

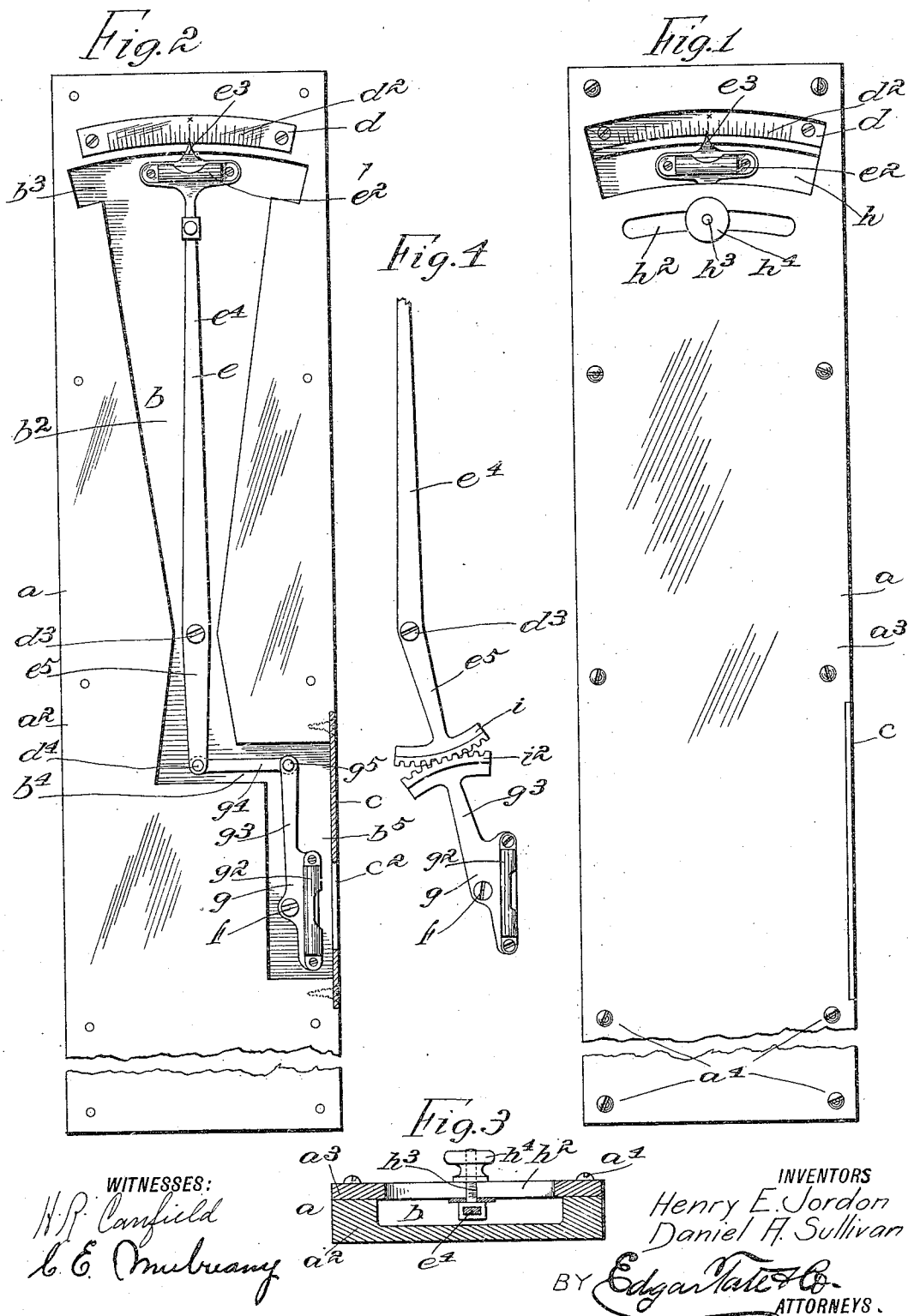
H. E. JORDON & D. A. SULLIVAN.

TOOL.

APPLICATION FILED JUNE 2, 1909.

961,617.

Patented June 14, 1910.



UNITED STATES PATENT OFFICE.

HENRY E. JORDON AND DANIEL A. SULLIVAN, OF NEW YORK, N. Y.

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Application filed June 2, 1909. Serial No. 499,673.

To all whom it may concern:

Be it known that we, HENRY E. JORDON and DANIEL A. SULLIVAN, citizens of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Tools, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to tools of the class known as levels and pitch or grade finders; and the object thereof is to provide an improved device of this class which may be used as an ordinary level and for indicating the pitch of a wall, the grade of a railroad and for various other purposes.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 is a front view of our improved tool, Fig. 2 a similar view showing the front part of the tool or the casing thereof removed, Fig. 3 a partial section on the line 3—3 of Fig. 1, and, Fig. 4 a view similar to Fig. 2 but showing only a portion of the operating parts of the tool and a modification of said parts.

In the practice of our invention we provide a casing *a* made in the form of an ordinary level and comprising, in the form of construction shown, a back member *a*² and front member *a*³ connected by screws *a*⁴, and in said casing and formed preferably in the back member *a*² thereof is a longitudinal chamber *b* consisting, in the form of construction shown, of a main longitudinal part *b*² provided at one end with a transverse part *b*³ which is arc-shaped in form and communicating at the other end with a transverse part *b*⁴ which communicates with a longitudinal supplemental chamber *b*⁵ adjacent to one side edge of the casing *a* and closed by a plate *c* having a longitudinal opening *c*², the part *b*⁵ of said chamber being approximately central of the casing *a*.

Secured between the part *b*³ of the chamber *b* and the corresponding end of the back

of the casing *a* is a scale plate *d* provided, in the form of construction shown, with a scale *d*² which is supposed to represent eighths and sixteenths of an inch, and pivoted at *d*³ in the chamber *b* is an arm *e* which ranges longitudinally through the main part of said chamber and the end of which is provided with a transverse spirit level *e*² having a pointer *e*³ which operates in connection with the scale *d*² on the plate *d*, and said arm consists of a longer end *e*⁴ and shorter end *e*⁵.

Pivoted in the part *b*⁵ of the chamber *b* at *f* is a plate *g* provided with a spirit level *g*² which may be seen through the opening *c*² of the plate *c* which is secured to the casing *a* and forms a part thereof, and the said plate *g* is provided with an arm *g*³ which ranges in the same direction as the arm *e* and which is connected with the shorter end *e*⁵ of the arm *e* by a link *g*⁴.

The distance between the pivot point *d*³ of the arm *e* and the end *d*⁴ of said arm is the same as the distance between the pivot point *f* of the plate *g*, and the end of the arm *g*³ at *g*⁵. The front plate *a*³ of the casing *a* is provided with a transverse opening *h* through which the spirit level *e*² and the scale plate *d* may be clearly seen, and inwardly of said opening with a transverse arc-shaped slot *h*² through which is passed a screw *h*³ connected with the part *e*⁴ of the arm *e* and provided with a thumb nut *h*⁴ by means of which the arm *e* or the longer end *e*⁴ thereof may be swung into any desired position and locked in or held in said position.

By means of this construction it will be apparent that any movement of the arm *e* or the longer end *e*⁴ thereof will be transmitted to the arm *g*³ of the plate *g* and to the spirit level *g*², and when the arm *e* or the end *e*⁴ thereof is in the position shown in Fig. 2 or in such position that the pointer *e*³ indicates the center mark of the scale *d*², the spirit level *g*² will be in a position parallel with the plate *c* and the device may be used as an ordinary level.

The operation of using the device to indicate the pitch of a well is as follows:—Suppose the end *e*⁴ of said arm to be one foot in length and the scale marks on the scale *d*²

to represent eighths and sixteenths of an inch, and it is desired to give a wall a pitch of one-eighth of an inch to the foot. The arm e or the end e^4 thereof is moved so that the pointer e^3 will indicate one-eighth of an inch at one side of the center of said scale and the air bubble in the spirit level e^2 cannot be seen until the tool is held upright and tilted so that said air bubble will appear in its proper place and the tilt of the side edge of the tool will then be the pitch which is to be given to the wall. With the construction shown in Fig. 2 of the arms e and g and the link g^4 , the operation will not be exact except for very small angles or inclinations, but in Fig. 4 we have shown a modification of this construction in which the shorter end e^5 of the arm e and the arm g^3 of the plate g are placed in a direct line between the pivot points d^3 and f , and said arms are provided with intermeshing segmental gears i and i^2 , and with this construction the operation of the device will be exact within any practical or desired limits.

The operation in measuring the grade of a railroad or other road will be as follows:— Suppose it is desired to give a road a grade or inclination of one-sixteenth of an inch to a foot, the arm e or the longer end e^4 thereof is moved so that the pointer e^3 will indicate one-sixteenth of an inch to one side of the center of the scale d . This operation will throw the spirit level g^2 into such position that the air bubble therein cannot be seen through the opening c^2 in the plate c , and by placing the back edge of the tool on a level surface and raising one end thereof so that the air bubble in the spirit level g^2 can be seen through the opening c^2 , the grade or inclination of the road will be indicated. This device may also be used in the same manner for indicating the desired height of one rail of a railway track above another in making curves in the track, and for various other and similar purposes, and our invention is not limited to any particular style of the scale d or the character of said scale, nor to the length of the longer arm e , nor to the length of the shorter end of said arm and the length of the arm g , and various changes in and modifications of the construction herein shown may be made, within the scope of the appended claims, without departing from the spirit of our invention or sacrificing its advantage.

Our invention is also not limited to any form or construction of the casing a , and the same may be made in any desired manner, and the chamber or chambers therein may consist of a continuous longitudinal chamber if desired.

Having fully described our invention,

what we claim as new and desire to secure by Letters Patent, is:—

1. A tool of the class described comprising a casing which is oblong in form and provided with parallel side edges in one of which adjacent to one end of the tool is an opening, a main arm pivoted in said casing and ranging longitudinally thereof and comprising longer and shorter end members, a spirit level connected transversely with the end of the longer end member of said arm and provided with a pointer, a scale in connection with which said pointer operates, and another spirit level pivoted back of said opening and provided with an arm which is in operative connection with the shorter end member of the main arm.

2. A tool of the class described comprising a casing which is oblong in form and provided with parallel side edges in one of which adjacent to one end of the tool is an opening, a main arm pivoted in said casing and ranging longitudinally thereof and comprising longer and shorter end members, a spirit level connected transversely with the end of the longer end member of said arm and provided with a pointer, a scale in connection with which said pointer operates, and another spirit level pivoted back of said opening and provided with an arm which is in operative connection with the shorter end member of the main arm, and means for moving said main arm into any desired position and locking it in such position.

3. A tool of the class described comprising a casing which is oblong in form and provided with parallel side edges in one of which adjacent to one end of the tool is an opening, a main arm pivoted in said casing and ranging longitudinally thereof and comprising longer and shorter end members, a spirit level connected transversely with the end of the longer end member of said arm and provided with a pointer, a scale in connection with which said pointer operates, and another spirit level pivoted back of said opening and provided with an arm which is in operative connection with the shorter end member of the main arm, and means for moving said main arm into any desired position and locking it in such position, consisting of a screw connected with said arm and passed through a transverse slot formed in one side of the casing and a thumb nut mounted on said screw.

4. In a device of the class described, a casing having parallel side edges, an arm pivoted in said casing and comprising longer and shorter end members, a spirit level connected transversely of the longer end member of said arm and provided with a pointer, a scale at one end of said casing and in

connection with which said spirit level operates, another spirit level pivoted adjacent to one side edge of said casing and adjacent to the opposite end thereof and provided
5 with an arm, the shorter end member of the main arm and the arm of the last named spirit level being provided with intermeshing segmental gears.

In testimony that we claim the foregoing

as our invention we have signed our names 10
in presence of the subscribing witnesses this
29th day of May 1909.

HENRY E. JORDON.
DANIEL A. SULLIVAN.

Witnesses:

H. R. CANFIELD,
C. E. MULREANY.