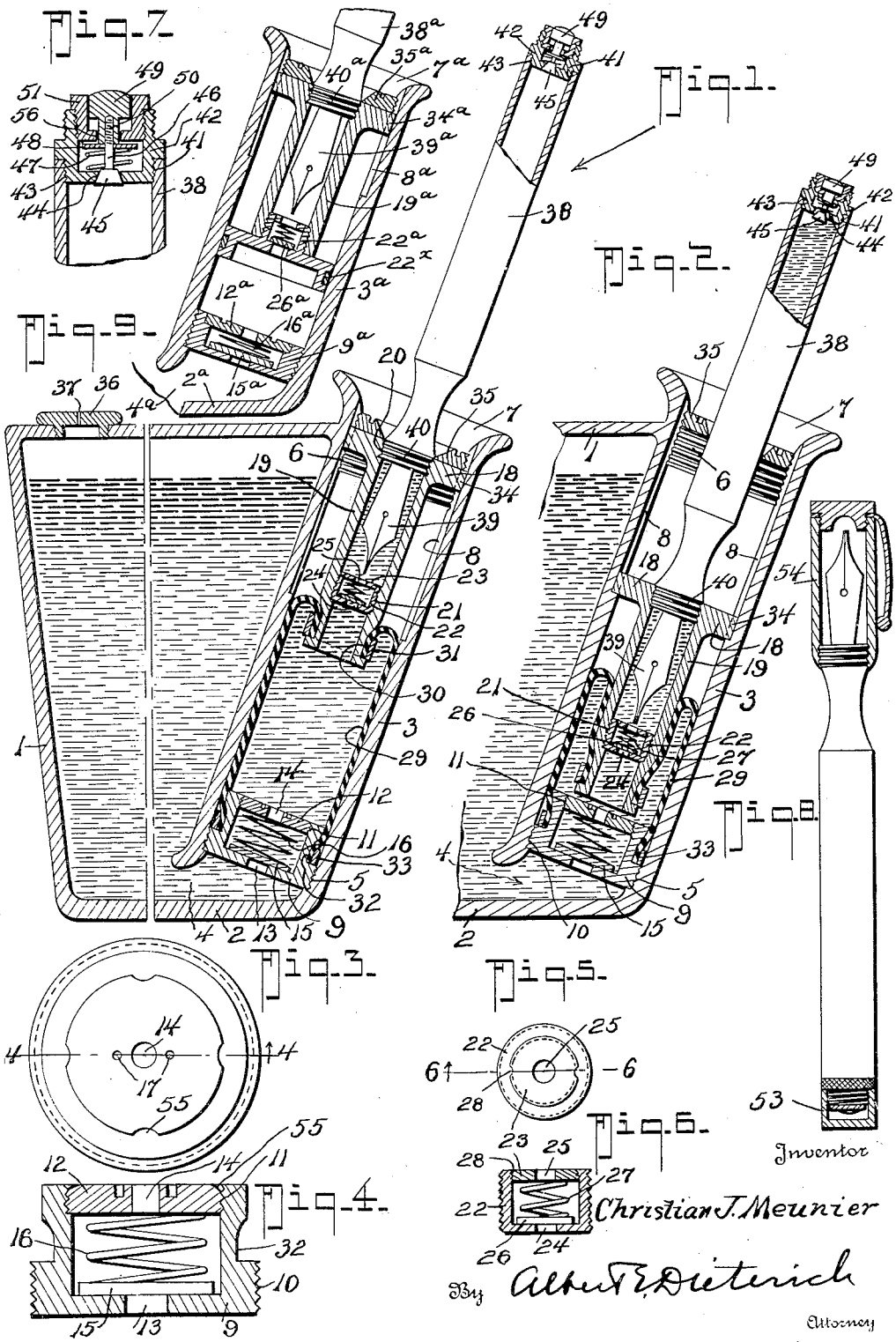
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COMBINATION PEN FILLING INKWELL AND FOUNTAIN PEN SET

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COMBINATION PEN-FILLING INKWELL AND FOUNTAIN PEN SET

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My invention relates to a combined ink well, fountain pen and pen-filling mechanism of such construction whereby the act of inserting the fountain pen into the well is utilized to effect the automatic filling of the pen with a definite or measured amount of ink.

Primarily, the invention has for an object to provide a pen and ink well and pen-filling mechanism of such cooperative design that upon insertion of the pen into the ink well only such amount of ink will be forced into the pen as is required to fill the barrel without overflowing the ink reservoir of the pen.

Another object of my invention is to provide a pen without the usual rubber ink bag now so commonly used in fountain pens. Further, it is an object to provide a pen which may be used in combination with the ink well as a desk set, or it may be employed as a pocket pen if and when desired.

Further, it is an object to provide an ink well which, while holding a large supply of ink, is so constructed that it will only feed measured amounts of ink into the pen-filling chamber to replace that which has been charged into the pen on a previous filling. Further, it is an object to provide a combination pen set of a simple, practical construction which can be easily manufactured and assembled, and which will readily and effectively serve its intended purposes.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention still further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, then be particularly pointed out in the appended claims, reference being had to the accompanying drawing, in which:—

Figure 1 is a vertical longitudinal section of my invention showing the pen in place ready for filling.

Figure 2 is a detail sectional view showing the pen filled.

Figure 3 is a plan of the lower back check valve unit.

Figure 4 is a vertical section on the line 4—4 of Figure 3.

Figure 5 is an enlarged plan of the plunger's back check valve unit.

Figure 6 is a vertical section on the line 6—6 of Figure 5.

Figure 7 is an enlarged longitudinal section of the butt end of the pen.

Figure 8 is an elevation of the pen with end caps in place.

Figure 9 is a detail section of a modified form of the invention.

In the drawing in which like numerals of reference designate like parts in all of the figures, 1 represents the well reservoir (comprising a storage chamber), 2 indicates the bottom of the well which is flat so that it may rest on a desk or other suitable support, and 3 indicates the neck of the well (comprising the dispensing chamber). The neck 3 communicates with the bottom of the well reservoir by means of a passage 4.

The neck 3 adjacent the passage 4 is internally threaded as at 5 to receive the threaded end of the box 9 of the lower back check valve unit.

The neck 3 is also threaded as at 6 adjacent its bell mouth 7 to receive the plunger-retaining and stroke-adjusting ring nut 35 hereinafter again mentioned. The neck is also provided near its mouth end with one or more longitudinal grooves 8 (preferably two grooves arranged 180 degrees apart). The lower back check valve unit's box is not only externally threaded as at 10 to cooperate with the threads 5, but it is internally threaded as at 11 to receive the threaded cover disk 12 which retains the valve 15 and the valve spring 16 in the box. The box and its cover have ink passing openings 13 and 14 respectively, the opening 13 being controlled by the valve 15. When the cover 12 is assembled with the box 9 the two are secured against unscrewing by upsetting the edge of the box as at 55. The cover 12 may also be provided with fork-wrench receiving recesses 17 the use of which will more fully appear later.

Mounted to operate in the direction of the axis of the neck is a plunger 18 having a

barrel 19 as shown. The plunger 18 has a threaded seat 20 to receive the threaded collar 40 of the fountain pen with the pen point 39 located within the upper end of the barrel 19.

Below the level of the pen point end the barrel is provided with an internally threaded seat 21 for the reception of the back check valve box 22, the latter being externally threaded to cooperate with the threads 21. The box 22 is also provided with a cover 23 held in place by upsetting the edge of the box 22 as at 28.

The back check valve box 22 and its cover 23 respectively have ink passages 24 and 25, the former being controlled by a suitable valve 26 held closed by a spring 27.

Within the neck and connecting the barrel 19 with the box 9 is a sac 29 made of rubber or other flexible, impervious material. One end of the sac 29 is secured by a suitable clamp band 31 to the seat 30 at the lower end of the barrel 19, while the other end of the sac 29 is secured to the seat 32 of the box 9 by means of a suitable clamp band 33.

The plunger 18 has lugs 34 which work in the longitudinal grooves 8 hereinbefore referred to and serve to prevent rotation of the plunger when the pen is being screwed into and out of the same. The well 1 has a filling aperture closed by a cap 36 which has a breathing hole 37.

38 is the fountain pen barrel and 39 the pen point. The barrel 38 is threaded at 40 adjacent the point end, as hereinbefore mentioned, and at its butt end it is provided with a threaded seat 41 for the reception of the air releasing valve unit. This unit comprises a box 42 threaded at 43 into the threaded end 41 of the barrel and is provided with a valve seat 44 controlled by a valve 45 whose stem 46 is threaded at 50 into the shank of a push button 49 held in a cup-like receptacle 51 that is threaded into the upper end of the box 42. The receptacle 51 has an aperture 56 to permit passage of the threaded shank 50, as well as to permit the outflow of air, it being understood that the button 49 has a loose seat in the receptacle 51.

The valve 45 is held to its seat by means of a spring 47 engaging a stop disk 48 on the valve stem.

When the pen is to be used as a desk pen the foregoing parts are all that is necessary, but when the pen is to be used as a pocket pen it is preferable to fit a protecting cap 53 over the butt end of the pen to prevent accidental displacement of the valve 45 when the pen is carried butt end down in the pocket, as is customary. The point of the pen should also be protected by a suitable cap 54.

In the practical construction of my invention the size of the neck 3 and the capacity of the filling unit which includes the sac 29, the barrel 19 and the upper and lower back check valve units 22 and 9 respectively, are so designed with relation to the capacity of the ink chamber of the barrel of the pen that as the pen is pushed all the way in only enough fluid will flow into the pen to fill the barrel without passing through the valve seat passage 44. To allow for slight variations in barrel capacity of the pens the adjustable ring nut 35 is provided so that by screwing in the nut 35 the capacity of the filling apparatus of the neck is reduced, while slacking up on that nut gives an increase of capacity.

In Figure 9 I have shown a modification of the invention in which the rubber sac 29 is dispensed with and in place thereof the valve unit 22*a* is provided with a piston portion having a suitable packing 22*x* as shown. In this figure those parts which correspond to like parts in the other figures bear the same reference numerals plus the index letter *a*, and as the operations of those parts are essentially the same a detailed description of this figure is thought to be unnecessary.

It will be seen that in virtue of my invention I am able to provide a fountain pen of a very simple construction and to provide a very simple, natural and convenient way of filling that pen when desired.

The design and arrangement of parts shown lend themselves to ease and economy of manufacture. The sac 29 may be readily replaced when desired. All that is necessary to do to remove the pumping unit is first to remove the check valve unit 22 with a fork-wrench, and then insert the wrench through the neck 19, place it in the recesses 17 and unscrew the check valve unit 9. After unscrewing ring nut 35 the plunger 18, sac 29 and unit 9 may be withdrawn. In assembling the parts the steps are reversed.

From the foregoing description, taken in connection with the accompanying drawing, it is thought that the advantages of my invention will be clear to those skilled in the art.

What I claim is:

1. In apparatus of the class described, a receptacle having a storage chamber and a dispensing chamber communicating with the storage chamber, a pen carrying plunger located in the upper end of the dispensing chamber, a back check valve controlling passage of fluid from the storage chamber to the dispensing chamber, and means which includes a flexible sac cooperating with said plunger and said back check valve for forcing ink into a pen when pushing the pen down with the plunger, and a back check valve carried by said plunger.

2. An ink receptacle having an ink reservoir and an upstanding neck which is in communication with said reservoir, mechanism in said neck which includes back check valves and a plunger device operable upon

insertion of a pen in the neck for forcing a charge of ink into the pen and for refilling said neck from the reservoir upon withdrawal of the pen from the neck.

3. An ink receptacle having an ink reservoir and an upstanding neck which is in communication with the reservoir, mechanism in said neck operable upon insertion of a pen in the neck for forcing a charge or ink into the pen and for refilling said neck from the reservoir upon withdrawal of the pen from the neck, said mechanism comprising a lower back check valve unit, a plunger device, a back check valve unit carried by the plunger device and a flexible sac having one end secured to said lower back check valve unit, and the other end secured to said plunger device, said plunger device having means to receive and hermetically secure the pen point end of a fountain pen thereto.

4. An ink receptacle having an ink reservoir and an upstanding neck which is in communication with the reservoir, mechanism in said neck operable upon insertion of a pen in the neck for forcing a charge of ink into the pen and for refilling said neck from the reservoir upon withdrawal of the pen from the neck, said mechanism comprising a lower back check valve unit, a plunger device, a back check valve unit carried by the plunger device and a flexible sac having one end secured to said lower back check valve unit, and the other end secured to said plunger device, said plunger device having means to receive and hermetically secure the pen point end of a fountain pen thereto, and means for adjusting the stroke of said plunger device to accord with the capacity of the pen to be filled.

5. A vessel enclosing an ink storage chamber and having a neck enclosing a dispensing chamber, the lower end of the neck being in communication with the ink storage chamber, said neck having a seat at the bottom, a back check valve unit secured in said neck on said seat and functioning to pass ink from the storage chamber into the neck, a plunger working in said neck above said back check valve unit, a flexible, impervious sac one end of which is secured to the plunger and the other end of which is secured to said back check valve unit, a back check valve unit carried by the plunger, said plunger having a portion to receive the pen point end of the fountain pen and hold it in fluid-tight engagement with the plunger.

6. A vessel enclosing an ink storage chamber and having a neck enclosing a dispensing chamber, the lower end of the neck being in communication with the ink storage chamber, said neck having a seat at the bottom, a back check valve unit secured in said neck on said seat and functioning to pass ink from the storage chamber into the neck, a plunger working in said neck above said back check valve unit, a flexible impervious sac one end of which is secured to the plunger and the other end of which is secured to said back check valve unit, a back check valve unit carried by the plunger, said plunger having a portion to receive the pen point end of the fountain pen and hold it in fluid-tight engagement with the plunger, and means to hold said plunger against rotation while the pen is being secured in and removed from the plunger.

7. A vessel enclosing an ink storage chamber and having a neck enclosing a dispensing chamber, the lower end of the neck being in communication with the ink storage chamber, said neck having a seat at the bottom, a back check valve unit secured in said neck on said seat and functioning to pass ink from the storage chamber into the neck, a plunger working in said neck above said back check valve unit, a flexible impervious sac one end of which is secured to the plunger and the other end of which is secured to said back check valve unit, a back check valve unit carried by the plunger, said plunger having a portion to receive the pen point end of the fountain pen and hold it in fluid-tight engagement with the plunger, and means to adjust the plunger stroke to the capacity of the pen being filled.

8. A vessel enclosing an ink storage chamber and having a neck enclosing a dispensing chamber, the lower end of the neck being in communication with the ink storage chamber, said neck having a seat at the bottom, a back check valve unit secured in said neck on said seat and functioning to pass ink from the storage chamber into the neck, a plunger working in said neck above said back check valve unit, a flexible impervious sac one end of which is secured to the plunger and the other end of which is secured to said back check valve unit, a back check valve unit carried by the plunger, said plunger having a portion to receive the pen point end of the fountain pen and hold it in fluid-tight engagement with the plunger, and means to hold said plunger against rotation while the pen is being secured in and removed from the plunger, and means to adjust the plunger stroke to the capacity of the pen being filled.

9. The combination of an ink reservoir and a means for forcing ink into fountain pens through the pen point end of the same, of a fountain pen having an ink receiving chamber, a pen point at one end and a butt end, an air releasing valve unit secured in the butt end as closure therefor, said unit comprising a valve box with a valve seat and a valve cooperating therewith, the valve having a stem, a button on the stem and a valve closing spring in the box around the stem for the purposes described.

10. The combination of an ink reservoir and a means for forcing ink into fountain

pens through the pen point end of the same, of a fountain pen having an ink receiving chamber, a pen point at one end and a butt end, an air releasing valve unit secured in the butt end as closure therefor, said unit comprising a valve having a stem, a button on the stem and a valve closing spring in the box around the stem for the purposes described, said valve box having a threaded portion, and a protecting cap threaded to said valve box to guard against accidental opening of the valve.

11. A vessel enclosing an ink storage chamber and having a neck enclosing a dispensing chamber, the lower end of the neck being in communication with the ink storage chamber, said neck having a seat at the bottom, a back check valve unit secured in said neck on said seat and functioning to pass ink from the storage chamber into the neck, a plunger working in said neck above said back check valve unit, a flexible impervious sac one end of which is secured to the plunger and the other end of which is secured to said back check valve unit, a back check valve unit carried by the plunger, said plunger having a portion to receive the pen point end of a fountain pen and hold it in fluid-tight engagement with the plunger, in combination with a fountain pen having an air escape valve in its butt end.

12. An ink receptacle having an ink reservoir and an upstanding neck which is in communication with said reservoir, mechanism in said neck operable upon insertion of said pen in said neck for forcing a charge of ink into the pen and for refilling said neck from the reservoir upon withdrawal of the pen from the neck, said mechanism including a lower back check valve unit and a plunger, said plunger having means to receive and hermetically secure the point end of a fountain pen thereto.

13. An ink receptacle having an ink reservoir and an upstanding neck which is in communication with said reservoir, mechanism in said neck operable upon insertion of said pen in said neck for forcing a charge of ink into the pen and for refilling said neck from the reservoir upon withdrawal of the pen from the neck, said mechanism comprising a lower back check valve unit, a plunger longitudinally slidable in the neck, means restraining said plunger against rotation in the neck, a piston carried by said plunger within the neck and a back check valve carried by the plunger, said plunger having a pen-receiving chamber into which ink passes through the last named back check valve, said plunger having a threaded portion to receive a threaded collar at the point end of a fountain pen the pen-point of which is adapted to be located in said chamber when the pen is screwed into the plunger for the purposes described.

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