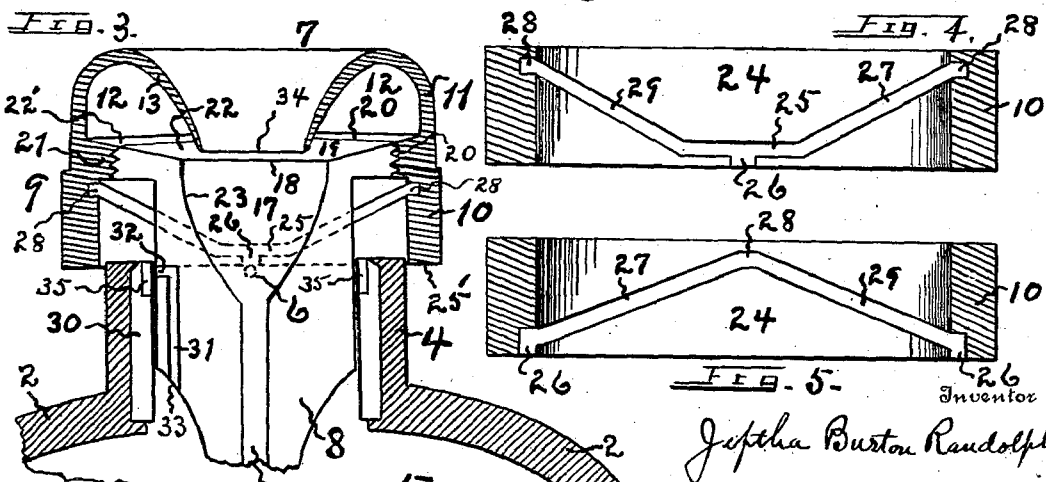
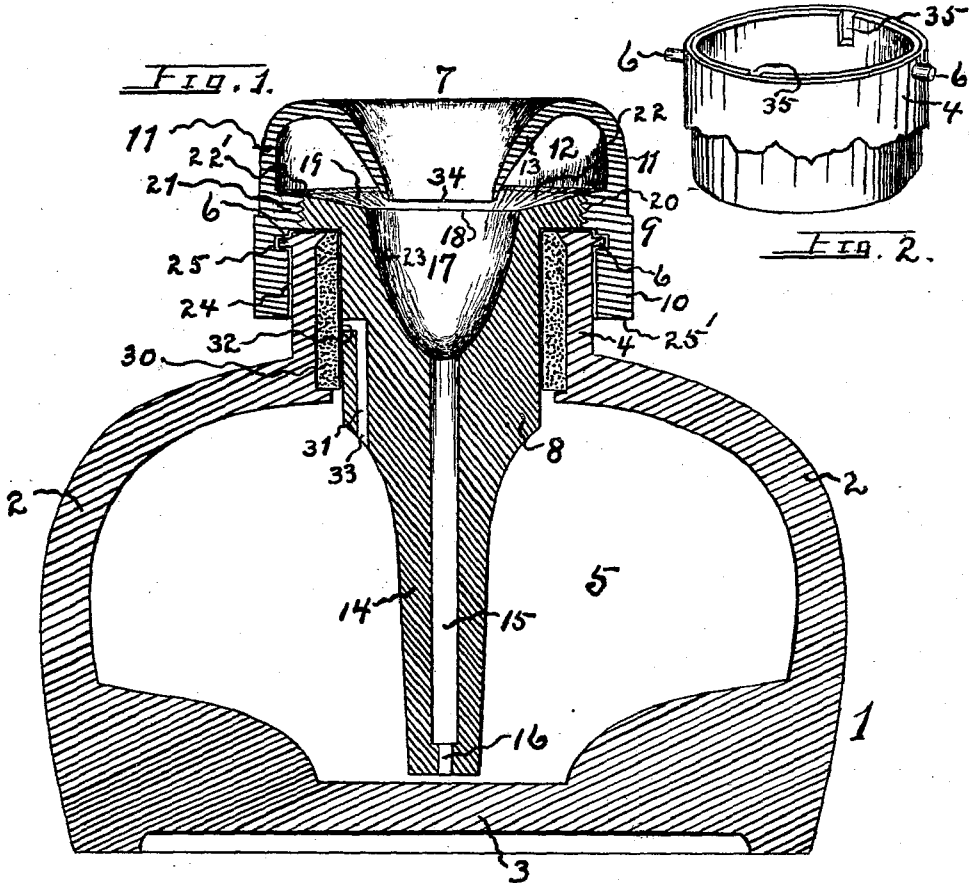


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J. B. RANDOLPH.
INK WELL.

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JEPHTA BURTON RANDOLPH, OF OMAHA, NEBRASKA.

INK-WELL.

No. 860,825.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that JEPHTA BURTON RANDOLPH, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, has invented certain new and useful Improvements in Ink-Wells, of which the following is a specification.

This invention relates to improvements in ink wells.

The object of the present invention, broadly considered, is to provide a receptacle for containing ink and especially adapted for commercial use.

The invention includes features for preventing evaporation, for control of the ink column and a construction which prevents loss of contents or spoilation of property when the ink well is accidentally overturned.

The invention presents an inclined, continuous groove formed upon the inner, circular wall of the hood of the plunger within which is seated oppositely-disposed lugs formed on the neck of the ink well, so that the plunger, when partly rotated, may have an inward or an outward travel while the inclined groove is in engagement with the lugs; this inward travel being for the purpose of causing the ink to ascend and occupy the dipping-cup, ready for use; the outward travel of the plunger being for the purpose of causing the ink to descend for avoiding evaporation, as when not in use.

The invention has reference to an overflow-chamber formed in the head of the plunger having an inclined floor in communication with the dipping-cup, this chamber having a containing capacity, when the well is placed horizontally, equal to that of the dipping cup, so that the ink, if the well should be overturned, will be reliably received within said chamber, and will thereafter, from gravity, return to the dipping-cup when the ink well is restored to a normal position.

The invention also has reference to the employment of an escape-way for air, communicating with the atmosphere from the interior of the well, this air vent being under control of devices to be described, so that the column of ink in the plunger will be sustained at times, and at time of descent of the plunger, as when first inserted will prevent ejection of ink and will regulate the quantity of ink entering the dipping-cup; this escape-way also being useful to prevent overflow of ink beyond the capacity of the dipping-cup and overflow-chamber which would be occasioned by expansion of air within the containing-chamber of the well at a time when the column has been evacuated, such exposure being caused from unusual heat.

The novel features of construction and operation will be fully described herein and in the appended claims.

In the drawing I have shown in Figure 1 an ink well, vertical in position, which embodies my invention, this being a central sectional view. Fig. 2 is a perspective view of the recessed lining for the neck, with a fragment

of the neck thereon, introduced to show relative position of lugs and recesses. Fig. 3 is a broken-away detail relating to Fig. 1, to clearly show relative position of parts at the time the air-passage is in communication with the recesses. While the view of the plunger in this figure is substantially the same as shown in Fig. 1, the ink well is shown as when rotated 90 degrees from the position shown in Fig. 1; and the view shows lug 6 in position to enter groove 26 of the hood, as when first inserting the plunger. Figs. 4 and 5 are to be considered together, to illustrate the continuous groove formed upon the inner wall of the hood; Fig. 5 being a sectional view of the hood transverse to that shown in Fig. 4.

Referring now to the numerals employed to designate parts: 1 represents an ink well having a side wall 2 extending convergingly upward from the bottom 3 to form the circular neck 4; 5 indicates the containing-chamber of the ink well, and at 6 is shown outwardly-extending lugs formed upon the neck and distanced substantially 180 degrees from each other, near its upper rim.

The plunger 7 consists of a cylindrical body 8 of a diameter and length sufficient to pass within and traverse the neck. It is provided with a hood 9 having an outer wall 10 adapted to encircle the neck, said hood having a wall 11 extended upward as an outer wall for the overflow-chamber 12 and intumed toward the center of the hood to form an inner wall 13 for said chamber 12. Upon the lower part of the cylindrical body 8 is formed the stem 14 adapted to pass within chamber 5, the stem having an aperture 15 extending longitudinally from the port 16 at its free end to a communication with the circular dipping-cup 17 formed in the upper end of said body 8. Wall 23 of the dipping-cup is formed upwardly flaring and terminates at the inner edge 18 of floor 19 of chamber 12.

I find it convenient, as a feature in manufacturing the plunger to form it as two parts, the hood portion 9 being joined to body portion 8 as by the threaded connection 20; and floor 19 of chamber 12, therefore, consists of the upper face 22 of body 8 and of the upper surface 22' of an inwardly projecting portion 21 of wall 11, and comprises an annular face or surface extending inclinedly from the inner surface of wall 11 to the edge 18 of said floor, where it forms a junction with flaring wall 23 of cup 17.

The inner, circular face 24 of wall 10 of the hood is provided with a continuous groove 25 adapted to contain lugs 6 of the neck, and when the plunger is first inserted in the neck, lower rim 25' of wall 10 will ride upon these lugs when the plunger is rotated and will fall within the groove-entrance 26, these groove-entrances being distanced 180 degrees from each other. A rotation of 90 degrees of plunger 7, after the entrances 26 are occupied by the lugs, will cause a com-

plete operative descent of the plunger, and a reverse rotation of 90 degrees will cause its withdrawal, this movement or reverse movement being equal to the depth of the groove; groove 25, therefore, is formed as two ways 27 inclined upwardly from the entrance 26 to apexes 28 each of said inclined ways occupying substantially a quarter of a circle, and as two ways 29 inclined downwardly from apexes 28 to entrances 26 and occupying the other half of the circle; this construction permits the plunger to be rotated in either direction without obstruction, and has been found of utility, since lugs by former constructions in the hands of novices, have become broken while attempting to perform a complete rotation of the plunger. In the present invention the plunger has a gradual outward and inward travel when rotated in either direction, and is under entire control of an operator who may manually rotate the plunger for the purpose, as will be understood, of causing the ink to ascend from the containing chamber 5 to the dipping-cup 17, or to descend therefrom.

It will be understood that wall 10 of the hood does not make a closure upon the outer surface of the neck, and air is not excluded therefrom. The interior lining of neck 4 is indicated by numeral 30, and consists, generally, of cork or other resilient substance to prevent percolation of ink between the plunger and neck, and to furnish an air-tight construction so that air in chamber 5 may be compressed. In order that the plunger may have a secure seating in the neck the cylindrical body 8 of the plunger should have a length sufficient to obtain an ample bearing upon lining 30, and this is provided for in the present construction, the operation of which will be explained.

When ink has been placed in the containing chamber 5 and the plunger first partly inserted for a complete entrance within the neck, as body 8 engages lining 30 and slides downward, it is apparent that ink will ascend aperture 15 and cup 17, being forced or elevated by compressed air, on account of the downward movement of the plunger. In order that there may not be an overflow of the dipping-cup from this downward movement, I provide an escape-way 31 in body 8 of the plunger, this escape-way having an outer and inner port shown, respectively at 32 and 33, the outer port being located midway the length of the wall of body 8, and the inner port, preferably, being at the lower part of this cylindrical body.

It will be understood that, on account of passage-way 31, air from within chamber 5 will not be compressed during the downward travel of the plunger until port 32 is obstructed by the closure it makes with lining 31, and this is a desired operative result, for as soon as this closure is made, travel of the plunger is then under control of groove 25 and lugs 6, and thereafter the raising of ink is gradual, and ejection of ink is impossible. The containing capacity of cup 17 and aperture 15 for ink is, by the construction, equal to the displacement occasioned by the plunger during the downward travel of the latter while groove 25 is engaged by the lugs.

After a closure is made of port 32 as shown in Fig. 1, a column of ink in the plunger would be sustained, as is evident. The size of cylindrical body 8 and other parts are constructed so that a displacement of air will

be occasioned sufficient for the filling of cup 17; at this time lugs 6 occupy apexes 28 of groove 25. If the ink well be accidentally overturned at this time, ink from cup 17 will pass into chamber 12, and upon again placing the ink well in a vertical position ink from chamber 12 will pass upon the inclined floor 19 of the chamber to the cup. If the ink well is rocked or wholly inverted ink will not pass orifice 34, but, without any attention or arranging of parts, the ink is wholly returned.

From the lowered position of the plunger just described, if rotation thereof is made 90 degrees, the plunger will be elevated until the lugs occupy points of lowest altitude of groove 25, as is evident, and it will be noted that, at this time, port 32 of escape-way 31 is in communication with one of recesses 35 of lining 30, and the function of these recesses will be presently explained. At this time, ink will not evaporate to any appreciable extent since the fluid is forced from aperture 15 of the stem into chamber 5; it will be noted, however, that air within chamber 5, while the parts are in the above relative position, is in communication with the atmosphere through air-passage 31 to one of recesses 35, and this is the desired construction and explains the function of these recesses, as it prevents the possible overflow of ink in wells of the class where plungers heretofore have been used to elevate the ink column, from unusual heating of the ink well, as when exposed to the sun or heating from any cause which expands the air within the containing chamber. By arrangement and use of the devices shown, accidental or undue heating of the ink well, would not tend to raise ink after the ink column has been evacuated.

Having quite fully described the parts, it is considered that operation will be understood without further explanation. After ink has been placed in the receptacle, the plunger is inserted and the lower face 25' of the outer rim or hood 10 will ride upon lugs 6 as the plunger is rotated; when these lugs reach entrances 26 (Fig. 3.) they will be seated in groove 25 as soon as they pass these entrances, and up to this time ink within chamber 5 will reach its own level in aperture 15 of stem 14; if now the plunger be rotated in either direction, it will have a gradual descent under control of the lugs and groove until apexes 28 are reached, at which time the ink will have reached an altitude sufficient to fill dipping-cavity 17; if a further rotation of the plunger is made until the lugs have reached the lowest portions of the continuous groove, ink will be evacuated from the dipping-cup and aperture 15 of the stem.

In ink wells of this class, it may be said that former constructions do not provide effective means for preventing ejection of ink when first inserting the plunger. The functions mentioned of escape way 31, which prevents such ejection will be appreciated by users of ink wells of this description; and recesses 35 in conjunction with escape way 31, wholly prevents overflow, as from unusual or accidental heating after aperture 15 has been evacuated.

What I claim as my invention is,—

1. In combination with a bottle having a neck with an inner circular wall and bearing outwardly-extending lugs adjacent its upper rim, and a plunger having a cylindrical body with a central dipping-cavity therein and a downwardly-extending stem formed thereon having a longitudinal aperture therein in communication with said dipping-cavity; of an outer annular rim formed upon the

plunger to overhang the neck and having a continuous groove formed within and traversing its inner wall with alternate upward and downward inclinations; an outer upwardly-extending wall formed on the plunger and in-
 5 turned to form an overflow chamber with an apertured roof and a floor having an aperture in communication with the central dipping-cavity of said cylindrical body; the cylindrical body of said plunger adapted to have a seating within the circular wall of said neck; said out-
 10 wardly-extending lugs of the neck adapted to have a seating within the continuous groove of the outer annular rim of the plunger.

2. In combination with an ink receptacle having a neck with an inner circular wall and bearing outwardly-extending lugs adjacent its upper rim, and a plunger having a cylindrical body with a central dipping cavity therein and a downwardly-extending stem formed thereon having a longitudinal aperture therein in communication with
 15 said dipping cavity; of an outer annular rim formed upon the plunger to overhang the neck and having a continuous groove formed within and traversing its inner wall with alternate upward and downward inclinations; an outer upwardly-extending wall formed on the plunger and in-
 20 turned to form an overflow chamber with a centrally-apertured roof and an inclined floor having a central aperture in communication with the central dipping cavity of said cylindrical body; the cylindrical body of said plunger adapted to have a seating within the circular wall of said neck; said outwardly-extending lugs of the neck adapted
 25 to have a seating within the continuous groove of the outer annular rim of the plunger.

3. In combination with an ink bottle having a neck-portion with outwardly-extending lugs thereon, of a rotatable plunger therefor, having an outer annular rim formed

upon the head of the plunger and having upon its inner
 35 wall a continuous groove extended with reversedly-inclined ways; said continuous groove adapted to furnish a seating for said outwardly-extended lugs of the neck-portion.

4. An ink well, comprising an upper receptacle, a lower receptacle, and a tube connecting said receptacles; an overflow-chamber formed in the ink well above the plane of and having a centrally inclined floor in communication with the upper receptacle; said upper receptacle being
 40 vertically movable within said lower receptacle; said lower receptacle being in exterior communication by means of an air escape way during a part of the vertical movement of the upper receptacle within said lower receptacle.

5. In combination with the neck portion of an ink well having recesses formed within its inner wall adjacent its upper rim; an upper receptacle; a lower receptacle; a tube in communication with said upper receptacle and lower receptacle; an overflow-chamber formed in the ink well above the plane of and having an inclined floor in communication with the upper receptacle; said upper re-
 50 ceptacle being vertically movable within said lower receptacle; said lower receptacle being in exterior communication with the recesses of the inner wall of said neck portion by means of an air escape way during a part of the vertical movement of the upper receptacle within said
 55 lower receptacle.

In testimony whereof he has affixed his signature in presence of two witnesses.

JEPHTHA BURTON RANDOLPH.

Witnesses:

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 E. M. VROMAN.