

of film. Each camera has specific requirements regarding the size of the loop or loops when threading (see Figure 1.17).

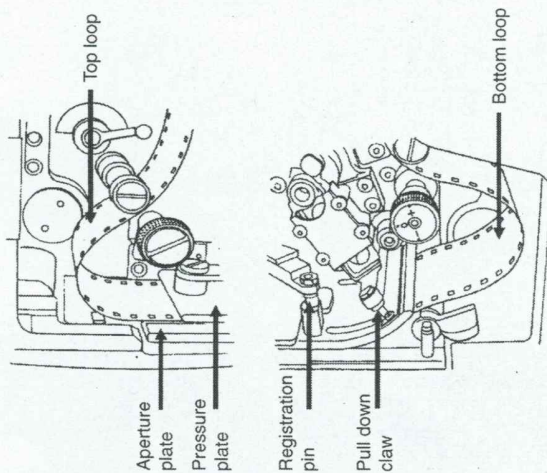


Figure 1.17
Threading diagram showing the loops and gate components in the Panavision camera. (Reprinted from the *Panaflex Users Manual* with permission of David Samuelson and Panavision Inc.)

There are four components to the gate area that work together to make this intermittent movement happen.

Pull Down Claw To move the film, a small hook or claw engages into a perforation in the film and pulls it through the gate. This small hook or claw is called the *pull down claw*. Each camera contains some type of pull down claw to move the film. Some of the more advanced cameras, including many 35 mm cameras and those used for special effects cinematography, contain two pull down claws, one on each side of the film frame.

Registration Pin When the pull down claw pulls the film into the gate so that it may be exposed, it must be held perfectly still during this exposure process. A metal pin engages into the film's perforation and holds it in place so that it may be exposed. This pin is called the *registration pin*. Some 16 mm cameras do not have a registration pin, but because of their design, the film is held securely enough in the gate area to ensure a steady image. As with the pull down claw, some of

the more advanced cameras, including many 35 mm cameras and those used for special effects cinematography, contain two registration pins.

Aperture Plate The metal plate that contains the opening or aperture through which light passes to the film is called the *aperture plate*. The opening may be called the *gate* or the *aperture* (not the same as the lens aperture or f-stop) and is usually the same size as the aspect ratio being used. The term *aperture* means "opening," and we often speak separately of lens apertures and camera apertures.

Pressure Plate The area where the film is held in the gate during exposure is called the *film plane* or *focal plane*. To keep the film flat against the aperture plate during exposure, the camera contains a metal plate located behind the film that pushes it against the aperture plate and keeps it flat and steady in the gate area. This metal plate is called the *pressure plate* because it puts pressure against the film.

When referring to the gate, most camera personnel usually are referring to the entire area in the camera that contains the pull down claw, registration pin, aperture plate, and pressure plate.

Shutter

The *shutter* is a spinning mechanism in the motion picture camera that controls the light striking the film. The shutter is mechanically linked to the other parts of the intermittent movement so that its timing is synchronized with the movement of the pull down claw and registration pin. The shutter spins and alternately allows the light to either expose the film or go to the viewfinder eyepiece so that the Camera Operator may see the image. As the pull down claw moves the film into position, the shutter will be in the closed position so that no light strikes the film. When the frame of film is in place and being held by the registration pin, the shutter will be in the open position so that the light may strike the film and create an exposure.

Shutter Angle

The opening in the shutter that allows the light to strike the film and create an exposure is called the *shutter angle*. A typical shutter contains a shutter angle of 180 degrees. This is what most people consider to be the standard shutter angle for motion picture photography. On all professional motion picture cameras, you will have either a fixed 180-degree shutter or a variable shutter that can be adjusted to