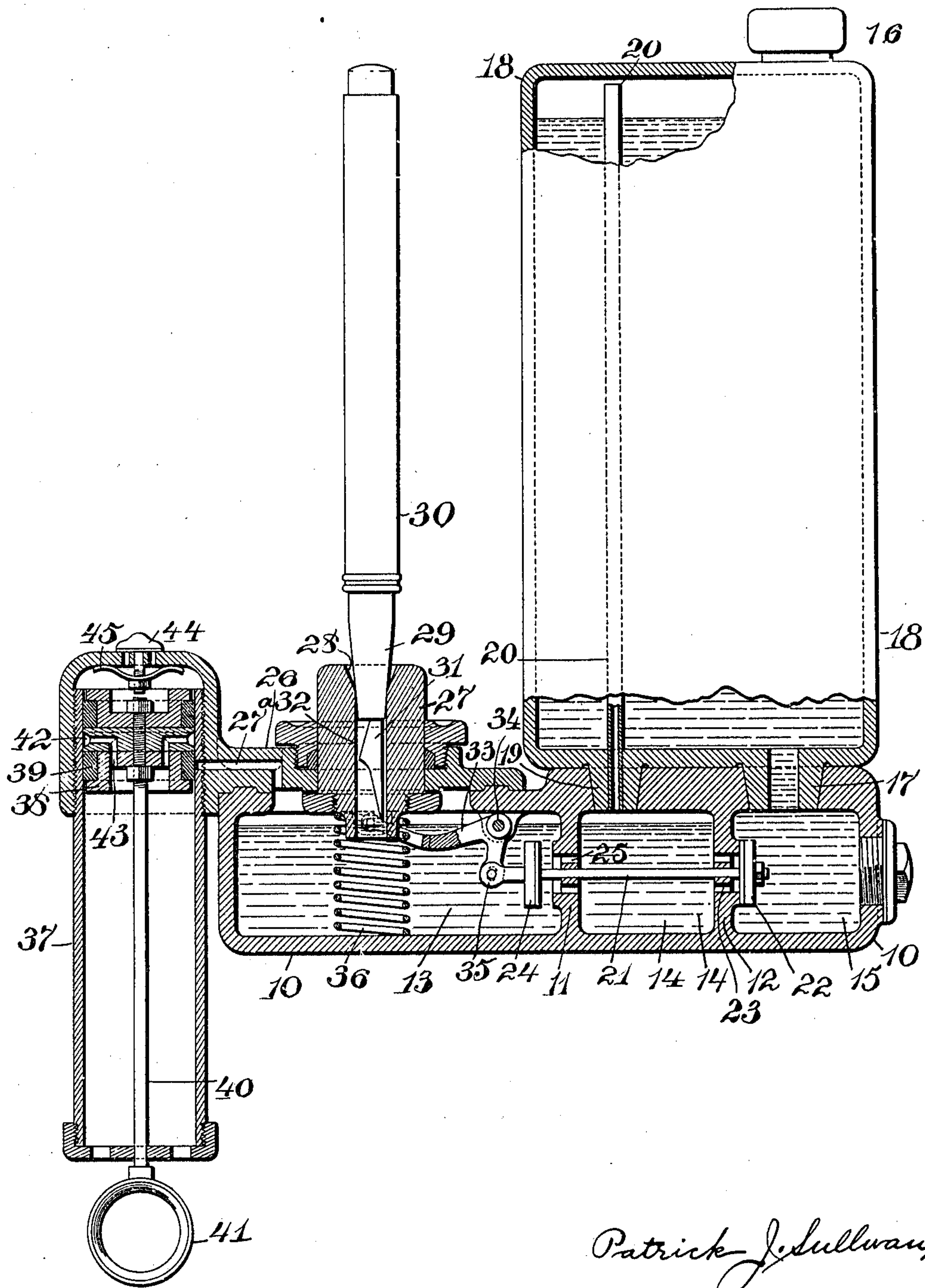


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 APPARATUS FOR FILLING FOUNTAIN PENS.
 APPLICATION FILED APR. 27, 1909.

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Patented Apr. 19, 1910.



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UNITED STATES PATENT OFFICE.

PATRICK J. SULLIVAN, OF EAST ORANGE, NEW JERSEY.

APPARATUS FOR FILLING FOUNTAIN-PENS.

955,830.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PATRICK J. SULLIVAN, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Filling Fountain-Pens; 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, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to a machine for filling fountain pens and is designed to receive a pen, the pen being manually manipulated to force an air tight closure, the machine being adapted to draw the air from the pen by means of a manually operated pump, and on the return of the pump to force ink into the pen barrel from which the air has been exhausted.

The machine is further designed to provide a means for preventing flooding in a reservoir that is adapted to supply the pen filling chamber and also prevent flooding of the chamber.

These machines as heretofore made, and allowed to stand in a temperature which causes the air in the reservoir to expand, have forced the ink from the reservoir and then from the filling chamber, if the machine is not used for a considerable length of time, and thereby cause the ink to overflow. Another defect in this kind of machine has been the pressure which is exerted on the ink, not being vented when the air pump is on its return, and when the pen is removed, a spurting of ink has been the result.

The invention is illustrated in the accompanying drawing, in which is illustrated a pen filling machine made according to my invention.

The device consists of a body portion 10 which is provided with a pair of partitions 11 and 12 forming three chambers 13, 14 and 15. The supply chamber 15 has an opening into which fits the connection 17 of a reservoir 18, which reservoir sits on the top of the body portion 10 and is supported thereby. Another connection 19 projects down into an opening through the intermediate chamber 14, and a vent tube 20 con-

nects the intermediate chamber 14 with the reservoir at the top thereof. A suitable closure 16 is provided on a filling inlet at the top of the reservoir. A valve stem 21 is adapted to reciprocate through the partitions 11 and 12 and is provided with a valve 22 which seats itself on an opening 23 in the partition 12, and the stem also has a valve 24 which is adapted to be seated on an opening 25 in the partition 11, these valves being so arranged that when the valve stem is operated to close one, it opens the other, and vice versa. A plate 26 closes the top of the filling chamber 13 and is provided with a suitable bushing in which slides a sliding block 27 which has a tapered opening 28 therein into which is adapted to be placed the tapered portion 29 of a pen, which pen has the usual barrel 30 and the pen point 31 which projects down into the bore 32 of the sliding block 27 so that when the pen is in place the opening in the sliding block is closed against the passage of air. The sliding block bears against a bell-crank 33 pivoted at 34 and being pivotally connected, as at 35, with the valve stem 21. The plate 26 has a channel 27^a connecting the filling chamber above the level of the ink with a cylinder 37 of an air pump. The air pump has a piston 38, with suitable packing rings 39, and a piston rod 40 which has a ring or handle 41 for manually manipulating it and sliding the piston in the cylinder.

When a pen is placed in the sliding block and pressed down against the action of the spring 36, the bell-crank 33 is operated to slide the valve stem 21, and the valve 24 is closed and the valve 22 is opened. The handle 41 is then pulled down and the piston 38 descends, causing a partial vacuum in the filling chamber 13 and thus draws out the air from the pen barrel 30. Then the piston is forced to cause the air in the cylinder 37 and in the filling chamber 13 to resume atmospheric pressure, which forces the ink up through the pen point and the feeding device of the pen into the pen barrel 30, this being possible because when the sliding block is down, the pen point is below the level of the ink. This reduces the ink level in the filling chamber 13. Any excess air pressure, after the pen is filled, is released from the chamber 13 and the passage 27^a when the groove 42 in the piston passes the channel 27^a, the groove being con-

nected by a duct or ducts 43 to permit the
 air to pass through the piston and into the
 cylinder, and in this way the pressure in the
 filling chamber is released so that when the
 5 pen is lifted from the sliding block and the
 sliding block rides upward, being forced by
 the spring 36, there is no spurting of ink
 due to any means of air pressure when the
 pen is removed. The piston is permitted to
 10 go past the point where the channel 27^a is
 vented into the groove 42 by reason of a
 safety valve 44 which has a spring 45 nor-
 mally holding it shut, the spring being
 adapted to resist air pressure up to atmos-
 15 pheric pressure which is necessary to force
 the ink into the pen. When the pen is re-
 moved the bell-crank 33 rides up to the posi-
 tion shown in the drawing, the valve 24 is
 opened to permit ink to flow from the inter-
 20 mediate chamber 14 into the filling chamber
 13 to replenish the ink that has been forced
 into the pen, and the valve 22 is closed to
 again shut off the reservoir and the supply
 chamber 15 from the intermediate chamber
 25 14. It will thus be seen that the ink passes
 successively from the reservoir into the sup-
 ply chamber 15, then into the intermediate
 chamber 14, then into the filling chamber
 13 and finally into the pen.

30 It has been found that when the supply
 chamber is connected directly with the fill-
 ing chamber 13, with the valve 24 between
 the two and normally open, the air in the
 reservoir 18, when it is caused to expand by
 35 a temperature change, forces the ink down
 from the reservoir and out into the filling
 chamber and causes it to overflow.

I have installed the vent pipe 20 between
 the intermediate chamber 14 and the top of
 40 the reservoir so that there is a means pro-
 vided for the excess pressure of the air,
 above the ink in the reservoir, to pass down
 through the pipe 20 into the intermediate
 chamber and from there into the filling
 45 chamber and there is no flooding of the de-
 vice. The filling machine is simple, positive
 and will fill fountain-pens very quickly
 without the necessity of the operator soiling
 the hands or clothing in any way, not being
 50 compelled to take care of any excess ink.

Having thus described my invention, what
 I claim is:—

1. An apparatus for filling fountain-pens
 comprising a body portion containing a fill-
 55 ing chamber an intermediate chamber and
 a supply chamber, valves adapted to close
 the supply chamber from the intermediate
 chamber and the intermediate chamber from
 the filling chamber, the valves being ar-
 60 ranged so that one is open when the other
 is shut, the filling chamber having a bore
 for the insertion of a fountain-pen, an air
 pump connected with the filling chamber
 above the level of the ink, and an automatic
 65 means for closing the valve between the

filling chamber and the intermediate cham-
 ber when a pen is in place.

2. An apparatus for filling fountain-pens
 comprising a body portion containing a fill-
 ing chamber an intermediate chamber and 70
 a supply chamber, a valve adapted to close
 the supply chamber from the intermediate
 chamber, a valve to close the intermediate
 chamber from the filling chamber, the valves
 being arranged to operate in unison, and so 75
 constructed that when one valve is open the
 other is shut, the body portion being adapt-
 ed to contain ink, a reservoir mounted on the
 body portion and communicating with the
 supply chamber to supply ink thereto, a 80
 vent leading from the intermediate chamber
 to the reservoir above the level of the ink,
 the filling chamber having a bore for the
 insertion of a fountain-pen, an air pump
 connected with the filling chamber above the 85
 level of the ink, and an automatic means for
 closing the valve between the filling cham-
 ber and the intermediate chamber when a
 pen is in place.

3. An apparatus for filling fountain-pens 90
 comprising a body portion containing a fill-
 ing chamber an intermediate chamber and
 a supply chamber, a valve adapted to close
 the supply chamber from the intermediate
 chamber, a valve to close the intermediate 95
 chamber from the filling chamber, the valves
 being arranged to operate in unison and so
 constructed that when one valve is open the
 other is shut, the body portion being adapt-
 ed to contain ink, a reservoir mounted on 100
 the body portion and communicating with
 the supply chamber to supply ink thereto,
 a vent leading from the intermediate cham-
 ber to the reservoir above the level of the
 ink, the filling chamber having a bore for 105
 the insertion of a fountain-pen, an air pump
 connected with the filling chamber above the
 level of the ink, an automatic means for
 closing the valve between the filling cham-
 ber and the intermediate chamber when a 110
 pen is in place, and means for automatically
 opening the valve between the filling cham-
 ber and the intermediate chamber and clos-
 ing the valve between the intermediate cham-
 ber and the supply chamber when the pen is 115
 removed from the bore.

4. An apparatus for filling fountain-pens
 comprising a body portion containing a fill-
 ing chamber an intermediate chamber and a 120
 supply chamber, a valve adapted to close
 the filling chamber from the intermediate
 chamber, a valve adapted to close the inter-
 mediate chamber from the supply chamber,
 the valves being adapted to operate in uni-
 son, one being open when the other is shut, 125
 a sliding block in the top of the filling cham-
 ber having a bore to receive a fountain-pen,
 means connecting the valves with the sliding
 block so that when the block is slid into the
 filling chamber the valve between the filling 130

chamber and the intermediate chamber is shut and the valve between the intermediate chamber and the supply chamber is open, a reservoir mounted on the body portion and communicating with the supply chamber to feed ink thereto, a vent pipe connecting the intermediate chamber with the reservoir above the level of the ink, means for automatically returning the sliding block to its normal position when the pen is removed, and an air pump connected with the filling chamber above the level of the ink.

5. An apparatus for filling fountain-pens comprising a body portion containing a filling chamber an intermediate chamber and a supply chamber, a valve adapted to close the filling chamber from the intermediate chamber, a valve adapted to close the intermediate chamber from the supply chamber, the valves being adapted to operate in unison, one being open when the other is shut, a sliding block in the top of the filling chamber having a bore to receive a fountain-pen, means connecting the valves with the sliding block so that when the block is slid into the filling chamber the valve between the filling chamber and the intermediate chamber is shut and the valve between the intermediate chamber and the supply chamber is open, a reservoir mounted on the body portion and communicating with the supply chamber to feed ink thereto, a vent pipe connecting the intermediate chamber with the reservoir above the level of the ink, means for automatically returning the sliding block to its normal position when the pen is removed, an air pump connected with the filling chamber above the level of the ink, and a piston in the air pump having a projecting means for its manual manipulation, the cylinder having its air connection with the filling chamber intermediate of its ends, the piston having a passage connected with its periphery and adapted to relieve the pressure from the filling chamber generated by the pump when the passage in the piston passes the air connection between the pump and the filling chamber.

6. An apparatus for filling fountain-pens comprising a body portion containing a filling chamber an intermediate chamber and a supply chamber, a valve adapted to close the filling chamber from the intermediate chamber, a valve adapted to close the intermediate chamber from the supply chamber, the valves being adapted to operate in unison, one being open when the other is shut, a sliding block in the top of the filling chamber having a bore to receive a fountain-pen, means connecting the valves with the sliding block so that when the block is slid into the filling chamber the valve between the filling chamber and the intermediate chamber is

shut and the valve between the intermediate chamber and the supply chamber is open, a reservoir mounted on the body portion and communicating with the supply chamber to feed ink thereto, a vent pipe connecting the intermediate chamber with the reservoir above the level of the ink, means for automatically returning the sliding block to its normal position when the pen is removed, an air pump connected with the filling chamber above the level of the ink, a piston in the air pump having a projecting means for its manual manipulation, the cylinder having its air connection with the filling chamber intermediate of its ends, the piston having a passage connected with its periphery and adapted to relieve the pressure from the filling chamber generated by the pump when the passage in the piston passes the air connection between the pump and the filling chamber, and a safety valve in the end of the pump.

7. An apparatus for filling fountain-pens comprising a body portion having a filling chamber and an intermediate chamber therein, a reservoir, means for supplying ink from the reservoir into the intermediate chamber, a valve between the intermediate chamber and the filling chamber, a bore in the body portion, automatic means for closing the valve between the filling chamber and the intermediate chamber when the pen is in place, means for varying the air pressure on the ink in the filling chamber, and a vent pipe leading from the intermediate chamber to the reservoir above the level of the ink.

8. An apparatus for filling fountain-pens comprising a body portion having a filling chamber therein, a reservoir, means for intermittently feeding fluid from the reservoir to the filling chamber, means for regulating the feeding means by the insertion and withdrawal of a pen, a pump comprising a cylinder, a passage leading from the cylinder intermediate of its ends to the filling chamber above the level of the ink, a piston in the cylinder, an air passage leading from the periphery of the piston to one end thereof, the passage being adapted to be placed in register with the passage connecting with the filling chamber, means on the end of the piston for manually manipulating it, and a safety valve in the end of the cylinder.

In testimony that I claim the foregoing, I have hereunto set my hand this 24th day of April 1909.

PATRICK J. SULLIVAN.

Witnesses:

WM. H. CAMFIELD,
E. A. PELL.