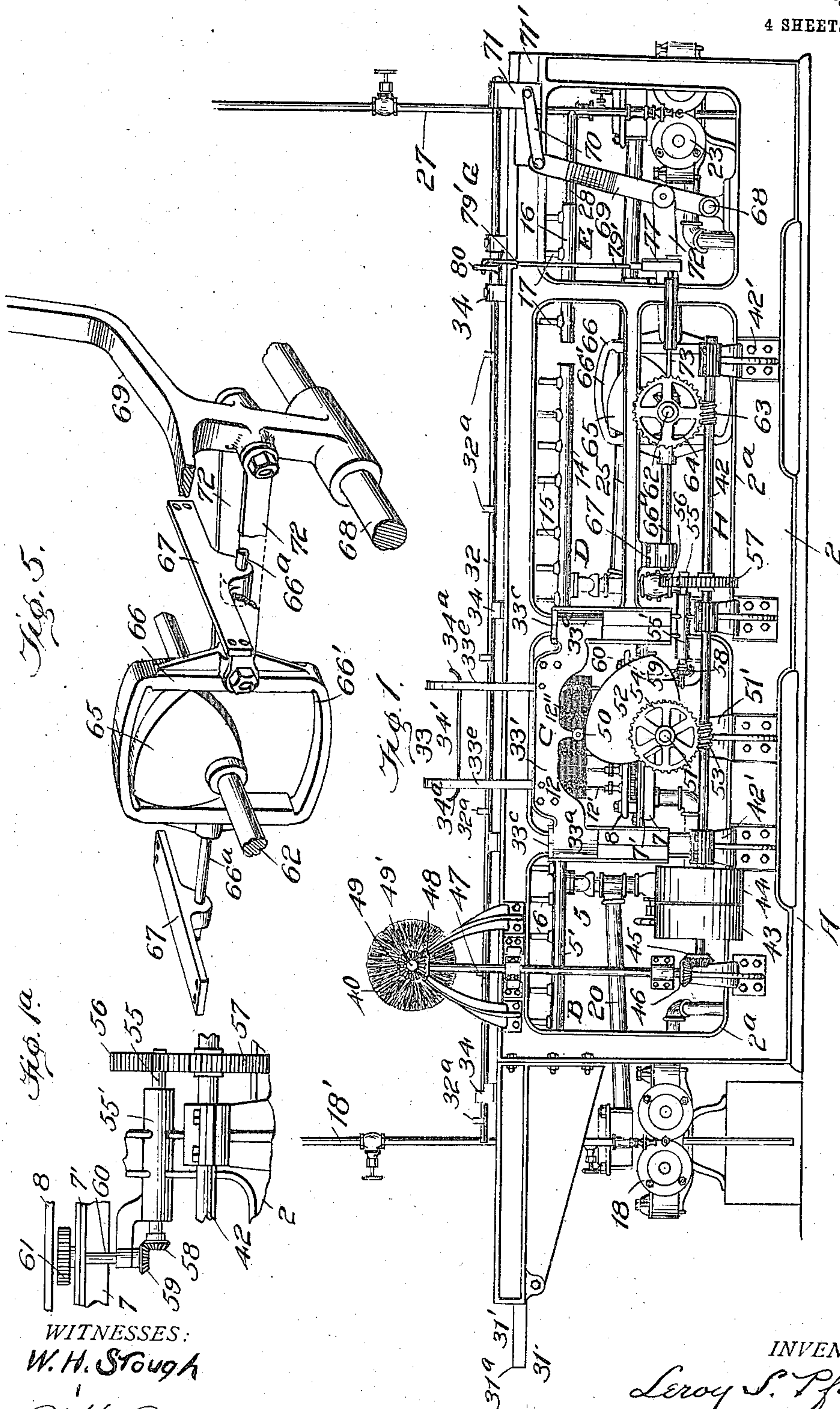


L. S. PFOUTS.
MACHINE FOR TREATING BOTTLES.
APPLICATION FILED OCT. 30, 1906.

963,247.

Patented July 5, 1910.

4 SHEETS—SHEET 1.



WITNESSES:
W. H. STOUGH
P. H. BURCH

INVENTOR.
Leroy S. Pfouts.
BY
Edward R. Alexander
ATTORNEY.

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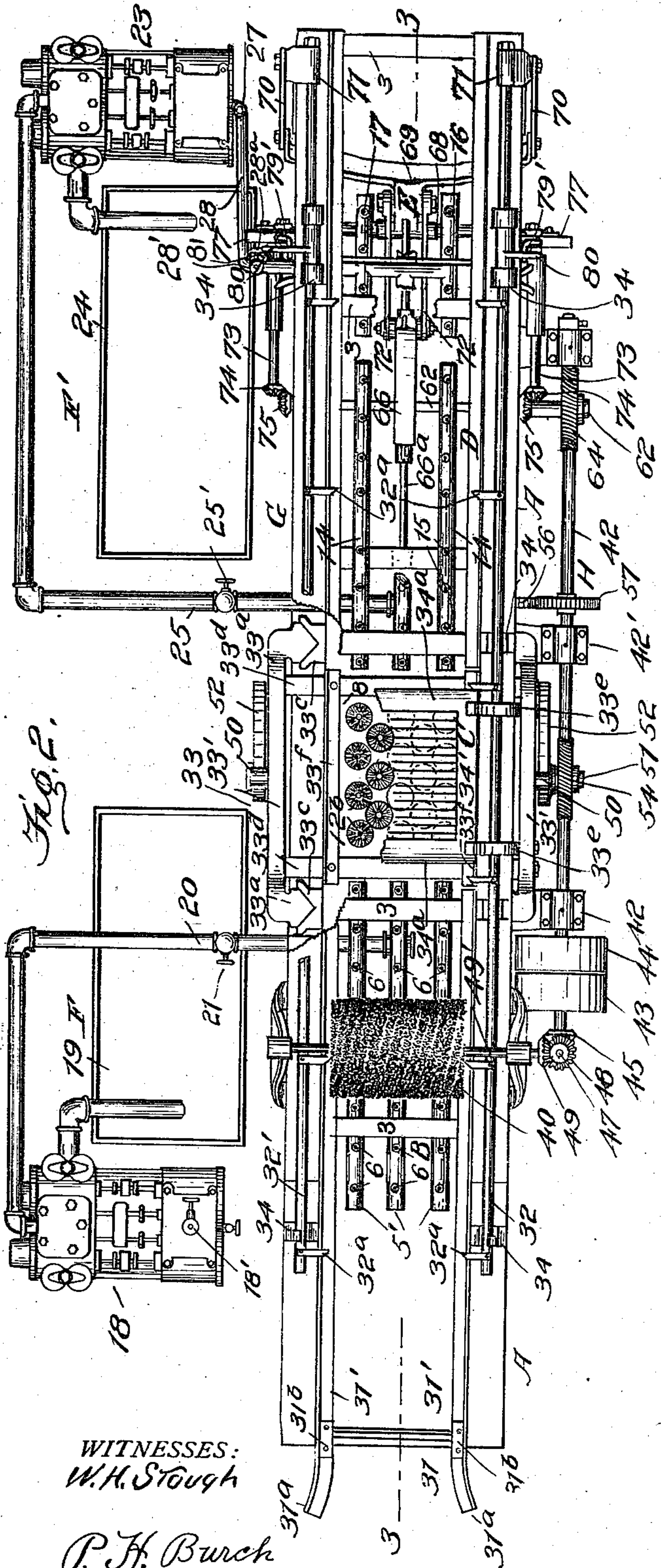


Fig. 2.

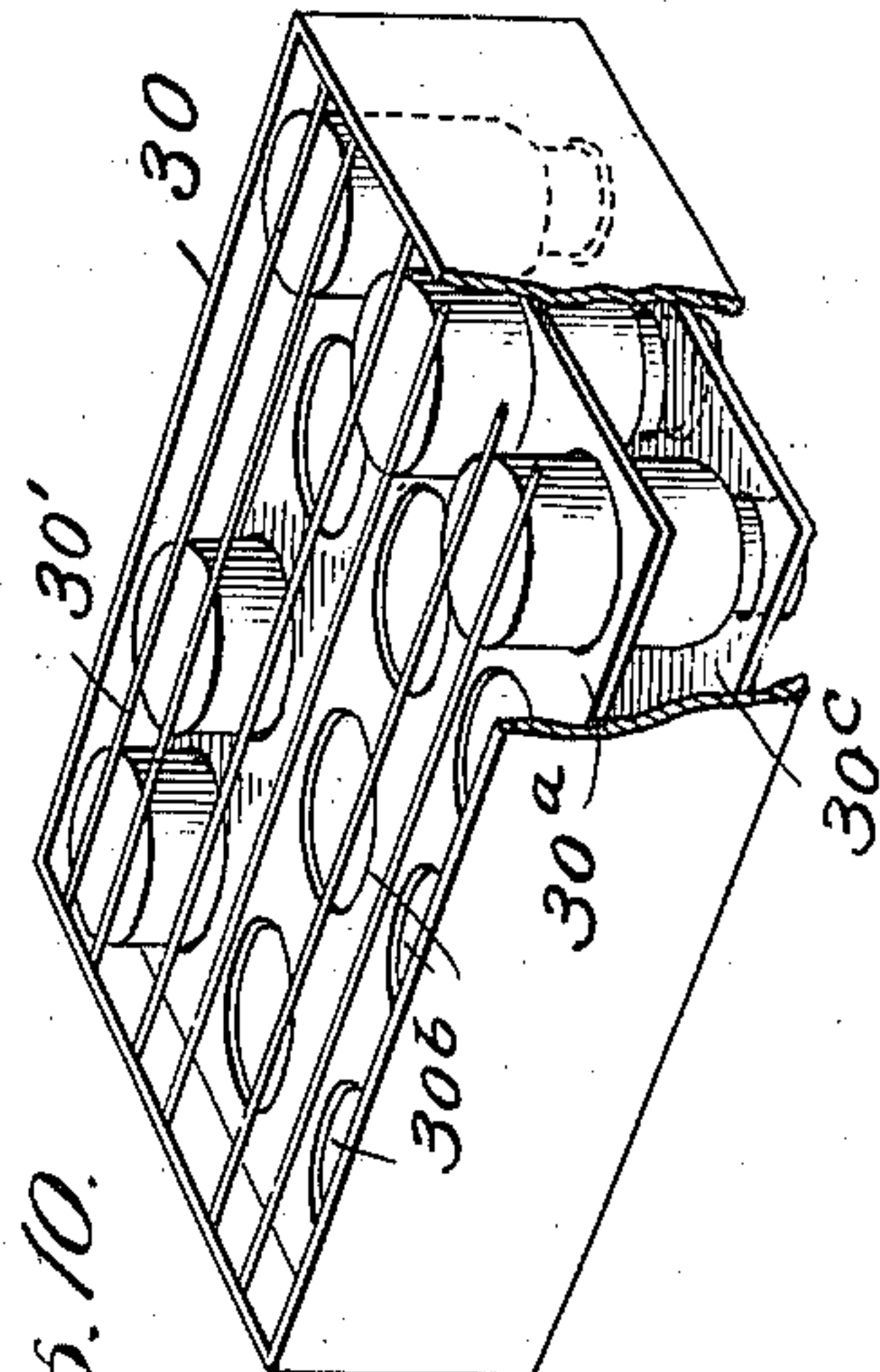


Fig. 10.

WITNESSES:
W. H. Stough

P. H. Burch

INVENTOR.

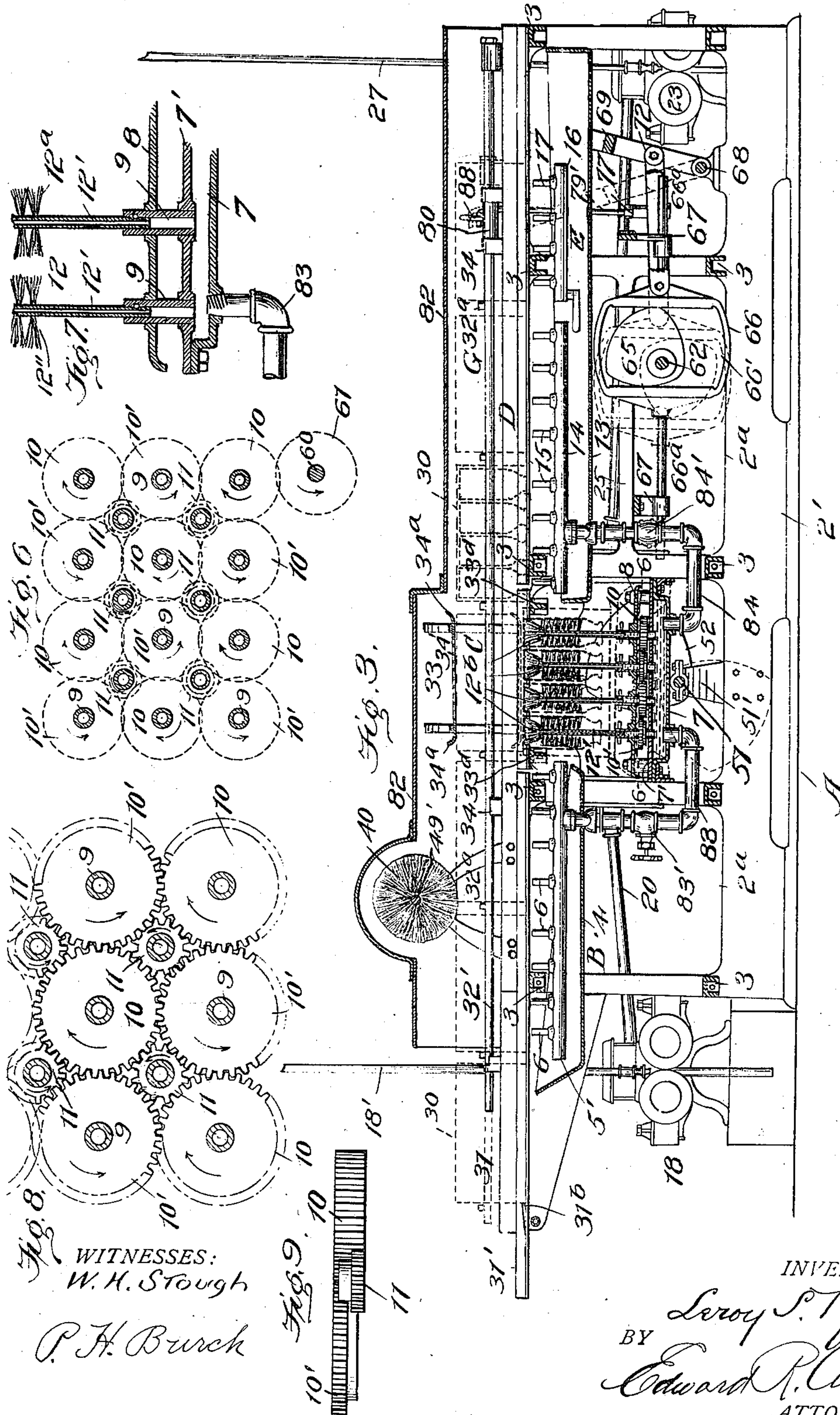
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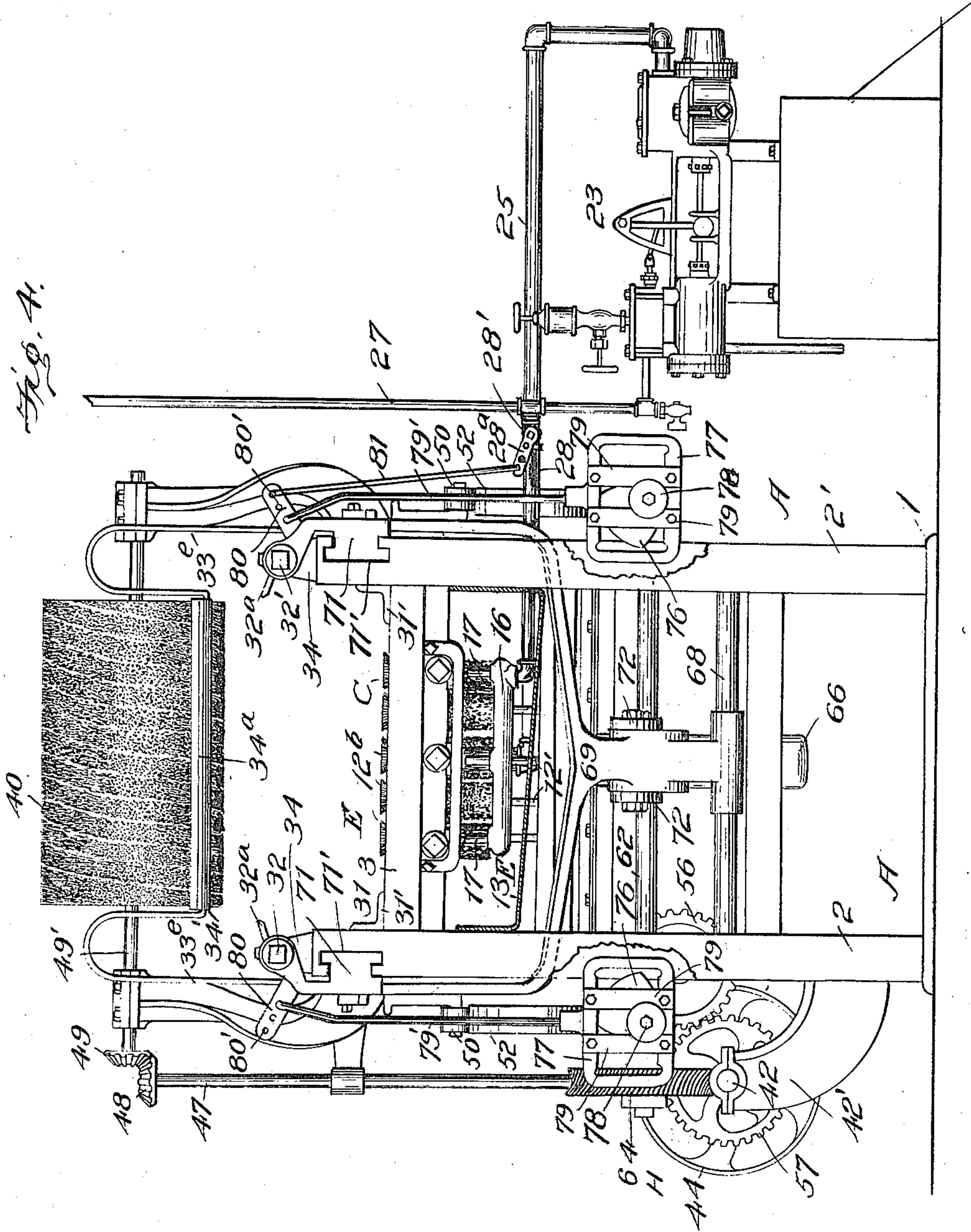


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4 SHEETS—SHEET 4.



WITNESSES:
W. H. Stough
P. H. Burch

INVENTOR.
Leroy S. Pfouts,
BY
Edward R. Alexander,
ATTORNEY.

UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO, ASSIGNOR TO THE MILLER PASTEURIZING MACHINE COMPANY, OF CANTON, OHIO, A CORPORATION OF NEW JERSEY.

MACHINE FOR TREATING BOTTLES.

963,247.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed October 30, 1906. Serial No. 341,364.

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Machine for Treating Bottles, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in machines for washing, cleaning and sterilizing bottles.

It has for its object to provide an apparatus adapted to receive successive charges of a plurality of bottles and to advance each charge step by step, and to perform upon it the various operations of which the machine is capable during the passage of a charge of bottles from the receiving to the delivery end of the machine.

Figure 1 is a side elevation of a mechanism embodying my improvements, parts being omitted to facilitate the illustration. Fig. 1^a is a detail view of a portion of the apparatus showing the driving connections for the main washing mechanism. Fig. 2 is a plan view of the mechanism, certain of the parts being omitted and broken away. Fig. 3 is a section on the line 3—3, Fig. 2. Fig. 4 is an end view looking at the delivery end of the machine. Fig. 5 is a perspective view of a portion of the tray conveyer actuating mechanism. Fig. 6 is a section on the line 6—6, Fig. 3. Fig. 7 is a vertical longitudinal section through a portion of the main washing mechanism. Fig. 8 is an enlarged plan view of some of the driving gears for the main washing mechanism. Fig. 9 is a view in side elevation showing the relationship of some of the said driving gears. Fig. 10 is a perspective view of a bottle tray or carrier.

In the drawings the principal groups of parts of the mechanism as entireties are represented as follows:

A is the main frame of the machine, B the preliminary or initial washing mechanism, C the main washing mechanism, D the rinsing mechanism, E the sterilizing mechanism, F, F' the water-circulating mechanism, G the conveying system for advancing bottles through the machine step by step, and H the power transmitting devices on the machine for effecting the desired coöperation of its various parts.

The main frame A comprises a base 1,

from which extend upward at either side thereof side plates 2, 2' suitably apertured as at 2^a so as to reduce their weight as much as possible. At intervals these side plates are connected by cross bars 3. This frame work may be of any suitable and desired construction.

4 is a horizontally disposed longitudinally arranged water trough or tank preferably secured between the side walls of the frame near the bottle-receiving end thereof and beneath the upper row of cross braces 3.

5 indicates means arranged above the bottom of the trough 4 for injecting into the bottles the water or washing fluid in jets corresponding in number and arrangement to the set or charge of bottles fed to the apparatus. These means preferably consist of a series of horizontal, longitudinally disposed pipes 5' suitably connected together and carrying a plurality of upwardly extending nozzles 6 arranged in rows in the lines of travel of the rows of bottles through the machine, the total number of these nozzles on the series of pipes corresponding to twice the number of bottles to be acted upon by the machine at each successive operation performed upon each charge of bottles, the pipes and nozzles constituting the preliminary or initial washer B.

The main washing mechanism C is arranged adjacent to the rear end of the tank 4. Of this mechanism 7 is a horizontally disposed water tank or head suitably secured in position between the side walls of the main frame and at a distance below the horizontal plane of the fluid injecting means 5. This head 7 has a cover and bearing plate 7' having a plurality of water-discharge passageways through it arranged in rows, each in longitudinal alinement with one of the rows of nozzles heretofore described and the passageways in each row corresponding in number with the number of bottles in each row to be washed or scrubbed at a given time, and in addition to this, said cover plate preferably has a plurality of water-discharge openings arranged so as to be between adjacent rows of bottles and staggered relatively to the bottle positions in said rows.

8 is a bearing plate arranged parallel to the cover 7', spaced therefrom and suitably held rigidly in position. It has extending through it a corresponding number of pas-

sageways to the passageways through the cover 7' and similarly arranged, so that when it is in position each one of the apertures through it is in axial alinement with an aperture through the cover 7' beneath it.

9 are tubular journals or hollow shafts each snugly fitting at its lower end into one of the bearings in the cover 7' and extending upwardly therefrom through the alined bearing in the bearing plate 8. These journals are all geared together as indicated in Figs. 6, 7, 8, and 9 so as to rotate in the directions indicated by the arrows on Fig. 8, in the following manner. The journals 9 are arranged in five longitudinal rows, three of which are in alinement with the lines of travel of certain rows of bottles through the machine and the journals in the other two rows are staggered between the journals of the three rows just described. 10 are gears, one secured to every other journal in each of said first three rows at points beneath the bearing plate 8.

10' are gears with teeth of about half the width of the face of the teeth of the gears 10, and each secured to a journal between journals carrying the gears 10 and in mesh with the latter.

11 are relatively small gear wheels having teeth of substantially the same width of face as the teeth on gears 10' and each secured to one of the journals staggered between the journals in the said three rows and having its teeth lying beneath the top of the adjacent gears 10' and in mesh with the adjacent gears 10.

12 indicates means or devices for engaging with as well as for directing the washing fluid in jets against the surfaces of the bottles. These devices preferably consist of brushes 12'' formed on hollow perforated spindles or tubes 12', the lower end of each one of which is inserted into and detachably secured in one of the journals 9. The bristles 12^a on the brushes are radially disposed for the greater part of the length of the brush proper and at the top is a bunch of vertically disposed bristles 12^b, which are adapted to wash internally the bottom walls of the bottles with which they may contact.

The series of brushes which enter between the bottles serve to scrub and scour the outside of the bottles as they rotate under the action of the brushes which are at work upon them, from within and without. It will be noted that the brushes on the inside and outside of the bottles of the series to be washed at any given time rotate in such way as to cause the rotation of all of the bottles and the consequent thorough cleansing of their exteriors, with the exception of the bottoms.

Extending rearwardly from a point adjacent to the rear end of the main washing mechanism is a horizontal trough or tank 13

longitudinally disposed and arranged beneath the upper row of cross bars 3 preferably in alinement with and similarly supported to the water trough 4.

14 indicates means for injecting the rinsing fluid in jets into the bottles. These means preferably consist of a series of longitudinally disposed pipes supported above the bottom of the trough 13 and each arranged in axial alinement with one of the rows of water-discharge orifices or jets hereinbefore described. The series of pipes 14 carry a plurality of upwardly directed nozzles 15 corresponding in number with the number of nozzles carried by the pipes 5, similarly disposed and adapted to direct rinsing water into the bottles which are introduced into the machine in a charge at any given time.

There are preferably two sets of rinsing means so that each set of cased bottles receives a preliminary and a final rinsing.

Immediately adjacent to the discharge end of the mechanism and above the rear end of the trough 13 is arranged a series of longitudinally disposed pipes 16 suitably connected together for the conducting of fluid from one to the other, each of these pipes being arranged in longitudinal alinement with one of the rows of washing and rinsing nozzles heretofore described and each being provided with a plurality of upwardly directed nozzles 17 corresponding in number to the number of bottles in each row of the series of bottles fed to the machine at any given time, these nozzles being adapted to direct steam for sterilizing purposes into the bottles, just prior to their removal from the machine.

Of the water circulating system F, 18 represents a double acting pump which receives its supply of water from a tank 19 or any other suitable source and its steam from a pipe 18' leading from any suitable source of steam power. 20 is a water conduit from the said pump to the series of pipes 5' of the initial washing mechanism in the trough, the said conduit being provided with a suitable shut-off valve 21 for regulating the flow of water.

Of the water circulating system F', 23 indicates a suitable double acting pump of any desired description receiving its water supply from a tank 24 or any other suitable source. 25 is a conduit for conducting water to the fluid injecting means of the rinsing mechanism. 25' is a suitable shut-off valve for regulating the flow of liquid through said pipe. 27 is a steam supply pipe to the pump 23. The tanks 19 and 24 may be arranged, if desired, below the injecting devices of the washing and rinsing mechanisms. 28 is a steam pipe leading from the said pipe 27 to the nozzle system 16. 28' is a throttle valve in the steam conduit 28.

having an operating lever 28^a. The pumps 18 and 23 are so operated and controlled as to cause jets of water or cleaning fluid to be directed from the nozzles to which the pumps are connected, respectively.

The apparatus herein shown is devised with the idea of having 12 bottles fed to it at each charge and operating upon this number at each step during travel of the charges through the machine. Preferably the bottles are fed to the machine in carriers or trays 30, the bottles being inverted while within the machine and thus held within the trays in any suitable and well known manner.

In Fig. 10 I have, for illustration purposes, shown a bottle tray having suitable side and end walls and a series of longitudinally disposed rods or bars 30' forming a support for the bottoms of the bottles. 30^a is a guide and spacing plate secured within the tray and having recesses or bottle spacing holes 30^b through it arranged in rows which will aline with the rows of nozzles and scrubbing brushes in the machine. 30^c is a detachably mounted bottle retaining plate which may be placed in the tray when it is desired to invert it for passage through the machine. This bottle retainer has a plurality of holes through it arranged in rows and each adapted to receive the neck end of one of the bottles in the tray the walls of each one of these holes engaging with the neck of a bottle to prevent the bottle from dropping down out of the tray. 31 indicates as an entirety a guideway for the bottle carriers or trays. It preferably consists of longitudinally disposed angle bars 31' arranged near either side of the machine and resting upon the cross bars 3 of the frame, each of these angle bars being outwardly flared as indicated at 31^a at the tray or carrier-receiving end of the machine, to facilitate the placing of the bottle tray or carrier in the guideway.

Of the conveying system G for advancing the bottle trays or carriers step by step through the machine, 32, 32' indicate longitudinally disposed reciprocating and oscillating rods or shafts, one arranged at either side of the machine and outside of and above the adjacent carrier or tray guide 31'. These reciprocating and rocking shafts 32, 32' are mounted at intervals in suitable bearings 34 supported by the main frame. 32^a are tray or bottle carrier-engaging lugs or projections rigidly secured to the said reciprocating and rocking shafts, there being a corresponding number of these lugs on each shaft to the number of steps of operation of the mechanism. At points adjacent to either end of the main washing mechanism C the stationary angle guide bars 31' are discontinued and between their adjacent ends is arranged a vertically rising and falling elevator or frame 33. This vertically reciprocating

elevator comprises side-plates 33' carrying at either end slides or cross heads 33^a fitted into and guided by vertically disposed guideways 33^c suitably secured to the adjacent sides of the main frame. 33^d are cross bars suitably connecting the side plates of the said cage together. 33^e are horizontally arranged longitudinally disposed angle guide bar sections, each secured upon said cross bars 33^d, one at either side of the machine and in alinement with the guide bar 31' at that side of the frame. 33^e are suitable uprights arranged at either side of the cage 33 and secured at their lower ends to the side plates 33'. 34' is a case engaging device, preferably comprising a horizontally disposed perforated plate carried by the upper ends of said uprights 33^e. The front and rear edges of this plate are bent upwardly as indicated at 34^a to permit the easy introduction of and discharge of the bottle carrying trays from the said cage.

40 indicates means for washing the external surface of the bottoms of the bottles. These means preferably comprise a horizontally disposed transversely arranged scrubber or revoluble brush arranged in the path of the line of travel of the bottoms of the bottles, adjacent to the point at which they are introduced into the machine and preferably above the preliminary or initial washers A and intermediate their ends. I have found it desirable to have this brush 40 formed with its bristles inserted in spiral fashion, as clearly shown in Figs. 2 and 4. This makes the brush self-cleaning and permits of its being mounted transversely across the frame of the machine and not at an angle to the longitudinal lines of the machine as has been the case with the brushes heretofore employed for a similar purpose but not having their bristles inserted in spiral conformation as here shown.

Power for actuating the various parts of the mechanism above described, so as to cause them to operate in proper sequence, or co-relation, may be secured from any well known source and is preferably applied to the machine through a single driven shaft, from which power is automatically transmitted to the various parts of the mechanism by devices to be hereinafter described, although it will be understood that any means for causing the parts to operate in proper sequence and co-relation may be employed.

Of the power transmitting mechanism H on the machine, 42 indicates a longitudinally disposed driven shaft mounted at one side of the machine in bearings 42', 42', carried by the main frame. 43, 44, are fast and loose pulleys arranged in the well known manner upon the said driven shaft near the front end thereof and adapted to be connected with a suitable source of power. 45 is a bevel gear rigidly secured to the front

end of the shaft 42 and in mesh with a bevel gear 46 rigidly secured to the lower end of a vertically disposed shaft 47 suitably mounted in bearings on the main frame. 48 is a bevel gear rigidly secured to the upper end of the shaft 47 and in mesh with a bevel gear 49 secured to the brush shaft 49'. 50 are anti-friction rollers mounted upon and extending laterally from the vertically rising and falling frame or cage 33 at either side thereof. 51 is a transversely arranged shaft suitably mounted in bearing standards 51', 51' carried by the main frame. 52, 52, are cams rigidly secured to the shaft 51 at either side of the vertically rising and falling elevator 33 and each adapted to have its periphery engage with the periphery of the adjacent anti-friction roller 50 on the said elevator or reciprocating frame. 53 is a worm rigidly secured to the driven shaft 42 at a point directly beneath the transverse shaft 51, and 54 is a worm gear rigidly secured to the said transverse shaft 51 and in mesh with the worm 53. 55 is a shaft arranged parallel to the driven shaft 42 and extending rearward from beneath the rear end of the main washing mechanism C, and suitably mounted in a longitudinal bearing 55' carried by the main frame. 56 is a spur gear rigidly secured to the rear end of said shaft 55 and in mesh with a spur gear 57 rigidly secured to the driven shaft 42. 58 is a bevel pinion rigidly secured to the front end of the said shaft 55, and in mesh with a bevel pinion 59 rigidly secured to a vertically disposed shaft 60, to the upper end of which latter shaft is rigidly secured a spur gear 61 which drives the gearing for operating the brushes 12''. 62 is a horizontally disposed transversely arranged shaft suitably mounted in bearings carried by the main frame and near the rear end of the driven shaft 42. 63 is a worm rigidly secured to the shaft 42 and 64 is a worm gear rigidly secured to the shaft 62 and in mesh with the worm 63. 65 is a cam rigidly secured to the shaft 62. 66 is a cam plate recessed as indicated at 66' to receive the cam 65. This cam plate is supported in position so as to be reciprocated by the cam 65 by means of the longitudinally arranged horizontally disposed rods or shafts 66^a extending from opposite ends of the said plate and each mounted in a bearing plate 67 secured to the main frame. 68 is a transversely arranged horizontally disposed rock shaft suitably mounted in bearings carried by the main frame and in the rear of the shaft 62. 69 is a yoke lever rigidly secured at its lower end to the rock shaft 68. The arms of the yoke extend upwardly and outwardly to points outside of the longitudinal lines of the adjacent sides of the main frame, and each has its upper end connected by a link 70 to a slide 71 secured to the

rear end of the adjacent reciprocating and rocking shaft 32 or 32', and suitably guided in a groove 71' in the adjacent wall of the main frame. 72, 72, are straps or arms connected at their rear ends to the yoke lever 69 intermediate of its ends and at their front ends to the cam plate 66. 73, 73, are longitudinally disposed shafts extending rearwardly from the transverse shaft 62 at either side of the main frame and suitably mounted in bearings carried by the main frame. 74, 74, are bevel gears rigidly secured to the front ends of said shafts 73, 73, respectively, and each in mesh with a bevel gear 75 secured to said transverse shaft 62. At its rear end each of said shafts 73 has secured to it a cam 76 about which is fitted a cam plate 77 which the cam is adapted to reciprocate, this cam plate being held in position by a suitable bolt and washer and the straps 79, 79 secured to the rear end of the cam plate. From each of said cam plates there extends upwardly a rod 79' which, at its upper end, is pivotally connected on a horizontal longitudinally disposed axis to a lever arm 80. This lever arm 80 is slidably fitted at its lower inner end to the squared end of the adjacent rocking and reciprocating shaft 32 or 32' in such manner as to permit endwise movement of the shaft 32 or 32', while causing it to turn or oscillate. This lever 80 is provided with a longitudinal series of holes 80' into which the upper end of the rod 79' may be inserted to adjust or vary the throw of the rock shaft, as desired. On the side of the machine adjacent to the steam pipe 27 the lever 80 is connected by a link 81 to the throttle control lever 28^a. This latter lever also has a longitudinal series of holes through it for regulating and adjusting the operation of the steam throttle valve 28' from the lever 80.

In operation, a tray containing twelve bottles in inverted position is placed upon the guide at the front end of the machine and forced forward until it is in advance of the inclined lugs 31^b at the front end of the angle bar guides. The pumps 18 and 23 are then started into operation, steam being admitted to them through the pipes 18' and 27, respectively. The driving belt is shifted from the loose pulley 43 to the fast pulley 44 on the driven shaft 42 and all of the various actuated parts of the mechanism are thereby connected to the source of power. The shafts 73 rotate the cams 76 and the devices between said cams and the rocking and reciprocating shafts 32, 32', rock said shafts so as to throw upwardly and outwardly the bottle carrier-engaging lugs or projections 32^a on each shaft until they are out of the path of the line of travel of the said bottle carriers. The cam 65 then forces forward the cam plate 66 and with it the yoke lever

69, which, in turn, causes the forward travel of the rods 32, 32'. As soon as they have reached their extreme forward positions, they are both rocked inwardly by the cams 76 and interposed devices, until the pair of carrier-engaging projections 32^a at the front ends of the rods 32, 32' are in front of and ready to engage the bottle carrier 30 which has just been inserted into the machine. The rods 32, 32' then start to move rearwardly causing the bottle carrier with its complement of bottles to be positioned above the first set of washing nozzles or jets 6, and the first step in the travel of the charge or series of bottles through the machine is completed. At this point the pumping mechanism 18 causes streams or jets of water or cleaning solution, of the desired temperature, to be injected into the series or charge of bottles. As soon as this is accomplished the bottle carrier is caused, through the operation of the reciprocating and rocking bars 32, 32', in the manner above described, to travel another step in its course through the machine, and while so doing the bottoms of the bottles are engaged by the bristles of the brush 40 projecting between the rods on the bottom of the tray and are cleansed. At the end of this second step of travel the series of bottles are above the second sets of jets or nozzles of the preliminary or initial washer, and the pump 18 again causes jets of the washing liquid to be forced into the bottles. Each succeeding step of longitudinal travel of a charge of bottles through the machine is effected in the same manner as the one first described and consequently further description of this operation is not necessary. From above the second set of nozzles of the preliminary washers the bottle carrier is moved into the vertically reciprocating cage or elevator 33. As soon as this step of travel has been completed the cams 52 on the shaft 51 permit the elevator to descend, and the weight of the elevator, bottle carrier and bottles forces the bottles downwardly to the main washing mechanism so that the bottles lie over their respective internal cleaning devices 12 and between the external cleaning brushes to engage the exteriors of the bottles as they are rotated under the action of the said devices and brushes upon them, the said devices and brushes being rotated by the mechanism hereinbefore described, and at the same time water is forced by the pumping mechanism 18 through the perforated spindles 12' of the main washing mechanism so as to assist them in the thorough cleansing of the bottle walls. When this is accomplished, cams 52 force the cage, bottle carrier and its complement of bottles upwardly until the bottom of the bottle carrier is in the path of its line of longitudinal travel through the machine. The bottle carrier then travels

rearward above the first set of rinsing devices 15 and the pump and mechanism 23 causes jets or streams of clean water of any desired temperature to be forced into the bottles. The next step is exactly similar to the last one and it is followed by the forced longitudinal travel of the bottle carrier to a point in which the bottles are positioned above the steam jet nozzles 17. As the rock shafts 32, 32' are then caused to rock so as to throw the bottle carrier-engaging projections 32^a outwardly, the lever 80 forces downward the rod 81 opening the valve 28' and permitting steam to rush into and escape through the nozzles 17 into the interior of the bottles, thereby sterilizing them. The bottle trays or carriers may be then removed from the machine in any desired or well known manner

The bottle trays or carriers in which the bottles in inverted position are fed to the machine are the same which are used for conveying the bottles from place to place for the purpose of any desired sort of distribution of them after they have been filled with milk or other liquid. In milk plants in which it is daily necessary to wash a large number of bottles, it is highly essential to the securing of efficient and beneficial results, that the bottles be handled as little as possible. With my apparatus the empties are brought to the washing machine in the trays or carriers in which they have been placed when collected and each of these trays is employed in the advancing of its quota of bottles through the initial washing, main washing, rinsing, and sterilizing sections within the machine.

Trays containing the bottles to be washed are fed to the front end of the machine as rapidly as the step by step operation of the tray-conveyers will admit. A suitable hood or casing 82 may be placed over that portion of the bottle-tray guide from which water or steam is liable to escape upwardly.

The water or cleaning fluid which is injected into the bottles from the hollow brush spindles 12' may be introduced under pressure into the water tank 7 in any suitable manner so as to cause it to rise up through and be ejected from the brush spindles. I have shown means whereby either the fluid from the tank 19 or from the tank 24 may be introduced into the said head or water receptacle 7.

83 is a conduit leading from the conduit 20 to the head or tank 7. It is provided with a suitable valve mechanism 83' which permits the opening or cutting off of the conduit as a means of escape for some of the fluid flowing through the pipe 20, the rest of which rises upward and is ejected from the nozzles 6. 84 is a conduit leading from the pipe or conduit 25 also to the head or tank 7, it being provided with a suitable

valve 84' whereby the flow of fluid through it from the pipe 25 may be permitted or prevented as desired.

With the arrangements of valves and conduits just described it will be seen that the brush spindles may be supplied with cleaning fluid from either or both of the tanks 19 and 24 at will.

It is not absolutely essential to the successful working of my apparatus that the bottles in the trays as they are advanced step by step should come directly above the preliminary nozzles 6 or the rinsing nozzles 15, but it is desirable that they should be directly above the sterilizing nozzles 17, so that the sterilizing fluid will be injected into the mouths of the bottles so as to completely sterilize them.

The water or cleaning fluid collecting in the tank or troughs 4 and 13 may be drawn off or permitted to escape therefrom in any suitable manner.

It will thus be seen that applicant provides a plurality of sets of fluid jet injecting means, one of which sets is arranged in a different horizontal plane from the others of said sets, and that the discharge of fluid from one set of jet injecting means is controlled by the bottle tray or case advancing means.

What I claim is—

1. In a machine of the class described, the combination of a plurality of upwardly directed nozzles arranged in sets in longitudinal alinement with each other, each set being adapted to act upon a charge of bottles to be cleaned, a bottle carrier, a guide for directing the bottle carrier above said successive sets of nozzles, a pair of reciprocating and oscillating rods one arranged at either side of said guideway for the bottle carrier and each provided with a plurality of bottle carrier engaging projections, and means for operating said rods.

2. In an apparatus for treating bottles, the combination of a mechanism for treating bottles in trays, means for supporting a tray of bottles in proper position to be treated by said treating mechanism, and means for advancing to and conveying away from the bottle treating mechanism the tray of bottles, the said advancing and conveying means comprising a reciprocating oscillatable rod provided with a device for engaging the bottle tray.

3. In an apparatus for treating bottles, the combination of a mechanism for treating bottles in trays, means for supporting a tray of bottles in proper position to be treated by said treating mechanism, means for advancing to and conveying away from the bottle treating mechanism the tray of bottles, the said advancing and conveying means comprising a reciprocating oscillatable rod provided with a device for engaging the bottle tray, and connections between the said

advancing and conveying means and the bottle treating mechanism for operating the latter at predetermined intervals.

4. In a bottle treating apparatus, the combination of a plurality of bottle treating mechanisms, means for supporting a tray of bottles and reciprocating oscillatable means for advancing to and conveying away from each of said mechanisms a tray of bottles along said supporting means.

5. In a bottle treating apparatus, the combination of a plurality of bottle treating mechanisms, means for supporting a tray of bottles, reciprocating oscillatable means for advancing to and conveying away from each of said mechanisms a tray of bottles along said supporting means, and connections between the said advancing and conveying means and one of said bottle treating mechanisms for operating the latter at predetermined intervals.

6. In a bottle treating apparatus, the combination of a plurality of bottle treating mechanisms, means for supporting a tray of bottles, and automatic intermittently operated reciprocating oscillatable means for advancing to and conveying away from each of said mechanisms a tray of bottles along said supporting means.

7. In a bottle treating apparatus, the combination of a washing mechanism, a support for trays of bottles, a rod extending parallel to said support and provided with means for engaging a tray of bottles, means for rotating said rod on its axis at intervals to cause said means to engage a tray of bottles, and means for endwise reciprocating said rod to move the tray of bottles along the said support.

8. In a bottle treating apparatus, the combination of a washing mechanism, a support for trays of bottles, a rod extending parallel to said support and provided with a series of devices for engaging trays of bottles, means for rotating said rod on its axis at intervals to cause said devices to engage a plurality of trays of bottles simultaneously, and means for endwise reciprocating said rod to move the trays of bottles along said support simultaneously.

9. In a bottle treating apparatus, the combination of a plurality of sets of bottle treating mechanism, a support for trays of bottles, a rod extending parallel to said support and provided with a series of devices for engaging trays of bottles, and means for automatically and intermittently reciprocating and oscillating said rod to cause the engagement of the said devices with a series of trays of bottles and their movement along said support step by step.

10. In a bottle treating apparatus, the combination of a plurality of sets of bottle treating mechanisms, a support for trays of bottles, a rod extending parallel to said sup-

port and provided with a series of devices for engaging trays of bottles, means for automatically and intermittently reciprocating and oscillating said rod to cause the engagement of the said devices with a series of trays of bottles and their movement along said support step by step, and connections between the rod and one of the said treating mechanisms for operating the latter at predetermined intervals.

11. In a bottle treating apparatus, the combination of a plurality of bottle treating mechanisms, means for supporting a tray of bottles, reciprocating oscillatable means for advancing to and conveying away from,

each of said mechanisms a tray of bottles along said supporting means, connections between the said advancing and conveying means and one of said bottle treating mechanisms for operating the latter at predetermined intervals, and means for adjusting the said connection.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

LEROY S. PFOUTS.

Witnesses:

J. A. JEFFERS,

E. R. ALEXANDER.