No. 662,085. Patented Nov. 20, 1900.

F. L. NICHOLS.

FILLER TIP.

(Application filed Mar. 14, 1900.

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

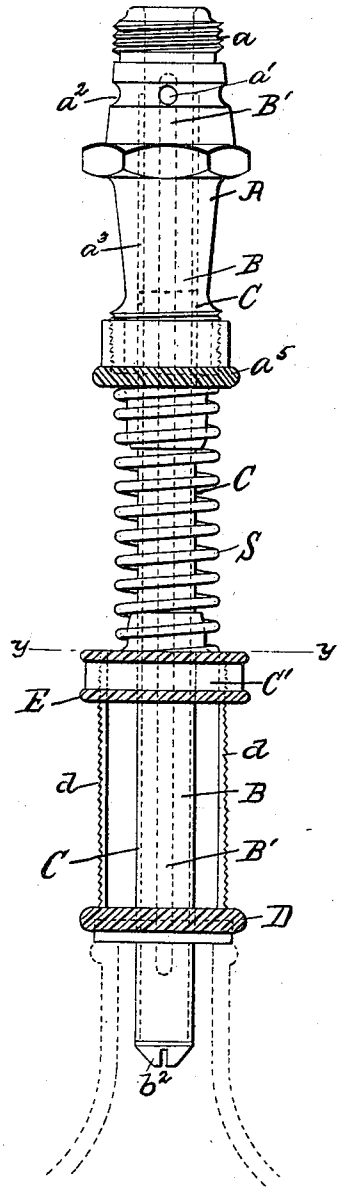


Fig. 3.

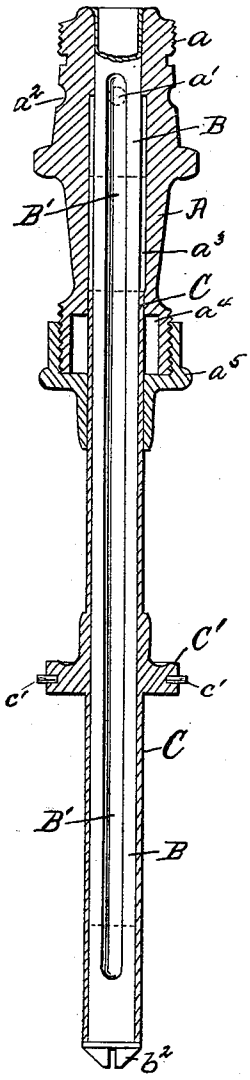
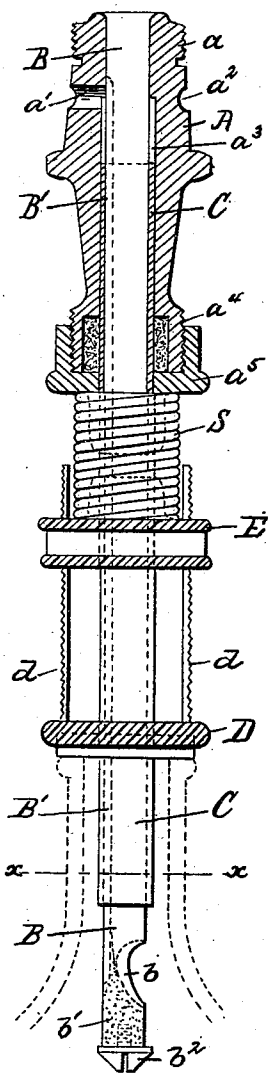


Fig. 2.



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ATTY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 5.

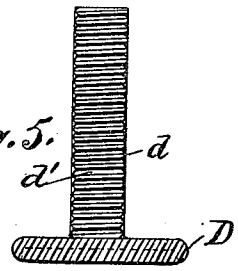


Fig. 4.

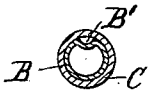


Fig. 6.

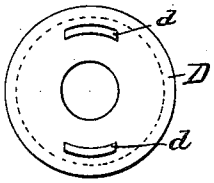


Fig. 8.

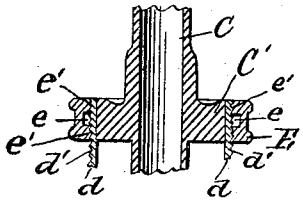


Fig. 7.

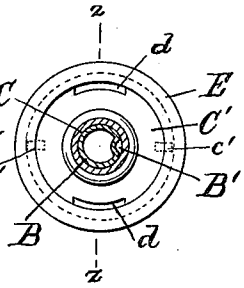


Fig. 9.

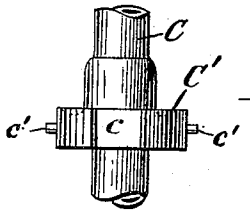


Fig. 10.

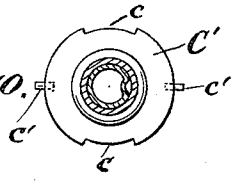


Fig. 11.

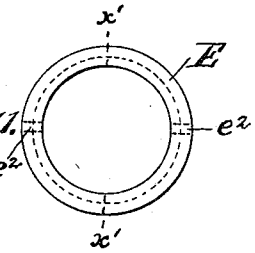
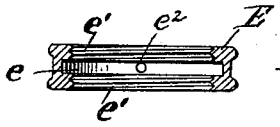


Fig. 12.



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UNITED STATES PATENT OFFICE.

FRANK LIBERTY NICHOLS, OF NEW YORK, N. Y., ASSIGNOR TO THE NEW IDEAS MACHINE COMPANY, OF WEST VIRGINIA.

FILLER-TIP.

SPECIFICATION forming part of Letters Patent No. 662,085, dated November 20, 1900.

Application filed March 14, 1900. Serial No. 8,645. (No model.)

To all whom it may concern:

Be it known that I, FRANK LIBERTY NICHOLS, a citizen of the United States, and a resident of New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Filler-Tips, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

My invention relates to a filler-tip for bottle-filling machines in which said tips, severally having communication with a liquid-reservoir, are usually mounted in a gang on a cross-head which has reciprocatory movement in ways toward and from a table on which the bottles to be filled are supported and arranged in a bank to be severally entered at their mouths by a filler-tip of the gang thereof in a movement of the cross-head toward said table, and the filler-tip to which my invention particularly relates is one in which the filler-tube adapted to enter the bottle-neck extends from and has communication with the liquid-reservoir through a plug seated in the reservoir-wall and in which the liquid-discharge aperture of said tube and the outlet of air through its adjunctive air-vent are governed by a spring-controlled sleeve-valve mounted and having reciprocatory play on said tube and in which the said sleeve-valve is thrown to open said tube-discharge and air-vent by the impingement of the bottle-mouth against a sealing-flange carried by said sleeve-valve, thereby throwing said valve against the stress of its controlling-spring.

My invention comprises the combination, in a filler-tip with a plug to seat in and communicate with a liquid-reservoir, of a filler-tube seated in and through and extending below said plug and provided at or near its lower end with a discharge-aperture and having an inwardly-depressed corrugation on the exterior face of its wall, extending longitudinally thereof from near its said lower end to and communicating with an outlet in said plug, and a sleeve-valve concentrically mounted on and having reciprocatory play longitudinally of said tube to govern the discharge-aperture and the end of said depressed corrugation in said lower end of said tube, whereby an air-vent is constituted on the filler-tube in connection with the sleeve-valve, which is economically formed, which tends to structurally strengthen said tube and which has a minimum of encroachment upon the area of the bore of said tube, so that the possible maximum of flow of liquid through said tube is approximated; also, in the combination, in a filler-tip with a filler-tube having a discharge-aperture at or near its lower end and an inwardly-depressed corrugation on the exterior face of its wall, extending longitudinally thereof from near its opposite ends, and a sleeve-valve concentrically mounted on and having reciprocatory play longitudinally of said tube to govern the discharge-aperture and the lower end of said longitudinal depressed corrugation constituting an air-vent on said tube, of a plug having a threaded top for connection with a liquid-reservoir and in and through which said filler-tube is rigidly seated and extends downwardly therefrom and having a radial aperture in its wall below its said threaded top, with which aperture the upward end of said longitudinal depressed corrugation in said filler-tube communicates, together with an external circumferential groove or channel on said plug with which said radial aperture therein communicates, whereby when said plug bearing said filler-tube and its valve is seated by its threaded top in the wall of the liquid-reservoir the air-vent constituted on said tube by said corrugation will, regardless of the position assumed by said radial aperture relatively to a pipe communicating with said circumferential groove or channel, have free outlet for air and any liquid overflow through said radial aperture and circumferential groove or channel in said plug; also, in the combination, in a filler-tip with the filler-tube having a discharge-aperture at its lower end and a depressed corrugation on the exterior face of its wall, extending longitudinally thereof from near its opposite ends to form an air-vent, of a plug adapted to connect to a liquid-reservoir and in and through which the upward end of said filler-tube is seated and with an outlet in the wall of which the upward end of said air-vent communicates, and which plug has in it an annular way concentric to said seated filler-tube

and extending from near the top of said plug to its lower end, together with a sleeve-valve slidably mounted on said filler-tube and of a length to extend from the lower end of said tube into said annular way in the plug and having reciprocatory play on said tube and in said way to govern the discharge-aperture and the inlet end of said air-vent in said tube, whereby the filler-tube is reinforced and strengthened throughout its length from the plug to its lower end by said sleeve-valve and its liability to bend or break at the portion thereof which extends beyond said plug when subjected to strain in operation is obviated; also, in the combination in a filler-tip with a plug adapted to connect with a liquid-reservoir, a filler-tube seated in and through said plug and extending downwardly therefrom, with a discharge-aperture at its lower end and having an air-vent leading from its said lower end to an outlet in said plug, and a sleeve-valve slidably mounted on said tube and of a length to extend from the lower end thereof into said plug and having reciprocatory play on said tube and in an annular way in said plug concentric therewith to govern the discharge-aperture and inlet of the air-vent in said filler-tube, of a stuffing-box on the lower end of said plug to surround the reciprocatory sleeve-valve playing in said way in the plug, whereby leakage or overflow from the air-vent or through the plug is effectively prevented, and also in the combination, in a filler-tip with a plug to connect to a liquid-reservoir, a filler-tube seated in and through said plug and extending downwardly therefrom, with a discharge-aperture at its lower end and an air-vent extending on said tube from near its lower end to an outlet in said plug, of a spring-controlled sleeve-valve slidably mounted on and having reciprocatory play longitudinally of said tube to govern said discharge-aperture and air-vent thereof, together with a disk which is centrally apertured to play upon said sleeve-valve and has arms which are segmental in lateral cross-section and which rigidly extend from the upward face of said disk at right angles thereto and are threaded on their outward peripheral faces, a collar fixed on said sleeve-valve and having transverse peripheral channels registering with and to receive and permit longitudinal play therein of the arms on said disk and also having peripheral radially-extending pins and an external collar having on its internal face an annular groove into which the said pins on the sleeve-valve collar engage and have play, and a threaded portion on said internal face of said external collar beyond the said annular groove therein, which threaded portion takes the threads on the outward faces of said disk-arms seated in the channels in said sleeve-valve collar, whereby the said disk constitutes a sealing-flange on said sleeve-valve for the mouth of a bottle being filled and whereby said flange may readily and conveniently be adjusted on said sleeve-valve relatively to the lower end thereof and of the filler-tube by manipulating the said external collar, thereby regulating the degree of projection of the filler-tube into a bottle to be filled, and consequently the height to which such bottle is desired to be filled.

In the drawings, Figure 1 is an elevation of a filler-tip containing my invention and showing the parts in normal position at rest. Fig. 2 is a similar view of the filler-tip with the upper portion in longitudinal section and showing the parts in position during the operation of filling a bottle and with my improved sealing-flange adjusted relatively to the filler-tube in a position different to that shown in Fig. 1. Fig. 3 is an elevation of the filler-tube with the plug and sleeve-valve shown in connection therewith in longitudinal section. Fig. 4 is a cross-section through the sleeve-valve and filler-tube on line $x\,x$, Fig. 2. Fig. 5 is an elevation of the sealing-flange and its arms detached. Fig. 6 is a plan of the same. Fig. 7 is a cross-sectional plan taken on the line $y\,y$, Fig. 1, through the sleeve-valve and filler-tube, looking downwardly. Fig. 8 is a vertical section taken on the line $z\,z$, Fig. 7. Fig. 9 is an elevation of a portion of the sleeve-valve and the collar fixed thereon. Fig. 10 is a plan of the same. Fig. 11 is a plan of the external collar for adjusting the sealing-flange; and Fig. 12 is a cross-section of the same on line $x'\,x'$, Fig. 11.

In the filler-tip illustrated, A is the plug, having the threaded top a, whereby it may be connected to a liquid-reservoir, (not shown,) and B is the filler-tube, which reaches through and is seated firmly in the base of the plug, with its lower end extended below the plug, as shown. The said tube has a discharge-aperture at its lower end, and in a filler-tube of the class described it is preferable that said aperture be located in the wall of the tube, as at b, Fig. 2, the extremity or end of the tube being closed by a plug of solder, as at b', with a flange-headed stud b^2 detachably seated in said plug on the lower end of the tube and the flange of said stud-head forming a shoulder at the tube end to constitute a seat for the sleeve-valve, hereinafter described. In the exterior face of the wall of said filler-tube B, I form an inwardly-depressed corrugation B′, extending longitudinally of said face of the tube from near its lower end to near its upward end, where said tube is seated in the plug, and with the upward end of said depressed corrugation B′ communicating with an outlet a' in the wall of said plug A. This outlet a' I prefer to make as a radial aperture in the plug-wall and to locate it therein below the threaded top a of said plug, and I desirably form on the exterior of the plug a circumferential groove or channel a^2, into which said aperture a' opens, as shown. The described depressed corrugation B′ in the wall of the filler-tube B constitutes the necessary air-vent in

the filler-tip of this class, and said air-vent is thus economically formed and tends to structurally strengthen the tube B and has a minimum of encroachment upon the area of the bore of said tube, so that the possible maximum of flow of liquid through the tube may be approximated, while when the plug bearing said filler-tube is seated by its threaded top a in the wall of the liquid-reservoir in a bottle-filling machine the air-vent constituted on said tube by said corrugation B′ will by reason of said outlet a' in and said channel a^2 on the plug A, regardless of the position assumed by said outlet a' relatively to a pipe or other means (not shown, but usually employed in a bottling-machine to receive the expelled air and any liquid overflow) communicating with said channel a^2, have free outlet for air and liquid overflow through said aperture a' and channel a^2.

C is a sleeve which is slidably mounted on, fits closely to, and has reciprocatory play longitudinally of the filler-tube B. This sleeve is of a length to extend from the lower end of the tube B, where when in normal position of rest it abuts against the flange of the stud b^2 upward along said tube B and into the plug A, where its upward end enters and has play in an annular space or way a^3, formed in said plug circumferential of and concentric to the lower part of said tube in said plug, as plainly shown in Figs. 2 and 3. The said sleeve constitutes the usual sleeve-valve in filler-tips of this class and by its reciprocatory play on the tube B governs the discharge-aperture b and the inlet or lower end of the air-vent B′ of the said tube; but by reason of its described length and its extension into the bore of the plug A the said sleeve-valve C reinforces and strengthens the filler-tube B throughout the length thereof from its seated end in the plug-bore to its lower end, so that the liability of the said filler-tube to bend or break at the portion thereof below its upward-seated end when subjected to strain in the operation of filling bottles is obviated. Upon the lower end of the plug A, I arrange a stuffing-box consisting of an interiorly-recessed annular enlargement a^4 of said lower end of said plug and an externally-shouldered gland a^5, which is screw-seated upon said enlargement, as plainly illustrated in Figs. 2 and 3. The sleeve C plays through this box, and the leakage of air or overflow liquid from the plug is thus effectively prevented. The sleeve-valve C is spring-controlled to maintain it in normal position on the filler-tube B to close the discharge-aperture and air-vent thereof by a spring S, which is seated and tensioned between the shoulder of the gland a^5 on the plug A and a collar C′, fixed on said sleeve-valve.

D is a disk which is preferably annular, as shown, and desirably annularly recessed on its under face to receive an elastic or yielding gasket, as is usually employed in filler-tips of this class. This disk is centrally apertured to pass over and permit play through it of the filler-tube and its sleeve-valve, and the disk is mounted on the sleeve-valve C, so as to be adjustable thereon relatively to the lower end thereof and of the filler-tube B.

I have provided the following-described devices as desirable for effecting the convenient adjustability of the disk D, to wit: Upon the upward face of the disk and extending upwardly at right angles thereto are the arms d, which are segmental in lateral cross-section, and the outward peripheral faces or sides of which are threaded, as shown at d', Figs. 5 and 8. In the periphery of the collar C′ on the sleeve-valve are formed mortises or transverse channels c, which register with, receive, and permit longitudinal play therein of the described arms d on the disk D, and also in the periphery of the said collar C′, I fix radially-extended pins c', set preferably at diametrically opposite points and intermediate the mortises or channels c, as shown in Figs. 7 and 10.

E is a supplemental collar having on its internal-face an annular groove e, adapted to receive and permit circumferential play therein of the radial pins c' on sleeve-collar C′ and also having on its said internal face beyond said groove e the threaded portion or portions e', adapted to take the threads d' on the disk-arms d, seated in the channels c in the sleeve-collar C′. In constructing and assembling these devices the seats for the pins c' are desirably formed in the periphery of the collar C′. The disk-arms d are then seated in the channels c in said collar C′, and the supplemental collar E is then turned on the threads d' of said disk-arms to its seat on the collar C′ until the groove e in said collar E registers with the seats for the pins c'. Apertures e^2 are then or previously bored through the collar E into the groove e, and through these apertures the pins c' are inserted and seated in their seats in the collar C′ and so as to play in the groove e. Thereafter by rotating the collar E on the collar C′ the threads e' on the said collar E will, by their engagement with the threaded faces d' of the disk-arms d, operate to draw said arms upwardly or downwardly through the channels in the sleeve-collar C′, and hence to adjust the disk D relatively to the lower end of the sleeve-valve C and filler-tube B, as indicated in Figs. 1 and 2. The disk D serves as a sealing-flange on the sleeve-valve C to be engaged by the mouth of a bottle to be filled and in the downward movement of the filler-tip in a bottle-filling machine to force the said sleeve-valve upwardly on the filler-tube against the stress of the spring S to open the discharge-aperture and the air-vent of said filler-tube in the usual manner in filler-tips of this class, and the said sealing-flange is given by the described devices the desirable adjustability on the sleeve-valve to regulate the degree of projection of the filler-tube into the bottle to be

filled, and consequently the height to which such bottle is intended to be filled.

It is evident that variations in the forms of the essential elements of my invention may be made without substantial departure from the true features thereof. Therefore I do not limit myself herein to the specific forms shown and described of said novel and essential features.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a filler-tip the combination with a plug to seat in and communicate with a liquid-reservoir in a bottle-filling machine, of a filler-tube seated in and through the bore of and extending below said plug and provided at its lower end with a discharge-aperture, and having an inwardly-depressed corrugation on the exterior face of its wall extending longitudinally thereof from near its said lower end to and communicating with an outlet in said plug, and a sleeve-valve slidably mounted on and having reciprocatory play longitudinally of said filler-tube, to govern the discharge-aperture and lower end of said depressed corrugation therein.

2. In a filler-tip the combination with a filler-tube having a discharge-aperture at its lower end and an air-vent extending exteriorly thereof longitudinally from near its opposite ends, of a plug having at its top means to connect it to a liquid-reservoir in a bottle-filling machine and in and through the bore of which plug said filler-tube is seated and below which said tube extends, and having a radial aperture in its wall below its said top end, with which aperture the upward end of said air-vent on said filler-tube communicates, together with an external circumferential groove on said plug into which said radial aperture therein opens, and a sleeve-valve slidably mounted on and having reciprocatory play longitudinally of said filler-tube to govern the discharge-aperture and lower end of said air-vent in said tube.

3. In a filler-tip the combination with a filler-tube having a discharge-aperture at its lower end and an air-vent extending exteriorly thereof longitudinally from near its opposite ends, of a plug having means to connect it to a liquid-reservoir in a bottle-filling machine and in and through the bore of which plug the upward end of said filler-tube is seated, and with an outlet in the wall of which the upward end of said air-vent communicates, and which plug is provided with an annular way in its bore concentric to and circumferential of the filler-tube therein and extending from near the top of the plug to its lower end, together with a sleeve-valve slidably mounted on said filler-tube and of a length to extend from the lower end thereof into said way in the plug, and having reciprocatory play on said tube and in said way.

4. In a filler-tip the combination with a plug having at its top means to connect it to a liquid-reservoir in a bottle-filling machine, a filler-tube seated in and through the bore of and extending below said plug and having a discharge-aperture at its lower end and an air-vent on its exterior leading from its said lower end to an outlet in said plug, and a sleeve-valve slidably mounted on said tube and of a length to extend from the lower end thereof into said plug, and having reciprocatory play on said tube and in an annular way in the bore of said plug around said tube to govern the discharge-aperture and lower end of the air-vent in said tube, of a stuffing-box on the lower end of said plug to surround the reciprocatory sleeve-valve having play in said way therein.

5. In a filler-tip comprising a plug to connect to a liquid-reservoir in a bottle-filling machine, a filler-tube the upward end of which is seated in and through the bore of said plug and has a discharge-aperture at its lower end and an air-vent extending from said lower end of said tube to an outlet, and a spring-controlled sleeve-valve slidably mounted on said filler-tube and seating to a flange on the lower end thereof, and having reciprocatory play longitudinally of said tube to govern said discharge-aperture and air-vent thereof, of a disk which is centrally apertured to play on said sleeve-valve and is provided with upwardly-extended arms which are at right angles to it and are segmental in lateral cross-section and the outward faces of which are threaded, a collar fixed on said sleeve-valve and having transverse peripheral channels registering with and to receive and permit longitudinal play therein of the arms on said disk, and also having peripheral radially-extended pins, together with a supplemental collar having on its internal face an annular groove in which said sleeve-collar pins engage and have circumferential play and a threaded portion on its said internal face which takes the threads on the outward faces of the disk-arms seated in the channels in said sleeve-collar.

Signed at New York, in the county of New York and State of New York, this 13th day of March, A. D. 1900.

FRANK LIBERTY NICHOLS.

Witnesses:
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ARDEN S. FITCH.