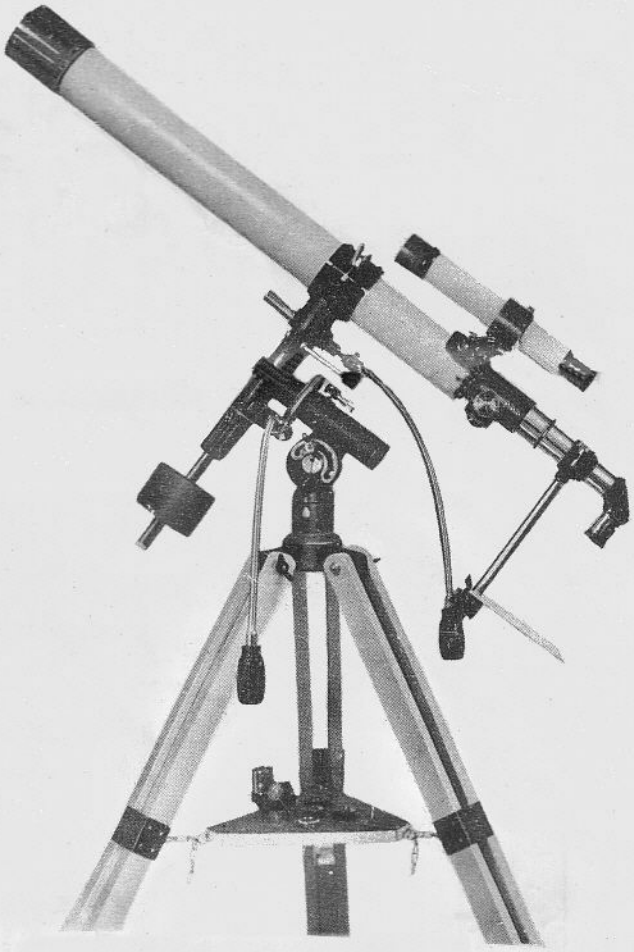
Lafayette

INSTRUCTION for USING

THE NEW LAFAYETTE MODEL F-342 TELESCOPE



LAFAYETTE RADIO ELECTRONICS CORPORATION

INSTRUMENT DIVISION

165-08 LIBERTY AVE., JAMAICA, N.Y.

EQUATORIAL TELESCOPE

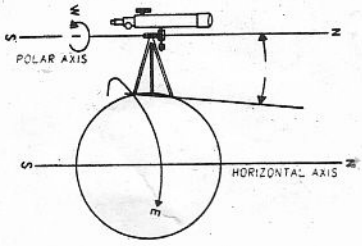


Fig. 1.

The equatorial telescope is a telescope specially designed for observation of celestial bodies in conformity with their diurnal movement.

The higher is the magnification of a telescope the narrower is the visual field of the telescope, a star caught by the telescope after laborious efforts does not remain in the visual field so long unless proper adjustment is made in the direction of the telescope.

The celetial bodies continue their regular diurnal movement revolving around the celestial axis to the direction opposite to that of the rotation of the earth. To retain a star within the visual field of the telescope, therefore, we have only to make the direction of the telescope change following the direction of diurnal movement of the celestial bodies at the same speed as that of the earth's rotation, with the polar axis of the telescope being placed in parallel with the earth's axis. The polar axis of the telescope must always be directed to the due north, its inclination conforming with the latitude of the location where the telescope is installed: if the telescope is installed at the pole, the polar axis of the telescope must be set almost perpendicularly and if installed on the equator the polar axis of the telescope must be set horizontally; that is to say, the polar axis should be set an angle in conformity with the latitude. For the practical purpose we have only to set the polar axis in the direction of the polar star, and once set in such direction, we need not change the position as we can observe the constellation in any direction by the operation of the declination axis and the main tube.

Nomenclature of the Parts of the Equatorial Telescope

① Hood
② Objective tube
③ Body or main tube
④ Body belt clamplever
⑤ Finder
⑥ Finder-eyepiece
⑦ Finder scope mount
⑧ Eyepiece tube
⑨ Micro-adjustment tube
⑩ Micro-adjustment eyepiece handle
⑪ Eyepiece adapter
⑫ Declination axis
⑬ Worm wheel
⑭ Balance weight
⑮ Declination micro-adjustment handle
⑯ Declination clamp handle
⑰ Right ascension clamp lever
⑱ Polar axis
⑲ Horizontal axis clamp lever
⑳ Right ascension micro-adjustment knobs
㉑ Horizontal axis clamp
㉒ Tripod
㉓ Diagonal prism
㉔ Erecting prism
㉕ Eyepiece
㉖ Eyepiece
㉗ Eyepiece
㉘ Eyepiece
㉙ Eyepiece
㉚ Sunglass
㉛ Sun screen hand clamp
㉜ Sun screen
㉝ Accessory tray

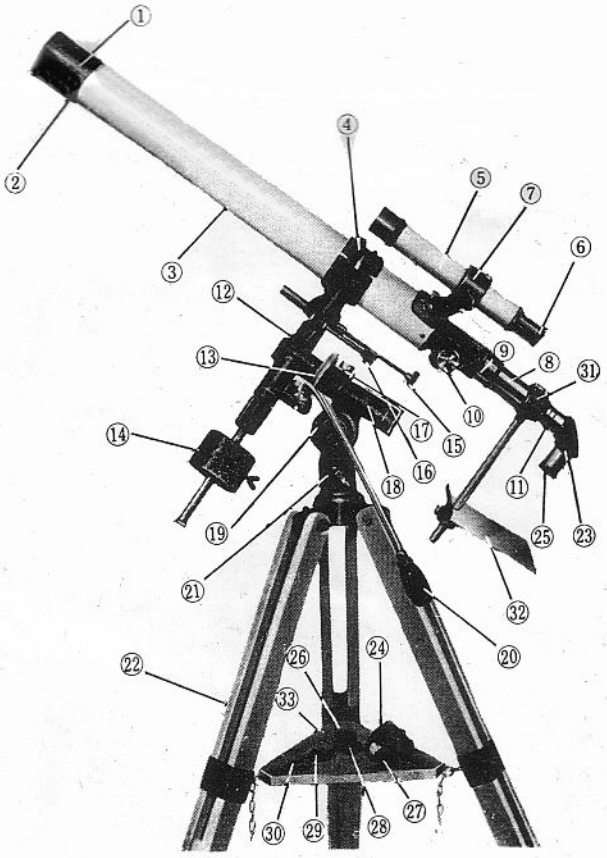


Fig. 2

OBJECTIVE LENS

The objective lens used in our telescope is an achromatic crown-flint two-ply glass, 62mm caliber, (effective caliber 66mm) and hard-coated. The focal distance is 80mm; the resolving power 1.5 seconds-1.8 seconds, visual magnitude 11.0 seconds.

EYEPIECE

Various kinds of eyepieces are available for the telescope. When our standard eyepieces are used, the magnifications and other efficiencies are as follows:

Focal distance	Magnification	Excit pupil aperture	Brightness	Visual field	
				Actual	Apparent
20 mm	40 ×	1.50 mm	2.25	1°00′	40°
9 mm	89 ×	0.67 mm	0.45	0°27′	40°
5 mm	160 ×	0.38 mm	0.14	0°15′	40°

When other eyepieces as are listed below are used the efficiencies are as foliows:

Focal distance	Magnification	Excit pupil aperture	Brightness	Visual field	
				Actual	Apparent
12.5 mm	64 ×	0.94 mm	0.85	38′	40°
6.0 mm	132 ×	0.46 mm	0.21	19′	40°
4.0 mm	200 ×	0.30 mm	0.09	12′	40°

ACCESSORIES (STANDARD)

Eyepiece (AH20mm, H9mm, H5mm)	3 pcs.	Sun screen	1 pc.
Diagonal prism	1 pc.	Sunglass	1 pc.
Erecting prism	1 pc.	Finder scope	1 pc.
		Carrying case	1 pc.

ASSEMBLING OF THE TELESCOPE

The telescope being taken out from the carring case, the tripod is assembled properly under the mount. All the screws are made tight, and the finder is fixed to the body of telescope and the balance weight is made fast, all the other accessories being fixed properly, and then the body belt clamp is tightened and when the parts marked ① as shown in the illustration have been well balanced, the clamp is made tight again. After that the balance weight is properly adjusted so as to maintain the balance of the parts marked ② as is shown in the illustration. When the assembling has been completed the collimations of the body of the telescope and the finder scope are focused on an object located at 500 meters or farther.

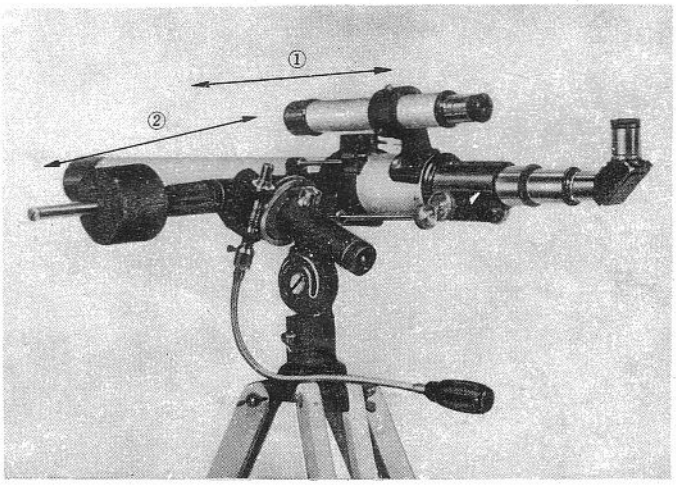


Fig. 3

ADJUSTMENT OF THE POLAR AXIS

1. Practical adjustment :

The body of the telescope ① and the polar axis ② are placed in parallel with each other. The declination clamp handle ⑥ is made tight. By loosening the horizontal axis clamp ③ so as to adjust the inclination of the polar axis, the pole star is caught in the visual field of the telescope. When the pole star is sighted at the center of the visual field, the horizontal axis clamp lever ③ and the horizontal axis clamp ④ are made tight. (The movements of the most of the stars can be pursued when the polar axis has been so adjusted.) When a given star is sighted in the center of the visual field by loosening the declination clamp handle ⑥ and the right ascension clamp lever ⑧, the handle and the lever are made tight. Thereafter the star may be pursued with the use of the right ascension micro-adjustment handle ⑨.

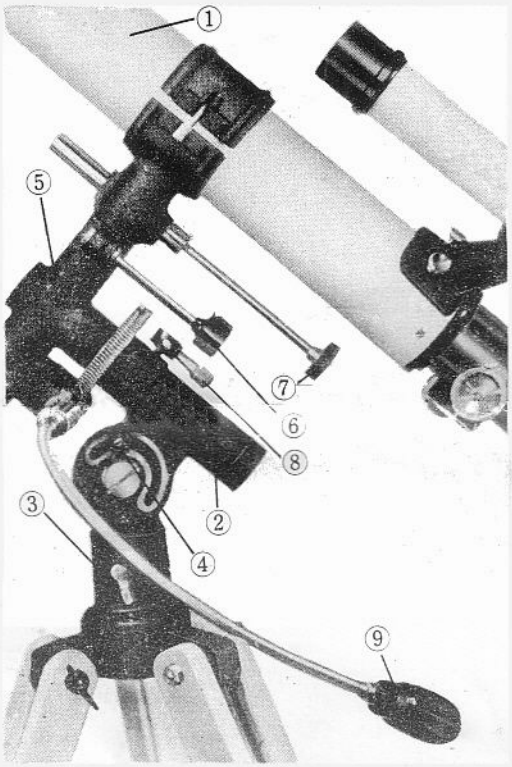


Fig. 4.

2. Precise adjustment :

This type of telescope is called a manual equatorial telescope with which stars can be pursued by the operation of the right ascension handle. Stars once caught by the telescope will very soon escape from the visual field of the telescope on account of the diurnal rotation. The escaped stars will be caught again by operating the right ascension micro-adjustment handle in accordance with the said practical method of adjustment. But the objects of observation do not remain so long at the center of the visual field unless the telescope is adjusted every moment by the use of the right ascension micro-adjustment handle.

For the precise adjustment of the telescope :

(A) The finder eyepiece of the finder is taken out and inserted into the adapter of the body. A bright star in the southern sky is canght in the visual field at the juncture of the cross hair of the eyepiece and the telescope is left as it is for a few minutes. The star moves to the left on account of the diurnal rotation. After two or three minutes the right ascension micro-adjustment handle is turned to the former position so as to ascertain whether the star has moved to the south (upward) or the north (downward).

(B) When stars are observed on the eastern side and on the western side of the pole axis,

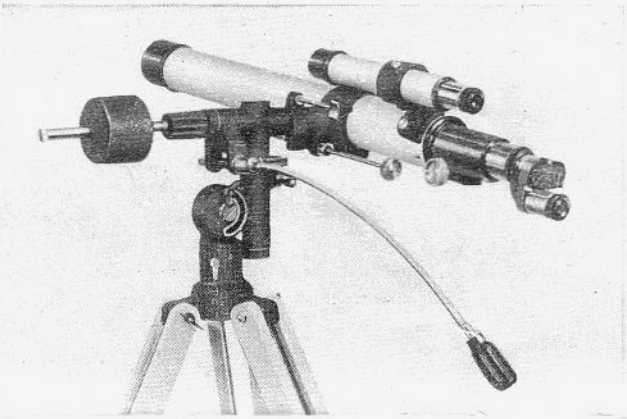
(1) If these stars are found to the north, the polar axis is set too high, and if they are found somewhat to the south, the pole axis is considered to have been set too low.

(2) If the stars are found to the north when they are sighted on the eastern side and they are found to the south when sighted on the western side, the polar axis is considered to be inclined to the east.

If the stars are found to the south when sighted on the eastern side and they are found to the north when sighted on the western side, the polar axis is considered to be inclined to the west.

If the inclination of the pole axis so ascertained is properly adjusted in accordance with the inclination, the pole axis will be directed correctly toward the celestial north pole.

TERRETRIAL OBSERVATION WITH THE USE OF THE TELESCOPE



If the pole axis is set perpendicularly as is shown in the illustration, the telescope is available for terrestrial observation as well as for speedy celestial observation in search of various stars.

Fig. 5.

SUN SCREEN

The sun screen is attached to the draw tube as is shown in the illustration. When the sun's image is projected on the screen, the use of AH 20 mm eyepiece is advisable. To get a magnified image of sunspots, to use a high magnification eyepiece is necessary. To obtain the best results, it is advisable to fasten a sheet of pure white paper on the reflecting side of the screen with a paper clip.

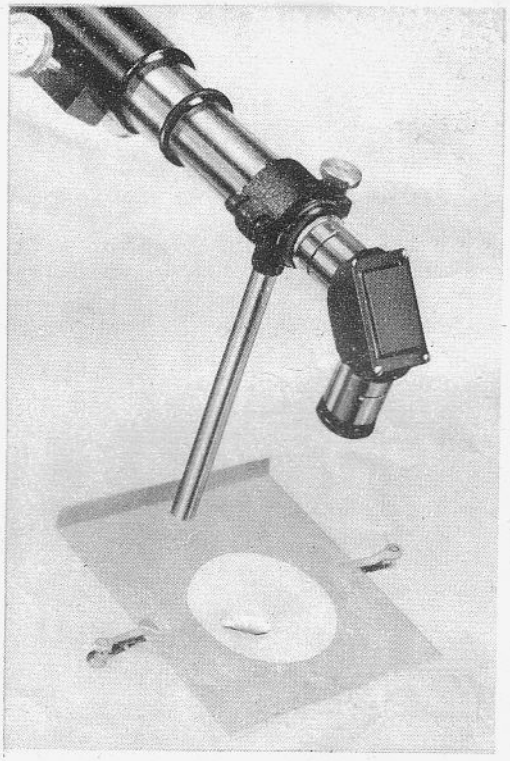


Fig. 6.

DIAGONAL PRISM (ZENITH PRISM)

When we use the diagonal prism, the magni-adjustment tube is inserted into the micro-adjustment tube. When the tube comes to 20mm, an object of observations will be brought to the focus.

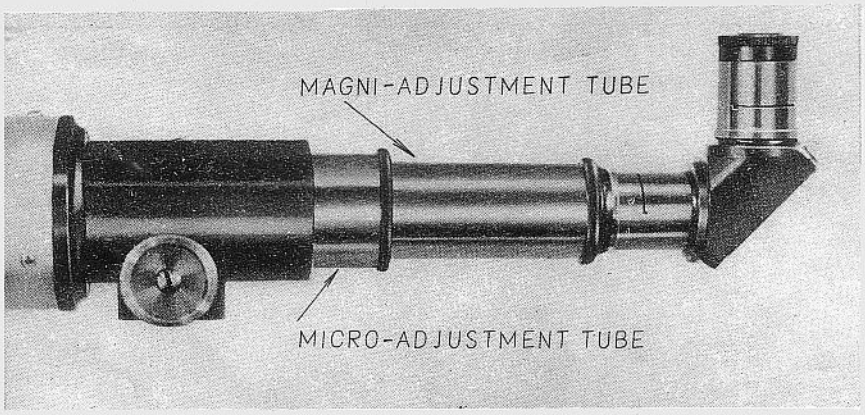


Fig. 7.

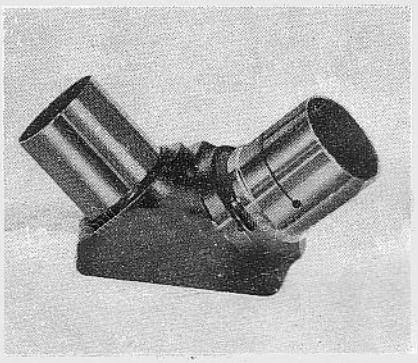


Fig. 8.

The diagonal prism, being composed of a rectangular prism, permits greater ease in astronomical observation, especially in the observation of the zenith and its vicinity. It is available for projecting the surface of the sun as shown in Fig. 8.

ERECTING PRISM

One of the distinguished features of our telescope is that the draw tube is composed of a magni-adjustment tube and a micro-adjustment tube so that the magnification may be common to terrestrial and celestial observation.

When the magni-adjustment tube is inserted into the micro-adjustment tube, images are sighted in the erect position through the eyepiece.

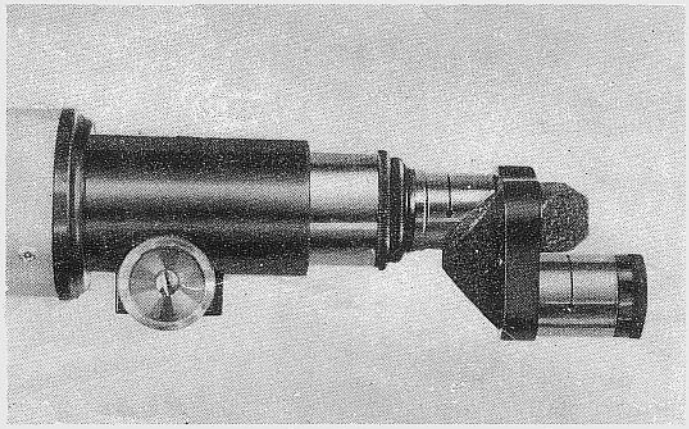


Fig. 9.

The erecting prism is designed for reflecting an upside-down image in an erect position. The celestial eyepiece is available for terrestrial observation.

SUNGLASS AND EYEPIECE

The sunglass is designed to filter out the heat and glare of the sunlight so as to permit safe solar observation. In common astronomical telescopes, the sunglasses are set to the eye lenses Such device is not recommendable, because high heat will sometimes concentrate on it and the glass may be destroyed. Our sunglass, being designed to be set the eyepiece, permits safe solar observation.

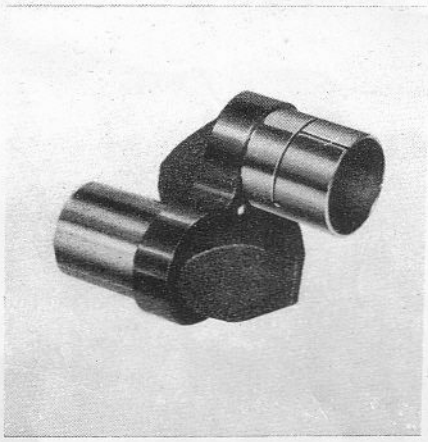


Fig. 10.

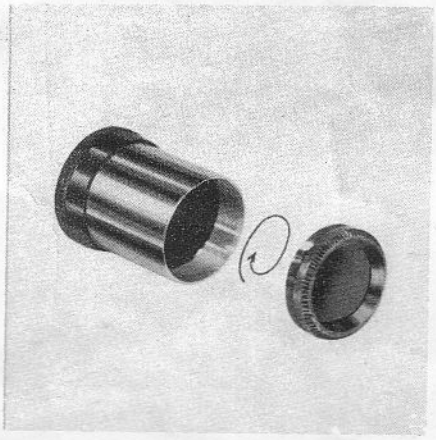


Fig. 11.

HINTS ON THE USE OF THE TELESCOPE

(1) If the telescope is brought outdoors where the air is very cold, the lens will be dimmed with moisture. Such moisture will disappear in a short time. It is advisable, however, to install the telescope about 20 minutes before you begin to take observations.

(2) Images will be blurred when the eye lens is moistened on account of perspiration of the observer or when the objective lens is moistened with dew or when the finger end or the eye lid of the observer touches the eye lens.

(3) Dim lights can be observed if the eyes of the observer are inured to darkness. It will take more than 30 minutes for our eyes to be inured to darkness.

(4) In case of terrestrial observation under conditions of haze or fog, the telescope will not enable you to see any more clearly than with the unaided eye.

(5) When you are observing objects on which the sun is shining directly, the rising air currents under these conditions often tend to distort the view. This is also true when observing over rooftops. Under such conditions, it is advisable to use as low a magnification as possible.

(6) The lens must be cleaned with a cloth slightly wet with alcohol. New cloth must not be used without previously being washed and dried. Cotton cloth is most recommendable for cleaning the lens.

Overhauling optical instruments, without the help of an expert technician, is not advisable, as it affects the efficiency of the instruments. If necessary, however, overhauling may be given a very careful manner making notes of the overhauling process.

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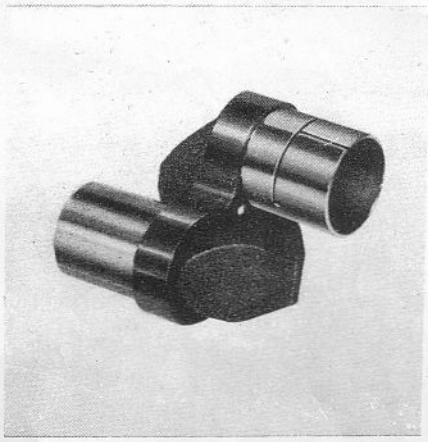


Fig. 10.

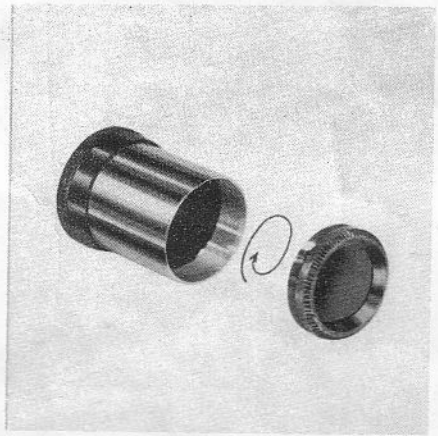


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(5) When you are observing objects on which the sun is [illegible]

BARLOW LENS

1. The Barlow lens gives twice the magnifying power of the telescope.
2. Slipe the lens into the eyepiece sliding sleeve, up to the enter, then slide the eyepiece into the Barlow lens tube as shown in Fig. 12.
3. Magnifications with Barlow lens

   F-342 320×, 160×, 178×, 89×, 80×, 40×.

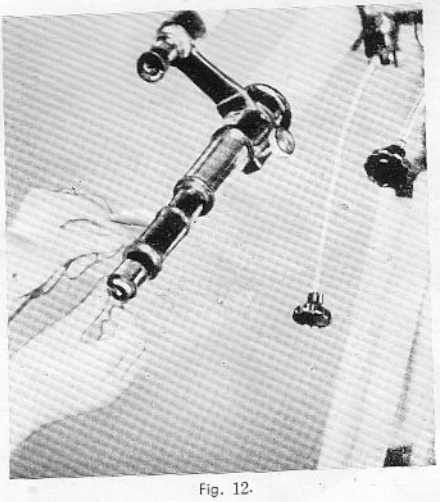


Fig. 12.

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