No. 661,269.

Patented Nov. 6, 1900.

# H. KORRODI.

## SIGHT FOR ORDNANCE.

(Application filed May 1, 1899.)

(No Model.)

Fig. 1.

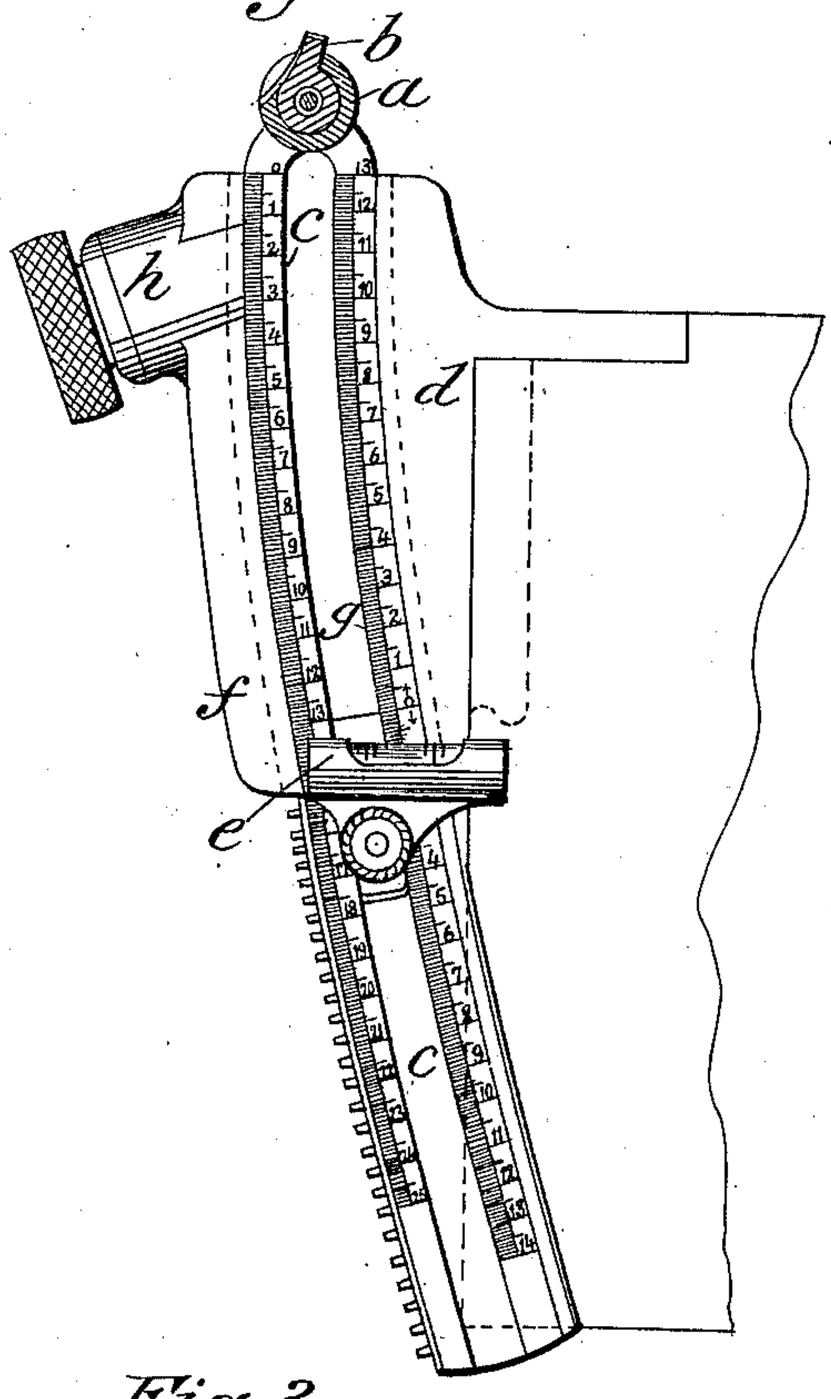


Fig. 2.

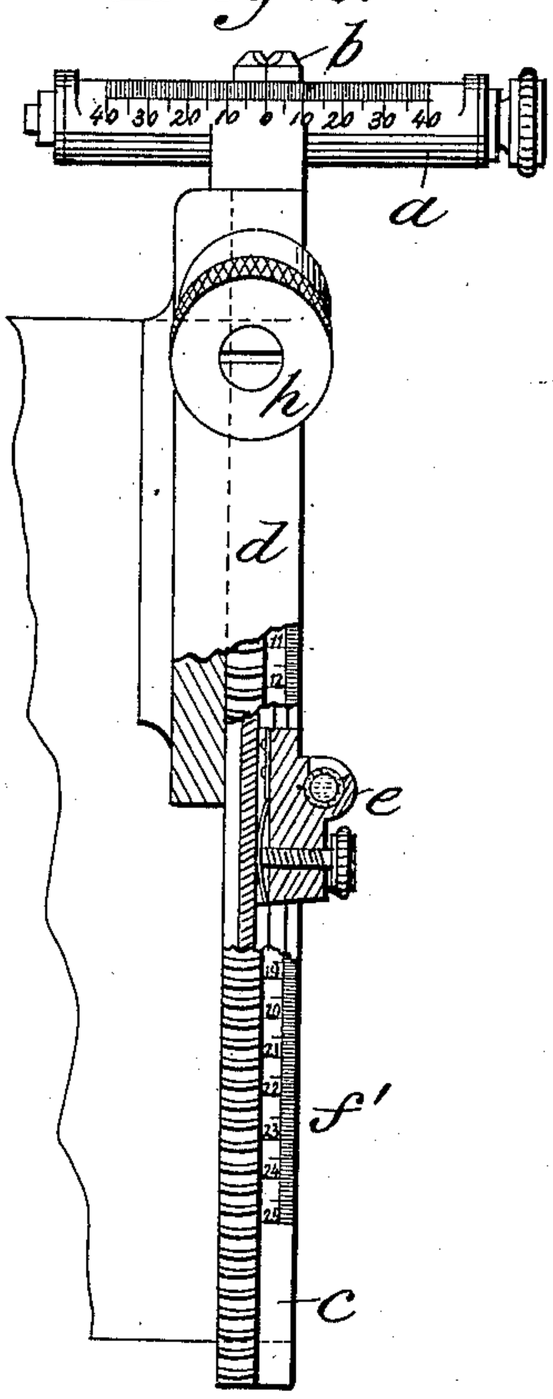


Fig. 3.

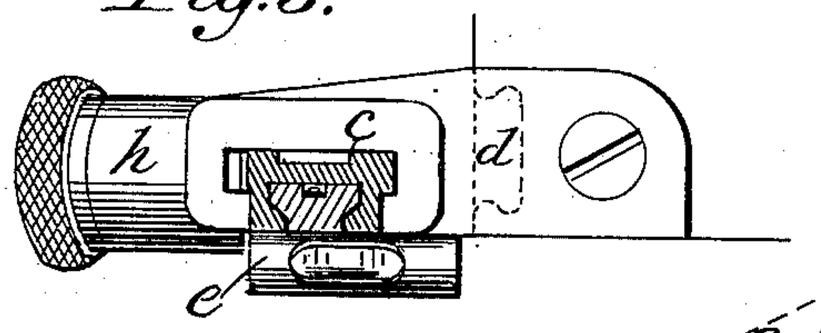


Fig. 4.




Witnesses

F. H. Schott

Anton A. Haetzner.

Inventor

Heinrich Korrodi

by Munn & Co

Attorneys

# UNITED STATES PATENT OFFICE.

HEINRICH KORRODI, OF BERN, SWITZERLAND.

## SIGHT FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 661,269, dated November 6, 1900.

Application filed May 1, 1899. Serial No. 715,077. (No model.)

*To all whom it may concern:*

Be it known that I, HEINRICH KORRODI, a citizen of Switzerland, residing at Bern, in the Republic of Switzerland, have invented certain new and useful Improvements in Sights for Ordnance, (applications filed in Switzerland, October 5, 1898; in Germany, October 13, 1898; in Austria, October 13, 1898; in Great Britain, October 28, 1898; in Belgium, March 3, 1899; in Spain, March 7, 1899; in Sweden, March 13, 1899; in Norway, March 15, 1899; in Italy, March 30, 1899, and in Hungary, April 7, 1899;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in sights for ordnance.

The object of my invention is to provide an ordnance-sight by means of which both the angle of elevation of the gun and also the angle of terrain may be set off independently of each other, thereby avoiding the necessity for calculation of the algebraic sum of the two angles, while at the same time the structure is such that the graduations of the scales on which these two angles are to be set off may be made coarse or large enough to render the use of verniers unnecessary for the refinements of ordinary service.

With this object in view my invention, broadly considered, consists in an ordnance-sight comprising a standard made bodily movable with relation to its gun in a vertical plane, said standard carrying a sight-piece, means for locking the standard in any of its adjusted positions, so that it will then be fixed with relation to the gun, a leveling device movable with relation to the gun and also with relation to the standard, means for locking said leveling device with relation to the standard, and preferably graduations and indices carried by the gun, standard, and leveling device whereby the angles of elevation and terrain may be read off without the use of separate scales.

The invention will first be described in its preferred form in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of an ordnance-sight embodying my invention; Fig. 2, an end view, partly in section, of the same; Fig. 3, a transverse sectional view taken just below the rear sight-piece, and Fig. 4 a diagrammatic view showing the application of the sight in pointing a gun.

Referring to the drawings, *c* is a standard, which is arc-shaped, the center of curvature of its arc being coincident with the front sight of the gun. The standard *c* is movable with relation to the gun, said movement being in a vertical plane, the said standard being mounted in a guideway *d*, preferably fixed to the rear of the gun and movable therewith. The guideway is curved concentrically with the standard *c*, so that the latter when raised or lowered moves in the arc of a circle whose center is the front sight of the gun.

The standard *c* carries a rear sight-piece *b* at its upper end or head *a*, this rear sight-piece being laterally movable in the usual way by means of a screw. Suitable means may be provided for moving the standard up and down and for holding it in any desired position to which it has been adjusted. For example, the back edge of the standard may be provided with rack-teeth, as shown in Figs. 1 and 2, and a spring-pawl or yielding bolt *h* may be provided to engage the said rack-teeth and hold the standard at any point. For moving the standard any suitable driving-gear may be used—as, for instance, a pinion engaging the rack-teeth and a hand-wheel for rotating the pinion. (Not shown.) The standard is provided with a groove, which is also arc-shaped concentric with the standard and undercut, as shown in Fig. 3, and receives a block carrying a spirit-level *e*, the said block being provided with a clamping-screw, by means of which the block may be locked to the standard at any desired point. A part of the back edge of the standard is graduated, these graduations being shown at *f'*, Fig. 2, and extending over one side of the standard adjacent to the groove. The opposite corresponding portion of the same side of the standard is provided with another scale or series of graduations, as indicated at *g*, Fig. 1. The last-mentioned scale is graduated in both directions from the zero-point which is at the middle of the scale. This

scale serves for setting off the angle of terrain, while the other scale (indicated at *f*, Fig. 1, and *f'*, Fig. 2,) serves for setting off the angle of elevation of the gun necessary for the range desired. The upper surface of the guideways *d* serves as the index for the scale *f*, while the upper edge of the block which carries the spirit-level *e* serves as the index for the scale *g*.

The manner of employing the new sight will be readily understood upon reference to Fig. 4. In this view Z indicates the mark at which it is desired to aim the gun. The line A B C represents the axis of the bore of the gun. A B Z is the trajectory of the projectile, V O Z the line of sight, and H O H the horizontal line passing through the front sight.

Direct pointing at the elevated mark Z: Let *n* be the sight corresponding to the estimated distance of the mark Z and indicated on the range or tangent scale *g*, for example, in thousandths of the curve-radius of such scale. The standard is so adjusted that its division *n* corresponds with the index—that is to say, with the upper surface of the guideway *d*. The cannon is then pointed directly at the mark Z by means of the sight-groove in the rear sight and the front sight-pin. As will be seen from Fig. 4, the inclination of the axis of the cannon consists of the sight or elevation *n* and the angle of terrain *p*, (likewise indicated on the standard in the thousandths of its curve-radius.) The angle *p* may be determined in the following manner: The spirit-level $e^0$, remaining at the zero-point of the graduation or marking indicating the angle of terrain, is parallel with the line of sight V O Z and forms an angle *p* with the horizontal line H O H. In order to bring it to the horizontal position, it is necessary to elevate it on the standard from the arc *p*—that is to say, the graduation for which it will be in the horizontal position will precisely indicate the angle of terrain sought for. The piece having served for pointing at the mark Z can thus indicate the angle of terrain to the other pieces of the battery, which could be adjusted for firing without direct pointing simply by means of the sight on the spirit-level in a uniform manner, which would considerably limit the dispersion of the range of the battery.

Indirect pointing: For this purpose it is necessary previously to know the angle of terrain. If the mark is visible, this angle can be determined by one of the pieces of the battery, as indicated above. If the mark is not visible, the angle of terrain will be determined by the map or in any other manner. Let *n* be the sight corresponding to the distance of the mark, and *p* the angle of terrain. The standard will be adjusted, as before, so that the division *n* of its graduation corresponds to the zero-point of the slide and the spirit-level will be put at the lowest point on the division *p* of the standard. In operating the elevating-screw of the cannon the cannon will be caused to form an angle $n+p$ with the horizontal, which will take place when the spirit-level is again in the horizontal position. If the angle of terrain is negative—that is to say, if the object is below the position of the cannon—the procedure will be the same, care being taken, however, to adjust the spirit-level on the lower graduations of the standard.

In the improved sight the graduated arc indicating the angle of terrain being entirely visible, and consequently it being quite easy for any one to read or exactly point an angle of terrain, it is clear that indirect pointing may be more frequently employed than in the past, since the inconvenience of indirect pointing resulting from the difficulty of exact point adjustment of the spirit-level is obviated.

The advantage of indirect firing, which consists, among other things, in a considerable reduction of the field of dispersion of a battery and in the possibility of firing at an object concealed by the smoke or otherwise, may in the future be better taken advantage of, since the rapidity and accuracy of the fire will no longer be injuriously affected by the difficulty of an exact point adjustment resulting from the deficiency of the existing spirit-level indices.

Compared with tangent-sights with spirit-level indices hitherto employed, in which the spirit-level, the graduated circle, and the point-adjusting arrangement are in the head of the scale, the present sight has the further advantage of a better disposition of the weight of the scale and enables the pointer to observe the spirit-level without being obliged to leave the pointing position, the spirit-level being at the side of the scale in place of on the head thereof.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ordnance-sight, the combination with a standard bodily movable in a vertical plane with relation to the gun, and a rear sight-piece carried by said standard, of a leveling device movable with relation to the standard and gun, means for fixing the leveling device with relation to the standard.

2. In an ordnance-sight, the combination with a standard bodily movable in a vertical plane with relation to the gun, and a rear sight-piece carried by said standard, of a leveling device movable with relation to the standard and gun, means for fixing the leveling device with relation to the standard, means for fixing the standard with relation to the gun, and indices and scales for indicating the relative positions of the standard with relation to the gun and the leveling device with relation to the standard.

3. In an ordnance-sight, the combination, with a standard bodily movable in a vertical plane with relation to the gun, and a rear sight-piece carried by said standard, of a leveling device movable on the standard,

means for fixing the standard with relation to the gun and means for clamping the leveling device at any desired position on the standard.

4. In an ordnance-sight, the combination, with a guide fixed with relation to the gun, a standard bodily movable in said guide, a rear sight-piece carried by said standard, and means for fixing the standard at any desired position with relation to the guide, of a leveling device movable with relation to the standard and means for fixing said leveling device to the standard at any desired position thereon.

5. In an ordnance-sight, the combination with a guide fixed with relation to the gun, a segmental standard bodily movable in said guide, a sight-piece on said standard and means for detachably locking the standard to the guide, of a leveling device movable with relation to the standard and means for detachably locking the said leveling device to the standard.

6. In an ordnance-sight, the combination, with a guide carried by the gun, an arc-shaped standard bodily movable in said guide in an arc whose center is coincident with the front sight of the gun, and means for detachably locking said standard to the guide at any desired point, of a leveling device movable along the standard in an arc concentric with the curve of the standard, and means for detachably locking the leveling device to the standard at any desired point.

7. In an ordnance-sight, the combination, with a guide carried by the gun, an arc-shaped standard bodily movable in said guide and provided with an arc-shaped groove, and means for detachably locking said standard to the guide at any desired point, of a leveling device movable in the groove of the standard, and means for detachably locking the leveling device to the standard at any desired point.

8. In an ordnance-sight, the combination, with a guide fixed to the gun, an arc-shaped standard bodily movable in said guide, said standard having a concentric arc-shaped groove and two scales, one at each side of said groove, of means for detachably locking the standard to the guide at any desired point, an arc-shaped block movable in said groove, a spirit-level carried by said block and means for detachably locking the block to the standard at any desired point.

In testimony whereof I affix my signature in presence of two witnesses.

HEINRICH KORRODI.

Witnesses:
EDUARD VON WALDKIRCH,
PAUL SCHNEIDER.