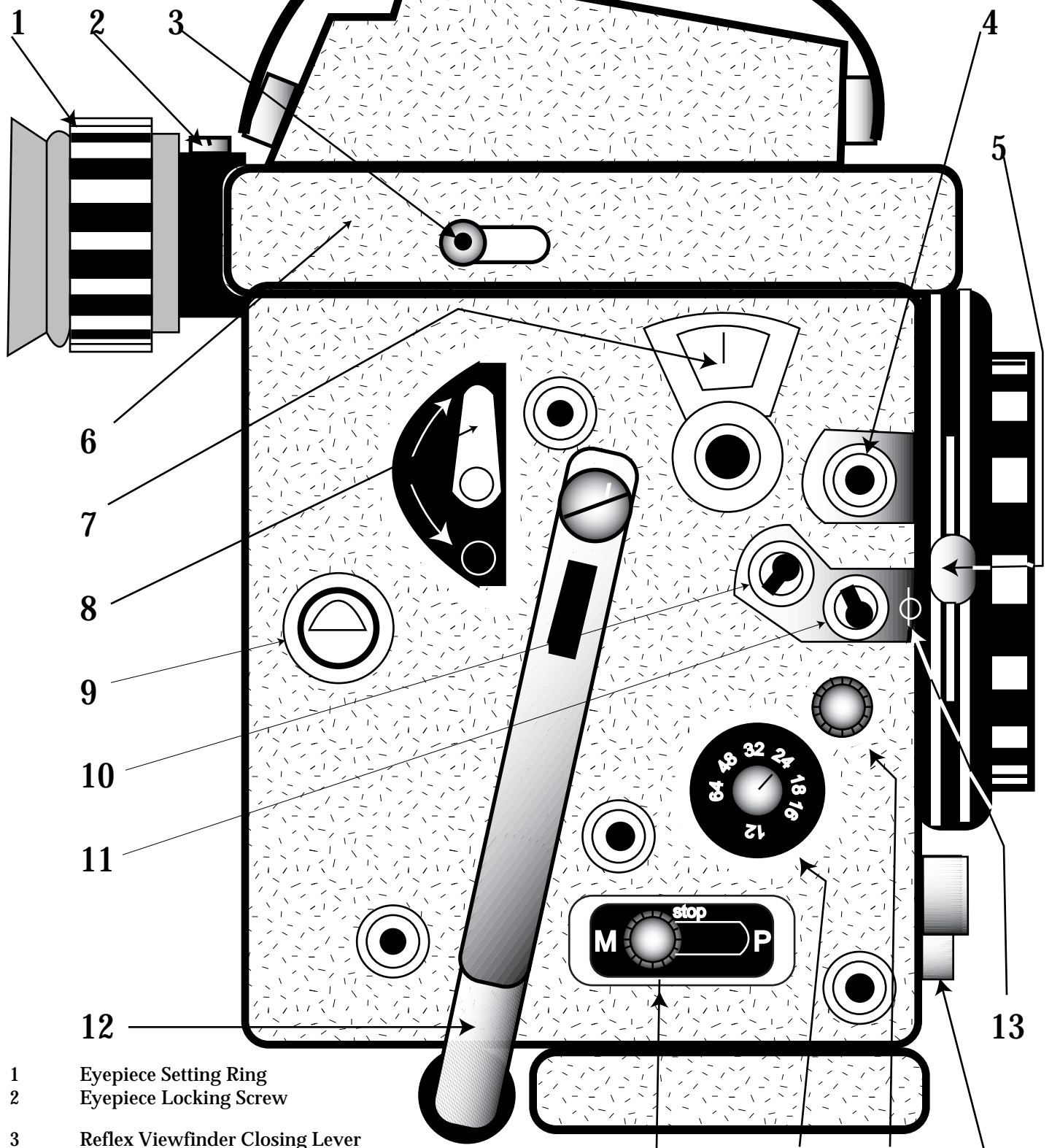
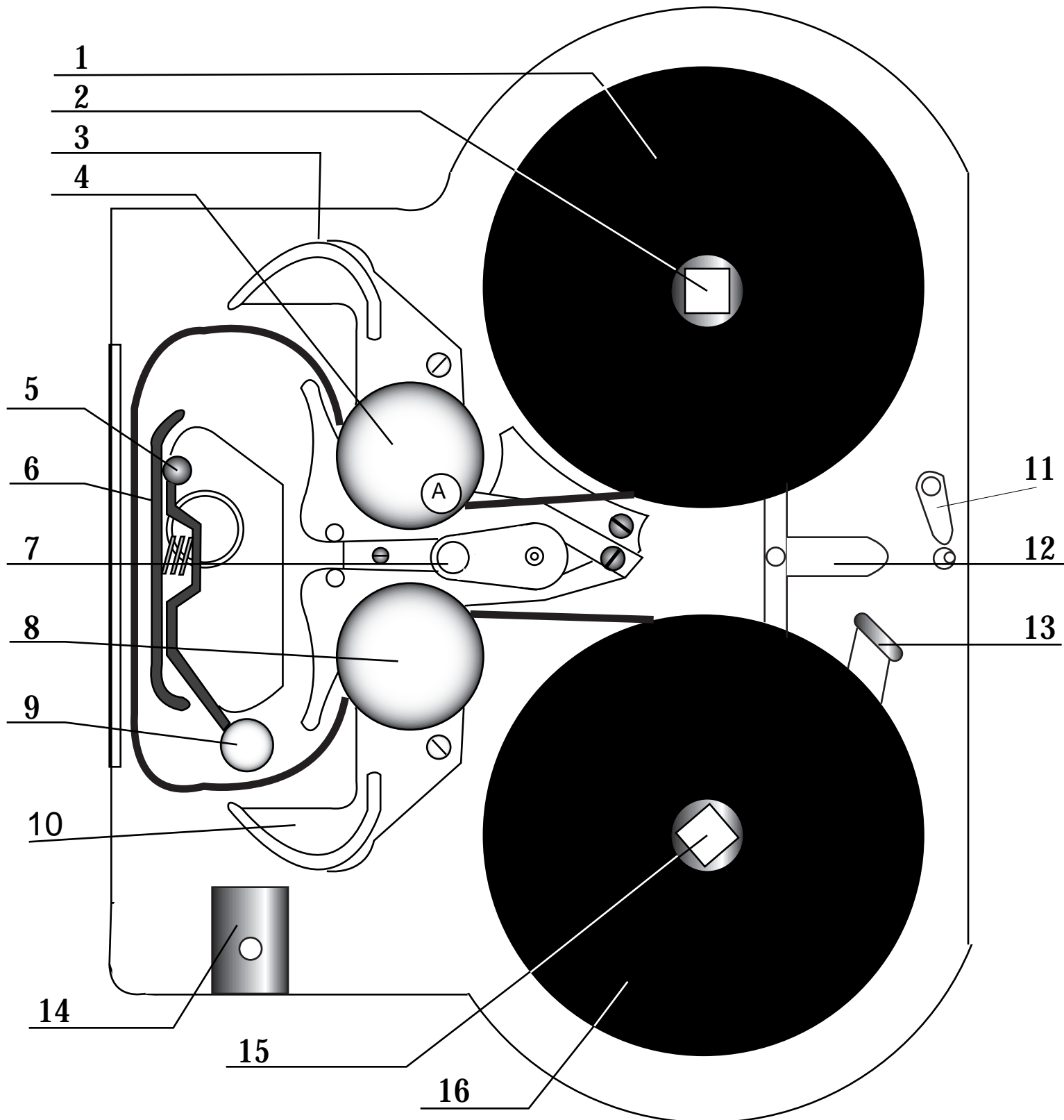


The Bolex SBM Exterior



- | | | | |
|----|---|----|---|
| 1 | Eyepiece Setting Ring | 13 | Film plane guide mark |
| 2 | Eyepiece Locking Screw | 14 | Slide release for Normal running, continuous (M) and single frame exposures (P) |
| 3 | Reflex Viewfinder Closing Lever | 15 | Filming speed selection knob |
| 4 | Threaded Holes for Various accessories and motors | 16 | Exposure control knob for instantaneous (I) or timed exposures (T) |
| 5 | Variable Shutter dial and control lever | 17 | Front release for normal running |
| 6 | Reflex Viewfinder | | |
| 7 | Frame Counter | | |
| 8 | Lever for disengaging Spring-wound motor | | |
| 9 | Footage counter | | |
| 10 | Shaft For rewind crank | | |
| 11 | Coupling spindle for Electric motor | | |
| 12 | Spring motor winding handle | | |

THE INTERIOR OF THE BOLEX



- | | | | |
|---|---------------------|----|-----------------------------|
| 1 | Daylight Spool | 9 | Pressure Pad Securing Screw |
| 2 | Upper Spindle | 10 | Lower Loop Former |
| 3 | Upper Loop Former | 11 | Audible Counter Control |
| 4 | Upper Sprocket | 12 | Spool Ejector |
| 5 | Pressure Pad Pin | 13 | Retaining Arm |
| 6 | Gate Pressure Pad | 14 | Film Knife |
| 7 | Loop Former Control | 15 | Lower Spindle |
| 8 | Lower Sprocket | 16 | Takeup Spool |

THE BOLEX

There are at least seven models of modern Bolexes: The H-16, M-5, RX-5, SB, EBM, and the EL. Excluding the H-16 and the M-5, all have Reflex Viewfinder systems, so you see approximately what you shoot. These reflex systems divert approximately 30% of the light that passes through the lens. As a result you must compensate for this light loss by opening up your lens $1/3$ stop from your calculated exposure.

The H-16 and the M-5 can mount a single "C" mount lens. The RX-5 features a triple "C" mount lens turret. This allows you to quickly rotate between lenses to change your focal length (Very handy for Documentary and Live-Action, not so necessary for Animation). The SB, SBM, EBM and EL have a single Bayonet lens mount. This is advantageous if you are using lenses with long focal lengths as the Bayonet mount is structurally stronger. In addition, a "C" mount to Bayonet adapter is available.

All models except the EBM and the EL have a spring-wound motor. The maximum run-time of the camera is approximately 28 seconds. This is about 16 feet (40 frames/ foot.). All cameras have speeds of 12, 16, 18, 24, 32, 48, and 64 fps. In addition, the cameras can be set to take single frames, either at a default shutter speed or a timed exposure. An assortment of wild, crystal controlled and animation motors can be fitted to the cameras. The EBM and the EL have an integrated 12 volt camera motor.

With the exception of the M-5, each camera can has a slot behind the lens for inserting gelatin filters. To prevent stray light leakage, the RX-5 must always have its gelatin filter holder inserted into the slot. Even if there is no filter in it. The SB, SBM, and EL models have a more advanced design that provides a two position filter slot. Therefore a loaded filter holder can be mounted in the filter slot in anticipation of its use. To use the filter, it is simply advanced to its second position behind the lens.

All models take 100 ft daylight spools or cores. Some models are adapted to take an external magazine, extending the capacity to 400 ft. 100 ft. of 16mm will give you two minutes and forty-four seconds of screen time.

Most models have a variable shutter. This allows the operator to further reduce the exposure time of the shutter. It can also be used to create in-camera fades and dissolves. (Note: these times take into account the $1/3$ stop compensation)

Shutter speed of EBM and EL at 24 fps — $1/67$ sec

Shutter speed of spring wound Bolexes at 24 fps $1/80$ sec

Variable shutter shutter speeds

At 24 fps shutter one quarter closed — $1/112$ sec

At 24 fps shutter half closed — $1/188$ sec

In Animation, the shutter speed is a combination of the motor speed and the size of the Variable shutter.

If the Variable shutter is not fully open, a triangular warning sign appears in the viewfinder. If the variable shutter is set to the 1/2 position and locked, exposure time is reduced by half—thereby reducing exposure by one stop. At the 1/4 position, exposure time is reduced by two stops

The EL is equipped with a through-the-lens exposure meter.

With the exception of the EBM all models have footage and frame counters on the side of the camera. (You tell me why the EBM doesn't need a footage counter, I don't know why.)

LOADING THE BOLEX

First off check to see that the Lever for engaging /disengaging the spring-motor (# 8 in the diagram) is set to "M" . This engages the motor. Fully wind the spring-driven cameras by gently rotating the winding handle in a counter-clockwise direction. Stop when you encounter resistance.

(A full wind of the mainspring will enable you to expose about sixteen feet of film.)
Beginners sometimes set the camera to the slowest running speed (12 fps) to make loading less stressful. (Change the camera speed by rotating knob # 15)

Hold the camera so that the viewfinder is closest to your body. On the left hand side of the camera body you will find a knob for opening the camera door.

Once the door is open, take a minute to inspect the empty camera. Is it clean?

Cleaning the Bolex

Remove the pressure pad (6) by pulling on the Pressure Pad Pin (5). At this point you can swing the pad to the right, away from the film gate. By unscrewing the Pressure Pad Securing Screw (9) you will be able to fully remove the pressure pad. **WARNING:** At no time should you lay the pressure pad flat on any surface. If the pad gets scratched it will begin to scratch your film.

Check the gate for debris, hair, dust or bits of emulsion. Pay special attention to the aperture. If the area needs cleaning, tilt the camera on its side and aim a stream of compressed at the area. Setting the camera upright onto its base allows the dust and particles to fall out when you dislodge them. Do not use Compressed air from a can when you are cleaning the film gate. Canned air can sometimes eject oils. You don't want those getting on your film. Instead use an enema syringe Get them at the drug store for a quarter the price of a camera syringe.

If the gate debris refuses to budge, try a gentle scrubbing with a clean cloth that has been wrapped around a small stick (No metal please). If this fails, you may need to dampen the cloth. Dry the part thoroughly. Now replace the pressure pad.

Putting Film in the camera

Putting Film in the camera

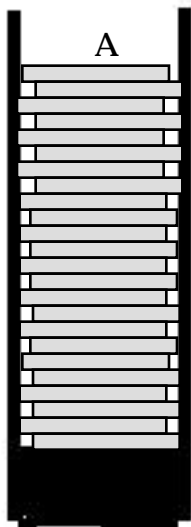
Double check that the pressure pad is locked in position.

If you desire the camera to make a small click every second (at 24 fps) this is the moment to set the Audible Counter Control (11) to point downwards.

If there is an empty spool in the takeup position (16) you can now remove it by pressing down on the Spool Ejector. Inspect the takeup spool to ensure the sides of the reel are parallel. If they have been bent out of shape, the film could bind and cause a camera jam. Test the reel by sliding a 16mm core all the the circumference. (Its always a good idea to have a few spare cores in the bottom of your schoolbag.) Swing the Loop Former Control (7) counter-clockwise until it clicks into the down position. The small button on the control returns the Loop Formers to their original position. Normally this task is accomplished with the closing of the camera door. But I digress.

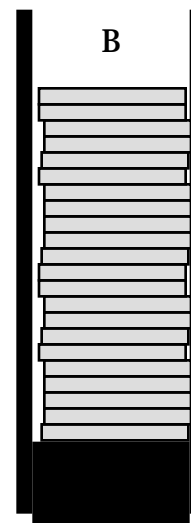
The Loop Former Control is in the down position and the Loop Formers have closed in around the film gate. You are now ready to insert the fresh roll of film.

A few words about Film. Generally you will be loading the Bolex with 100 foot rolls. If the film has come from the manufacturer mounted on a daylight spool it is safe for you to load the camera in subdued light. It is usually cheaper to buy film in larger amounts, such as 400 foot rolls . These rolls can then be taken into a darkroom and wound down onto four 100 ft rolls. If you are about to load one of these “broken down” rolls I would recommend that you load the camera in total darkness. Even though the film has been wound onto “Daylight reels” it is not daylight safe like the same film coming straight from the manufacturer. The difference is in how the film is wound onto the reels.

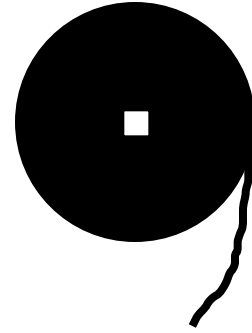


The illustration (A) on the left is a cross section of film wound onto a daylight core by the manufacturer. Notice that the film zig-zags, one layer touching the left interior wall, the next layer touching the right interior wall. This winding arrangement assures “Daylight loading” because at any given moment, only one layer of film is exposed to light.

The Illustration (B) on the right represents a roll of film broken down onto a daylight spool. (As you can do in a darkroom when you break up 400 feet into four 100 ft rolls.) Notice the wind is random and usually favours one side of the interior wall of the spool.



This space allows light to leak down and fog the edge of the entire roll. Depending on the light conditions where you load the film, the leak could be minor. But why take a chance? To be safe you should load this roll in the dark.



One other thing, when you insert the film spool into the camera (Position one on the diagram) the film should hang like this:

Okay, now back to the camera.

To review, you've checked the pressure pad. It is locked in its position. You've removed the takeup spool and you've swung the loop formers into position. **Now, place the Daylight spool holding the unexposed film on to the Upper Spindle (2). Pulling down on the film, check to see that the emulsion (the matte brown side) is facing towards the lens. The Base of the film (the shiny black side) should be facing the back wall of the camera interior, close to the viewfinder.**

Pull the film down to the Film Knife (14) and cut the end diagonally between two sprocket holes. (Check the illustration inside the camera.) Don't forget to remove the piece of film that you cut away.

Press the Release (17 of the Bolex Exterior illustration) while pushing the end of the film against the upper sprocket (Position A in the Diagram). The film should be automatically threaded through the gate mechanism. Continue to run the film through the camera until 12 to 14 inches have run through the mechanism. At this point stop the camera. Insert the end of the film into the slot on the core of the take-up spool. Rotate this a few times to ensure that the film will stay secured. Mount the take-up spool on the Lower Spindle (15). Turn the takeup spool by hand until the slack is taken up. Note: check that the film isn't caught and running over the Retaining Arm (13) . This can quite easily happen and will scratch your film.

Open the Loop Formers by pressing the knob in the center of the Loop Former Control. Run the film for a few seconds to check that film is advancing normally, the loops at both ends of the film gate are holding, and the take up reel is functioning.

Replace the lid of the camera. This is not altogether straightforward, for the lid has a small lip that must be hooked into the interior before the lid will sit flush on the body. Lock the lid by turning the knob clockwise. Now run the film until the footage counter reads "0".

You are now ready to go.

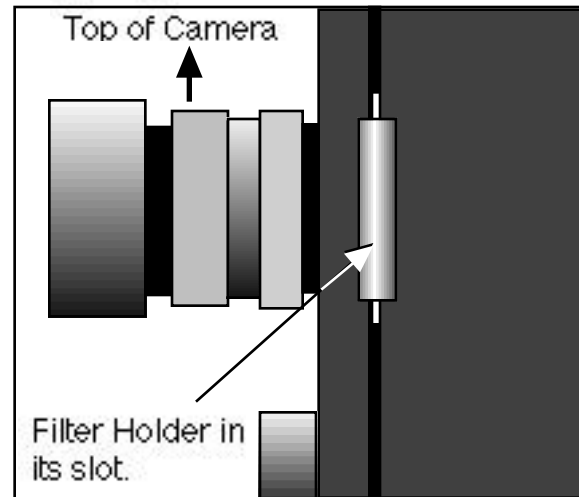
A few mistakes to avoid while you shoot.

Make sure that the filter holder is inserted in its slot, even if no filters are used.

The filter slot can be found by turning the camera so that handle faces away from you and the lens points to your left.

Always close the Viewfinder when you take your eye away from the camera. Light going into the viewfinder can actually make its way to your film and ruin your pretty pictures.

If you backwind your film, to create a double exposure, close the Variable Shutter (Ext. # 5) and the Reflex Viewfinder Baffle Lever (Ext. # 3). Failure to do so will cause an accidental exposure over your footage.



Always make sure that the Variable Shutter Control Lever is locked in position, whether it be fully open or at one of the alternative settings. the lever has a tendency to move by itself when not locked, causing variations in exposure on the film.

“It looked focussed to me!”

It is always most accurate to focus a Bolex by looking through the viewfinder. Filters placed behind the lens, in the filter slot, may cause a focus shift. Therefore the distance scale on the lens may not give you the results you want. However, everyone's eyesight is different. Before you shoot anything, you must calibrate the viewfinder to your vision. Set the camera on a tripod facing of a bright white wall. Remove the lens from the front of the camera (Don't do this in a sandstorm please.) Now look through the viewfinder. Can't see anything? Maybe you've left the Reflex Viewfinder baffle lever (Exterior # 3) closed. Raise the lever to close the viewing system, lower it to open the system.

Once you have opened the lever you should be able to look through the viewfinder and see nothing.... just a white blobby blur. However, depending on your eyes, you may see the viewfinder frameline. Now you must loosen the Viewfinder locking screw. (Ext. # 2) and then rotate the Eyepiece Setting Ring (Ext. #1) while looking through the viewfinder. At a certain point you will see the grain of the viewfinder screen become sharp and gritty. Stop and tighten the Eyepiece Locking screw. You have now managed to focus the viewfinder to your eyesight. Put the lens back on. Now, anything that appears focussed through the viewfinder will be focussed on the film.

If more than one person operates the camera, only one person should focus it.

Preparing the Bolex for a motor

4. Threaded holes for various accessories and motors.

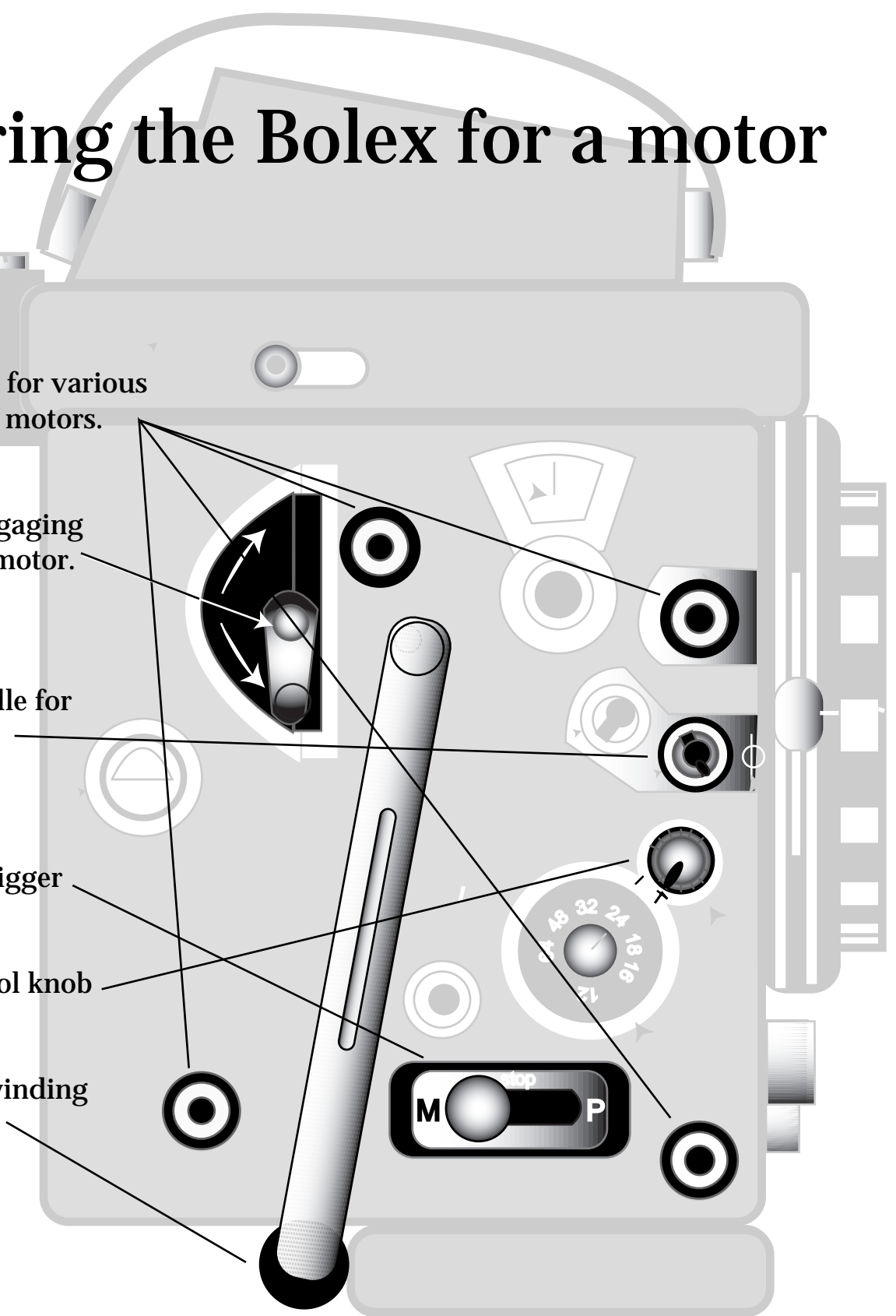
8. Lever for disengaging spring wound motor.

11. Coupling Spindle for electric motor.

14. Slide Release trigger

16. Exposure control knob

12. Spring motor winding handle



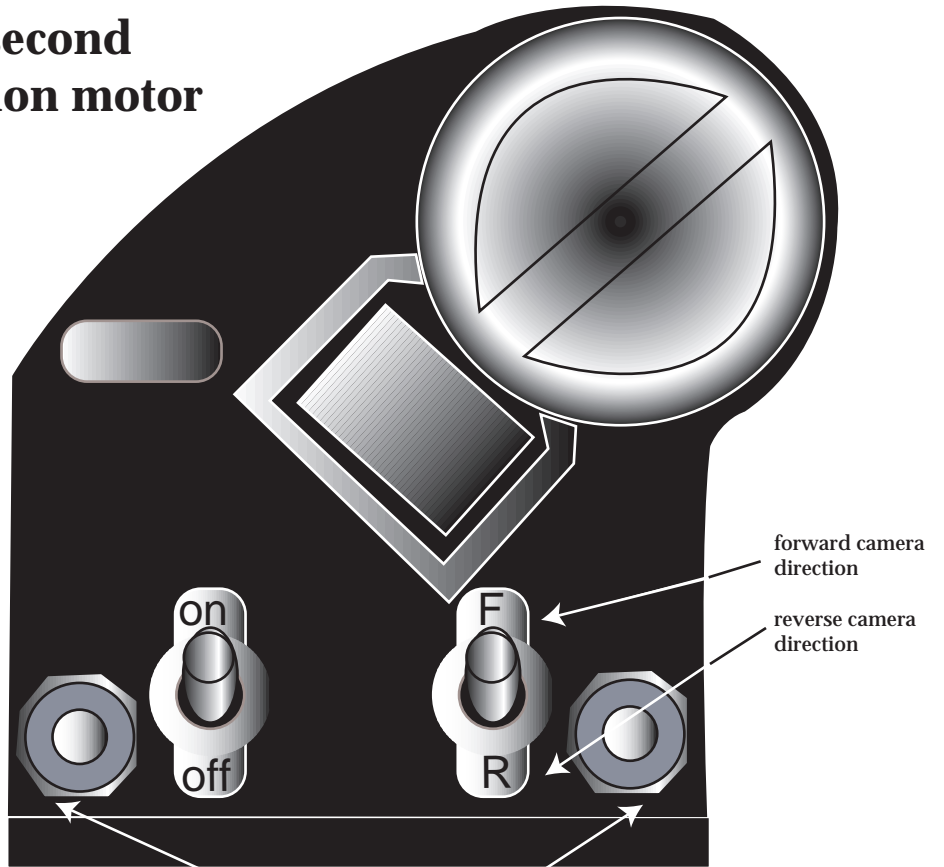
These are all the features that you have to worry about when you mount a motor onto the Bolex. The spring motor wind handle(#12) has to be removed by rotating it clockwise.

The spring motor is then disengaged by moving the lever (#8) down to off while sliding the slide release trigger (#14) towards "M" until the trigger locks into position. The Exposure control knob (#16) must be turned to "T". Now you are ready to mount a motor onto the side of the camera

The Bolex 1/2 second exposure, animation motor

Push this button and be brilliant.

(SIDE VIEW)



If your motor makes a grinding noise and the camera shutter does not turn over, carefully loosen these two bolts and adjust the motor forwards or backwards until the binding noise stops and the shutter turns over freely.... (Hope that you never have to do this...)

(FRONT VIEW)

Tripod screw attaches to the underside of the motor mount base.

Coupling spindle goes into # 11 on the Bolex. Check to make sure that the teeth engage correctly.

Motor mount screw attaches to underside of Bolex base.

