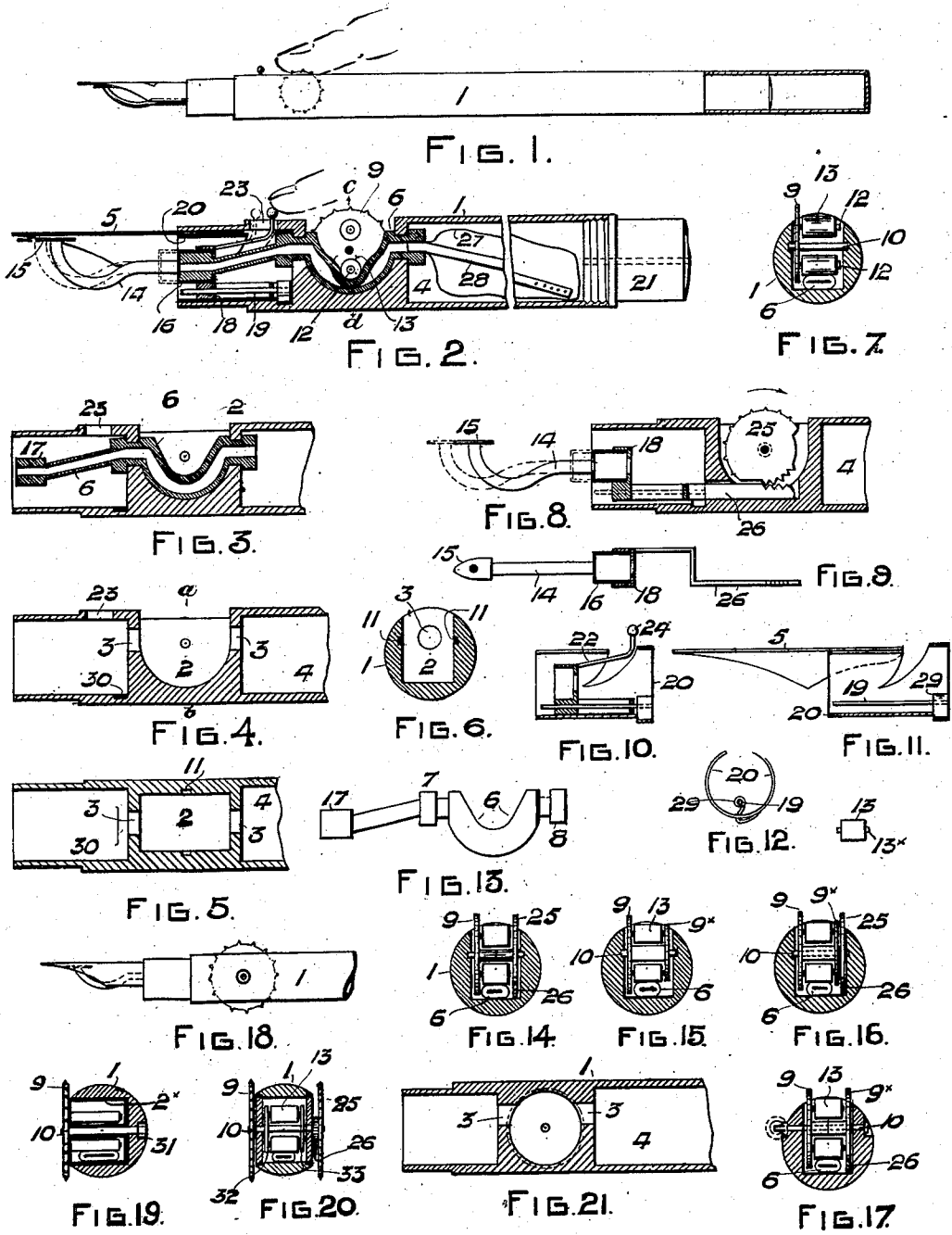


A. MUNRO.
RESERVOIR PEN OR THE LIKE.
APPLICATION FILED AUG. 11, 1902.

NO MODEL.



Witnesses:
John Camp.
William Castwood.

Inventor:
Alexander Munro.
By his Attorney: Walter Gunn.

UNITED STATES PATENT OFFICE.

ALEXANDER MUNRO, OF STOCKPORT, ENGLAND.

RESERVOIR-PEN OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 754,000, dated March 8, 1904.

Application filed August 11, 1902. Serial No. 119,313. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER MUNRO, a subject of the King of Great Britain and Ireland, and a resident of Stockport, England, have invented certain new and useful Improvements in Reservoir-Pens or the Like, of which the following is a specification.

This invention relates to what are commonly known as "reservoir" or "fountain" pens; and its object is to insure a proper flow of the ink whenever the pen is required for use, to provide means for drawing any ink that may remain on the pen-nib after use back into the reservoir, and to allow of the reservoir being filled without inconvenience.

With fountain-pens as at present made the ink often flows too fast or refuses to flow until the pen has been violently shaken, while after use the ink is often allowed to remain on the pen-nib and become wasted by evaporation or otherwise.

According to this invention I employ an arrangement of devices within or about the pen which constitute a pump capable of being worked by the user's finger while writing and when operated in one direction serving to draw ink into the pen and by continued action fill the reservoir and when operated in the opposite direction serving to eject the ink and feed it onto the nib-point. In conjunction with such feed devices I may employ means for wetting or cleaning the nib-point prior to writing.

On the accompanying drawings, Figure 1 illustrates an exterior view of a fountain-pen fitted with my invention. Fig. 2 illustrates a longitudinal section of Fig. 1 to a larger scale. Figs. 3 and 4 illustrate like views (in part) but with certain of the devices removed. Fig. 5 illustrates a sectional plan of Fig. 4. Fig. 6 illustrates a transverse section of Fig. 4 on the line *ab*. Fig. 7 illustrates a transverse section of Fig. 2 on the line *cd*. Fig. 8 illustrates a further longitudinal section, but upon another plane to that shown in Fig. 2 and showing a modification. Fig. 9 is a plan of certain parts shown in Fig. 8. Figs. 10, 11, 12, and 13 illustrate details. Fig. 14 illustrates a transverse section of Fig. 8, and Figs. 15, 16, and 17 illustrate like views of

modifications. Fig. 18 illustrates a side exterior view in part, and Figs. 19 and 20 transverse sections of two further modifications, Fig. 21 being a longitudinal section.

Referring to Figs. 1 to 13, 1 is the pen-holder, wherein is formed a cavity 2. In the opposite end walls of such cavity are small holes 3, leading, respectively, into the ink-reservoir 4 and to the pen-nib 5. Within the said cavity (the floor of which, as shown, is semicircular) and projecting through the said holes 3 is an india-rubber tube 6. This tube is by preference of the shape shown in Fig. 13, having flanges 7 and 8, so that after passing through the holes 3 such flanges serve to hold the tube in its proper place and to resist any tendency of being pulled out. It may, however, be of other shapes and be held in other ways, such as by an adhesive substance. Also within the said cavity is a wheel 9, mounted on an axle 10, the ends of which take their bearings in small recesses 11 in the opposite sides of the cavity. (See Figs. 5 and 7.) Upon the said wheel are studs 12, preferably two in number, and upon each stud is an antifriction roller or sleeve 13. The wheel 9 lies to one side of the tube 6, and the rollers 13 lie directly over the tube 6 and in the same plane. The position of the rollers relatively to the wheel center is also such that as the wheel is rotated the rollers roll and press upon the tube, thereby flattening the tube, as shown in Fig. 2, and diminishing or closing the passage for the ink at the point of contact, the tube, due to its own elasticity, extending or expanding again as soon as the roller has passed.

To one end of the india-rubber tube is connected an ink-feeder consisting by preference of a small tubular part 14, terminating at one end in a plate 15, which loosely fits the channel of the pen-nib 5, and at the other end terminates in an enlarged tubular part 16, which fits over the flanged end 17 of the india-rubber tube, as shown in Fig. 2, and thereby connects the feeder and tube to each other. The said enlarged part of the feeder is held in position within the holder by fitting tightly or screwing into a metal piece 18, carried by a rod 19, which in turn is secured to the split

steel nib-holder 20. (See Figs. 11 and 12.)
 With the parts thus assembled the user may
 charge the ink-reservoir 4 in the ordinary way
 through the removable end 21 or he may charge
 5 it by dipping the pen-nib into a supply of ink
 and by constantly rotating the wheel 9 pump
 it in through the tube 6.

To prepare for writing, the wheel 9 is ro-
 tated by, say, the user's finger-tip until the
 10 ink reaches the pen, each traverse of one of
 the rollers along the tube serving to drive for-
 ward a portion of ink.

After using the pen and desiring to prevent
 the waste of ink remaining on the nib the user
 15 rotates the wheel backward, and thus causes
 the rollers to roll up on the tube in an opposite
 direction, and thereby drive the ink back into
 the reservoir.

To provide for the more effective flow of the
 20 ink and wetting of the nib or to clear the nib
 of dried or clotted ink, the feeder 14 and its
 holder 18 may be capable of sliding to and fro
 upon the rod 19, and in such connection the
 retraction of the tube 6 may serve for return-
 25 ing the feeder after it has been moved out-
 ward, and to facilitate the moving out of the
 feeder I may provide a small bent wire 22, se-
 cured to the part 18 and after passing through
 a slot 23 in the holder terminating in a small
 30 head 24, so that the user by applying his
 thumb-nail or finger-tip thereto may readily
 move the feeder forward and allow the india-
 rubber tube to draw it back again, the plate 15
 thereby rubbing the ink over the point of the
 35 nib and making it ready for use. In place
 of the said wire 22 I may use a further wheel
 25 within the cavity 2 and upon the same axle
 10, but loose, as shown in Fig. 14, also a rack
 26, (see Fig. 8,) gearing with the said wheel
 40 25. This rack is a continuation of the part 18,
 (a small hole being provided for it to pass
 through,) so that upon rotating the wheel 25
 in the direction of the arrow the feeder-plate
 15 is moved forward to the nib-point, as shown
 45 by dotted lines in Figs. 2 and 8, the tube 6 re-
 turning it after the wheel 25 is released.

In Figs. 15 to 17 I show various ways of
 mounting the wheels and rollers, the roller-
 studs 12 in Figs. 15 and 16 being carried by
 50 the wheel 9 and a disk 9^x. In such examples
 the rollers 13 may be on studs secured to both
 wheel and disk or be solid and have trunnions
 13^x, taking loosely into holes in the
 wheel and disk.

In Fig. 17 I show how the axle 10 may pass
 right through the holder and the wheel 9 be
 rotated by a loose key applied to the squared
 end of the axle or by a ring; but I prefer the
 wheel to be rotated as aforesaid.

60 In Fig. 7 the wheel 9 is fast to the axle; but
 it may have an elongated boss and be loose.

In Fig. 14 the wheel 9 is fast on the axle,
 and the wheel 25, with its supporting-boss or
 sleeve, is loose.

In Fig. 15 the wheels 9 and 9^x, together 65
 with the axle and trunnions, are formed out
 of one piece.

In Fig. 16 both wheels and disk are loose on
 the axle, and the boss of the wheel 9 forms
 also the boss of the wheel 9^x. 7c

When the axle 9 does not pass through the
 holder, it is sprung into position. The wheels
 and their rollers may be variously made and
 mounted, the main requirement being cheap-
 75 ness of production and efficiency.

The reservoir may consist of a thin rubber
 bag 27, lying inside the holder and attached
 to one end of the rubber tube 6, as shown in
 Fig. 2. Inside such bag I may place a vul-
 80 canite or thin metal tube 28, perforated with
 a few holes. The rod or tube serves to keep
 the rubber bag in position, to conduct the ink,
 and to afford a means of affixing the rubber
 bag to the rubber tube.

The top end of the holder is closed by the plug 85
 21, which fits tightly or screws into the holder,
 and in such plug I form a small air-hole.
 When so constructed, it is impossible that the
 ink can spill or leak when the pen is carried
 in any position in the pocket. 90

Fig. 11 illustrates a section of the split steel
 lining 20, which holds the pen-nib pressed
 against the inside of the penholder. The
 steel lining also supports at its inner end the
 95 rod 19, and the projection 29, which supports
 the rod, takes into a recess 30 of the pen-
 holder and prevents the lining being with-
 drawn when the pen-nib is withdrawn. Fig.
 10 illustrates a section of the lining 20 and
 the metal piece 18 when the stud 22 is used, as
 shown in Fig. 2. Fig. 12 is an end view of
 the lining 20. 100

The cavity between the wheels may be cov-
 ered by a small lid or flap, fixed or sliding,
 and to facilitate the manufacture the wheels 105
 and tube may be fitted in a metal box adapted
 in turn to fit the cavity. I may use the wheel
 9 for operating any other kind of small pump;
 but I prefer the rubber tube and semicircular
 cavity. 110

The rod 19, as shown more particularly in
 Figs. 2 and 11, may be screwed into its place
 after all the other parts have been fitted in.
 The rubber tube used may also be round or
 oval in section. 115

In the illustrations I have shown the wheel
 25 mounted on the opposite side of the cavity
 to the wheel 9. As a modification it may be
 mounted adjacent to such wheel. The holder
 1 may be made of a larger diameter where it
 120 contains the cavity in order to permit of the
 cavity being made of larger size than would
 be the case if the penholder was of a uniform
 size in every part. The cavity itself may also
 be formed from the side or from the bottom 125
 instead of from the top, the essential points
 being that it should contain part of a circle,
 whereon the rubber tube may rest, and that it

should permit of a part of the wheel circumference being outside the cavity and convenient to the finger-tip.

Figs. 1 to 13 have particular reference to cases where a U-shaped cavity is employed. In the modifications hereinafter described where a transverse cylindrical cavity is used the whole of the wheel or wheels may lie outside the cavity.

In the modification shown in Fig. 19 the transverse cylindrical cavity extends only partly across the penholder. The movable feeder is operated by means of a stud 22, as already described, and the wheel 25 is therefore unnecessary. The rollers 13 are supported on studs 12 on the wheel 9, and a metal liner 2^x is used. The liner is of cylindrical shape to fit the cavity, and in it are formed holes to lie exactly opposite the holes 3. One end of the liner 2^x is open, and the closed end supports in its center a sleeve or tubular part which serves to hold the axle of the wheel 9. The end of the axle away from the wheel is secured by a nut 31.

In the modification shown in Fig. 20 the cylindrical cavity passes right through the penholder, and I use two disks 32 33, with holes at their centers, to support the axle 10 and in which the axle revolves. These disks are fixed by their circumference fitting tightly against the substance of the penholder at the ends of the cylindrical cavity. The gear-teeth in this case are preferably formed on a small pinion affixed to and lying on the inner side of the wheel 25, and the rack 26 is bent to pass through a slot in the disk or holder, which enables the rack to be moved as described in order to operate the movable feeder. The wheel 25 is loose on the axle. In this modification it will be seen that I employ two disk-wheels to support the rollers 13. Preferably I form these two disk-wheels and the axle out of one piece of metal, and the wheel 9 is made fast to the axle after the other parts are placed in position.

What I claim is—

1. In a reservoir-pen or the like, a holder a small pump within the said holder and a wheel capable of being rotated in either direction by pressing its outside edge and of operating the said pump, as and for the purposes set forth.

2. In a reservoir-pen or the like, a holder, an india-rubber tube with a portion arranged along part of the circumference of a circle in such holder and opening at one end to the ink-reservoir of the holder, a pen-nib feeder connected to the opposite end of the tube, rollers adjacent to such tube and means for carrying such rollers and causing them to press upon the tube for the purposes set forth.

3. In a reservoir-pen or the like, a holder, a movable ink-feeder and an india-rubber tube, one part of the tube being fixed to the

holder and another part to the feeder so that upon the feeder being moved forward to the pen-nib point the contraction of the tube automatically pulls the feeder back as set forth.

4. In a reservoir-pen or the like, a holder having a cavity an ink-feeder secured to the holder, a tube of india-rubber in the said cavity, a wheel also in the cavity, and means for axially sustaining the wheel, studs on the wheels and rollers loose on the studs, as and for the purpose set forth.

5. In a reservoir-pen or the like a holder having a cavity and slot, an ink-feeder loosely fitted to the holder, a tube of india-rubber in the said cavity connected at one end with the feeder and at the other end leading into the ink-reservoir a wheel in the cavity, means for axially supporting the wheel, studs on the wheel and rollers loose on the studs, and means for moving the ink-feeder toward the pen-nib, as set forth.

6. In a reservoir-pen or the like, a holder having a cavity with curved floor and holes in each end wall an india-rubber tube in such cavity with its ends passing through the said holes, a wheel and axle in the said cavity, and studs and rollers on the wheel, substantially as set forth.

7. In a reservoir-pen or the like, a holder having a cavity, a wheel and axle within the cavity and studs and rollers on the wheel, substantially as and for the purposes set forth.

8. In a reservoir-pen or the like, a holder having a cavity, a wheel and axle in the said cavity and the said wheel having gear-teeth, a rack gearing with the said teeth and a movable ink-feeder connected to the said rack, substantially as and for the purposes set forth.

9. In a reservoir-pen or the like, a holder having a cavity a wheel and disk, and an axle within such cavity, rollers mounted between the wheel and disk as set forth.

10. In a reservoir-pen, a holder having a cavity a wheel and disk and an axle within such cavity, rollers mounted between the wheel and disk, an india-rubber tube also within the cavity with one end leading to an ink-reservoir, and the other end leading to and connected with an ink-feeder as set forth.

11. In a reservoir-pen or the like, a holder having a cavity two wheels and a disk and axle within such cavity, rollers mounted between one of the wheels and the disk, and the other wheel having gear-teeth, a rack also within the cavity and gearing with the said wheel, a movable ink-feeder connected with the said rack, and an india-rubber tube in the cavity with its ends connected to the said feeder and the ink-reservoir respectively, substantially as set forth.

12. In a reservoir-pen or the like, a holder having a cylindrical transverse cavity with two holes at the opposite sides of such cavity, a movable ink-feeder, an india-rubber tube in such cavity with one end connected to the

said feeder and the other end leading into the ink-reservoir, an axle in such cavity, a wheel on such axle and adjoining the said cavity studs on the wheel and rollers on the said 5 studs and within the cavity, as and for the purposes set forth.

13. In a reservoir-pen or the like, a holder having a transverse cylindrical cavity and with two holes at opposite sides of such cavity, a movable feeder, an india-rubber tube 10 in said cavity with one end connected to the feeder and the other end leading into the ink-reservoir, two disk-wheels in such cavity, studs on such disks and rollers loose on such 15 studs; disks at the ends of the cavity, an axle passing loosely through the disks, a wheel fastened at one end of the axle, another wheel running loose at the opposite end of such axle and having a boss with gear-teeth, a rack op-

erated by such gear-teeth and connected to the 20 feeder, substantially as set forth.

14. In a reservoir-pen a movable feeder having a box-like part with lateral extension a rod upon which the extension is capable of sliding, and said box-like part also having a fur- 25 ther extension terminating in a rack, as set forth.

15. An india-rubber tube with one part straight and another part curved to the form of a semicircle, and said tube having flanges as 30 and for the purposes set forth.

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

ALEXANDER MUNRO.

Witnesses:

WILLIAM EASTWOOD,
EMILY ROSS.