

## The Workings of the Modern Pen



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The pen, common in settings such as schools, homes, offices, and many more is a staple everyday in life. The first recorded instance of a pen is from ancient Egypt, where any important information was documented, which would then be shared across the world. This practice sparked an information revolution. As information could now be shared with citizens from any social class, change was inevitable. Now education became more available to those who previously didn't have access to it and individuals who previously had access learned of new ideas, birthing new innovations and change. The clicker pen, the most modern revision of the pen, is arguably the most iconic and important invention of modern life.

Throughout time, the idea function and appearance of the pen has changed. The original pen was a feather quill that held ink. Since then, the pen has morphed from a steel quiver pen to a fountain pen, and finally a ballpoint pen. The modern ballpoint pen was invented in 1938 by Laslo Biro, right before the start of World War II ("The History of Pens, 2010). Along with his brother, Georg Biro, Laslo created the first commercially popular ballpoint pen. The inspiration of Biro came from issues that came with the fountain pen, mainly that it smudged too frequently due to how long it took the ink to dry. ("The History of Pens", 2010). The commercial success of the pen made it popular in the Royal Airforce as it was much sturdy and usable at any altitude, unlike the fountain pen which would burst ("History of Pens", 2018). This popularity contributed to why it is common today. The ballpoint pen has many variants, but this paper will be analyzing the "clicker" style pen.

The Clicker Pen can be broken down into the main parts, and the subparts of a pen. The interior of the pen, which is the main parts of the pen, is made up of seven parts which are the spring, thrust device, thrust tube, reservoir, ball, socket, and ink. The Exterior, which are the

subparts, are made up of four parts, the tip, the rubber grip, barrel, and grip. These two combine to make a seemingly simple but operationally complex tool that should be aesthetically and ergonomically pleasing to use. All of these parts can be seen in Figure 1 where it shows what we see and what we don't see in these everyday tools.

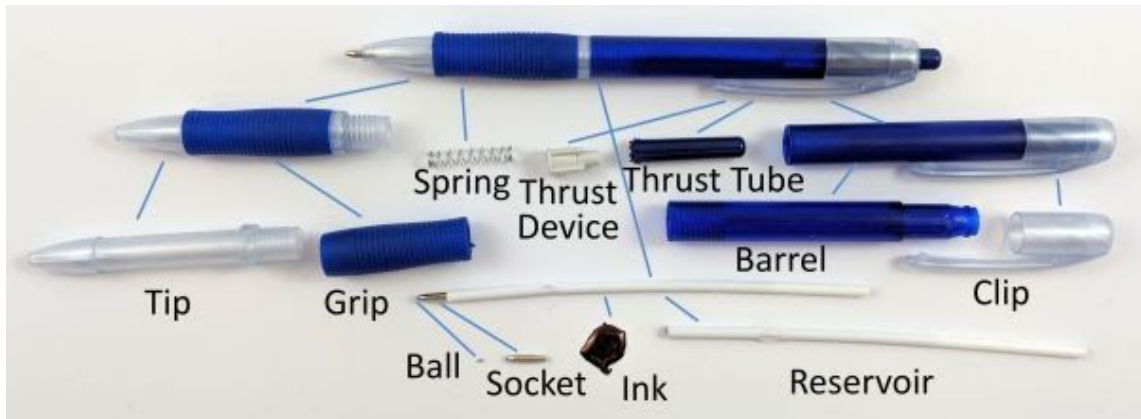


Figure 1

As previously mentioned, the interior of the pen is made up of seven parts that interact to expose the ball and socket when the user activates the clicker mechanism. The process begins with the thrust tube and thrust device. When the user activates the mechanism, the two parts rotate and separate from each other. As seen in Figure 2, both the thrust device and tube are geared. However, only the thrust device has gears on both sides, whereas the thrust tube has gears on one side which interacts with the thrust device. These two different teeth have similar shape but differ in length which determines what effect the thrust tube has on the thrust device.

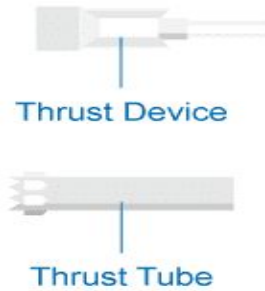


Figure 2

The thrust tube makes contact with the thrust device which, in turn makes contact with the reservoir. When activated, the thrust device exerts a force on the reservoir, pushing the nib of the reservoir out of the pen. This is because the device rotates, changing which teeth the tube is in contact with. Once the reservoir has been pushed out, a ball and socket inside the nib of the reservoir is pushed out which serves as a funnel with a plunger inside of it. In addition, the reservoir has two notches that pop out to hold the spring in place at the bottom of the pen. When the pen is used to write, the ball is lifted out of the opening of the socket. This allows the ink to flow out of the pen and onto the paper. When the user is done writing, they reactivate the clicker mechanism. Once again the thrust tube is pushed again, causing the thrust device to rotate again and rising up due to the spring lifting the reservoir, which is connected to the device, up and into the pen. All these motions combine to make the classic clicking sound of a pen as when the thrust device rotates, it does it with enough force to make a sound clicking.

The seven interior parts are enclosed within the exterior of the pen, which protect and hold in place this process. The main protector and largest part is the barrel of the pen which is the biggest part of the entire pen and it connects with the tip of the pen. The barrel serves as protection and the tip serves as the holder of the place which helps guide where the tip is supposed to exist from. The tip is usually, but not always, fitted with a grip made of rubber. The

grip is intended to give the user a stronger hold of the pen, leading to fewer mistakes. The barrel is also connected to the pen clip. The clip is attached to the top of the barrel and is in the shape of a hook. This allows the pen to hang off any surface or material thin enough such as shirts or pockets. It also serves as a guide of sorts for the thrust tube where the clip has a hole for the tube to exit from and help keep its position. Since these parts are interchangeable, it makes sense that they are subparts and less important than the interior parts as they can be changed to suit the aesthetic you want. However, this does not mean they can be taken out entirely and must be present to help make the process of writing better. This leads to a product you use every day in many parts of your life to look like whatever you want.

The importance of the pen could not be understated. It is amazing and it changed what it means to communicate, and helped rapidly innovate changes and brought forth a new age of communication. In addition, the effectiveness of a pen has been massively improved over time, leading to better and more accessible pens to any and everyone. All of this makes it seem as though the pen is forever. However, the rise of the digital age may make the pen seem like a product for the past, the influence it had to make it get that way seems like it will survive the gauntlet of time and persist in everyday life. The pen is often an unsung hero of humanity but will always be need, and always be there for you to write down your next thought.

Citations:

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