H. U. PRINDLE.

MIXING MACHINE.

APPLICATION FILED JULY 18, 1911.

1,039,192.

Patented Sept. 24, 1912.

3 SHEETS—SHEET 1.

Fig. 1.

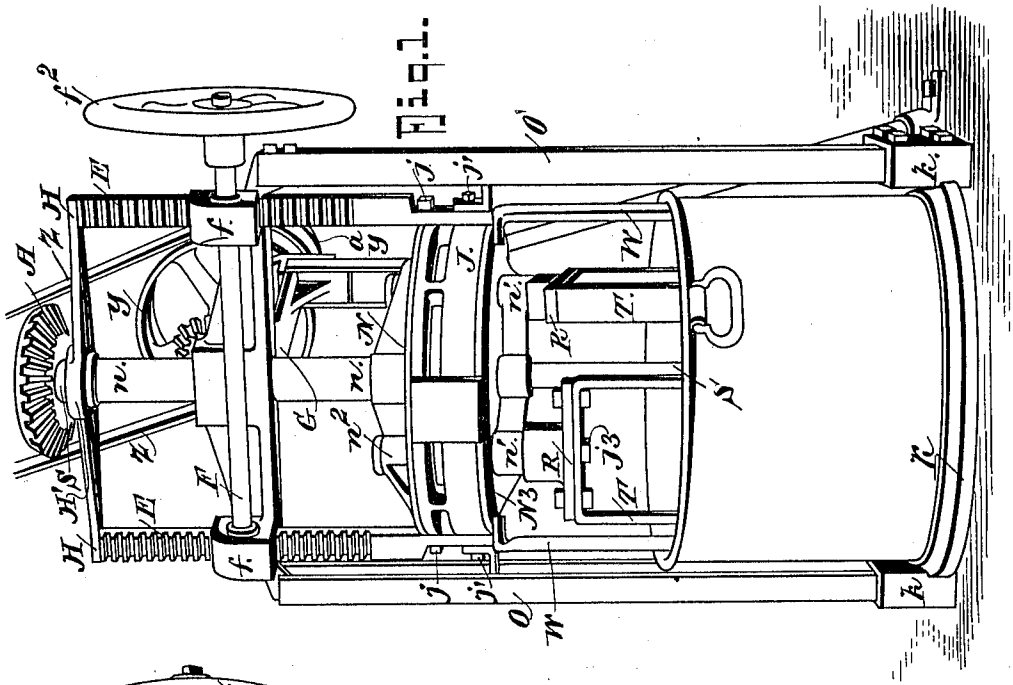
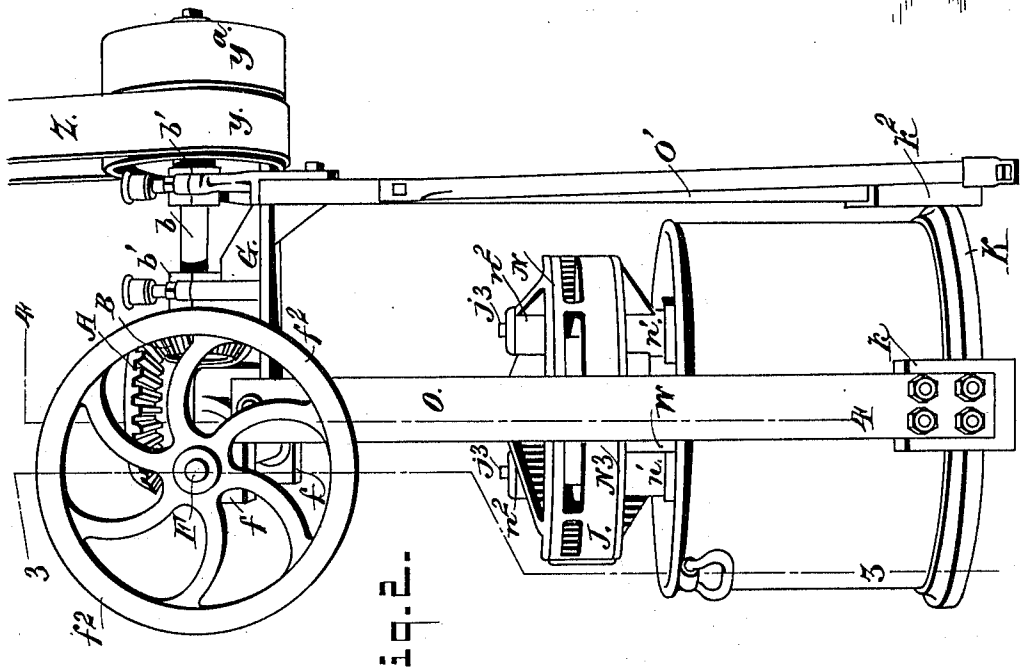


Fig. 2.



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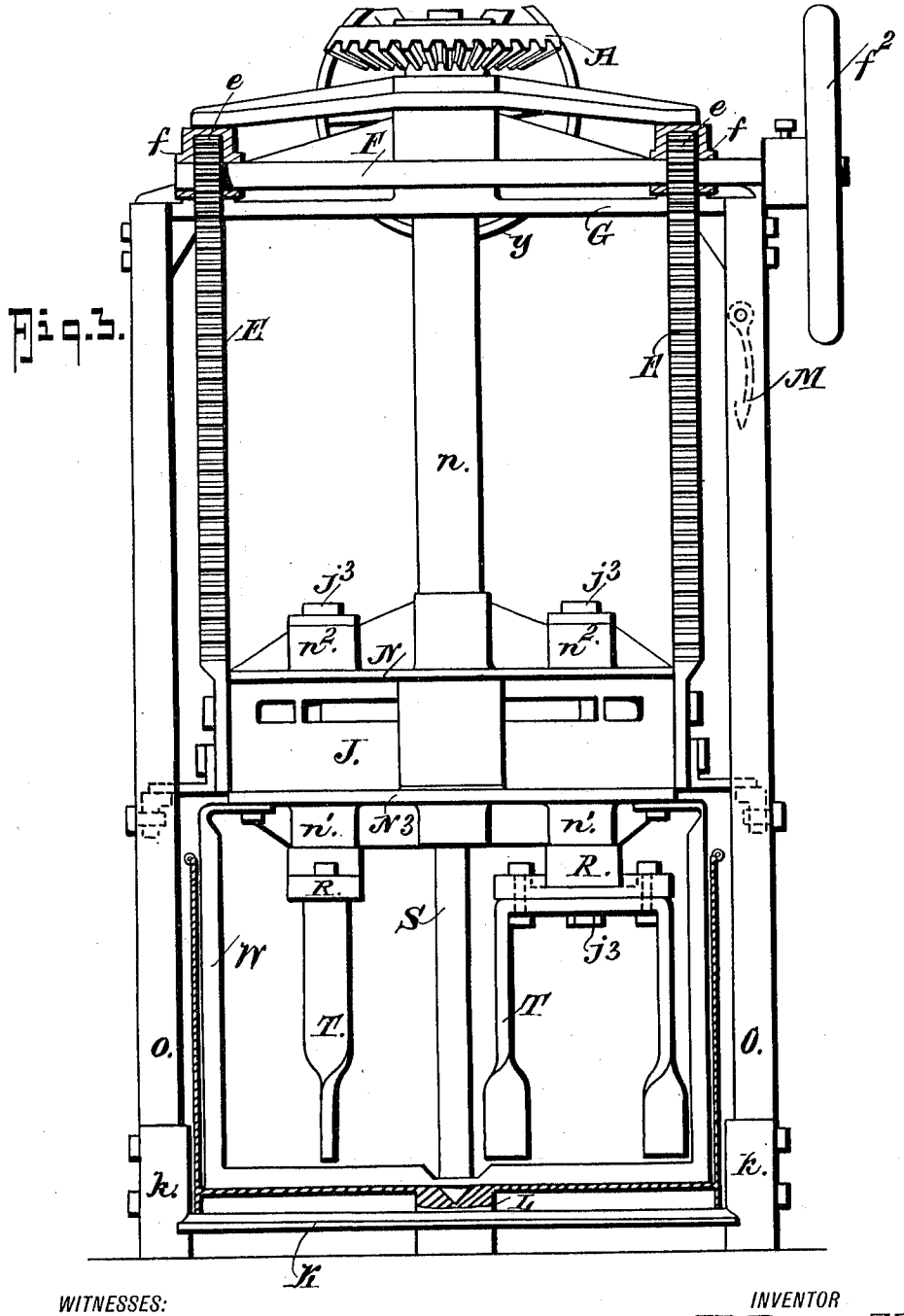
3 SHEETS—SHEET 2.

Fig. 3.



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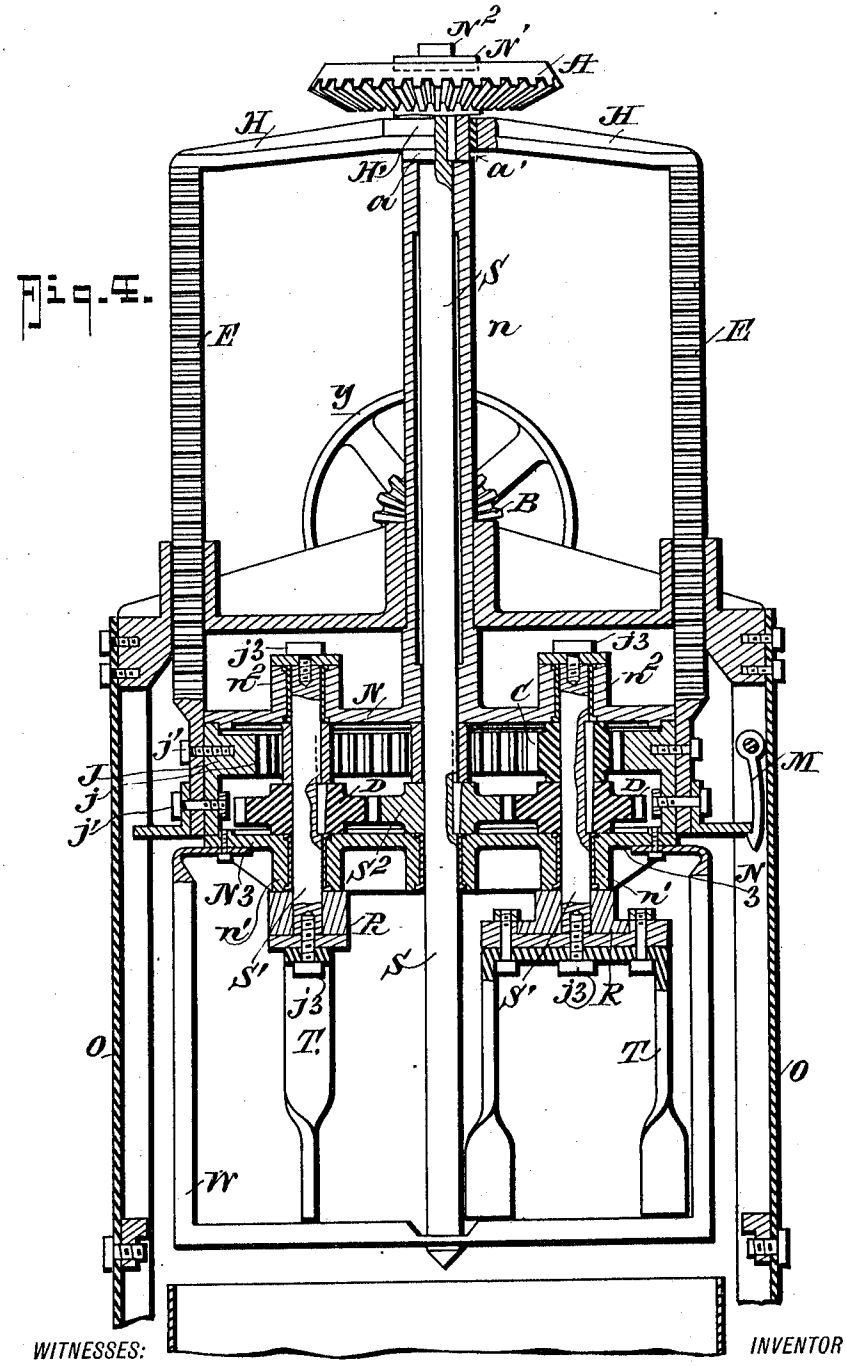
3 SHEETS—SHEET 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY URSON PRINDLE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO PLANETARY MACHINERY COMPANY, INCORPORATED, OF SAN FRANCISCO, CALIFORNIA.

MIXING-MACHINE.

1,039,192. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed July 18, 1911. Serial No. 639,213.

To all whom it may concern:

Be it known that I, HENRY U. PRINDLE, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a specification.

My present invention more particularly has reference to that general type of mixing machines disclosed in my Patent No. 856,295, dated June 11, 1907, in which the mixing or agitating members have a rotary planetary movement with respect to the bottom of the mixing tank, and in which power transmission means is applied for imparting such motion to the stirrers, or mixing members under great speed and considerable power.

My present invention embodies generally an improved mounting for the stirrers, or agitating means, that includes devices for readily raising and lowering the mixing mechanism into or out of the tank, as conditions may make desirable.

In its subordinate features, my invention consists in the peculiar combination and novel arrangement of parts, all of which will be hereinafter fully explained, specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1, is a perspective view of my improved construction of mixing machine, the mixing elements being shown at a partly elevated position. Fig. 2, is a similar view that shows them lowered into the mixing tank. Fig. 3, is a vertical section of the same on the line 3—3 on Fig. 2, the mixing devices being at their operative position. Fig. 4, is a similar view on the line 4—4 on Fig. 2, the mixing device being shown elevated from the tank.

In the practical application of my present invention, the mixing mechanism is mounted for being bodily elevated or lowered into the tank or other receptacle in which the mixing is to be done, means being also provided for holding the mechanisms elevated and at an inoperative position while removing mixed material from the tank, or the tank with the material contained therein, the operative parts being so designed that when the mixing devices are lowered into the tank they are thrown into an operative position.

In carrying out my invention, I employ two side standards O—O, the lower ends of which are bolted in socket bearings *k*—*k* that project up from a base member K which is also provided with a third socket bearing k^2 to receive the lower end of a back standard O′, presently again referred to. The base member K is also provided with a centrally disposed shaft seat or step L that forms a center bearing for the lower end of the central drive shaft S, when the operating parts are lowered to the active position, as is best shown in Fig. 3, by reference to which it will be readily seen the upper end of the shaft S carries a beveled pinion A which, when the parts are in their lowered or active position meshes with a bevel gear B on a drive shaft *b* mounted on bearings *b′*—*b′* on the top or spider plate G and which carries fast and loose belt pulleys *y* and y^a around either of which is the drive belt Z, suitable means, in practice, being provided for shifting the belt from one to the other of the said pulleys.

The upper end of the shaft S is mounted in a long tubular and vertically projected sleeve *n* that extends upwardly from and forms an integral part of a top yoke plate N, the upper end of the said sleeve forming the support for the pendent hub *a* of the gear A that rotates within a babbit bearing collar *a′* held in the central hub H′ of the cross head H mounted on the upper ends of the rack bars E—E, presently again referred to, and as best shown in Fig. 4, by reference to which it will be also noticed the gear A is keyed to the upper end of the shaft S and is held from vertical displacement by the cap N′ and the lag screw N^2.

J designates an annular rim provided with an internal gear *j* and the said rim is carried on the lower ends of the rack bars E—E, to which it is secured by the bolts *j′*—*j′*.

N^3 designates a bottom yoke plate, that forms a mate for the top plate N, as is best shown in Fig. 4, by reference to which it will be seen, the top and bottom plates N—N^3 are held in position on the upper and lower edges of the gear rim J by the bolts j^3, or in other suitable ways.

The lower plate N^3 has a pair of oppositely disposed bearings *n′* that aline the bearings n^2 in the upper plate N and in said bearings are mounted the stirrer or mixing paddles carrying shafts S′. The lower ends of the shafts S′ are secured to the cross

heads R to which the paddles T are pendently secured.

One shaft S′ carries a gear C held in mesh with the internal gear rim J and each a gear D, the latter meshing with the gear S^2 keyed to the central shaft S, the arrangement of the several gears being such that the paddles or mixers are carried around the mixing tank with the paddles revolving on their axes, the two paddles receiving, as it were, a planetary movement whereby to thoroughly mix the material within the tank.

To steady the mixing mechanism when it is lowered into the tank, and also to serve as a scraper a U-shaped metal frame W preferably of angle iron is pendently secured to the outer or rim edges of the bottom plate N^3

M designates a pivoted hook for holding the mixing mechanism to the elevated position.

F designates a shaft that extends across the top of the mixer devices and journaled in bearings *f*—*f* on the top or spider head plate G, before referred to, and the said shaft carries a hand wheel f^2 at one end and a pair of pinions *e*—*e*, for meshing with the rack bars E—E.

From the foregoing taken in connection with the drawings, the complete construction and the manner in which my present machine is manipulated, together with its advantages will be apparent.

By reason of the construction and coöperative arrangement of the parts, as shown and described, the entire mixing mechanism can be readily raised up out of the mixing tank and held to the elevated position while the contents of the tank are being removed or the tank shifted to be replaced by another, it being also clear that the operation of the mixing devices cease immediately after the drive gear on the shaft S discharges the drive gear B, the operation of raising and lowering the mechanism being controlled by the proper turning of the hand wheel f^2.

The invention is adapted for mixing anything that is capable of being mixed by a machine of this type.

What I claim is:—

1. In a mixing mechanism of the character stated, the combination of a suitable base, a tank on the base, standards that rise from the base, a cross head mounted on the top of the standards, said cross head having a central passage and side passages, a yoke frame including a pair of pendent side bars having rack faces movable through the side passages in the cross head, a central shaft pendent from the yoke frame, movable through the central passage in the yoke frame and the driven gear on the upper end of the said shaft, mixing elements sustained by the pendent rack bars, drive gearing actuated from the central shaft for imparting movement to the elements, a driving gear mounted on the cross head, and a manually actuated means for raising and lowering the rack bars and the mechanism sustained thereby into and out of active position, to disconnect or connect said driving and driven gears according as said rack bars are raised or lowered, said means comprising a shaft journaled on top of the cross head, gears thereon that mesh with the rack bars and means for holding the said rack bars and the mechanism sustained thereby to the elevated position.

2. In a mixing machine of the character described, the combination with a suitable base, uprights that rise therefrom, a cross head mounted on the uprights, said cross head having a central and two side passages, a yoke frame including pendent side bars that slide through the side passages in the cross head, a central shaft having a driven gear at the upper end suspended from and movable with the yoke frame, said shaft extending through the central passage of the cross head; a mixing mechanism carried on the lower ends of the pendent rack bars, said mechanism including a rim having an internal gear, upper and lower plates carried on the said rim, a pair of shafts journaled in the said plates, stirrer members on the said shafts and gears connecting the central shaft, the stirrer shafts and the internal gear of the rim, other means for bodily raising and lowering the yoke with its attached parts and a drive gearing for imparting motion to the gear on the central shaft when it is lowered to the active position.

3. In a mixing machine, the combination of a base, standards projected upwardly therefrom, a cross head connecting said standards, said cross head having a central opening, a yoke frame movable through apertures in said cross head, a receptacle mounted on the base, mixing mechanism supported by said yoke frame and including a rotatable shaft sleeve vertically movable in the central bearing of said cross head, a rotatable shaft relatively fixedly located and carried by said yoke frame and sleeve, and coöperatively connected with said mixing elements to actuate the same, a gear on said shaft also relatively fixedly located with regard to said yoke frame, a driving shaft having a pinion for meshing with said first mentioned gear when said yoke frame is lowered, and means coöperative with said yoke frame for raising and lowering said yoke frame and the parts carried thereby to unmesh and mesh said gears according as said yoke frame is raised or lowered.

4. In a mixing machine, the combination with a suitable base, standards projecting vertically therefrom, a cross head on said standards, said cross head having a central

opening and a pair of side openings, a yoke frame movable through said side openings, a mixing mechanism supported by said yoke frame and including a sleeve projecting through said cross head central opening, a U-shaped frame supported by said mixing mechanism, a shaft mounted in said sleeve and U-shaped frame in a relatively fixed relation thereto, a relatively fixedly located driving pinion mounted on said cross head, and a gear mounted on said shaft, to move with said shaft and with said yoke frame, and means coöperative with said yoke frame for raising and lowering said yoke frame and the mechanism carried thereby to unmesh and mesh said gears and pinion according as said yoke frame is raised or lowered, substantially as shown and described.

5. In a mixing machine of the character described, the combination with a suitable base, uprights that rise therefrom, a cross head mounted on the uprights, said cross head having a central and two side passages, a yoke frame including pendent side bars that slide through the side passages in the cross head, a central shaft having a driven gear at the upper end suspended from and movable with the yoke frame, said shaft extending through the central passage of the cross head, a rim member secured to said side bars, upper and lower plates carried on said rim member, a sleeve carried by said upper plate and projecting through the central passage of said cross head to support said central shaft, mixing elements mounted on said upper and lower plates, power transmitting gearing mechanism between said mixing elements and said central shaft, a driven gear on said central shaft, said driven gear having a fixed relation to said yoke frame to move therewith, a relatively fixedly located driving gear, and means for raising and lowering said yoke frame with its attached parts to disconnect or connect said gears according as said yoke frame is raised or lowered.

6. In a mixing machine of the character described the combination with a suitable base and supports that rise therefrom, a cross head mounted on said supports, a yoke frame including pendent side bars that slide through said cross head, a central shaft mounted on and movable with said frame and passing through said cross head, mixing elements carried by said frame and cooperatively connected with said central shaft, a U-shaped frame supported pendently beneath said yoke frame and including a bearing for said central shaft, a driving shaft and power transmitting connections between said driving shaft and said central shaft, and means for raising and lowering said yoke frame with its attached parts to disconnect or connect said driving and central shafts according as said yoke frame is raised or lowered.

7. In a machine of the character stated, a base or support, standards rising therefrom, a cross head surmounting said standards, said cross head having a central opening and a pair of side openings, a yoke frame projecting through said side openings, a mixing mechanism carried by said yoke frame and including a central sleeve projecting through said cross head central opening, and also including a central driven shaft mounted in said sleeve and a driven gear mounted on said shaft to move with said yoke frame, a relatively fixedly located driving shaft and a driving gear thereon, and means for raising and lowering said yoke frame with its carried parts to unmesh and mesh said gears according as said yoke frame is raised or lowered.

8. In a machine of the character stated, a base or support, standards rising therefrom, a cross head surmounting said standards, said cross head having a central opening and a pair of side openings, a yoke frame projecting through said side openings, a mixing mechanism carried by said yoke frame and including a central sleeve projecting through said cross head central opening, and also including a central driven shaft mounted in said sleeve and a driven gear mounted on said shaft to move with said yoke frame, a relatively fixedly located driving shaft and a driving gear thereon, and means for raising and lowering said yoke frame with its carried parts to unmesh and mesh said gears according as said yoke frame is raised or lowered, said standards having grooves and members on said yoke frame projecting into grooves to act as guides.

HENRY URSON PRINDLE.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."