W. L. BODMAN.

BOTTLE SOAKING MACHINE.

APPLICATION FILED JUNE 7, 1909.

966,405.

Patented Aug. 2, 1910.

4 SHEETS—SHEET 1.

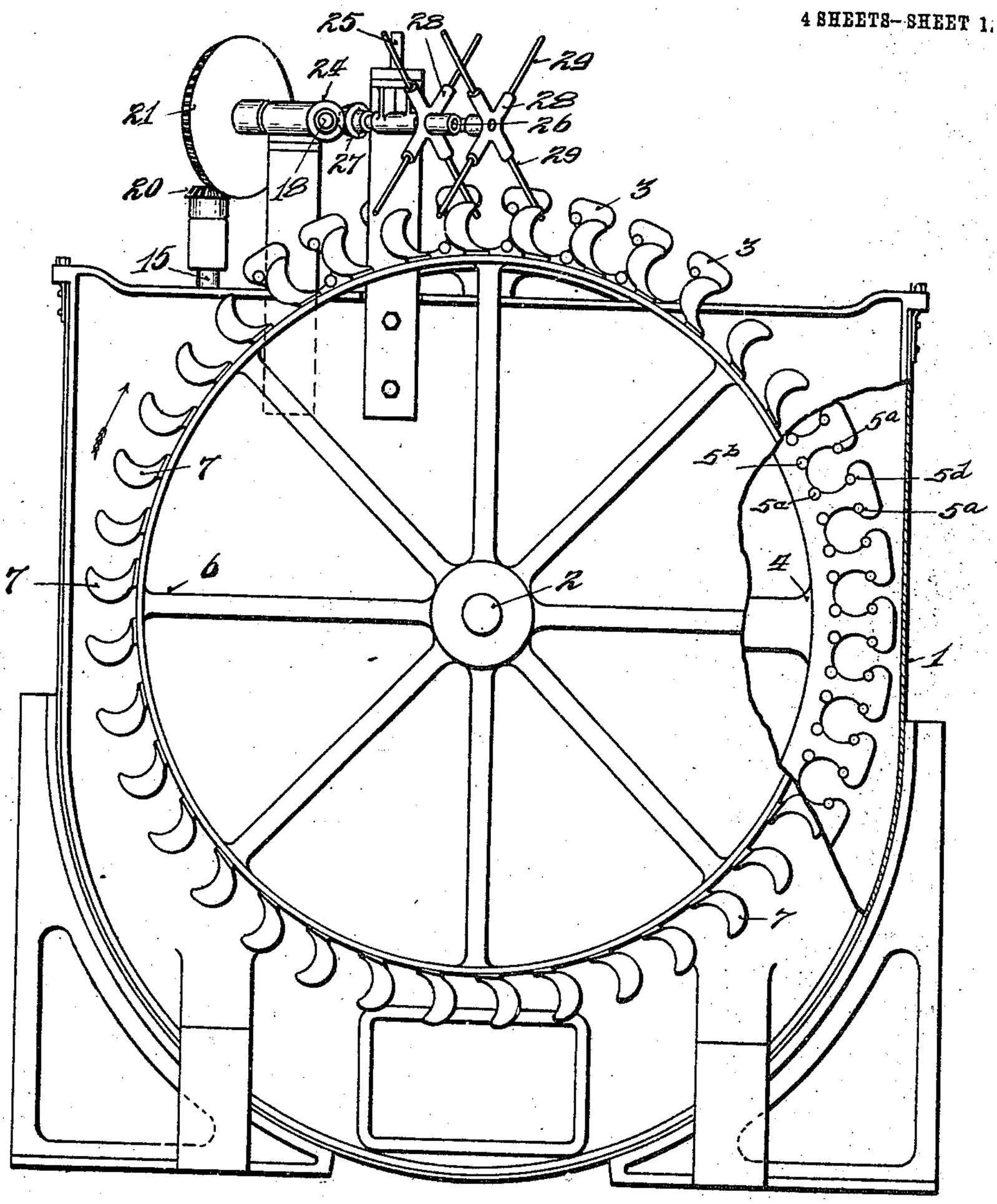

Fig. 1.

Witnesses

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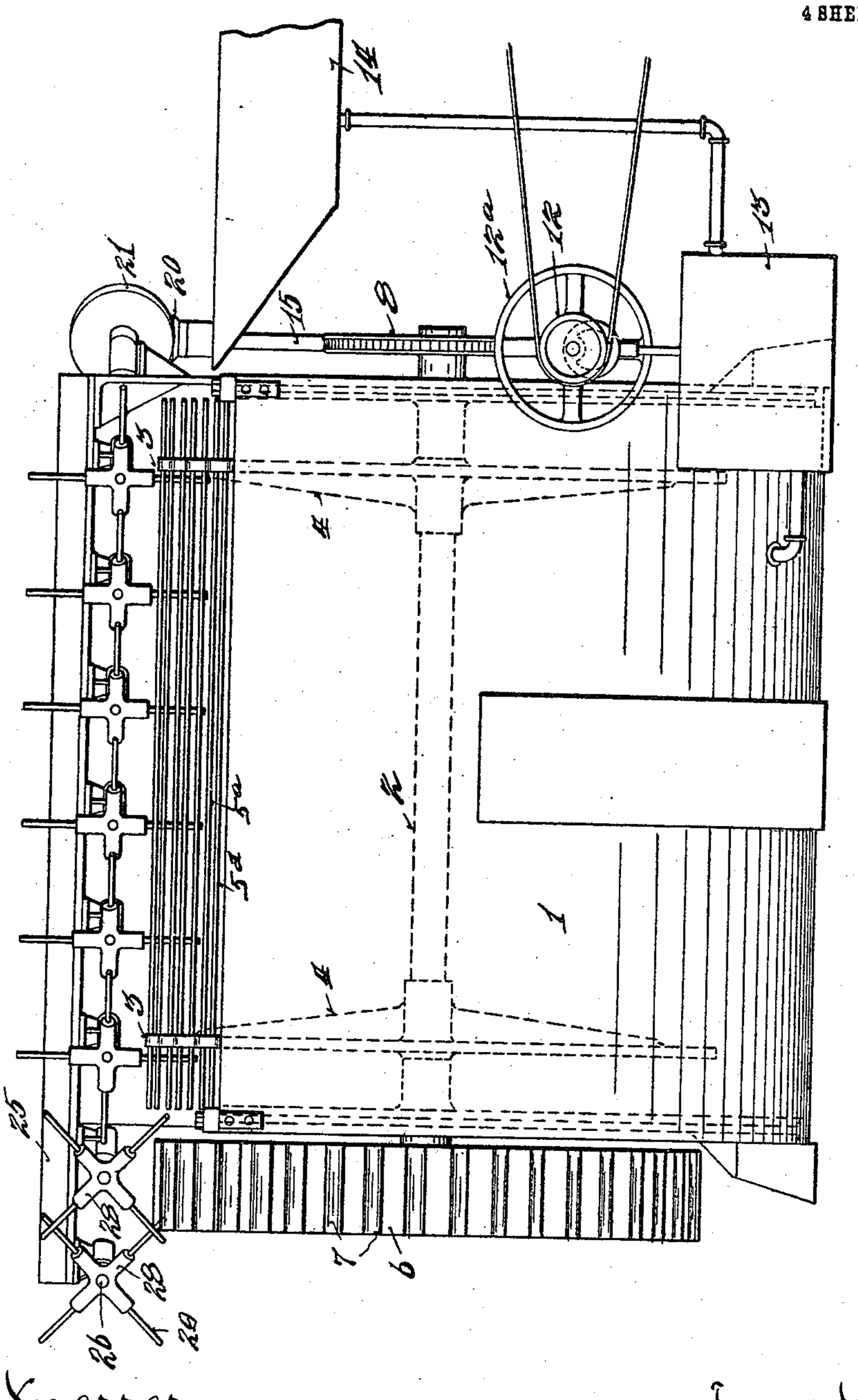

Fig. 2.

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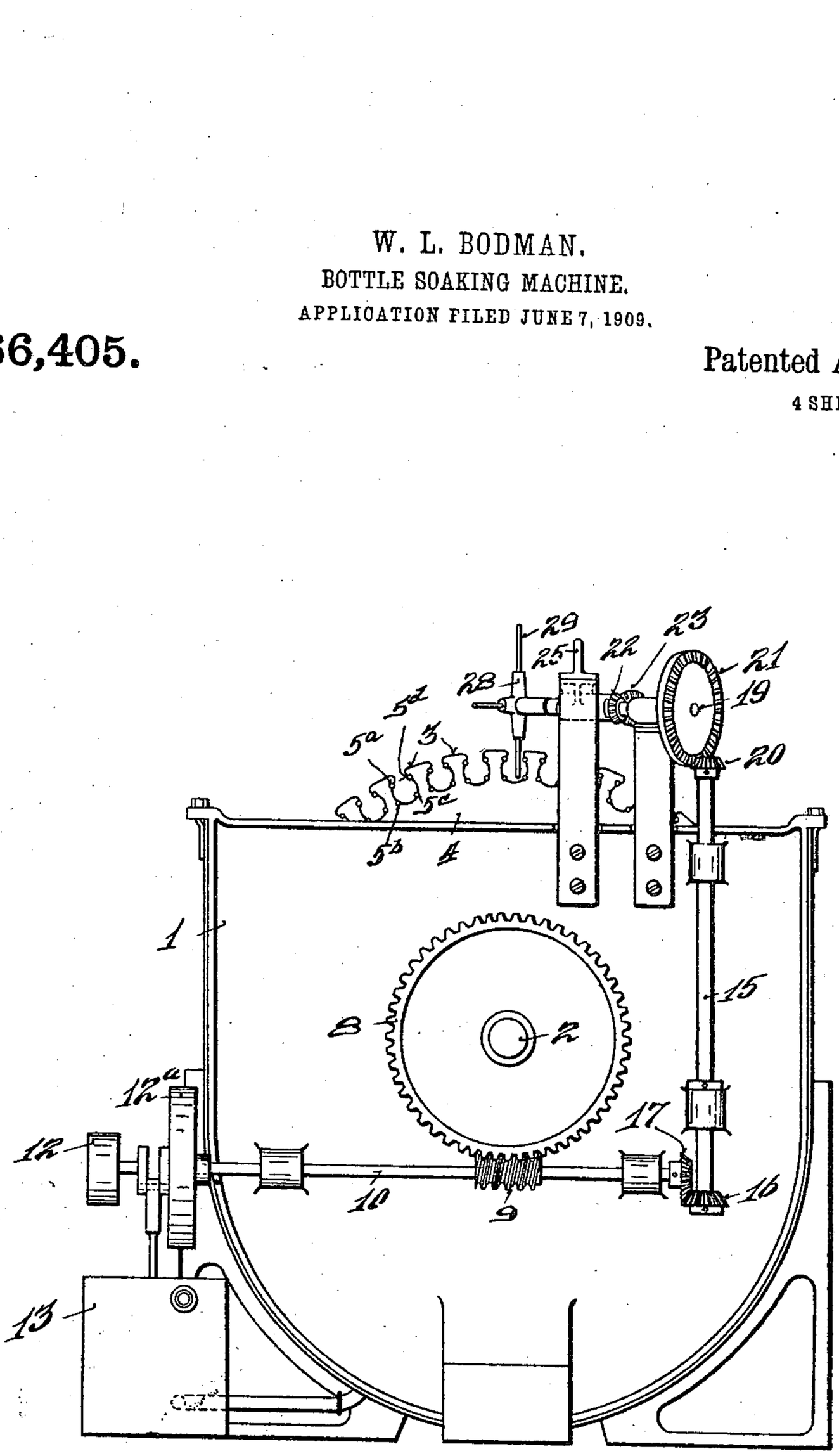

Fig. 3.

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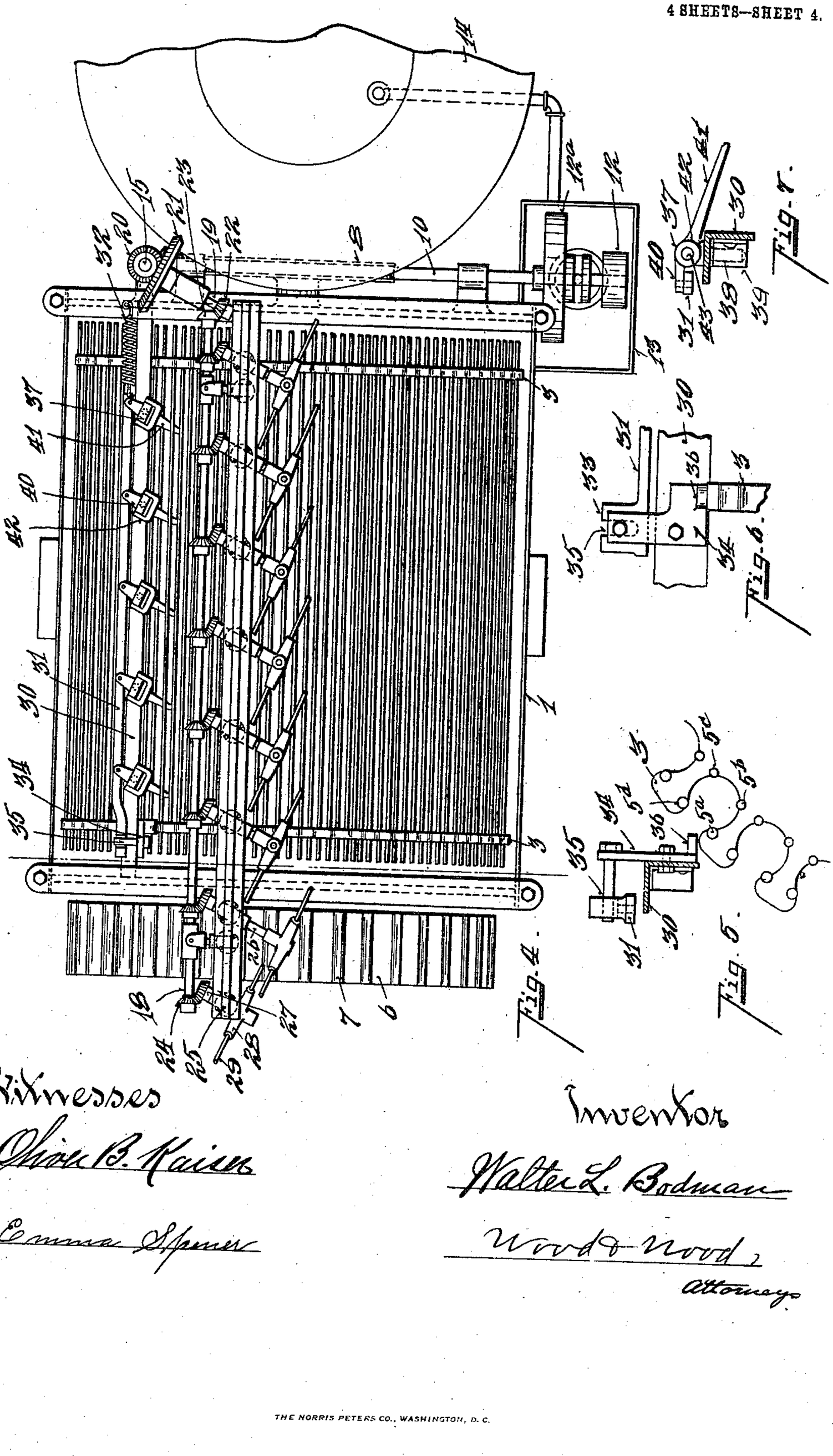

Witnesses

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BOTTLE-SOAKING MACHINE.

966,405. Specification of Letters Patent. Patented Aug. 2, 1910.

Application filed June 7, 1909. Serial No. 500,700.

To all whom it may concern:

Be it known that I, WALTER L. BODMAN, a subject of the Kingdom of Great Britain, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Bottle-Soaking Machines, of which the following is a specification.

My invention relates to a machine which is adapted for soaking bottles preparatory to the washing operation, or for sterilizing bottles, or for other analogous uses, in which it is desirable to subject the bottles to the influence of a fluid, and to feed the bottles through a tank in a manner most effectively exposing the bottles to the fluid.

The general features of this invention are disclosed and claimed in my prior application, filed October 14, 1908, Serial No. 457,697. Certain features disclosed in the prior application, but not claimed therein, such as the bottle feeding wheel, are claimed in this application, for the reason that they are herein shown in their preferred form and in combination with other mechanisms not disclosed in my said first application.

The object of the present invention is to provide a positive and efficient means for horizontally moving the bottles in their supports while they are being revolved in the tank, this mechanism being especially adapted to engage each of a series of bottles lying upon their sides in the holders and move them a step at a time in the direction from the receiving to the discharging end of the tank.

Another object of the invention is to provide means for automatically spacing and alining a series of bottles, supported by one of the holders, so as to insure the engagement of the positive feeding instrumentalities between the adjacent ends of the bottles in a manner preventing breaking or clogging.

Another object of the invention relates to improved means for automatically passing the bottles, one at a time, into the holders formed on the periphery of the wheel within the tank.

The invention comprises other features of improvements which will be more especially pointed out in the specification.

Various other features of this invention are more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is an end elevation of the receiving end of the device. Fig. 2 is a side elevation. Fig. 3 is an end elevation of the discharging end of the device showing the driving mechanism. Fig. 4 is a top plan view. Figs. 5, 6, and 7, show detail views of the instrumentalities for automatically placing the bottles.

1 represents the tank.

2 is a horizontal shaft extending through the tank and mounted upon suitable bearings therein. Upon this shaft 2 are mounted the spider-wheels 4, formed with peripheral lugs 3, which support a series of rods extending parallel with the axis. These rods are arranged in groups of four, 5^a, 5^b, 5^c, 5^d, respectively, each group constituting a longitudinally extended bottle holder, adapted to hold at the same time a series of bottles lying upon their sides, end to end, in a manner permitting the bottles to be shifted endwise from one end to the other of the holder. This endless carrier or wheel is rotated in the tank and the bottles are positively fed endwise through the holders in directions parallel with the axis, so that each bottle moves continuously in the plane of vertical rotation, and in step movements horizontally through the tank. This form of bottle holder offers the least possible resistance to the movement of the wheel through the water and at the same time most efficiently exposes the bottles to contact with the water.

Outside of the tank, at the receiving end, and upon shaft 2, is mounted a feeding wheel 6, having on its periphery a series of curved plates 7, each adapted to support a bottle, and to carry it upward to the point at which the bottle is passed into the holders within the tank, the direction of movement being indicated by the arrow, Fig. 1. Upon the other end of the shaft 2, outside of the tank, and at the discharge end, is fixed a worm wheel 8, driven by the worm 9, on shaft 10, driven by pulley wheel 12.

12^a represents a pulley for transmitting power to the bottle washing machine 14. 13 represents a pump also actuated by the shaft 11 for supplying water to the tank.

This pump also supplies water to a washing machine 14, see Fig. 4, driven in connection with the soaking mechanism, the coacting mechanism of the washing and soaking machines forming the subject-matter of a separate application now under preparation.

The feeding mechanism, not only serves to shift the bottles from plate 7 into the holders 5ª, etc., but it also extends across the tank parallel with the axis of rotation and is arranged to progressively feed the bottles, one at a time, from one end of the tank to the other, in step movements.

15 represents a vertical shaft on the outside of the tank, having a driven connection with the shaft 10, through the engagement of bevel pinions 16, 17.

18 represents a shaft mounted in suitable bearings at the top of the tank and extending parallel with the axis.

19 represents an angularly disposed shaft at the top of the tank, having a driven connection with the shaft 15, through the engagement of the bevel pinion and gear wheels 20, 21. Shaft 19 has a driven connection with shaft 18, through the engagement of bevel pinions 22, 23. Upon shaft 18 is fixed a series of bevel pinions 24.

25 represents a supporting rail extending horizontally across the top of the tank and overhanging the wheel 6.

26 represents a series of stud shafts journaled at intervals upon the support 25, said shafts being angularly inclined relative to the shaft 18, and being driven therefrom by the bevel pinions 27, respectively intermeshed with the bevel pinions 24, on the shaft 18. Upon the outer ends of the shafts 26 are secured the rotary feeding devices 28, each composed of a series of radial spokes 29, the distance between the ends being greater than the length of the longest bottle to be fed. These members 28 rotate in planes disposed at an angle to the plane of rotation of the wheel in the tank, the angle and the relative rotation being such, that the ends of the spokes move into and out of the radial spaces defined by the bottle holding rods 5ª, etc., as the bottle carrier is rotated, so as to fall between the adjacent ends of the bottles supported in a row by a single holder, imparting to each of said bottles a lateral movement from the receiving to the discharging end of the soaker. The two rotating feeding members at the receiving end of the tank operate in like manner in relation to the bottles supported upon the plates 7, so as to feed the bottles to the holders of the carrier in the tank. The rotary feeding members which overhang the tank operate successively upon the bottles in the successive holders, as they are brought, one at a time, by the bottle carrier into the line of action of the spokes 29.

In order to insure such a spacing of the bottles constituting a given row supported by a holder, as will insure the ends of the spokes falling into position between the adjacent ends of the bottles, I provide the following automatic bottle spacing instrumentalities, see Figs. 4, 5, 6 and 7.

30 represents a supporting angle iron across the top of the tank located in front of the feeding devices relative to the direction of rotation of the bottle holders in the tank.

31 represents a longitudinally, reciprocating rod extended across the same and supported in suitable bearings, said rod being held in normal position by the spring 32, connecting one end of the rod with the end of the tank. Upon the other end of the rod 31, is the U-bracket 33.

34 is a bell crank lever fulcrumed on top of the angle iron 30, and having a pin and slot connection 35, with the bracket 33, for longitudinally moving the rod 31. The free end of the bell crank lever 34, has a lug 36, extending in position to be engaged by the peripheral lugs 3, of the bottle carrying wheel in the tank. The spacing devices are duplicates, and the description of one will be sufficient; they each comprise a sleeve 37, having a downwardly extended pintle 38, swiveled in the bearing 39, on the angle iron 30. Each sleeve has a rear extension 40, pivotally connected to the rod 31, this arrangement laterally oscillating the sleeve when the rod 31, is longitudinally reciprocated.

41 represents the spacing finger, having the yoke end 42, connected by bolt 43, to the sleeve 37. By reason of this arrangement, the fingers are positively oscillated laterally and are free to rise and fall vertically, so as to fall into position between the supporting rods 5ª, etc., and in position between the ends of the bottles, thus imparting to them a predetermined lateral shifting which will separate them sufficiently to insure the ends of the spokes 29, traveling between the ends of the bottles. It will be seen that the lugs 3, actuate the bell crank lever 34, reciprocating the rod 31, and laterally oscillating the spacing fingers 41, to automatically space a row of bottles preparatory to the engagement of the rotary bottle feeding members 28.

The bottles are preferably discharged, one at a time, into a receiving mechanism constituting a part of the bottle washing machine, and need not be here described.

Each of the plates 7 is adapted to receive a single bottle and carry it up to the first two of the rotary feeds 28, which act on the successively presented bottles to insert them into the successive bottle holders of the carrier in the tank. When the carrier in the tank has made one complete rotation, each holder will contain a single bottle at the receiving end, which has been shifted along

a step toward the discharging end of the carrier. Upon the second rotation of the carrier, a second bottle will be transmitted into each holder and so on until each holder contains a row of bottles lying upon their sides, end to end, a single holder being adapted to hold a row of six bottles in the mechanism shown in the drawings.

It is obvious that this organization has an immense bottle holding capacity, that it offers little resistance to the water, that each bottle is substantially surrounded by the water when immersed, and that the continuous vertical revolution of the bottles in conjunction with the intermitting lateral movement of the bottles causes each bottle to describe a spiral path through the tank, most efficiently subjecting it to the action of the water or fluid, whether the work is soaking or sterilizing in its nature. Also, the positive feeding of the bottles into the holders and the step-like lateral shifting of the bottles through the holders, without clogging the machine or breaking the bottles, is a feature of the greatest practical value in the commercial utilization of the invention.

Having described my invention, I claim:—

1. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles lying upon their sides, end to end, and a rotatable feeder operating in conjunction with the bottle holders to engage the end of a bottle and move it longitudinally in the direction from the receiving to the discharging end of the tank.

2. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles lying upon their sides, end to end, and a feeder rotatable in a plane inclined to the plane of rotation of the carrier, and adapted to engage the ends of the bottles supported in the holders and to move them a step toward the discharging end of the tank, and means adapted to rotate the said carrier and feeder at relative speeds, for the purposes described.

3. A machine of the class described, comprising a tank, a rotatable bottle carrier, bottle holders thereon, a rotatable feeder having radial members adapted to engage the bottles in the holders and move them endwise, the carrier and feeder being relatively inclined and rotated to cause the radial members to move into and out of the holders, for the purposes described.

4. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles lying upon their sides, end to end, and a series of rotatable feeders each inclined to the axis of the carrier, provided with members to engage into the holders as they are successively presented and to move a line of bottles in step movements toward the discharge end of the tank.

5. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles lying upon their sides, end to end, a wheel on the outside end of the shaft formed with peripheral bottle holders, and a series of rotary feeders adapted to transmit the bottles from the outside holders to the holders on the carrier within the tank and to coöperate with the holders in the tank to shift the bottles in step movements from the receiving to the discharging end of the tank.

6. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles upon their sides, end to end, a series of rotatable feeders adapted to move in and out of the holders and shift the bottles endwise, and means for automatically spacing the bottles in each holder before they are presented to the feeders.

7. A machine of the class described, comprising a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders and each adapted to support a series of bottles upon their sides, end to end, a series of rotatable feeders adapted to move in and out of the holders and shift the bottles endwise, and a series of bottle spacing fingers adapted to be automatically reciprocated laterally by the carrier, and adapted to move vertically whereby the fingers fall into position between the ends of the bottles and space the bottles held by a given holder in advance of the presentation of the bottles to the feeding mechanism.

8. In a machine of the class described, a wheel, having a series of rods on its periphery grouped to form a circumferential series of axially disposed bottle holders, and a rotatable feeder having radial spokes, the said wheel and feeder being relatively inclined and rotated to cause the spokes to move into and out of the spaces between the rods of a holder to engage the end of a bottle and move it endwise horizontally while it is being rotated vertically by the carrier.

9. A machine of the class described, a tank, a rotatable carrier therein, having a circumferential series of axially disposed bottle holders, each adapted to support a series of bottles lying upon their sides, end to end, a series of fingers adapted to fall into position between the ends of the bottles supported by a given holder, and means ac-

tuated by the carrier to automatically shift said fingers laterally for moving the bottles in their holders.

10. In a machine of the class described, the combination of a rotatable member, rods on the periphery thereof grouped to form a series of bottle holders, and a rotatable feeder having spokes adapted to move into and out of the bottle holding channels between the rods.

11. In a machine of the class described, the combination of a rotatable member, rods on the periphery thereof grouped to form a series of bottle holders, a rotatable feeder having spokes adapted to move into and out of the bottle holding channels between the rods, a series of spacing fingers adapted to fall into position between the ends of the bottles of a holder prior to their presentation to the feeder, and means for automatically actuating the fingers to space the bottles.

12. In a machine of the class described, the combination of a shaft and a rotatable member thereon, formed with peripheral bottle holders, a countershaft parallel with the shaft of the rotary member and driven therefrom, a series of stud shafts projecting at an angle from the countershaft and driven therefrom, a rotatable feeder upon each of said inclined shafts having radial spokes, adapted to shift the bottles laterally.

13. In combination with a rotatable carrier and peripheral bottle holders thereon, each adapted to support a series of bottles lying upon their sides end to end, a series of fingers adapted to be automatically shifted laterally in the holders to engage the ends of the bottles and move them along in their holders, and means for moving said fingers into and out of said holders as the carrier is rotated to successively act with relation to the successively presented holders.

14. In a machine of the class described, the combination of a rotatable carrier formed with peripheral bottle holders, and a series of rotatable feeders arranged in a line parallel with the axis of the carrier and acting at an angle thereto, said feeders being adapted to laterally shift the bottles in each holder as it is brought into position.

15. In a machine of the class described, in combination with a rotatable carrier formed with peripheral holders, a series of automatic spacing fingers acting in a line parallel with the axis of the carrier to position the bottles in the holders as they are successively presented, and a series of rotatable feeders acting in a line parallel with the axis of the carrier and adapted to laterally shift the series of bottles in the holders successively brought into position after the spacing operation.

In testimony whereof, I have hereunto set my hand.

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Witnesses:
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