mirror thus equipped is then known as the "station mirror" and reflects the light to the distant station. The other reflects the light from the sun to the station mirror and is known as the "sun mirror." All metal parts are brass or aluminium bronze and are finished in dull black.

(c) *Screen.*—The screen consists of a metal frame 4½ in. square. Within this frame, swung on pivots, the lines between which are horizontal, are four thin metal leaves or vanes. At one side of the screen is a movable bar connected by levers to the vanes in such a way that when it is pressed downward the vanes rotate on their horizontal axis through an angle of 90° and thus open the screen. On releasing the bar, a spring causes it to fly back to its original position and with it the vanes, thus closing the screen. On the bottom of the screen frame is an angle foot by which it is attached to the head of the tripod. Near the bottom of the sliding-bar is a small projecting lug with a hole in it through which is passed a string by which the screen or shutter is opened and closed while being used for signalling. An adjusting screw near the top of the retractile spring enables it to be tightened if it becomes weakened through use.

(d) *Sighting-rod.*—This is a round metal bar 3½ in. long, flattened and pointed at one end. To this flattened portion a small metal vane is pivoted which carries a white target at the top for use in adjusting. This sighting-rod fits in a round hole in one of the mirror bars in which it is held by a set-screw.

(e) *Mirror Bars.*—Two are required. They are similar in construction except that the one used with the sun mirror has a hole near the tripod attachment for the insertion of the sighting-bar, and a set-screw for holding it in place. This bar is also equipped with a tangent adjusting screw at the end, by means of which the mirror mounted on it may be rotated on its vertical axis. The bars are 9 in. long, rectangular in cross-section and enlarged at the end that fits on the tripod to a circle 2 in. in diameter. At the other end, both have a round, tapered hole in which the studs on the frames of the mirrors fit. A pivoted catch on the underside of each bar holds the mirrors when in place. The slow-motion adjusting screw provided on one of the bars together with the similar screw on the mirror enable the operator to rotate the sun mirror simultaneously on both its vertical and its horizontal axes. These axes intersect at the centre of the mirror at the point where the unsilvered spot is located, and by means of the two adjusting screws the mirrors may be made to follow the sun while the instrument is in use.

(f) *Tripod.*—A light but strong tripod with a flat, circular, brass head-plate is provided. The cross-section of the legs is one-third of a circle, so that when folded the tripod forms a neat cylindrical package. In the centre of the brass head is a round hole in which is fitted a bolt having a three-wing nut at the lower end. The upper end is provided with a lug. This lug fits in holes in the mirror bars and over the angle foot of the screen, and by tightening the winged nut the various parts may be attached firmly to the head of the tripod. A cylindrical sole-leather cup with strap and buckle fits over the points of the tripod legs when folded for transportation.

Section 105—Using the Godwin Heliograph

1—Setting Up

Set the tripod firmly on the ground with one leg toward the distant station and the metal head as level as possible. A station heliograph on hard ground, rock, or a wooden platform may have the legs set in pails, boxes, etc. filled with earth. To prevent vibration in heavy wind, suspend a bag filled with sand or earth beneath the tripod so that it touches the ground just enough to keep it from swaying (Fig. 105). In the Godwin type this cannot be done until setting up is completed as the weight must be attached to the tripod head-bolt. Other types are provided with special anchoring hooks for this purpose.