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The Lamy Al-Star Fountain Pen
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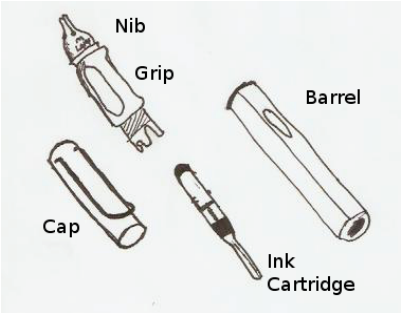
1.0 Introduction

The Lamy Al-Star Fountain Pen is an ink-based writing utensil used for drawing, writing and most other activities involving general writing utensils. While it can be used for most of the same tasks as the more common ballpoint and rollerball pens, its tip does not have a ball mechanism, thus requiring less force from the user to dispense ink, though it also requires more careful maintenance. It has four parts: the cap, barrel, ink cartridge and nib and grip assembly. It is designed to be comfortable to use at multiple angles against the page.



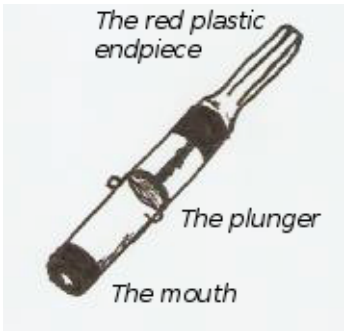
2.0 Cap

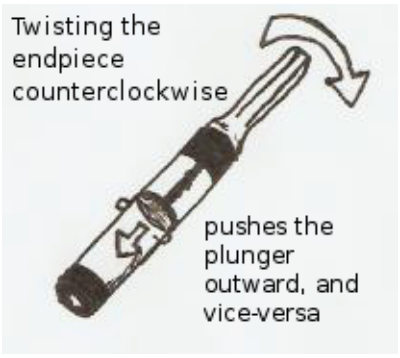
The cap is used to close the pen and keep its tip protected when in a pocket or otherwise not in use. It can also be attached, or "posted," to the back of the pen while it is in use to counterbalance the weight of the rest of the pen and increase usage comfort. It is a hollow aluminum cylinder with walls roughly [insert measurement] thick, a black plastic top, and chrome-colored brass clip. The inside of the cap is lined with plastic bracings that help it match the shape of the grip so it can lock in place onto the grip while the pen is closed. The plastic top is used during the construction of the pen to attach the brass clip to the rest of the cap, but in daily use serves no purpose other than cosmetics: rotating the plastic top using its screw-top-like grooves does not affect the pen. The brass clip is large for a pen's clip, measuring .8" by 3.1", and is suitable for holding the pen in pockets of several widths. This clip, along with the flatted sides of the pen's barrel, reduce the risks of the pen rolling off a tabletop or other flat surface, though it may still slide.

2.1 Barrel

The barrel of the pen is, like the cap, an aluminum cylinder, although longer and thinner (.6” thick and 5” long) and with two flatted sides to counter the pen's rolling. There is a firm but flexible rubber ring on the barrel where it meets the grip of the pen; when the cap covers the grip of the pen rather than the back of the barrel, it clicks down at its furthest depth and is held in place by this rubber ring. The pen features identical openings on each of its flats each running .25” wide and 1” lengthwise along the barrel, with the surrounding .13” along each hole tapering smoothly inward to the pen. These openings serve as windows into the pen so the user can determine how much ink is left in the cartridge without disassembling the pen. The inside of where the barrel meets the grip is screw-threaded to match corresponding threads on the grip to hold the pen together. The Lamy logo is indented in italicized block letters on one of the flats of the pen, away from the grip. There is a black plastic circle on the bottom of the outside of the barrel with the indented block letters “GERMANY” on it to indicate the pen's country of origin. The circle has no daily use.

2.2 Ink Cartridge

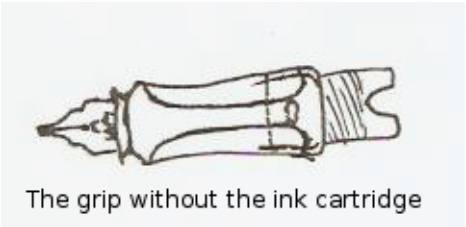


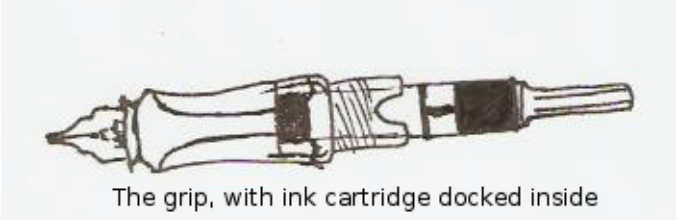


The ink cartridge allows the pen's user to fill it with ink, and holds ink to be dispensed by the pen. Ink is held in the translucent plastic cylinder marked A in the figure below, which houses a black plastic ring, noted as the “mouth,” at its head to more snugly link into the pen's grip; two plastic bumps adorn the sides of the cylinder, and are the main means by which the ink cartridge is secured to the nib. This cylinder, the ink reservoir, also contains a plunger within it that is driven by the red plastic endpiece of the cartridge. The plunger forms a water-resistant barrier with the inner walls of the reservoir, and its shaft is screw-threaded. When filling the ink reservoir with ink, the pen's user first twists the red end of the cartridge counterclockwise, driving the plunger head outward by exerting force on its screw-threads, until the plunger contacts the mouthpiece. The user then dips the mouth of the reservoir into an inkpot or inkwell and twists the red endpiece of the cartridge clockwise, drawing the plunger back towards the endpiece. As the plunger withdraws into the reservoir, it creates a partial vacuum in the reservoir, ducking ink from the inkpot into the reservoir. This process can also be completed with the ink cartridge docked into the grip, if the user instead holds the nib of the pen into the inkpot instead of the mouth of the ink cartridge. The red endpiece of the cartridge is thinner than the rest of the cartridge except for where they meet; it, like the pen's barrel, has two flatted sides, serving to make the endpiece easier to grip and turn. The endpiece of the pen is connected to the reservoir by a smooth black plastic cylinder, which, aside from connecting the endpiece and reservoir together, also sheathes and stabilizes the plunger's threaded shaft. In total, the ink cartridge features a hollow plastic cylinder, to serve as an ink reservoir, a thinner red plastic flatted cylinder that drives a plunger within the reservoir, and a black plastic cylinder between the previous two pieces that serves to connect them together.

2.3 Nib and Grip

The nib and grip are two pieces that are normally never separated, with the nib being a triangular piece of steel bent to the shape of and affixed to the head of the grip. Together with the ink cartridge, the nib and grip enables the functioning of the pen as a writing utensil, and these two pieces alone can be used as a pen, though they would not be ergonomic. The ink cartridge clicks securely into the nib and grip as shown below. After the ink cartridge docks inside the grip, and its mouthpiece connects to the inner ink channel of the grip, ink flows from the cartridge through a channel on the inside of the grip towards the nib, flowing out of the head of the grip and through the nib. Due to the surface tension of the ink within the nib, it will not flow unless a very large amount pools in the nib, the user subjects the nib to a large change in force (e.g. by shaking or throwing the pen), or, as in the standard usage of the pen, the surface of the ink makes contact with something else. When the nib makes contact with a surface like paper, the ink within the nib makes contact with that surface, breaking the surface of the ink and allowing it to flow, which allows the pen's user to write. The nib also features an air channel at the foot of its ink channel, which, by letting air flow back into the ink cartridge as ink flows out of it, allows ink to smoothly flow out of the pen, giving the user a more even writing experience. The word “LAMY” is printed at the foot of the nib to indicate the pen's brand, with either one or two letters printed, centered, above “LAMY” to indicate the thickness of lines the nib will produce, as a fountain pen's line thickness is highly dependent upon the width of the nib's channel.


The grip without the ink cartridge

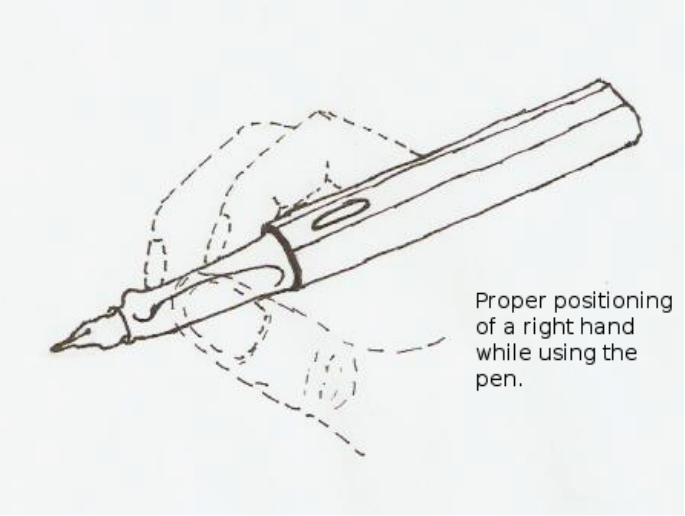

The grip, with ink cartridge docked inside

The grip, as a whole, possesses a head, a black plastic piece to which the nib is affixed, a molded grip, and a tail (see figure below). The inside of the grip is hollow from the end of the tail to 1/3 of the way along the grip to the tip of the nib, save for a small, rigid feeding tube extending from

inside the grip towards the end of the tail; this hollowed body and feeding tube allow the ink cartridge to snap into place in the grip while also fitting the mouth of the cartridge over the opening of the feeding tube to both secure the ink cartridge to the grip and allow ink to flow through the pen. The screw threads on the tail of the grip lock in to corresponding threads on the barrel, providing the pen a more ergonomic shape and protecting the ink cartridge from disturbance. The molded plastic grip of the grip has the shape of a gently shaped truncated cone. The grip features two flatted sides running much of the length of the grip where the user's hand is meant to grip the pen to provide ergonomic comfort. These flatted sides are symmetric along the grip, so the pen can be held with equal comfort in either the left or right hands. The molded grip also fits into bracings that line the inside of the pen's cap, causing the pen to click when being closed keeping the cap secured in such a state.

3.0 Usage

To use the pen, first make sure its ink cartridge is full. If it is not, remove the nib and grip from the barrel and either fill the cartridge by itself or through the nib as described in paragraph one of section 2.3. The user may hold the pen in either hand, and though it is recommended that he or she hold it as shown in the figure to the right, with the thumb, index and middle fingers, unorthodox hand positions are not impossible, and can even yield different thicknesses and styles of lines. Writing with the pen turned upside-down, so the top of the nib makes contact with the paper rather than the bottom, consistently yields thinner lines, allowing the user to write or draw with increased precision.


Proper positioning of a right hand while using the pen.

To begin writing, drawing, or otherwise applying marks to a medium, the user must place the nib of the pen to said medium. When this happens, ink will flow through the pen, and continue to do so until the user lifts the pen, breaking its contact with its medium. Pressing harder or lighter on the pen, as long as it continues to contact the medium, yields thicker or thinner lines, respectively. Pressing very hard on the pen is not necessary, as the pen's method of ink delivery relies merely on contact, and for this reason some victims of arthritis choose to use fountain pens because it largely mitigates the

pain that would be caused by writing with a ballpoint or rollerball pen. The relative paucity of force being applied through the pen as opposed to more common pens also causes many users to perceive a smoother, more fluid writing experience with fountain pens than with other kinds of pens.

A wide variety of inks are available for use with fountain pens, in dark to bright colors, with some even engineered so that they can't be removed or tampered with, in case they are used on legal or financial documents! Pen inks can even be mixed together to create new colors, should a pen's user wish it so. Some inks run more fluidly than others, and so pen ink plays a part in determining the smoothness and thickness of lines laid down by the pen that dispenses it. **The user should never use India Ink inside a fountain pen**, as it can irreparably damage the mechanisms within the pen. The pen should be stored upright to reduce the risk of ink sitting in the nib of the pen and drying there, making the flow of ink through the pen uneven or choppy.

The pen will require either frequent or occasional maintenance, depending on how well it is taken care of. If the pen begins to write less smoothly, its user can clean it by removing the nib and grip and ink cartridge from the pen, separating them, and soaking them in cold water for 24 hours, before allowing the parts to dry. At this point, the user should be able to refill and reassemble the pen and use it as normal. If the pen's nib is subjected to physical punishment, its nib may go out of alignment; it may be pushed back into alignment using tweezers or other precision machining tools. Very heavy usage or other wear may also grind away parts of the pen's nib; unevenness in the nib can generally be fixed by writing with the nib, either with ink or without, on brown grocery bag paper, whose roughness will gently grind away unevenness in the nib. This process can be done until writing with the pen feels smooth again.

4.0 Conclusion

While fountain pens require more maintenance than ballpoint or rollerball pens, they can also provide a more personalized, customizable writing experience, and greater writing comfort than either of the aforementioned pens. Contrary to popular image, they are not all expensive collector's items: a new Lamy Al-Star costs roughly $30 (comparable to ballpoint and rollerball pens of similar build quality), and ink is not particularly expensive, with $10 of ink being sufficient for roughly a year, depending on how often it is used.

For all the qualities listed above, fountain pens, and the experience of writing with them, are often highly regarded by their users. Their capacity for personalization in everything from the color of

their ink to the subtle differences in thickness in the lines they lay down make every person's handwriting recognizably different, so if you are the type who obsesses over their own mortality and desperately seek an affirmation of the significance of their own existence and individuality while scrawling away in a secret journal while also hoping that said journal will be discovered posthumously and the writings contained within will become wildly popular and influence the composition and style of all the fiction to follow it, perhaps a fountain pen is for you!

Fountain pens, because of their somewhat niche status as writing utensils, can also be practical for people with specific needs, as noted above for people with arthritis, and for certain professions, as with the Rotring 600, which is designed for the precise drafting required of engineers and architects.