(No Model.)

G. FERRAND & G. GÖTTL.

SIPHON FOR AERATED LIQUIDS.

No. 490,742. Patented Jan. 31, 1893.

Fig. 1.

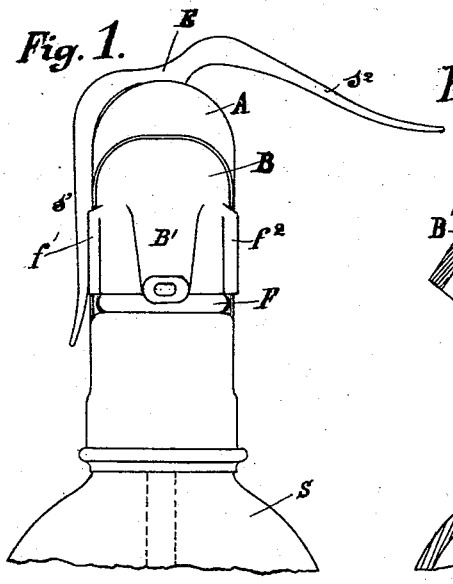


Fig. 2.

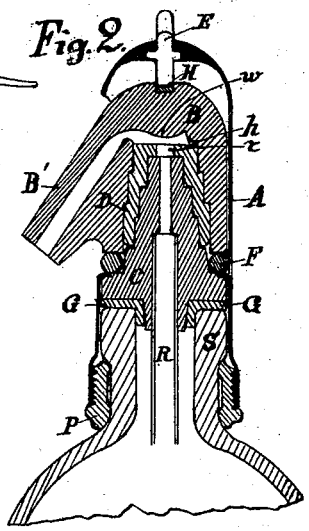


Fig. 3.

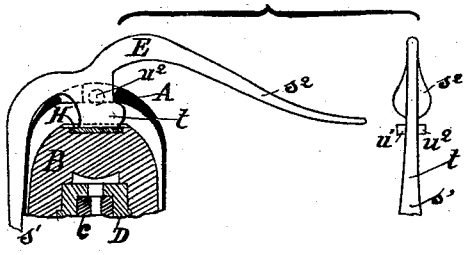


Fig. 4.

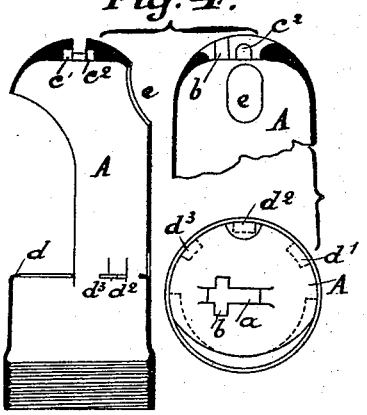


Fig. 5.

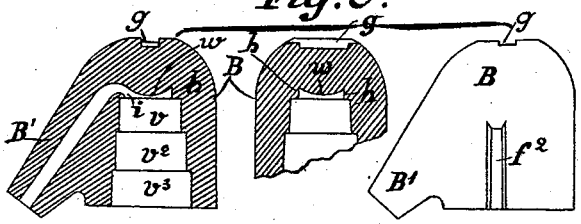
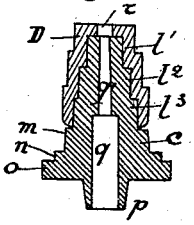


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGES FERRAND, OF BRUSSELS, BELGIUM, AND GUSTAV GÖTTL, OF CARLSBAD, AUSTRIA-HUNGARY.

SIPHON FOR AERATED LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 490,742, dated January 31, 1893.

Application filed July 18, 1892. Serial No. 440,334. (No model.) Patented in Belgium January 26, 1888, No. 80,396; in Germany April 30, 1888, No. 45,592; in France July 23, 1888, No. 192,002; in England July 25, 1888, No. 10,769; in Austria-Hungary September 15, 1888, No. 1,611 and No. 6,465, and in Spain October 31, 1888, No. 8,851.

To all whom it may concern:

Be it known that we, GEORGES FERRAND, a subject of the King of Belgium, residing at Brussels, in the Kingdom of Belgium, and GUSTAV GÖTTL, a subject of the Emperor of Austria-Hungary and King of Bohemia, residing at Carlsbad, Bohemia, Austria-Hungary, have invented certain new and useful Improvements in Siphons for Aerated Liquids; (for which we have obtained Letters Patent in Belgium dated January 26, 1888, No. 80,396; in Germany dated April 30, 1888, No. 45,592; in France dated July 23, 1888, No. 192,002; in England dated July 25, 1888, No. 10,769; in Spain dated October 31, 1888, No. 8,851; and in Austria-Hungary dated September 15, 1888, No. 1,611 and No. 6,465,) of which the following is a specification.

This invention relates to siphon heads or appliances for delivering aerated or gaseous liquids from bottles containing the same, the object being chiefly to construct a siphon head which secures durability and absence of leakage, even with high pressure, and also to prevent the contact of the liquid with metal.

In the accompanying drawings, Figure 1 is a front elevation of a siphon head constructed according to our invention. Fig. 2 is a sectional side view of the head. Fig. 3 shows in section and elevation the arrangement for opening and shutting the valve. Fig. 4 shows, in vertical sections and plan, the outer casing of the parts of the head. Fig. 5 shows the inner casing of the valve itself in vertical sections and elevation, and Fig. 6 is a vertical section of the internal parts of the valve.

As illustrated by the accompanying drawings the improved siphon head chiefly comprises a cap B, provided with a lateral discharge pipe B′ and made of glass, porcelain, stoneware, or other suitable equivalent material; a conical capsule D, of india-rubber over which the cap is placed, and which in its turn fits over a cone C of porcelain, in the lower cylindrical opening of which is set the ascension pipe R by means of shellac, wax, or the like, and which is fixed upon the usual siphon bottle S having a packing ring G interposed. The whole of the parts are held together by a stamped, cast or drawn casing A of aluminium, brass, cast iron, steel, or other suitable substance, which is screwed onto the bottle or flask by means of the usual screw ring P. In the upper part of this casing there is a cross shaped slot, through which a lever E with its fulcrum enters a groove or depression in the cap B underneath the top of the casing.

Between the cap B and the cone C is inserted an india-rubber ring F. In the groove or depression g in the head of the capsule B there is inserted a metal plate about two millimeters thick, acting as a regulator as hereinafter described.

The actual closing parts are, as shown in the drawings, neither screwed nor riveted, they mutually support each other and are only moved by the elasticity of the india-rubber and the pressure of the lever and of the water. In order to obtain an absolutely tight closure which shall act quite surely with every, even the least, pressure of gas and allow of the withdrawal of the aerated water to the last drop, in almost a complete manner, and at the same time to effect this object with as little wearing out as possible of the parts themselves the latter may suitably be arranged as follows:—The cone C Figs. 2 and 6 of porcelain, glass, or earthenware, with its packing ring G, set upon the bottle S, is made up of three cylinders l' l^2, l^3, of successively increasing diameter conically arranged from above downward and of equal height, 1^3 is in contact with a supported conical piece m which rests upon the plate o, provided with a circular rabbet n, and this plate is continued downward by a small conical support p. In the inside of the cone C at its lower part is a cylindrical socket q for the reception of the ascension pipe R. This socket extends approximately to the middle of the cone, and its termination limits the entrance of the ascension pipe; from this point a somewhat smaller bore q' of a slightly conical form is continued through the cone. The conical support p projects into the mouth of the bottle, and insures the centering of the whole of the closing mechanism with reference to the bottle. The cone

piece m serves to support the lower edge of the india-rubber cone D, to prevent the latter from coming out when the siphon bottle is filled and closed, and it also serves to guide the the cap B. The plate o with the circular rabbet n serves as a hold for the incurved portions (more particularly described hereinafter) of the casing A, by means of which portions the cone C is tightly pressed on to the packing ring G, that is to say, on to the bottle.

On the porcelain cone C is drawn the elastic cone D, of white, black or red Para rubber (Figs. 2 and 6) its inner diameter being somewhat smaller than the outer diameter of the porcelain cone, and its outer diameter being at the same time in a similar proportion larger than that of the inner conical hollow in the cap B, to the extent of about one tenth of a millimeter upon the whole diameter. As is shown in Figs. 2 and 6 the india-rubber cone D is also constructed with three steps, inside and out, and tapered off at the edge. In the interior it forms the graduated hollow receiver for the three cylinders of which the cone C is made up, but its lowest stage is about one millimeter less in height than the cylinder l^3 of the cone C which corresponds to it, the object of this being to afford room for the play of the india-rubber when the connection with the flask is made, and to avoid jamming of the cone and cap. It is closed above with the exception of a small hole r in the center, which corresponds with the upper hollow q' of the cone C. The india-rubber cone D cuts off absolutely the connection between the cap B and the cone C and completes the non-metallic passage for the water between the lower end of the ascension pipe and the outlet at the nozzle B′.

The space inside the porcelain cap B (Figs. 1, 2, 3 and 5) which rests upon the india-rubber cone D is made up of the three cylindrical spaces v', v^2, v^3, slightly conical from above downward (Fig. 5). The top of the hollow is as shown in Figs. 2, 3 and 5, somewhat convex at w for the sake of rapid division of the water, it is moreover furnished with a ring shaped depression h which is interrupted by the outlet i corresponding to the nozzle in front. This depression h effects the self-acting opening or retreat of the cap independently of the pressure of gas, and keeps the siphon always open when not in action, whereby the emptying of the last portion of the contents of the siphon is effected, and also the india-rubber cone is saved from wearing out too rapidly. The spout B′ of the cap forms the outlet.

The cap is cylindrical outside, rounded above, and provided with the spout B′ previously mentioned. Its upper part is provided with a groove g in which fits a regulating plate H of brass or any hard metal, the thickness of the plate varying according to the amount of the cut off and the desired force of the outflowing stream. This regulating plate H not only protects the cap from the direct pressure of the lower eccentric portion of the lever E and lessens the friction of the latter, but has also the purpose of regulating, when used of different strengths, the rate of outflow of the water as well as the degree of tightness of the whole closing mechanism, and also allows the india-rubber cone when it has been long used to have an efficacious pressure exerted upon it until it becomes nearly worn out.

On the right and left of the cap are provided rib-shaped projections f' and f^2 which prevent the cap from rotating in the casing A. On the incurved edge of the latter between the cone C and the cap B is interposed a ring F of white, black, or red Para rubber of circular section, the inner smaller diameter of which is somewhat less than the middle diameter of the cone piece m of the cone. The diameter of its circular cross section is equal to the distance between the edge of the cap and the incurved portion of the casing. This ring F is intended to check the back play of the cap, caused by the action of the cone D and recess h by its elasticity, when the siphon is opened and in addition to prevent the entrance of dust and dirt between the cone and the cap. All the parts are held together by the previously mentioned casing A (Figs. 1, 2 and 4) of aluminium, brass, or the like, which casing ends above in a rounded head, and has its front side cut away nearly to the middle for the admission of the cap B. On the under part of this opening the plate which forms the casing is curved inward in a semicircular form at d and at the same height the plate on the hinder portion of the casing is cut through at three or several places and the resulting flaps d', d^2, d^3 are curved inward. The edge d and the flaps d', d^2, d^3, are intended to press the cone C upon the packing ring G and the latter again upon the neck of the bottle, when the casing A is drawn upon the screw P, and to draw the cone down thus giving stability to the casing or cone and the whole apparatus.

An opening E provided in the back part of the head of the casing serves, when the bottle is being filled, to allow of the passage of the steadying support of the filling apparatus, which might otherwise press against the cap, and so prevents the siphon from receding when the month-piece of the filling apparatus presses against the spout B′. The lever E (Fig. 3) which has been previously referred to with its centrally placed eccentric piece t and pins u', u^2, passes through a cross-shaped opening a, b, provided in the upper portion of the head. On the inner surface of the head of the casing exactly in the middle are depressed bearings c', c^2, which serve to receive the pins u', u^2 on which the whole lever E moves. The latter is a double lever of a form so chosen that when mounted in position every time one arm of the lever comes into contact with the casing the movement is limited, and the other arm is ready for open-

ing or closing the siphon. The inner curve of the two arms s', s^2, corresponds exactly to that of the outer surface of the casing. The eccentric piece t (Fig. 3) comes into action when the siphon is being closed, and presses down the regulating plate H until the motion of the lever arm s^2 having reached its full extent said eccentric piece t will be situated nearly above the center toward the left, whereby the return motion of the lever arm which has descended is prevented. The pins u', u^2 which rest in the bearings c', c^2 in conjunction with the eccentric piece t which moves in the longitudinal slot a effect the accurately firm and straight guiding of the lever in the casing. After the separate parts have been properly put together and are firmly connected to the bottle by the operation of the annular screw P, the filling of the siphon bottle may be effected in the usual way by driving the water in through the spout B', the siphon bottle being turned upside down. The closure of the siphon is then effected by pressing down the right arm s^2 of the lever, whereupon the eccentric presses upon the bearing plate H, this again presses down the cap B, the curved inner surface of which is then driven against the opening r in the india-rubber cone D, covers the latter, and thus prevents the outflow; the throw of the arm s^2 being now at its limit the eccentric piece t stands somewhat laterally above the vertical line, whereby the closure is insured. The several stages in the india-rubber cone are at the same time pressed firmly against the internal graduations of the cap B, and the porcelain cone C so that the closure is always absolutely certain, while the pressure exerted by the eccentric and the gas not only acts upon the upper part of the outlet but is distributed over the whole of the india-rubber cone. The india-rubber ring F is likewise compressed at the same time by the lower part of the cap. When the siphon is to be opened the left lever arm s' is pressed down, the eccentric is thereby shifted to the right, as shown in Fig. 3, and thus permits the retreat of the cap, brought about by the elasticity of D and F, whereupon the annular groove h in the head of the cap raises the latter automatically from the india-rubber to a sufficient extent, to allow the proper outflow for the stream of liquid as it issues, this stream being controlled in its force and speed by the plate H. The path for the issuing water is thus nearly a straight one so that the carbonic acid, which is only mechanically mixed, is not as in siphons, as heretofore constructed, disengaged by contact with sharp angles and so on. In its whole course the liquid does not come into contact with any metal, which is of considerable importance from a sanitary and hygienic point of view, the liquid has also a more agreeable taste in consequence.

By means of the arrangement described the ordinary siphon bottles may be made use of; the closing mechanism may however, without departing from the fundamental principle of the invention, be so arranged as that for example the glass or porcelain cone C may in part be made in one piece with the flask, while the upper part carries the ascension pipe, or that the cone may be inserted in the widened neck of the flask instead of being set upon the latter. Moreover, the lever arrangement E for opening and closing the siphon may be replaced by a screw mechanism, and the casing A may be replaced by a simple stirrup, the lever arrangement above described, and the casing, are however to be preferred as being more advantageous.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. The combination of a stepped cone adapted to be affixed to a bottle or the like, a stepped cone shaped sleeve washer adapted to be placed around said cone, an outlet piece having a stepped cone shaped recess placed around the cone shaped washer, and means for compressing and releasing the outlet-piece.

2. The combination of a cone C, a cone shaped washer D placed thereon, an outlet piece B having a cone recess placed upon said washer, a casing A, a lever E having bearings in the casing and adapted to compress and release said outlet piece.

3. The combination of a stopper-cone having a series of annular steps thereon, a flexible cone washer having a series of annular steps thereon fitting over and concentric with the steps on the stopper, and a cap outlet fitting over said washer, having a valve-piece adapted to engage said washer.

4. The combination of a conical stepped stopper C, a conical stepped washer fitting over said stopper, a cap outlet having conical stepped surfaces fitting over said washer and provided with a valve seat and outlet, and a casing fitting over said cap outlet having a lever journaled therein at its top provided with a cam.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

GEORGES FERRAND.
GUSTAV GÖTTL.

Witnesses to the signature of G. Ferrand:
GEORGE BEDE,
GREGORY PHELAN.

Witnesses to the signature of Gustav Göttl:
WILHELM MOVISHY,
GEORGES SCHMAUS.