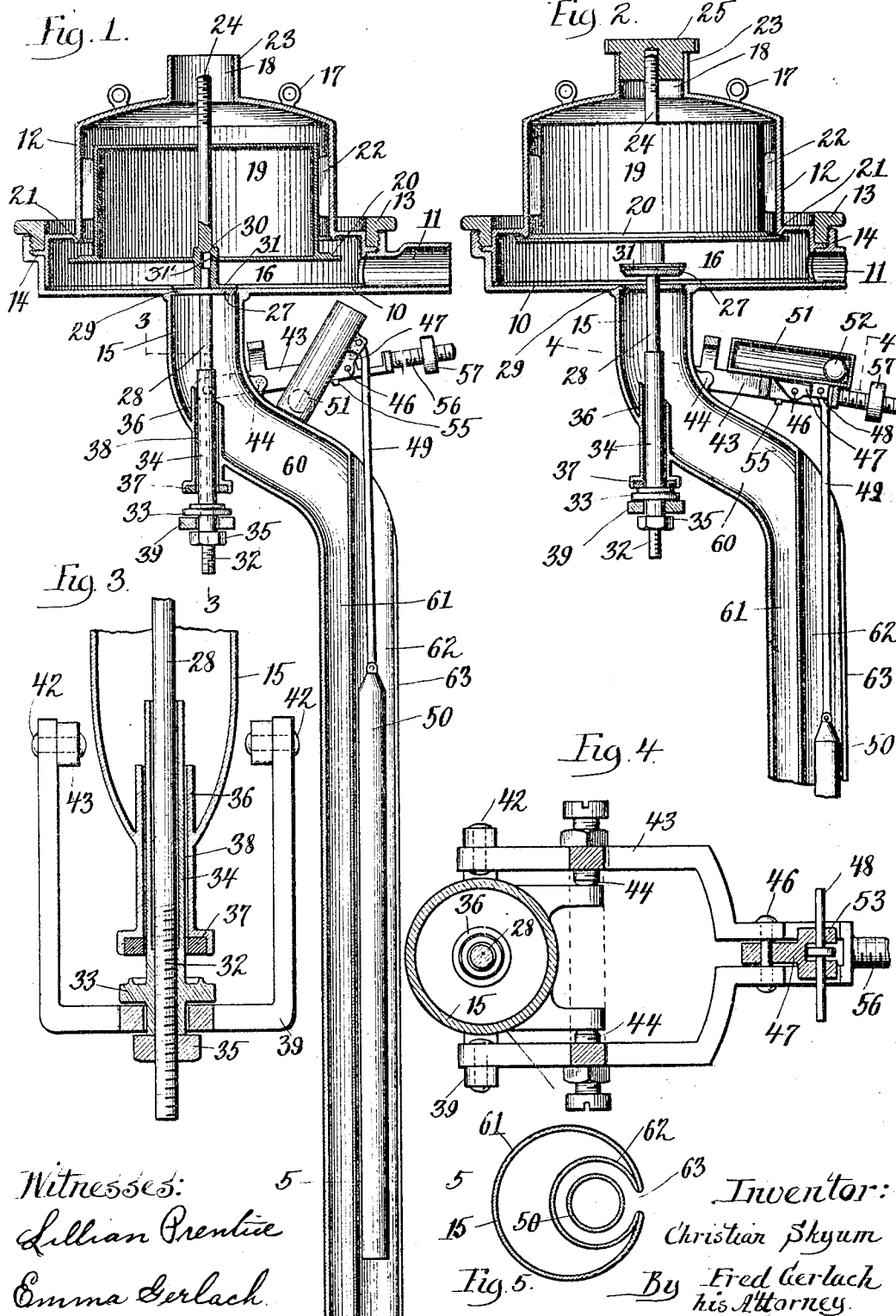


C. SKYUM.
FILLING DEVICE.

APPLICATION FILED SEPT. 5, 1902.

2 SHEETS—SHEET 1.

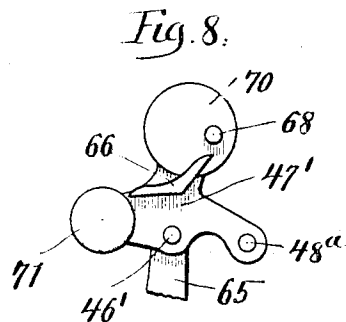
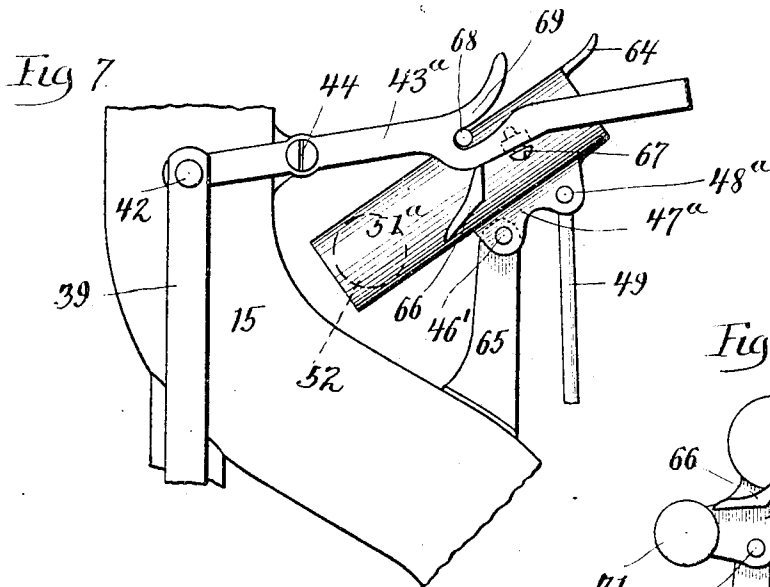
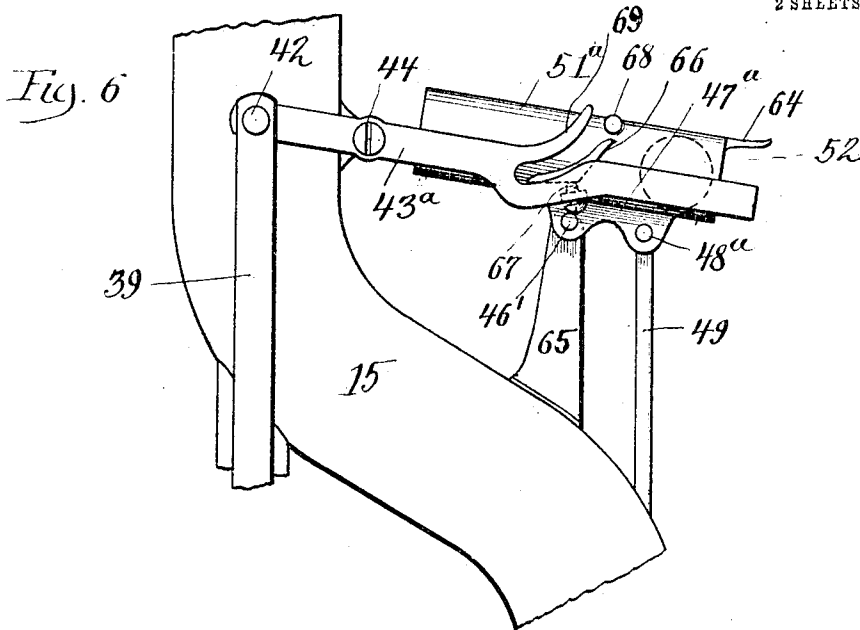


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHRISTIAN SKYUM, OF CHICAGO, ILLINOIS.

FILLING DEVICE.

No. 798,637.

Specification of Letters Patent.

Patented Sept. 5, 1905.

Application filed September 5, 1902. Serial No. 122,166.

To all whom it may concern.

Be it known that I, CHRISTIAN SKYUM, a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Filling Devices, of which the following is a full, clear, and exact description.

The invention relates more particularly to devices used for filling bottles, casks, and the like.

One of the objects of the invention is to provide an improved siphon filling device in which communication between the exhaust-opening for the air and the siphon is automatically interrupted when a flow of liquid has been established.

The invention further designs to provide improved means for automatically cutting off the liquid-supply when the vessel has been filled.

A further object of the invention is to provide an improved construction of filling-tube, and, lastly, the invention designs to provide an improved filling device and an improved construction for the several parts thereof.

With these objects in view the invention consists in the several novel features of construction hereinafter set forth, and more particularly defined by claims at the conclusion hereof.

In the drawings, Figure 1 is a view in central vertical section of a device embodying the invention. Fig. 2 is a similar view, the parts being shown in position assumed when the device is in operation. Fig. 3 is a detail view, in vertical section, taken on line 3 3 of Fig. 1. Fig. 4 is a view in horizontal section taken on line 4 4 of Fig. 2. Fig. 5 is a detail view of the filling-tube in horizontal section, taken on line 5 5 of Fig. 1. Fig. 6 is a view in side elevation of a device embodying a modified form of the invention. Fig. 7 is a view of the same, illustrating the parts in another position. Fig. 8 is a detail view of another modification.

A casing of suitable construction comprises a base 10 and a body 12, secured to the base. A screw-threaded ring 13 engages an annular projection 14 on said body and removably secures the casing-sections together. Base 10 is provided with an inlet 11, with which the liquid-supply is connected. A filling-tube 15 is secured to base 10 and communicates with a chamber 16 within the casing. The filling-tube conducts the liquid from the casing to the bottom of the vessel to be filled. Body 12

is usually provided with eyes 17 or other means whereby it may be conveniently suspended.

In many instances it is desired to employ a siphon filling device, and one object of the invention is to provide means for automatically interrupting communication with the exhaust-opening and the liquid-supply when flow of the liquid has been established. When the device is employed as a siphon, the casing is provided with an exhaust-opening 18 and a float 19, which operates a valve 20, adapted to engage a valve-seat 21, formed in the casing-body. Ribs 22 guide the float vertically. Exhaust-opening 18 is usually formed within a mouthpiece 23, of such shape that the operator can place the tube to his lips and draw the air from the siphon conductor and the valve-casing, so that liquid from the source of supply will flow to chamber 16. If desired, a pump can be attached to mouthpiece 23, as well understood in the art. The object in providing this automatic cut-off is to prevent the liquid from passing to the mouth of the operator or passing to any other means for exhausting the air which may be employed. As soon as the liquid passes into chamber 16 the liquid will lift float 19 and shift valve 20 against valve-seat 21. Communication will then be interrupted between the inlet for the liquid and the exhaust-opening for the air, so it will be impossible for the operator to draw the liquid into his mouth. Float 19 is secured to a stem 24, which is provided with a screw-thread. When it is desired to retain the float in lifted position, so the siphon can be continuously operated without the necessity of starting the flow of liquid for each filling operation, the float may be retained in lifted position by a cap 25, which is provided with a screw-threaded socket adapted to engage the screw-thread of stem 24 and is also adapted to engage mouthpiece 23 and firmly secure valve 20 in lifted position and against valve-seat 21.

The invention also designs to provide an improved cut-off mechanism whereby the supply of liquid to the bottle or other vessel may be discontinued at any desired time. Such mechanism comprises a valve 27, secured to a stem 28. Valve 27 engages a valve-seat 29, formed in the bottom of base 10 of the casing and controls the flow of liquid to the filling-tube. A portion of stem 28 is extended upwardly from valve 27 and is guided in a socket 30, formed in the lower portion of

stem 24 of float-valve 20. Stem 24 is extended downwardly to form a guide for stem 28 of valve 27 and is provided at its lower end with a flange 31, adapted to cover cut-off valve 27.

5 A duct 31' serves as a vent for the guide-socket in stem 24. The purpose in providing flange 31 is to cover the upper surface of valve 27 and prevent the liquid passing through chamber 16 from exerting pressure upon the upper side

10 of the valve sufficiently to close the valve while the device is in operation and while suspended in balanced position with respect to the mechanism for shifting the cut-off. Valve-stem 28 of the cut-off is adjustably connected

15 by screw-thread 32 with a sleeve 34 of an air-valve 33. A lock-nut 35 secures stem 28 and sleeve 34 in assigned relative position. Sleeve 34 is extended through a tubular guide 36, which is rigidly secured to the filling-tube and

20 which is provided with a valve-seat 37, of elastic material, and an air-duct 38 is formed between guide 36 and sleeve 34 of the cut-off valve. A loose fit between sleeve 34 and guide 36 is sufficient to provide the desired

25 air-passage. Valve 33 controls the admission of air to the filling-tube. When the valve is in lower position, (seen in Figs. 1 and 3,) air can pass through duct 38 to the filling-tube so the said tube will be drained and the contents thereof be discharged. When the valve

30 is in position seen in Fig. 2 and the device is in operation, valve 33 will be in closed position.

The mechanism for automatically operating

35 cut-off 27 and air-valve 33 comprises a bail 39, provided with a ring portion which encircles sleeve 34 and with vertical arms pivotally connected, as at 42, with a lever 43, which is pivotally sustained, as at 44, in lugs secured

40 to the filling-tube. Lever 43 is preferably bifurcated, as shown, and has pivotally connected thereto, as at 46, a supplemental lever 47, to which is pivotally connected, by a pin 48, a pendent link 49, to the lower end of

45 which is connected a float 50. Lever 47 is preferably provided with a cylinder 51, in which a guideway is formed for a weight 52. Lever 47 is formed to fit between the sides of lever 43, and a portion thereof is adapted to rest upon lever 43 while the parts are in position seen in Fig. 2. Lever 43 is provided

50 with a stop 55, which restricts the swing of lever 47 in one direction. Lever 43 is preferably provided with a screw-threaded extension 56, and a counterweight 57 is adjustably secured therein, whereby the relative weight of the parts of the cut-off-operating mechanism on each side of lever-fulcrum 44 may be varied. The cut-off-operating mechanism is

60 constructed so the preponderance of weight is on that side of lever-fulcrum 44 on which cut-off is located—*i. e.*, so the normal tendency of the valve is to remain closed. Weight 52 is arranged to travel on both sides of the

65 fulcrum of lever 47, so its force will be dif-

ferentially applied—*i. e.*, when the cut-off-operating mechanism is in position to close valve 27 the gravity of the weight will tend to swing lever 47 about its fulcrum and lift the float—

70 and will also be indirectly applied to lever 43 at a point so close to the fulcrum of lever 43 that the ponderance of weight on the valve side of lever 43 will readily overcome the force of all of the parts on the opposite side of lever 43, and when the mechanism is in position seen in Fig.

75 2 the gravity of weight 52 will be applied at a point farther from fulcrum 44, and so the preponderance of weight is then on the float side of lever 43. Guide 51 is arranged to occupy an inclined position when the cut-off

80 valve is open and such as will cause weight 52 to quickly roll to the opposite side of pivot 44 and shift the preponderance of weight as soon as float 50 is lifted by the liquid within the vessel being filled. The purpose in em-

85 ploying this construction of valve-shifting mechanism is to provide a mechanism which is controlled by a float which is necessarily of limited size, because it must be inserted through the mouth of the vessel to be filled,

90 and which mechanism is sufficiently sensitive to respond to a slight movement of the float and which when slightly shifted will quickly and positively close the cut-off, and thus result in effecting the shift of the cut-off when

95 the liquid column in the vessel reaches the desired height and results in filling the vessels to a uniform height.

The diameter of the filling-tube is necessarily restricted to the size of the mouth or

100 opening in the bottle or vessel to be filled, and therefore it is of importance to provide a construction in which the flow of liquid is not materially interfered with, so that the flow of liquid will not be retarded and so the

105 vessel will be quickly filled. In order to provide a construction of tube in which a float can be held and in order to provide a channel through which the displaced air within the vessel can be discharged therefrom, the tube

110 is preferably of the construction shown. The upper portion of the filling-tube 15 is preferably provided with a connecting portion 60 and with a lower vertical portion 61. A tube

115 62, eccentrically arranged within the vertical portion 61 of the filling-tube, forms a guide for float 50. The walls of tubes 61 and 62 are cut away to form a vertical slot 63, which affords communication between the chamber within the vessel and the chamber within tube

120 62 and also to provide an exit for the air. As the liquid rises in the vessel it will pass into tube 62 and maintain a corresponding column in tube 62, and, furthermore, the air within the vessel will pass through the slot

125 63 and out of the upper open end of tube 62. In practice this construction of filling-tube has been found to be efficient and positive in operation. It will be observed that by providing tube 62 around float 50 the down-

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wardly-passing liquid does not contact with the float and the operation of the float will be uniform regardless of rapidity of the flow through the filling-tube.

5 The operation of the improved filling device will be as follows: Assuming the flow of liquid to have been established between the source of supply and chamber 16, as hereinbefore described, and assuming the parts to be in position shown in Fig. 1, the operator will depress pin 48 until the parts assume the position seen in Fig. 2. Such shift will cause lever 47 to swing into position to lower float 50 and to shift lever 43 into position to open valve 27, and thus establish a flow of liquid to the filling-tube and into a vessel to be filled. When lever 47 has been shifted, weight 52 will travel into position to apply its force at a point where it will overcome the normal preponderance of weight on the valve side of lever 43, and the weight will be on that side of lever-fulcrum 46 on which it will permit the float to remain in lower position and so the float will be free to be lifted by the liquid column. So long as the parts remain in such position the flow of liquid through the filling-tube and into the vessel will continue. When valve 27 is opened, air-valve will be closed, and vice versa, so that while the supply of liquid continues air or liquid cannot pass through duct 38. When the liquid within the bottle or vessel being filled has reached the desired height, float 50 will be lifted. A slight upward lift of float 50 will tilt lever 47 sufficiently to cause weight 52 to travel to the opposite end of guide 51 and there differentially apply its force to assist the rising liquid column in lifting the float and at a point with respect to fulcrum 44 at which the preponderating weight of the valve will cause it to be quickly closed, so the valve 27 will cut off the further supply of liquid. Simultaneously with the shift of valve 27 air-valve 33 will be shifted to permit air to pass into the upper end of the filling-tube, so that when the tube is withdrawn from the liquid column in the vessel the liquid column will not be held in the tube until the tube has been withdrawn, but will quickly pass into the vessel. It will be observed that when the float has caused the shift of the valve-operating mechanism the parts will be positioned so they will be held or locked in position to retain valve 27 closed, because the force of float 50 is applied close to fulcrum 44 and the force of weight 52 is applied at a point where it cannot overcome the normal preponderance of the valve side of lever 43. Such construction automatically holds itself in assigned positions—i. e., when it is shifted in either of its positions it will be held there until again and reversely shifted.

Thus it will be seen that the invention provides a mechanism whereby the liquid-supply is automatically discontinued and which re-

sponds quickly, positively, and uniformly to the liquid column in the vessel and in which air is supplied to the filling-tube, so the liquid therein will quickly pass in the vessel while the tube is being withdrawn from the vessel. 70

The invention is not to be understood as restricted to the details shown and described, but may be modified by the skilled mechanic without departing from the spirit of the invention. So, also, the several features thereof may be employed severally without adoption in entirety. For example, in Figs. 6 and 7 there is shown a modified form of the invention. In this form a supplemental lever 47^a is pivotally sustained by a support 65, rigidly secured to the filling-tube. Weight-guide 51^a is provided with a lug 66, positioned to engage an adjustable stud 67, formed on the valve-operating lever 43^a when valve 27 is in open position, and securely hold the lever, so as to cause the valve to be held in said position. Said lug and stud are positioned to free lever 43^a upon a slight shift of lever 47^a by float 50. Lever 47^a is also provided with a stud 68, which will engage a cam projection 69 during the shift of lever 47^a in that direction in which said lever is shifted by float 50. When the lever 43^a has been shifted to close valve 27, the force of weight 52 will be applied to lever 47^a on that side of fulcrum 66, which will hold lever 47^a in position to bring stud 68 under projection 69 of lever 43^a and lock the lever in position to keep valve 27 in closed position. A finger-piece 64 is secured to guide 51^a, and thereby the lever 47^a can be conveniently depressed. Pivot-pin 48^a is extended laterally to engage the under side of lever 43^a and restrict the independent travel of lever 43^a and insure the passing of stud 68 beneath cam 69. The operation of this form will be as follows: Assuming the parts to be in position to hold valve 27 in closed position, stud 68 of lever 47^a will be in position adjacent cam 69 and will thus insure the retention of the parts in such position. (See Fig. 7.) When the device is to be operated, levers 43^a and 47^a will be depressed by the operator until the parts assume the position shown in Fig. 6. During the latter portion of such shift weight 52 will pass to the outer end of guide 51^a and tend to depress the outer end of lever 47^a and stud 67 of lever 43^a will pass beneath lug 66. These parts will then be locked in position to hold valve 27 open (see Fig. 6) and will remain there until the vessel has been filled, when float 50 will tilt lever 47^a sufficiently to cause weight 52 to travel to the inner end of lever 47^a, and thus effect a sudden shift of said lever. During the initial portion of such shift of lever 47^a lug 66 will pass away from stud 67 and release lever 43^a, and during the latter part of such shift stud 68 will pass beneath cam 69, and thus secure the lever mechanism in position to retain the valve in closed position. 130

In Fig. 8 there is shown another modified form of the invention and in which the differential mechanism comprises a weight 70, which is secured to travel with a lever 47' and is arranged to cross the line of gravitation, so that its force will be differentially applied—*i. e.*, on opposite sides of fulcrum 46' of lever 47'—and so it will tend to hold the lever mechanism in both positions. Lever 47' is also provided with a counterbalance 71, which assists the float in overcoming the force of weight 70. In operation the parts will be in position shown in Fig. 8, when valve 27 is open and weight 70 will be arranged to lock lever 43 in assigned position. A slight shift of float 50 will cause weight 70 to cross the line of gravitation and then tend to reversely tilt lever 47' and to bring the other parts in position to retain the parts in position to hold valve 27 in closed position. It will be understood that the construction of the other parts will be the same as the construction of the corresponding parts shown in Figs. 6 and 7.

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

1. In a siphon filling device, the combination of a casing, having a chamber therein, a liquid-inlet leading into said chamber, a filling-tube, a valve controlling flow of liquid through said tube and which, when closed, will cause the liquid to collect in said chamber, an exhaust through which air can be drawn to establish liquid-flow into said chamber; a float located in said chamber and operated by the liquid therein and a valve within said chamber operated by said float, and closing the outlet when the liquid has been lifted into the chamber.

2. In a siphon filling device, the combination of a casing having a chamber therein, a liquid-inlet leading into said chamber, a filling-tube, a valve controlling flow of liquid through said tube and which, when closed, will cause the liquid to collect in said chamber, an exhaust through which air can be drawn to establish liquid-flow into said chamber, a float located in said chamber and operated by the liquid therein, a valve within said chamber, operated by said float, and closing the exhaust when the liquid has been lifted into the chamber and means whereby said valve can be secured in closed position, so fluctuation of the liquid-level in said chamber will not cause shift of the float-valve.

3. In a siphon filling device, the combination of a casing having a chamber therein, a liquid-inlet leading into said chamber, a filling-tube, a valve controlling flow of liquid through said tube and which, when closed, will cause the liquid to collect in said chamber, an exhaust through which air can be drawn to establish liquid-flow into said chamber, a float slidably held in said casing and operated by the liquid

in said chamber and a valve closing the exhaust-opening and carried by said float.

4. In a siphon filling device, the combination of a casing having a chamber therein and an inlet, a filling-tube adapted for insertion into a vessel to be filled, a valve controlling passage of liquid through said tube, shifting mechanism, operated by the liquid in the vessel, and operating said valve to automatically cut off the passage of liquid through said tube, when the vessel has been filled, an exhaust through which air may be withdrawn to establish liquid-flow to said chamber, a float in said chamber and a valve operated by said float and cutting off passage of liquid to said exhaust when liquid-flow to said chamber has been established.

5. In a siphon filling device, the combination of a casing having a chamber therein and an inlet, a filling-tube adapted for insertion into a vessel to be filled, a valve controlling passage of liquid through said tube, shifting mechanism operated by the liquid in the vessel, and operating said valve to automatically cut off the passage of liquid through said tube, when the vessel has been filled, an exhaust through which air may be withdrawn to establish liquid-flow to said chamber, a float in said chamber, a valve operated by said float and cutting off passage of liquid to said exhaust when liquid-flow to said chamber has been established, and means whereby said float-valve can be secured in closed position so fluctuation of the liquid-level in the chamber will not cause shift of the float-valve.

6. In a filling device, the combination with a body having a chamber therein, an inlet for the liquid, of a filling-tube connected with said body, a valve controlling passage of liquid to the vessel, mechanism whereby said valve will be automatically shifted when the vessel has been filled and a cover above said valve and serving to relieve the upper surface of said valve from the influence of the current in said chamber.

7. In a siphon filling device, the combination with a body having a chamber therein, an inlet for the liquid, and an air-outlet, of a float-valve whereby communication between said inlet and said outlet will be interrupted, a filling-tube connected with said casing, a cut-off valve controlling the passage of liquid to the vessel to be filled, mechanism whereby said cut-off valve will be automatically shifted when the vessel has been filled, said cut-off valve being provided with a stem guided in the float-valve and a cover carried by said float-valve and whereby the cut-off valve will be relieved from the influence of the current in said chamber.

8. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, a valve controlling admission of air to the filling-tube between

the liquid discharge and the cut-off, and to permit the liquid to be drained from said tube, of mechanism whereby said cut-off valve will be shifted, when the vessel has been filled, and means whereby said air-valve will be shifted.

9. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, a valve controlling admission of air to that portion of the filling-tube between the liquid-discharge and the cut-off valve, and whereby the liquid can be drained from the tube, and mechanism whereby said cut-off valve and said air-valve will be shifted when the vessel has been filled.

10. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, a valve controlling admission of air to that portion of the filling-tube between the liquid-discharge and the cut-off valve, and whereby the liquid can be drained from the tube, and mechanism whereby said cut-off valve and said air-valve will be automatically shifted when the vessel has been filled.

11. In a filling device, the combination with a filling-tube comprising a vertical portion, an offset portion and a connecting portion, of a stem extending through said connecting portion, a cut-off valve and a valve controlling passage of air to said tube, both of said valves being connected to said stem.

12. In a filling device, the combination with a filling-tube comprising a vertical portion, an offset portion and a connecting portion, of a cut-off valve and a stem for said valve extending downwardly and through said connecting portion a valve controlling passage of air to said tube, and mechanism whereby both of said valves will be automatically shifted when the vessel has been filled.

13. In a filling device, the combination with a filling-tube comprising a vertical portion, an offset portion and a connecting portion, of a stem extending through said connecting portion, a cut-off valve and a valve controlling passage of air to said tube, both of said valves being connected to said stem, and mechanism whereby both of said valves will be automatically shifted when the vessel has been filled.

14. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, mechanism whereby said valve will be caused to be automatically shifted when the vessel has been filled, means whereby said valve will be held in shifted position, said mechanism comprising a float and two levers, one of which is connected with the valve and the other of which is connected with said float and pivotally sustained by the other lever.

15. In a filling device, the combination of a

filling-tube, a cut-off valve controlling the flow of liquid to the vessel, mechanism whereby said valve will be caused to be automatically shifted when the vessel has been filled comprising a weight, and means whereby the force of said weight will be differentially applied to hold said mechanism in either of its alternative positions.

16. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, mechanism whereby said valve will be automatically shifted when a vessel has been filled, said mechanism comprising a float, and a weight having its force applied in manner to resist the upward movement of the float, and differentially applied to assist reverse shift of said float after the initial upward shift of the float.

17. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, mechanism whereby said valve will be caused to be automatically shifted when the vessel has been filled, said mechanism comprising a lever and a weight applied alternately on opposite sides of the pivot of said lever to differentially apply the force of said weight.

18. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, and mechanism whereby said valve will be caused to be automatically shifted when the vessel has been filled, said mechanism comprising a lever, a tilting weight-guide, a weight movable in said guide and a float connected with and tilting said guide.

19. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, and mechanism whereby said valve will be caused to be automatically shifted, when the vessel has been filled, said mechanism comprising a lever, a tilting weight-guide, a weight movable in said guide, a float having an eccentric connection with said guide, and a lever connected with said valve.

20. In a filling device, the combination with a filling-tube, of a cut-off valve controlling the flow of liquid to the vessel, mechanism whereby said valve will be automatically shifted when the vessel has been filled, and whereby said valve will be held in shifted position, said mechanism comprising a float, and two members one of which is connected with said float, and the other of which is connected with said valve, and means whereby said members will be interlocked in both positions.

CHRISTIAN SKYUM.

In presence of—

FRED GERLACH,
EMMA GERLACH.