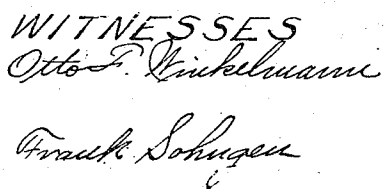


1,017,418.

2 SHEETS—SHEET 1.



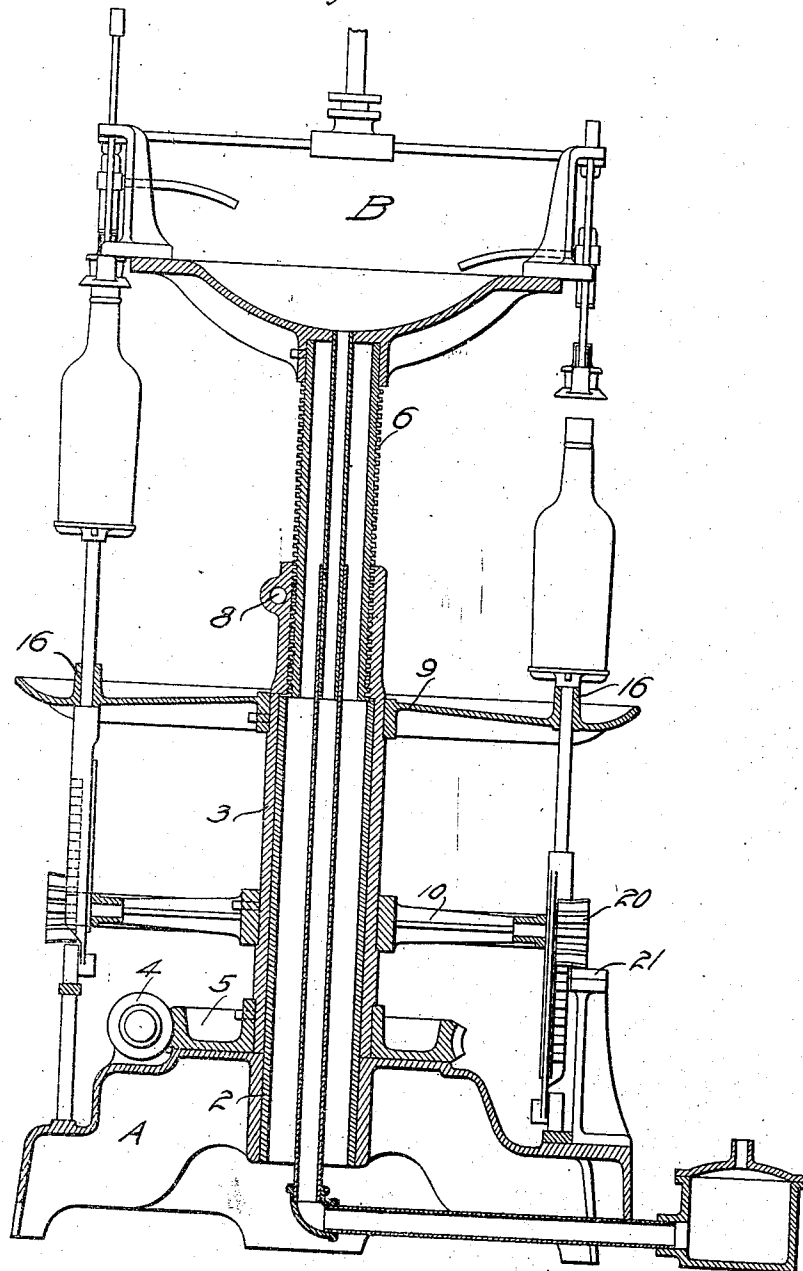
INVENTOR
Karl Kiefer

1,017,418.

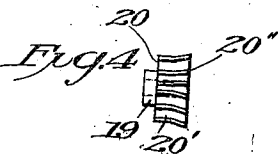
K. KIEFER.
 ROTARY MACHINE.
 APPLICATION FILED APR. 17, 1909.

Patented Feb. 13, 1912.
 2 SHEETS—SHEET 2.

Fig. 3



WITNESSES
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UNITED STATES PATENT OFFICE.

KARL KIEFER, OF CINCINNATI, OHIO.

ROTARY MACHINE.

1,017,418.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed April 17, 1909. Serial No. 490,635.

To all whom it may concern:

Be it known that I, KARL KIEFER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Rotary Machines, of which the following is a specification.

My invention relates to improvements in machinery in which an operating head rotates, carrying a number of operating elements, together with a number of lifting elements presenting the articles to be operated upon, these lifting elements being raised and lowered during such rotation.

The objects of my invention are to save time and avoid friction in the operation of the machine, and to provide adjustments for such a machine making it readily adaptable for operating on articles of different sizes and shapes.

My improvements are especially desirable in the construction and operation of bottle-filling machines.

It is also readily applicable to other machines operating upon the general principles above set forth.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an upright view of a bottle filling machine embodying my improvement, showing, however, for the sake of simplicity, only three bottle tables; Fig. 2 is a horizontal view of one of the bottle tables; and, Fig. 3 shows another vertical view with a partial cross section through some of the parts of the machine. Fig. 4 is a detail view of the composite gear wheel.

Similar letters refer to similar parts throughout the several views.

The filling machine is mounted upon a substantial base A, Fig. 3, rigidly attached to which is a tubular part 2, which serves for a bearing for all the rotating parts of the machine. All the rotating parts are mounted on a heavy cast tubular part 3, that finds its bearing upon tube 2, which tubular part is set in motion by a worm and worm wheel 4 and 5 respectively, the latter rigidly attached to the tubular part 3.

The filling head, by which word I designate the filling apparatus proper and which I will call B, in its rotation is carried by a tubular screw 6 that is held securely by the

upper part of the tube 3, which has been threaded for this purpose. A lock screw 8 will clamp the filling head in any position so as to be rigidly attached to the tube 3 and rotate therewith. Attached to the tube 3 is a table 9 having apertures 16 corresponding in number with the number of filling tubes. Below is another disk-shaped holder 10, also securely fastened on the tube 3, and providing another set of bearings for the bottle table lifters, as will be described later on.

In order to adjust the machine for the different heights of bottles, I screw the filling head more or less into the threaded part of the tube 3. It is necessary, however, that bottles of different sizes, especially different diameters, should be brought centrally below the filling tube of the filling head, and for this purpose the bottle tables, as shown in drawing Fig. 2, have a raised part 11, formed of two straight borders that meet at an angle of about 120 degrees in the direct center line of the filling tubes. Upon this table 2, Fig. 2, dotted circles are drawn 12 and 13, these circles representing different sizes of bottles. If such bottles are pressed against the angle-shaped border 11, their centers will approximately fall in line with the dotted line indicated by #14; which approximately corresponds with the line bisecting the angle formed by the two halves of the border. It is necessary in the filling operation that these bottles should therefore be pressed against this border 11, in order to insure the placing of the bottle in the center line marked 14, this center line leading through all centers of the filling tubes.

In order to also center the bottle radially, it is necessary that when screwing the filling head into the tube 3 by means of the threaded part 6, the filling tube should be stopped and the filling head fastened by means of the lock screw 8, so as to allow for the difference in diameters of the bottles, which will be easily understood from the drawing, Fig. 2. In this figure the two circles in dotted lines represent bottles of different diameters. Should the bottle table be stationary, approximately under the center of the filling tube, the small bottle, indicated by the dotted circle 12, would be somewhat aside of the center, and an accurate working adjustment of the machine would not be possible. To compensate for this, I provide the operating

or filling head B with both vertical and circumferential adjustment. Thus, in the case illustrated, the relative positions of the head B and the bottles, or other articles, to be operated upon, may be varied through the angle represented by the radii 14' and 14'', intersecting at the axis of rotation of the parts of the machine, so that the filling tubes, or other operating elements, in the head B, are stopped over the respective centers of the small bottles. When this adjustment is completed, the head B is locked in its position by means of the screw 8.

The table lifting mechanism is easily visible in Fig. 1. A strong rod 15 carries at its upper end the bottle table, and slides in bearings 16 contained in the table 9. It carries a casting on its lower end, having a rack 17 and a roller 18 at its lowest end. This casting is of elongated slotted formation, and the slot serves as a second guide by receiving the guide roller 19, which forms part of the composite gear wheel 20, journaled on a stud in the holder 10. This gear is composed of a spur part 20' and a bevel part 20''. The spur part 20', which lies next to the guide roller part 19, is in constant mesh with the rack 17 of the casting above described, while the bevel part 20'' periodically meshes with the segmental rack 21, mounted on the base A of the machine. The composite gear is well illustrated in Fig. 4, and the co-action of the parts will be readily understood from the following explanation.

In Fig. 1, gear 20 is in constant mesh with rack 17. Rack 17 is at its lowest point now, and the roller 18 is rolling at its lowest point on a track 22. The segmental rack 21 is of the approximate length of the rack 17, and it is supposed that the operation of the machine, in drawing Fig. 1, is from right to left. The mechanism is in the position of the gear 20 just starting to come into mesh with the segmental rack 21; the action of the mechanism will be that as the gear 20 will rotate counter-clockwise, rack 17 will be moved upward and a bottle will be lifted. The track 22 is in inaction, but as soon as the bottle is at its full height, the roller 18 will find a new section of the track, marked 23, to roll upon, which track will hold the bottle in its upper position during the operation of filling, and until it drops back into its lowest position when coming over the lowest part of the track 22.

By means of my arrangement a great deal of friction that has heretofore been incurred by inclined tracks is avoided, and the table can be lifted very rapidly at any desired angle.

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

1. In a rotary machine of the character described, the combination consisting of a

number of lifting elements rotating around a common center, in combination with a number of gears co-acting to raise the lifting elements, and of a stationary rack operating said gears.

2. In a rotary machine of the character described, the combination consisting of a number of lifting elements, racks attached to said elements, gears meshing with said racks, said lifting elements being movable around a common vertical axis, and of a stationary rack operating said gears.

3. In a rotary machine of the character described, the combination consisting of a frame movable around a vertical axis, a number of lifting elements carried by said frame, a number of gears carried by said frame co-acting to raise the lifting elements, and a stationary rack meshing periodically with the gears.

4. In a rotary machine of the character described, the combination with a filling head, of lifting tables, the filling head being adjustable vertically and circumferentially with relation to the lifting tables, so as to accommodate vessels of different heights and diameters, and means for maintaining the radial positions of the vessels.

5. In a rotary machine of the character described, the combination with a vertically and circumferentially adjustable filling head, of a series of lifting tables to coöperate with said filling head, provided with convergent bottle centering guides to maintain the radial positions of bottles carried by the tables.

6. In a rotary machine of the character described, the combination consisting of a stationary base, a supporting column rotatable thereon, lifting tables carried in a circular series by said supporting column, a filling head with which the lifting tables coöperate, a screw support for said filling head, working up or down in said supporting column, and locking means for said screw support in said supporting column, whereby the filling head is adjusted vertically and circumferentially with relation to said lifting tables, said lifting tables being provided with means for maintaining the radial position of the bottles of different diameters placed thereon.

7. In a rotary machine of the character described, the combination consisting of a stationary base, a supporting column rotatable thereon, lifting elements arranged in circular series, an upper guide carried by said column for each of said elements, lower guides for said elements, and periodically co-acting gear teeth, severally, on said stationary base, on said lifting elements, and on said lower guides, whereby the lifting elements are raised on rotation of the supporting column.

8. In a rotary machine of the character described, the combination consisting of a

segmental rack lying in a horizontal plane, lifting elements with vertical racks arranged in circular series and rotatably carried to pass close to the segmental rack, and pinions carried with the vertical racks, in constant mesh therewith, and adapted to mesh periodically with the segmental rack.

9. In a rotary machine of the character described, the combination consisting of lifting elements, a holder supporting them in circular series for vertical movement thereon, means to rotate the holder, racks on the lifting elements, pinions on the holder meshing with the racks on the lifting elements constantly, and a stationary rack close to the path of rotation of the holder, with which the pinions mesh periodically.

10. In a rotary machine of the character described, the combination consisting of lifting elements, a rotatable holder therefor, slotted guides on the lifting elements whereby they are vertically movable on their holder, racks on the lifting elements parallel to the slotted guides, and pinions on the holder, meshing with the racks, there being intermittent rotation of the pinions during rotation of said holder.

11. In a rotary machine of the character described, the combination consisting of lifting elements, vertical racks thereon, pinions in constant mesh with the racks, a rotatable holder for the lifting elements and their racks and pinions, a stationary rack meshing periodically with the pinions, and a stationary track holding the lifting elements up

during their rotation, except in the region of the stationary rack.

12. In a rotary machine of the character described, the combination consisting of lifting elements, vertical racks thereon, pinions in constant mesh with the racks, rollers on said lifting elements, a rotatable holder for the lifting elements and their racks, pinions, and rollers, a stationary rack meshing periodically with said pinions, and a stationary track upon which the rollers travel, except in the region of the stationary rack.

13. In a rotary machine of the character described, lifting mechanism comprising the combination of an integrally formed rack and slotted guide, and a pinion having a plain guiding roller within the slot of the guide, a spur part meshing with the rack, and a bevel part beyond the rack, and a segmental rack to mesh with the bevel part of the pinion.

14. In a rotary machine of the character described, as a part of lifting mechanism thereof, a segmental bevel rack mounted stationarily, and a pinion having a bevel part, carried around to mesh periodically with said bevel rack.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

KARL KIEFER.

Witnesses:

E. E. FINCH,
G. W. WERDEN.