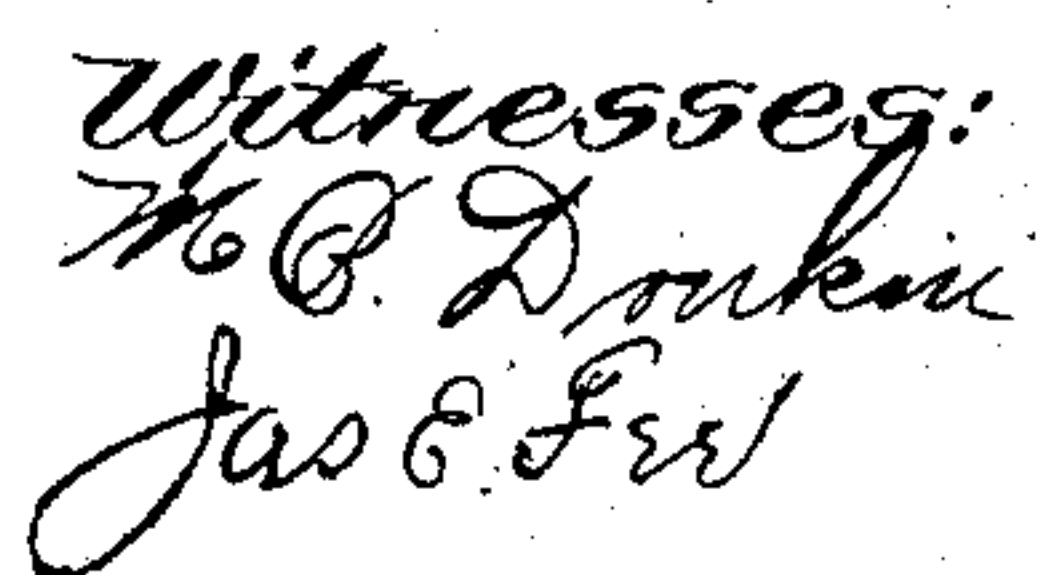


973,816.

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UNITED STATES PATENT OFFICE.

BENTON C. ROWELL, OF CHICAGO, ILLINOIS.

APPARATUS FOR CONVEYING LIQUIDS UNDER PRESSURE.

973,816.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BENTON C. ROWELL, of Chicago, in the county of Cook and State of Illinois, have invented an Apparatus for
5 Conveying Liquid Under Pressure, of which the following is a specification.

The object of my invention is to provide an apparatus for conveying liquid from a source of supply to a point of delivery, such an apparatus, for example, as is used in delivering beer and like beverages, and my improved apparatus comprises a storage vessel or receptacle; a delivery conduit leading therefrom; a source of pressure connected with the receptacle for delivering the liquid; means connecting a source of equal pressure with the delivery conduit near the upper end thereof; and means to control this connection.

20 A feature of my invention consists in having the pressure conduit above referred to of relatively small capacity so as to regulate and control the movement of the liquid in the delivery conduit and prevent undue disturbance of the liquid while being returned to the package.

Another feature of my invention consists in providing means to exhaust the delivery conduit in a regulated fashion when the liquid is first being elevated therein so as to prevent undue or undesirable disturbance of the liquid at this time.

35 An important feature of my invention is the means for controlling the flow of liquid which means also controls the application of pressure to return the liquid to the source.

Other features are described below:

40 In the drawings: Figure 1 is a diagram showing an apparatus embodying my invention. Fig. 2 is an elevation partly in section of the improved faucet hereinafter described for use in that form of my invention shown in Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 4 is a section on line 4—4 of Fig. 2. Fig. 5 is a section on line 5—5 of Fig. 2. Figs. 6 and 7 are details hereinafter described.

50 A is a tank holding compressed air or the like and constituting a source of pressure which is connected by a conduit a with a vessel A' for the liquid and this receptacle may be the usual keg or package. Leading from vessel A' is a delivery conduit a' connected with a faucet A^2 which is threaded to receive a nut a^2 by which the faucet is clamped to the bar fixture or the like X.

Mounted on faucet A^2 is a sleeve A^3 which has a double branch pipe a^3 and passages a^4 leading therefrom to packing boxes a^5 . A plate A^5 alongside sleeve A^3 is provided, 60 having bosses a^6 through which extend holes a^7 . A plate B at the opposite side of fixture X has a boss b with a hole b' through it to receive a pipe B' which connects a passage b^2 with one of the branches a^4 , leakage at 65 the joints between b^2 and pipe B' and branch a^4 and pipe B' being prevented by packing b^3 . Passage b^2 leads through casing D to a valve chamber d and is part of the pressure conduit hereinafter referred to. A port 70 d' leads from one end of casing D to the opposite end and is part of the delivery conduit a' hereinafter referred to.

Upon the top of the casing is a segmental lug d^3 . The hollow plug E within the 75 chamber d has ears e and ports e' for registry with the liquid conduit d' and these ports are of the same size as port d' . Plug E has also ports e^2 at right angles to ports e' and also for registry with conduit d' . 80 Port e^{21} is for registry with pressure conduit b^2 . At its lower end plug E receives washer e^3 and is threaded to receive nut e^4 . Plug F within plug E has a handle f , an ear f' to coöperate with ears e ; a port f^2 to 85 register with ports e' ; a port f^3 opening at one end into port f^2 and adapted at its other end to register with port e^{21} . A port f^4 communicates at one end with port f^2 and at its other end is adapted to register with that 90 part of port d' at the outlet end; also plug F is threaded at f^5 to receive a cap F' and nut F^2 . In the normal position of rest of my apparatus port e^{21} of hollow plug E registers 95 with passage b^2 and port f^3 of plug F registers with port e^{21} of plug E.

In starting my apparatus the handle is turned until ear f' bears upon ear e in which position the pressure in passage b^2 will be shut off from communication with conduit 100 d' and the air in conduit d' will pass out through the plugs E and F by means of the ports e^2 and f^2 into the atmosphere owing to the pressure upon the liquid in receptacle A' . The handle is then turned a quarter turn 105 farther until ear e bears against segmental projection d^3 , plug F having been thus turned a half revolution and plug E a quarter from the original position. In this position the ports e' register with conduit d' 110 through the casing but the flow of liquid is prevented by plug F. This position of the

ports is illustrated in Figs. 2, 3, 4 and 5 of the drawing. In order to allow the flow of liquid the handle is turned back a quarter turn when the liquid will flow smoothly and without disturbance through the continuous round passage afforded by the conduit d' and ports e' and f^2 .

To shut off the fluid the handle is turned back to the position shown in Figs. 2 and 4. When it becomes desirable to shut down the apparatus for any considerable time as in the case of closing down for the night the handle is turned a half turn to its first position when port b^2 of the casing registers with port e^{21} of plug E and f^3 of plug F and then the pressure coming through sleeve A^3 and pressure pipe g and being the same pressure that is exerted on the liquid at its source of supply, the liquid will return to its source of supply, under the influence of gravity and without any disturbance owing to the equalizing of pressure and the relatively small capacity of port b^2 and e^2 . It will therefore be clear that with my apparatus there can be no waste of the liquid due to deterioration on account of standing in the pipes or other cause, and that the first portion of liquid drawn off when the apparatus is used will be in as good condition as any drawn later, and that the normal condition of liquid is not disturbed at the starting or stopping of the apparatus or at any time and this is due to my equalizing and control of the pressure and to the novel construction of the faucet. The purpose of having a double branch a^4 and double nipple a^3 in sleeve A^3 is to allow for adjustment. That is in some cases it is necessary to install my apparatus with the sleeve A^3 in inverted position from that shown in Fig. 2 in which case the other opening a^5 connects with pipe B' which brings the nipples a^3 upon the under side of the faucet. It will be understood that the branch of the pipe a^3 and the opening a^5 which are not in use are closed by screw caps or the like.

The function of ears e in addition to being a means of turning plug E is that they act as stops in the turning of the handle so that the operator can readily tell when the handle is in the exact position for passage of the fluid and for completely shutting off the fluid and when it is in the exact position for equalizing the pressure and thereby return the liquid to the receptacle, it being clear that the means for controlling the flow of liquid controls also the equalizing of the pressure. By the use of washer e^3 and nut e^4 I can make the turning of plug E much harder than the turning of plug F with its cap F' and nut F^2 and in this way the operator can readily tell when he is moving merely plug F and when he is moving plug E in addition to plug F. It will be clear that in my apparatus I insure a passage of

liquid through a uniform round passage free from obstructions or constrictions which is highly desirable, and that my arrangement of plugs, which is the preferred form of my invention, provides a very simple and efficient arrangement for controlling the flow of liquid and for returning the liquid to the source of supply.

A very desirable feature of my apparatus consists in making the exhaust of relatively smaller size than the delivery conduit for the purpose of insuring at the time the apparatus is started a delivery without stirring up the liquid.

What I claim is:

1. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a source of pressure; a faucet comprising a casing having a conduit leading to the source of liquid and a conduit leading to the source of pressure; a plug valve within the casing and having a multiplicity of telescopic plugs with various ports adapted to be moved independently or conjointly for the registry of any predetermined combination of ports and so arranged that the initial plug is free to move through a predetermined arc independently when further movement carries with it the other plugs, the several ports and conduits being arranged to provide a predetermined, normal velocity of the liquid in its conduit with one registry of ports and a predetermined, abnormal velocity of the liquid in its conduit with another registry of ports.

2. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a delivery conduit; and means for controlling the delivery conduit comprising a plurality of valve members movable with relation to each other and to the delivery conduit to provide either a predetermined relatively small discharge for said conduit or a predetermined relatively large discharge for said conduit.

3. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a delivery conduit; a plurality of valve members controlling said conduit made with coöperating ports comprising a set of relatively small ports and a set of relatively large ports, said members being relatively movable and movable with relation to the delivery conduit to selectively adjust the ports so as to provide either a relatively large liquid delivering discharge of a predetermined capacity, or a restricted pressure reducing vent.

4. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a delivery conduit; a plurality of valve members controlling said conduit made with coöperating ports comprising a set of relatively small ports and a set of relatively large ports, said members

being relatively movable and movable with relation to the delivery conduit to selectively adjust the ports so as to provide either a relatively large liquid delivering discharge of a predetermined capacity, or a restricted pressure reducing vent whose maximum capacity is insufficient for delivering liquid.

5. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a source of pressure; a faucet comprising a casing having a conduit leading to the source of liquid and a conduit leading to the source of pressure; a hollow plug fitting within the casing and a plug fitting within the hollow plug, the two plugs being provided with one registry of ports to permit a predetermined, normal velocity of the liquid in its conduit and another registry to permit a predetermined, abnormal velocity of the liquid in its conduit.

6. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a source of pressure; a faucet comprising a casing having a conduit leading to the source of liquid and a conduit leading to the source of pressure; a plug valve within the casing and having a multiplicity of telescopic plugs with various ports; and means through which one of the plugs operates the remainder to give a registry of certain ports to provide a predetermined relatively small discharge for said liquid conduit and to give a registry of certain other ports to provide a predetermined relatively large discharge for said liquid conduit.

7. A faucet of the character described comprising a discharge conduit; a pressure conduit connected with the discharge conduit; a plurality of plugs at the junction of said conduits made with cooperating ports; a single control member; and means connecting the two plugs and control member through which the plugs are operated by the control member to independently control the flow through the discharge conduit or to close the outlet of the discharge conduit and connect the latter with the pressure conduit.

8. A faucet of the character described comprising a liquid conduit and a pressure conduit; a primary valve having large and small through ports for alternate registry with the liquid conduit and a port for registry with the pressure conduit; and a secondary valve having a through port to register with the ports for the liquid of the pri-

mary valve, a port from that through port to register with the pressure port of the primary valve and a port from the through port of the secondary valve for registry with one of the through ports of the primary valve.

9. A faucet of the character described comprising a casing with a liquid conduit and a pressure conduit a hollow plug fitting within the casing and having two large through ports and two small through ports to alternately register with the liquid conduit of the casing and a small pressure port to register with the pressure conduit of the casing; and a plug within the hollow plug having a through port to register with the through ports of the hollow plug, a port leading from that port for registering with the small pressure port of the hollow plug and a port leading from the through port for registry with one of the through ports of the hollow plug; and means to turn the inner plug with relation to the hollow plug and to turn both with relation to the casing, substantially as, and for the purposes described.

10. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a delivery conduit; and means for controlling the delivery conduit comprising a plurality of valve members movable with relation to each other and to the delivery conduit to provide either a predetermined relatively small discharge for said conduit or a predetermined relatively large discharge for said conduit, one of said members controlling the movement of the other.

11. In an apparatus for conveying liquid under pressure the combination of a source of liquid supply; a pressure conduit; a delivery conduit; a plurality of valve members made with cooperating ports said members being relatively movable and movable with relation to the delivery and pressure conduits to relatively adjust the ports so as to provide a relatively large liquid delivering discharge for the delivery conduit, a restricted pressure reducing vent for the delivery conduit and a connecting passage between the pressure conduit and the delivery conduit, each to the exclusion of the other.

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Witnesses:

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