Sept. 22, 1953 A. KURT 2,652,841

ARTICLE CLEANING MACHINE

Filed Dec. 8, 1950 9 Sheets-Sheet 1

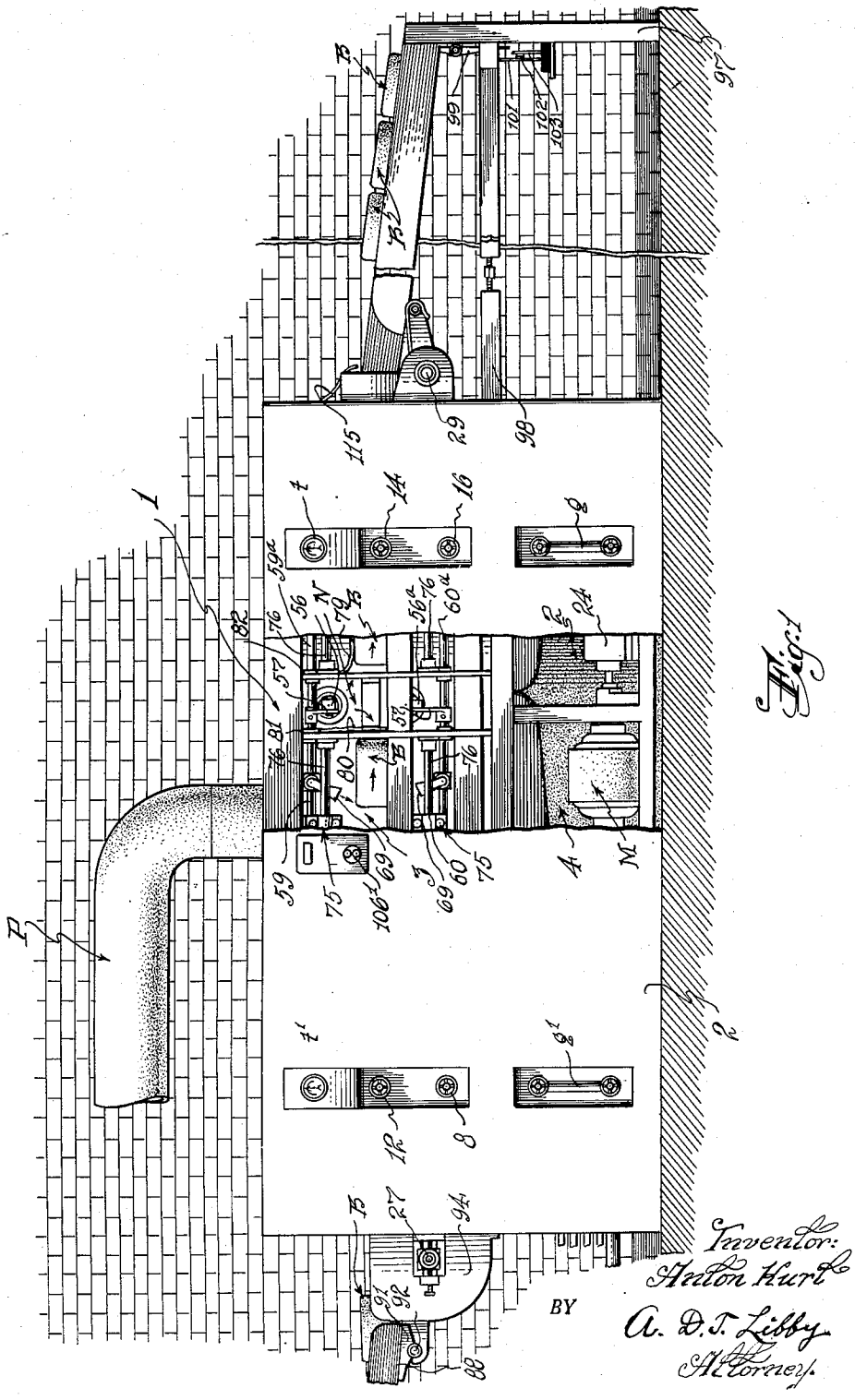


Fig. 1

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ARTICLE CLEANING MACHINE

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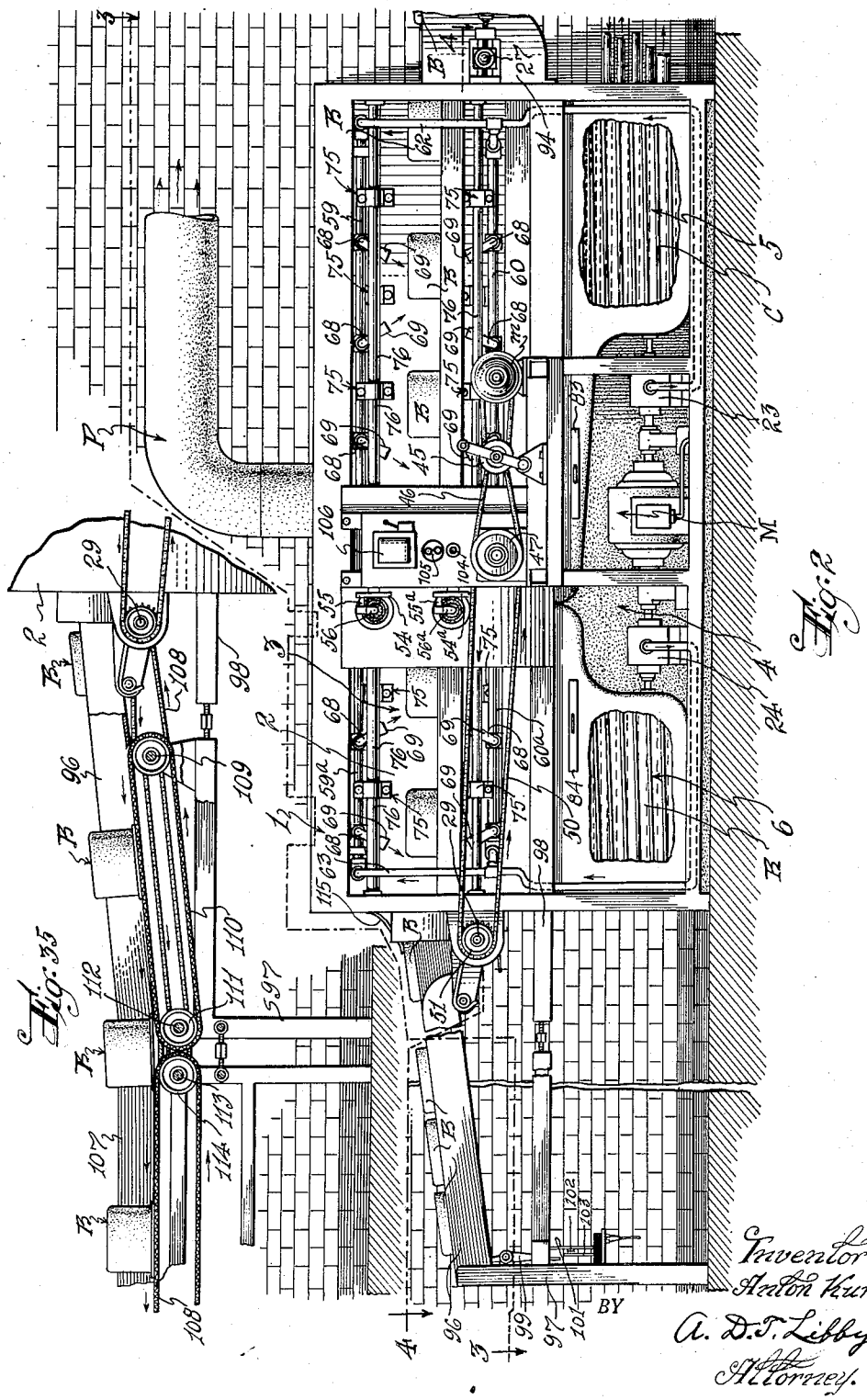


Fig. 2

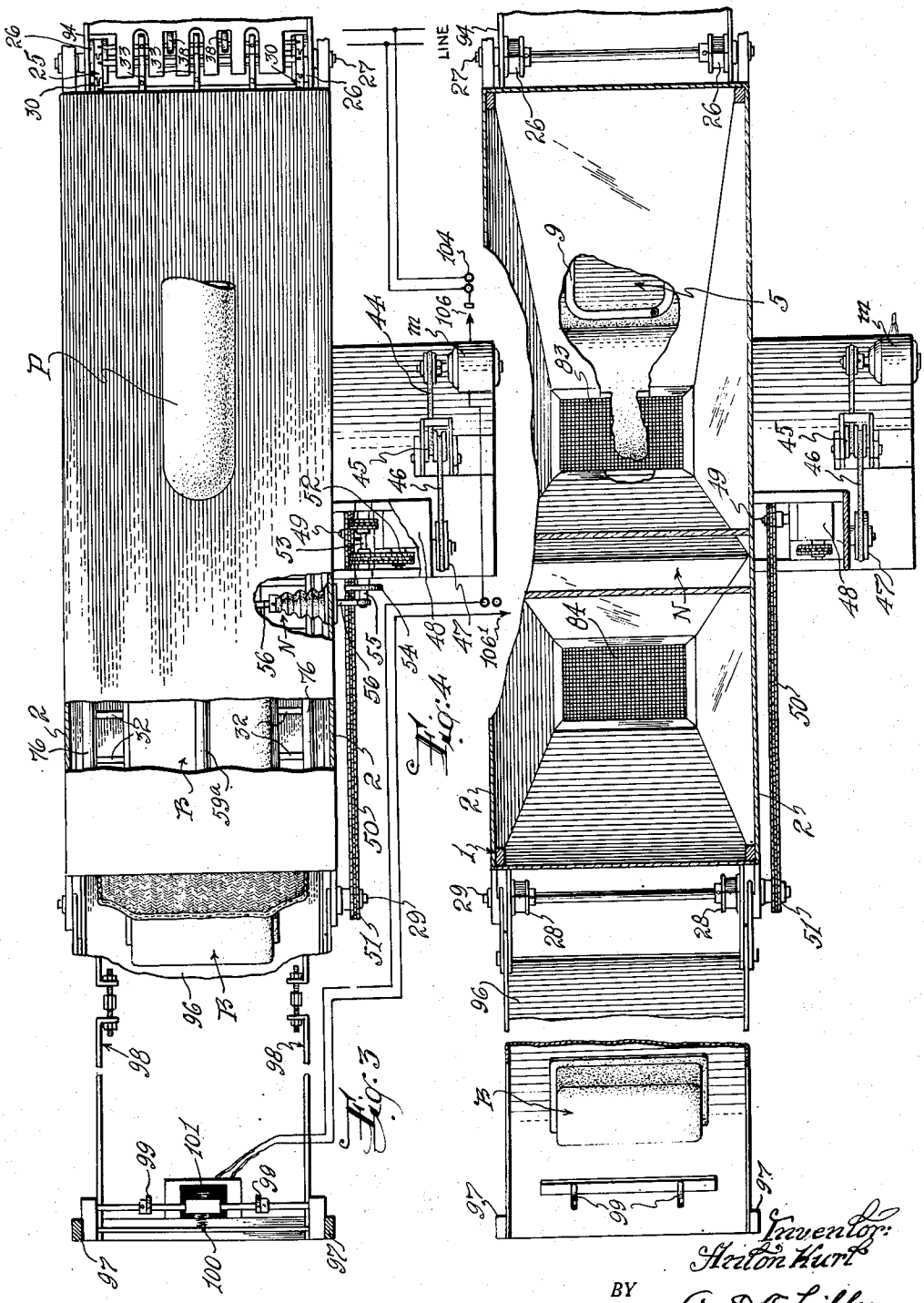
Fig. 35

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ARTICLE CLEANING MACHINE

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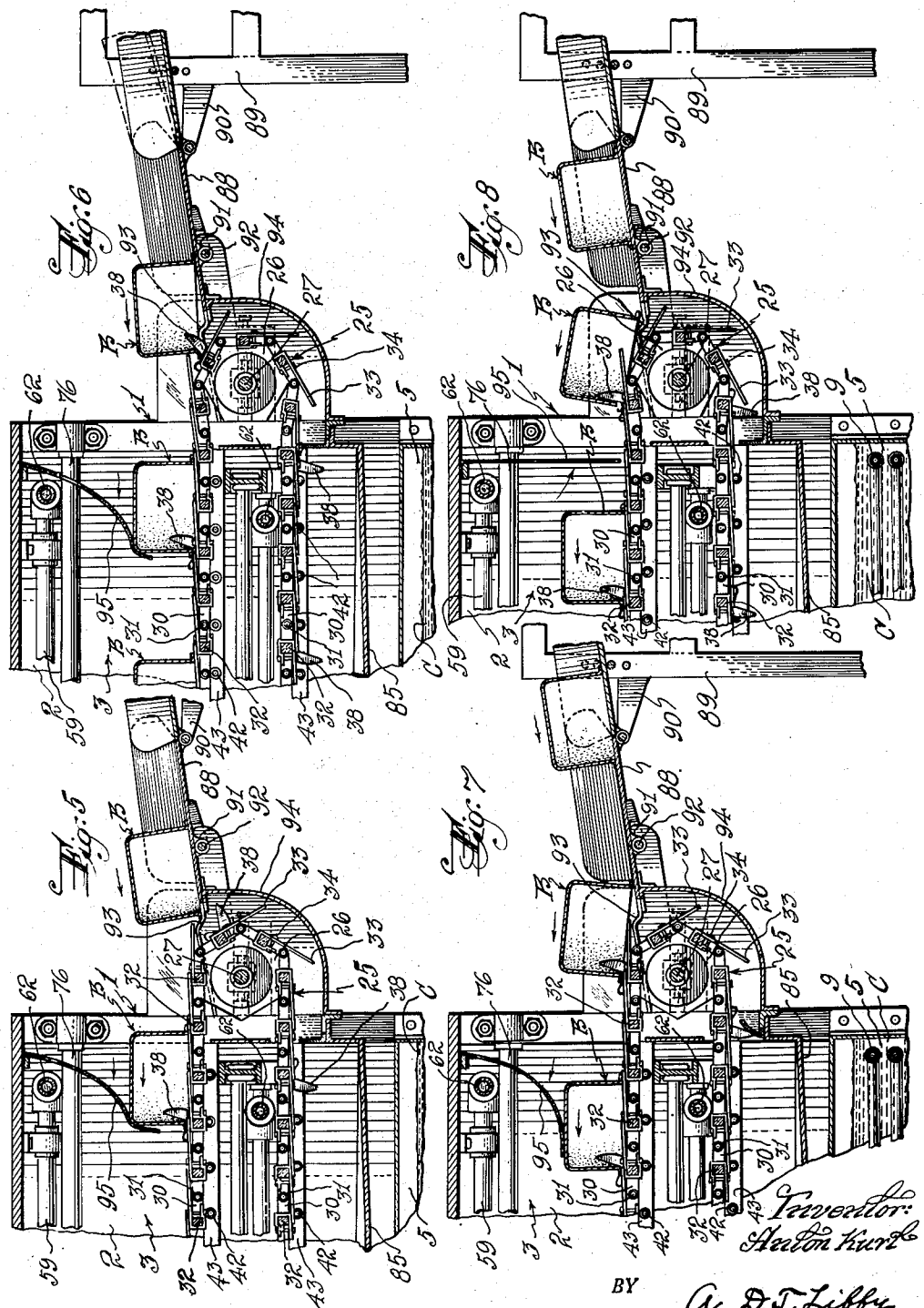


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ARTICLE CLEANING MACHINE

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ARTICLE CLEANING MACHINE

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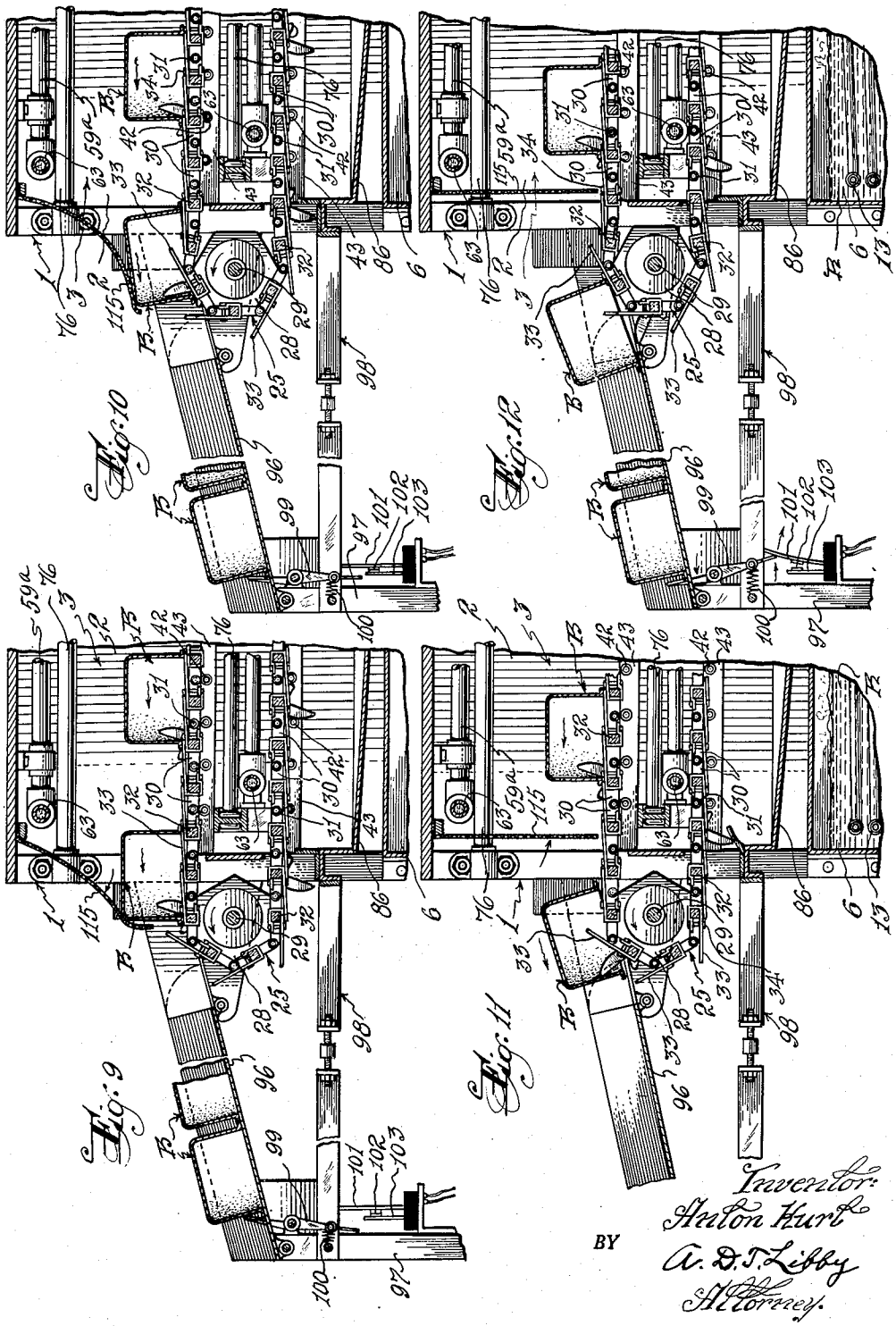


Fig. 10

Fig. 12

Fig. 9

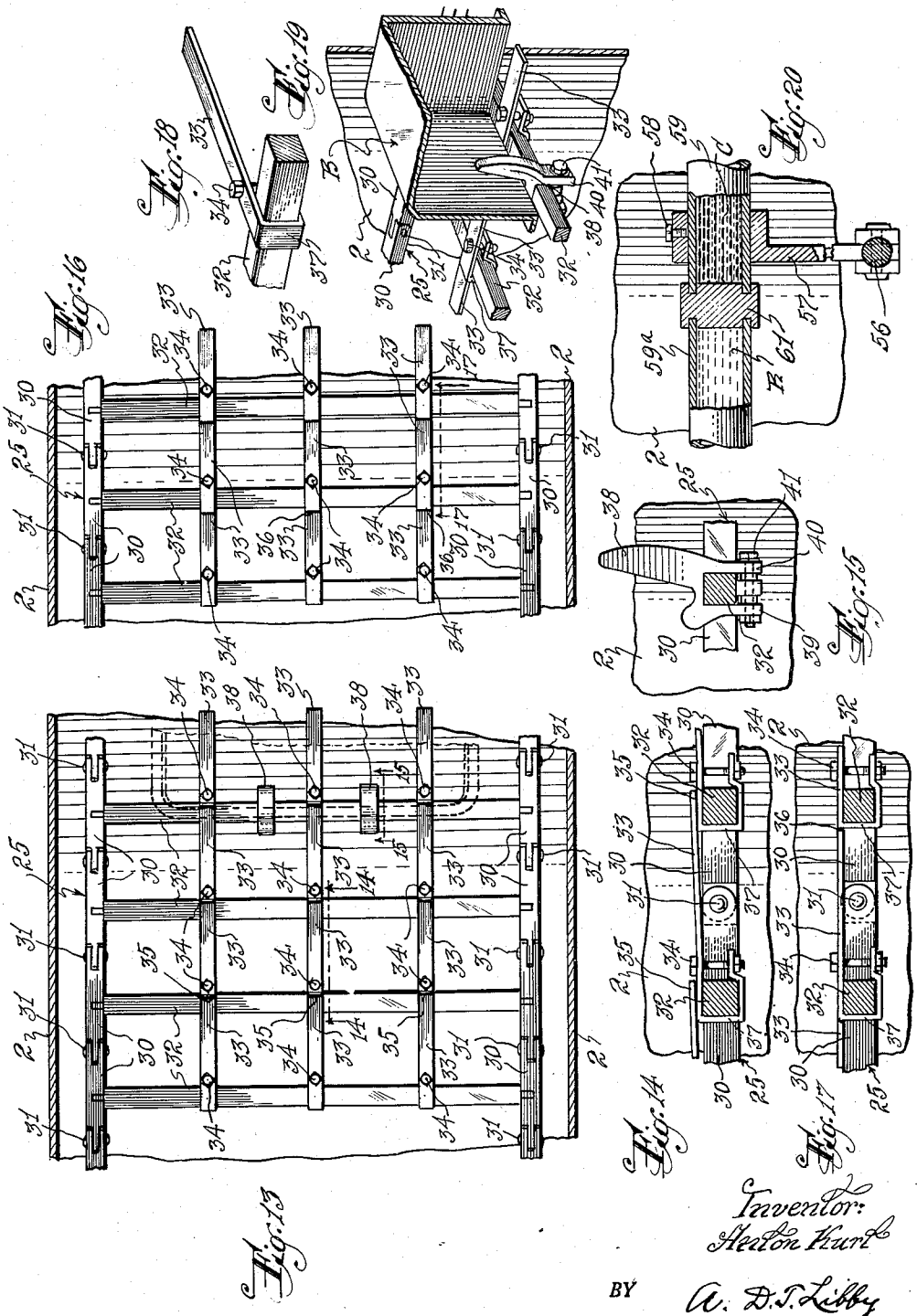
Fig. 11

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ARTICLE CLEANING MACHINE

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ARTICLE CLEANING MACHINE

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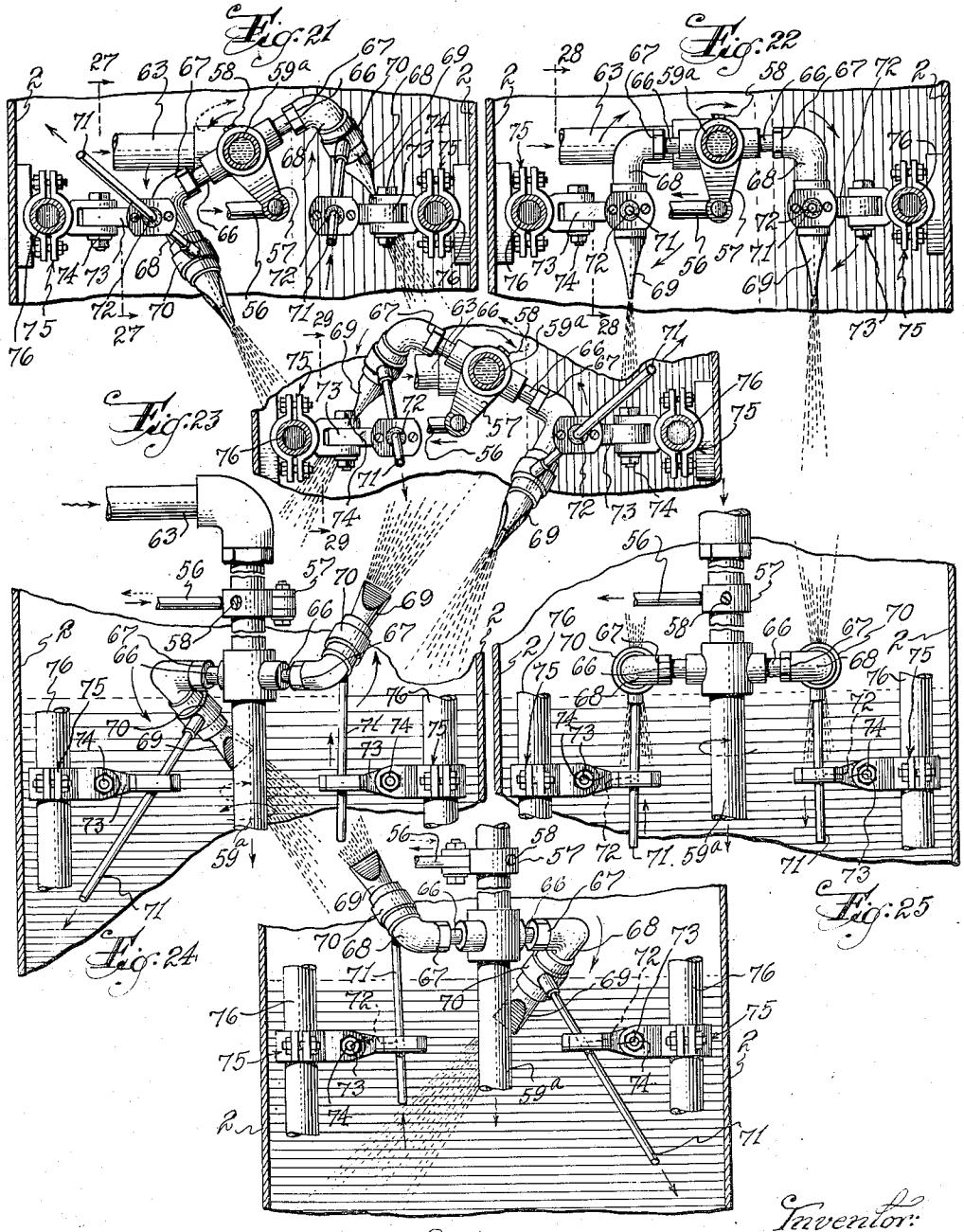


Fig. 21

Fig. 22

Fig. 23

Fig. 24

Fig. 25

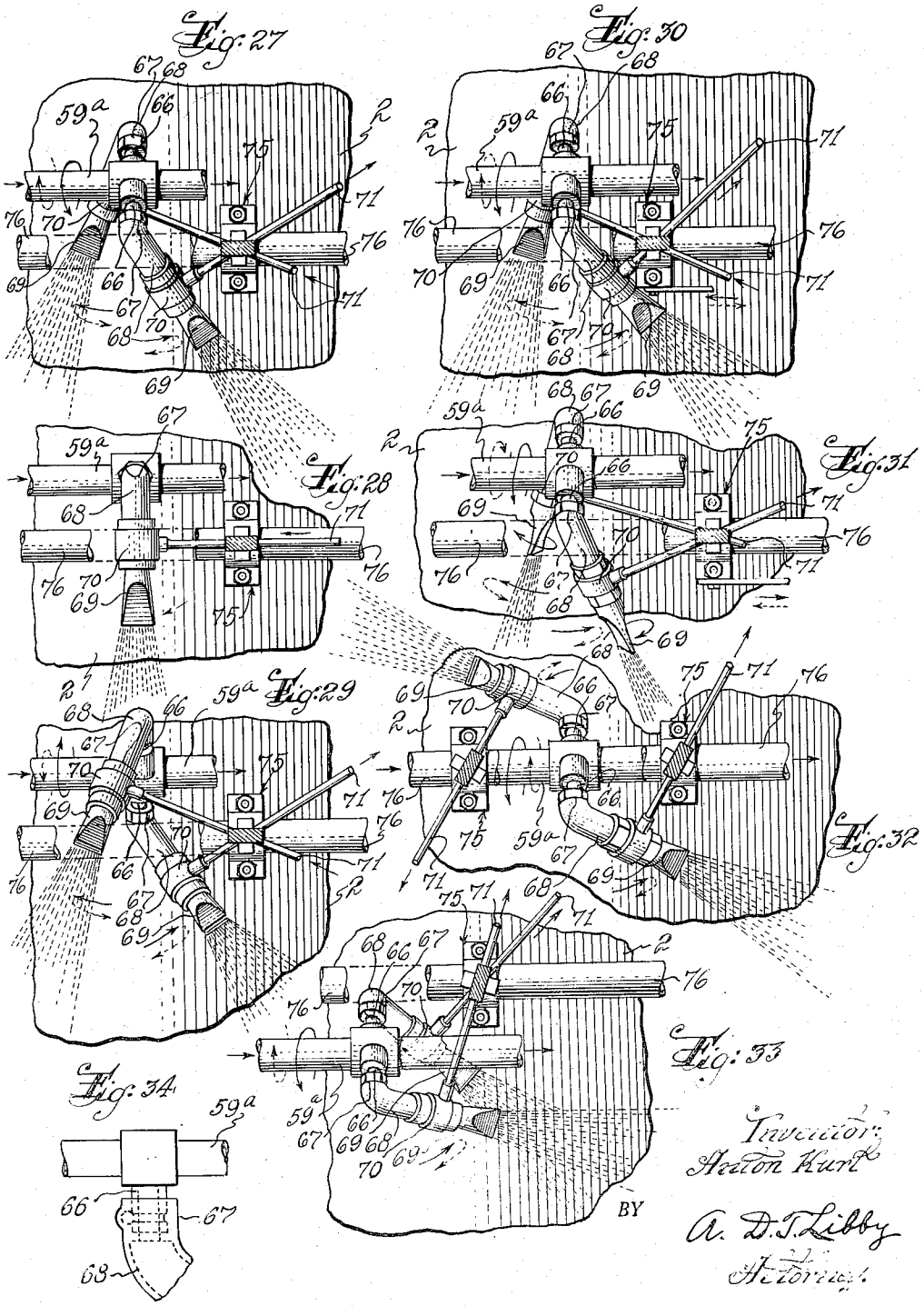
Fig. 26

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ARTICLE CLEANING MACHINE

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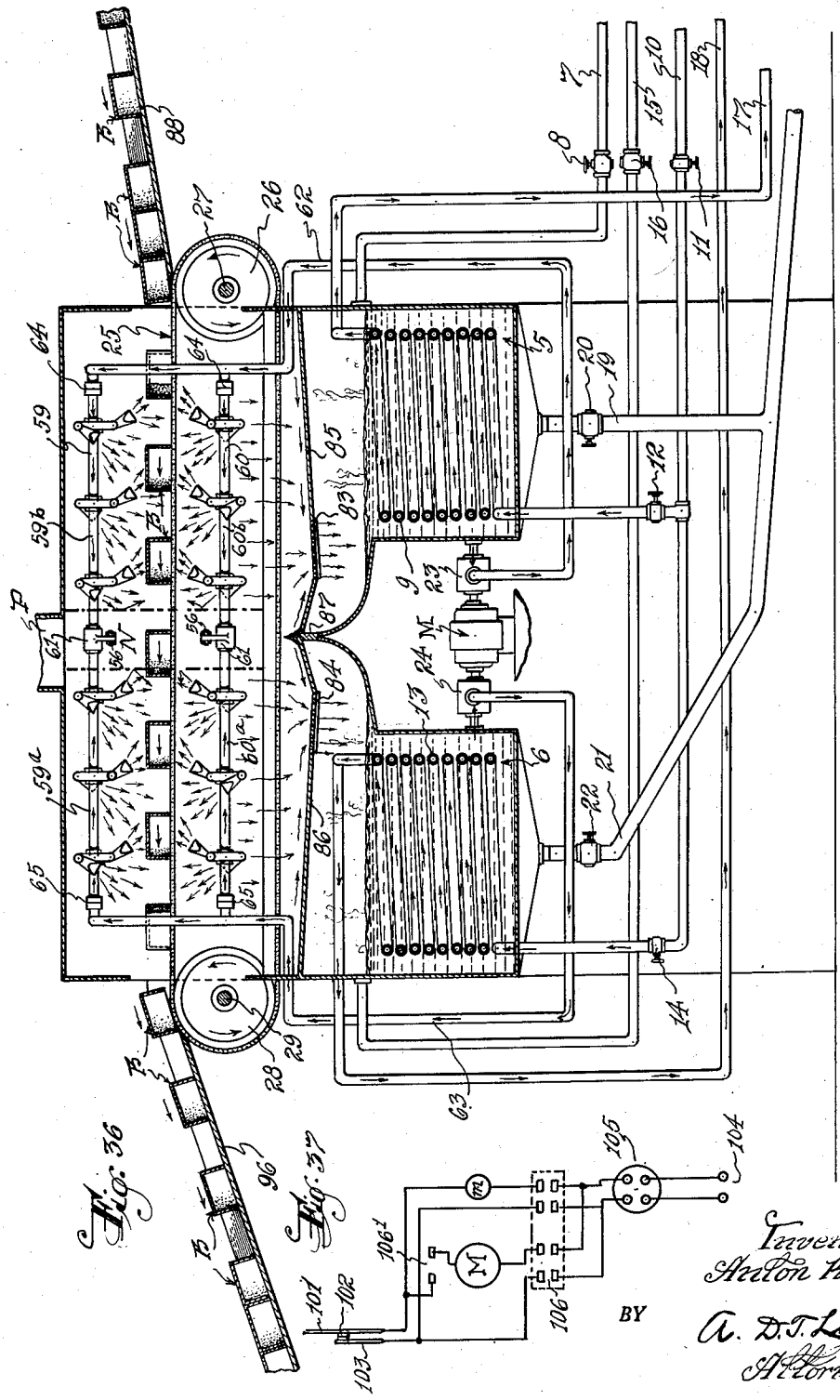


Fig. 36

Fig. 37

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UNITED STATES PATENT OFFICE

2,652,841

ARTICLE CLEANING MACHINE

Anton Kurt, Jersey City, N. J., assignor to Anlo Inc., Newark, N. J.

Application December 8, 1950, Serial No. 199,773

20 Claims. (Cl. 134—46)

1

This invention relates to a mechanism for use in cleaning various articles or devices which have been utilized for various purposes but require thorough cleaning before being used as containers for various products, especially those utilized in food products such as meats of different kinds which carry thereon more or less fat. When articles having grease thereon are to be cleaned, I have found that the ordinary methods of procedure such as hand operations are slow and expensive and not always perfect.

The mechanism that is to be described herein has been especially designed to clean metal boxes in which hams that have been cooked and the bones removed, are compressed thereinto for delivery purposes and these boxes become quite greasy especially on the inside. While the mechanism is especially adapted for this use it is not limited to this but is adaptable for cleaning other articles or things as will be readily seen from the detailed description which follows. The cleaning fluid used may be varied to suit conditions and the machine will handle all kinds.

The mechanism is shown in the attached drawings wherein:

Figure 1 is a side elevation of the mechanism, a central part of the casing being broken away to show some of the interior pieces of apparatus included in the whole mechanism;

Figure 2 is a view similar to Figure 1 but looking at the opposite side of the machine with the sideplate of the framework being removed;

Figure 3 is a view about on the line 3—3 of Figure 2, parts being broken away for the sake of clarity;

Figure 4 is a view about on the line 4—4 of Figure 2; parts being omitted to show parts not normally in sight;

Figure 5 is a part elevational and part sectional view of the right hand end of Figure 2, showing one end of the conveyor bringing the article to be cleaned, in this case a meat containing box brought down to the conveyor for transmission to the machine;

Figure 6 is a view similar to Figure 5 but showing the box moved from its stopped position onto the end of the conveyor;

Figure 7 is a view similar to Figures 5 and 6 but showing an additional step in the movement of the conveyor;

Figure 8 is a view similar to Figure 7 but showing a further movement of the conveyor;

Figure 9 is a view similar to Figure 5 but of the delivery end of the machine showing the boxes being moved from the conveyor to a delivery chute;

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Figure 10 is a view similar to Figure 9 but with a further movement of the conveyor;

Figure 11 is a view similar to Figure 10 but showing a further step in the movement of the conveyor and the boxes thereon;

Figure 12 is a view similar to Figure 11 but showing a further step in advance of the conveyor and the articles carried thereon;

Figure 13 is a partial plan view of one form of the conveyor;

Figure 14 is a view on the line 14—14 of Figure 13;

Figure 15 is a view on the line 15—15 of Figure 13 showing one of the studs for moving the boxes shown onto and off the conveyor;

Figure 16 is a view similar to Figure 13 showing a somewhat different construction of form of the conveyor parts;

Figure 17 is a view on the line 17—17 of Figure 16;

Figure 18 is a perspective view showing one of the longitudinally positioned members used as an element of the conveyor;

Figure 19 is a perspective view showing the application of the parts shown in Figures 15 and 16 in operative position with respect to the box being carried on the conveyor;

Figure 20 is a sectional view showing the blind joint between the two sections of the pipe one of which contains the cleaning liquid and the other the rinsing liquid; this view also shows an arm fastened to one of the pipe sections for turning the whole pipe;

Figure 21 is a part sectional and part elevational view across one of the pipes shown in Figure 20 together with the means for distributing the liquid from the pipe and the means for varying the angle of the distribution of the liquid;

Figure 22 is a view similar to Figure 21 but with the parts in what might be termed a neutral position that is to say, with the pipe turned to a position whereby the distribution nozzles are pointed in the same direction;

Figure 23 is a view similar to Figure 21 but with the parts turned in the opposite position of their movement from that shown in Figure 21;

Figure 24 is a view looking down on the top of Figure 21;

Figure 25 is a view looking down on the top of Figure 22;

Figure 26 is a view looking down on the top of Figure 23;

Figure 27 is a view about on the line 27—27 of Figure 21;

Figure 28 is a view about on the line 28—28 of Figure 22;

Figure 29 is a view about on the line 29—29 of Figure 23;

Figure 30 is a view similar to Figure 27 but with the means for controlling the oscillating movement of the nozzles in a different location;

Figure 31 is a view similar to Figure 30 but with the nozzle control means moved farther away from the pipe nipple that feeds the liquid to the nozzles;

Figure 32 shows a modified arrangement of the nozzle and control means therefor;

Figure 33 shows a further modified arrangement of the nozzles and controls therefor;

Figure 34 is a view showing the preferred form of attaching the nozzles to the pipe nipple that supplies liquid to the nozzle;

Figure 35 is a view showing a modified form of the discharge conveyor from the machine;

Figure 36 is a schematic arrangement showing on a reduced scale the movement of the boxes or other devices through the machine and the method of applying cleaning liquid to the cleaning compartment of the machine and the rinsing liquid for the final cleaning step;

Figure 37 is a diagrammatic view showing electrical connections in the machine.

Referring now to the details wherein like numbers refer to corresponding parts, 1 generally denotes the framework having side cover plates 2, the one on the opposite side from Figure 1 being entirely removed to show the interior part. The framework may be considered as having sections 3 and 4 one above the other, the bottom section 4 has at the incoming end a cleaning chamber 5 and at the opposite end a rinsing chamber 6. As will be readily seen from Figure 36, the washing or cleaning liquid is taken into the chamber 5 through a pipe 7 and valve 8. Chamber 5 preferably contains heating coils 9 to which steam is supplied by pipe 10 and valves 11 and 12. The chamber 6 is likewise provided with heating coils 13 to which steam is supplied by the pipe 10 and valve 14, water being supplied by the pipe 15 and valve 16. The steam exit pipe 17 is connected to pipes 9 in the chamber 5 and a corresponding pipe 18 to the coils 13 in chamber 6. The chamber 5 has a drain pipe 19 controlled by valve 20 and the chamber 6 a drain pipe 21 controlled by valve 22. Connected to the chamber 5 is a pump 23 and to the chamber 6 pump 24, both pumps being driven by a motor M.

Mounted in the upper longitudinal compartment of the framework is a conveyor 25 which is supported at the intake end on a suitable pair of wheels 26 connected by shaft 27 while a similar pair of spaced wheels 28 are connected by shaft 29, it being understood that the shafts 27 and 29 are suitably supported on the framework of the machine. The conveyor 25 is made up of a plurality of similar side links 30 which are held together by pivot studs 31. Connected beween the side links 30 in spaced relation are a plurality of cross bars 32, one to each pair of links. Fastened to these cross bars 32 are fingers 33 which are preferably adjustable along the bars 32 by a clamping screw 34 as shown in Figures 14 and 18. It will be seen from Figures 13 and 14 that the fingers 33 extend from one bar 32 to the next adjacent. As shown in Figure 14 the fingers 33 overlap at 35 the next adjacent bar 32 and one end of the fingers 33 is bent around the bar 32. In Figure 17 the end of the finger terminates at 36 in clearance space to the bent over end 37 of the finger 33. Either form of construction may be utilized but in either case the finger 33 is free to move into different positions as shown in Figures 5–12 for the purposes to be later explained. Carried on the bars 32 in any desired lateral and longitudinal spaced relation are studs 38 which have lugs 39 and 40 which span the bar 32 and are adjustably held thereto by a clamping stud and nut 41. The use of the studs 38 will be later described. The side link members forming the driving parts of the conveyor 25 are carried on rollers 42 fastened to side frame members 43 it being understood that there is one of the members 43 on opposite sides of the chamber in which the conveyor is located.

The conveyor is driven by motor *m* (see Figures 3 and 4), which is connected by a belt drive 44 to a speed changing device 45 which is connected by a belt 46 to a pulley 47 carried on a shaft connected to a differential gearing in a box 48, the output shaft 49 which carries a chain drive 50 that is connected to a pulley 51 carried by the shaft 29 on which the operating wheels 28 of the conveyor are mounted. Also associated with the differential gearing 48 is an output shaft which is connected with belt 52 of a suitable type which drives the shaft 53 on which is mounted a disc 54 which may be provided with a plurality of holes into one of which the pin 55 may be inserted to change the throw given the rod 56 by the disc 54. The rod 56 is connected to an arm 57 that is adjustably fastened as by a set screw 58 to a pipe 59 which extends longitudinally through the cleaning and rinsing compartments through which the conveyor 25 carries. One of these pipes 59, divided into two sections 59*a* and 59*b* is located in the upper part of the mechanism (see Figure 2) and another one 60, is divided into two sections 60*a* and 60*b* below the conveyor. The pipe 59 is divided into the two parts above mentioned by what I term a neutral section N, that section over the cleaning compartment which is over the chamber 5 being section 59*b* while the other portion of the pipe 59*a* is over the rinsing chamber 6. As shown in Figure 20 the pipe 59 is divided in the neutral section by a blind union 61, so as to keep the cleaning liquid C separate from the rinsing liquid R, it being understood that the cleaning liquid is of a suitable nature which will dissolve or take up grease or other dirt that may be in the articles going through the machine on the conveyor 25, while the rinsing liquid may be clean water, both liquids being heated by steam coils 9 and 13 as heretofore explained. I prefer to have a single pipe with the blind union 61 in preference to two separate pipes one for the cleaning liquid and the other for the rinsing which is the simplified construction as will be readily seen from what follows. Instead of the arm 57 being fastened alongside of the blind union 61 as shown in Figure 20 the arm 57 may be placed directly on or made a part of the blind union so that as the motor *m* is operated the crank disc 54 through the rod 56 will oscillate the shaft 59—59*a*. As will be seen from Figure 2 there is a companion disc 54*a* having a crank pin 55*a* connected to the pipe 60—60*a* in the same manner as in the Figure 20.

By reference to Figure 36 it will be seen that the pipe 62 comes from the pump 23 and is connected to the pipe end 59*b* which is located above the articles going through on the conveyor and also to the pipe end 60 which is below the articles going through on the conveyor. While pipe 63 coming from the pump 24 is connected to the pipe end 59*a*, as well as to the pipe end 60*a*.

Referring now to Figures 21–33 the means for delivering the cleaning and rinsing liquid from the pipe ends 59b—59a, 60b and 60a will be seen. A description of the distribution from one of the pipe lines will apply in a general way to all of the Figures 31–33. Referring first to Figures 21 and 36 it will be seen that there is a plurality of nozzles distributed longitudinally along the pipe ends 59b and 59a which are connected to their respective supply pipes 62 and 63 by nipples 66 on which is rotatably mounted a suitable coupling 67 to which the nozzle 68 is attached. The end of the nozzle 69 as shown has an oblong hole for spreading out the liquid as it is forced through the nozzle 68, through suitable unions 64 and 65, whereby the whole pipe may be turned or oscillated to a desired angle by means of the rod 56 which is connected to the arm 57 as has been described.

Loosely mounted on the nozzle 68 is a collar 70 to which is attached a rod 71 that passes through a clearance hole 72 in the end of an arm 73 that is pivotally mounted at 74 to a clamp, the parts of which are generally referred to by 75. The clamp 75 is adjustably positioned on a support member 76 which is preferably in the form of a hollow pipe that extends longitudinally along the opposite sides of the framework and fastened thereto in any satisfactory manner. As shown in Figure 2 the nozzles 68 are shown for simplicity in individual arrangements along the length of the pipe 59b–59a but in Figures 21–33 they are shown as they are preferably utilized in pairs, but they may be arranged individually on opposite sides in spaced relation on the supply pipe.

By reason of the control connections just described, as the supply pipes 59b, 59a are oscillated by the rod 56 and arm 57 the nozzles are caused to turn through a multitude of angles as will be seen from these Figures 21 to 33. This angularity being controlled by the rods 71 and the adjustment along the support pipes 76. In these different Figures 21–22 it has been endeavored to show from actual movements of the nozzles just what takes place in the distribution of the liquids in the cleaning compartment as well as in the rinsing compartment, these two compartments being divided by the neutral space connection which is divided by the screens 79 and 80 these screens being flexible and made out of water-proof material and suspended from the framework at the points 81 and 82. These screens prevent the cleaning liquid from mixing with the rinsing liquid and as these liquids pass down through the sieves 83 and 84 which are slidably mounted in the framework as shown in Figure 2, the liquids pass back into their respective chambers 5 and 6. Whatever vapor may get past the screen 79 to the articles going through on the conveyor which moves the screens out of their vertical position, is taken up by an exhaust pipe P which may be equipped with an exhaust fan. It will be noted from Figure 36 that the sieves 83 and 84 are positioned in slightly slanting surfaces 85 and 86 that extend inwardly from the opposite ends of the framework, these surfaces terminating in upwardly inclined portions supported by a projection 87 formed by inner sides of the chambers 5 and 6. The article receiving end of the mechanism is provided with a chute 88 fastened at one end to a support 89 by one or more arms 90, while the opposite end has lugs 91 on opposite sides to receive holding studs 92. This end of the bottom part of the chute 88 has an upwardly extending rounded end 93 which sets in a recess in the shelf 94 that is fastened to the end of the framework of the machine. This rounded end 93 while acting as a stop for a box 3, allows the box to be easily moved upwardly over the rounded surface onto the conveyor (see Figures 5–7). As the conveyor moves in the direction of the arrows in Figures 5 and 6 the stud 38 passes upwardly within the article which in this case is a metal box B and which moves it out of the stop position as shown, up into the conveyor and into engagement with a screen or curtain 95 which is utilized to prevent liquid, which is being sprayed out of the nozzles from coming out of the machine. As shown in Figure 5 the second box has been moved down into stop position and in Figure 6 another stud 38 is about to engage it to move it onto the conveyor. The different steps in these movements will be clear from inspection of Figures 5, 6, 7 and 8 without further description.

The discharge end of the mechanism is shown in Figures 9, 10, 11 and 12 and comprises a chute 96 having one end fastened to the delivery end of the machine with its opposite end as shown in Figure 2 attached to a support member 97. Preferably an adjustable brace member 98 is utilized as shown in Figure 2. Pivotally connected to the support member 97 is a lever 99 held by a spring so that the downwardly projecting end of the lever 99 is held away from the spring contact member 101. Normally the spring 101 carries a contact which is engaged by a cooperating contact 102 on a spring 103. This pair of contacts 102 is for controlling a circuit through the motors M and *m* as shown in Figure 37. The motor M has a switch 106 mounted in a switch box which preferably contains a fuse for the circuit. The switch 106 is connected to a plug-in socket 104 to which the main power supply is connected. Leads run from the switch 106 which is preferably of the four-pole type to the motors M and *m* and from the latter direct to the switch contact 102. The motor M is connected to a push button switch 106'. This arrangement as shown in Figure 37 allows the small motor *m* to start into operation which will move the conveyor 25 and the oscillation of the pipes 59b—59a, 60b and 60a but no liquid will come through the nozzles until the pump motor M is started by operating the switch 106'. A pair of plug-in contacts 105 are furnished so that extension cords may be fastened thereto for interior inspection of the machine before the motor M is started. As the articles, in this case boxes B come down the chute 96 they push aside a screen or curtain 115 which serves the same purpose as the screen 95 does at the opposite end of the machine. As the conveyor brings the boxes B to the discharge end of the machine the lug 38 moves the boxes B onto the chute 96 and as succeeding boxes come along they push the boxes down the chute. An operator is presumed to be in attendance to take the boxes B off the chute 96 as they come off the machine but in case the attendant is called away for some reason when the chute becomes filled the pressure on the last box coming from the machine will push the line of boxes downwardly so as to operate the lever 99 and cause it to operate the spring 101 and open the circuits to both motor M and *m* as shown in Figure 37, thereby stopping the conveyor as well as the motor forcing the liquid through the nozzles. In Figure 35 I have shown an alternate arrangement by which the chute 96 may have an extension 107 connected thereto with a conveyor belt

108 to carry the article being washed, out to a place of deposit. In this figure the power drive is obtained by the belt 108 to a pulley carried on a shaft 109 which in turn has a pulley driving a belt 110 that passes over a pulley 111 fastened to shaft 112 that carries an additional pulley that is fastened to the shaft 113 that carries pulley 114 that drives the belt 108.

By reference to Figure 1 it will be seen that both of the chambers 5 and 6 have gauges *g* and *g'* for showing the height of liquid in each chamber. Likewise, the temperature of the liquids in the two chambers are given by the thermostats *t* and *t'* for controlling the temperature of the liquids in the cleaning tank and rinsing tank. In Figure 34 I have shown a separate view of the union between the nipple coming from one of the liquid supply pipes. This union is of the Chiksan type in which a ball bearing is utilized between the nipple 66 and the swivel elbow which I have previously referred to as a suitable coupling. The gaskets which may be used at the union are not shown, also in Figure 36 the neutral space N is illustrated by the two broken lines, but the curtains such as 79 and 80 as shown in Figure 1 are not shown and neither are their companion curtains below the conveyor 25 shown.

It is apparent from the preceding description and the type of mechanism described that a great many of the details may be varied without departing from my invention and the scope of the appending claims.

I claim:

1. A cleaning mechanism including an enclosing framework, a chamber at one end of the framework for carrying a cleaning liquid, a separate chamber at the other end of the framework for carrying a rinsing liquid, means for heating said liquids, a conveyor for carrying the material to be cleaned through the framework above said chambers and means for separately forcing said liquids from their respective chambers at their respective ends of the framework through a plurality of continually oscillating nozzles with further means for shifting said nozzles while being oscillated through a multitude of continuously varying angles to produce widely shifting streams all over the material as it passes along on the conveyor.

2. A cleaning mechanism as set forth in claim 1 further defined in that said means for forcing the liquids over the material to be cleaned including, a pair of pipes extending, within and longitudinally of the framework, one pipe above and the other below the central line of the conveyor, the pipes being oscillatably mounted and divided in sections at approximately their central location by a complete blind union to keep the two liquids in the pipes at all times separate, each pipe section having spaced nipples extending outwardly therefrom to over- and underlap the conveyor, a nozzle rotatably carried on each nipple, a pair of longitudinally extending supports on each interior side of the framework, one support of a pair being above while the other is below the conveyor, arms adjustably carried on said supports, one arm for each nozzle and each arm having a hole therethrough in its free end, a rod for each nozzle having one end passing through said hole in the free end of each of said arms, a collar loosely carried on each of said nozzles and having one of said rods operatively connected thereto to move its nozzle through a plurality of varying angles as the pipes are oscillated and means for oscillating said pipes through a preset angle.

3. A cleaning mechanism as set forth in claim 1 further defined in that said means for forcing the liquids over the material to be cleaned including, pipe lines for each type of liquid, the pipe lines being arranged above and below the conveyor and having movable nozzles attached thereto, means for oscillating said pipes and means co-operative with the pipes to continuously vary the direction of motion of the nozzles for the purposes described.

4. A cleaning mechanism as set forth in claim 1 further defined in that said means for forcing the liquids over the material to be cleaned including, a pipe line extending a distance above the conveyor and another pipe line extending a distance below the conveyor, each pipe line having a complete blind union approximately at its longitudinal center whereby only one type of liquid can be inserted into each pipe line sector, means for feeding the cleaning liquid to the pipes located over the cleaning liquid chamber, means for feeding the rinsing liquid to the pipes over the rinsing liquid chamber, means for feeding the liquid out of the pipes which comprises a plurality of spaced nozzles operatively connected to the pipes, means for oscillating the pipes and means for shifting the nozzles through changing angles as the pipes are oscillated.

5. A cleaning mechanism as set forth in claim 1 further defined in that said means for forcing the liquids over the material to be cleaned including, a pipe line extending a distance above the conveyor and another pipe line extending a distance below the conveyor, each pipe line having a complete blind union approximately at its longitudinal center whereby only one type of liquid can be inserted into each pipe line sector, means for feeding the cleaning liquid to the pipes located over the cleaning liquid chamber, means for feeding the rinsing liquid to the pipes over the rinsing liquid chamber, means for feeding the liquid out of the pipes which comprises a plurality of spaced nozzles operatively connected to the pipes, the nozzles on the pipe above the conveyor being alternately spaced with the nozzles on the pipe below the conveyor, means for oscillating the pipes and adjustable means for controlling the amount of oscillation, and means for shifting the nozzles through changing angles as the pipes are oscillated.

6. A cleaning mechanism as set forth in claim 1 further defined in that said means for forcing the liquids over the material to be cleaned including, a pipe line extending a distance above the conveyor and another pipe line extending a distance below the conveyor, each pipe line having a blind union approximately at its longitudinal center, means for feeding the cleaning liquid to the pipes located over the cleaning liquid chamber, means for feeding the rinsing liquid to the pipes over the rinsing liquid chamber, means for feeding the liquid out of the pipes which comprises a plurality of spaced nozzles operatively connected to the pipes, the nozzles on the pipe above the conveyor being alternately spaced with the nozzles on the pipe below the conveyor, means for oscillating the pipes and adjustable means for controlling the amount of oscillation, adjustable support arms one for each nozzle carried on fixed supports in longitudinal spaced relation and fixed in any adjusted position with respect to the nozzles, a member movably associated with each nozzle and a rod having one end op-

eratively connected to said movable member and its other end going through a hole in its support arm for the purpose described.

7. A cleaning mechanism as set forth in claim 1 further defined in that the conveyor has a readily removable feed in end plate for bringing material to the cleaning end of the conveyor, the plate having an upwardly extending rounded end fitting in a recess at the framework end so as to form a smooth acting stop for the material and means on the conveyor for automatically releasing the material from said stop and moving it onto the conveyor.

8. A cleaning mechanism as set forth in claim 1 further defined in that two separate electric motors are provided, one for forcing said liquids in said streams while the other moves the conveyor through the framework, the conveyor having a readily removable delivery chute with means on the conveyor for automatically moving the material from the conveyor onto said chute and a switch at the discharge end of the chute for directly opening both motor circuits to stop the mechanism should the chute become full of material.

9. A cleaning mechanism including a longitudinally extending framework having a chamber at one end for carrying a cleaning liquid and a chamber at the opposite end for carrying a rinsing liquid with a space between said chambers, an enclosed cleaning space above said chambers, said space having a continuous conveyor located in said space, at least two cleaning pipes extending longitudinally through said space, one above the conveyor and the other below it, said pipes over the cleaning liquid chamber carrying only that liquid while the pipes over the rinsing chamber carrying only rinsing liquid, means for forcing the liquid from the chambers to the pipes, said pipes being rotatably mounted with means for oscillating them through a predetermined angle said pipes having spaced L shaped nozzles and means separate from the pipes for shifting the nozzles in a direction different from the direction of rotation of the pipes, as the pipes are turned.

10. A cleaning mechanism as set forth in claim 9 further defined in that said means for shifting the nozzles includes nipples extending at right angles to the pipes with the nozzles oscillatably carried on the nipples, a rod movably attached at one end to each free end of the nozzles, support members carried by framework within said space, arms adjustably carried on said support members, a clearance hole in the free end of each arm to receive the free end of a rod and thereby control as described the path of movement of its nozzle as the pipes are turned.

11. A cleaning mechanism as set forth in claim 9 further defined in that said means for shifting the nozzles includes nipples extending at right angles to the pipes with the nozzles oscillatably carried on the nipples, a rod movably attached at one end to each free end of the nozzles, circular members extending longitudinally through said cleaning space and located one in each of the four corners of said space, arms adjustably carried on said circular members, a clearance hole in the free end of each arm to receive the free end of a rod and thereby control as described the path of movement of its nozzle as the pipes are turned.

12. A cleaning mechanism as set forth in claim 9 further defined in that said conveyor has a pair of laterally spaced main side members composed of links pivoted together with operative means at both ends of the framework for supporting and moving said members, spaced cross bars extending between directly opposite links, surface forming fingers attached to said bars and extending toward the loading end of the conveyor and reaching to the next bar for the purpose described.

13. A cleaning mechanism as set forth in claim 9 further defined in that said conveyor has a pair of laterally spaced main side members composed of links pivoted together with operative means at both ends of the framework for supporting and moving said members, spaced cross bars extending between directly opposite links, surface forming fingers attached to said bars and extending toward the loading end of the conveyor and reaching to the next bar and one or more article engaging studs adjustably fastened to certain of said cross bars for engaging the articles to be cleaned at the entrance end of the mechanism.

14. A cleaning mechanism as set forth in claim 9 further defined in that an article feeding chute is attached to the framework in a manner to furnish a stop area for an article coming down said chute, and studs carried by the conveyor to engage the article against the stop area and to release it and then move it onto the conveyor.

15. A cleaning mechanism as set forth in claim 9 further defined in that a chute is attached to the discharge end of the machine with means including electric motors for moving the conveyor through the machine and also for forcing the liquids through the pipes and means at the end of the chute directly responsive to the longitudinal pressure of the articles in the chute for opening the motor circuits to directly stop all the activities of the mechanism.

16. A cleaning machine having a cleaning liquid located at one bottom end of the machine, a rinsing liquid located at the opposite bottom end, a liquid distributing chamber extending through the machine above the liquid locations, cleaning pipes located in said chamber over the cleaning liquid location, rinsing pipes located in said chamber over the rinsing liquid location, an article conveyor having means for moving it through said chamber in spaced relation to said pipes, liquid distributing nozzles attached to said pipes, means for forcing said liquids into their respectve pipes and through their nozzles, means for oscillating said pipes and means for moving said nozzles through continuously changing angles as the pipes are oscillated.

17. A cleaning machine as set forth in claim 16 further defined in that means are provided in said liquid distribution chamber and in the oscillating pipes to keep the liquids specified separate and having further means for returning each liquid to its location.

18. A cleaning machine as set forth in claim 16 further defined in that an article supply chute is attached to the cleaning end of said chamber while an article delivery chute is attached to the rinsing end of the delivery chute to stop the entire operation of the machine in its operations when the chute becomes fully loaded with articles that have been cleaned.

19. A cleaning machine as set forth in claim 16 further defined in that the machine has means for heating the liquids and automatic means for regulating the temperature of the liquids.

20. A cleaning machine as set forth in claim 16 further defined in that the machine has means for heating the liquids and automatic means for

regulating the temperature of the liquids, means for collecting the liquids after they leave said chamber and returning them to their respective locations and means for filtering the liquids before they reach said locations.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,043,010	Hoofnagle	Oct. 29, 1912
1,157,017	Lowe	Oct. 19, 1915
1,512,918	Forsgard	Oct. 28, 1924
1,916,255	Cabot	July 4, 1933
1,929,345	Brown	Oct. 3, 1933
2,057,388	Mackin	Oct. 13, 1936
2,096,512	Greer	Oct. 19, 1937
2,132,634	Kurt	Oct. 11, 1938
2,225,421	Marchev	Dec. 17, 1940

FOREIGN PATENTS

Number	Country	Date
734,639	France	Oct. 25, 1932