No. 830,769. PATENTED SEPT. 11, 1906.

E. F. CHANDLER.

SKETCH BOARD.

APPLICATION FILED OCT. 4, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

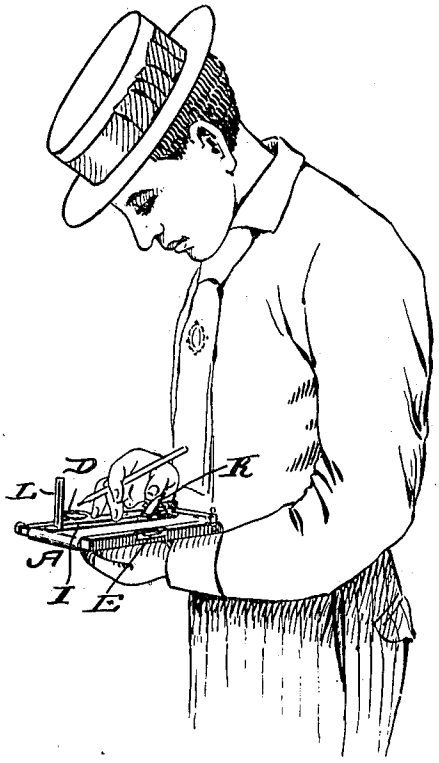
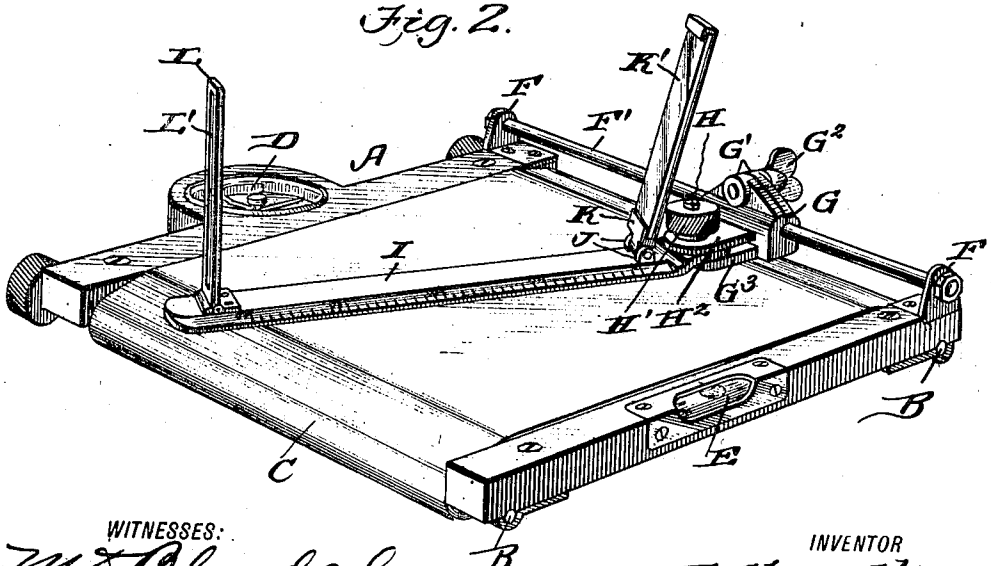


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

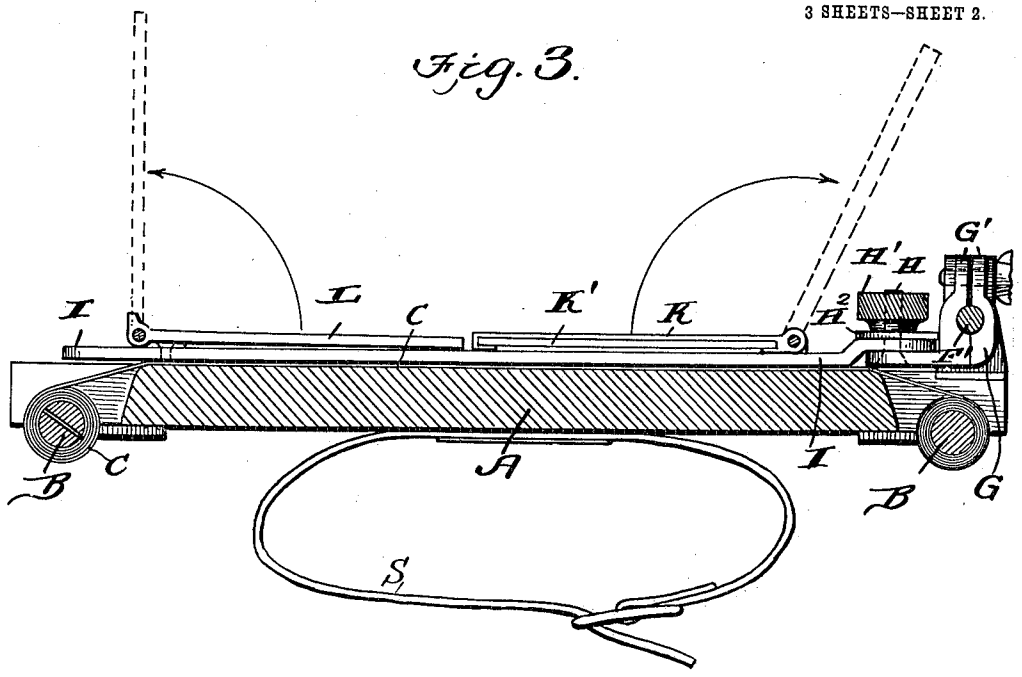


Fig. 4.

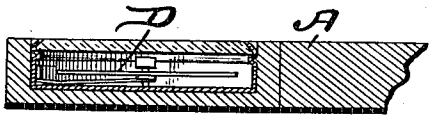


Fig. 5.

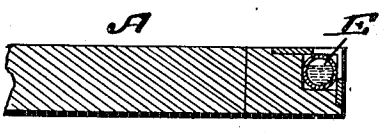


Fig. 6.

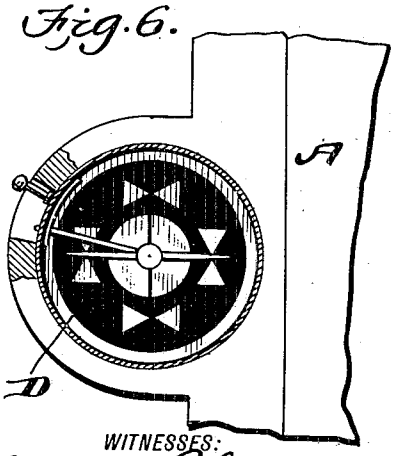
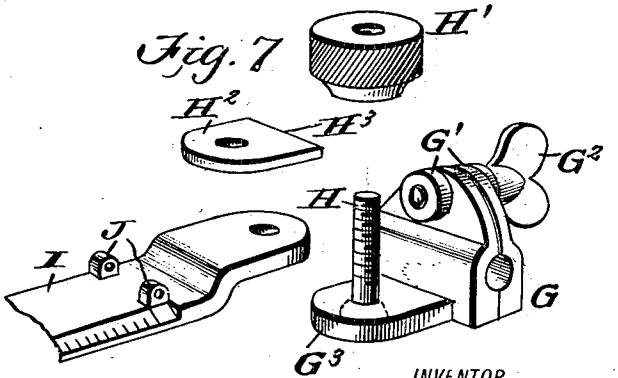


Fig. 7



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3 SHEETS—SHEET 3.

Fig. 8.

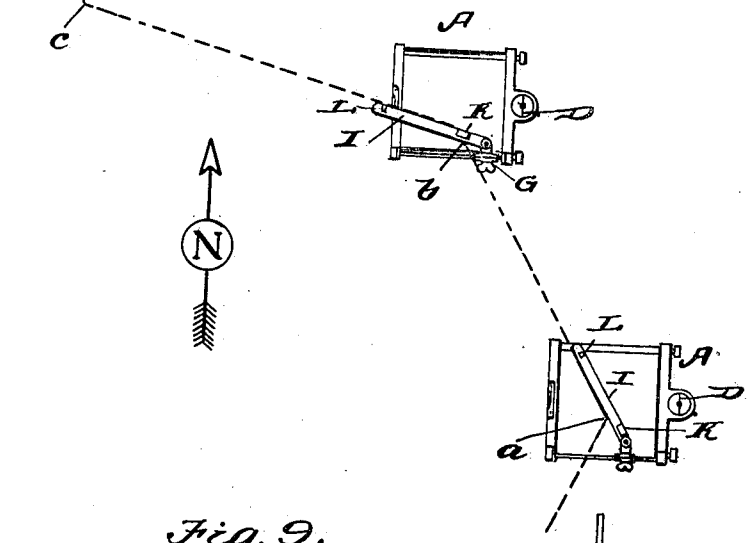


Fig. 9.

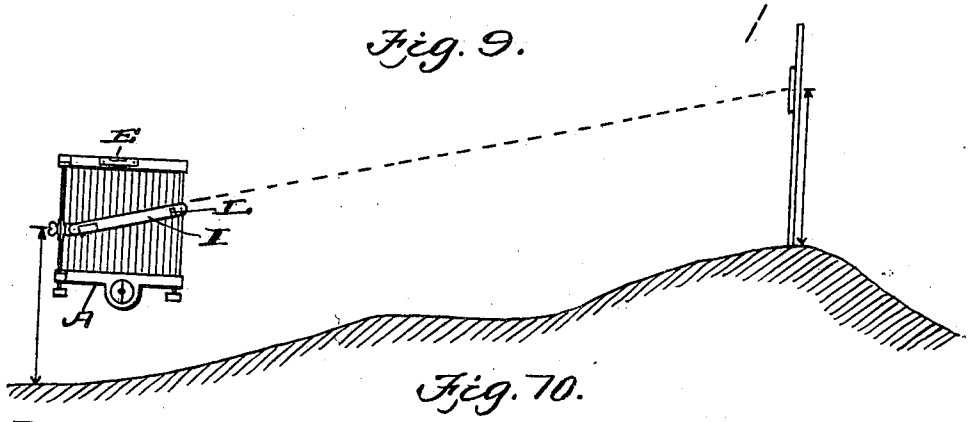
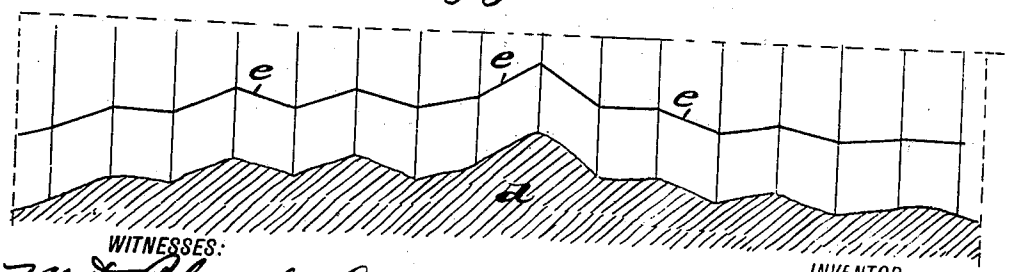


Fig. 10.



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SKETCH-BOARD.

No. 830,769. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed October 4, 1905. Serial No. 281,317.

To all whom it may concern.

Be it known that I, EDWARD FARINGTON CHANDLER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Sketch-Boards, of which the following is a specification.

This invention relates to an improvement in sketching-boards and to what is generally known as "rapid field sketching-cases;" and the object of the invention is to provide a cheap and simple attachment that is easy of operation and particularly adapted to facilitate ascertaining the line or direction of roads, rivers, boundary-lines, &c., and also for various other purposes of engineering, as will readily appear to those having experience in engineering or military surveying work of all kinds.

A further object of the invention is to provide an attachment capable of being folded in a compact form when the board is not in use.

With these briefly-stated objects in view the invention comprises, in combination with a sketch-board, a bar having a bracket adjustably mounted thereon and to which is pivotally connected an alidade having a folding reflector and a sight-bar through which an objective point may be accurately sighted and the direction laid off upon the paper to agree exactly with the direction or angle of the line with respect to the magnetic meridian and regardless of the direction or course being followed.

The invention also comprises certain details of construction and peculiar combination and arrangement of parts by which the device may be utilized for the purposes stated and also for various other purposes, as will be fully set forth in the following specification.

In the drawings forming part of this specification, Figure 1 is a view illustrating the manner of using my sketching-board. Fig. 2 is a detail perspective view of the board. Fig. 3 is a longitudinal section of the same. Fig. 4 is a detail sectional view drawn through the compass, and Fig. 5 is a detail sectional view drawn through the spirit-level. Fig. 6 is a sectional plan view of the compass-casing. Fig. 7 is a detached perspective view illustrating the attachment of the alidade to its supporting-bracket. Fig. 8 is a diagrammatic view illustrating the use of the board. Fig. 9 is a similar view illustrating the board used as a profile-reporter, and Fig. 10 is a diagrammatic view illustrating the profile of a plot of ground and also showing a portion of profile-paper and illustrating the manner of recording the undulating surface of the ground.

In carrying out my invention I employ the usual construction of sketch-board A, having paper-carrying rollers B journaled therein and carrying a roll of paper C, which is extended and stretched over the upper surface of the board. Upon one side of the board is held any suitable form of a compass D, the casing of which is countersunk in the board, so that the face of the glass will be flush with the upper surface of the board. Upon the opposite side of the board I arrange a suitable spirit-level E, also countersunk to avoid obstructions.

Upon one end of the board and adjacent one of the paper-rollers are secured brackets F, in which is securely held a rod F′, and upon this rod is mounted a bracket G, having split ears G′, in which operates a set-screw G^2 for securely clamping the bracket in any position upon the rod. The lower portion of the bracket is provided with a forwardly-projecting flange G^3, having a threaded bolt or screw H projecting therefrom and upon which is pivotally held an alidade I, that is held and clamped in position by a nut H′, and interposed between the nut and the end of the alidade is a washer H^2, one end H^3 of which is square and bears against the bracket G, so that when the nut is screwed upon the bolt to clamp the alidade in position the said washer, and likewise the alidade, will be prevented from moving, and thus assuring the alidade being clamped in the exact position to which it has been adjusted.

Near the inner or pivotal end of the alidade are arranged lugs J, between which is pivotally held a frame K, and in which frame is held a mirror or reflector K′. In practice I propose to provide the frame with overlapping flanges to produce a slideway in which the mirror or reflector is held, which permits the insertion of a new mirror or reflector should the one in use become broken. Upon the opposite end of the alidade is hingedly secured a sight-bar L, having a slot or opening L′ therein, through which an object is reflected into the mirror. To the under side of the board A is connected a strap S, through

which the operator extends his hand when using the board, thereby providing a convenient means for holding the board.

The manner of using my improved board is as follows: Assuming the direction or course of a road or river is to be ascertained, the operator after adjusting the paper upon the board starts to lay out the course and standing at a certain point—for example, *a*, as shown in Fig. 8 of the drawings—selects an object or point *b* of known distance and sights it through the sight-bar by looking into the mirror. The alidade is then clamped and a line is drawn upon the paper according to the scale the drawing is to be made. The operator then advances to the object or point *b* and selects another object or point *c* and adjusts and clamps the alidade and draws a line along the edge thereof from the point *b*. This operation is repeated throughout the entire course being laid out, and of course care is taken that the board is adjusted so that the needle will always point due north. Besides taking courses and angles in the horizontal plane, as above described, my improved board may be used as a hand-level for engineering-work, topography, &c. As illustrated in Fig. 9 of the drawings, the instrument is shown as being used for profile-work, and by reference to the said figure it will be seen that the board is held vertically before the face with its edge in which the spirit-level is held in a perfectly horizontal position, and then by sighting at a bull's-eye of a level-rod held by an assistant the angular altitude is obtained. The alidade is then clamped and a line drawn upon the paper. In this operation the board is held at the same distance from the ground as the bull's-eye upon the level-rod, and care is always taken that the board is held in a perfectly horizontal position. In taking profiles a ruled paper is used, the lines representing a certain scale, the scale being determined according to the distance from which the assistant with the level-rod is stationed from the operator. In Fig. 10 of the drawings I show diagrammatically a plot of ground *d* in profile, above which are the lines *e*, which are drawn upon the paper to correspond with the profile of the ground.

From the foregoing it will be seen that I provide a very cheap, simple, and highly efficient device by which the direction of a road or the undulating surface of the ground may be easily and accurately recorded, and in certain classes of work—for instance, in military surveying, in which rapidity in laying out a course is almost as essential as accuracy—my invention will be found most useful, as a given course or a plot of ground may be rapidly and accurately recorded. It may be further stated that in practice I propose to provide one edge of the alidade with a scale, and the advantages of hinging the mirror-frame and sight-bar permit them being folded against the alidade when the board is not in use, thus providing a compact device, which not only facilitates transportation, but also decreases the danger of the several parts becoming broken or bent out of alinement.

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

1. In a sketching-board, the combination with the board, of an alidade pivotally held at one end upon the board, said alidade having a reflector at one end and a sight-bar at its opposite end.

2. In a sketching-board, the combination with the board, of an alidade adjustably held thereon, said alidade having a hinged frame carrying a reflector connected thereto at one end and a sight-bar hingedly connected to its opposite end.

3. In a sketching-board, the combination with the board, of a bracket adjustably connected thereto, an alidade pivotally connected to the bracket, said alidade having a reflector, and a sight-bar positioned thereon.

4. In a sketching-board, the combination with a board, of a rod held thereon, a bracket adjustably mounted upon the rod, an alidade pivotally connected at one end to the bracket, said alidade having a reflector at one end and a sight-bar at the opposite end, and means for holding the alidade in its adjusted position.

5. In a sketching-board, the combination with the board, of a rod held thereto, a bracket adjustably mounted upon the rod and having a set-screw for clamping it upon the rod, and an alidade pivotally connected to the bracket, a folding reflector pivotally connected to one end of the alidade, a folding sight-bar pivotally connected to the opposite end of the alidade, and means for clamping the said alidade to the bracket.

6. In a sketching-board, the combination with the board, of a rod connected thereto, a bracket adjustably mounted upon the rod, said bracket having a forwardly-projecting flange, a bolt projecting from the flange, an alidade pivotally connected to the bolt, a clamping-nut operating upon the bolt, and a washer interposed between the said alidade and the clamping-nut, said washer having a square edge bearing against the bracket, all for the purpose specified.

7. In a sketching-board, the combination with the board, of a rod connected thereto, a bracket adjustably mounted upon the rod, said bracket having a flange projecting therefrom, a bolt supported by the flange, an alidade having a perforation through which the said bolt projects, and by which the alidade is pivotally connected to the bracket, a clamping-nut operating upon the bolt, a washer interposed between the end of the alidade and

the nut, and having a square edge which is adapted to engage the bracket, a frame carrying a reflector hingedly connected to the alidade, and a sight-bar also hingedly connected to the alidade.

8. In a sketching-board, the combination with the board, having paper-carrying rollers journaled therein, a compass arranged upon one side of the board, and a spirit-level connected to the opposite side of the board, of a bracket adjustably mounted at one end of the board, and an alidade pivotally connected to the bracket, and common means for holding the alidade to the bracket, and also clamping it in its adjusted position.

9. A sketching-board of the kind described, comprising a board having paper-carrying rollers journaled therein, and adapted for holding a length of the paper across the board, a compass arranged upon one edge of the board, and a spirit-level arranged upon the board opposite the compass, a rod mounted upon the board adjacent one of the paper-carrying rollers a bracket slidably retained upon the rod, and having a set-screw for clamping it in position, an alidade pivotally connected to the bracket, a hinged reflector secured to the alidade adjacent its pivotal end, a sight-bar hingedly connected to the opposite end of the alidade, and means for clamping the alidade in position.

10. A device of the kind described, comprising a board adapted for holding a roll of paper, and having a compass arranged upon one side, and a spirit-level arranged upon the opposite side, an alidade adjustably mounted upon the board and adapted to be moved from one side of the board to the other, and also adapted to be moved upon an arc, and means for clamping the said alidade in the position to which it has been adjusted.

11. A sketching-board of the kind described, comprising a board proper, a bracket adjustably retained at one end of the board and adapted to be moved from one side to the other, an alidade pivotally connected to the bracket and adapted to be moved upon the arc of a circle, a reflector hingedly connected to the alidade adjacent its pivotal end, a sight-bar hingedly connected to the alidade at its outer end, and means for clamping the alidade in its adjusted position.

12. A sketching-board of the kind described, comprising a board proper having paper-carrying rollers journaled in the ends thereof, a compass arranged upon one edge of the board, a spirit-level arranged upon the opposite edge of the board, a rod held at the end of the board adjacent one of the paper-carrying rollers, a bracket adjustably mounted upon the rod, and having a set-screw for clamping it in position, said bracket also having a forwardly-projecting flange, a bolt held by the flange, an alidade pivotally mounted upon the bolt, a nut operating upon the bolt, a washer interposed between the nut and the alidade, a frame hingedly connected to the alidade, and having channelways adapted to receive and hold a mirror or reflector, and a sight-bar also hingedly connected to the alidade, said frame and sight-bar being adapted to fold down upon the face of the alidade, all substantially as specified.

EDWARD FARINGTON CHANDLER.

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