(No Model.) 3 Sheets—Sheet 1.

T. FERGUSON.

MACHINE FOR SIRUPING AND FILLING SIPHON BOTTLES.

No. 526,861. Patented Oct. 2, 1894.

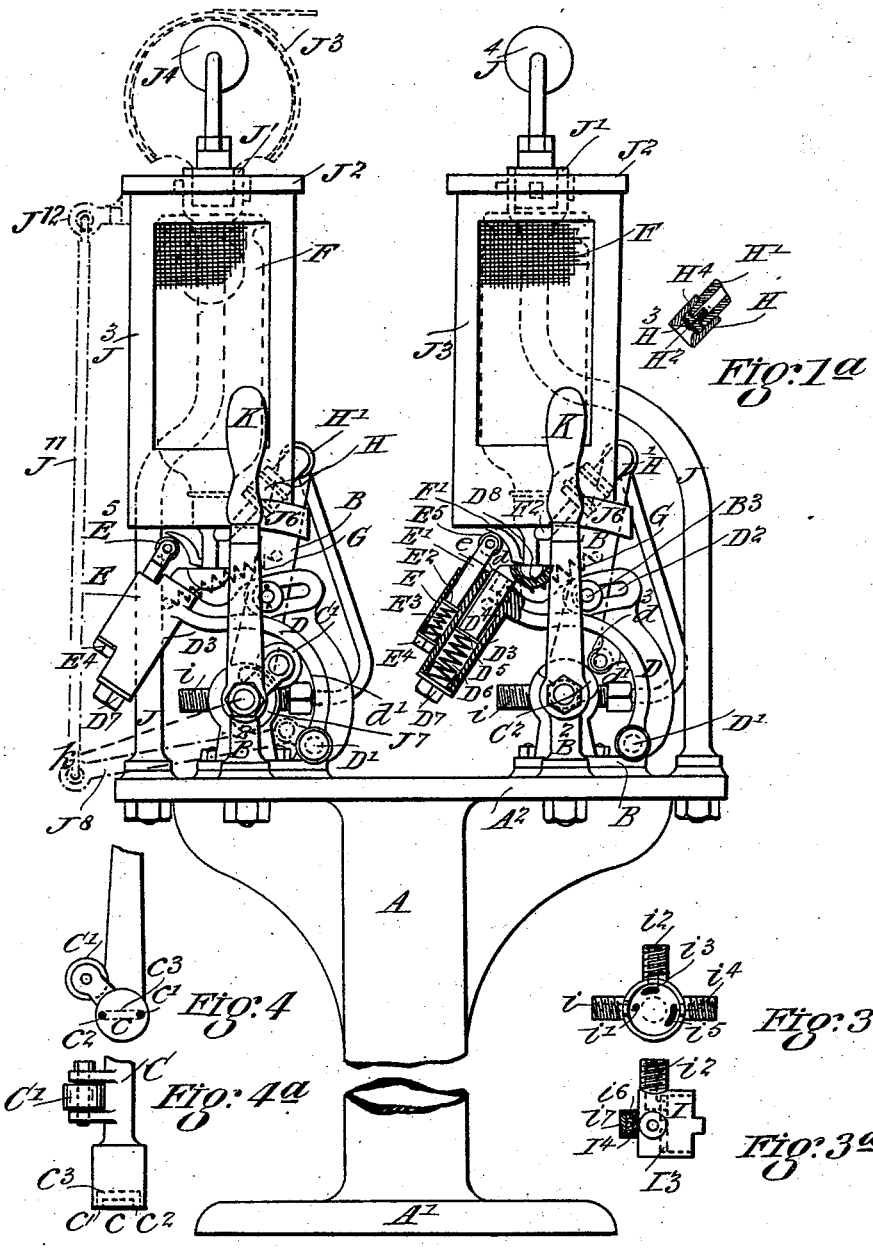

FIG: 1

FIG: 1a

FIG: 4

FIG: 4a

FIG: 3

FIG: 3a

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(No Model.) 3 Sheets—Sheet 2.

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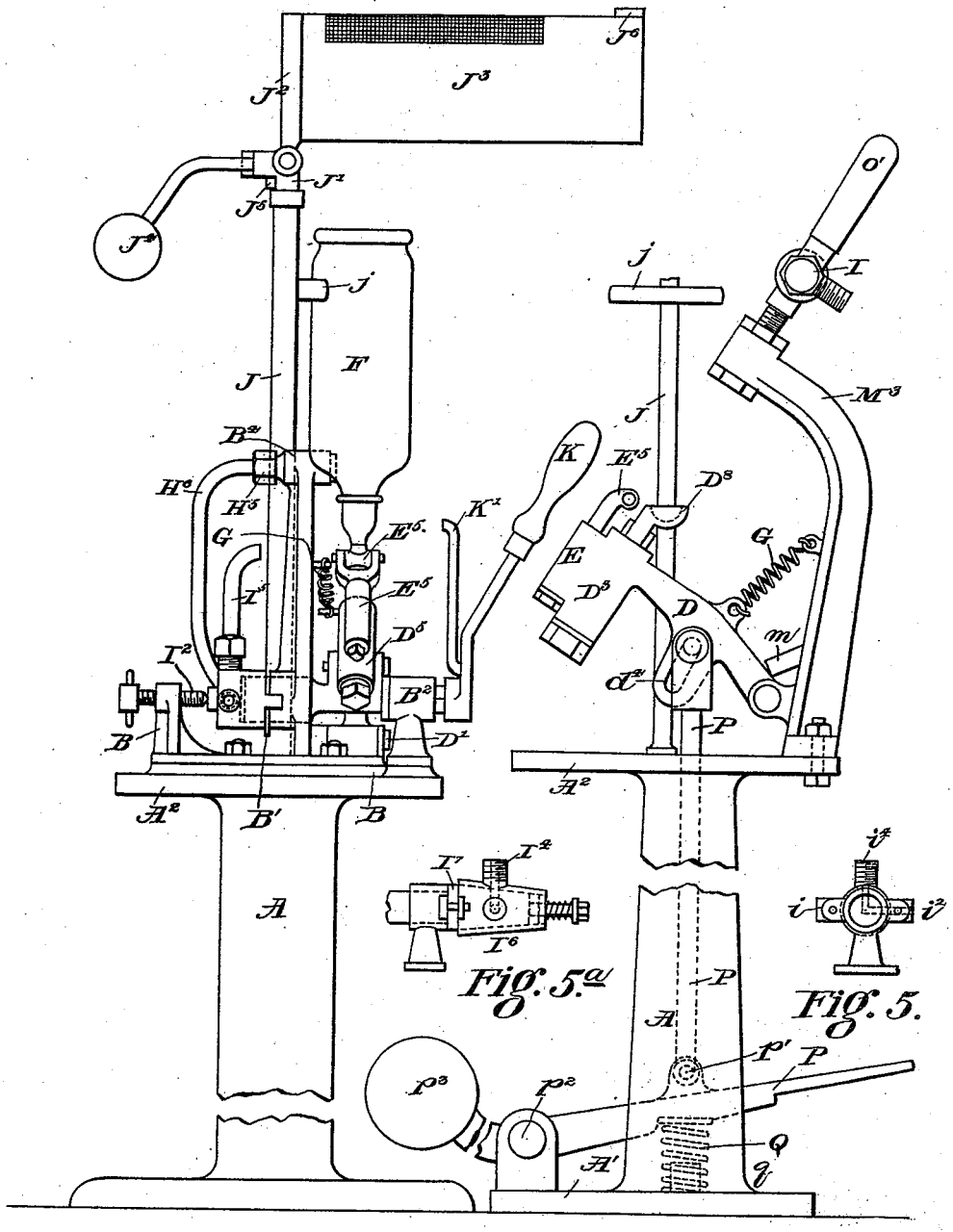

Fig. 2.

Fig. 5a.

Fig. 5.

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Fig. 10.

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(No Model.) 3 Sheets—Sheet 3.

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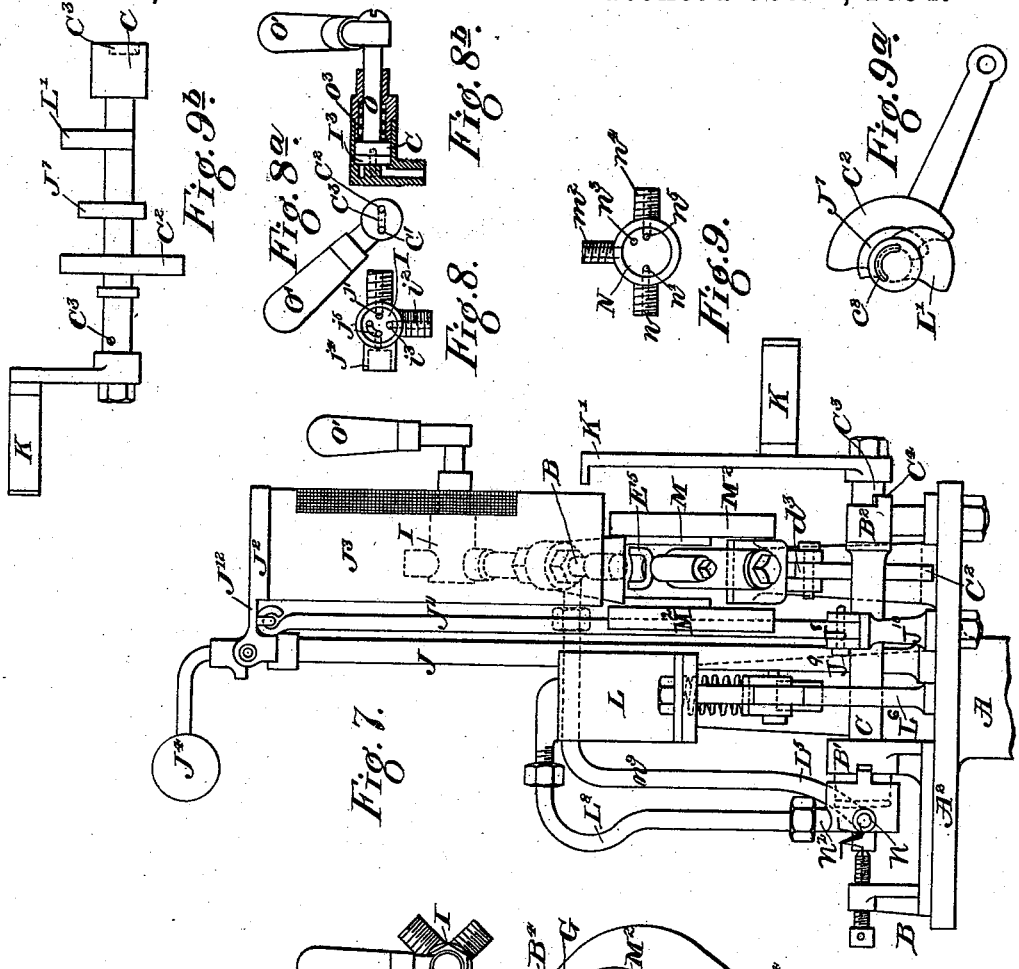

Fig. 9½.

Fig. 8a.

Fig. 8½.

Fig. 8.

Fig. 9.

Fig. 9a.

Fig. 7.

Fig. 6.

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UNITED STATES PATENT OFFICE.

THOMAS FERGUSON, OF HAWKSBURN, VICTORIA.

MACHINE FOR SIRUPING AND FILLING SIPHON-BOTTLES.

SPECIFICATION forming part of Letters Patent No. 526,831, dated October 2, 1894.

Application filed September 19, 1893. Serial No. 485,837. (No model.) Patented in Victoria September 19, 1892, No. 9,972; in New South Wales September 21, 1892, No. 3,995, and in England October 7, 1892, No. 17,920.

To all whom it may concern:

Be it known that I, THOMAS FERGUSON, a subject of Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, residing at 8 Oban Street, Hawksburn, in the British Colony of Victoria, have invented certain new and useful Improvements in Machinery for Siruping and Filling Siphon-Bottles with Aerated Waters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Applications for patents for this invention have been filed in the following countries: Victoria, No. 9,972, dated September 19, 1892; New South Wales, No. 3,995, dated September 21, 1892, and Great Britain, No. 17,920, dated October 7, 1892.

A machine embodying my improvements is preferably constructed for filling two siphons, that is, it is provided with two heads or brackets each to receive one bottle and so arranged that while the filled bottle is being removed and replaced with an empty one, the bottle in the other head is undergoing the filling process. I find from experience that two heads are just enough to engage the attention of one man who with a hand machine can fill forty-five dozen per hour.

My improvements can also be utilized in a one bottle machine and in which I sometimes employ a novel arrangement of spring or weighted treadle gear to support the arm carrying the "siphon" while being filled.

In order that my invention may be well understood I will now describe it by reference to the accompanying sheets of drawings throughout which similar letters of reference will indicate corresponding parts.

Figures 1 and 2 are front and side elevations respectively of a two head machine constructed in accordance with my improvements and designed for filling siphon bottles with aerated or soda waters and Fig. 1^a a central section of the socket for the siphon spout. Figs. 3 and 3^a are details of the three way seating box for the aerated water supply and air escape disk valve and Figs. 4 and 4^a details of the said disk valve at end of operating spindle. Figs. 5 and 5^a are end and side views of a three way plug cock that may be used as an alternative for the disk valve shown in Figs. 1 and 2. Figs. 6 and 7 are front and side elevations respectively of a machine embodying most of my improvements and designed for siruping and filling siphon bottles with aerated waters. Figs. 8, 8^a and 8^b are details of the aerated water and air escape disk valve and Figs. 9, 9^a and 9^b are details of the sirup supply disk valve and the cam spindle by which it is controlled. Fig. 10, is a front view of one head of a machine constructed in accordance with my improvements and showing the treadle gear for supporting the swinging arm that carries the siphon.

The improvements will be first described as embodied in a machine designed for filling siphon bottles with aerated or soda water such a machine being shown in Figs. 1 to 4^a.

Referring to Figs. 1 and 2, A. is a column having a foot flange A′ at its base and a broad flange or plate A^2 at its top and upon the latter is bolted two bracket pieces B each having a bearing at B′ to receive a horizontal spindle C the front part of each spindle being supported by pillar bearings B^2. D are curved arms centered on pins D′ carried by lugs cast on the bracket piece B. Each curved arm has a slotted guide D^2 working on flanged pins B^3 secured to the bracket B. The fore end of curved arm has a tubular head D^3 within which is a sliding piece D^4 having an inner collar D^5 seated on a coiled spring D^6 that is retained in position by a screw cap D^7. The top end of sliding piece D^4 is furnished with a cup D^8 to receive the head of siphon. Again on the outer side of said tubular head D^3 is another tubular piece E also having a sliding piece E′ furnished with collar E^2 and seated on coiled spring E^3 the latter being retained in position by screw cap E^4 while the outer end of sliding piece E′ has a fork formed on it to receive and carry a small friction roller E^5 that contacts with, and presses upon the valve lever F′ of siphon F to open the valve. It will be noticed that both said sliding pieces D^4 and E′ fit in holes in their respective tubes that are bored

smaller at the end in which they fit and also that they are fitted with feathers d and e respectively which prevent their turning about.

The curved arm D as shown in the machine at left hand side of Fig. 1. has a curved path d' that is an arc of a circle drawn from center of spindle C and upon such path a friction roller C′ travels said friction roller being centered between lugs formed on aforesaid spindle C while in the machine shown at the right hand side of Fig. 1, I employ alternative means for operating the arm D as I cast snugs on it and between them I center a small friction roller d^3 that is acted on by a cam C^2 formed on main spindle C.

G is a coiled spring secured at one end to a pin on the bracket B and at its other end to a pin on the side of tubular head D^3 the purpose of such spring being to hold the curved arm up. The top end of bracket B has a branch piece B^4 on it to the front of which a bend piece H′ is secured while the outer end of the bend has a socket H screwed on it which is designed to receive the spout F^2 of siphon. This socket has a small tube H^2 at its center that passes into the siphon spout such small tube having a flange on it that is secured between a rubber washer H^3 and a leather washer H^4. The back end of branch B^4 is screwed to receive the coupling nut H^5 of a pipe H^6 leading from a valve box I arranged at back end of spindle C such valve box or branch piece being retained in its position by projecting pieces I′ passing into recesses formed in the bearing B′ and also by being pressed upon by the end of a screw pin I^2 also supported by said bracket piece B.

J is a wrought iron bracket bolted to plate A^2 and having a fork piece J′ at its upper end to receive and hinge thereto the head plate J^2 of the siphon bottle guard J^3 while at the position shown in Fig. 2 is a backwardly projecting arm carrying a balance weight J^4 a stop J^5 being provided, to prevent the guard rising above the horizontal line.

j is a guide for bottle on bracket J. Upon front end of spindle C is a handle K and to it an arm K′, is secured the upper end of which is designed to form a stop to travel in front of a horn piece J^6 secured to lower end of guard J^3.

In the bottling head at the right hand side of Fig. 1, I show in dotted lines parts marked J^{12}. J^{11} J^8. J^7 (hereinafter fully referred to) forming the mechanism for automatically lowering guard J^3 by the cam J^7 on spindle C acting on lever J^8 and so from it through medium of rod J^{11} bringing guard J^3 down over the siphon bottle. When the lever J^8 is not acted on by cam J^7 the weight J^4 raises the guard J^3 to its horizontal position above top of siphon bottle.

Referring now more particularly to the details shown in Figs. 3, 3^a, 4 and 4^a, the valve box I has three screwed branches on it, branch i of which is the aerated or soda water inlet leading to the hole i' in valve box face. i^2 is the air escape branch leading from hole i^3 in valve box face while, i^4 is the branch for connection to pipe H^6 leading to and from the siphon bottle and through which aerated water is supplied to and the atmospheric air allowed to escape from bottle. The hole or slot i^5 in valve box face leads to said branch i^4. The disk valve c is formed at end of spindle C, and consists of the two holes c' and c^2 connected together by an under passage c^3 and so forming one through passage way. I^3 is a leather washer or face for valve box said leather being kept in position and prevented from turning by three small pins that project from face of valve box and it has holes through it to correspond with holes i'. i^3 and i^5 shown in Fig. 3. A small socket I^4 is formed at back of valve box I, and in it are a rubber buffer i^6 and a metal disk i^7 against which latter the rounded end of pin I^2 bears. I^5 is the air escape pipe leading from branch i^2.

In Figs. 5 and 5^a I show a plug cock that may be used in place of the valve box I and valve c just described, the plug I^6 of cock being formed at end of spindle C while the three way box is secured in such a manner that it will not revolve, the bearing B^2 having lugs cast on it from which pins I^7 project and enter holes in the lugs cast on box. Branch i^8 is for the aerated water supply, branch i^9 for the escape of atmospheric air and branch i^{10} for supplying aerated water to and allow exit of air from bottle. A coiled spring I^8 is arranged upon a pin projecting through end of box to put the requisite tension upon the plug.

The operation of each head of the machine shown in Figs. 1 to 4^a is as follows: Aerated or soda water is supplied by main attached to branch i and the handle K, is placed at about the position indicated by dotted line k thus placing the spindle C so that friction roller C′, is clear of the path d' of arm D and the hole c' of valve c is not upon the hole i' of valve face and through which two holes the supply of aerated water must pass to siphon. The siphon is now placed in the machine its head passing into cup D^8 and its spout into socket H the coiled spring G meanwhile holding the arm D up and also allowing it to be depressed to place the siphon in position and retain it thereat after being so placed. Then the guard J^3 is swung down over the bottle. The handle K is now raised to the vertical position shown in the drawings and by so doing the friction roller C′ is put upon circular path d' of arm D and the small roller E^5 has pressed upon the lever F′ of siphon valve and opened it while also the port hole c' is upon port i' and port c^2, upon port i^5. Consequently the aerated water entering branch i flows through it and through ports and passages i'. c'. c^3. c^2 and i^5 to branch i^4 and from it to pipe H^6 through branch B^4, bend H′ and small tube H^2 to nozzle F^2 of siphon. The handle is left in its vertical position for a few seconds to allow as much as possible of the aerated or soda water to pass into the siphon

but it cannot as yet fill for the atmospheric air within must be first allowed to escape. The latter is accomplished by pushing the handle downward toward the right hand side of bottling head and thus cutting off the supply to bottle through port i' and placing port c' opposite the port i^3 and the port c^2 opposite the slotted port i^5 when the pressure within the siphon will force the atmospheric air therefrom through the passages and ports $H^2 H' B^4 H^6 I^4 i^5 c^2 c^3 c' i^3$ and i^2 to the escape pipe I^5. The atmospheric air having been expelled the handle K is returned to its vertical position and allowed to remain there until the siphon is filled with aerated water which passes thereto through the same passages and ports described for the first part of the filling operation. When the siphon is full the handle is pushed down toward the left hand side to about the position marked k and the friction roller C′ being now off the circular path the roller E^5 will by relieving its pressure from the lever F′ of siphon valve allow the latter to close and the guard J^3 is lifted and the filled siphon removed and replaced by an empty one. In working the two bottling heads the attendant first places a siphon in one head and while it is filling he places a siphon in the other head to also allow of its filling. Then he lowers the first handle to its position to allow the atmospheric air to escape immediately returning the handle to its filling position and afterward does the same with the second head. The first siphon being now filled it is removed and replaced with an empty one, and then the second being filled is removed and replaced with an empty one and the cycle of operations continued until the requisite quantity is filled.

To prevent as far as possible the attendant being hurt by a siphon bottle bursting by reason of the liquid pressure put in it I have the horn bar J^6 on the guard of such a length that the arm K′ is in front of it until after the air escape ports have been opened.

In Figs. 6 and 7 I show a modified form of bottling head having my improvements embodied in it and to allow of it siruping as well as filling with aerated water it is furnished with a sirup pump L. Also it will be understood that to obtain the best results two or more of these heads should be secured on a plate or column stand as shown in Figs. 1 and 2. In this machine I employ sliding piece M in place of the before mentioned arm D, said sliding piece being supported by friction rollers M′, running within guides M^2 secured to a bracket M^3 and such sliding piece carries the cap D^8 for siphon head, the roller E^5 for pressing on siphon valve lever F′ and the friction roller d^3 which is acted on by cam C^2 on spindle C while both the sliding piece and the before mentioned arm are held up by a coiled spring G. Sirup pump L has its up stroke imparted to it by a cam L′ on spindle C acting on a friction roller L^2 carried at end of an arm L^3 that is centered at L^4 to a bracket L^5 which latter together with post L^6 supports the pump, the down stroke of pump being as is usual in these machines obtained by aid of a coiled spring L^7. L^8 is a pipe connecting the branch piece N with sirup pump. The branch piece N and disk valve c shown in details in Figs. 9, 9^a, and 9^b are in this machine used solely for supplying sirup to the bottles and the position and form of the ports differ slightly from those shown in Figs. 3 and 4. In the sirup branch piece n is the branch to receive the supply from main and leading to port n'. n^2 is the branch to which pump pipe L^8 is connected said branch leading from port n^3. n^4 is a branch leading from port n^5 said branch being connected to pipe n^9 leading to branch B^4 immediately behind the siphon nozzle socket H. The disk valve c for the sirup has a segmental open slot c^8, in it as shown in Fig. 9^a. The aerated water three way disk valve I, is shown in detail in Figs. 8, 8^a and 8^b, i being the aerated water supply branch and i' the port leading from same. i^2 is the air escape branch and i^3 its port in valve face, i^4 branch leading to bottle and i^5 port in valve face from such branch. The disk valve c has the ports c' c^2 c^3 already described while said valve in this machine is supported at end of spindle O operated by handle O′. O^2 is a screwed gland having a coiled spring O^3, within it, to press upon back of valve c and keep it against the leather face I^3. In this machine means are provided for lifting the guard J^3 by means of a cam J^7 upon spindle C said cam acting on a lever J^8 centered at J^9 upon post J^{10} the outer end of lever being connected to a vertical rod J^{11} the upper end of which is attached to an eye J^{12} projecting from side of head plate J^2 of guard and which latter is hinged as before described. C^8 is a pin on spindle C to contact with shoulder C^4 and terminate the stroke of handle.

In the machine shown in Figs. 6 to 9^b the siphon bottle is placed in the head in precisely the same manner as that described for Figs. 1 and 2 while the supply of sirup is drawn into the pump L on the down stroke of its piston or when the handle K places the two ends of the segmental slot c^8 over the ports n' and n^3 to form a passage way between them and when such is done the sirup entering branch n passes through slot c^8 to port n^3, branch n^2 and pipe L^8 to pump and immediately the siphon is locked in position the slot c^8 has traveled with spindle so as to form a connecting passage between ports n^3 and n^5 and consequently by the up stroke of pump being produced by cam L′ passing under friction roller L^2 and forcing up pump piston the sirup is forced out therefrom through pipe L^8 to branch n^2 and from port n^3 to segmental slot c^8 and from it through port n^5, branch n^4, pipe n^9, branch B^4 and small tube H^2 (Fig. 1^a) to nozzle F^2 of siphon.

The necessary quantity of sirup having been injected the aerated water is now supplied through the disk valve *c* being so placed by handle O′ as to allow the supply entering branch *i* to pass from *i′* through *c′* c^3 c^2 i^5 i^4 B^4 and socket H to the nozzle of bottle as will be well understood by the operation of the similar disk valve of Figs. 1 and 2. To allow the atmospheric air to escape prior to the final filling disk valve *c* is turned to make a connection with its ports *c′* c^3 and c^2 between ports i^5 and i^3 so that the air may escape through branch i^2 when afterward valve *c* is again turned to its aerated water supply position to complete the filling of siphon and upon such being completed the supply is cut off and the siphon released and removed from machine and replaced with an empty one. The guard in this machine is lifted automatically by means of the cam J^7 on spindle and its connections J^8 J^{11} and J^{12} as before described.

In the bottling head shown in Fig. 10 the arm D is centered between lugs on the bracket M^3 and to support it and the bottle without the aid of a cam or roller acting on a curved arm or on a slide as before described. I provide a rod P that has a pin *p* at its upper end arranged in a slot d^4 formed in a lug on said arm D. The lower end of rod P is connected at *p′* to a treadle P′ centered at p^2 to a lug on sole plate and furnished with weighted back end p^3. Q is a strong coiled spring held in position by a stud *q* and bearing at its top against the under side of treadle lever. The purpose of spring Q is to hold arm D up when supporting a siphon bottle while being filled, the purpose of the treadle being to allow the attendant by placing his foot thereon to force down the spring Q and allow the siphon bottle to be removed, the arm D having only to strain the weaker coiled spring G. *m* is a stop on bracket M^3 to limit the upward travel of arm D. Valve box I is precisely similar to that shown in Figs. 8, 8^a, and 8^b hereinbefore described and explained.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent in machinery for siruping and filling siphon-bottles with aerated water or in machinery for filling siphon-bottles, with aerated water or soda-water, is—

1. In a machine for filling siphons, the combination with a shaft provided with a cam, of a support movable by said cam and carrying a cup for the siphon head and an arm for opening the siphon valve, substantially as described.

2. In a machine for filling siphons, the combination with a shaft provided with a cam, of a support movable by said cam obliquely to the axis of the siphon, and carrying a cup for the siphon head and an arm for opening the siphon valve, substantially as described.

3. In a machine for filling siphons, the combination with a shaft provided with a cam, of a lever hinged at one side of said shaft and in contact with said cam, and yielding devices carried on said lever, for supporting the head of the siphon, and opening the siphon valve, substantially as described.

4. In a machine for filling siphons, the combination with a movable support, of a spring for holding it yieldingly raised, a cup for the siphon head and an arm for opening the valve, both carried on said support, and each provided with an independent spring to render it yielding and means for forcibly raising the support, substantially as described.

5. In a machine for filling siphons, the combination with a movable support, of tubes carried thereby, a stem in each tube, a coiled spring in each tube acting against the stem, a cup on one of said stems and a roller on the other stem, substantially as described.

6. In a machine for filling siphons, the combination with a movable support, to receive the head of the siphon, of a cam shaft to actuate said support, and a fluid controlling valve operated by the same movement of the shaft, substantially as described.

7. In a machine for filling siphons, the combination with a fixed filling nozzle, and a movable support for the head of the siphon, of a cam shaft for actuating said support, a stationary valve box at one end of said shaft, suitable connections between the filling nozzle and the valve box, and a cooperating valve face on the cam shaft, substantially as described.

8. In a machine for filling siphons, the combination with a filling-valve operating handle, and a bottle guard having a horn upon it, of an arm secured to said handle and adapted to pass in front of and be arrested by said horn, the length of the horn being such that in the reverse movement of the handle it will close the valve before the arm passes from in front of the horn, substantially as described.

9. In a machine for filling siphons, the combination with a suitable standard, of a bottle guard hinged thereon, so as to move vertically, a counterweight for said guard, a valve operating shaft, carrying a cam, and connecting devices whereby said cam lowers said guard, substantially as described.

In testimony whereof I affix my signature in in presence of two witnesses.

THOMAS FERGUSON.

Witnesses:
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BEDLINGTON BODYCOMB.