J. B. E. DELSUC.

WATER TAP OR FAUCET.

APPLICATION FILED APR. 26, 1910.

1,047,763. Patented Dec. 17, 1912.

Fig. 1.

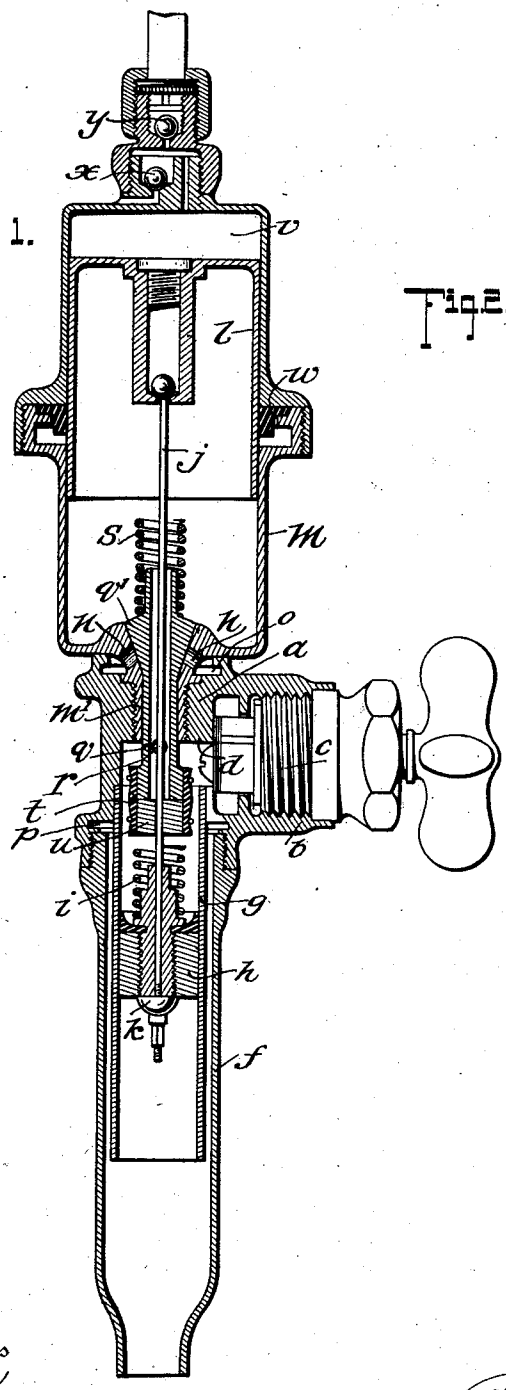
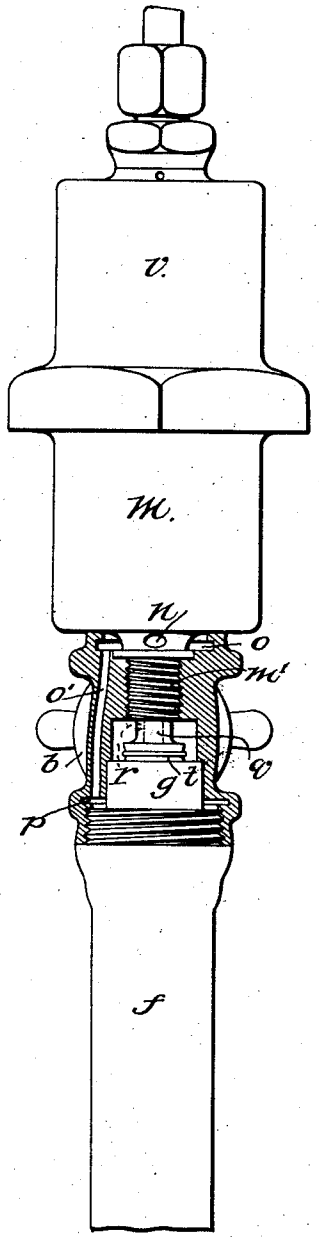


Fig. 2.



Witnesses

C. H. Wagner.

N. M. Brookes.

Inventor

Jean B. E. Delsuc,

By Peters Robb & Robb

Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JEAN BAPTISTE EMILE DELSUC, OF PARIS, FRANCE.

WATER TAP OR FAUCET.

1,047,763. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed April 26, 1910. Serial No. 557,739.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE EMILE DELSUC, a citizen of the Republic of France, residing at Paris, in the Republic of France, have invented certain new and useful Improvements in Water Taps or Faucets, of which the following is a specification.

This invention has for its object a constructive arrangement of a tap, the principle of which is already known, and which is adapted to be used either as an ordinary tap, or as a pump and air compressor, the air thus compressed being more particularly intended for raising liquids, for instance beer in saloons, but capable of being utilized for any other purpose where air under pressure is used. The part of the tap which forms the pump comprises a differential piston to which the hydraulic pressure communicates a reciprocatory movement owing to the use of a double valve of peculiar form and two suitably arranged springs. This tap is distinguished substantially by the combination as a whole of very important constructive arrangements enabling it to be easily made and its good working and easy maintenance insured.

In the accompanying drawings:—the figure is a longitudinal axial section of the preferred form of construction of the tap which forms the object of this invention.

The apparatus comprises a member *a* provided with a water supply pipe *b*, in which a plug *c* moves which closes or opens the admission aperture *d*. This water admission serves for operating the apparatus as a pump. An external pipe *f* with which a second water supply pipe directly or indirectly connects is attached to the member *a*. In this pipe *f* a cylinder *g* is arranged in which is a piston *h* surmounted by a spring *i* and connected by a rod *j* (which carries a nut *k* and works only by traction) to a piston of larger diameter *l*. This piston works in a cylinder *m* attached to the part *a* and adapted to communicate by holes *n* with a chamber *o* which communicates through a by-pass or duct with another chamber *p* and from thence with the outside by the pipe *f*. A double valve formed by a hollow tube *q*, the wall of which is perforated at *r* and which is provided with a head or conical plug *q'* surmounted by a spring *s*, works in the lower part *m'* of the large cylinder *m*. A piece *u* bored to allow the rod *j* to pass through it with slight friction, is elastically and tightly connected with the lower part of this hollow tube *q* by a piece of india rubber piping *t*. The upper extremity of the large cylinder *m* is closed by a screwed cap *v* and a packing or washer *w*. This cap communicates by a ball valve *x* with the external air, and by a ball-retaining valve *y* with the pipe for compressing the air. The retaining valve *y* is placed just above the suction valve *x*. The cap may thus be completely turned on the lathe, which would not be possible with juxtaposed valves.

The action is as follows:—When the valve *c* is open to cause the apparatus to act as a pump, water under pressure enters at *d*, acts on the little lower piston *h*, then passes through the hole *r* and the pipe *q* of the valve into the large cylinder *m* and acts on the piston *l*. The latter being larger than the piston *h*, in rising it draws the piston *h* by means of the rod *j*, and this latter piston compresses the spring *i* against the part *u* until the upwardly acting pressure thus transmitted to the valve, exceeds the downwardly exerted pressure of the water of the cylinder *m* on the conical plug *q'* of this valve. The latter then lifts and the spring *i* throws it upward. Immediately the lower part of the valve adheres on its seat and remains held there by the pressure of the water, so that the aperture *r* is closed. As pressure is no longer transmitted to the large cylinder and the latter communicates by the holes *n* and chambers *o* and *p* with the outside air, the whole of the pistons re-descend under the pressure exerted by the water on the upper end of the piston *h*. In the course of the descent the piston *l* compresses the spring *s*, which effects the closing of the valve. The operation then continues in the manner described and so-forth. The movement of the piston *l* in the upper cylinder is used for pumping air by the valves *x* and *y*.

It will be readily seen that the rod *j* has only for its effect to draw one of the two pistons under the action of the other. The result is that it works constantly by traction, so that it may be of very small diameter, less, for instance, than 2 millimeters. This allows of there being obtained between the piece *u* of the valve which the rod passes through and the rod itself, a passage free of friction with a very small passage of water.

The rod *j* is not fixed to the pistons. The latter may on the contrary slide on it, so that if the pressure of the water ceases, positions which are relatively different to those which they occupy during the working of the apparatus may be given to the pistons. When it is desired to examine the upper piston and its packing, this arrangement enables the piston to be displaced without risking bending the rod. The effective length of this rod may also be very easily diminished or increased by means of the nut *k* so as to regulate the apparatus, in order to give it a maximum air pressure. In fact the downward pressure which is exerted on the valve is proportionate to the water pressure beneath the large piston. The water pressure itself is also in direct proportion to the pressure at which the air is compressed at the end of the stroke, therefore the action on the valve is itself in direct proportion to the said air pressure. As, however, the compression of the lower spring *i* may serve as a measure of the downward action exerted on the valve, the result is that the compression of the spring may also serve as a measure of the air pressure hereinbefore indicated. On the other hand, the upper piston will approach more or less the end of the pump cylinder, according as the compression of the spring is greater or less. It is thus evident that the length of the rod may be regulated in such a way that when the air is compressed at a given pressure, the upper piston contacts with the end of the pump cylinder before the valve is lifted. At this moment the apparatus is stopped.

As has been shown, the valve is in two parts *q* and *u* connected by the piece of india rubber piping *t*. The reason of this arrangement is the following:—It is important that the hole bored in *u* for the passage of the rod *j* shall be as exact as possible. It is, however, extremely difficult in practice to obtain this perfect centering of the hole, and with valves in a single piece there are great risks either of having friction on the rod in the bottom of the valve sufficient to prevent the valve working, or, of the valve not dropping on to its seat. The elastic tight connection hereinbefore described allows sufficient play to prevent these disadvantages.

The upper conical part *q'* of the valve bearing on a conical seat has a double closing action. It interrupts both the communication between the large cylinder *m* and the outside, and between the small cylinder *g* and the outside. If in fact the adjustment of the valve tube in its lodgment is relied upon for producing the separation between the small cylinder *g* and the outside, careful fitting is necessary and wear will rapidly destroy the action. The arrangement shown however allows of more play being given to the valve tube and wear can only improve the closing. This valve thus constitutes a triple means of closing, viz. at the top between the large and the small cylinders, on the one hand, and the outside on the other hand, and at the bottom between the small and the large cylinder by the hole *r*. A slightly countersunk part in the lower extremity of the part *m'* receives the corresponding surface of the valve.

The piston *l* is of the type called a plunger piston, which allows of the use of a packing formed by a shaped leather or an india rubber washer of the profile indicated, which the pressure of the water presses on the piston and which is maintained as shown. It is evident that this packing may be very easily inspected and changed, an important point seeing that the fouling and wear of this packing must be avoided, in order that the apparatus may properly work.

I declare that what I claim is:—

The combination with a cylinder, of a smaller cylinder, pistons slidably mounted therein, means adjustably connecting said pistons, a tubular member slidably mounted on said means for opening and cutting off communication between said cylinders, said tubular member comprising a conical portion, the body of said tubular member being provided with an opening, and a member of smaller bore than said tubular member tightly joined to the latter, spring means carried by one of said pistons adapted to operate said tubular member at a greater speed than that of said pistons, spring means carried by said conical portion adapted to be operated by the other of said pistons for reversing the movement of said tubular member, and an inlet opening provided intermediate the pistons through which is adapted to pass the fluid for operating the pistons in either direction, as set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JEAN BAPTISTE EMILE DELSUC.

Witnesses:
ANTONIN MONTELLHET,
H. C. COXE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."