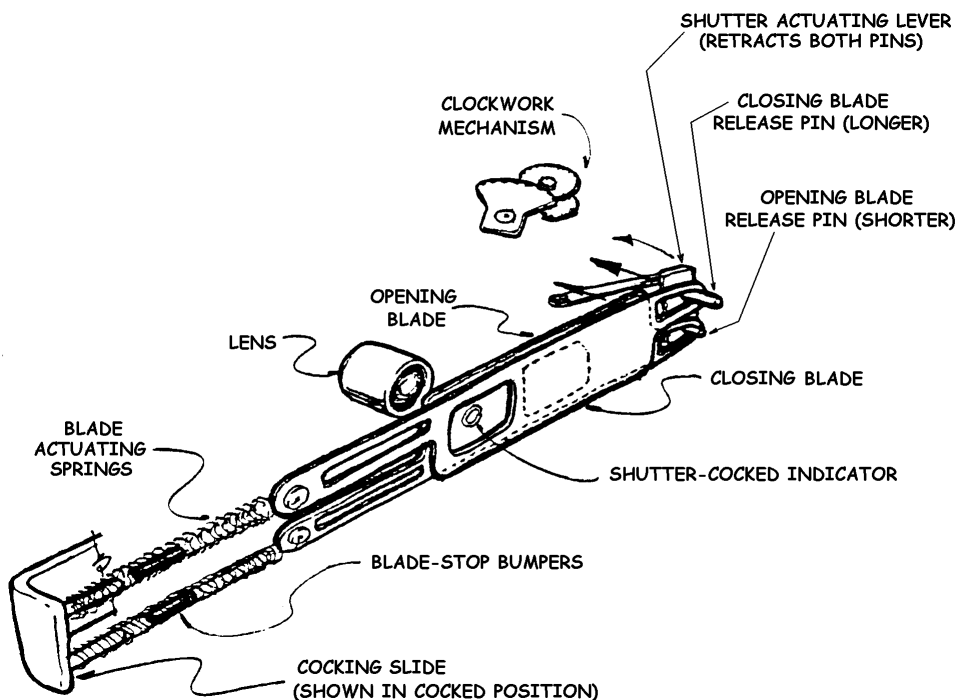


The Minox Shutter

Models A (I, II, III & IIIS) and B

Of all the world's great camera designs, the Minox is perhaps the most remarkable. Developed in Latvia by a firm that had never produced a camera before, the very first Minox combined shutter speeds from 1/2 to 1/1000 second, focusing to 8 inches, automatic parallax compensation in the viewfinder, built-in filters and a 50-exposure film load, all in a package so small you could carry 8 of them in the space occupied by one Leica M3 body.

As one might expect for this list of credits, the inside of a Minox is a veritable wonderland of mechanical ingenuity, and the story of its origins could easily make a book in itself. But I'll try to confine myself for the moment to a single area of the Minox design: the shutter mechanism.

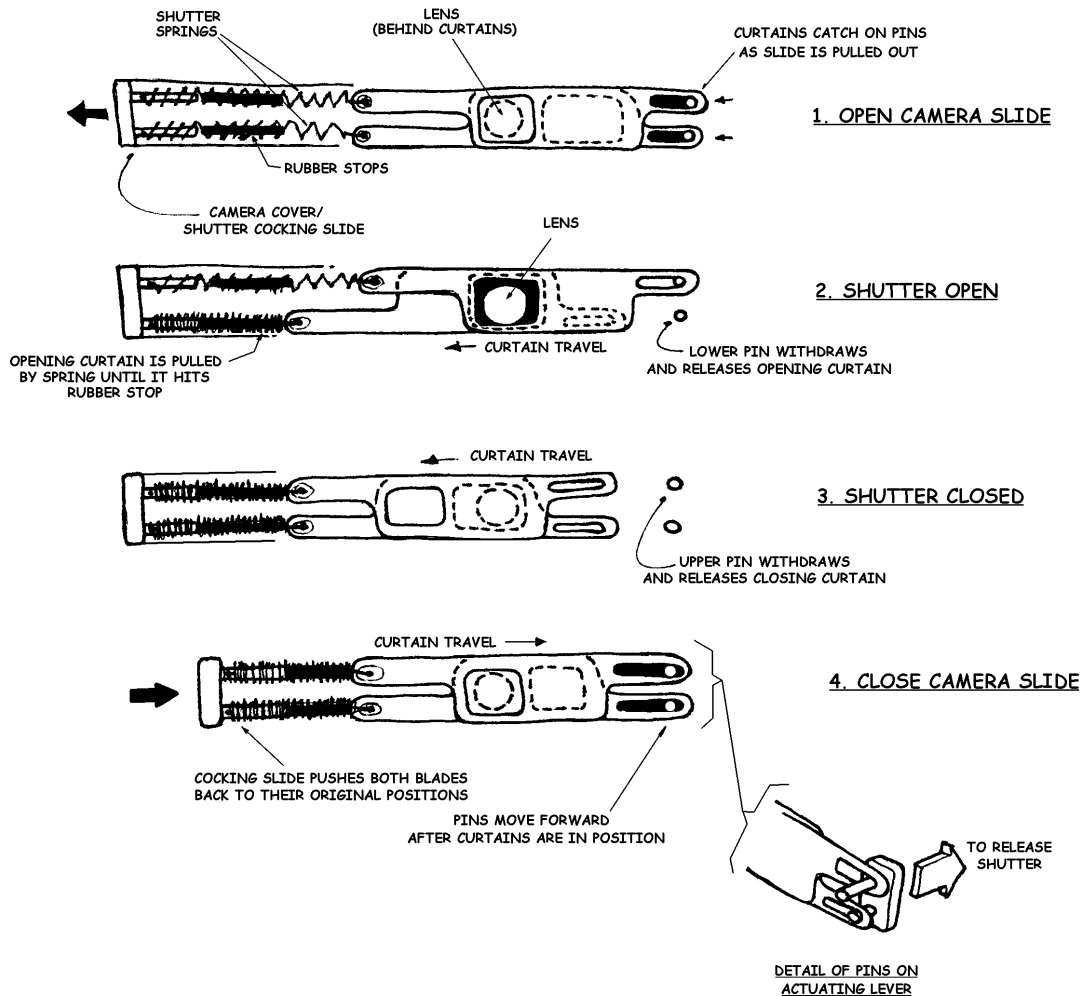


The Minox shutter is a two blade guillotine type, similar in action to a focal plane shutter but located in front of the lens. Its paper-thin stainless steel blades travel horizontally by the force of two tiny extension springs, and timing is provided by a gear train mechanism tucked into the space above the viewfinder. Both blades are released by a single lever which withdraws two unequal-length pins from slots in one end of the blades. Since both pins move in the same direction, at the same speed and at the same time, the shutter speed is determined by the difference between the lengths of the two pins (which is fixed) and the speed at which the lever moves (which is dependent on the position of the shutter speed dial). When released, the lever draws back far enough to fully withdraw the shorter pin from the opening blade, which is then pulled across by its coil spring until it comes to rest against a stop bumper. In this position, a rectangular hole in this blade is aligned with a similar hole in the closing blade, allowing light to enter the lens. The activating lever, meanwhile, has run into the timing mechanism and has been slowed down. Once it has passed through the required delay, the lever proceeds until the longer pin is withdrawn and the second blade travels across. Now the openings in the two blades are no longer aligned, and the shutter is closed.

The timing mechanism is unusual in a few respects: first, a single gear set of a simple design covers all speeds from 1/2 to 1/1000 second (most shutters require a speed shift or two, in order to cover such a wide range). Second, the spring driving the actuating lever is opposed by a weaker one acting directly on the gear set, and both are totally independent of the springs powering the blades themselves. And third, because of this unusual spring arrangement, the timing mechanism literally winds itself back up with its rewinding spring when the camera is closed. Which brings us back to our story.

To recock the shutter which has just been released, the camera body is "closed". In this operation, the bumpers which stopped the blades now push them back to the starting position. The actuating lever is also returned to its starting position, and the timer rewinds with a faint buzzing sound which lasts for about a second.

MINOX SHUTTER OPERATION SEQUENCE



Although the triggering and timing mechanisms are now cocked, the shutter springs will be tensioned only when the camera is reopened for the next exposure.

Clever as it is, though, the original Minox design does have its shortcomings. One of these is that the 'closing' action automatically advances the film, even if no exposure has been made. And while a non-resettable, 50-exposure frame counter was probably fine when Minox film came only on a 50-shot roll, it's a bit inconvenient when you have to cycle the camera an extra 14 times to line up the counter for reloading with today's 36-exposure loads. Potentially more serious, though, is the inherent delicacy of the small parts which make up the mechanism. Spring breakage is a real possibility; and in a

device that requires a pair of .001-inch-thick blades to be pushed into position, the slightest obstruction can result in total and permanent disaster. (We are very fortunate today for the presence of Marty Doctor, who at his own expense commissioned manufacture of replacement blades and springs for the Minox. As of the autumn of 2009, he can be found at <http://www.minoxdoc.com/>)

Still, it's easy to find a 50 year old unrestored Minox still working, and many have survived hard use to become famous tools of espionage and military intelligence for generations.