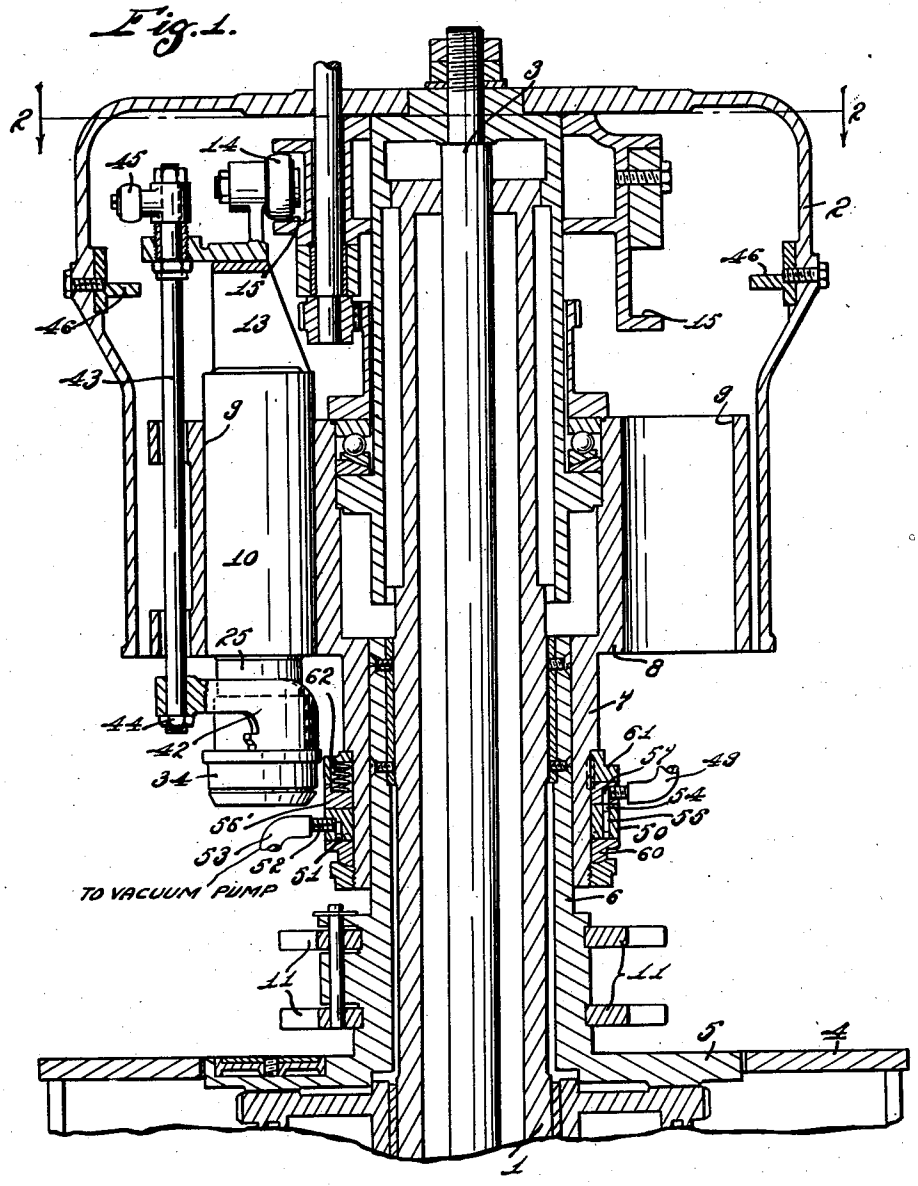
June 19, 1945. J. KANTOR 2,378,640

APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

Filed Jan. 5, 1940 6 Sheets-Sheet 1

Fig. 1.



INVENTOR.
James Kantor,

BY
Wood & Hahn.
ATTORNEYS.

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APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

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Fig. 2.

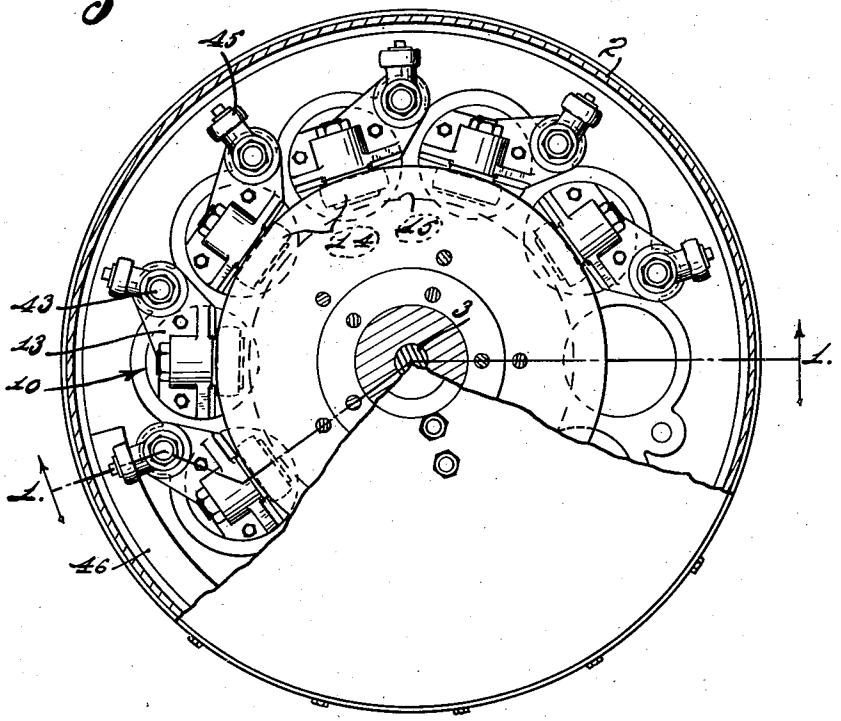
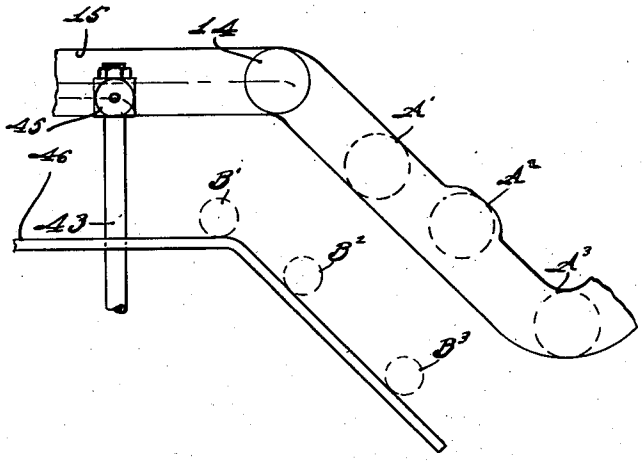


Fig. 6.



INVENTOR.
James Kantor,

BY

Wood & Dalton.
ATTORNEYS.

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APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

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Fig. 5

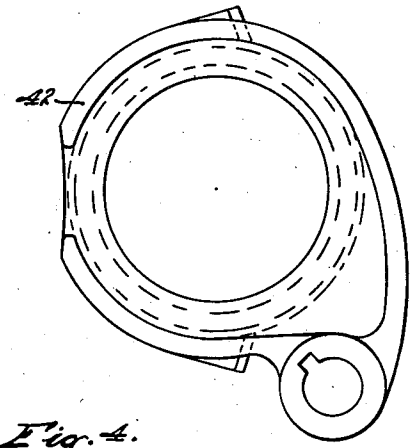


Fig. 4.

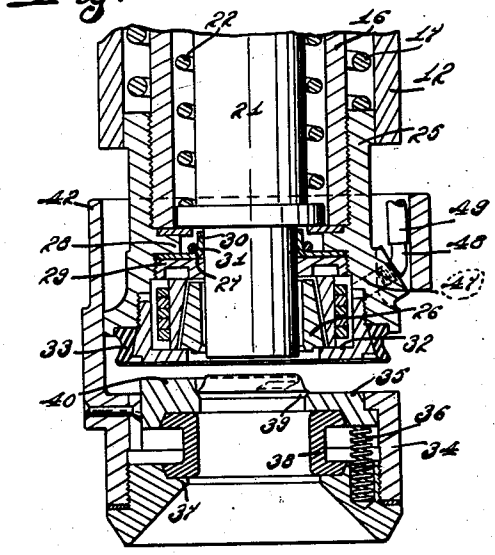
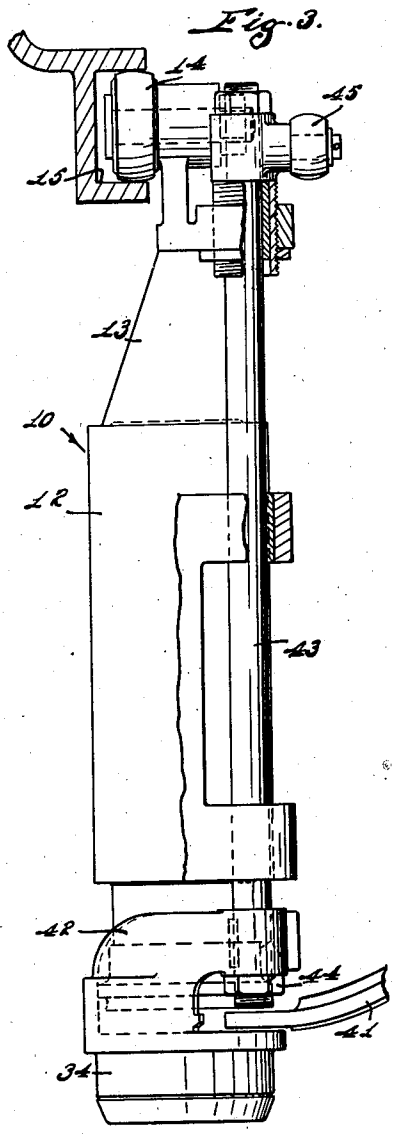


Fig. 3.



INVENTOR.
James Kantor,

BY

Wood & Hahn.
ATTORNEYS.

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APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

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Fig. 7.

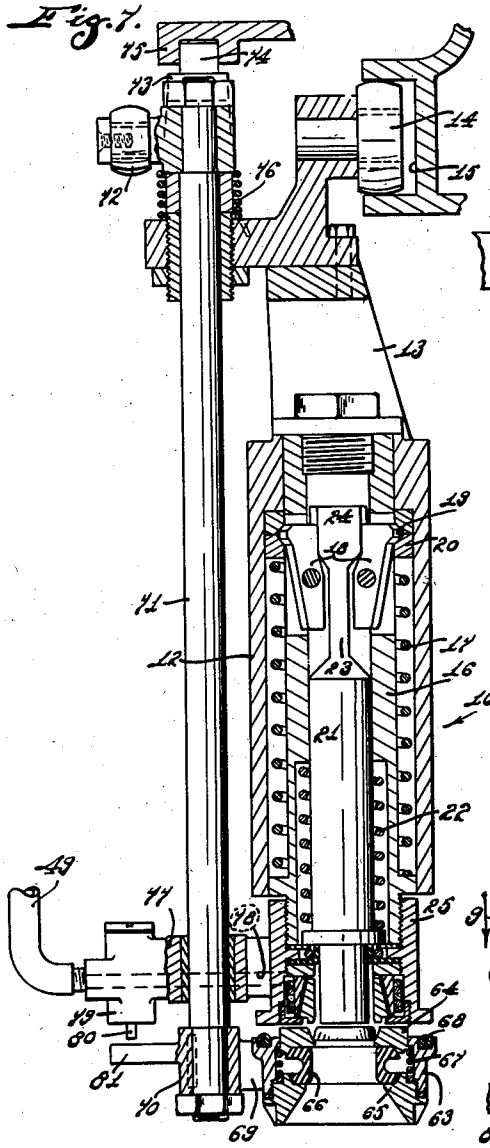


Fig. 9.

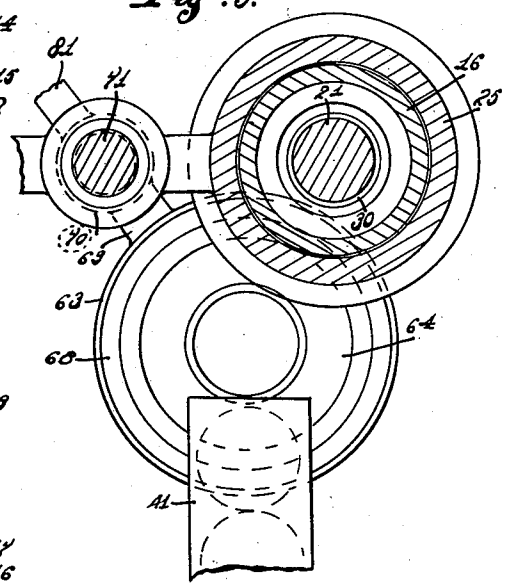
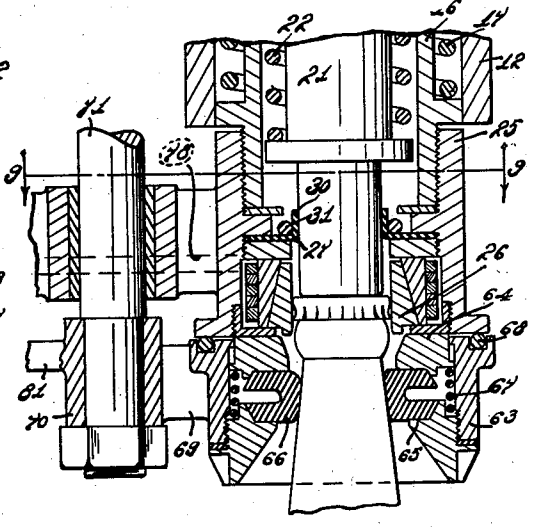


Fig. 8.



INVENTOR.

James Kantor,

BY

Wood & Hahn.

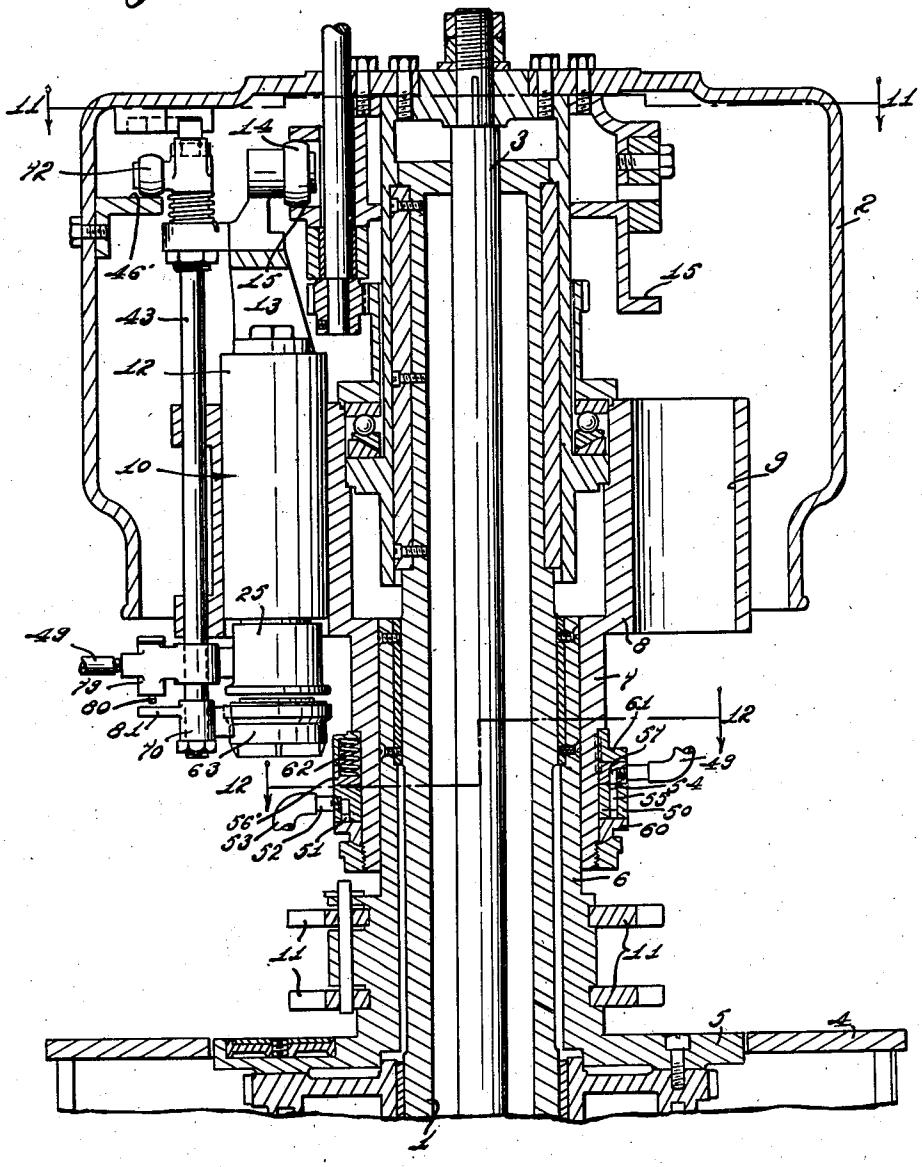
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APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

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Fig. 10.



INVENTOR.
James Kantor,
BY
Wood & Hahn.
ATTORNEYS.

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APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

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Fig. 11.

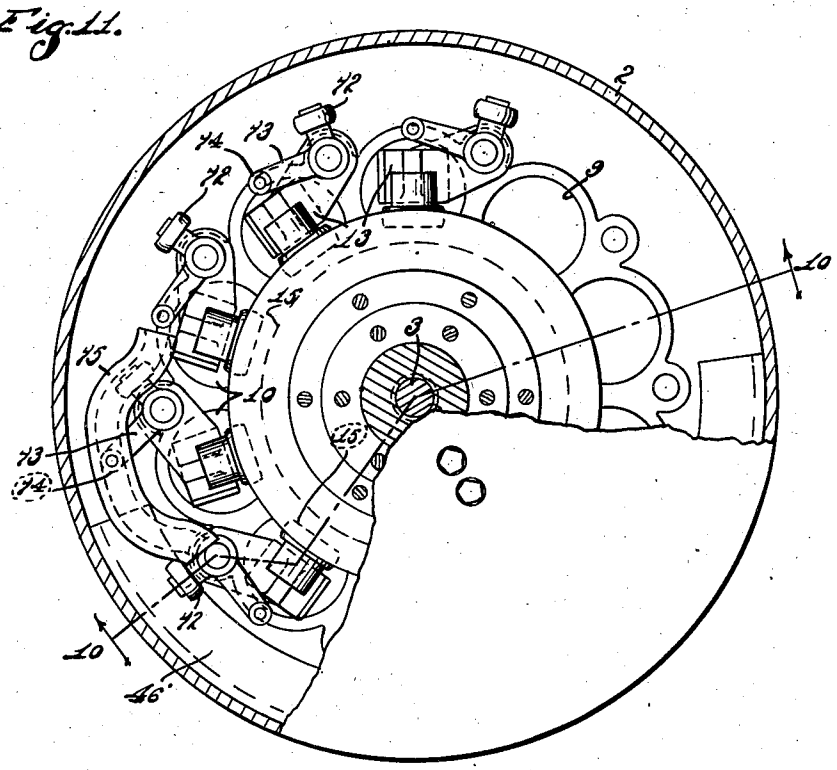
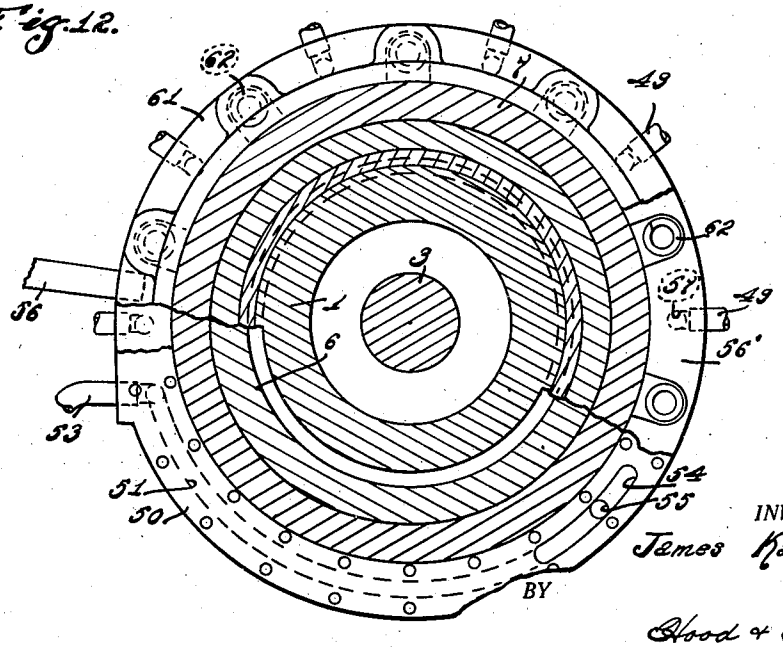


Fig. 12.



INVENTOR.
James Kantor,
BY
Hood & Hahn.
ATTORNEYS.

Patented June 19, 1945 2,378,640

UNITED STATES PATENT OFFICE

2,378,640

APPARATUS FOR CROWNING CONTAINERS UNDER VACUUM

James Kantor, Chicago, Ill., assignor to The Liquid Carbonic Corporation, Chicago, Ill., a corporation of Delaware

Application January 5, 1940, Serial No. 312,487

15 Claims. (Cl. 226—82)

The present invention relates to improvements in apparatus for applying crowns or caps to filled containers.

In the bottling of beverages, and the expression "bottling" is used to include other containers than actual bottles, after the bottle has had the contents delivered thereto, there is a small space between the top of the contents and the mouth of the bottle. Experience has shown that the small amount of air contained in this space, after the cap has been applied and sealed to the mouth of the bottle, has a deteriorating effect on the beverage contained in the bottle. This is particularly so in conneection with beer and other carbonated beverages. Even this small amount of air in a bottle of beer has a tendency, after a period, to affect the taste of beer and also affect the color thereof.

It is one of the objects of my invention to provide means in a crown-applying apparatus, whereby immediately prior to the sealing of the crown or cap on the bottle mouth, this small amount of air in the neck of the bottle may be exhausted.

It is a further object of my invention to provide means for establishing, during the crowning operation, a hermetically sealed chamber which encloses the mouth of the bottle and its associated cap, whereby immediately before the sealing of the cap on the bottle mouth, a vacuum may be produced around the bottle mouth for the purpose of exhausting such air as is contained in the bottle neck above the contents of the bottle.

For the purpose of disclosing my invention, I have illustrated certain embodiments thereof in the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of so much of a crowning apparatus as is necessary for the disclosure of my invention, this section being taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a sectional view of the apparatus illustrated in Fig. 1, taken on the line 2—2 of Fig. 1;

Fig. 3 is an elevation of one of the crown heads of the crowning apparatus;

Fig. 4 is a longitudinal sectional view of the lower part of the crowning head, with its accompanying crown throat;

Fig. 5 is a plan view of the crown support illustrated in Figs. 3 and 4;

Fig. 6 is a developed view of the cam tracks controlling the operation of the crowning heads and crown support;

Fig. 7 is a longitudinal sectional view showing a crowning head, like that illustrated in Figs. 3 and 4 with a modified crown support;

Fig. 8 is an enlarged detail section showing the crown support of Fig. 7 in its sealed position;

Fig. 9 is a sectional view on the line 9—9 of Fig. 8, showing the crown support swung into crown-receiving position;

Fig. 10 is a longitudinal sectional view, similar to Fig. 1, showing, however, the location of the crown support swinging cam, this figure being taken on the line 10—10 of Fig. 11;

Fig. 11 is a transverse sectional view taken on the line 11 of Fig. 10; and

Fig. 12 is a detail section of the vacuum controlling valve shown in Figs. 1 and 10, and taken on the line 12—12 of Fig. 10.

In the machine illustrated, a preferably hollow center post 1 extends upwardly from the base supporting mechanism (not shown) and carries, in addition to the rotating parts of the crowner, the stationary housing 2 which surrounds the upper part of the crowning heads. This housing 2 is clamped and secured in place through the medium of the clamping rod 3 which extends centrally of the post 1. This post 1 projects through an opening in an operating table 4, also supported on the base which table has an opening therein to accommodate the rotating bottle-receiving support 5. This bottle support 5 rotates with the crowning heads and to this end, I provide a rotating cylinder 6 having the support 5 at its lower end and carrying the hub 7. This hub, in effect, is a part of the cylinder 6, and comprises a part of the spindle 8. The spindle has formed therein a plurality of cylindrical guides 9, one for each of the crowning heads 10 so that as the spindle rotates, the crowning heads will rotate therewith. The bottle, when it moves on the table 5 is positioned between the fingers of a pair of vertically spaced star wheels 11 which thereby position the bottle or other container beneath a crowning head 10.

In commercial practice, I preferably provide ten crowning heads for one machine but inasmuch as the heads are all of the same construction it is only necessary to describe the specific construction of one of said heads.

Each of the heads comprises a cylindrical housing 12 supported from a top yoke 13 having at its upper end, a roller 14 adapted to travel in a stationarily mounted track 15. This track is so developed that, as the head 10 rotates, the roller 14, operating in the track will cause the head and its associated parts to reciprocate, thereby moving the head downwardly toward a bottle which may

be located beneath the same for performing the necessary crowning operations. In Fig. 1, it is apparent that the track 15 on the lefthand side of the figure is such as to have raised the head 10 to the uppermost limit of its stroke, while at the righthand side of the figure, the track 15 will have moved the crown head 10 to the lowermost limit of its stroke and to the point where the application and crimping of the crown on the container has been completed.

This housing 12 has reciprocably mounted therein a hollow stem 16 which is biased downwardly by a coiled spring 17. During a portion of its movement, the stem 16 is locked to the housing 12 by a pair of dogs 18 pivoted in slots in the walls of the cylinder 16 and adapted to engage in a V-shaped slot 19 formed in the annular rings 20 against which the upper end of the spring 17 bears.

A plunger 21 is arranged within the cylinder 16 which plunger is biased toward its lower position by a coiled spring 22. This plunger, at its upper end, is provided with a reduced neck 23 and a wedge-shaped head 24 normally fitting between the dogs 18 to maintain the same spread into the notch 19, thereby locking the parts so that during the initial downward movement of the housing 12, all of the parts will move together. When, however, the lower end of the plunger comes in contact with a crown on the mouth of a container, the movement of the plunger 21 will stop, permitting the cylinder 16 in the housing 12 to continue to descend until the wedge 24 has moved from between the dogs 18. This releases the dogs and disconnects the cylinder 16 from the housing 12, permitting the housing 12 to continue on its downward movement while the cylinder 16 may remain stationary.

The lower end of this cylinder 16 supports a crowning throat 25. This throat is provided with a suitable crown crimper 26 and to hermetically seal the upper portion of this throat, I provide a sealing washer 27 gripped between a flange 28 and a ring 29. This washer has an upturned portion 30 held in sealing engagement with the lower end of the plunger 21 by a clamping ring 31 in the form of a coiled spring having its ends connected to form a circular clamp. This arrangement permits the plunger to move relatively to the throat and, at the same time hermetically seals the upper portion of the throat. The lower end of the throat 25 has an annular projecting portion 32 which is surrounded by a rubber sealing ring or gasket 33.

Supported below the crowning throat is a crown support 34 within which is vertically movably mounted a crown rest 35. This crown rest is biased in its projected position by suitable coiled springs 36 between the crown rest and an annular flange 37. On the crown support, I mount a rubber ring 38 substantially U-shape in cross section, which, as the crown rest 35 moves downwardly, is compressed vertically and horizontally expanded. The crown rest 35 is adapted to receive and support a crown thereon for application to the mouth of the container to be crowned and throughout a portion of its periphery and surrounding the opening 39 over which the crown is supported, is provided with an annular flange or crown stop 40. In its normal position, the crown support is sufficiently spaced vertically from the crown thoat to permit the insertion therebetween of the end of a crown chute 41 which delivers a crown to a position immediately above the opening 30 and on to the crown rest 35. With the crown chute 41 vertically and horizontally stationary and the crown rest rotating past the same and being vertically stationary at this moment a crown is deposited on the rest. After the crown has been deposited in position and with the crown support held vertically stationary and the crowning throat moving downwardly, the portion 32 of the throat will engage the crown stop 40 forcing the crown rest 35 downwardly, thus expanding the ring 38 into gripping and sealing engagement with the bottle neck to thereby hermetically seal the junction between the neck and the crown rest. The sealing ring 33 engages the top portion of the crown support 34 effectually hermetically sealing the junction between the crown support and the crowning throat, thus providing a chamber enclosing the top of the container to be filled, which chamber is hermetically sealed.

The crown support 34 is supported from a bracket 42 extending upwardly and surrounding the throat 25 and receiving the lower end of a supporting rod 43. This rod is provided with a key for locking the support and rod against relative rotation and with a supporting nut 44 at its lower end, on which the bracket 42 rests. At its upper end, it carries a roller 45 adapted during a predetermined portion of the rotation of the crowning head, to engage a cam 46 carried on the interior of the housing 2. This cam is so developed that, at a predetermined point during the rotation and downward movement of the head 10, it will engage the roller 45, thereby preventing further downward movement of the support 34, although, due to the relationship between the cam 46 and the cam track 15, the crown head 10 will continue in its downward movement after the support 34 has come to rest.

Thus, by the above construction, after a container has been positioned beneath the crowning head and on the table 5, the crowning head, together with the crown support, is lowered, causing the neck of the container to be crowned to project through the throat of the crown support. At this point, during the downward movement of the crowning head 10, the support 34 comes to rest. The crowning throat 25, however, continues to descend, causing the projecting portion 32 to engage with the top surface of the crown rest 35 forcing the crown rest downwardly and squeezing the ring 38 about the neck of the bottle. At the same time, sealing ring 33 engages the top surface of the crown support 34, sealing the joint between the support 34 and the throat 25, thereby establishing a hermetically sealed chamber surrounding the mouth of the container to be sealed. Immediately prior to the final seating and crimping of the cap on the mouth of the bottle, a vacuum is drawn in this chamber, thus exhausting from the neck of the bottle, any air which may be in the neck of the bottle above the contents of the bottle or container. This vacuum is maintained during the continued downward movement of the throat 25. The exhaustion of air from the neck of the container takes place immediately prior to the engagement of the cap by the plunger 21, so that for a short period, the cap is only loosely resting upon the mouth of the bottle. By the time the plunger 21 has engaged the cap to firmly seat the same thereon, the air has been exhausted from the neck of the bottle and during the continued downward movement of the throat for the purpose of crimping the cap or crown on the mouth of the bottle, the throat 25 also moves downwardly, the ring 38 maintaining the seal around

the neck of the bottle but sliding on the neck of the bottle.

In Fig. 6, I have illustrated a development of the cam tracks 15 and 46 showing the relationship between the positions of the rollers 14 and 45. The horizontal spacing between the rollers 45 and 14 of course remains constant. Therefore, at the point A' in the travel on the dip of the cam track 15, the track 46 is so positioned that the roller 45 will engage the track 46 at a point B' whereby the vertical distance between the rollers 14 and 45 will be modified to the extent that the support 34 will have been moved into sealing engagement with the sealing ring 33, thus establishing the hermetically sealed chamber within which the neck of the bottle is positioned. From this point until the point A^3 has been reached for the roller 14 and the point B^3 has been reached for the roller 45, the two rollers will travel together so that the parts 34 and 33 remain in sealed condition. It will be noted that the upper run of the track 15 at the point A^2 has a slight upward bend so that at this point, there will be no continued downward movement of the roller 14, thus giving a slight pause in the vertical movement of the roller 14 and the head. During this slight vertical pause, the vacuum is drawn in the sealed chamber surrounding the neck of the container. By the time the roller 14 has reached the point A^3 and the roller 45 has reached the point B^3, the vacuum has been drawn and the sealing of the crown on the container completed. The roller 14 then, of course, commences to move in the upward bend of the track 15. The crown throat and the associated ring 33 will therefore be vertically separated from the support 34 permitting the parts to move to their normal position, as illustrated in Fig. 4 and by the time this separation of the parts has taken place, the entire head, with the crown support, will be moved upwardly for the bottle to be removed from crowning position. Thus, for a short period, the crown support 34 will be held stationary to effect the sealing of the joint between the support 34 and the bottom of the throat 25. After this has been effected and the vacuum drawn to exhaust the air from the neck of the bottle or container, the support 34 and throat 25 will continue to move down together while the crown and mouth of the bottle pass upwardly through the crimper mechanism 26. During this crimping operation, the vacuum is maintained so that there would be no danger of air passing back into the neck of the bottle, although at this period, the crown is fairly well seated on the mouth of the bottle through the medium of the plunger 21.

For drawing the vacuum in the sealed chamber surrounding the mouth of the bottle, I provide in the throat 25 an inlet port 47 which leads to the interior of the crimper supporting chamber and is connected with a nipple 48. This nipple has connected thereto a flexible conduit 49 leading to the valve controlling the connection of the chamber with a means for pulling a vacuum.

The valve is carried by the rotating spindle 7 and on this spindle, I provide a ring 50, having on its under face a groove or channel 51, which extends partially around the ring and at one point is connected through a suitable port with the nipple 52 connected by suitable conduit 53 with a vacuum pump. This ring 50 is provided, on its upper face, with a short annular groove 54 above one end of the groove 51 and is connected with the groove 51 by vertically drilled openings 55. The ring 50 is held against rotation by any suitable means, as by a holding rod 56 extending and connected to the housing 2 in any suitable manner and cooperating with this ring 50, I provide a valve ring 56' which is keyed to and rotates with the hub 7. This valve ring is provided with a plurality of ports 57, one for each of the heads, which ports are connected by the flexible conduits 49 to their respective crown heads. The rings 50 and 56' are held in tight sliding engagement between a bottom ring 60 mounted on the hub 7 and a top ring 61 keyed and mounted on the hub 7, coiled springs 62 being interposed between the top ring 61 and the ring 56' for maintaining the ring 56' in close engagement with the ring 50. The top groove 54 in the ring 50 is so positioned in the ring that it is in such timed relationship to the cam track 14 and the cam 46 that the port 57 is placed in communication with its hermetically sealed chamber of the crowning head immediately after the sealing engagement of the support 34 with the sealing ring 33 and this communication is maintained until the crown or cap is crimped on the bottle mouth.

In Figs. 7, 8, 9, 10, and 11, I have shown a modification of the crown support 34 wherein the crown support is adapted to be swung outwardly away from beneath the crowning head during the application of a crown to the crown rest and then swings beneath the crowning head immediately prior to the descent of the crowning head toward the bottle. With the exception of the construction and mounting of the crown support, the remaining parts of the machine are the same and I, therefore, illustrate certain details of the construction of the vacuum controlling valve and the crowning head of the structure illustrated in Figs. 1 to 6 in these latter figures, in order to avoid duplication of figures.

In Figs. 7 to 11, I have illustrated a structure wherein the crown support and rest are swingable in a horizontal plane from beneath the crown throat for the purpose of receiving on the crown rest a bottle cap or crown. In these figures, the crowning throat and the operating mechanism thereof is the same as that illustrated in Figs. 1 to 6 inclusive, and description thereof need not be repeated. The crown support illustrated more particularly in Figs. 7, 8 and 9 comprises the annular supporting ring or member 63 which has arranged therein a vertically movable crown rest 64 and between this crown rest and a flange 65 in the throat of the ring 63, I arrange a sealing ring 66 similar to the sealing ring illustrated in Fig. 5 and compressed vertically in the same manner for causing the ring to grip about the neck of a container. The rest 64 is biased in its projected position by means of a single coiled spring 67. The top surface of the support 63 is grooved and receives therein a rubber sealing ring 68 which, when the support 63 is held vertically stationary, during the downward movement of the crowner 10 makes sealing engagement with the bottom face of the crown throat 25.

This crown support 63 is provided with a laterally projecting bracket 69 receiving through a boss 70 thereof the supporting rod 71 which rod supports the crown support 63 in a manner similar to the rod 43. The upper end of the rod 71 is provided with a roller 72 corresponding in function to the roller 45 of the structure illustrated in Fig. 3 and in addition thereto is provided with an angularly extending arm 73 carrying a roller 74 on

a vertically disposed pin. This roller, during a portion of the rotation of the crowning head 10 engages in a cam track 75 secured on the under side of the housing 2, as illustrated in Fig. 10, and by this engagement with this track 75, the lever or crank arm 73 imparts a turning movement to the rod 71, thereby swinging the crown supports 63 outwardly from beneath the crowning head and into position to receive a crown from the crown chute 41, as illustrated in Fig. 9. Bearing in mind that the crowning heads 10 rotate in a counter-clockwise direction, by reference to Fig. 11, it will be apparent that the track 75 is at the intake part of the travel of the crowning head, so that the crown support 63 is swung outwardly into position to receive a cap or crown prior to the time when the crowning head commences to descend for the purpose of crimping the crown. Therefore, by the time the crowning head has reached the descending portion of the cam track 15, the crown support 63 will have swung back into a position beneath the crowning throat 25 and the roller 72 will be in a position to operate in cooperation with its cam track 46' in the same manner that the roller 45 operates in connection with its cam track 46 to hold the crown support 63 stationary for a sufficient period to permit the crown throat 25 to make sealing engagement with the sealing ring 68, thereby establishing a hermetically sealed chamber surrounding the mouth of the container. Thereafter, the crown support 63 descends with the crown throat 25 in the same manner as has been described with respect to the crown support 34 and the crown throat 25.

To insure the support 63 remaining in position beneath the throat 25, after it has swung back from receiving the bottle cap or crown, I provide a torsion spring 76, one end of which is secured to the bracket for carrying the roller 14 and the other end of which is connected to the bracket carrying the roller 72. This spring is placed under tension when the crown support swings outwardly for receiving the crown cap and thus assists in maintaining the support beneath the crown throat when the support is released from the cam bracket 75.

In the structure illustrated in Fig. 7, the inlet to the chamber enclosing the crimper mechanism is slightly different from that illustrated in Fig. 4. In this structure, the valve stem 77 extends laterally from the throat 25 and is provided with a port 78 corresponding to the port 47. This port is connected by the flexible pipe or conduit 49 with the vacuum timing ring 56', as in the structure illustrated in Fig. 1, but the bracket is provided with an additional valve 79, the stem 80 of which is adapted to be contacted by a lip 81 on the boss 70 for opening the valve in timed relationship to the closing of the chamber surrounding the mouth of the bottle. The operation of this structure, so far as the application of a crown thereto, is substantially the same as that of the structure illustrated in Figs. 1 to 6. As the throat 25 and support 63 descend, initially the bottle is projected through the ring 66. At this point, the downward movement of the support 63 is stopped. The continued downward movement of the throat 25 first moves downwardly, the crown rest 64, and with it, of course, the crown supported thereon, thereby squeezing the ring 66 tightly about the bottle neck. The continued downward movement of the throat 25 causes the bottom of the throat to engage the sealing ring 68, thus hermetically sealing the chamber enclosing the bottle mouth and crown. At this point, the valve 79 is opened, thereby establishing a vacuum in this sealed chamber and exhausting the air from the neck of the container or bottle. From this point on, the support 63 and throat 25 move downwardly in unison causing the cap to be engaged by the plunger 21 to firmly seat the same on the mouth of the bottle or container and eventually projecting the bottle through the crimper for the purpose of crimping the cap around the neck of the bottle and sealing the same.

I claim as my invention:

1. The combination with a crowning head having a crown throat and crimper means arranged in said throat, a crown plunger adapted to be projected through said throat and a crown support having a crown rest and separable from said throat to permit the deposit of a crown on said rest, of sealing means in said throat surrounding said plunger to seal said throat against the escape of air, means for sealing a container neck in said support below said crown rest, means for sealing a junction between said support and head after a crown has been deposited on said rest to provide a sealed chamber enclosing the top of the container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is in position on said rest.

2. The combination with a crowning head having a crown throat and crimper means arranged in said throat and a crown support having a crown rest and separable from said throat to permit the deposit of a crown on said rest, of means for sealing the top portion of said throat, a sealing ring in said crown support compressible about a container neck after the same has been projected through said support, means for sealing the junction between said support and head after a crown has been deposited on said rest to provide a sealed chamber enclosing the top of the container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is in position on said rest.

3. The combination with a crowning head having a crown throat and crimper means arranged in said throat and a crown support having a crown rest and separable from said throat to permit the deposit of a crown on said rest, of means for sealing the top portion of said throat, a sealing ring arranged in said crown support below said crown rest and adapted to sealingly engage the neck of a container when the same is projected through said support, means for sealing the junction between said support and head after the crown has been deposited on said rest to provide a sealed chamber enclosing the top of the container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is in position on said rest.

4. The combination with a crowning head having a crown throat and crimper means arranged in said throat and a crown support vertically movable relatively to said head, a crown rest vertically movable in said support, a sealing ring in said support beneath said crown rest and compressible by the vertical movement of said rest about the neck of a container projected through said support, means for sealing the junction between said support and said head after a crown has been deposited on said crown rest to provide a sealed chamber enclosing the top of the container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is in position on said rest.

5. The combination with a crowning head having a throat member and crimper means arranged in said throat member, and a crown support member having a crown rest therein and separable from said throat member to receive a crown on said rest, a sealing ring on one of said members for engaging with the other of said members for sealing the joint between said members when the members are moved together, means for moving said support relatively to said throat to effect a sealing engagement between said ring and other member after the deposit of a crown on said rest and to provide a sealed chamber embracing the neck of the container, and means for drawing a vacuum in said chamber while said chamber is sealed and a crown is supported on said rest.

6. The combination with a crowning head having a crown throat and crimper means arranged within said throat and a crown support having a crown rest and separable from said throat to receive a crown on said rest, of a sealing ring carried by said throat and engageable with said support for sealing the joint between said support and throat when the same are moved together, means for sealing the upper part of said throat while permitting the operation of said crimper means, means for sealing a container neck in said support, means for moving said support and throat into sealing engagement after a crown has been deposited on said rest to provide a sealed chamber for the top of a container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is supported on said rest.

7. The combination with a crowning head having a crown throat and crimper means arranged in said throat, of a crown support, a crown rest vertically movable in said support, said support being separable from said throat to receive a crown on said rest, a sealing ring in said support moved to make sealing engagement with the neck of a container by a vertical movement of said crown rest in said support, means for sealing the upper portion of said throat while permitting the operation of said crimper means, means for sealingly connecting said throat and support after a crown has been deposited on said rest to provide a sealed chamber for the top of the container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is supported on said rest.

8. The combination with a crowning head having a crown throat member and crimper means arranged in said throat member and a crown support member having a crown rest and separable from said throat to receive a crown on said rest, said crown rest being vertically movable in said support, means for sealing the upper portion of said throat while permitting the operation of said crimper means, a sealing ring on one of said members for engagement with the other of said members to seal the joint between the same, a sealing ring carried in said support and movable into sealing engagement with the neck of a container by the vertical movement of the crown rest to provide a sealed chamber for the top of a container, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is supported on said rest.

9. The combination with a crowning head having a crown throat and crimper means arranged in said throat and a crown support having a crown rest vertically movable in said support, said support being separable from the throat to receive a crown on said rest, means for sealing the upper end of said throat while permitting the operation of said crimper means, a sealing ring carried by said throat for engagement with the support to seal the junction between the two and a sealing ring carried by said support movable into sealing engagement with a container neck by the vertical movement of said crown rest, means for moving said support into sealed engagement with said throat after the deposit of a crown on said rest, and means for creating a vacuum about the neck of a container while said sealing junction has been effected and a crown is supported on said rest.

10. The combination with a crowning head member having a crown throat and crimper means arranged in said throat and a crown support separable from said throat and having a crown rest vertically movable therein, of means for sealing the upper part of said crown throat while permitting the operation of said crimper means, a sealing ring on one of said members engageable with the other of said members for sealing the joint between said members, a sealing ring carried in said support and movable into sealing engagement by the vertical movement of said crown rest, said crown rest being vertically movable by engagement with said crown throat whereby a sealed chamber enclosing the neck of a container is provided, and means for creating a vacuum in said chamber while said chamber is sealed and a crown is supported on said rest.

11. The combination with a crowning head adapted for reciprocating movement, a cylindrical plunger reciprocable with and relatively to said head and having a crown throat at its lower end and crimper means carried in said throat, a crown plunger arranged within said cylindical head and adapted to project through said throat and reciprocate with and relatively to said throat, of a sealing ring carried by said cylindrical plunger at its lower end and embracing said crown plunger, a crown support having a crown rest and reciprocable relatively to said head and into sealing engagement with the lower end of said head, and means in said support adapted to make sealing engagement with the neck of the container to be crowned.

12. The combination with a crowning head adapted for reciprocating movement, a cylindrical plunger reciprocable with and relatively to said head and having a crown throat at its lower end, and crimper means carried in said throat, a crown plunger arranged within said cylindrical head and adapted to project through said throat and reciprocable relatively to and with said throat, of a sealing ring carried by said cylindrical plunger at its lower end and embracing said crown plunger, a crown support having a crown rest and reciprocable relatively to said head and having means for making sealing engagement with the lower end of said crown throat, a crown rest reciprocable in said support and a sealing ring in said support adapted to embrace the neck of a container to be crowned and forced into sealing engagement therewith by the reciprocable movement of said crown rest in said support.

13. In combination, a reciprocating crowning head, a crown throat and crimper means arranged in said throat carried by said head, a crown support having a crown rest carried by said head and reciprocable with and relative to said throat, said support and rest being separable from said throat to receive a crown on said rest and having an aperture therethrough to receive

the neck of a container, means for delivering a crown to said support on said rest when the same is separated from the throat, means for moving said throat and support downwardly to project a container neck through said aperture and continuing the downward movement of said throat while said support is held stationary to seal the junction between said support and throat and provide a sealed chamber embracing the container neck with a crown resting on the container neck and continuing said downward movement of the throat to crimp the crown on said neck, and means for drawing a vacuum in said chamber while said chamber is sealed and before and during the crimping of a crown.

14. In combination, a reciprocating crowning head, a crown throat and crimping means arranged in said throat carried by said head, a crown support reciprocable with and relative to said throat, a crown rest carried by said support and reciprocable relatively to said support, said support and rest being separable from said throat to receive a crown on said rest and having an aperture therethrough to receive the neck of a container, means for delivering a crown to said support on said rest when the support is separated from said throat, means for moving said throat and support downwardly to project the container neck into said aperture and continuing said downward movement while said support is held stationary to seal the junction between said support and throat and move the crown rest relatively to said support to seal the neck of the container and provide a sealed chamber embracing the container neck with the crown resting on the container neck and continuing said downward movement of the throat to crimp the crown, and means for drawing a vacuum in said chamber while said chamber is sealed and before and during the crimping of a crown.

15. The combination with a crowning head having a crown throat and crimper means arranged in said throat and a crown support having an aperture therein adapted to receive and embrace the neck of a container, of a crown rest at the top of said aperture, said support and throat being separable to permit the deposit of a crown on said rest, means for sealing the top of said throat, means for sealing said aperture about a bottle neck below said crown rest, means for sealing the junction between said support and head after a crown has been deposited on said rest to provide a sealed chamber enclosing the top of the container, and means for creating a vacuum in said chamber while the same is sealed and a crown is in position on said rest.

JAMES KANTOR.