No. 609,931. Patented Aug. 30, 1898.

C. C. F. EHRENGART.

BARREL WASHER.

(Application filed Oct. 19, 1897.)

(No Model.) 3 Sheets—Sheet 1.

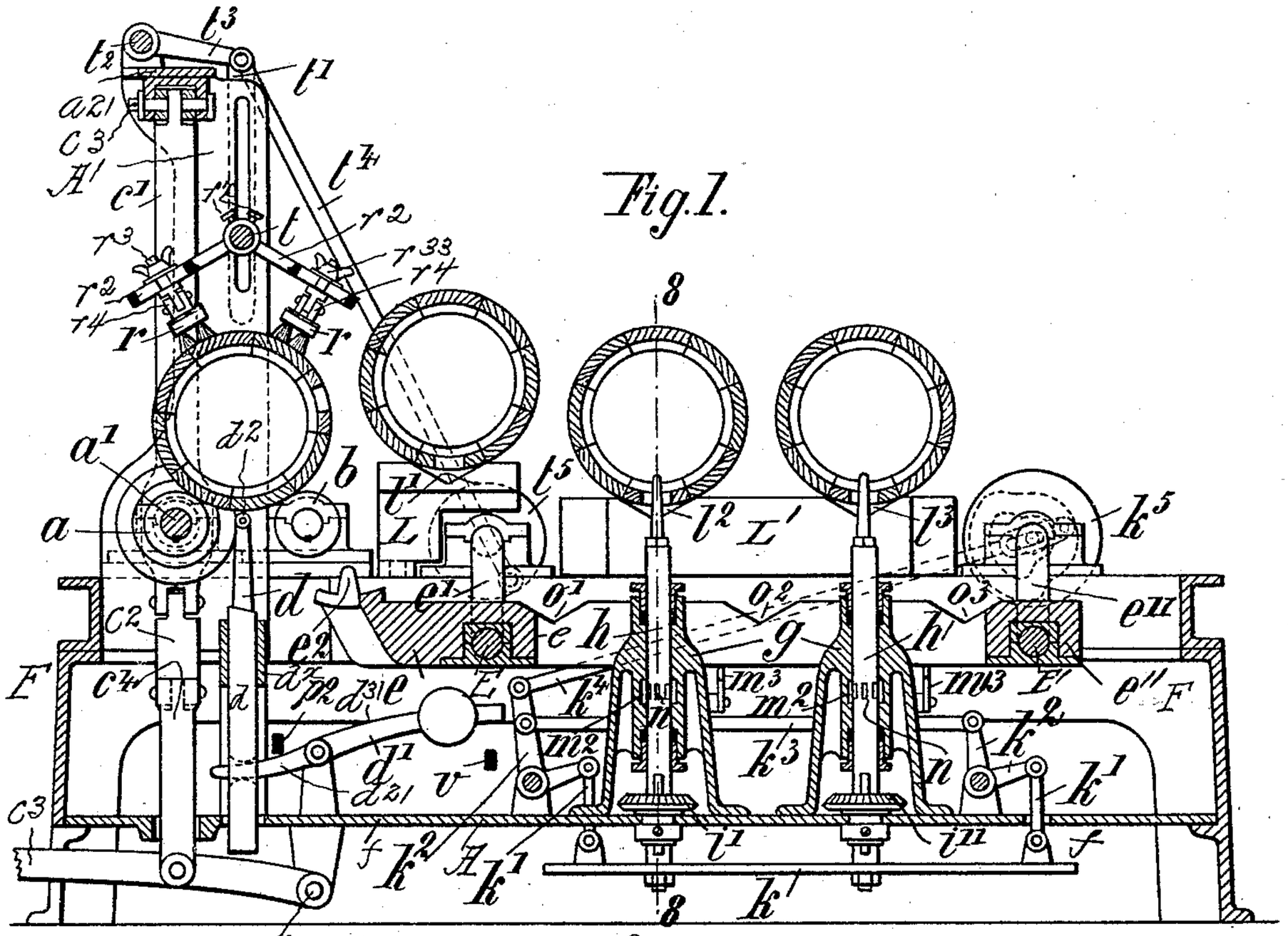

Fig. 1.

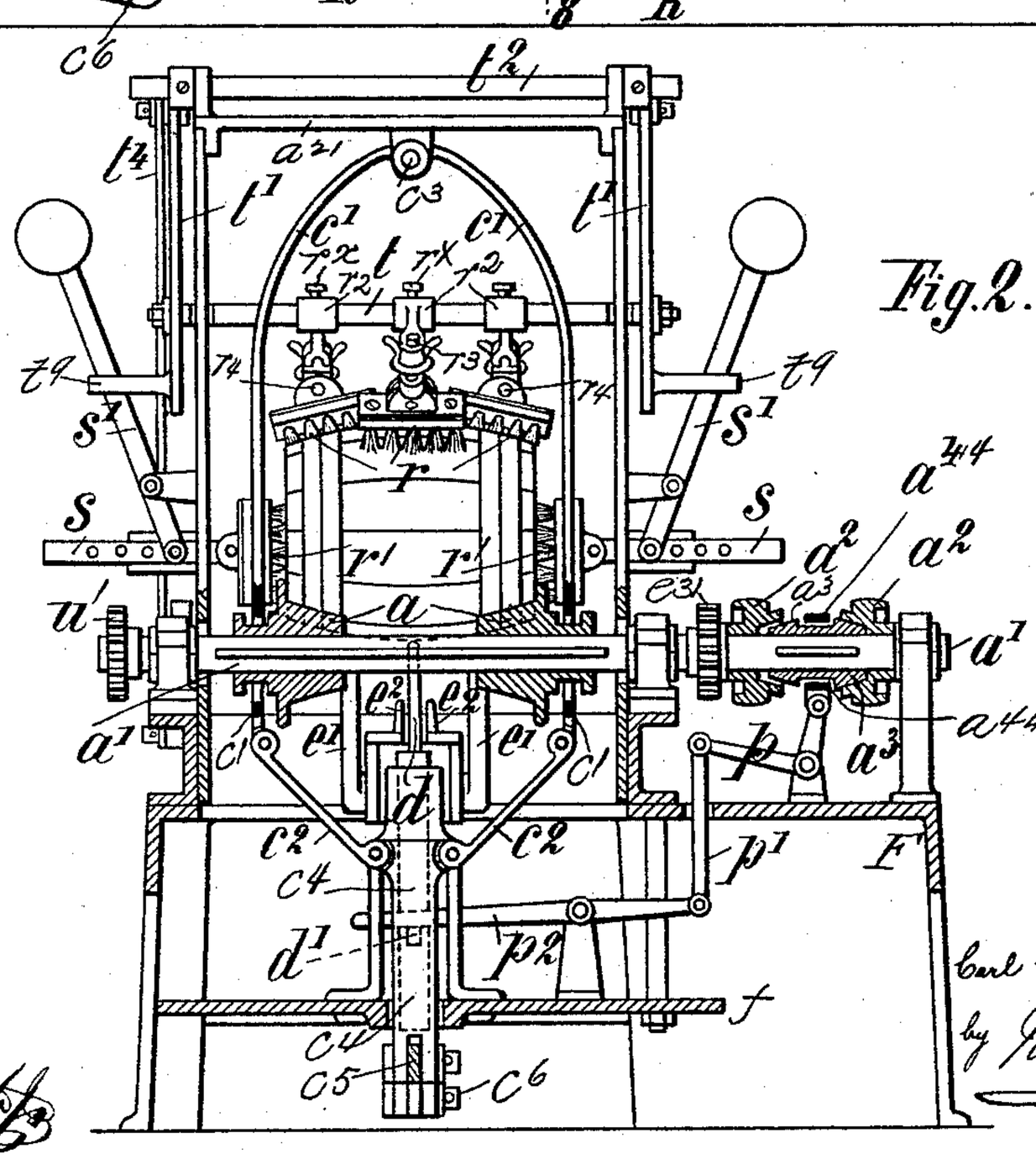

Fig. 2.

Witnesses:
R. S. Ober.
Henry Orth & Co.

Inventor.
Carl C. F. Ehrengart.
by Henry Orth & Co.
Attorney.

No. 609,931. Patented Aug. 30, 1898.

C. C. F. EHRENGART.

BARREL WASHER.

(Application filed Oct. 19, 1897.)

(No Model.) 3 Sheets—Sheet 2.

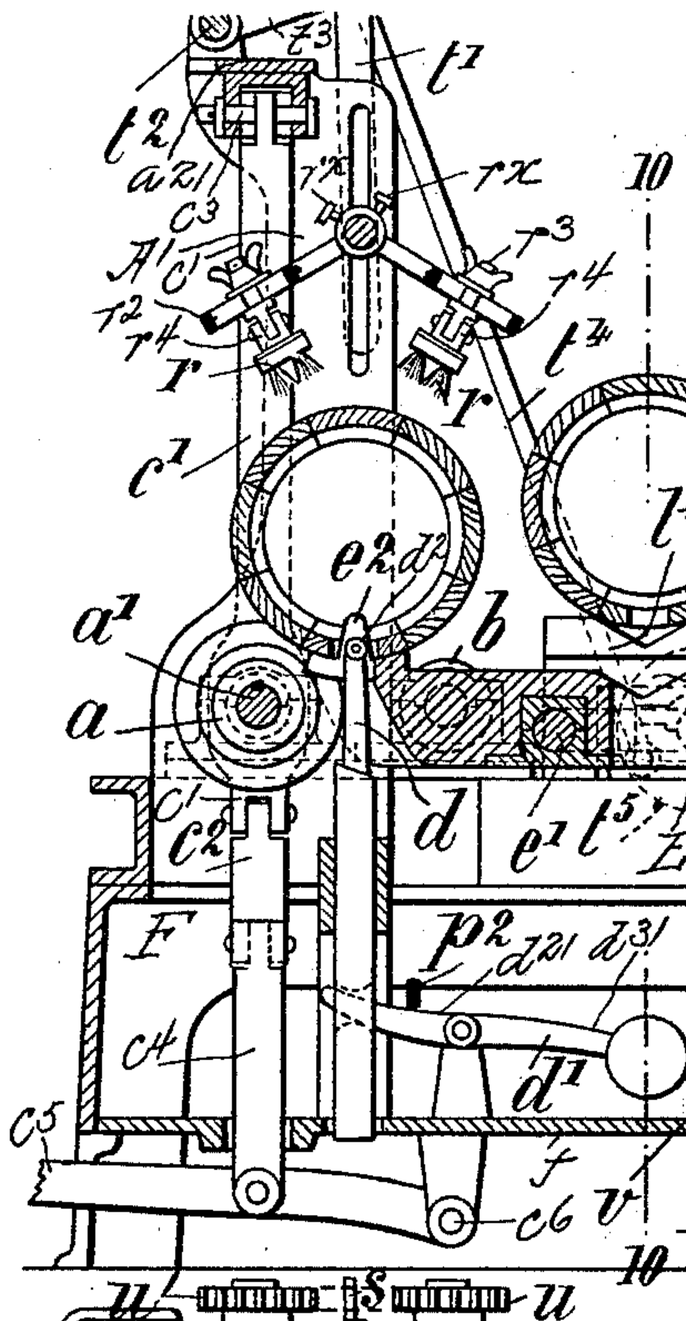

Fig. 3.

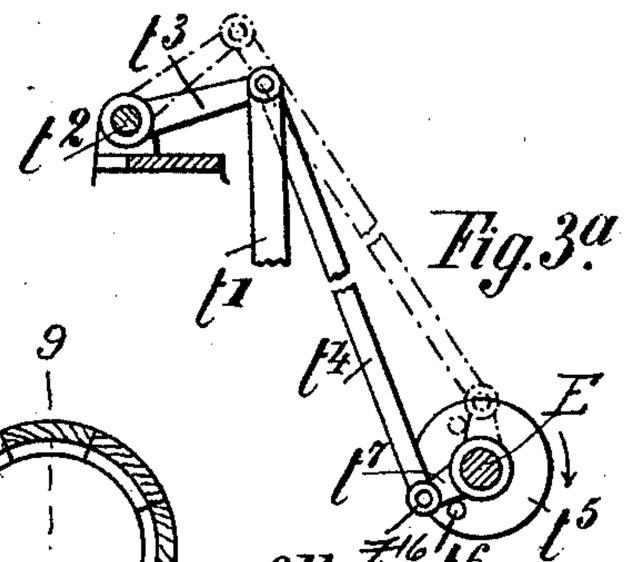

Fig. 3a.

Fig. 4.

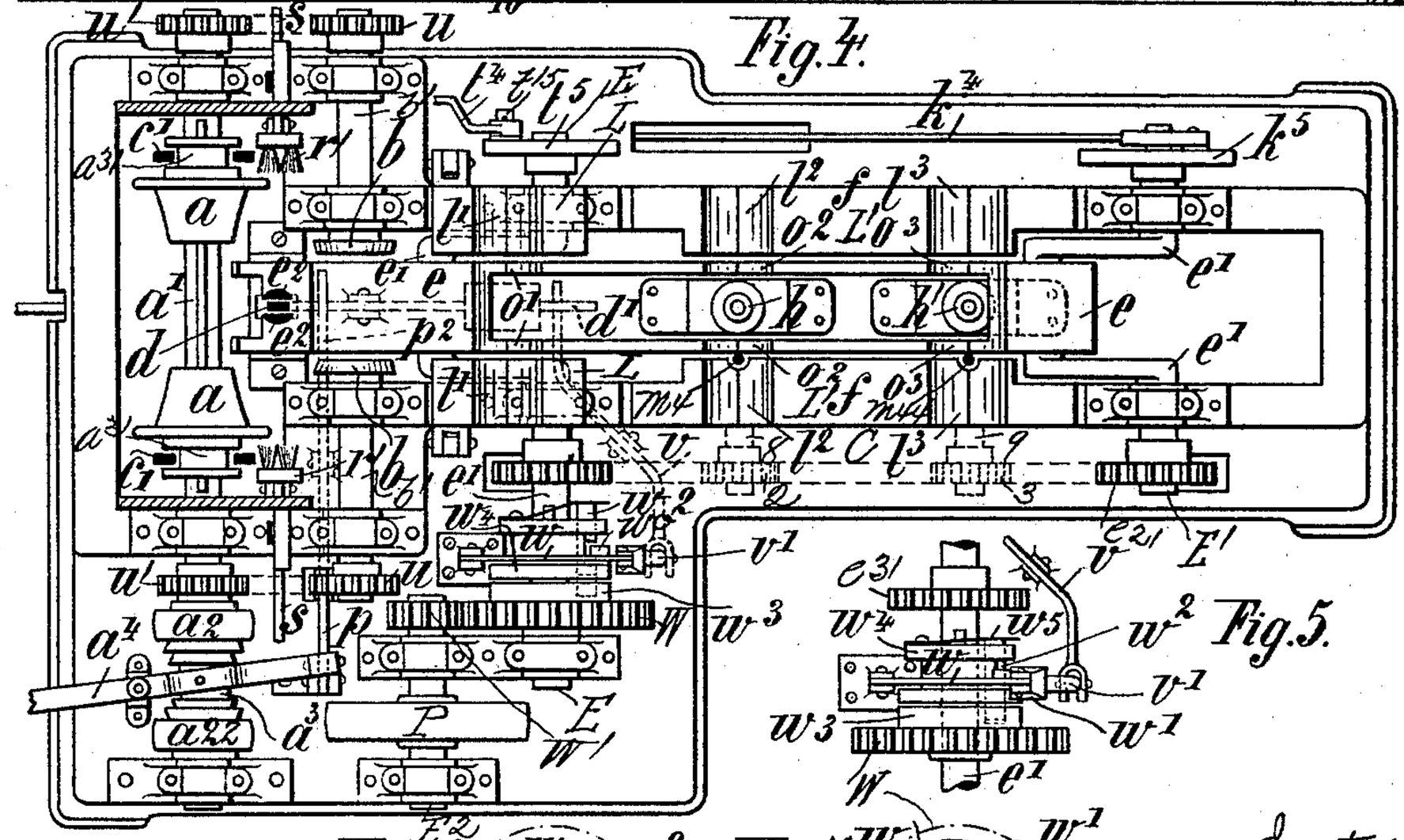

Fig. 5.

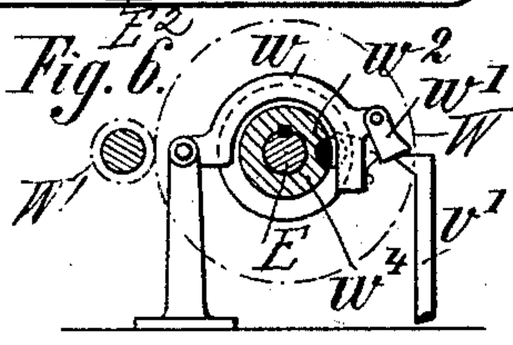

Fig. 6.

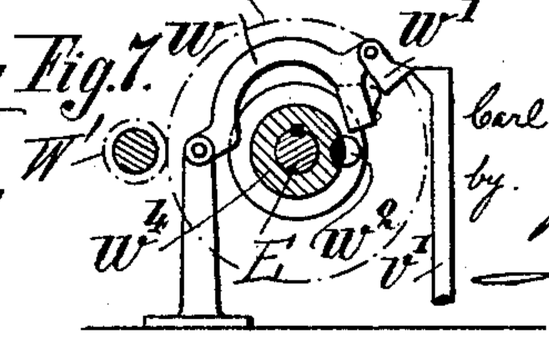

Fig. 7.

Witnesses.
B. S. Ober.
Henry Orth Jr.

Inventor.
Carl C. F. Ehrengart.
by Henry Orth
Attorney.

No. 609,931. Patented Aug. 30, 1898.

C. C. F. EHRENGART.

BARREL WASHER.

(Application filed Oct. 19, 1897.)

(No Model.) 3 Sheets—Sheet 3.

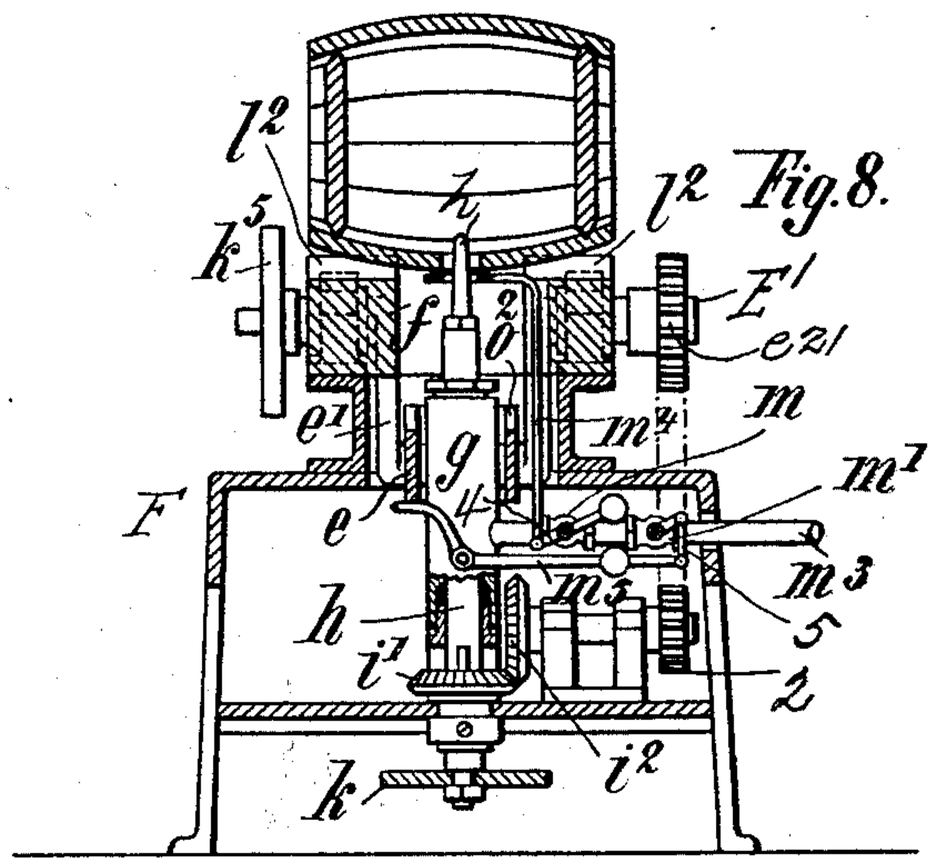

Fig. 8.

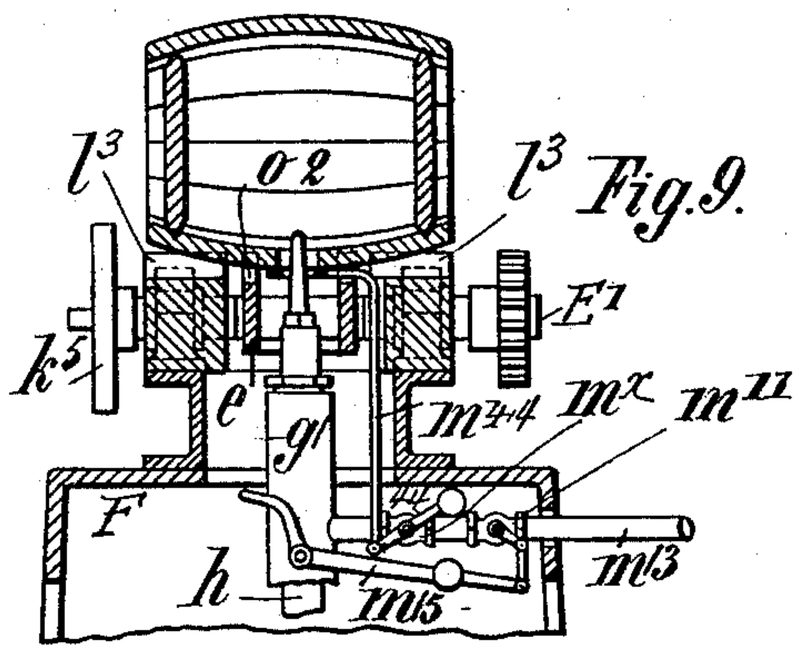

Fig. 9.

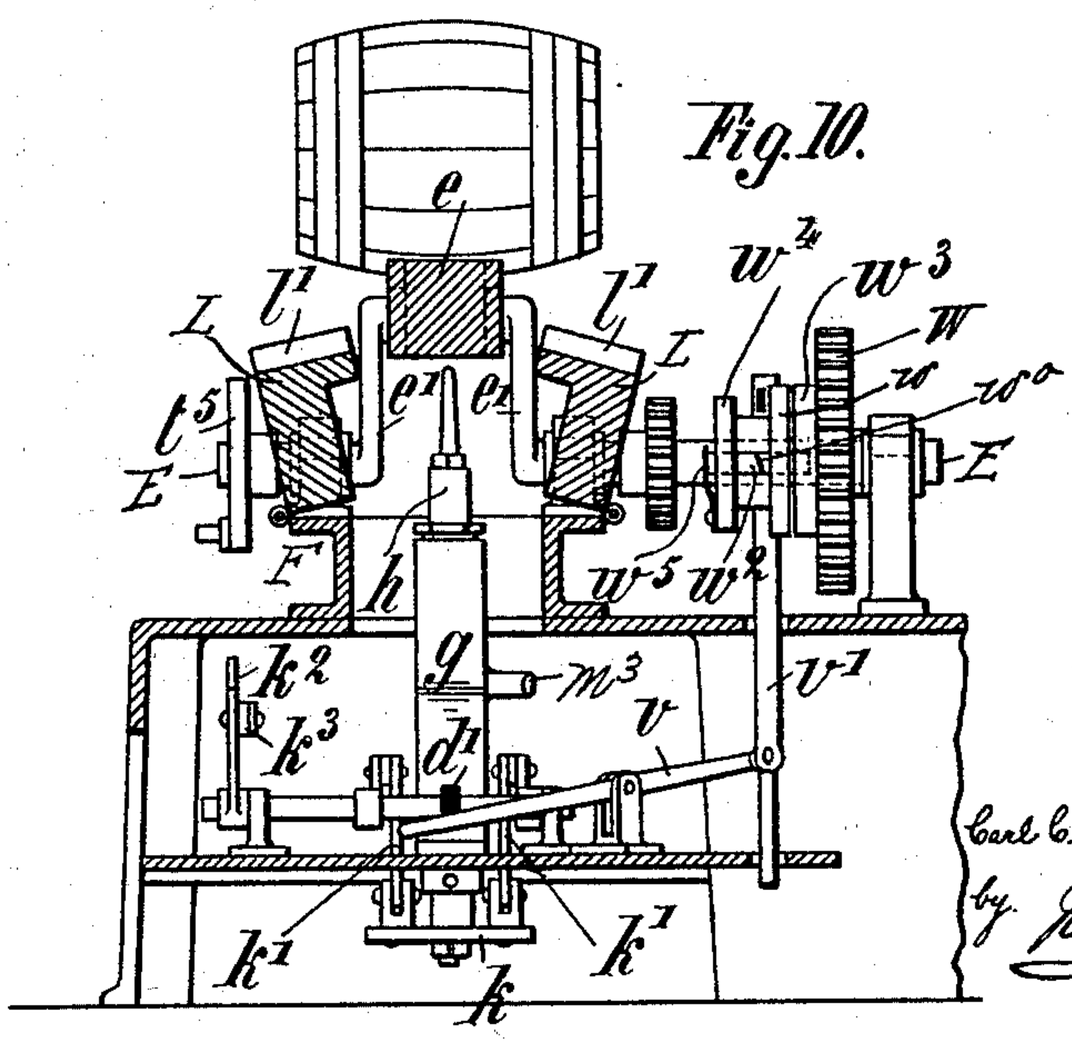

Fig. 10.

Witnesses:
B. S. Ober.
Henry Orth Jr.

Inventor
Carl C. F. Ehrengart
by Henry Orth
Attorney.

UNITED STATES PATENT OFFICE.

CARL CHRISTIAN FRIEDRICH EHRENGART, OF NIENSTEDTEN, GERMANY.

BARREL-WASHER.

SPECIFICATION forming part of Letters Patent No. 609,931, dated August 30, 1898.

Application filed October 19, 1897. Serial No. 655,702. (No model.)

To all whom it may concern:

Be it known that I, CARL CHRISTIAN FRIEDRICH EHRENGART, a subject of the German Emperor, and a resident of Nienstedten, in the Province of Sleswig-Holstein, Kingdom of Prussia, in the German Empire, have invented certain new and useful Improvements in Machines for Washing Casks or Barrels, of which the following is a specification.

The present invention relates to improvements in machines for washing casks or barrels; and the object of the improvements is to enable the casks or barrels to be washed externally and cleansed (rinsed or flushed) internally. For this purpose my improved machine is so constructed that the casks, which are introduced into it in succession, take up of their own accord the proper position for washing and cleansing and are automatically moved from one operative position to the next, while at the same time the several devices or parts of the working mechanism are automatically thrown into and out of gear. I attain these objects by the means illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a vertical longitudinal section, and Fig. 2 an end elevation, partly in section, of the entire machine. Fig. 3 is a similar view to Fig. 1, showing the machine in another operative position. Fig. 3^a is a detailed view illustrating the means for raising and lowering one set of cleaning-brushes. Fig. 4 is a plan view, partly in section, of Fig. 3. Figs. 5, 6, and 7 are detail views showing a stop mechanism in plan and section, respectively. Fig. 8 is a section on the line 8 8 of Fig. 1; and Figs. 9 and 10 are sections on the lines 9 9 and 10 10, respectively, of Fig. 3, the front crank in Fig. 10 being shown in its uppermost position and the forward ends of the frame-cheeks forced apart by the said crank.

Similar letters and numerals refer to like parts throughout the several views.

The operative elements are mounted upon and supported from a suitable frame F, from the feed end of which (left-hand end in Figs. 1, 3, and 4) rises a frame composed of two vertically-slotted standards A′, connected at their upper end by a cross-tie a^{21}, and in brackets projecting above said cross-tie are formed bearings for a cross-shaft t^2, while the cross-tie a^{21} has a bearing-bracket for the fulcrum-pin c^3 of two levers c'.

The main frame F is provided with bearings for three parallel shafts a', E, and E′, the last two shafts being crank-shafts, and for two stub or short shafts b' b' in line with each other, said frame having also secured thereto two stub-shafts 8 and 9, carrying sprocket-wheels 2 and 3, respectively. The shaft a' carries two conical rolls a a, flanged at their wider ends or bases and connected with said shaft by spline or tongue and groove, so as to revolve with and have endwise motion on said shaft, said rolls being provided at their flanged ends with a grooved hub a^{31} and said rolls constituting one set of revolving bearings for a cask or barrel. The shaft a' also carries two loose driving-pulleys a^2 and a^{22}, a double-cone friction-clutch a^3 being adapted to coact with conical friction-surfaces in the proximate faces of the hubs of the said pulleys, said clutch being operated by a clutch-ring a^{44}, Fig. 2, to which is pivoted a shifting lever a^4, Fig. 4, that has its fulcrum on the main frame, and to said lever is pivoted the vertical arm of a bell-crank lever p, for purposes presently to be explained. Finally, the shaft a' carries two sprocket-wheels w', connected by chains with the like wheels u on the stub-shafts b', which carry at their inner ends beveled disks b b, that constitute the second set of revoluble bearings necessary to properly support and revolve a cask or barrel.

The cone-bearings a a, as stated, have motion lengthwise of their shaft a', so as to adapt them to receive between their flanges barrels of different sizes, and in order that the feeding device hereinafter referred to may operate with freedom and for the purpose of centering the barrel to be cleansed, so that its bung-hole will be in the plane of the stop-bar and injector-nozzles hereinafter to be described, I provide means whereby the said bearings can be moved apart and again brought together to support such barrel. To this end the bearings a a are provided with grooved hubs a^{31}, as above stated, for the reception of loops or eyes on two levers c' c', whose upper ends converge and have a common fulcrum c^3 on the cross-tie a^{21} of the upper frame, as above set forth. The lower ends of these levers c' are con-

nected by links c^2 with a bar c^4, pivoted at its lower end to a weighted lever c^5, fulcrumed on a bracket depending from a shelf f on the main frame F, the tendency of the weight of said lever being to hold the bearings $a\ a$ in a normal position close together. If, however, said lever is lifted by hand, for instance, the links c^2 will move the levers c' apart and therethrough the bearings $a\ a$, so that barrels of different dimensions can be placed upon said bearings, and when the said lever c^4 is again released the levers c' will move the bearings $a\ a$ together, thereby also positioning or centering the barrel relatively to the stop-bar and injector-nozzles above referred to.

From the sides of the main frame rise cheeks L and L′, provided in their upper faces at suitable distances apart with V-shaped grooves $l'\ l^2\ l^3$, forming bearings for the barrels, whereby they are retained in proper position.

The shaft E′ carries a loose gear-wheel W, meshing with a pinion W′ on a continuously-revolving stub-shaft E^2, which carries a suitable belt-pulley P, which latter and the pulleys $a^2\ a^{22}$ on shaft a' are driven from any suitable prime motor. The shaft E also carries a sprocket-wheel e^{31}, connected by chain C with a sprocket-wheel e^{21} on shaft E′, said chain also driving the sprocket-wheels 2 and 3 on stub-shafts 8 and 9, above referred to and shown in dotted lines in Fig. 4.

The shaft E carries an automatically-operated clutch, (shown in detail in Figs. 5, 6, and 7,) consisting of a flanged sleeve w^4, revoluble with the shaft, in the flanges of which slides a spring-actuated coupling-pin w^2, whose spring w^5 tends to move said pin into and out of engagement with the hub w^3 of the loose gear W. The pin has a lock-notch adapted to be engaged by an arcuate locking-lever w, embracing the sleeve w^4 at a point intermediate of its end flanges, and said lever has on one side an inclined projection w^0, (see also Fig. 4,) adapted to engage at a certain time a corresponding surface on the coupling-pin w^2, whereby said pin is moved out of engagement with the hub w^3 of gear W, thereby enabling the lever to drop into the notch of the pin and hold it out of engagement with the aforesaid hub.

To the free end of the locking-lever w, which has its fulcrum or pivot on a suitable bracket on the main frame, is pivoted a spring-actuated pawl w', acted upon by a pawl-rod v' in the manner hereinafter explained.

To the crank e' of shaft E and to the crank e^{11} of shaft E′ is pivoted a feed-frame e, composed of two side bars having V-shaped notches $o'\ o^2\ o^3$, corresponding with the like notches $l'\ l^2\ l^3$ in the frame-cheeks L and L′, said bars being united at opposite ends by blocks or cross-pieces, in which the cranks are pivoted. The cross-piece at the forward or feed end of the frame is constructed in the form of a shoe, it being provided at its forward end with a concave bearing in its upper face, centrally of which there is an upwardly-projecting nose or lug e^2, the forward portion of said bearing and said lug being forked, and the lug is of such cross-sectional area as to adapt it to pass into the bung-hole of a barrel, for purposes presently explained.

The cheeks L′ at their rear end have their proximate faces recessed, so as to admit of the free rotation of the crank e^{11} of shaft E, and in order that the cheek-bearings L may be placed as close together as possible relatively to the feed-frame e, so as to admit of the cleansing of comparatively small barrels without interfering with the revolution of the cranks e' of shaft E, I hinge said feed-bearings to the main frame in such manner that the cranks e' will move them outwardly as they pass between said bearings sufficiently to clear the same and that said bearings will move back into their normal position by gravity. (See Fig. 10.)

In the slots of the standards A′ of the upper frame slides a cross-rod t, to which are adjustably secured, by means of set-screws $r^\times$, the sleeves r^2 of brush-carriers, which latter consist of a longitudinally-slotted arm radiating from the respective sleeves, to which arms the brush-heads r^4 are secured by means of bolts r^3, to which said heads are pivoted, and wing-nuts r^{33}, said bolts having a flange straddling the slot in the carrier-arms, as clearly shown in Fig. 1. By means of these brushes r the outer surface of the body of a barrel is scrubbed or cleansed, and in Fig. 3 I have shown three such brushes so arranged as to overlap one another, in order to adapt them to the cleansing of barrels of different sizes.

The cross-rod t is secured in hangers t', which latter are provided with a number of holes (not shown) for the purpose of adjusting the brushes r vertically in the hangers in accordance with the diameter of the barrels to be scrubbed. The upper ends of these hangers are pivoted to radial arms t^3, secured to the aforesaid cross-shaft t^2, above the cross-tie of the upper frame, and to one of said radial arms is pivoted a connecting-rod t^4, the other end of which is or may be connected to the wrist-pin of a crank-disk t^5 on one end of the shaft E, Fig. 4, so that at each complete revolution of said shaft the brushes will be raised from and again lowered into their operative position.

Inasmuch as the feed-operating shafts E E′ revolve somewhat slowly and in order that the brushes $r\ r$ may be moved back into their operative position before said shafts make a complete revolution, so that a barrel may be subjected to the action of the brushes as soon as a previously-scrubbed barrel has been moved clear or out of the way of the bearings $a\ a$ and $b\ b$, I pivot the connecting-rod t^4 to a crank-arm t^7, loose on the shaft E, and provide the disk t^5 with a pin t^6, adapted to engage said crank-arm, so that as soon as the

said arm has passed its vertical upper dead-point the crank will at once drop and therewith the brush-hangers t', thus moving the brushes back into operative position to act on a barrel to be scrubbed, while the feeding device returns into its normal position. The arrangement is such that a barrel after being scrubbed will be taken up by the feed-frame e and moved away from its bearings a a and b b during the first half-revolution of the shafts E and E'.

The heads of a barrel are scrubbed or cleansed by means of brushes r' r', pivoted to rods s, sliding in slots in the standards A', and to each of said rods s is adjustably secured a weighted lever s', that has its fulcrum in a bracket on said standards and is held in a slotted arm t^9 on the hangers t', so that as the latter are raised, as above described, the levers s' are moved inwardly, thereby swinging the rods s outwardly away from the barrel, as clearly shown in Fig. 2.

In the longitudinal central plane of the feed-frame e between the revoluble bearings a a and b b is arranged a stop-bar d, tapering upwardly and preferably provided at its upper end with a small roller d^2, said stop-bar having sliding motion in a tubular bearing $d^\times$ on the main frame. The stop-bar d has a slot for the reception of one end of a two-armed lever d', whose other arm is weighted, said tubular bearing $d^\times$ being likewise slotted to admit of the vertical movement of the lever-arm to lift and lower the bar.

The stop-bar d is held in its normally-depressed position by the end of a two-armed check-lever p^2, engaging the arm d^{21} of lever d', said check-lever p^2 being fulcrumed in a bracket on the main frame and having its opposite end pivoted to a link or connecting-rod p', itself pivoted to the horizontal arm of the bell-crank lever p, whose vertical arm is pivoted to the clutch-operating lever a^4, that operates the double-cone friction-clutch a^3 on shaft a', hereinabove referred to.

In the path of the weighted arm d^{31} of lever d' lies the free end of a lever v, fulcrumed on a bracket on the main frame and pivoted at its opposite end to the pawl-arm v', hereinbefore referred to, so that when the lever p^2 is tilted by the coupling-lever a^4 to allow the lever d' to swing on its pivot and lift the stop-bar d the weighted arm d^{31} of said lever d' will tilt the lever v, thereby lifting the pawl-arm v' and therethrough the arcuate locking-lever w, thereby releasing the coupling-pin w^2, which under the stress of its spring w^5 is thrown into engagement with the hub w^3 of the loose gear W, causing the feed-shafts E and E' to revolve. As the shaft E revolves the locking-lever w drops. Its pawl w', being spring-held, is enabled to slide over the pawl end of arm v', and when the said shaft is about to complete a revolution the inclined projection w^0 on the locking-lever w engages a corresponding projection on the coupling-pin w^2, forcing the same back against the stress of its spring, so that when said shaft has completed a revolution the notch in said coupling-pin will be in line with the locking-lever, which latter drops into said notch, thus uncoupling the loose gear W from said shaft E.

In line with the stop-bar d, between the bearings l^2 l^3 in the fixed cheeks L' on the main frame F, are arranged injectors h and and h', respectively, adapted to inject heated and cold water into barrels. These injectors work fluid-tight in casings g and g', respectively, in which is formed an annular chamber m^2, the injector-pipes having peripheral ports formed by longitudinal slots n, adapted to be moved into and out of the chambers m^2, which latter are in communication with a supply of hot and cold water under pressure through pipes m^3 and m^{13}, respectively, Figs. 1, 8, and 9. The hot-water pipe m^3 has two stop-cocks m and m', the plug of the stop-cock m carrying a weighted lever 4, one end of which is connected to a rod m^4, whose upper end is bent inwardly and on a line with the bearing l^2 in the fixed cheeks L' on the main frame. In the normal closed position of the stop-cock m the bent end of the rod m^4 lies sufficiently above the bearing l^2 as that when a barrel is deposited therein said rod will be depressed by said barrel sufficiently to open the stop-cock and admit water to the annular chamber m^2 in casing g. The second stop-cock m' in advance of the stop-cock m in the water-supply pipe has a crank-arm secured to its plug connected by a link 5 with a weighted lever m^5, having a fixed fulcrum 6, the free end of said lever being bent and lying in the path of one of the side bars of the feed-frame e, the arrangement being such that so long as said feed-frame e is in its lowermost position, Figs. 1 and 8, the stop-cock m' will remain closed, being held in that position by one of the side bars, (as the left side bar, Fig. 8;) but as soon as the feed-frame e rises the weight on lever m^5 will turn the stop-cock m' and admit water to stop-cock m in hot-water pipe m^3 or to the cock $m^\times$ in cold-water pipe m^{13}, as shown in Fig. 9. The same system of cut-off cocks is provided for the cold-water pipe m^{13} as shown in Fig. 9, in which $m^\times$ m^{11} are the stop-cocks controlled by the barrel and feed-frame e, respectively, 44 and m^{15} being the controlling-levers, and in said Fig. 8 the stop-cock m is opened by the weight of the barrel on the rod m^4, while the stop-cock m' is held closed by feed-frame e; but as soon as said frame rises the stop-cock m' or m^{11} is opened, water being then injected into the barrel until the feed-frame lifts said barrel off the bent end of rod m^4 or m^{44}, when the stop-cock m or $m^\times$ is closed by the weight on lever 4 or 44, as shown in Fig. 9, thus leaving the stop-cock m' or $m^\times$ open until the feed-frame again descends and impinges upon lever m^5 or m^{15} to close the same. It will thus be seen that during the upward movement of the feed-frame e water is injected into a barrel either hot or

cold or hot and cold water into two barrels on the bearings l^2 l^3, while so long as there is no barrel on one or the other or on either of said bearings the water-supply to the injectors remains cut off through the stop-cocks m' and m^{11}, whereby waste of water is prevented.

The upper bent portions of the rods m^4 m^{44} have an eye or loop for the passage of the nozzles of the injectors h and h', respectively.

The injectors h and h' are supported from a bar or plate k, suspended by links k' from the horizontal arm of bell-crank levers k^2, whose vertical arms are connected by a rod k^3. The vertical arm of the forward bell-crank lever k^2 is connected to one end of a rod k^4, whose opposite end carries a pin that works in a cam-groove in the outer face of a disk k^5 on the rear crank-shaft E′ of the feed-frame e, so that as said shaft revolves the injectors are alternately lifted and lowered to move their nozzles into the bung-hole of a barrel positioned at l^2 or l^3, or both, and at the same time bring the ports n in the injector-nozzles in register with the annular water-chambers m^2 in the injector-casings g and g'.

Each of the injectors h or h' carries near its lower end a bevel-wheel i' and i^{11}, respectively meshing with bevel-wheels i^2 on stub-shafts which carry a sprocket-wheel i^3, driven from the sprocket-wheels 2 and 3, respectively, and the chain C, that drives the sprockets e^{31} e^{21} on the feed-shafts E and E′, respectively, as hereinbefore described. The bevel-wheels i' and i^{11} are connected with the injector-pipes by spline or tongue and groove, and their hubs have a contracted bearing fitting a corresponding opening in the shelf f on the main frame F.

It is obvious that by proper adjustment of the pitman or connecting rod k^4—that is to say, by lengthening or shortening the same—the amplitude of the up-and-down motion of the injectors h and h' can be sufficiently varied to cause the ports n to register more or less with the annular feed-chambers m^2 in the injector-casings g, so that the volume of water, either hot or cold, injected into the barrel can be varied substantially in accordance with the internal area of such barrel.

The operation of the machine is as follows: The shaft a' is coupled to sleeve a^{22} through the double-cone coupling-sleeve a^3, and the stub-shaft E^2 is set in motion to revolve the loose gear W. The weighted lever c^5 is now lifted to move the bearings a a on shaft a' apart, and a barrel is placed on said bearings and on the beveled or coned bearings b b and said lever c^5 is allowed to drop, whereby the bearings a a are moved toward each other and the barrel is positioned thereon so that its bung-hole will lie in the plane of the stop-bar d and of the nozzles of the injectors h and h', or, in other words, in the longitudinal central plane of the feed-frame e. A jet or jets of water may now be directed upon the barrel while it is being revolved and acted upon by the brushes r and r', which operation may be continued for any required length of time. When the exterior of the barrel has been scrubbed, the double-cone coupling-sleeve a^3 is shifted to couple the pulley a^2 with shaft a', which has for result the tilting of the lever p^2 through the shifting lever a^4, Fig. 2, the bell-crank lever p and rod p', connecting the two levers, thereby allowing the weighted lever d' to drop and lift the stop-bar d into contact with the revolving barrel, and as soon as its bung-hole comes into line with the upper end of said rod the latter will under the weight of lever d' move into said bung-hole, stop the revolution of the barrel, and hold it in a position to be taken up by the feed-frame e. As the lever d' drops its weighted arm strikes the free end of lever v, Fig. 10, thereby lifting the pawl-arm v', which, acting upon the pawl w' on locking-lever w, will lift the same out of engagement with the notch in the coupling-pin w^2, Fig. 7, so that the spring w^5 of said pin will throw the latter into engagement with the hub of the loose gear W on shaft E, whereby said shaft and therethrough the shaft E′ and the sprocket-wheels 2 and 3 are also caused to revolve, thereby revolving the injectors h and h' through the gearing i^3 i^2 i'. At the same time the feed-frame e moves forward and then upward with its bearing end straddling the stop-bar d until the lug or projection e^2 enters the bung-hole of the barrel on bearings a a and b b, when said barrel will be supported from the forward end of the said feed-frame and will rise therewith and then descend as the cranks e' e' and e^{11} e^{11} revolve until said barrel is deposited upon the hinged cheek-bearings L, which during the passage between them of the cranks e' are moved apart, as above described. As soon as the shaft E commences to revolve the pin t^6 on the disk t^5 thereon moves the crank t^7, Fig. 3, up, thereby lifting the rod t^4, and therethrough and through the cross-shaft t^2 and radial arms t^3 the hangers t' and brushes r r and simultaneously therewith the brushes r' r' will be moved apart, thus leaving the barrel on bearings a a and b b free to be taken up by the feed device. When said barrel has been so taken up and moved out of the path of said brushes, the crank t^7 is about to pass its upper dead-point and will then drop, thereby moving the brushes r and r' back into their operative position, another barrel to be scrubbed being meanwhile placed on said bearings. As the shafts E and E′ revolve and the feed-frame is raised out of contact with the levers m^5 m^{15}, Figs. 8 and 9, the stop-cocks m' m^{11} will be opened, thereby admitting water to the stop-cocks m and $m^{\times}$, which, however, remain closed, as their connecting-rods are not now weighted down by a barrel. Simultaneously therewith the injectors h and h' will be caused to rise through the action of the cam-groove (shown in dotted lines in Figs. 1 and 3) in the disk k^5 on shaft E′, and as the feed-frame

shafts commence the second half of their revolution the feed-frame descends, deposits the externally-scrubbed barrel onto the hinged bearing-cheeks L, and when said shafts have completed their revolution the operative parts will have returned into their normal position.

As hereinbefore stated, when the shafts E E′ are about to complete a revolution the locking-lever *w* retracts the coupling-pin w^2 from the hub of the loose gear W on shaft E, thereby stopping the rotation of said shafts E and E′. At this time the double-coned friction-clutch sleeve a^3 is moved out of engagement with the belt-pulley a^2 and into engagement with the belt-pulley a^{22}, thereby also depressing the check-lever p^2 and therethrough the lever *d′*, whereby the stop-bar *d* is moved down into its normal position while the lever *v* is released by lever *d′*, thereby causing the pawl-arm *v′*, Fig. 10, to drop and slide by the pawl *w′* on said locking-lever *w*, which pawl *w*' is immediately moved by its spring over the pawl end of said arm *v′*, Fig. 6. After the second barrel has been scrubbed and the belt-pulley a^2 is again coupled to shaft *a′* the described operations are repeated, and during the up-and-down movements of the feed-frame *e* the barrel on hinged cheeks L will be transferred to the bearings l^2 on the fixed cheeks L′, while the barrel last scrubbed will be transferred to said hinged cheeks, and as the stop-bar *d* positions the barrels so that the bung-hole thereof will be on the under side and as the said position suffers no change in the transfer of the barrel from L to the bearings l^2 on L′ the bung-hole of the transferred barrel will be in line with the nozzle of the injector *h*. As the barrel is lowered onto bearings l^2 the injector *h* will be revolved and at the same time caused to rise and enter the bung-hole of said barrel, the ports *n* in the injector-body being moved into register with the annular chamber m^2 in the injector-casing *g*. In its movement onto bearings l^2 the barrel depresses the rod m^4, thereby opening the stop-cock *m* and admitting hot water to the injector *h*, the supply of which is again cut off as soon as the feed-frame has returned into its lowermost position, at which time the shaft *a′* is again coupled to belt-pulley a^{22}. At the next operation of the described appliances the barrel on bearings l^2 will be transferred to bearings l^3 to be rinsed or flushed with cold water, while the barrel on bearings *l′* will be transferred to bearings l^2 and the barrel on bearings *a a* and *b b* to bearings *l′*, there being now three barrels operated on simultaneously, the fourth barrel on bearings *l′* waiting transfer. These operations are now continued until all the barrels have been cleansed, when the rotation of shaft *a′* is stopped. The cleansed barrels can be taken off the rear end of the machine by any suitable means.

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

1. In a barrel-washing machine, the main frame a support for the barrel comprising a revoluble shaft, two bearings adapted to revolve with and have endwise motion on said shaft, means for moving said bearings from and toward each other on their shaft, and two complementary revoluble bearings, for the purpose set forth.

2. In a barrel-washing machine, the main frame a support for the barrel comprising a revoluble shaft, two bearings adapted to revolve with and have endwise motion on said shaft, means for moving said bearings from and toward each other on their shaft, and two complementary revoluble bearings; in combination with horizontally and vertically arranged brushes, adjustable relatively to the aforesaid support to enlarge or contract the space between them, and means for moving said brushes out of and back into their normal adjusted position, for the purpose set forth.

3. In a barrel-washing machine, the main frame a vertical stop-bar adapted to be raised and lowered, revoluble bearings for a barrel on opposite sides of said bar, one set of said bearings adjustable and adapted to position the barrel relatively to the stop-bar to adapt the latter to enter the bung-hole of said barrel, brushes arranged relatively to and above the said bearings to act upon the body and heads of a barrel thereon, a feed device provided with a forked bearing for a barrel, and mechanism adapted to actuate said device to move said bearings horizontally toward the stop-bar, then upwardly along the same then rearwardly and downwardly, for the purpose set forth.

4. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of the bar, complementary revoluble centering-bearings on the opposite side thereof adapted to center a barrel so as to adapt said bar to enter the bung-hole of such barrel, brushes arranged relatively to the aforesaid bearings to act upon the body and heads of a barrel thereon, a feed device provided with a forked bearing for a barrel, and mechanism adapted to actuate said device to move its bearing upwardly to, along, and away from the stop-bar, and then downwardly; in combination with mechanism adapted to automatically lift the stop-bar, and a retaining-lever adapted to hold said bar against upward motion, for the purpose set forth.

5. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of the bar, complementary revoluble centering-bearings on the opposite side thereof adapted to center a barrel so as to adapt said bar to enter the bung-hole of such barrel, brushes arranged relatively to the aforesaid bearings to

act upon the body and heads of a barrel thereon, a feed device provided with a forked bearing for a barrel, and mechanism adapted to actuate said device to move its bearing upwardly to, along, and away from the stop-bar, and then downwardly, in combination with mechanism adapted to automatically lift the stop-bar, and a retaining-lever adapted to hold said bar against upward motion, and mechanism adapted to shift said retaining-lever and enable the lifting mechanism to lift said stop-bar, for the purpose set forth.

6. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of said bar, complementary revoluble centering-bearings on the opposite side thereof, adapted to center a barrel so as to adapt said bar to enter the bung-hole thereof, brushes arranged relatively to the aforesaid bearings to act upon the body and heads of a barrel thereon, a feed device provided with a forked bearing for a barrel, mechanism actuating said device to move its bearing upwardly to, along and away from the stop-bar and then downwardly, in combination with mechanism adapted to lift said bar, and mechanism controlled by a moving element of the machine and adapted to move the brushes out of their operative position when the feed device is set in motion, for the purpose set forth.

7. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of said bar, complementary revoluble centering-bearings on the opposite side of said bar adapted to center a barrel so that the stop-bar may enter the bung-hole thereof, brushes arranged relatively to the bearings to act upon the body and heads of a barrel thereon, a feed device provided with a forked bearing for a barrel, and mechanism actuating said device to move its bearings upwardly to, along and away from the stop-bar, and then downwardly; in combination with bearings adapted to intercept a barrel on the feed device as it moves downward, mechanism controlled by a moving element of the machine, adapted to move the brushes out of their operative positions during the upward movement of the feed device, a lifting-lever adapted to lift the stop-bar, a check-lever adapted to check the movements of the lifting-lever, and mechanism actuating the check-lever to release the lifting-lever, for the purpose set forth.

8. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side thereof, complementary revoluble centering-bearings on the opposite side of said bar adapted to center a barrel so that the stop-bar may enter the bung-hole thereof, a weighted lever supporting said bar and tending to lift the same, a check-lever checking the action of said weighted lever, means for shifting the check-lever to release the weighted lever, and brushes arranged relatively to the barrel-bearings to act upon the body and heads of a barrel thereon; in combination with a feed device provided with a forked bearing for a barrel, mechanism actuating said device to move its bearing upwardly to, along and away from the stop-bar and then downwardly, a barrel-bearing arranged to intercept a barrel on the feed device as it moves downwardly, and mechanism controlled by a moving element of the feed device, adapted to move the brushes out of their operative positions, for the purpose set forth.

9. In a barrel-washing machine, the main frame a vertically-movable stop-bar, a weighted lever connected therewith and tending to lift the same, a check-lever checking the action of said weighted lever, bearings for a barrel on one side of the stop-bar, a shaft on the opposite side thereof, two belt-pulleys loose on said shaft, a clutch device adapted to lock either pulley to said shaft, and means controlled by movements of the clutch device to shift the check-lever out of or into engagement with the aforesaid weighted lever; in combination with complementary barrel-bearings revoluble with and having endwise motion on the pulley-shaft, actuating-levers connected with the complementary bearings, a weighted lever connected with the actuating-levers and tending to hold the complementary bearings in a normal position relatively to the stop-bar, and brushes arranged relatively to the barrel-bearings to act on the body and heads of a barrel, for the purpose set forth.

10. In a barrel-washing machine, the main frame a vertically-movable stop-bar, a weighted lever connected therewith and tending to lift the same, a check-lever checking the action of said weighted lever, bearings for a barrel on one side of the stop-bar, a shaft on the opposite side thereof, two belt-pulleys loose on said shaft, a clutch device adapted to lock either pulley to said shaft, and means controlled by the movements of the clutch device to shift the check-lever out of or into engagement with the aforesaid weighted lever; in combination with complementary barrel-bearings revoluble with and having endwise motion on the pulley-shaft, actuating-levers connected with the complementary bearings, a weighted lever connected with the actuating-levers and tending to hold the complementary bearings in a normal position relatively to the stop-bar, brushes arranged relatively to the barrel-bearings to act on the body and heads of a barrel, an up-and-down movable feed device adapted to take a barrel when held against rotation by the stop-bar and move said barrel away from said stop-bar, and bearings adapted to intercept said barrel on the downward motion of the feed-bar, for the purpose set forth.

11. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side thereof,

complementary revoluble centering-bearings on the opposite side of the bar adapted to center a barrel so that said bar when lifted may enter the bung-hole thereof, brushes arranged relatively to said bearings to act upon the body and heads of a barrel thereon, non-revoluble spaced barrel-bearings in rear of said revoluble bearings, a feed-frame provided with a corresponding number of barrel-bearings, mechanism actuating said feed-frame to take a barrel and transfer it from the stop-bar to the non-revoluble bearings successively, vertically-movable injectors adapted to enter the bung-holes of barrels as they are deposited by the feed-frame on said non-revoluble bearings, pipe connections connecting the injectors with a liquid under pressure, and means controllable by the feed-frame and by the barrels, adapted to establish communication between the supply-pipes and injectors only when the latter enter the bung-hole of a barrel, for the purpose set forth.

12. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side thereof, complementary revoluble centering-bearings on the opposite side of the bar adapted to center a barrel so that said bar when lifted may enter the bung-hole thereof, brushes arranged relatively to said bearings to act upon the body and heads of a barrel thereon, non-revoluble spaced barrel-bearings in rear of said revoluble bearings, a feed-frame provided with a corresponding number of barrel-bearings, mechanism actuating said feed-frame to take a barrel and transfer it from the stop-bar to the non-revoluble bearings successively, vertically-movable injectors adapted to enter the bung-holes of barrels as they are deposited by the feed-frame on said non-revoluble bearings, pipe connections connecting the injectors with a liquid under pressure, and means controllable by the feed-frame and by the barrels adapted to establish communication between the supply-pipes and injectors only when the latter enter the bung-hole of a barrel, and means for regulating the volume of liquid supplied to the injectors, for the purpose set forth.

13. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side thereof, complementary revoluble centering-bearings on the opposite side of the bar adapted to center a barrel so that said bar when lifted may enter the bung-hole thereof, brushes arranged relatively to said bearings to act upon the body and heads of a barrel thereon, non-revoluble spaced barrel-bearings in rear of said revoluble bearings, a feed-frame provided with a corresponding number of barrel-bearings, mechanism actuating said feed-frame to take a barrel and transfer it from the stop-bar to the non-revoluble bearings successively, revoluble and vertically-movable injectors adapted to enter the bung-holes of barrels as they are deposited by the feed-frame on said non-revoluble bearings, pipe connections connecting the injectors with a liquid under pressure, and means controllable by the feed-frame and by the barrels, adapted to establish communication between the supply-pipes and injectors only when the latter enter the bung-hole of a barrel, for the purpose set forth.

14. The combination of the main frame the shaft a', the loose belt-pulleys a^2 a^{22} thereon, the double-cone friction-clutch a^3 between said pulleys, the shifting-lever a^4 for said clutch, the bell-crank lever p connected with said lever, and the lever p^3 connected with said bell-crank lever; with the vertically-movable stop-bar d, and the weighted lever d' engaging said bar and engaged by the lever p^2, substantially as and for the purpose set forth.

15. In a barrel-washing machine, the main frame a vertically-movable stop-bar, a weighted lever tending to lift said bar, a check-lever checking the action of said weighted lever, revoluble bearings for a barrel on one side of the stop-bar, a shaft on the opposite side of said bar, two loose belt-pulleys on said shaft, a clutch device adapted to lock either pulley with the shaft, and complementary barrel-bearings on and revoluble with such shaft, in combination with the feed-frame e, provided at one end with a barrel-bearing, geared shafts having cranks pivoted near opposite ends of said feed-frame, a loose driving-gear and a clutch device on one of said shafts, and mechanism adapted to be operated by the aforesaid weighted lever and to operate the clutch on the feed-frame shaft to lock the loose gear thereto when the aforesaid check-lever is shifted to release the weighted lever, for the purpose set forth.

16. The combination with the main frame the feed-frame shaft E, the loose gear W, the clutch device comprising a sleeve revoluble with said shaft, a spring-actuated coupling-pin w^2 having motion in the sleeve toward and from said loose gear and provided with a lock-notch, the arcuate locking-lever w normally in engagement with said notch to hold the coupling-pin out of engagement with the loose gear, and the spring-actuated pawl w' pivoted to the free end of said locking-lever, the pawl-arm v' normally in engagement with the pawl w', and the actuating-lever v; of the weighted lever d', the weighted arm of which is adapted to act on the free end of lever v', the check-lever p^2 checking the action of said weighted lever, and means for shifting the check-lever to release the weighted lever, substantially as and for the purpose set forth.

17. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of said bar, complementary revoluble bearings on the opposite side thereof adapted to center a barrel so that the stop-bar when lifted may enter the bung-hole thereof, brushes arranged

relatively to said bearings to act upon the body and head of a barrel thereon; in combination with a feed-frame, guard-shafts provided with cranks to which said frame is pivoted near its opposite ends, a continuously-revoluble loose gear on one of the shafts of said frame, a coupling device revoluble with and adapted to be coupled to said loose gear, and mechanism operating automatically and adapted to couple said device to said loose gear whenever the aforesaid stop-bar is lifted, substantially as and for the purpose set forth.

18. In a barrel-washing machine, the main frame a vertically-movable stop-bar, revoluble bearings for a barrel on one side of said bar, complementary revoluble bearings on the opposite side thereof adapted to center a barrel so that the stop-bar when lifted may enter the bung-hole thereof, brushes arranged relatively to said bearings to act upon the body and head of a barrel thereon; in combination with a feed-frame, guard-shafts provided with cranks to which said frame is pivoted near its opposite ends, a continuously-revoluble loose gear on one of the shafts of said frame, a coupling device revoluble with and adapted to be coupled to said loose gear, mechanism operating automatically and adapted to couple said device to said loose gear whenever the aforesaid stop-bar is lifted, and appliances operating automatically and adapted to uncouple the coupling device from said loose gear as the feed-frame shaft completes a revolution substantially as and for the purpose set forth.

19. The combination with the main frame, the bearings L hinged thereto, and the fixed bearings L′; of the crank-shafts E and E′, the feed-frame *e*, pivoted between two cranks on said shafts and having motion between the aforesaid bearings, substantially as and for the purpose set forth.

20. The combination with the revoluble bearings *a a* and *b b*, of the vertically-movble stop-bar *d* in the plane of rotation of the bung-hole of a barrel on said bearings, said stop-bar provided with an antifriction-roller at its upper end having its axis of rotation parallel with the axis of rotation of said bearings, for the purpose set forth.

21. The combination with the main frame, oppositely-arranged bearings for a barrel or barrels on said frame, a longitudinally-slotted feed-frame between said bearings, and two revoluble shafts having cranks between which said frame is pivoted near its opposite ends; of an injector-casing provided with an internal annular chamber, an injector-pipe provided with peripheral ports, said pipe projecting through the slot in the feed-frame to the bearings thereon and having vertical motion in its casing to move the ports into and out of register with the annular chamber, a supply-pipe connected therewith, two stop-cocks *m* and *m′* in said pipe, a weighted lever 4 on the plug of stop-cock *m*, a rod m^4 connected with said lever and extending vertically to a point slightly above the frame-bearings for the barrel, said rod having its upper end bent horizontally in line with said bearings, a weighted lever 44 connected with the plug of stop-cock *m′*, the free end of said lever in the path of the feed-frame below the same, substantially as and for the purpose set forth.

22. The combination with the main frame, oppositely-arranged bearings for a barrel or barrels on said frame, a longitudinally-slotted feed-frame between said bearings, and two revoluble shafts having cranks between which said frame is pivoted near its opposite ends; of an injector-casing provided with an internal annular chamber, an injector-pipe provided with peripheral ports, said pipe projecting through the slot in the feed-frame to the bearings thereon and having vertical motion in its casing to move the ports into and out of register with the annular chamber, mechanism adapted to impart rotary motion to said injector-pipe, a supply-pipe connected with said chamber, two stop-cocks *m* and *m′* in said pipe, a weighted lever 4 on the plug of stop-cock *m*, a rod m^4 connected with said lever and extending vertically to a point slightly above the frame-bearings for the barrel, said rod having its upper end bent horizontally in line with said bearings, a weighted lever 44 connected with the plug of stop-cock *m′*, the free end of said lever in the path of the feed-frame below the same, substantially as and for the purpose set forth.

23. The combination with the main frame provided with oppositely-arranged bearings for a barrel; of a longitudinally-slotted feed-frame between said main-frame bearings provided also with oppositely-arranged bearings for a barrel, two revoluble shafts having cranks between which the feed-frame is pivoted near its opposite ends, chain-connected sprocket-wheels on said shafts, and a cam on the rear crank-shaft; of an injector-pipe projecting through the slot in the feed-frame to a point on a line with the main-frame barrel-bearings, a support for the pipe, bell-crank levers from the horizontal arms of which said support is suspended, a connecting-rod connecting the vertical arms of said levers, an actuating-rod connected with one of said vertical arms and adapted to be reciprocated by the cam on the aforesaid rear crank-shaft, substantially as and for the purpose set forth.

24. The combination with the main frame provided with oppositely-arranged bearings for a barrel, and the sprocket-wheel 2 revoluble on a spindle on said frame; of a longitudinally-slotted feed-frame between said main-frame bearings, provided also with oppositely-arranged bearings for a barrel, two revoluble shafts having cranks between which said feed-frame is pivoted near its opposite ends, a sprocket-wheel on each of said shafts, a chain connecting said sprocket-wheels and driving the aforesaid sprocket-wheel 2, and a cam on the rear crank-shaft; of an injector-

pipe projecting through the slot in the feed-frame to a point on a line with the main-frame barrel-bearings, a bevel-wheel adapted to revolve with and slide longitudinally on said pipe, a support for the latter, bell-crank levers from the horizontal arms of which said support is suspended, a connecting-rod connecting the vertical arms of said levers, an actuating-rod connected with one of said vertical arms and adapted to be reciprocated by the cam on the aforesaid rear crank-shaft, and a bevel-wheel on the shaft of sprocket-wheel 2 meshing with the bevel-wheel on the injector-pipe, substantially as and for the purpose set forth.

25. The combination with the main frame the cross-shaft t^2, the radial arms t^3, hangers t', and connecting-rod t^4; of the feed-frame crank-shaft E, a disk rigidly secured thereto and provided with a laterally-projecting pin t^6, and the crank-arm t^7 connected with rod t^4 and loose on said shaft E in the path of the aforesaid pin, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 7th day of October, 1897.

CARL CHRISTIAN FRIEDRICH EHRENGART.

Witnesses:

ALEXANDER SPECHT,

E. HH. MINNMENHOFF.