delivers the concrete at one side of the truck. This conveyer is disposed at such an elevation from the ground as to allow a wheel-barrow to be placed thereunder if desired to receive the concrete.

By employing the described clutches, it will be evident that the conveyers may be conveniently and independently started or arrested at will.

What I claim as my invention is:—

1. An apparatus of the class described comprising a revolubly supported drum, mixing-devices including a rotary shaft within the drum, mechanism for rotating said shaft, a conveyer for delivering the concrete-materials to the drum, mechanism actuated by the shaft for driving the conveyer, means for controlling the operation of the conveyer, a locking device maintaining the drum normally stationary, said drum being adapted to be inverted by the mixing-devices to effect the discharge therefrom, and means for actuating the aforesaid locking device for controlling the inverting action of the mixing-devices as set forth.

2. The combination with an apparatus of the class described, comprising a revolubly supported horizontal drum, a revoluble shaft extending axially through the drum, mixing-devices disposed within the drum and actuated by said shaft, mechanism rotating said shaft, and means for maintaining the drum normally stationary, of a conveyer for delivering the concrete-materials to the drum and receiving motion from said shaft, clutch-devices for throwing the conveyer into and out of operation, and means operative for releasing the drum and permitting the mixing-devices to impart a half-revolution to the drum for the purpose set forth.

3. A concrete-mixing machine comprising a suitably supported rotatable horizontal shaft, a drum mounted loosely on said shaft, and provided in its top with an opening, a set of blades secured to the shaft within the drum, mechanism rotating said shaft, a rock-shaft, means on the rock-shaft for maintaining the drum normally irrevoluble, and means for actuating the said rock-shaft to release the drum to allow the blades to impart a half-revolution to the drum for the purpose of discharging the concrete through the opening thereof as set forth.

4. A concrete-mixing apparatus comprising a suitably supported rotatable horizontal shaft, mechanism rotating the shaft, a drum loosely mounted on said shaft and provided in its top with an opening, a rock-shaft disposed parallel with the drum, an arm connected to the rock-shaft, means on the drum adapted to be engaged by the arm to maintain the drum normally irrevoluble, a set of mixing-blades secured to the shaft within the drum, and a lever for actuating the rock-shaft to disengage the arm from the drum to allow the drum to be automatically inverted for the purpose of discharging the concrete through its opening as set forth.

5. In a machine of the character described, the combination of a suitably supported revoluble shaft, a mixing-drum mounted loosely upon said shaft and provided in its top with an opening, a locking-device holding the drum normally irrevoluble and operative for allowing the drum to be inverted for the purpose of discharging, a set of mixing-blades secured to said shaft within the drum, a hopper supported above the drum, a conveyer for loading the concrete-materials into the hopper, a conveyer travel-

ing under the drum into which the concrete is discharged, a pipe for supplying water to the drum, a pump connected to said pipe, a suitable engine and its shaft, a counter-shaft driven by the engine, mechanisms transmitting motion from the counter-shaft to the mixing-blade-shaft, discharge-conveyer and pump, mechanism transmitting motion from the mixing-blade-shaft to the loading-conveyer, a main clutch on the counter-shaft for throwing said mechanisms into and out of operation, and supplemental clutches for independently throwing the conveyer-mechanisms into and out of operat on as set forth

6. In a machine of the character described, the combination of a concrete-mixing-apparatus, a hopper for receiving the materials to be mixed, means at the bottom of the hopper for depositing the material into the mixing-apparatus, an elevated endless conveyer for loading the hopper, a horizontally traveling endless conveyer under the mixing-apparatus onto which the concrete is discharged, means including a pump for supplying the mixing-apparatus with water, an engine and its shaft, a counter-shaft driven by the engine, a supplemental shaft disposed parallel with the counter-shaft, mechanisms for transmitting motion from the counter-shaft to said supplemental-shaft, a main clutch for throwing said mechanism into and out of operative connection with the counter-shaft, mechanism transmitting motion from the supplemental-shaft to the mixing-apparatus, mechanism transmitting motion from the counter-shaft to the pump, for transmitting motion from the supplemental-shaft to the discharge-conveyer, mechanism transmitting motion from the mixing-apparatus to the loading-conveyer, and additional clutches for independently stopping and starting the two conveyers as set forth.

7. In combination with a concrete-mixer, comprising a drum and a set of blades disposed therein, a suitable engine, and mechanism driven by the engine for operating the mixer, of a tank for storing water, a system of water-pipes communicating with the mixer and tank, a pump connected to the system and operated by the engine, and valves included in the system whereby the water may be pumped into either the mixer or storing-tank as and for the purpose set forth.

8. In a concrete-mixing machine, the combination with a truck, of a collapsible elevated frame composed of upper and lower detachable sections and having the lower section pivotally mounted on the truck and extending below the top of the truck, a box secured to the lower frame-section for receiving the materials to be mixed, and an endless conveyer carried on said frame and traveling through the box for delivering the materials to the mixing-device as set forth.

9. A portable machine of the character described comprising a truck provided with traction-wheels, an engine mounted on the truck, a counter-shaft driven by the shaft of the engine, power-transmitting devices including a shaft and differential-gear connected to the traction-wheels, mechanism adapted to be driven by the counter-shaft for imparting motion to the power-transmitting devices, a concrete-mixing apparatus mounted on the truck and consisting of a normally irrevoluble horizontal drum provided with an opening in its top, a revoluble shaft supporting the drum, and a set of blades secured to the shaft, mechanism for transmitting motion from the supplemental shaft to the shaft of the mixing-apparatus, a hopper supported above the mixing-drum, an elevated endless conveyer carried on the truck for delivering the concrete-material to the hopper, mechanism for transmitting motion from the drum-shaft to the conveyer, a trough extending across the top of the truck and disposed under the mixing-drum, an endless - conveyer traveling through the trough, means operative for permitting the revolving blades to impart a half-revolution to the drum for the purpose of discharging into the trough, mechanism for transmitting motion from the aforesaid supplemental shaft to the discharge-conveyer, main clutch-devices on the counter - shaft whereby the power of the engine may be transmitted to either the traction-wheels or concrete-mixing apparatus, and supplemental clutch-devices on the supplemental-shaft and shaft of the mixing - apparatus for independently controlling the operation of the two conveyers as set forth.

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