

No. 864,588.

PATENTED AUG. 27, 1907.

A. C. YOUNG.  
LEVEL HEAD.

APPLICATION FILED AUG. 22, 1906.

2 SHEETS—SHEET 1.

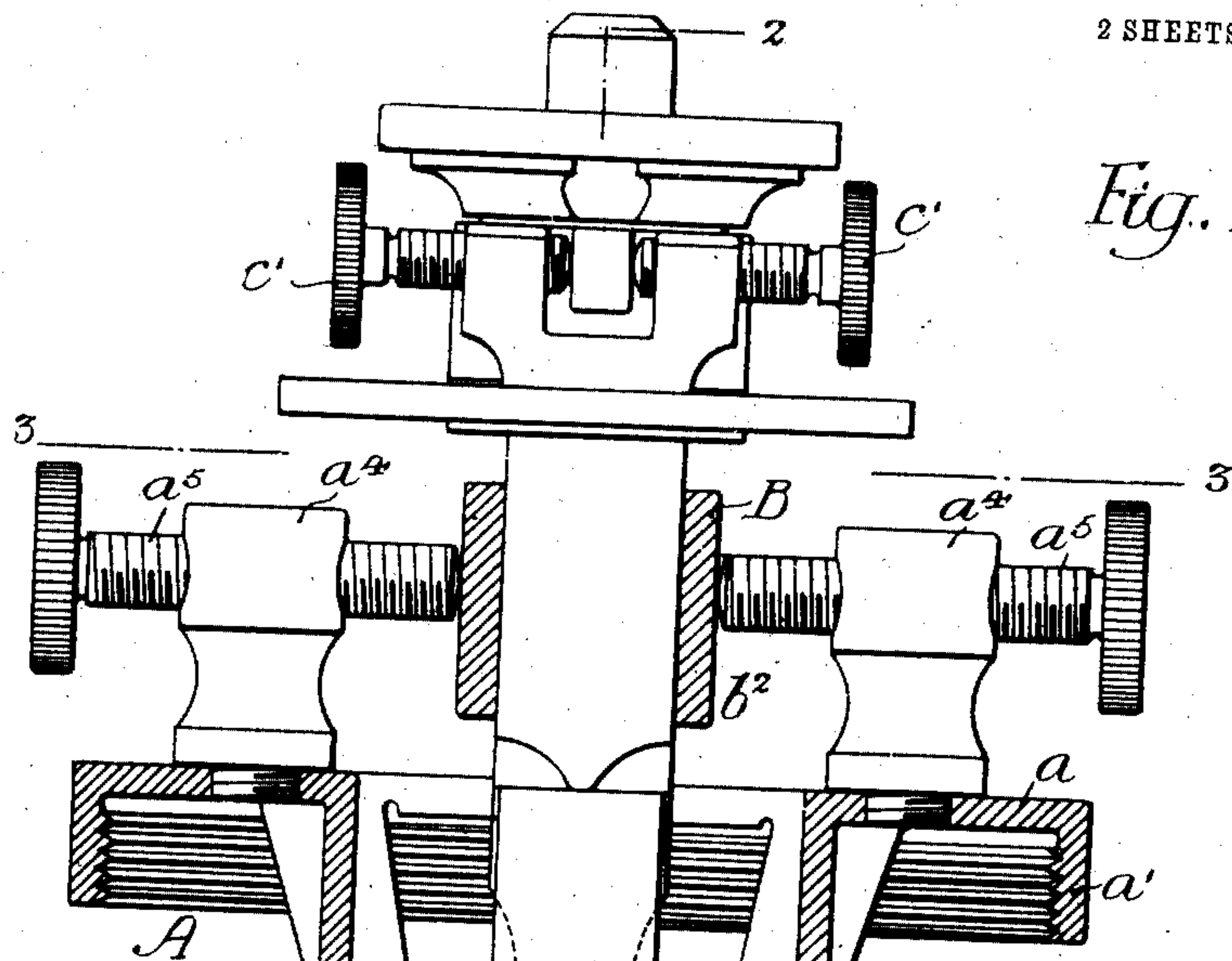


Fig. 1.

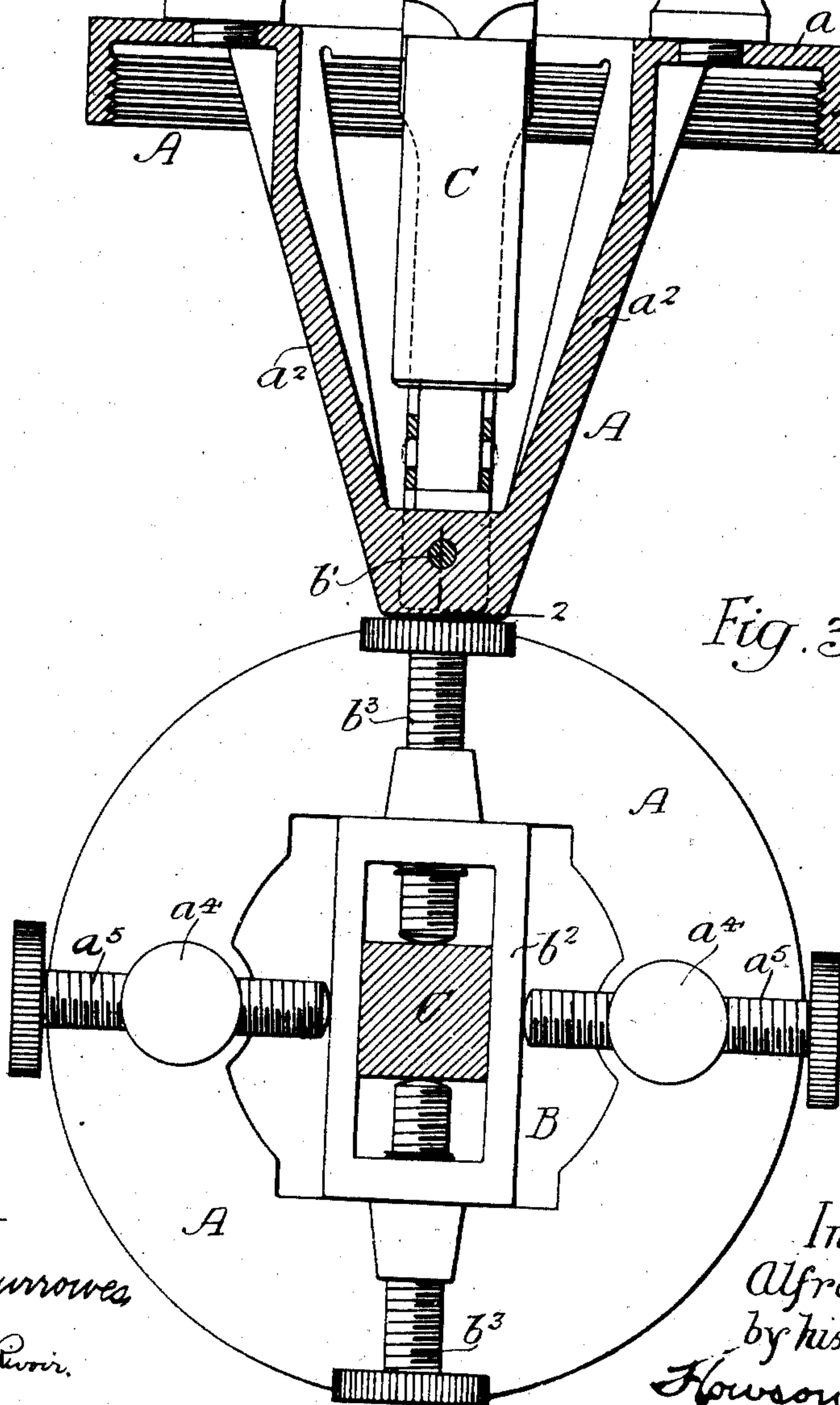


Fig. 3.

Witnesses:-  
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Inventor:-  
Alfred C. Young,  
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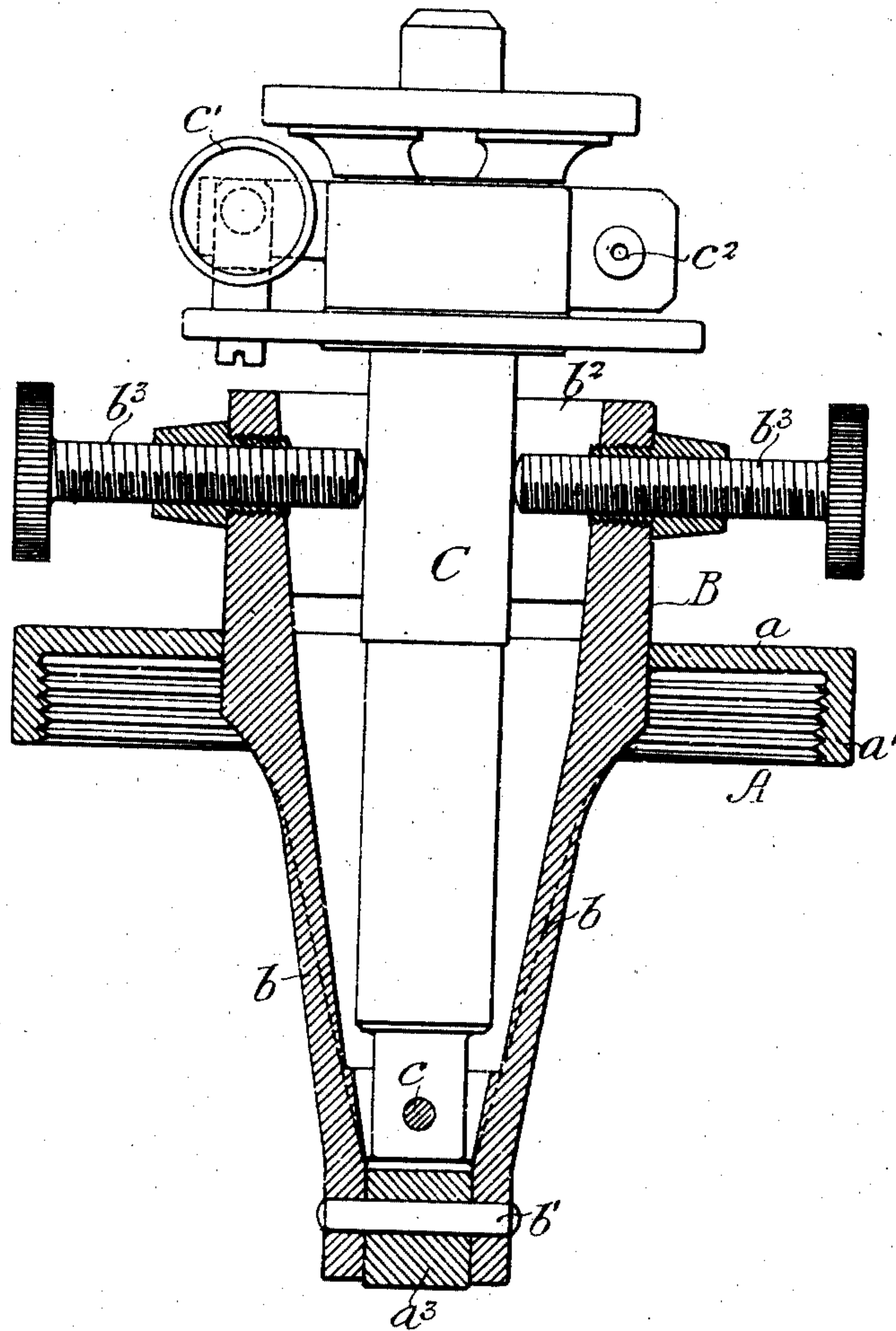
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2 SHEETS—SHEET 2.

*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

ALFRED C. YOUNG, OF PHILADELPHIA, PENNSYLVANIA.

## LEVEL-HEAD.

No. 864,588.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed August 22, 1906. Serial No. 331,606.

*To all whom it may concern:*

Be it known that I, ALFRED C. YOUNG, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Level-  
5 Heads, of which the following is a specification.

One object of my invention is to provide a structure for connecting an engineer's level or transit with its supporting tripod, which shall consist of fewer parts than has hitherto been considered possible in devices  
10 of this class: the said structure consisting of a depending cup-shaped piece formed integral with the base plate, whereby the centers of instruments of the class noted are supported below the surface of the tripod head.

15 It is further desired that the construction shall be such as to withstand the conditions found in transporting the device, as well as in using the same, without likelihood of any of the various parts becoming loosened, detached or disarranged.

20 Another object of the invention is to provide a level head of relatively simple construction and having its parts so made and constructed as to cause it to be inexpensive to manufacture and to maintain in good condition when in use.

25 These objects I attain as hereinafter described, reference being had to the accompanying drawings, in which:

Figure 1, is a vertical section of my improved level head; Fig. 2, is a vertical section taken on the line 2—2,  
30 Fig. 1, and Fig. 3, is a horizontal section taken on the line 3—3, Fig. 1.

It has been noted under practical working conditions that level heads of the type illustrated in the patent granted to L. B. Denison, Feb. 3, 1880, No. 224,155,  
35 were extremely difficult to maintain in operative condition, owing to their very large number of parts. Not only was this the case, but even under the conditions found in transporting the levels from place to place, screws and other parts would become loosened, so that  
40 in many cases the instrument was unfit for use on arriving at its destination. Moreover, levels of this type have been relatively expensive to manufacture owing to the large number of their parts and for the same reason it has been found difficult to maintain them in  
45 working order. It is with the idea of overcoming these very material objections that I have devised the instrument shown in the drawings and described hereafter, and I have found that this has successfully overcome all of the above noted difficulties.

50 In the above drawings, A represents a casting which consists of a circular plate *a* provided with a downwardly projecting and inwardly threaded flange designed to be screwed on to the top plate of a tripod. Extending from the under side of the plate *a* are two  
55 oppositely placed concave pieces *a*<sup>2</sup> united at their lower ends and having that portion of the said plate *a*

between them cut away, as shown best in Fig. 3, so as to form what may be roughly described as a cup-shaped piece. It is to be noted that these parts *a*, *a*' and *a*<sup>2</sup> are formed as a single casting, which has its lowermost portion *a*<sup>3</sup> finished on two faces for the reception of the side  
60 members *b* of a casting B, there being a pivot *b*' whereby said casting is movably supported from said bottom portion of the head casting A so that it is free to move in a vertical plane. 65

Two posts *a*<sup>4</sup> are screwed into the top surface of the plate *a* of the casting A and these each have a horizontal passage through their upper portion threaded for the reception of milled-head screws *a*<sup>5</sup> designed to engage opposite faces of the casting B, which it will be seen, is  
70 box-shaped at its upper end, as indicated at *b*<sup>2</sup> in Figs. 1 and 3.

Immediately above the portion *a*<sup>3</sup> of the casting A there is pivoted to the bottom of the two supporting parts *b* of the casting B a vertically extending bar or  
75 post C; this being carried on a pivot pin *c* so placed as to permit of its movement in a vertical plane at right angles to the plane of movement of the casting B. In order to control the movement of this latter piece, I mount at each end of the box-like portion *b*<sup>2</sup> of said  
80 casting B a pair of milled-head adjusting screws *b*<sup>3</sup>, which preferably pass through suitably threaded bushings, in turn threaded into suitable openings in said casting. The bar or post C carries on its upper end a  
85 pair of tangent screws *c*' and a clamping screw *c*<sup>2</sup> and is otherwise constructed in the manner well known in the art.

Under operating conditions the level head illustrated in the figures is screwed directly upon the externally threaded tripod plate, after which the engineer's level  
90 is placed on the upper end of the post or bar C in the well known manner. The leveling is then accomplished by the proper manipulation of the adjusting screws *a*<sup>5</sup> and *b*<sup>3</sup>.

I claim as my invention:

1. A casting having a threaded portion constructed to fit a tripod plate, and a depending part integral therewith, a structure having a single pivot connecting it to said depending part and movable in a vertical plane, a post constructed to receive a level and pivoted so as to be movable in a plane at right angles to the plane of movement of said structure, with means for adjusting the position of said post relatively to the structure, and means for adjusting the structure relatively to the casting, substantially as described. 105

2. The combination of a post constructed to receive a level, a structure pivotally connected to the lower end of said post and extending upwardly therefrom, adjusting screws carried by the structure for varying the position of the post relatively thereto, with a single metallic piece  
110 having side members united at their lower ends and connected by a pivot to the structure, said piece also having a longitudinally threaded depending flange constructed to fit a threaded tripod head, with screws carried by said piece for adjusting the position of the post-supporting  
115 structure relatively thereto, substantially as described.



3. The combination of a single casting consisting of a substantially circular plate provided with a threaded flange and two downwardly extending side sections united at their lower ends, a piece consisting of a box-like section  
5 provided with depending portions, a pivot connecting said depending portions with the lower portion of the side members of said casting, with a post having its upper end shaped for the reception of a level and pivotally connected to said piece so as to be movable in a plane at right angles  
10 to the plane of motion thereof, with means carried by the casting for adjusting the position of the piece on its pivot, and other means carried by said piece for independently adjusting the position of the level supporting post on its pivot, substantially as described.
- 15 4. An instrument head consisting of a base plate and a cup-shaped piece depending from and formed integral with the same, said piece being constructed to support the centers of an instrument supported by it, below the surface of the head, with a pivot extending through the vertical  
20 center line of the instrument for connecting the cup-

shaped piece and the instrument supporting means, substantially as described.

5. A casting constructed to be attached to a tripod plate and having integral therewith a depending part extending through the vertical center line of the instrument, a structure having a substantially horizontal pivot connecting it  
25 to said depending part and also extending through the vertical line of the instrument, a post constructed to receive an instrument and supported so as to be movable in a plane substantially at right angles to the plane of movement of said structure, with means for adjusting the position of the post relatively to the structure, and means  
30 for adjusting the structure relatively to the casting, substantially as described.

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

ALFRED C. YOUNG.

Witnesses:

WM. D. DICK,  
HARRY HUDSON.