No. 657,354. Patented Sept. 4, 1900.

J. MÜLLER.

BARREL WASHING MACHINE.

(Application filed Dec. 29, 1899.)

(No Model.) 4 Sheets—Sheet 1.

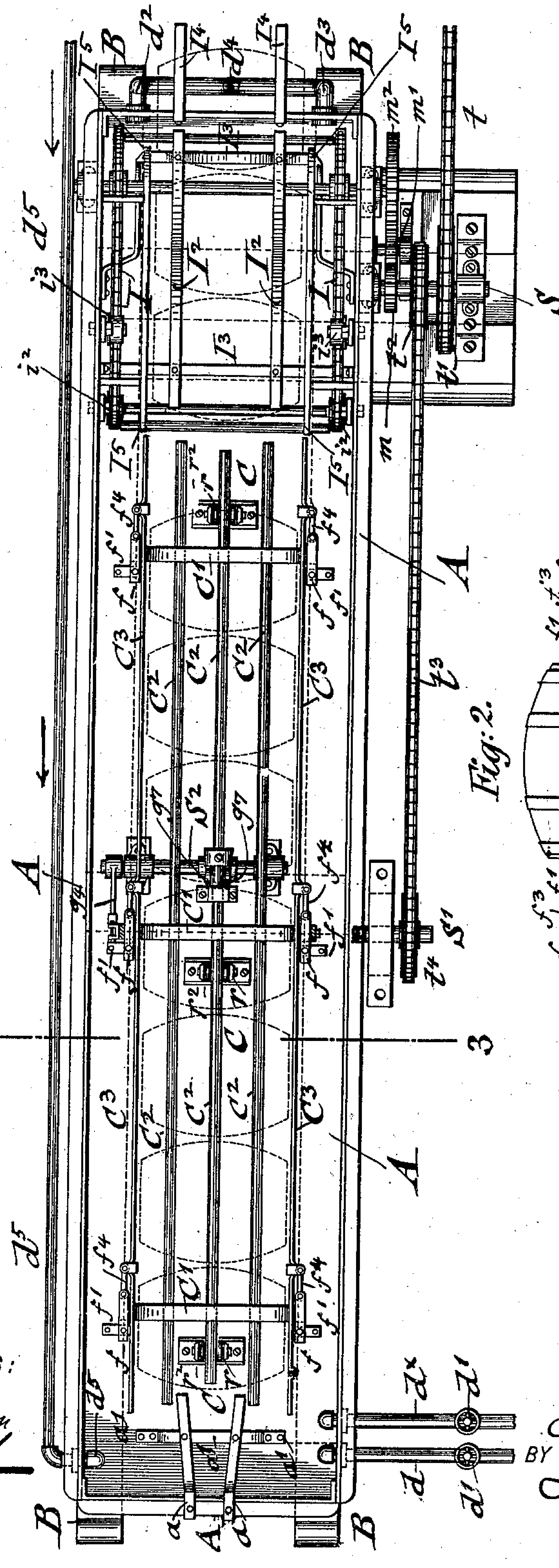

FIG. 1.

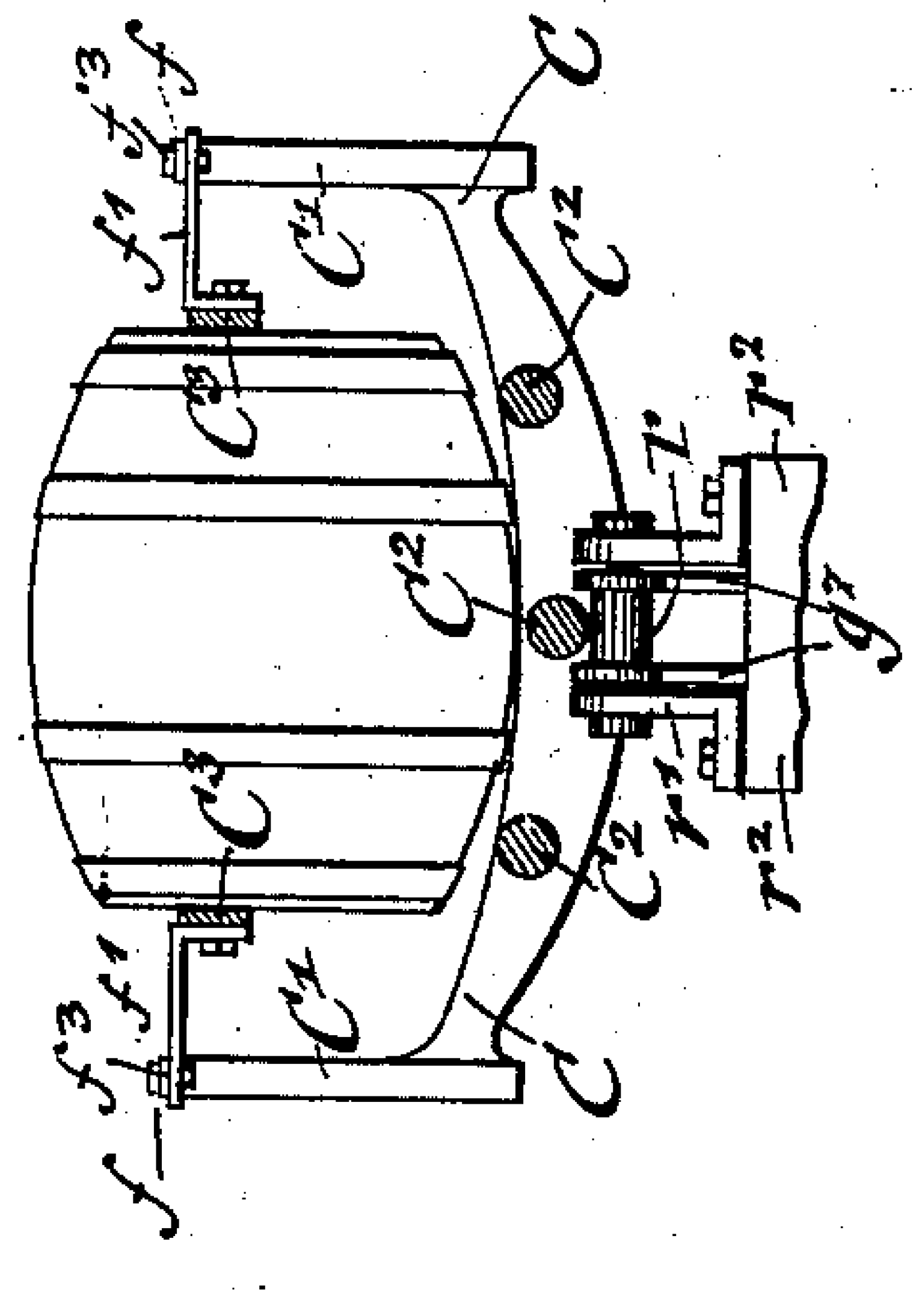

Fig: 2.

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(No Model.) 4 Sheets—Sheet 2.

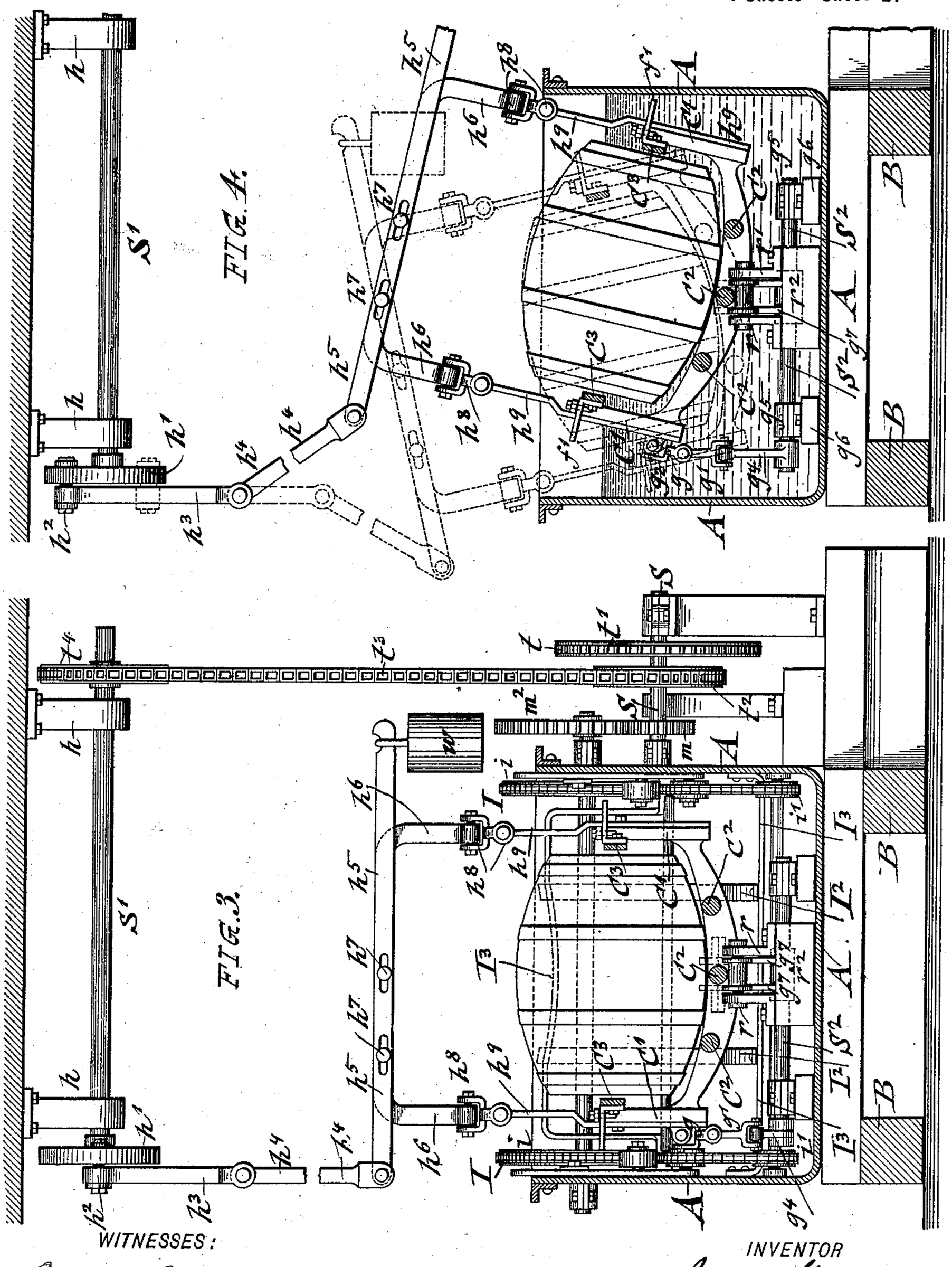

FIG. 3.

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BARREL WASHING MACHINE.

(Application filed Dec. 29, 1899.)

(No Model.) 4 Sheets—Sheet 3.

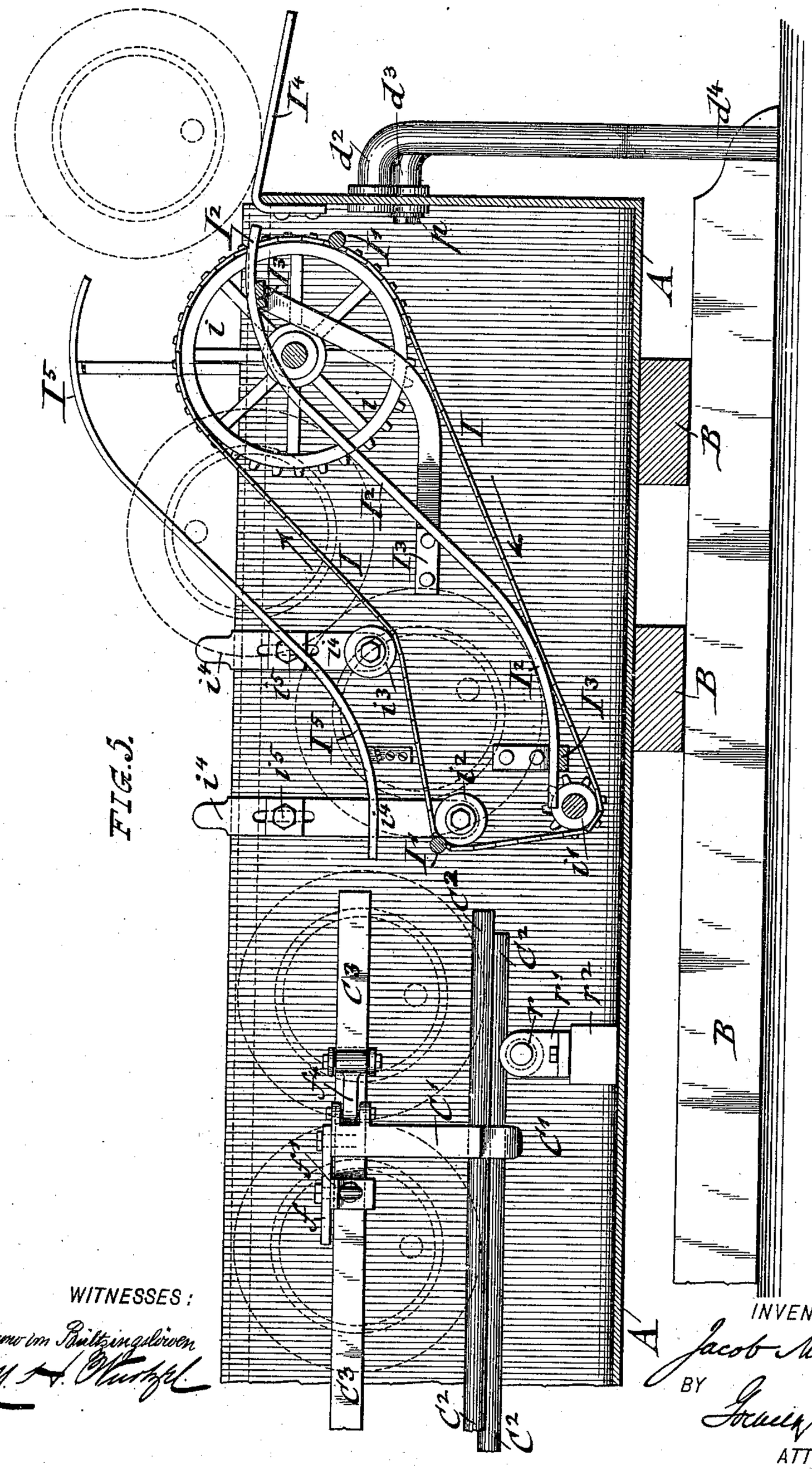

FIG. 5.

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No. 657,354. Patented Sept. 4, 1900.

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BARREL WASHING MACHINE.

(Application filed Dec. 29, 1899.)

No Model.) 4 Sheets—Sheet 4.

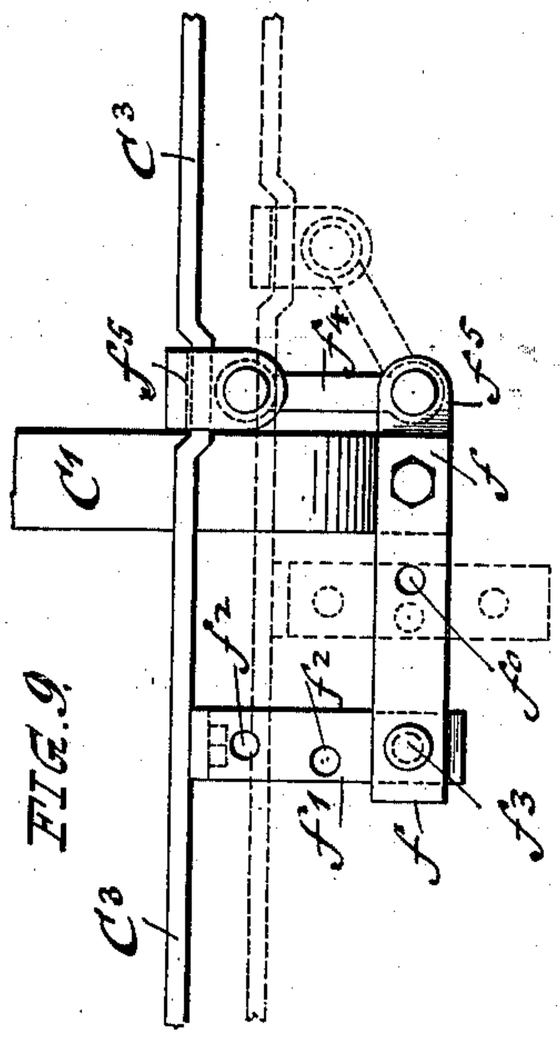

FIG. 9.

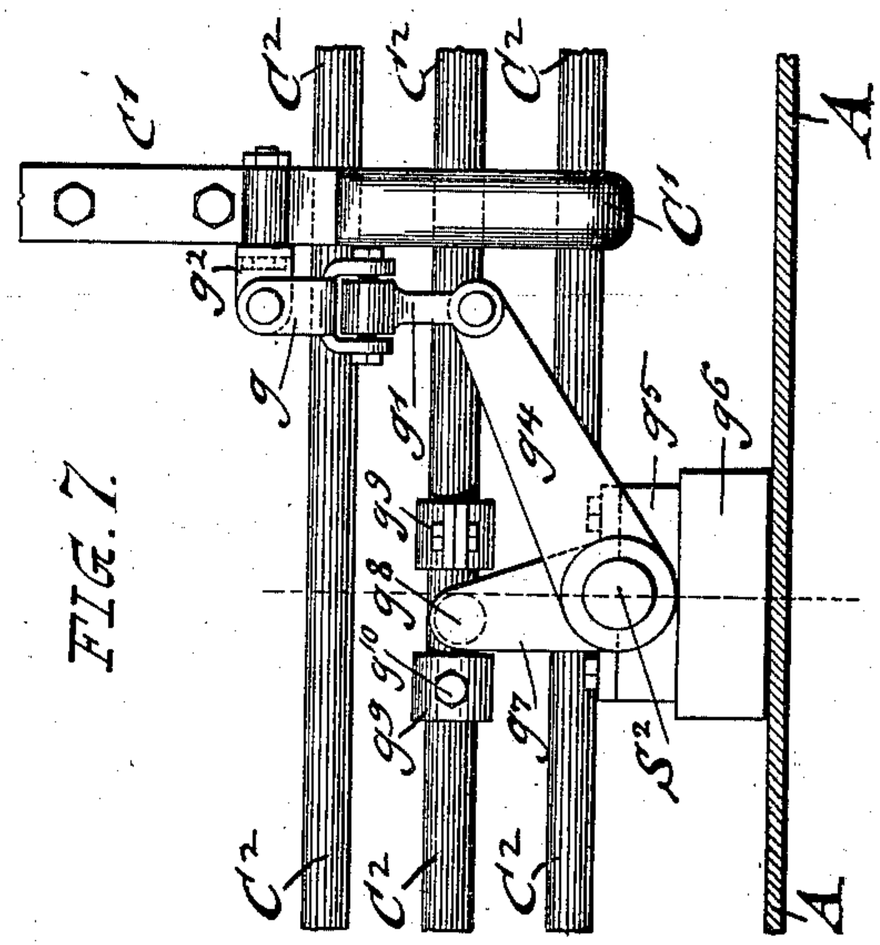

FIG. 7.

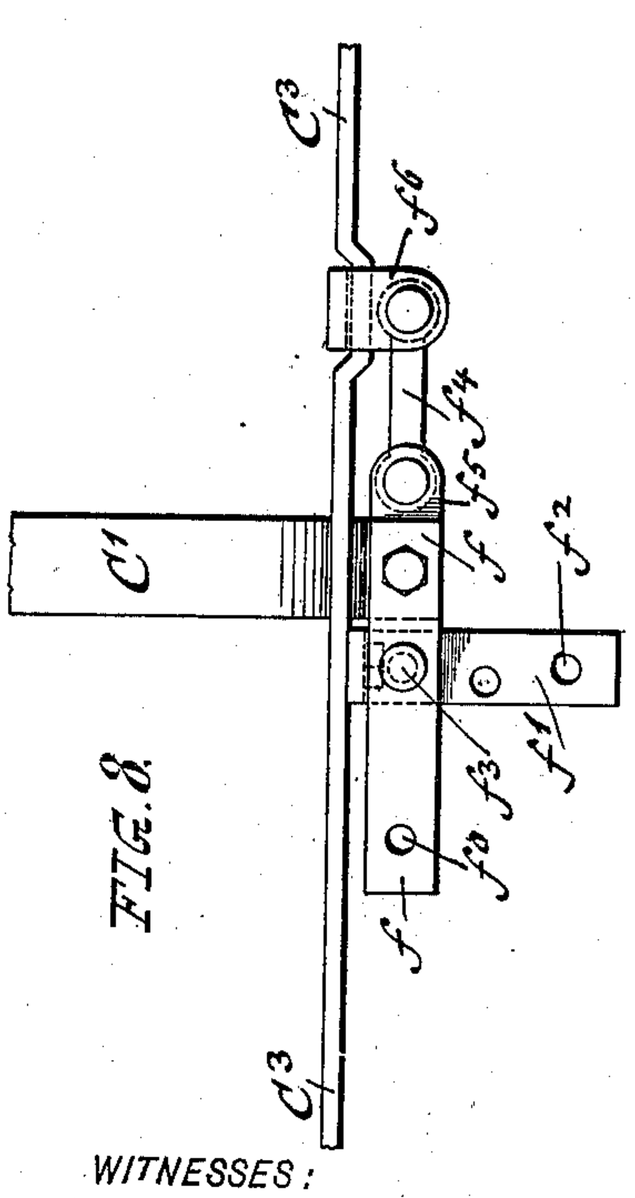

FIG. 8.

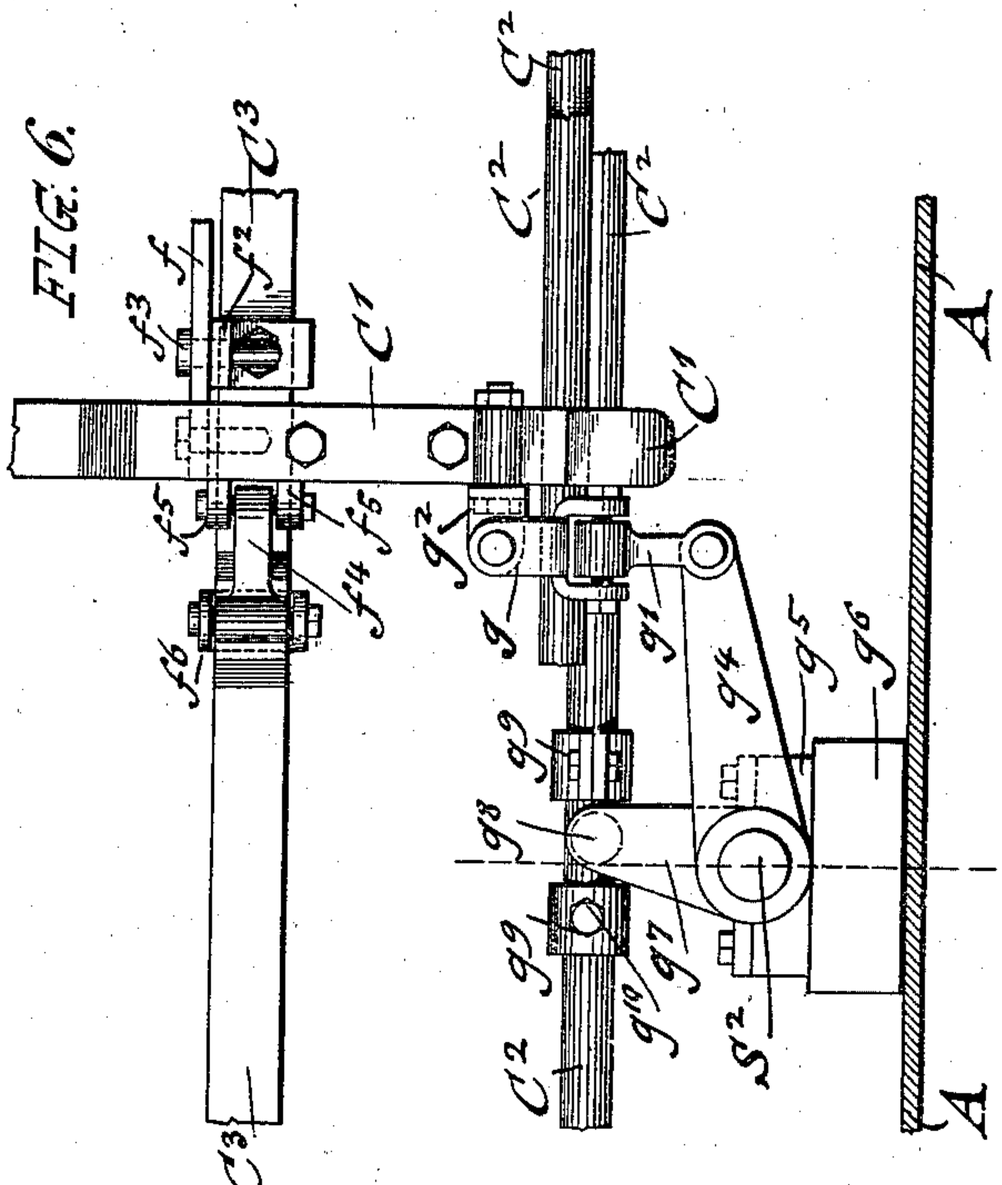

FIG. 6.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JACOB MÜLLER, OF NEW YORK, N. Y., ASSIGNOR TO CAROLINE H. MÜLLER, OF SAME PLACE.

BARREL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 657,354, dated September 4, 1900.

Application filed December 29, 1899. Serial No. 741,891. (No model.)

To all whom it may concern:

Be it known that I, JACOB MÜLLER, a citizen of the United States, residing in the city of New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Barrel-Washing Machines, of which the following is a specification.

This invention relates to an improved self-acting keg and barrel washing machine for breweries, which has for its object to wash the kegs or barrels, at the same time both inside and outside, in an effective manner and to deliver them directly to the scrubbing-machine and sprinkler for final outside and inside cleaning; and the invention consists of a barrel-washing machine which comprises a tank, a cradle in said tank, means for supplying barrels to said cradle, and means for imparting a combined rocking and forward and backward motion to said cradle, so that the barrels and the water are subjected to a rocking and gyrating motion while they are moved forward in the cradle, so as to be thoroughly washed at the inside and outside.

The invention consists, further, of the combination, with a tank, a cradle, and mechanism for imparting a combined rocking and forward and backward motion to said cradle, of mechanism for taking up one barrel after the other at the outgoing end of the cradle and conducting it over the delivery end of the tank to the scrubbing-machine.

The invention consists, further, of means by which the cradle can be adjusted for different sizes of barrels, such as halves, quarters, or sixths; and the invention consists, finally, of certain additional details of construction, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan view of my improved barrel-washing machine. Fig. 2 is a vertical transverse section of the cradle, showing the mechanism for adjusting the side rails of the same to the size of the barrels to be washed. Fig. 3 is a vertical transverse section on line 3 3, Fig. 1, showing the barrel-washing mechanism and the barrel in its median position in the cradle. Fig. 4 is a similar section showing the barrel in the act of being rocked toward the right-hand side, the dotted lines indicating the extreme limit of motion of the barrel toward the left-hand side. Fig. 5 is a vertical longitudinal section of the delivery end of the tank of my improved barrel-washing machine, showing the mechanism for taking up one barrel after the other and delivering it to the scrubbing-machine. Figs. 6 and 7 are detail side views of the mechanism for imparting simultaneously a laterally-rocking and longitudinally-reciprocating motion to the barrel, said figures corresponding, respectively, to the median line of the cradle and to the side position of the same; and Figs. 8 and 9 are detail top views showing the mechanism for adjusting the side rails of the cradle for larger or smaller barrels.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents a tank which is made of suitable length, so as to wash a number of barrels at the same time. The tank is preferably made of boiler-iron, the sides and ends of which are reinforced by suitable angle-pieces, while the lower corners are rounded off. A tank A is supported on a suitable bed-frame B of wood, and provided at one end with supply-pipes d $d^{\times}$, provided with stop-cocks d' for supplying hot and cold water to the tank, so that the water in the same can be readily kept at the temperature required for properly soaking and washing the barrels. The supply-pipes d $d^{\times}$ are arranged at the ingoing end of the tank, while the outgoing end is provided with two waste-pipes d^2 d^3, of which one is arranged at a higher level than the other, the higher one being used when larger barrels are washed, while the lower one is used when smaller barrels are washed, so that the level of the water in the tank can be adapted to the size of the barrels to be washed. When the higher waste-pipe d^2 is used, the lower waste-pipe d^3 is closed by a suitable screw-plug p, while when the lower pipe d^3 is used the higher pipe d^2 is closed by the screw-plug. Both pipes are connected by a common outlet-pipe d^4 with a sewer, so as to carry off the waste water. The ingoing end of the tank A is further connected by a pipe d^5 with a sprinkler located near

the outgoing or delivery end of the washing-tank A, so that the water, after being used for sprinkling the interior of the barrels, is conducted to the tank for being used as wash-water before it is conducted off into the sewer.

At the ingoing end of the tank is arranged a number of curved rails *a a*, which are connected at their inner ends by a transverse bar *a'*, so as to form an inclined delivery-chute for the barrels to be washed. At the outgoing end of the tank A is arranged a mechanism for taking up and delivering the barrels after they have been washed in their passage through the tank. Between the ingoing-rails and the delivery mechanism is arranged a cradle C, which is formed of three or more transverse frames C', of approximately U shape, which are connected by three or more longitudinal rods C^2, that pass through the curved bottoms of the frames C' and longitudinal side rails C^3, which are attached to the upright side portions of the U-shaped frames C', and which rails are adapted to be moved in lateral direction toward each other, so as to be adjusted for taking up and guiding different sizes of barrels, such as half-barrels, quarters, and sixths, through the tank. The central longitudinal rod C^2 of the cradle C is supported on three or more flanged rollers *r*, which are supported in upright lugs *r'*, attached to wooden blocks r^2, that are located at the center of the bottom of the tank A. The flanged roller *r*, near the ingoing end of the tank, is somewhat higher than the roller near the delivery mechanism of the tank, so that a slight inclination is given to the cradle by which the automatic movement of the barrels through the entire length of the cradle is facilitated. Each U-shaped frame C' of the cradle C is provided at each end with a fixed strap *f*, arranged parallel with the longitudinal axis of the cradle C and provided with two holes f^0 for connection with a fixed bracket *f'*, which is attached at right angles to the strap *f* to the side rail C^3 and which is also provided with holes f^2, as shown clearly in Figs. 8 and 9. The strap *f* and bracket *f'* are connected by screw-bolts f^3 either closely to each other, as in Fig. 8, or at such a distance from each other as permitted by the length of the bracket *f*, as shown in Fig. 9, the screw-bolts passing through the holes f^0 and f^2 of the strap *f* and bracket *f'*, respectively. Each frame C' is further connected with the side rail C^3 by links f^4, which are pivoted to lugs f^5 on the frame C' and to a clip f^6 on the side rail C^3. When the bolt-hole f^2, which is arranged in the bracket *f'* close to the side rail C^3, is connected with the bolt-hole near the center of the strap *f* by the screw-bolt f^3, as shown in Fig. 8, the side rail C^3 is arranged close to the strap *f* and frame C', so that the cradle has then the full width which is required for washing half-barrels; but when quarters or sixths are to be washed the side rail is moved inwardly by swinging the pivot-link f^4 into an inclined position or at right angles to the strap *f*, as shown, respectively, in dotted and full lines in Fig. 9, by which inward motion the side rail is moved into a position parallel with its former position, so that its fixed bracket *f'* can be connected by the bolt f^3 either at the middle or outer hole with the middle or outer hole in the strap *f*, as shown in Fig. 9. The side rail C^3 is then rigidly supported by the strap and bracket and link connection with the frame C' firmly in the position required for washing quarter or sixth barrels, and thus the cradle is adapted for washing any one of the different sizes of barrels used in breweries. In larger breweries different washing-machines, one for each size of barrel, may be used; but in smaller breweries one washing-machine is adapted for washing the different sizes of barrels and will do the work required. By the adjusting mechanism of the side rails C^3 the cradle can be readily changed, so as to wash any required size of barrel while it is passed through the washing-tank. As the adjusting mechanism is comparatively simple, it is easily manipulated, so as to facilitate the adjustment of the side rails from one position into the other by the simple unscrewing and removing and reattaching of a clamping-nut, which can be quickly accomplished by the attendant.

The cradle receives a combined laterally-rocking and longitudinally-reciprocating motion by suitable mechanism from an overhead driving-shaft, (not shown,) which is connected by a chain-and-sprocket-wheel transmission *t t'* with a short counter-shaft S and by a second chain-and-sprocket transmission t^2 t^3 t^4 with an auxiliary shaft S', which latter is supported in suitable hangers *h h* near the ceiling. The shaft S' is provided at its opposite end with a crank-disk *h'*, connected by a crank-pin h^2 and intermediate pivot-links h^3 h^4 with a transverse bar h^5, that is supported on a bail h^6 of inverted-U shape. The transverse bar h^5 is adjusted on the bail h^6 by means of slots and clamping-bolts h^7 and provided at the end opposite to its connection with the pivot-link h^4 with a suitable counterweight *w*. The bail h^6 is connected at its lower ends by means of universal joints h^8 with the upper ends of straps h^9, that are attached by suitable bolts to the straight side portions of the middle U-shaped frame C' of the cradle C. The rotary motion of the shaft S' imparts, by the crank-disk *h'* and the intermediate mechanism described, a laterally-rocking motion to the cradle from its central or median position (shown in Fig. 3) either to the left or right hand side, as shown, respectively, in full and dotted lines in Fig. 4. When the crank-pin h^2 is at its uppermost position, the crank and intermediate mechanism are lifted and the cradle is rocked over toward the right; but when the crank-pin is in its lowermost position the parts assume the position shown in dotted lines in Fig. 4 and move the cradle over to its ex-

treme left-hand position. When the cradle-disk is in an intermediate position between its uppermost and lowermost positions, the cradle assumes a median or horizontal position, as shown in Fig. 3.

Simultaneously with the laterally-rocking motion imparted to the cradle by the mechanism just described a longitudinally-reciprocating motion is imparted thereto by means of a compound strap connection of the cradle with a second auxiliary shaft S^2, which is supported in suitable bearings at the bottom of the tank A. The compound strap connection is shown at the left-hand side of Figs. 3 and 4 and in detail in Figs. 6 and 7. It consists of a double pivot-link g g' in the nature of a universal joint, one link being pivoted to the lug g^2 on the intermediate frame C′ of the cradle and the other in a plane at right angles to the first link, the lower link g' being pivoted to the outer end of a crank-arm g^4, attached to the end of the transverse shaft S^2. The shaft S^2 is supported in bearings g^5, which are attached to bottom blocks g^6 of the tank A. On the shaft S^2 are mounted below the longitudinal center rod C^2 of the cradle C two parallel cams g^7, that are provided at their adjacent faces and near their ends with raised circular cheeks g^8, which are located close to said center rod and which engage two collars g^9, that are tightly applied to the center rod, one collar g^9 being slipped on the rod and secured by a clamping-screw g^{10}, while the other collar is preferably split and secured by screw-bolts at opposite sides, so as to be conveniently removed from the rod for permitting the proper location and adjustment of the collars relatively to the cams g^7. As the cradle C is rocked from one side to the other its middle U-shaped frame C′ imparts by the compound pivot-strap mechanism a rocking motion to the transverse shaft S^2 as its crank-arm g^4 is raised and lowered by laterally-rocking motion of the cradle. The rocking motion imparted to the shaft S^2 produces the oscillations of the parallel cams, and thereby the longitudinally-reciprocating motion of the cradle. This longitudinally-reciprocating motion is rendered possible by the universally-jointed strap connection of the center frame of the rocking cradle with the crank-arm on the shaft S^2, as shown in Figs. 3 and 4, the universal joint yielding sufficiently in every direction in the same manner as the universal-joint connection between the upper ends of the center frame of the cradle with the yoke-shaped bail h^6 of the rocking mechanism, so that a reliable combined laterally-rocking and longitudinally-reciprocating motion is imparted to the cradle.

In place of the mechanism shown for imparting laterally-rocking motion to the cradle any other equivalent mechanism may be used. For instance, instead of the overhead shaft S′ a shaft below the cradle, extending transversely across the tank, may be employed. Likewise in place of the mechanism for imparting longitudinally-reciprocating motion to the cradle any other equivalent mechanism may be employed.

By the compound motion imparted to the cradle the barrels are moved forward automatically and rolled around while passing from the ingoing end toward the outgoing end of the cradle. While they are rolled in the cradle, the barrels are filled with tepid water up to the level of the water in the tank. The water enters through the faucet and bung-holes of the barrels and produces by the shaking action to which it is subjected the thorough washing of the interior of the barrel, while the outside of the barrel is simultaneously cleaned to some extent by the agitation to which the water in the tank is subjected by the rocking motion of the barrel. The gradual forward-rolling motion of the barrels in the cradle is produced by the forward stroke imparted to the cradle, which is accomplished by locating the parallel cams g^7 of the transverse shaft S^2 and the collars of the center rod of the cradle slightly in front of a vertical center plane passing through the median normal position of the cams on the shaft S^2, so that a forward impulse is given to the barrels even if the cradle C were supported in a horizontal position on its supporting-rollers; but as the cradle has a slight inclination the gradual forward and turning motion of the barrels is effectively produced simultaneously with the longitudinally-reciprocating motion of the same, so that they finally arrive near the outgoing end of the cradle, where they are taken up by the delivery mechanism at the outgoing end of the tank. The delivery mechanism of the barrels is clearly shown in Fig. 1 and in detail in Fig. 5. It consists of two endless sprocket-chains I, which are stretched over larger and smaller sprocket-wheels i i' and over guide and tension rollers i^2 i^3. The shaft of the upper sprocket-wheels i receive rotary motion by a gear-wheel transmission m m' m^2 from the driving-shaft S, as shown in Fig. 1. The guide and tension rollers i^2 i^3 are supported on short shafts which are applied to slide-bars i^4, which are adjusted on the side walls of the tank by means of slots and clamping-screws i^5, as shown in Fig. 5. The endless sprocket-chains I are connected by two transverse rods I′, that are attached to diametrically-opposite points on the sprocket-chains, said chains being located below the outgoing end of the cradle, so that the barrels are taken up by the transverse rods I′ as they are moved-over the outgoing end of the cradle and conducted along two curved stationary guide-rails I^2, that are supported on yoke-shaped transverse straps I^3, attached at their ends to the side walls of the tank. The guard-rails lead up to a level with the upper edge of the outgoing end of the tank, so as to conduct the barrels over the guide-rails and deliver them over the downwardly-

inclined bracket-arms I^4 to the scrubbing-machine, which is set up adjacent to the washing-machine and by which the exterior cleaning of the barrels is completed. From the scrubbing-machine the barrels are conducted to the sprinkler by which the final interior cleansing of the barrel is produced. A second set of curved guide-rails I^5 is arranged parallel with the main guide-rails I^2, but close to the sprocket-chains I, said guide-rails being attached to the side walls of the tank and serving to guide the barrels in a reliable manner while they are moved over the main guide-rails by the delivery mechanism. The side guide-rails correspond to the side rails of the cradle and prevent the contact of the barrels with the sprocket-chains and their guide and tension rollers, so that they are protected against injury by the barrels. Without the side guide-rails the barrels would be liable to wabble from one side to the other as they pass over the main guide-rails and would interfere with the proper operation of the delivery mechanism of the machine.

The main advantage of my improved machine for washing barrels is that the barrels are thoroughly washed in tepid water while passing through the tank, as the compound laterally-rocking and longitudinally-reciprocating motion to which they are subjected shakes up the barrels and the water in the same to such an extent as to exert a thorough washing action on the same. Another advantage is that the barrels are slowly and gradually fed forward automatically, taken up automatically from the cradle, and delivered automatically to the scrubbing-machine. Still another advantage is that the separate "soap-tank," which was heretofore used for soaking the barrels preparatory to washing the same, is dispensed with and directly combined with the mechanism for rocking and rolling the barrels into one structure.

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

1. The combination, with a washing-tank, of a cradle in said tank for receiving the barrels to be washed, and means for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, substantially as set forth.

2. The combination, with a washing-tank, of a cradle in said tank for receiving the barrels to be washed, means for imparting a laterally-rocking motion, and means for imparting a simultaneously longitudinally reciprocating motion to said cradle, substantially as set forth.

3. The combination, with a washing-tank, of a cradle in said tank, for receiving the barrels to be washed, means at the bottom of the tank for supporting said cradle in the same, and means for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, substantially as set forth.

4. The combination, with a washing-tank, of a cradle supported in said tank, for receiving the barrels to be washed, means for guiding the barrels in said cradle, and mechanism for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, substantially as set forth.

5. The combination, with a washing-tank, of a cradle supported in said tank, means for conducting the barrels to the ingoing end of said cradle, means for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, and a delivery mechanism for conducting the barrels from the cradle over the outgoing end of the tank, substantially as set forth.

6. The combination, with a washing-tank, of a cradle for receiving the barrels to be washed, means for supporting said cradle in said tank, means for conducting the barrels to the ingoing end of said cradle, guide-rails in said cradle for guiding the barrels, means for imparting a combined laterally-rocking and longitudinally-reciprocating motion to the cradle, and mechanism for delivering the barrels from the cradle over the outgoing end of the tank, substantially as set forth.

7. The combination of a washing-tank, supporting-rollers at the bottom of said tank, a cradle supported on said rollers, said cradle being composed of transverse U-shaped frames, longitudinal connecting-rods and guide-rails at opposite sides of said frames, and means connected with one of said frames for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, substantially as set forth.

8. The combination of a washing-tank, a cradle supported in said tank, means for conducting the barrels to the ingoing end of said cradle, means on said cradle for guiding said barrels when passing through the cradle, means for imparting a combined laterally-rocking and longitudinally-reciprocating motion to said cradle, a delivery mechanism for conducting the barrels from the cradle over the outgoing end of the tank, and guide-rails on the delivery mechanism for guiding the barrels over the same, substantially as set forth.

9. In a machine for washing barrels, a cradle for receiving the barrels, composed of transverse U-shaped frames, longitudinal connecting-rods for said frames, and side guide-rails at the upper ends of said frames, substantially as set forth.

10. In a machine for washing barrels, a cradle for receiving the barrels, composed of transverse U-shaped frames, longitudinal rods connecting said frames, guide-rails on the sides of said frames, and means for adjusting said guide-rails laterally to different sizes of barrels, substantially as set forth.

11. In a barrel-washing machine, a cradle

composed of transverse U-shaped frames, longitudinal connecting-rods for said frames, side guide-rails provided with fixed outwardly-extending brackets, straps connecting said brackets with said frame, pivot-links connecting said straps with the side rails, and clamping-bolts for connecting the brackets and straps, according as the side rails are to be adjusted for larger or smaller barrels, substantially as set forth.

12. The combination, with a washing-tank, of a cradle for receiving the barrels, said cradle consisting of transverse U-shaped frames, longitudinal connecting-rods, and side guide-rails, means for imparting laterally-rocking motion to said cradle, a universal joint connecting said actuating mechanism with the cradle, a rock-shaft supported in bearings on the bottom of the tank, means for connecting one of the frames of the cradle with said rock-shaft, cams on said rock-shaft, rollers on the bottom of the tank, said pieces engaging said clamps so as to impart longitudinally-reciprocating motion to the cradle simultaneously with the laterally-rocking motion, substantially as set forth.

13. The combination, with a washing-tank, of a cradle in said tank, rollers for supporting said cradle on the bottom of said tank, means for imparting a laterally-rocking motion to said cradle, a transverse rock-shaft turning in bearings at the bottom of the tank, a crank-arm on said shaft, a universal joint connecting said crank-arm with the cradle, cams on said rock-shaft, and collars on the center rod of the cradle, said cams engaging said collars, so as to impart longitudinally-reciprocating motion to the cradle, simultaneously with the laterally-rocking motion, substantially as set forth.

14. The combination of a washing-tank, a cradle supported in said tank, means for imparting laterally-rocking and longitudinally-reciprocating motion to said cradle, a delivering mechanism for conducting the barrels from the cradle over the outgoing end of the tank, said delivery mechanism consisting of curved guide-rails, sprocket-wheels and chains, and transverse rods carried by said chains, said rods engaging the barrels as they are delivered from the cradle and conducting them over the outgoing end of the tank, substantially as set forth.

15. The combination, with a washing-tank, of a cradle in said tank, means for imparting a laterally-rocking and longitudinally-reciprocating motion to said cradle, a barrel-delivery mechanism arranged between the cradle and the outgoing end of the tank and consisting of curved bottom and side guide-rails, sprocket chains and wheels and transverse rods on said chains for engaging the barrels and conducting them over the outgoing end of the tank, substantially as set forth.

16. In a machine for washing barrels, the combination, with a washing-tank, of a barrel-delivery mechanism, consisting of rotary sprocket-chains, sprocket-wheels for driving said chains, transverse rods attached to said chains for taking up the barrels, curved bottom rails, curved side guide-rails, for conducting the barrels over the outgoing end of the tank, and guide and tension rollers for guiding said sprocket-chain relatively to said curved bottom and side rails, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JACOB MÜLLER.

Witnesses:
PAUL GOEPEL,
M. H. WURTZEL.