No. 817,040. PATENTED APR. 3, 1906.

F. C. BUCK.

VALVE AND COCK.

APPLICATION FILED MAY 13, 1905.

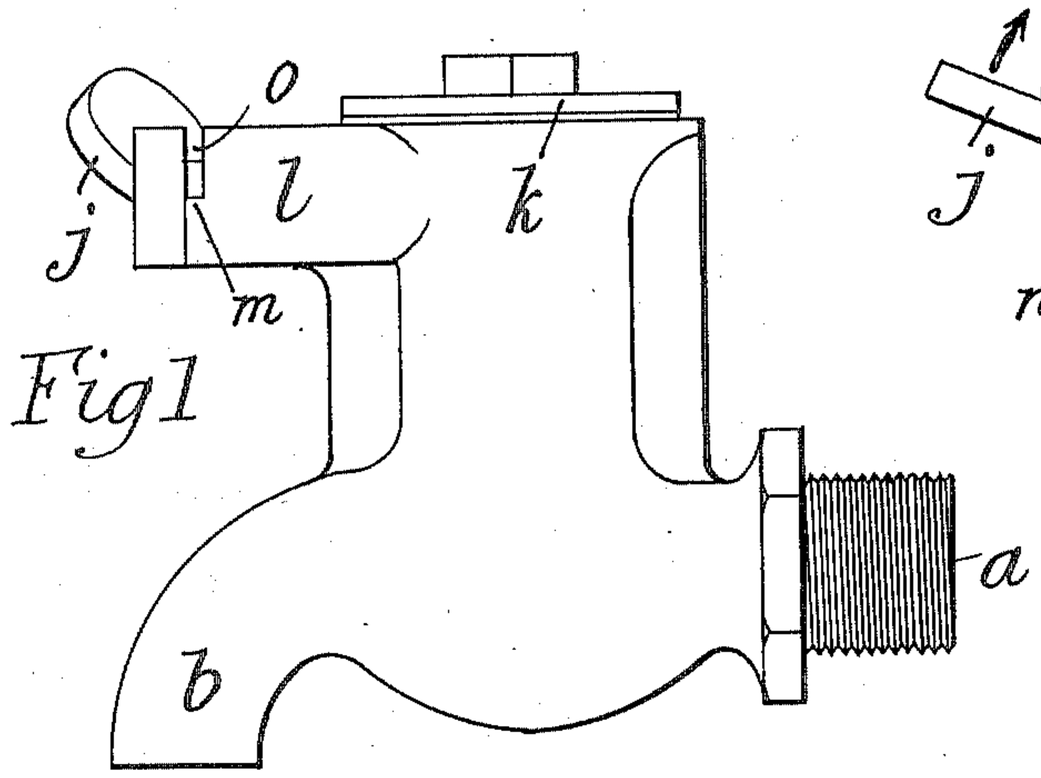

Fig 1

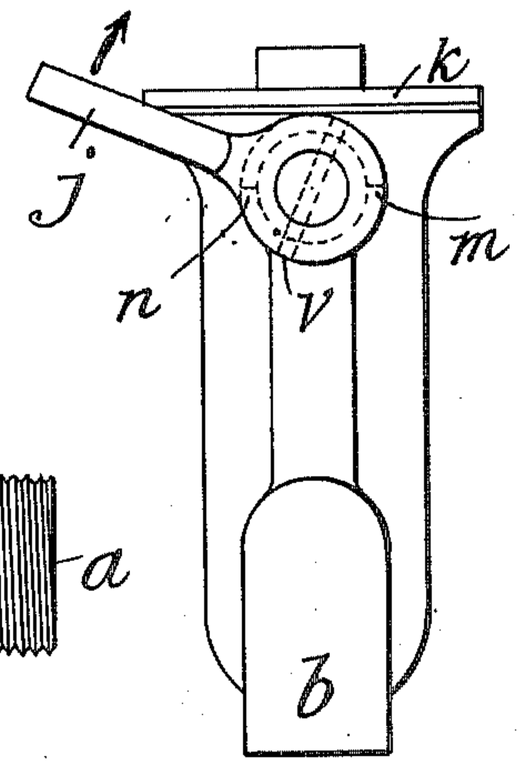

Fig 3

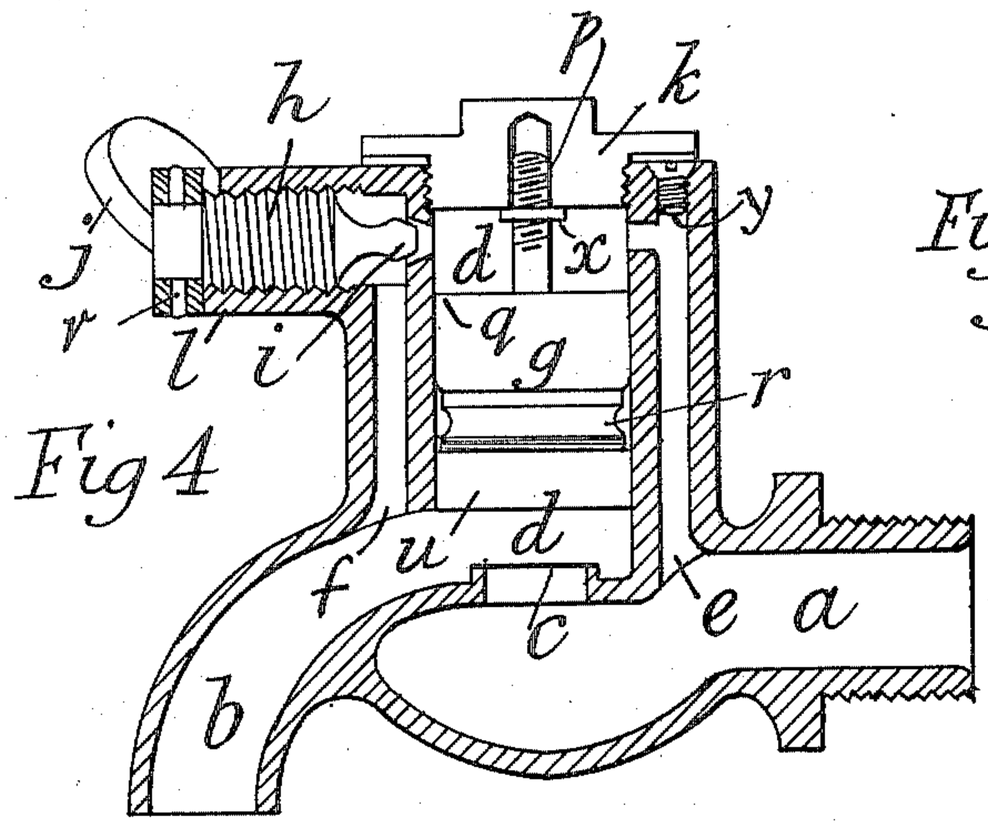

Fig 4

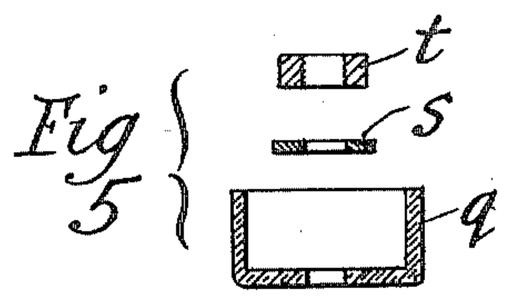

Fig 5

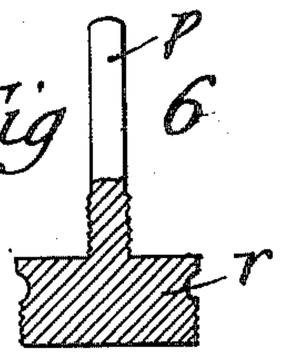

Fig 6

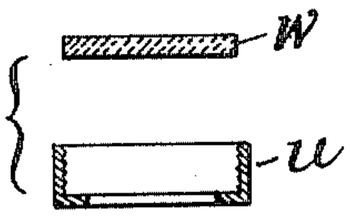

Fig 7

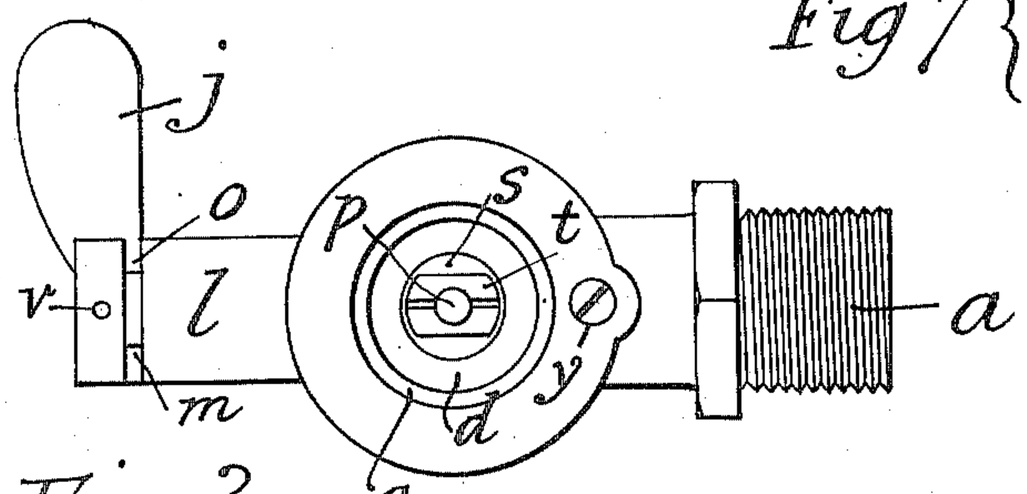

Fig 2

Witnesses.
H. May. Durall.
Geo. A. Bryce.

Frank Croom Buck.
Inventor.

By Wilkinson & Fisher,
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK CROOM BUCK, OF PRAHRAN, VICTORIA, AUSTRALIA.

VALVE AND COCK.

No. 817,040. Specification of Letters Patent. Patented April 3, 1906.

Application filed May 13, 1905. Serial No. 260,230.

To all whom it may concern:

Be it known that I, FRANK CROOM BUCK, a subject of the King of Great Britain and Ireland, &c., residing at Prahran, in the State of Victoria, Commonwealth of Australia, have invented certain new and useful Improvements in Valves and Cocks; and I do hereby 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.

These improvements, which are applicable to various kinds of cocks and valves, possess the advantages of conducing to long life of the wearing parts, of allowing an unobstructed flow past the valve-seat, of effecting a tight closure of the valve upon its seat by the pressure of the fluid itself, of admitting of rapid and easy adjustment of the operating handle, lever, or plug, and some other advantages which will in due course be apparent.

The main valve of my device is of the variety adapted to lift by pressure from its inlet side, and the chamber into which it lifts or in which it moves (hereinafter called the "valve-chamber") is provided with a by-pass within the casing connecting with the fluid-passage or tubing at each side of the valve-seat. The by-pass is conveniently made in two distinct or disconnected parts, one part called the "feed," or "inlet" by-pass, being open at all times to the main inlet of the fluid-supply, so as to keep the valve-chamber full of fluid, and the other part or discharge by-pass being normally closed by a plug, spindle, or other easily-operated subsidiary-valve device. As soon as the plug (of comparatively small diameter with a conical or needle valve or other suitable by-pass-closing device) opens water from the aforesaid valve-chamber will escape through the discharge by-pass, and the pressure in that chamber on the lift-valve being thus lessened the valve will rise clear of its seat by the pressure beneath of the main supply. Once the lift-valve opens any subsequent increase of the fluid-pressure from the main inlet side will tend to further open it. The extent of the rise of the valve is, if desired, regulated by means of an adjustment on its spindle or by any adjustment above said valve limiting its rise or by equivalent means. As soon as the outlet by-pass valve is slightly opened fluid will begin escaping from the cock, and the rate of escape will increase as the opening is enlarged and being largely increased when the main valve opens.

Before proceeding to mention the further details of the construction reference will be made to the accompanying drawings, in which a simple form of the invention is illustrated by way of example, for it will readily be understood that sundry variations may be made while keeping within the scope of the invention.

Figure 1 shows a cock in side elevation; Fig. 2, a plan view of the parts in Fig. 1 with the valve-chamber cap removed; Fig. 3, a front elevation, and Fig. 4 the cock, partly in vertical middle section, and Figs. 5 to 7 show in vertical middle section valve parts or adjuncts, which when assembled have functions hereinafter explained.

In the drawings, *a* shows the inlet, and *b* the outlet, passages of the cock or tubing with a valve-opening having seat *c* shown shouldered at the base of a valve-chamber *d* of larger diameter than said opening. The inlet-by-pass passage is marked *e* and the outlet one *f*, both communicating with chamber *d*, in which the assemblage of valve parts is located and marked *g*. Communication through the discharge by-pass between chamber *d* and outlet *b* is opened or cut off by any suitable plug *h* with a small valve *i* and a handle *j*.

In Fig. 4 the small valve *i*, controlling by-pass *f*, and the main valve *g* are both shown raised above their seats, so that fluid can then flow through all the passages *a* to *f*, and plug *h* is shown screwed in a casing *l* and with coned valve *i*. *m* and *n* are side stops on casing *l*, limiting the travel of a projection *o* on the handle *j*, the modes of arranging and positions of which may be obviously varied in many ways.

k shows any suitable closure for the valve-chamber *d*, as a screw-cap with washer, the cap being in some cases recessed on the inner side, as shown.

The valve-stem spindle *p* carries a cupped washer *q*, of leather, rubber, or similarly suitable material, the pressure of the fluid in the valve-chamber *d* pressing the cup-rim closely against the valve-chamber wall, but when that pressure is relieved the cupped washer readily slips upward with the rest of the valve yielding to greater pressure below. The washer-base is between suitable supports, as a body, flange, or disk *r*, and washer *s* held

on by nut *t*, screwed on the spindle *p*, into which is inserted a disk or facing *w*, of rubber or suitable material, to act as a valve-face protected by an outer rim of metal or other strong material. *u* shows an apertured cap suitable for this purpose, adapted to screw or fasten to body *r*.

The operating-handle is best made so that at each end of its stroke it is not liable to move further by gravity, but rests or has a shoulder that rests upon a stop, or its valve end tightens on its seat. The handle *j* may sweep the upper part of a circle in its travel and have the stop or stops *m n* at opposite sides of a vertical diameter thereof.

The by-pass passages are located so that they may be easily cleaned from time to time. Thus passage *e* has ordinarily a removable plug or stopping *y*, and as the invention is applicable to other fluids as well as to water modifications or minor details to suit the fluid are used as required. In some cases instead of rubber or other such material to rest on the valve-seat there may be any other well-known valve-seating, such as a metal cone, or a ball-valve or other suitable variety known in the art may be used.

v shows a pin fastening the head of handle *j* to the plug *l*, and the arrow in Fig. 3 shows the direction of movement whereby to cut off the flow by causing valve *i*, and thereby valve *g*, to close. In some cases a small stop-nut *x* is screwed on stem *p* to limit the rise of the main valve; in others the recess in cap *k* has its depth regulated to suit. The recess acts as a guide, but in its absence some other stop is easily provided, it being kept in view that the by-pass ports of chamber *d* must be protected from closure by valve *g*. Their location is a means serving this end in some cases.

Various parts and minor details shown are in some cases omitted, and there are other obvious modifications practicable while yet retaining some feature of value pertaining to my invention.

What I do claim as my invention, and desire to secure by Letters Patent of the United States, is—

A cock or faucet provided with a casing, having a central valve-chamber, an inlet and an outlet therefor, a cap fitting in said chamber, a by-pass formed in the wall of said casing, the lower portion of said by-pass communicating with said inlet and the upper portion communicating with said valve-chamber, a supplemental cap fitting in said inlet by-pass, said valve-chamber cap having a flange adapted to lap over said supplemental cap, when the latter is inserted in said inlet by-pass, a second by-pass formed in the wall of said casing, the lower portion of which communicates with said outlet, and the upper portion of which communicates with said valve-chamber, the mouths of the upper portions of both the inlet and outlet by-passes, communicating with the valve-chamber, being disposed opposite one another, in combination with a valve operating in said valve-chamber between said inlet and outlet, and an auxiliary valve controlling said outlet by-pass substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRANK CROOM BUCK.

Witnesses:

GEORGE G. TURRI,

ANTHONY J. CALLINAN.