The Univex Mercury

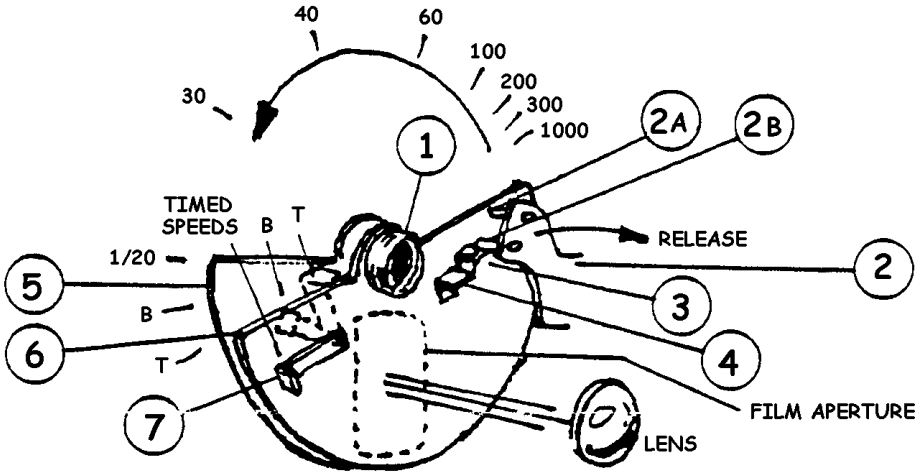
The Mercury shutter is an exceptional design for reliability and accuracy at high speeds. Unlike most focal plane shutters, its opening and closing blades travel as a unit, locked rigidly together and powered by a single spring. This feature effectively eliminated the fade and adjustment problems which plagued nearly all other focal plane shutters at high speed settings. This same feature limited the slow-speed capabilities of the shutter, as no time delay was possible except by stopping the entire mechanism in mid-cycle. The slowest timed speed of 1/20 second corresponds to the travel time of the widest slit (about 150° of arc) past the film aperture; narrower slits give proportionately shorter exposures. Another unique characteristic of the Mercury shutter is that it travels for .025 - .050 second before the slit reaches the film aperture, thus assuring that the mechanism has fully accelerated and thus its speed is constant as it passes the film. Consistent with the high-speed orientation of the design, this delay is longest at the highest speeds, ensuring the greatest possible accuracy at that end of the scale.

In concept and in operation, the shutter is quite simple. The diagram shows a front view of the shutter, cocked at 1/20 second. To adjust speed, the opening blade is rotated to the required position as marked on the sketch.

Because the opening blade is the adjustable one, the distance traveled before opening varies from about 90° at 1/20 second to 200° at 1/1000, with closing time the same at all speeds.

UNIVEX MERCURY SHUTTER

(SHOWN COCKED AT 1/20 SECOND SETTING)



1 WINDING SPRING
2 RELEASE PAWL ASS'Y (A) B STOP PIN (B) TRIP & T STOP PIN
3 RELEASE TAB
4 STOP TAB
5 OPENING BLADE (ADJUSTABLE)
6 CLOSING BLADE (CONSTANT)
7 B/T STOP TAB

When the release is pressed, pawl 2 moves sideways as indicated, allowing tab 3 to pass. The disc spins freely for about 350° until stop tab contacts stop pawl (not shown in diagram). This pawl is linked to the winding mechanism, so that it releases and allows the disc to proceed on to pawl 2B just as the shutter spring is fully rewound. This operation is identical at all timed speeds, only the slit width being variable.

Setting speed dial to "B" opens blade 5 slightly beyond its normal range, causing B/T stop tab 7 to move to its middle position. Now, when the button is pressed and held, the disc travels as before until this tab catches on pin 2A of the release pawl, stopping the disc in the open position. As the pawl is allowed to return to its normal position, the tab passes on the outside of the pin and the shutter closes.

At the "T" setting, tab 7 shifts to its far-inboard position. The disc spins as before but tab 7 is caught by pin 2B instead of 2A. As the button is released, the tab slides off of 2B but is immediately caught by 2A. Pressing again allows the tab to pass on the inside, and the shutter closes. Thus, the Mercury can boast another rare feature, a true 'press to open/press to

close' Time Exposure function, something which was lacking in other focal-plane-shuttered cameras such as the Leica.

Unlike other shutters, rewinding the shutter of the Mercury does not involve reversing the motion of the blades to return them to their original positions; the motion being circular, the shutter blades have returned to their starting position at the end of the exposure. Rewinding is simply a matter of retensioning the shutter spring as the film is advanced to the next frame.

Introduced in the autumn of 1938 and produced in series with both 1/1000 and 1/1500 second top speeds, the Mercury ceased production in 1952 – a victim of a weak economy, an undercapitalized manufacturer, and old age.