

July 14, 1953

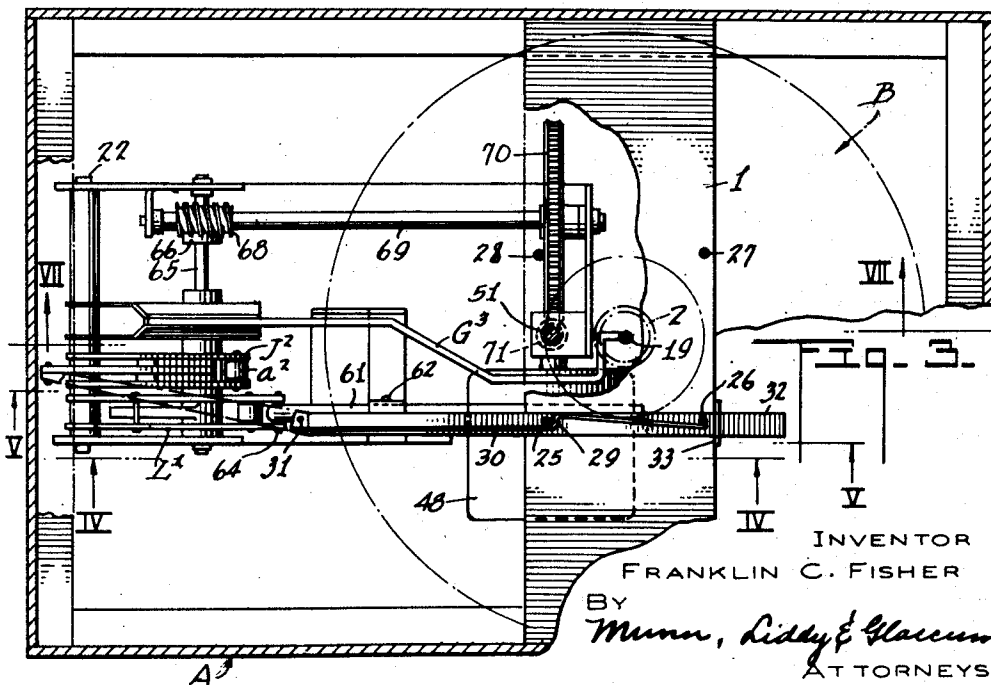
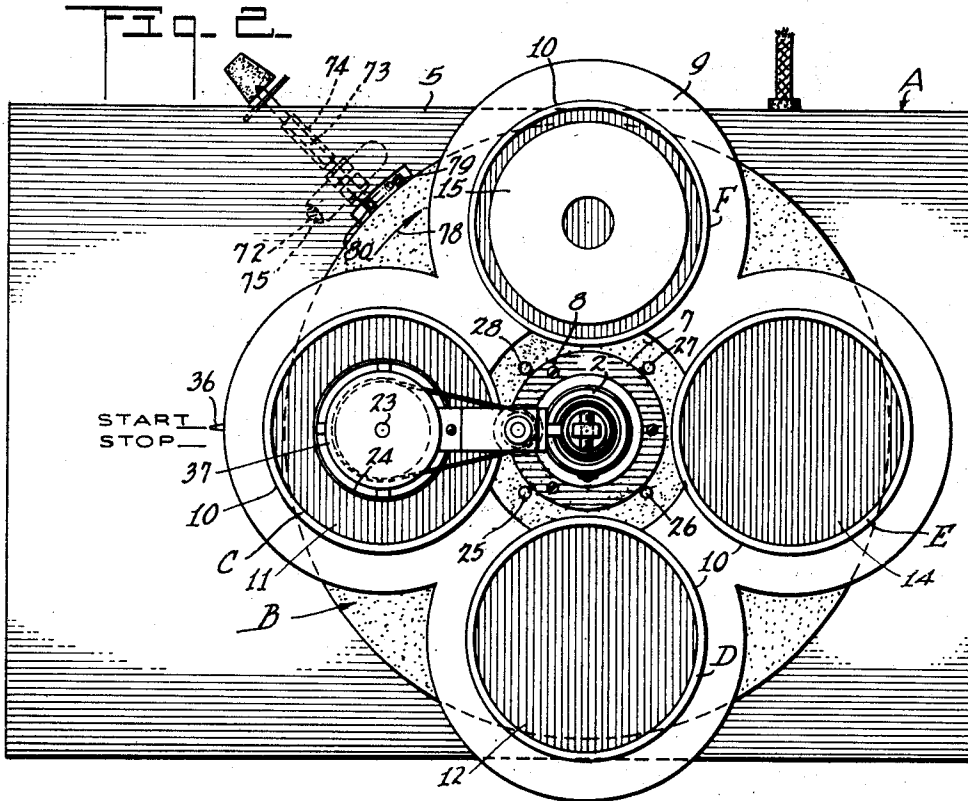
F. C. FISHER

2,645,236

MACHINE FOR WASHING WATCH PARTS

Filed Nov. 10, 1947

7 Sheets-Sheet 2



INVENTOR
FRANKLIN C. FISHER

BY *Munn, Riddy & Glacum*
ATTORNEYS

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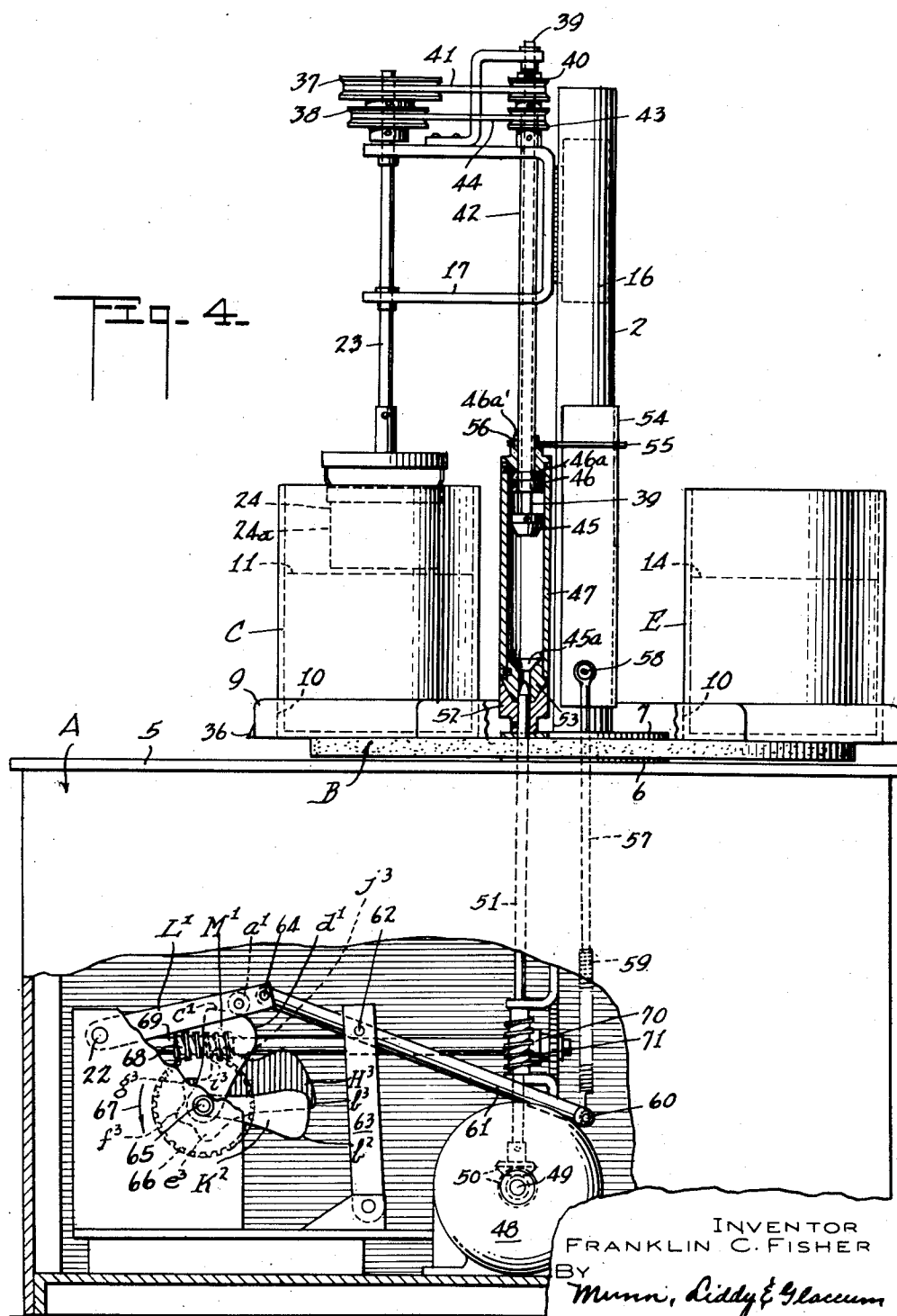
F. C. FISHER

2,645,236

MACHINE FOR WASHING WATCH PARTS

Filed Nov. 10, 1947

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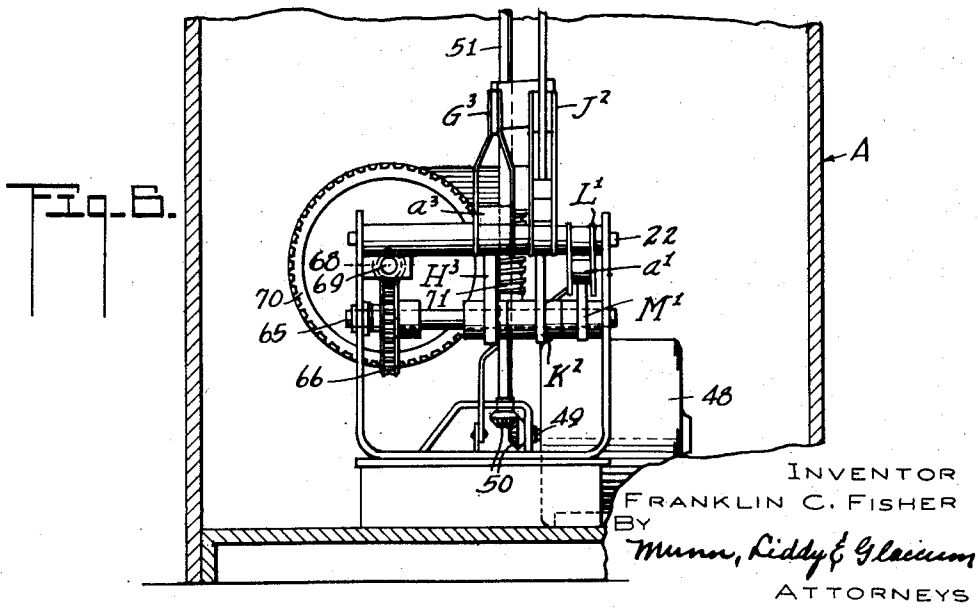
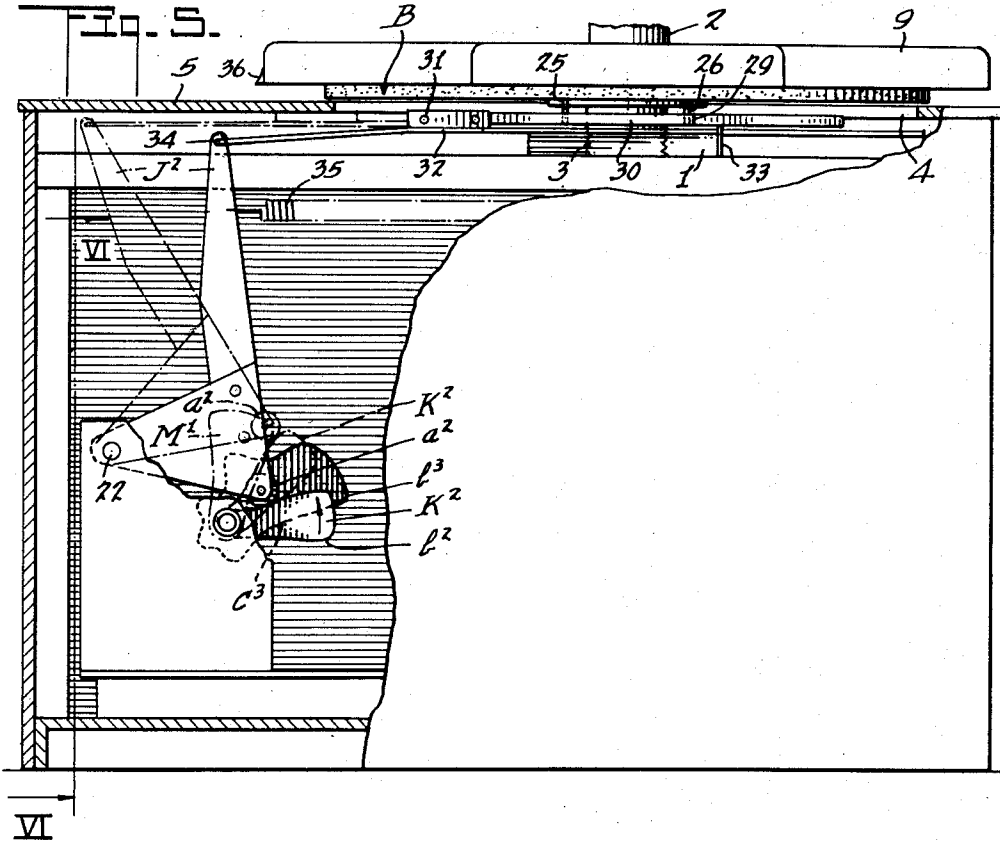
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2,645,236

MACHINE FOR WASHING WATCH PARTS

Filed Nov. 10, 1947

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July 14, 1953

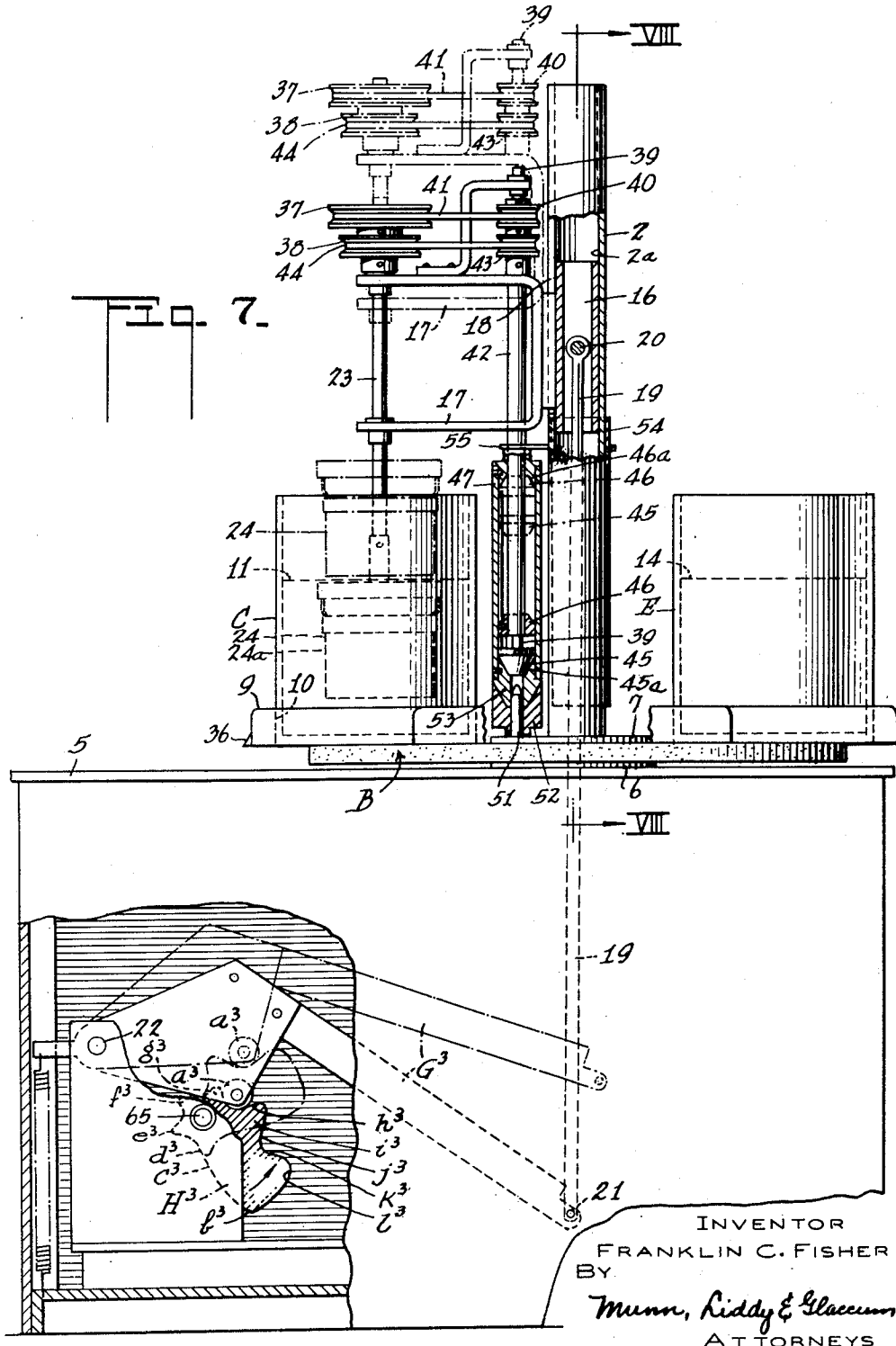
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2,645,236

MACHINE FOR WASHING WATCH PARTS

Filed Nov. 10, 1947

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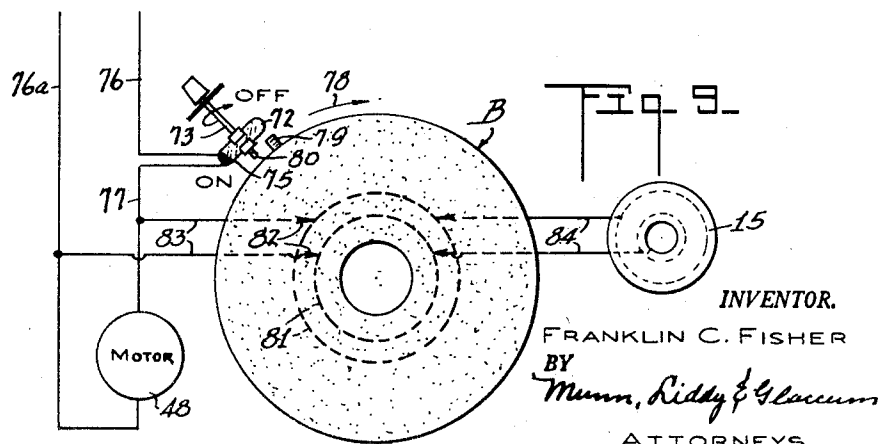
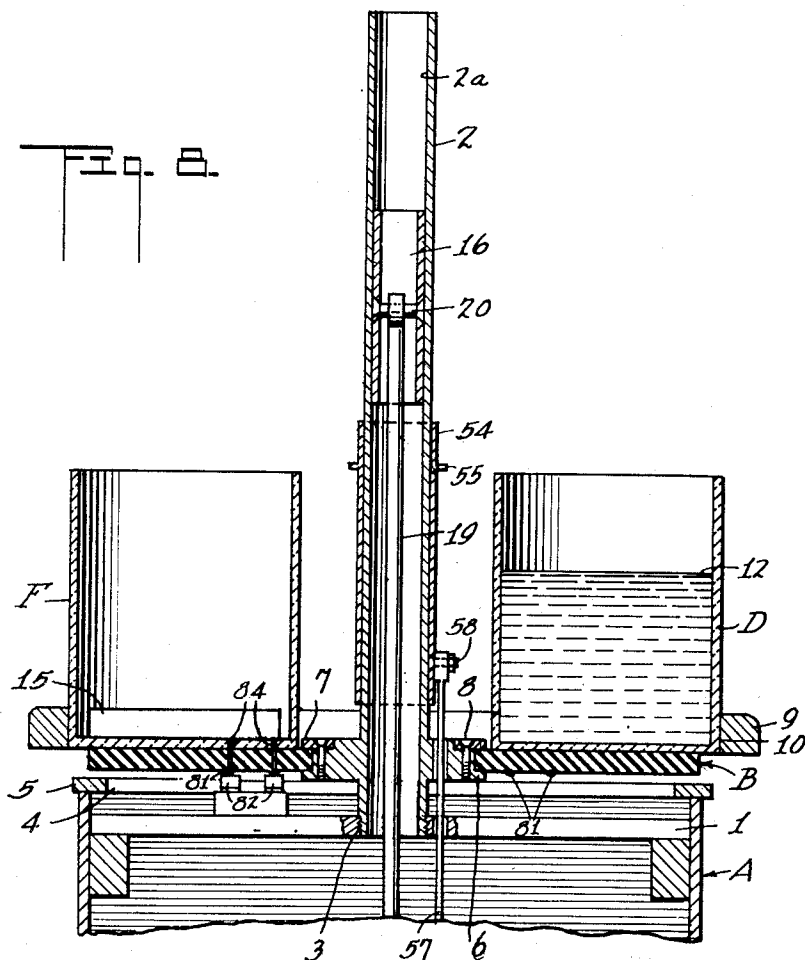
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MACHINE FOR WASHING WATCH PARTS

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July 14, 1953

F. C. FISHER

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MACHINE FOR WASHING WATCH PARTS

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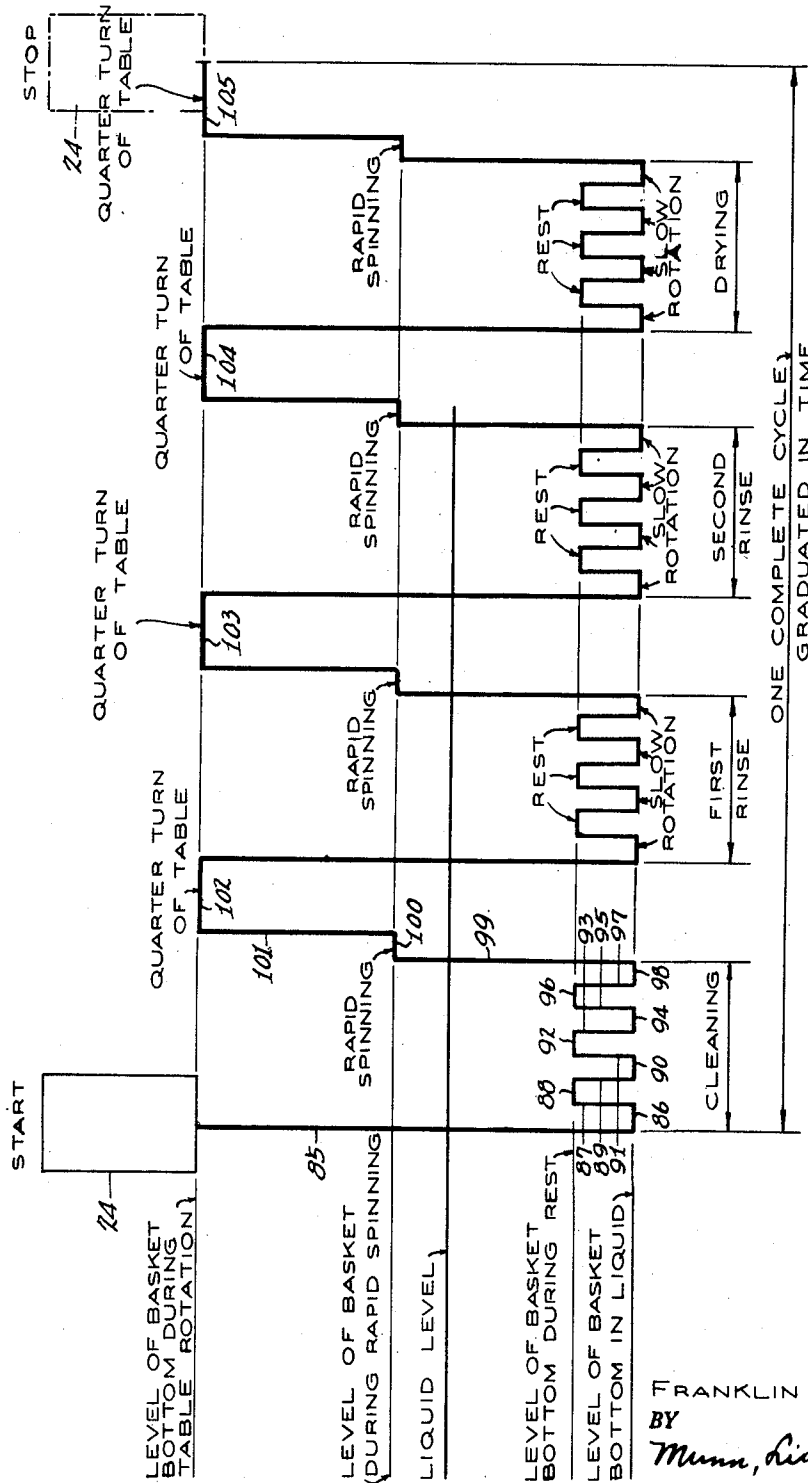


Fig. 10.

INVENTOR.
FRANKLIN C. FISHER
BY
Munn, Riddy & Glacum
ATTORNEYS

UNITED STATES PATENT OFFICE

2,645,236

MACHINE FOR WASHING WATCH PARTS

Franklin C. Fisher, San Francisco, Calif.

Application November 10, 1947, Serial No. 785,119

7 Claims. (Cl. 134—61)

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The present invention relates to improvements in a machine for washing watch parts. It consists of the combinations, constructions and arrangement of parts, as hereinafter described and claimed. It will be understood, of course, that the machine may be used for washing other small articles.

An object of my invention is to provide a compact machine that is designed to thoroughly clean, rinse and dry parts of a watch. The machine is automatic in operation after it has been started, and the steps of cleaning, rinsing and drying are carried out in sequence.

Heretofore, jewelers have utilized a rotatable basket for whirling the parts of a watch in a cleaning liquid. However, during such operation the liquid has a tendency to whirl with the basket, reducing the relative movement between the watch parts and the liquid, thereby resulting in a rather inefficient cleaning of the parts.

In order to overcome this disadvantage, I provide a basket for the watch parts that is alternately rotated and then rendered stationary while in the cleaning and rinsing liquids. During the rest periods of the basket, the liquids become quiescent. Accordingly, when the basket is rotated again after each pause, the watch parts are advanced through the liquid instead of moving therewith. This will cause the liquids to flow over the watch parts and effectively remove foreign matter therefrom.

More specifically described, I provide a rotatable table having containers mounted thereon for holding the cleaning and rinsing liquids. This table is advanced intermittently so as to bring the containers successively beneath a basket carrying the watch parts. The basket is lowered into the containers during their rest periods and raised thereabove when the table is turned. Also, I make use of a heated container, which is carried by the table. After the watch parts are cleaned and rinsed, the basket is lowered into the heated container for drying the parts.

A still further object of my invention is to provide a machine of the character described, in which the basket carrying the watch parts is made to spin at a relatively high speed after it has been withdrawn from the cleaning and rinsing liquid. In this manner, the liquids are discharged by centrifugal force from the parts being cleaned.

Other objects and advantages will appear as the specification continues, and the novel features will be set forth in the claims hereunto appended.

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For a better understanding of my invention, reference should be had to the accompanying drawings, forming part of this application, in which:

5 Figure 1 is a side elevation, partly in section, disclosing my machine in starting position;

Figure 2 is a top plan view of the machine;

Figure 3 is a horizontal sectional view taken along the line III—III of Figure 1;

10 Figure 4 is a vertical sectional view taken along the line IV—IV of Figure 3, with the parts arranged in a position for rapid spinning of the basket;

Figure 5 is a vertical sectional view taken along the line V—V of Figure 3, illustrating the mechanism for imparting intermittent rotary movement to the table;

Figure 6 is a transverse vertical sectional view taken along the line VI—VI of Figure 5;

20 Figure 7 is a vertical sectional view taken along the line VII—VII of Figure 3, the full line position of the parts showing the basket during its last period of rotation in the cleaning solution, while the dot-dash lines disclose the basket raised into a rapid spinning position;

Figure 8 is a transverse vertical sectional view taken along the line VIII—VIII of Figure 7;

Figure 9 is a wiring diagram; and

Figure 10 is a diagrammatic graph (not to scale) showing the trace taken by the basket during a complete cycle of the machine.

30 While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

In carrying my invention into practice, I provide a cabinet indicated generally at A. This cabinet has a horizontally-disposed bar 1 mounted therein, which forms a support for a vertically arranged column 2. Referring to Figure 8, it will be noted that this column is threaded at 3 into the bar 1 and projects upwardly through an opening 4 provided in the top 5 of the cabinet. Any other suitable means may be employed for supporting the column.

The column 2 is provided with an annular flange 6 immediately above the top of the cabinet, and this flange has an insulated rotatable table B supported thereon. A ring 7 overlies the table B and coacts with the flange 6 in holding the table in place, while permitting rotation of the table. Screws 8 are provided for retaining the ring 7 in place (see Figures 2 and 8).

The table B has a frame 9 secured thereto so as to rotate therewith. This frame has four pockets 10, which are adapted to receive the lower ends of open-top containers C, D, E and F. The container C holds a cleaning liquid 11, while the containers D and E hold a "first rinse" liquid 12 and a "second rinse" liquid 14, respectively. The container F has a heating element 15 disposed therein, which is adapted for drying watch parts after they have been subjected to the cleaning and rinsing liquids.

The column 2 has a bore 2a extending lengthwise thereof in which a slide 16 is guided for vertical movement. A basket-carrying frame 17 is secured to the slide 16 so as to be movable with the latter. A slot 18 is fashioned in the column in order to allow the frame 17 to move vertically (see Figure 7). For raising and lowering the frame 17, I provide a connecting rod 19 that is pivoted to the slide 16, as at 20.

The rod 19 extends downwardly through the bore of the column and has its lower end pivoted at 21 to the free end of a lever G3. This lever is swingable on a main pivot shaft 22 and carries a roller a3, the latter bearing on a cam H3. The exact construction of this cam and the particular times at which the lever G3 is moved for raising or lowering the basket-carrying frame 17 will be set forth in detail as the specification proceeds.

The frame 17 has a vertical shaft 23 journaled therein for rotation which carries a screen basket 24 at its lower end. The basket is adapted to hold the parts of a watch, or other small articles, which are to be cleaned. It will be understood that the basket is rotated at the same speed that the shaft 23 operates.

The table B is advanced one-quarter of a turn at a time at predetermined intervals when the basket 24 is raised above the tops of the containers C, D, E and F (see Figure 1). In order to turn the table intermittently, I provide four pins designated at 25, 26, 27 and 28. These pins are carried by the table B and project therebelow (see Figures 1-3 and 5) so as to be engageable in sequence by a hook 29 formed on a leaf spring 30 when the latter is reciprocated. This leaf spring is anchored at 31 to a reciprocating bar 32. The latter passes through a guide 33.

The bar 32 is connected at 34 to a lever J2, which is swingably mounted on the main pivot shaft 22 previously mentioned. This lever is provided with a roller a2 that rides on a cam K2. The lever J2 normally occupies the full-line position shown in Figure 5, and is yieldingly urged into that position by a coil spring 35. When this lever is moved to the left until it reaches the position illustrated in Figure 1, the table is advanced a quarter turn.

The starting position of the machine is shown in Figures 1 and 2. At this time, a pointer 36 on the frame 9 is disposed in registry with the word "Start" on the top 5 and the hook 29 engages with the pin 25. After the cam K2 has turned a predetermined amount, the lever J2 advances the leaf spring 30 until its hook 29 engages over the pin 26, as shown in Figure 5. Subsequent movement of the spring 30 to the left will impart a quarter turn to the table B. The latter advances when the basket 24 clears the top of the containers C, D, E and F. This particular phase will be discussed in detail as the specification continues.

The basket-carrying shaft 23 has a pair of pulleys 37 and 38 fixed thereto. The pulley 37

is somewhat larger in diameter than the pulley 38. A shaft 39 has a pulley 40 pinned thereon, which is connected to the larger pulley 37 by an upper belt 41. The shaft 39 is surrounded by a sleeve 42 carrying a pulley 43 that drives the pulley 38 through a lower belt 44. The shaft 39 and sleeve 42 are supported by the frame 17 and move vertically therewith. It is obvious that when the shaft 39 is driving the basket-carrying shaft 23 through the pulley 40, belt 41 and pulley 37 the speed at which the basket 24 is rotated will be slower than when the sleeve 42, pulley 43, belt 44 and pulley 38 are used for rotating the basket.

The shaft 39 has a cone 45 secured to its lower end, while the sleeve 42 has a cone 46 fixed thereto (see Figures 1, 4 and 7). These cones are mounted in a driven clutch housing 47 and are spaced from the wall of the latter. This housing is rotatable relative to the sleeve 42 and is provided at its top and bottom with conical-shaped seats 46a and 45a, respectively. When the cone 45 is engaged with the seat 45a, as in Figure 7, the shaft 39, pulley 40, belt 41 and pulley 37 will be driving the basket 24 at its slower speed. However, when the cone 46 is engaging the seat 46a, as in Figure 4, the sleeve 42, pulley 43, belt 44 and pulley 38 will operate the basket at a somewhat greater speed, which I call "rapid spinning."

The mechanism for driving the clutch housing 47 now will be described. An electric motor 48 has its shaft 49 connected through bevel gears 50 to a main drive shaft 51. The latter extends vertically and has a clutch cone 52 fastened to its upper end so as to be rotated thereby. Whenever the motor 48 is operating, the cone 52 is rotating.

It will be noted that the clutch housing 47 is fashioned with a clutch cone 53 as its bottom, which is arranged in axial alignment with the cone 52. Upon moving the cones 52 and 53 into driving relation with one another, as in Figures 4 and 7, during operation of the motor 48, the clutch housing 47 is caused to rotate. When the cones 52 and 53 are out of engagement, as in Figure 1, the clutch housing 47 is stationary.

Referring now to Figure 4, it will be seen that the cone 46 is in driving engagement with the top cone seat 46a of the clutch housing 47, and the basket 24 has its bottom disposed above the liquid 11 in the container C. At this time the basket is being rotated rapidly with sufficient speed to throw any liquid from the watch parts by centrifugal force. This "rapid spinning" of the basket takes place in each of the containers C, D and E above the liquid levels therein. This "rapid spinning," however, takes place while the mesh part 24a of the basket is still within the containers C, D, and E. The same "rapid spinning" of the basket takes place while the basket is arranged in the drying container F.

When the basket 24 is being rotated rapidly, which means that the cone 46 is engaging the seat 46a (see Figure 4), it is necessary to apply downward pressure to the housing 47 for maintaining the cones 52 and 53 in driving engagement. For this purpose, I provide a sleeve 54 that is slidably disposed on the column 2. This sleeve has an arm 55 formed integral therewith. Figure 4 illustrates the free end of this arm as having an opening 56 therein that loosely receives an upper reduced end 46a' of the cone part 46a.

A connecting rod 57 is pivoted to the sleeve 54, as at 58, and has one end of a spring 59 firmly an-

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chored to its lower end. The other end of this spring is connected at 60 to a lever 61. The latter is fulcrumed at 62 to a swingable support 63 intermediate the ends of the lever, and is pivoted at 64 to the free end of another lever L1. Figures 1, 3 and 4 disclose the lever L1 as being swingably supported on the main pivot shaft 22 previously mentioned.

The levers 61 and L1 normally occupy the positions shown in Figure 1. However, during "rapid spinning" of the basket 24, a cam M1 bears against roller a1 carried by the lever L1. This will swing the levers 61 and L1 into the positions shown in Figure 4, which will tension the spring 59. As the latter spring is placed under additional tension, the connecting rod 57 will pull the sleeve 54 downwardly. This will hold the clutch cones 52 and 53 in driving engagement during the "rapid spinning" of the basket.

The cams H3, K2 and M1 are secured to a shaft 65, and the latter is driven by a worm gear 66 in the direction of the arrow 67 (see Figures 1 and 4). The gear 66 meshes with and is driven by a worm 68 fixed to a shaft 69. In turn, the shaft 69 is operated by a worm gear 70 that meshes with a worm 71 secured to the main drive shaft 51. The gear ratios are such that the cams H3, K2 and M1 are rotated as a unit four times for each rotation of the table B. This arrangement will permit the basket 24 to be lowered into the containers C, D, E and F, in sequence, during their rest periods.

The motor 48 is controlled by a mercury switch 72 (see Figures 2 and 9). This switch is fixed to a swingable shaft 73, which is supported in a suitable bearing 74. When the switch is "On," a body of mercury 75 bridges the contacts of the switch. At this time, current flows from a line 76, through the switch, and over a conductor 77 to the motor 48. Flow of current from the motor back to the source takes place over line 76a.

The table B rotates in a clockwise direction, as suggested by the arrow 78. After one rotation of the table, a finger 79 projecting from the table trips an arm 80 extending vertically from the switch shaft 73. This will throw the switch into "Off" position, that is, the mercury will gravitate away from the contacts of the switch.

In order to supply electricity to the heating element 15, I provide a pair of conductor rings 81 on the underneath surface of the table B. These rings are connected to the lines 76 and 76a by brushes 82 and conductors 83. Wires 84 connect the rings 81 to the heating element 15. It will be noted that as long as the mercury switch is "On," current will flow to the heating element 15 as well as to the motor 48. After the table B has made a complete turn, the pointer 36 will be opposite the word "Stop" on the cabinet top. At this time, the finger 79 has just tripped the arm 80 and current flow to the heating element and motor is stopped.

Coordinated summary of operation

In setting up the machine at the beginning of an operation, the pointer 36 on the frame 9 is arranged opposite the word "Start" (see Figure 2). The basket-carrying frame 17 is arranged at its uppermost position on the column 2 (see Figure 1). The container C, which holds the cleaning liquid 11, is disposed below the basket 24. The parts of a watch to be cleaned are placed in the basket 24. At this time, the cams H3, K2 and M1 occupy the positions illustrated in Figure 1.

As the next step, the mercury switch 72 is

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turned "On," as shown in Figures 2 and 9. This will close the circuits to the motor 48 and the heating element 15 and both will start functioning. It will be noted that the finger 79 on the rotatable table B has cleared the vertically-disposed arm 80 of the mercury switch at this time. Accordingly, the table will make a complete clockwise turn as suggested by the arrow 78, before the finger 79 strikes the arm 80 and moves the switch into "Off" position.

The motor shaft 49, bevel gears 50 and the main drive shaft 51 will set the clutch cone 52 in motion. However, it will be noted from Figure 1 that the cone 53 is out of engagement with the cone 52 at this time. Therefore, no rotary motion will be imparted to the basket 24 until the operation of the machine has continued further.

Rotation of the main drive shaft 51, through worm 71 and worm gear 70 sets the shaft 69 in motion. This will cause the worm 68 and its worm gear 66 to rotate the shaft 65 on which the cams H3, K2 and M1 are mounted. These cams maintain their relative position with respect to one another and are advanced in a counter-clockwise direction, as suggested by the arrow 67.

As soon as the roller a3 on the lever G3 clears the edge b3 of the cam H3, that roller will descend along the cam H3 to a point c3 thereon. This will lower the cone 53 into engagement with the rotating cone 52 and the clutch housing 47 will start turning. However, the basket 24 does not rotate at this time, since the cone 45 has not descended into engagement with the bottom cone seat 45a, which is fixed to the lower end of the housing 47.

As the basket 24 descends, the roller a2 clears the edge b2 of the cam K2 and the spring 35 (see Figure 1) will pull the lever J2 in a clockwise direction about the main pivot shaft 22. This will advance the leaf spring 30 until its hook 29 engages over the pin 26, where the parts are arranged for turning the table B a quarter turn when the leaf spring 30 is retracted.

When the cam H3 has turned until its roller a3 rests on that cam at the point d3, cone 45 will engage with the cone seat 45a. The vertical descent of the basket during this phase is indicated by the segment 85 of the trace in Figure 10, and the basket is immersed in the cleaning liquid 11 disposed in the container C. Now, the basket 24 starts to rotate at slow speed. This is accomplished by the cone 45 turning the shaft 39. The latter, through pulley 40, belt 41 and larger pulley 37, imparts rotary motion to the basket-carrying shaft 23. The basket will continue to turn for a predetermined time interval, as indicated by the horizontal segment 86 of the trace in Figure 10.

As the cam H3 continues to turn, its lobe e3 will bear against the roller a3, which results in raising the basket 24 slightly relative to its lowermost position in the container C. This is accomplished by the lever G3, connecting rod 19, slide 16 and the basket-carrying frame 17. However, the basket will still be disposed in the cleaning liquid 11. This upward movement of the basket is designated by the segment 87 of the trace in Figure 10.

When the roller a3 starts riding over the lobe e3 of the cam H3, the basket stops rotating until the roller a3 has cleared the highest part of the lobe e3. This rest period of the basket is designated by the horizontal segment 88 of the trace in Figure 10, and is sufficient in duration to per-

mit the cleaning fluid 11 to reach a quiescent state.

After the roller a3 clears the lobe e3, the basket descends again to its lowermost position in the cleaning liquid, as suggested by the vertical segment 89 of the trace in Figure 10. Now, the basket starts rotating again at slow speed for a predetermined time interval (see horizontal segment 90 of trace).

The cam H3 is further provided with a lobe f3 which coacts with the roller a3 in first raising the basket slightly (see vertical segment 91 of trace); providing a horizontal rest period 92; and thereafter a vertical descent of the basket, as suggested by the segment trace 93. Then, the basket turns again at slow speed (see segment 94 of trace). Likewise, another lobe g3 on the cam H3 produces a vertical segment 95 of the trace; a horizontal rest period segment 96; a vertical descent segment 97; and a horizontal slow speed segment 98.

When the cam H3 has rotated until the roller a3 strikes the point h3 on another lobe i3, the lever H3 starts to raise the rod 19 and thereby elevate the basket-carrying frame 17 (see dot-dash lines in Figure 7 and vertical trace segment 99 in Figure 10).

As the roller a3 starts to ride across the surface j3 of the cam H3, the edge c1 of the cam M1 engages with the roller a1 on the lever L1. (See Figure 4.) This moves the levers L1 and 61 into the position shown in Figure 4, which tensions the spring 59. The tensioning of this spring pulls downwardly on the rod 57, sleeve 54 and arm 55, holding the cones 52 and 53 in driving relation. At this time, the cone 46 is engaging the top cone seat 46a. It will be noted that this arrangement will rotate the sleeve 42, pulley 43, belt 44 and pulley 38. Accordingly, the basket will rotate at a "rapid spinning" rate above the level of the liquid 11 in the container C. (See horizontal segment 100 of trace in Figure 10.)

Next, the roller a3 will strike the surface k3 of the cam H3. At this time the edge d1 of the cam M1 will clear the roller a1 (slightly beyond the position shown in Figure 4) and levers L1 and 61 will return to the positions illustrated in Figure 1.

When the roller a3 reaches the edge l3 of the cam H3, the cam K2 starts bearing against the roller a2 (see dot-dash lines in Figure 5), moving the leaf spring toward the left. The hook 29 pulls on the pin 26 and starts rotating the table B in a clockwise direction (see arrow 78 in Figure 2). As the roller a3 passes the point l3 on cam H3, the basket raises above the top of the container C (see vertical segment 101 of trace in Figure 10).

As the leaf spring 30 continues to move toward the left and finally reaches the position shown in Figure 1, the table B finishes a quarter turn (see horizontal trace segment 102) and the container D having the first rinse solution 12 therein is brought into a position below the basket 24.

The same steps are repeated for rinsing the watch parts in the first rinse, as were accomplished in the cleaning solution container. Thereupon, the table B is rotated another quarter turn (see trace segment 103), bringing the second rinse container E into a position below the basket 24. The steps are repeated again and the table B is turned another quarter turn (see trace segment 104) whereupon the steps are repeated again in the drying container F.

As a final step, the table B is rotated another quarter turn (see trace segment 105). At this time, the finger 79 strikes the arm 80, swinging the mercury switch 75 into "Off" position, with the pointer 36 opposite the word "Stop" in Figure 2, completing the cycle.

I claim:

1. In a machine for cleaning watch parts or the like; a container having a liquid therein; a rotatably-mounted basket for holding the parts to be cleaned; motor-actuated means for lowering the basket to submerge the watch parts in the liquid, thereafter raising the basket into a position above the liquid level with the basket still in the container, and finally raising the basket into a position above the top of the container; means for alternately rotating the basket at a slow speed and then rendering it stationary while the parts are submerged in the liquid; the stationary periods of the basket while in the liquid being of sufficient duration for the liquid to reach a quiescent state before the basket is rotated again; and motor-driven means rendered active upon raising the basket for spinning the basket rapidly after it has been raised above the liquid level and is still within the container.

2. In a machine for cleaning watch parts or the like; a container having a liquid therein; a rotatably-mounted basket for holding the parts to be cleaned; motor-actuated means for lowering the basket to submerge the watch parts in the liquid, thereafter raising the basket into a position above the liquid level with the basket still in the container, and finally raising the basket into a position above the top of the container; means for alternately rotating the basket at a slow speed and then rendering it stationary while the parts are submerged in the liquid; the stationary periods of the basket while in the liquid being sufficient in duration for the liquid to reach a quiescent state before the basket is rotated again; and motor-driven means rendered active upon raising the basket for spinning the basket rapidly after it has been raised above the liquid level and is still disposed within the containers.

3. In a machine for cleaning watch parts or the like; a container having a liquid therein; a rotatably-mounted basket for holding the parts to be cleaned; motor-actuated means for lowering the basket to submerge the watch parts in the liquid, and thereafter alternately raising and lowering the basket while maintaining the parts in the liquid; and intermittently-operated driving means for alternately rotating the basket and then rendering it stationary while in the liquid, with the rotations of the basket occurring after each lowering of the basket, and the stationary intervals taking place after each raising of the basket while still disposed in the liquid; the stationary periods of the basket still in the liquid being of sufficient duration for the liquid to reach a quiescent state before the basket is rotated again.

4. In a machine for cleaning watch parts or the like; a vertical column; a table arranged for rotating around the column; the table having a plurality of liquid-holding containers supported thereon for turning therewith; a slide guided by the column; a basket-supporting frame carried by the slide and movable vertically therewith; a shaft carried by and movable vertically with the frame and having a basket thereon for holding the parts to be cleaned; means for intermittently advancing the table to bring each con-

tainer in order into a position underneath the basket; motor-actuated means coordinated with the table-advancing means for moving the slide downwardly periodically to lower the basket into each container, and for thereafter elevating the basket above the containers; a housing rotatably mounted alongside the column; the housing having an external clutch cone on its lower end; a driven clutch cone engageable with said external cone when the housing is lowered into engagement therewith; the housing having upper and lower cone seats on the interior thereof; internal upper and lower clutch cones slidably disposed in the housing and being engageable with the upper and lower internal cone seats, respectively, when they are moved axially of the housing; means for driving the basket at a predetermined speed when the lower internal cone engages with the lower internal cone seat; and means for driving the basket at a higher speed when the upper internal cone engages with the upper cone seat of the housing.

5. In a machine for cleaning watch parts or the like; a vertical column; a table arranged for rotating around the column; the table having a plurality of liquid-holding containers supported thereon for turning therewith; a slide guided by the column; a basket-supporting frame carried by the slide and movable vertically therewith; a shaft carried by and movable vertically with the frame and having a basket thereon for holding the parts to be cleaned; means for intermittently advancing the table to bring each container in order into a position underneath the basket; motor-actuated means coordinated with the table-advancing means for moving the slide downwardly periodically to lower the basket into each container, and for thereafter elevating the basket above the containers; a housing rotatably mounted alongside the column; the housing having an external clutch cone on its lower end; a driven clutch cone engageable with said external cone when the housing is lowered into engagement therewith; the housing having upper and lower cone seats on the interior thereof; internal upper and lower clutch cones slidably disposed in the housing and being engageable with the upper and lower internal cone seats, respectively, when they are moved axially of the housing; means for driving the basket at a predetermined speed when the lower internal cone engages with the lower internal cone seat; means for driving the basket at a higher speed when the upper internal cone engages with the upper cone seat of the housing; and means for holding the external clutch cone of the housing in engagement with the driven clutch cone when the basket is being rotated at the higher speed.

6. In a machine for cleaning watch parts, or the like, means for supporting a partially-filled liquid-holding container; a basket-carrying frame projecting over the container, and guided for up and down movement; a shaft carried by and movable vertically with the frame, and having a basket thereon for holding the parts to be cleaned; the basket being movable into and out of the container; a swingable lever operatively connected to the frame for raising and lowering the basket when the lever is moved in corresponding directions; a roller carried by the lever; 70

and a rotatable cam provided with a continuous surface over which the roller is movable when the cam is rotated; this cam surface having a portion spaced from the axis of rotation of the cam at a distance to elevate the basket above the top of the container; this cam portion being followed by another cam portion designed for lowering the basket until the parts to be cleaned are submerged in the liquid; the latter portion in turn being followed by a plurality of lobes designed to alternately raise and lower the basket while maintaining the parts in the liquid; these lobes being followed by a higher lobe designed to elevate the basket above the liquid level, while still retaining the basket within the upper part of the container; the cam surface continuing back to the first-mentioned cam portion.

7. In a machine for cleaning watch parts, or the like; means for supporting a partially-filled liquid-holding container; a basket-carrying frame projecting over the container, and guided for up and down movement; a shaft carried by and movable vertically with the frame, and having a basket thereon for holding the parts to be cleaned; the basket being movable into and out of the container; a swingable lever operatively connected to the frame for raising and lowering the basket when the lever is moved in corresponding directions; a roller carried by the lever; a rotatable cam provided with a continuous surface over which the roller is movable when the cam is rotated; this cam surface having a portion spaced from the axis of rotation of the cam at a distance to elevate the basket above the top of the container; this cam portion being followed by another cam portion designed for lowering the basket until the parts to be cleaned are submerged in the liquid; the latter portion in turn being followed by a plurality of lobes designed to alternately raise and lower the basket while maintaining the parts in the liquid; these lobes being followed by a higher lobe designed to elevate the basket above the liquid level, while still retaining the basket within the upper part of the container; the cam surface continuing back to the first-mentioned cam portion; means for rotating the basket at a predetermined speed while the parts are submerged in the liquid; and means for spinning the basket rapidly after it has been raised above the liquid level, but still disposed within the container.

FRANKLIN C. FISHER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,733,192	Haber	Oct. 29, 1929
1,795,167	Gross	Mar. 3, 1931
1,879,441	Olson	Sept. 27, 1932
2,162,250	Emrick	June 13, 1939
2,183,401	Judelshon	Dec. 12, 1939
2,195,123	Pabst	Mar. 26, 1940
2,277,508	Bingham	Mar. 24, 1942
2,282,999	Engelke	May 12, 1942
2,341,198	Weiskopf	Feb. 8, 1944
2,348,631	Keehnel	May 9, 1944
2,416,475	Friedman	Feb. 25, 1947
2,496,506	Wagner	Feb. 7, 1950