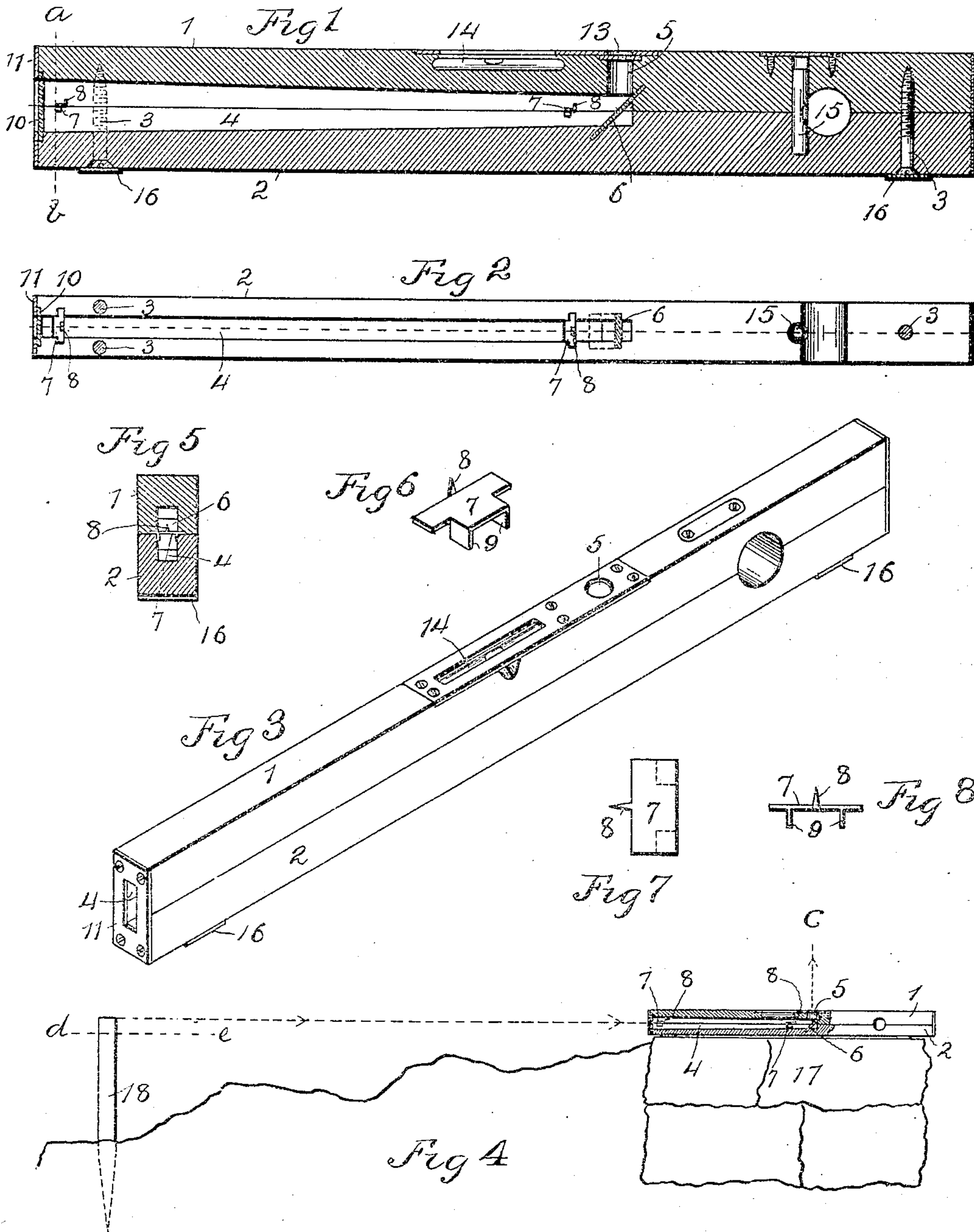


No. 778,508.

PATENTED DEC. 27, 1904.

T. SANDBROOK.
LINE SIGHTING LEVEL.
APPLICATION FILED MAY 14, 1903.



WITNESSES:

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THOMAS SANDBROOK, OF KANSAS CITY, MISSOURI.

LINE-SIGHTING LEVEL.

SPECIFICATION forming part of Letters Patent No. 778,508, dated December 27, 1904.

Application filed May 14, 1903. Serial No. 157,040.

To all whom it may concern:

Be it known that I, THOMAS SANDBROOK, a citizen of the United States of America, residing in Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Line-Sighting Levels, of which the following is a specification, reference being had therein to the accompanying drawings, forming a part thereof.

My invention relates to improvements in leveling instruments.

The object of my invention is to provide a line-sighting level by means of which the height of a distant body relative to one on which the level is placed may be accurately and quickly ascertained. By the use of my instrument the stakes representing the corners of the foundation-wall of a building may be quickly and accurately positioned.

In the accompanying drawings, illustrative of my invention, Figure 1 is a longitudinal central vertical sectional view. Fig. 2 is a horizontal longitudinal central sectional view. Fig. 3 is a perspective view of the instrument. Fig. 4 is a view, partly in side elevation and partly in vertical section, of the instrument placed upon one corner of a wall, the said view showing also in side elevation a distant stake driven in the ground, the top of the stake being in line with the sighting devices of the level. Fig. 5 is a transverse sectional view taken on the dotted line *a b* of Fig. 1. Fig. 6 is a perspective view of one of the sighting devices detached from the level. Fig. 7 represents a blank from which one of the sighting devices is formed. Fig. 8 is a side elevation view of one of the sighting devices.

Similar characters of reference indicate similar parts.

In its preferable form the body of the leveling instrument comprises two longitudinal members 1 and 2, respectively disposed side by side and secured together by means of three transverse grooves 3, extending through one and into the other member. Each of said members is provided on the side adjacent to the opposite member with a longitudinal groove tapering inwardly toward one end of the member toward the opposite member

thereof. The said two longitudinal grooves are oppositely disposed with reference to each other and form a longitudinal tapering opening 4 in the body of the instrument. The member 1 is provided with a transverse opening 5, extending from the upper side of the said member vertically toward and intersecting the inner end of the longitudinal groove in the said member. An inclined mirror 6 is inserted in slots provided therefor at an angle of forty-five degrees in the adjacent sides of the two members, the said inclined mirror being disposed in a position such that it will intersect the longitudinal opening 4 of the transverse opening 5. Thus a ray of light entering the opening 4 will be reflected by the mirror at right angles. Therefore by placing the eye above the opening 5 an object can be seen by reflection from the mirror 6 through the opening 4. Two sighting devices 7, comprising, preferably, two horizontal plates, are disposed in four transverse recesses provided in the upper side of the member 2 and located two near the outer and two near the inner end of the longitudinal opening 4. Each of the sighting devices 7 is provided near the middle thereof with a vertical pointed projection 8, extending upwardly from the upper side of the plate 7. The projections 8 are of the same height and are disposed both in the plane which vertically bisects the opening 4. The upper sides of the plates 7 are disposed in the plane which horizontally bisects the opening 4. Each of the plates 7 is provided with two downwardly-extending projections 9, fitted, respectively, against the side walls of the longitudinal groove of the member. The two projections 9 serve to properly locate and retain the projections 8 in the vertical plane bisecting the opening 4.

The object of having the opening 4 tapering inwardly is to provide that the rays of light may enter and be reflected by the mirror 6 in order that a distant object may be properly aligned with the plates 7 and the projections 8 thereof. The outer end of the opening 4 may be closed by a vertical transparent glass plate 10, which is held in place by a vertical plate 11, secured to the ends of the members 1 and 2 and provided with a hole 12, preferably of

the same size and shape as the outer end of the opening 4. A horizontal glass plate 13 may be employed to close the outer end of the opening 5. To the body may be secured, preferably to the member 1, an ordinary leveling device, such as a spirit-level, (indicated by 14.) The disposition of the said spirit-level is such that when a bubble therein is centrally disposed in the said level the plates 7 will be disposed in a horizontal plane.

The instrument may be provided also with an ordinary transverse spirit-level 15, commonly used as a plumb-level in said instrument. Upon the lower side of the member 2 are provided two horizontal plates 16 of equal thickness and disposed below the bottom line of the said member. Thus any slight inequalities upon the surface of a piece of timber or other body upon which the level may be placed will not prevent the instrument being disposed in a perfectly horizontal position.

In operating my invention, the parts having been assembled as described, the body of the instrument is set in a level position upon an object from the upper side of which it is proposed to locate a horizontal line. Upon this object—for instance, the stone pillar 17, (shown in Fig. 4)—is placed the instrument, with the longitudinal opening 4 disposed in a position directed toward the place where it is desired to drive the stake required for guidance in building another pillar or portion of a wall. Having properly positioned the level, a vertical stake 18 is driven in the ground in line with the vertical plane in which are located the projections 8 of the sighting device 7. By placing the eye at C above the opening 5 of the level the stake 18 will be seen reflected by the mirror 6. The stake 18 is then driven into the ground until the top of the stake is in alinement with the plates 7. By measuring downwardly from the top of the stake 18 the distance corresponding with the distance between the top of the pillar 17 and the upper sides of the plates 7 can be obtained the proper position for the top of the wall or pillar that is built adjacent to the stake 18. This position may be indicated at the stake 18 by any suitable mark which will correspond to the dotted line *d e* in Fig. 4. It will be seen that by means of the horizontal plates 7 and the central vertical plates 8 the distant object, such as the stake 18, may be accurately located in both a horizontal and a vertical plane.

By making the body of the instrument in two parts 1 and 2 and securing the same by means of the screws 3 the sighting devices 7 and the mirror 6 may be readily inserted or removed, as desired.

My invention may be modified in many ways without departing from its spirit.

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

1. In a leveling instrument, the combina-

tion with the body provided with a longitudinal opening and a transverse opening intersecting the longitudinal opening, of an inclined mirror intersecting at an angle both of said openings, two transverse plates disposed horizontally in the longitudinal opening and provided each with a vertical projection disposed centrally between the side walls of the longitudinal opening, the said two projections extending both in the same direction and at right angles to the said plates, and a level connected with the body.

2. A leveling instrument comprising a body consisting of two longitudinal members, means for securing the said two members together, each member being provided on the side adjacent to the other member with a longitudinal groove registering with the longitudinal groove in the other member, the said two grooves forming a longitudinal opening, one of the members being provided with a transverse opening intersecting at its inner end the inner end of the longitudinal groove of the said member, an inclined mirror intersecting the longitudinal and the transverse openings, two horizontal transverse plates in the said longitudinal opening, one disposed near the inner and the other near the outer end of the said opening, the two said plates being provided on similar sides, each with a vertical projection disposed centrally between the side walls of the longitudinal opening, and a level secured to one of the side members.

3. A leveling instrument comprising a body, provided with a longitudinal opening extending outwardly from one end, a transverse opening extending from one side and intersecting the inner end of the longitudinal opening, an inclined mirror intersecting both of the said openings, two horizontal transverse plates centrally mounted in the longitudinal opening, and disposed one near the inner and one near the outer end thereof, the said plates being provided on similar sides each with a vertical projection disposed midway between two side walls of the longitudinal opening, each of said plates being provided with means for preventing movement lengthwise of the side plates in the said longitudinal opening, and a level connected with the body.

4. A leveling instrument comprising a body consisting of two longitudinal members secured together, a longitudinal opening, extending from one end of the body inwardly thereof, the division-line between the two members bisecting the said longitudinal opening, a transverse opening from one side of the body inwardly and intersecting the inner end of the longitudinal opening, an inclined mirror intersecting both of said openings, one of the members being provided on the side adjacent of the other member with four transverse recesses, disposed two upon each side of the longitudinal opening, two transverse plates being provided on similar sides, each with a

sighting device disposed midway between the side walls of the longitudinal opening, and a level connected with the body.

5 5. A leveling instrument comprising a body provided with a longitudinal opening extending from one end thereof, a transverse opening extending from one side toward and intersecting the inner end of the longitudinal opening, an inclined mirror intersecting both of
10 said openings, two sighting devices extending across the longitudinal opening, and disposed in the horizontal plane bisecting the longitudinal opening, one of the said sighting devices being located near the inner and one near
15 the outer end of the said longitudinal opening, both of the said sighting devices being provided on similar sides each with a projection disposed in the vertical plane bisecting the longitudinal opening, and a level connect-
20 ed with the body.

6. A leveling instrument comprising two longitudinal members secured together, the adjacent sides of said members being provided each with a longitudinal groove extending
25 from one end of the member, said grooves forming a longitudinal opening, one member having a transverse opening intersecting said longitudinal opening, an inclined mirror intersecting both of said openings, two horizon-
30 tal plates clamped between the said two members, disposed one near the inner and one near the outer end of the longitudinal opening, each of said plates being provided with a vertical projection disposed centrally in the
35 longitudinal opening, and each plate having vertical projections fitting against opposite walls of the longitudinal opening for preventing lateral movement of the plate, and a level carried by one of said members.

40 7. A leveling instrument comprising a body, provided with a longitudinal opening extending from one end thereof, and having a transverse opening extending from one side toward and intersecting the inner end of the longitu-
45 dinal opening, an inclined mirror intersecting each of said openings, two transverse sighting devices extending across the longitudinal opening and located one near the inner and one near the outer end thereof, the said two
50 sighting devices being provided on similar sides with projections of equal length, one pro-

jection on each sighting device, the said projections being disposed in the plane vertically bisecting the longitudinal opening, and the said sighting devices being disposed in the
55 plane horizontally bisecting the longitudinal opening.

8. A leveling instrument comprising a body provided with a longitudinal opening extend-
60 ing from one end of the body and tapering inwardly toward the other end of the body, the body being provided also with a transverse opening extending from one side and intersecting the inner end of the longitudinal open-
65 ing, an inclined mirror intersecting each of said openings, two sighting devices disposed in the plane horizontally bisecting the said longitudinal opening and located one near the inner and one near the outer end of said open-
70 ing, the said sighting devices being provided each with a vertical projection, the said vertical projections being disposed on like sides of the said sighting devices and located in the plane vertically bisecting the said longitu-
75 dinal opening, and a level connected with the said body.

9. A leveling instrument comprising a body consisting of two longitudinal members se-
cured together side to side, the side of each member adjacent to the opposite member pro-
80 vided with a longitudinal groove extending from one end of the member toward the other end, the said grooves forming in the body a longitudinal opening tapering inwardly, one
85 of the members being provided with a transverse opening extending from one side toward and intersecting the said groove of the said member near the inner end of the said groove, an inclined mirror intersecting each of said
90 openings, two transverse sighting devices secured between the two said members and disposed one near the inner and one near the outer end of the said longitudinal opening, and a level connected with one of the members.

In testimony whereof I have signed my name
95 to this specification in presence of two subscribing witnesses.

THOMAS SANDBROOK.

Witnesses:

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HENRY F. ROSE.