(No Model.) 2 Sheets—Sheet 1.

C. C. GÖTZE.

LEVELING INSTRUMENT.

No. 313,723. Patented Mar. 10, 1885.

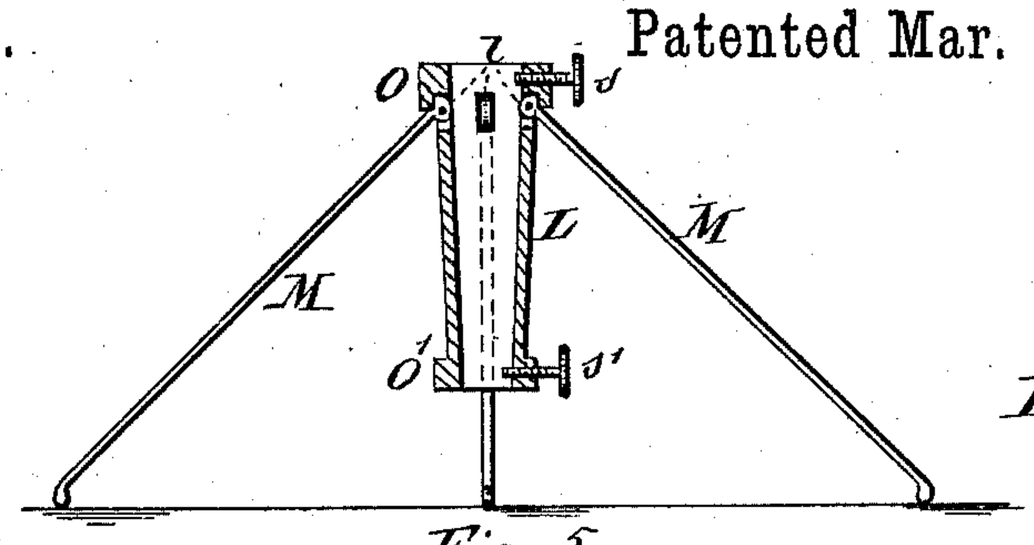

Fig. 5.

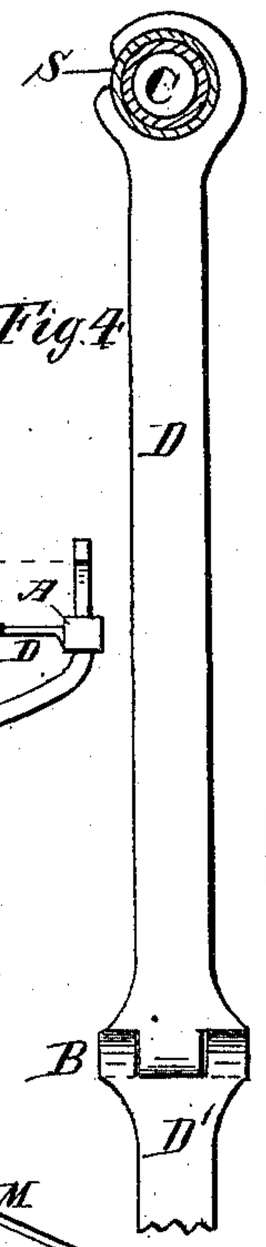

Fig. 4

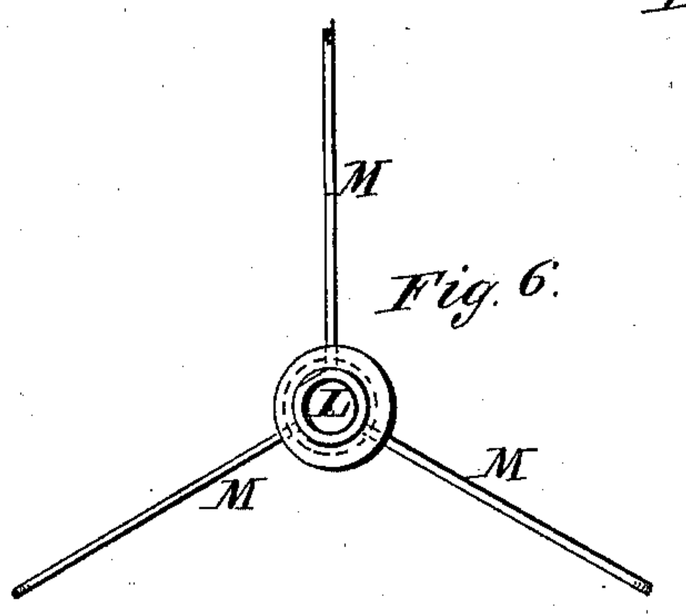

Fig. 6.

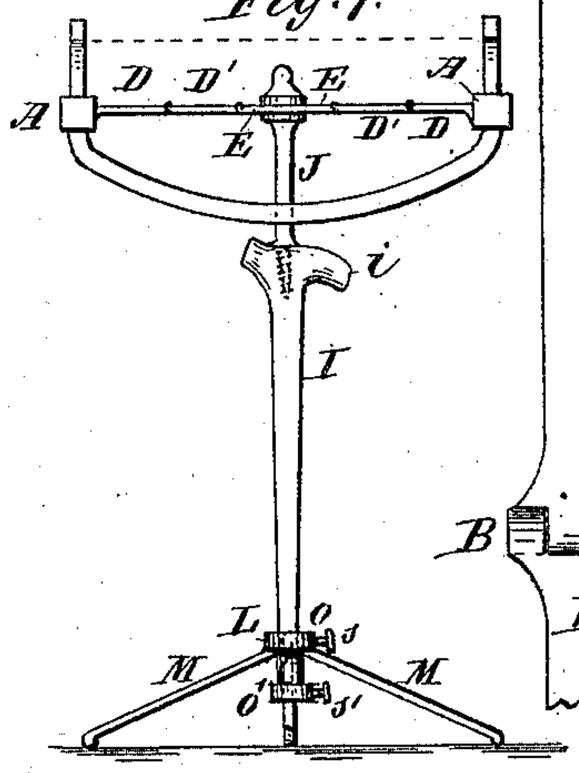

Fig. 7.

Fig. 1

Witnesses.
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per Henry Orth
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(No Model.) 2 Sheets—Sheet 2.

C. C. GÖTZE.

LEVELING INSTRUMENT.

No. 313,723. Patented Mar. 10, 1885.

Fig. 2.

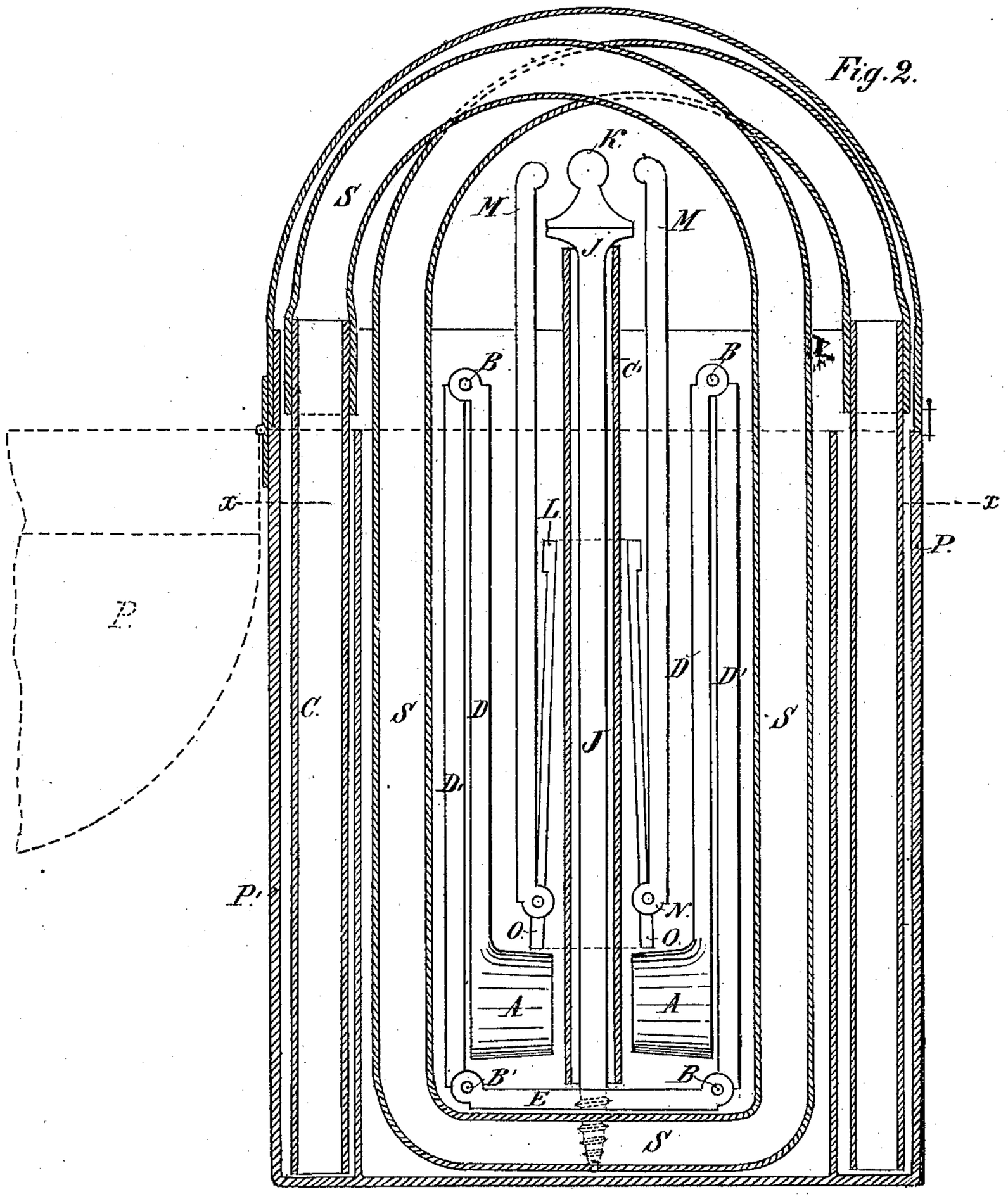
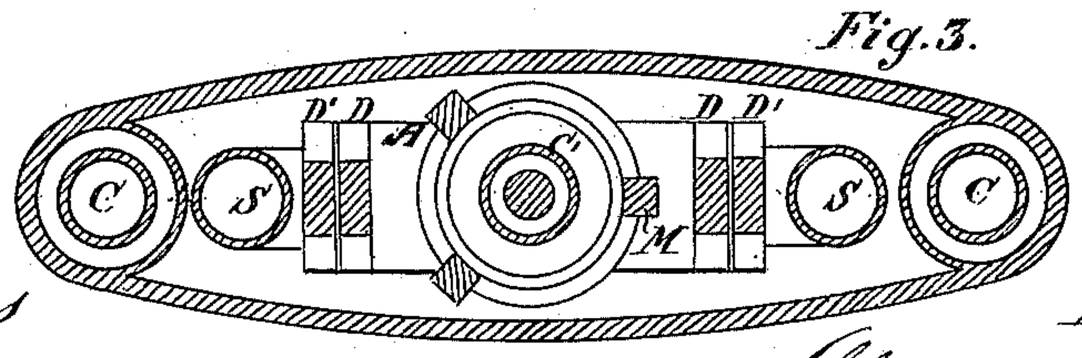


Fig. 3.



Witnesses
W. E. Coulter
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UNITED STATES PATENT OFFICE.

CHRISTIAN CARL GÖTZE, OF CÖTHEN, GERMANY.

LEVELING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 313,723, dated March 10, 1885.

Application filed September 30, 1884. (No model.) Patented in France November 22, 1883, No. 158,718; in Belgium November 29, 1883, No. 63,377, and in Austria-Hungary January 6, 1884, No. 43,110 and No. 57,669.

To all whom it may concern:

Be it known that I, CHRISTIAN CARL GÖTZE, a subject of the Emperor of Germany, residing at Cöthen, in the German Empire, have invented certain new and useful Improvements in Water-Gages, of which the following is a specification.

This invention relates to improvements in the construction of leveling-instruments; and it has for its object to produce an instrument adapted to be folded or put up into a small compass and carried about on the person; and to this end the invention consists in the construction, arrangement, and combination of the parts that constitute the instrument, and, in combination therewith, of a supporting-staff and inclosing-tube, substantially as hereinafter fully described.

In the accompanying drawings, Figure 1 shows my improved leveling-instrument secured to its staff by a vertical sectional elevation, only a part of the staff being shown. Fig. 2 is a vertical section through the longer axis of the inclosing-case, showing the arrangement of the parts of the leveling-instrument within said case. Fig. 3 is a horizontal transverse section of Fig. 2 on line *x x*. Fig. 4 is a detail view of one of the articulated braces, illustrating the mode of securing the stand-glasses thereto. Figs. 5 and 6 are a sectional and a plan view of the tripod adapted for connection with the staff, and Fig. 7 is an elevation showing the instrument set up for use.

In these drawings, P′ indicates the inclosing-case, of substantially elliptical form in cross-section, provided with a suitable cover, P, (shown in part in dotted lines, Fig. 2,) thrown open, said cover or lid being suitably hinged or otherwise connected with the case, so as to be readily thrown open or removed therefrom. Within the case, at each end of its longer axis, is formed a pocket for the reception of the stand-glasses C C of the leveling-instrument, which is composed as follows: of the stand-glasses referred to, a flexible, preferably rubber, tube, S, connecting the stand-glasses, an articulated brace rod or bar, D D′ E, a fastening pin or spindle, J, and a staff, I, which may be of any suitable form and material; but for convenience of carriage and use for a twofold purpose I employ a staff in the form of a walking-cane, provided at one end with a suitable handle, *i*, and at the other end with the usual ferrule, so that the said staff will serve the double purpose of a support for the instrument and a walking-cane. Finally, the instrument is composed of a tripod, L, and these parts are constructed and adapted for use as a leveling-instrument, as follows: The stand-glasses C C, with their rubber-tube connection, are secured in sleeves A A, formed at the outer end of the articulated sections D D of the brace rod or bar, as more plainly shown in Figs. 1 and 4, the brace-rod being composed of five sections, hinged or otherwise articulated together—namely, the outer sections, D D, provided with the clamping or holding sleeves A A for the stand glasses, the sections D′ D′, and the intermediate section, E. By means of this construction the brace-rod may be folded into a compact form, and as the stand-glasses C are connected by means of a rubber tube the latter also may be arranged to occupy but a comparatively small space, as shown in Figs. 2 and 3. The glasses C are inserted into the sleeves A of the extended brace-rod, so that the ends of the rubber tube on one end of said glasses will lie within or project through the sleeves. In this manner the glasses will be held more securely in position than could well be done by a direct connection between them and their supporting-sleeves, as it is obvious that the rubber tube will form an elastic packing around the end of the glasses, and hold them securely within the sleeves by frictional contact, and at the same time protect the glasses against breakage. The intermediate section, E, of the brace-rod has a screw-threaded perforation; and J is a spindle or pin screw-threaded at one end and terminating at its other end in a flaring collar or boss, *j*, that has an axial screw-threaded socket, Fig. 1, for the reception of a clamping-screw, G, on which works a clamping-nut, K. The end of this screw G is passed through the perforation of the section F of the brace-rod and screwed into the upper end, *j*, of the spindle J, and by tightening the nut G the stand-glasses will be firmly held on the said spindle. When the parts are thus arranged, the spindle is screwed into the upper end of the staff, or, as shown in Figs. 1 and 7, in the handle portion

i of the cane I, that is provided with a suitable screw-threaded socket for this purpose.

In order to adapt this staff or the cane I to be erected into position, a tripod is applied thereto, which is constructed of a sleeve, L, which, when a cylindrical staff is employed, may be made of corresponding form; but when a tapering cane is employed, as shown, said sleeve is made of such a taper as to fit the lower or ferruled end of such cane. The tapering sleeve has at its upper and lower ends a collar, O and O′, respectively, through each of which passes a binding-screw, *s* and *s*′, for securing the sleeve to the cane. Below the collar O of the sleeve L are formed three slots, *l*, in which are pivoted the legs M, as shown in Fig. 5. If desired, the legs M may be formed of sections connected substantially like the sections of the brace-rod; or lengthening-bars adapted for connection with the legs M may be employed. When the tripod is secured to the cane I and the support for the leveling devices erected in proper position, said devices are screwed to the cane, as above set forth, and the apparatus will be ready for use, as shown in Fig. 7.

It will be seen that the spindle J forms a pivot on which the stand-glasses may be rotated, and then secured in the desired position by the clamping-nut K. It will also be seen that when the instrument is to be used in a locality where a scarcity of water exists or is feared the stand-glasses and their tubular connection may be filled with water and said glasses securely corked up before reaching such locality.

Having now described my invention, what I claim is—

1. In a leveling-instrument, the combination, with the stand or level glasses, of a flexible tubular connection, a brace-rod for supporting the glasses in the proper relation to each other, and a staff to which said rod is detachably secured, as described.

2. In a leveling-instrument, the combination, with the stand or level glasses, of a flexible tubular connection and an extensible brace-rod for supporting the glasses in proper relation to each other, as described.

3. In a leveling-instrument, the combination, with the stand or level glasses, a flexible tubular connection therefor, and an extensible brace-rod having bearing-sleeves at its extremities, of a flexible packer or gasket for the glasses, interposed between the latter and the bearing-sleeves of the brace-rod, for the purpose specified.

4. In a leveling-instrument, the combination, with the stand or level glasses, a flexible tubular connection therefor, a brace-rod for holding the glasses in proper relation to each other, and a staff for supporting said glasses in proper position, of a pivotal connection between the brace-rod and staff, and a clamping device whereby said glasses are rotatably connected with and may be clamped to said staff, said parts being detachably connected together, as described, for the purpose specified.

5. In a leveling-instrument, the combination, with the stand or level glasses, a flexible tubular connection therefor, an extensible brace-rod to support said glasses in proper relation to each other, and a staff for supporting the brace-rod and glasses in an upright position, of a tripod secured to the staff, said parts being detachably connected with one another, as described, for the purpose specified.

6. A leveling-instrument consisting of stand or level glasses, a flexible tubular connection therefor, an extensible brace-rod for holding the glasses in proper relation to each other, a spindle and clamping device for securing the brace-rod to a staff, a tripod, said parts being constructed to be folded into compact form, and an inclosing-case, as described.

7. A leveling-instrument consisting of stand or level glasses, a flexible tubular connection therefor, an extensible brace-rod for holding the glasses in proper relation to each other, a spindle and clamping device for securing the brace-rod to a staff, and a tripod, said parts being constructed to be folded in compact form, and, in combination therewith, of an inclosing-case having pockets for the stand or level glasses, and a chamber for containing the other parts of the instrument, substantially as described, for the purpose specified.

8. The combination, substantially as described, with the stand-glasses, their flexible connecting-tube, and the extensible brace-rod for holding said glasses in proper relation to each other, and provided at a point intermediate of its extremities with a perforation, of the spindle J, the screw G, and nut K, for the purpose specified.

9. The combination, substantially as described, with the stand glasses, their flexible connecting-tube, and the extensible brace-rod for holding said glasses in proper relation to each other, and provided at a point intermediate of its extremities with a perforation, of the spindle J, the screw G, nut K, and cane I, into which said spindle is screwed, for the purpose specified.

10. The combination of the stand or level glasses, their flexible connecting-tube, the extensible brace-rod to hold the glasses in proper relation to each other, the spindle J, and the screw G and nut K, for securing the brace-rod to the spindle of the cane I, and a tripod consisting of a sleeve, legs hinged thereto, and binding-screws, said parts being arranged for co-operation substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHRISTIAN CARL GÖTZE.

Witnesses:

WILHELM HAÜSEL,

FRED. P. WILKIE.