

(No Model.)

2 Sheets—Sheet 1.

H. A. HOUSE & H. A. HOUSE, Jr.
LEVELING ATTACHMENT FOR TRIPOD HEADS.

No. 409,356.

Patented Aug. 20, 1889.

Fig 1

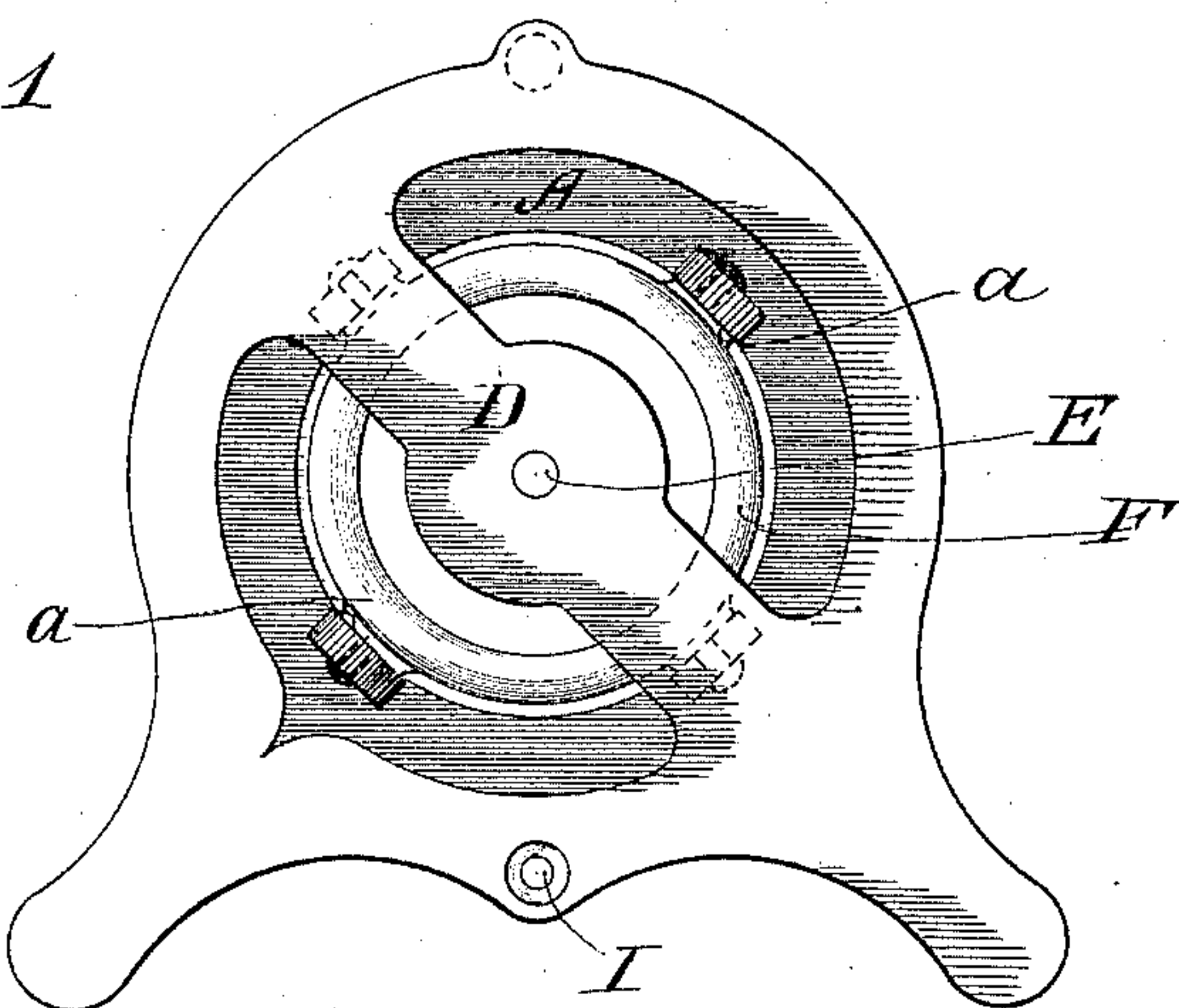
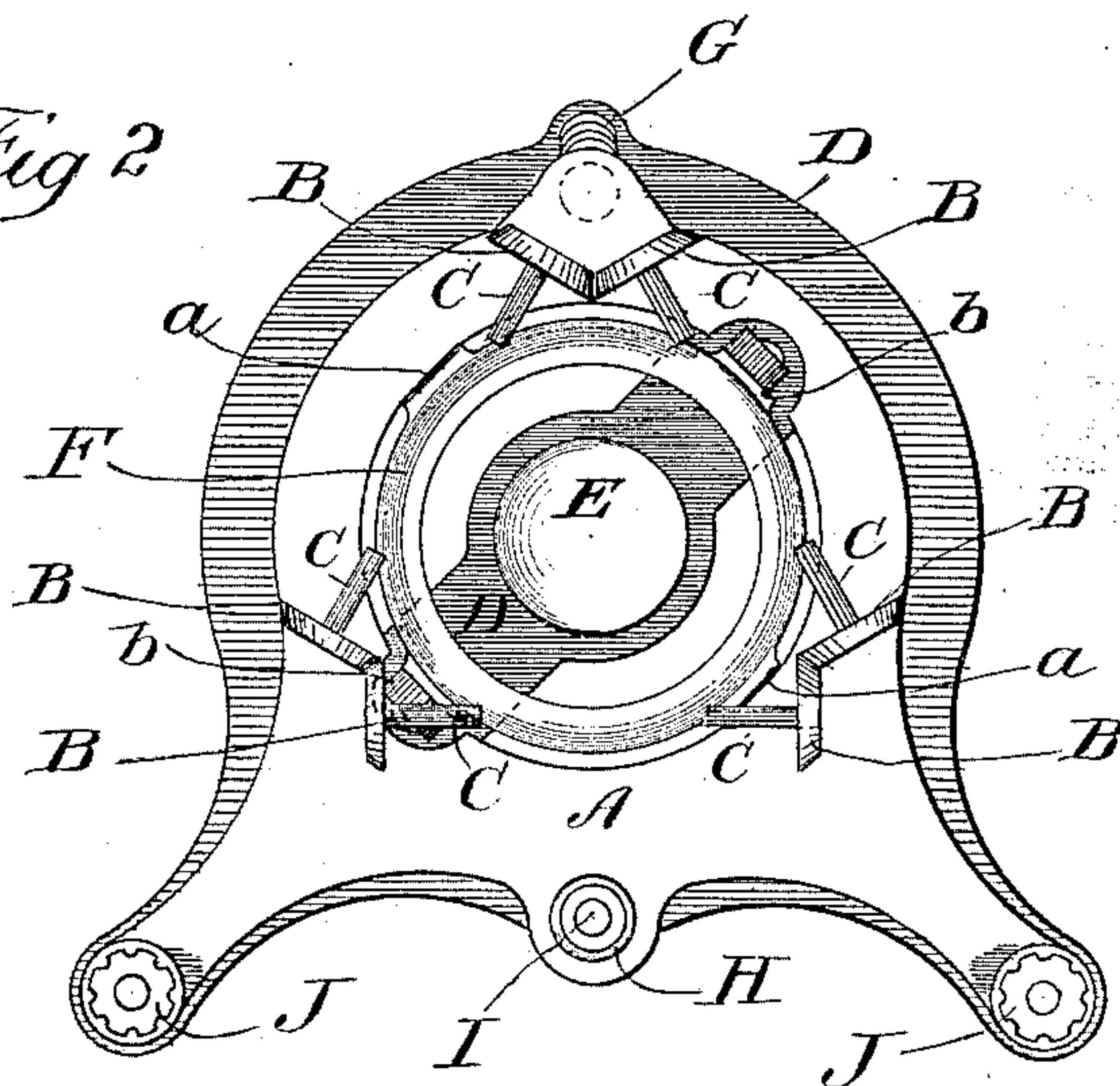


Fig 2



Witnesses

S. Williamson

E. S. Sumner

Inventors

Henry A. House

Henry A. House Jr.

By

J. M. Smith

att'y

2 Sheets—Sheet 2.

No. 409,356.

Patented Aug. 20, 1889.

Fig 3

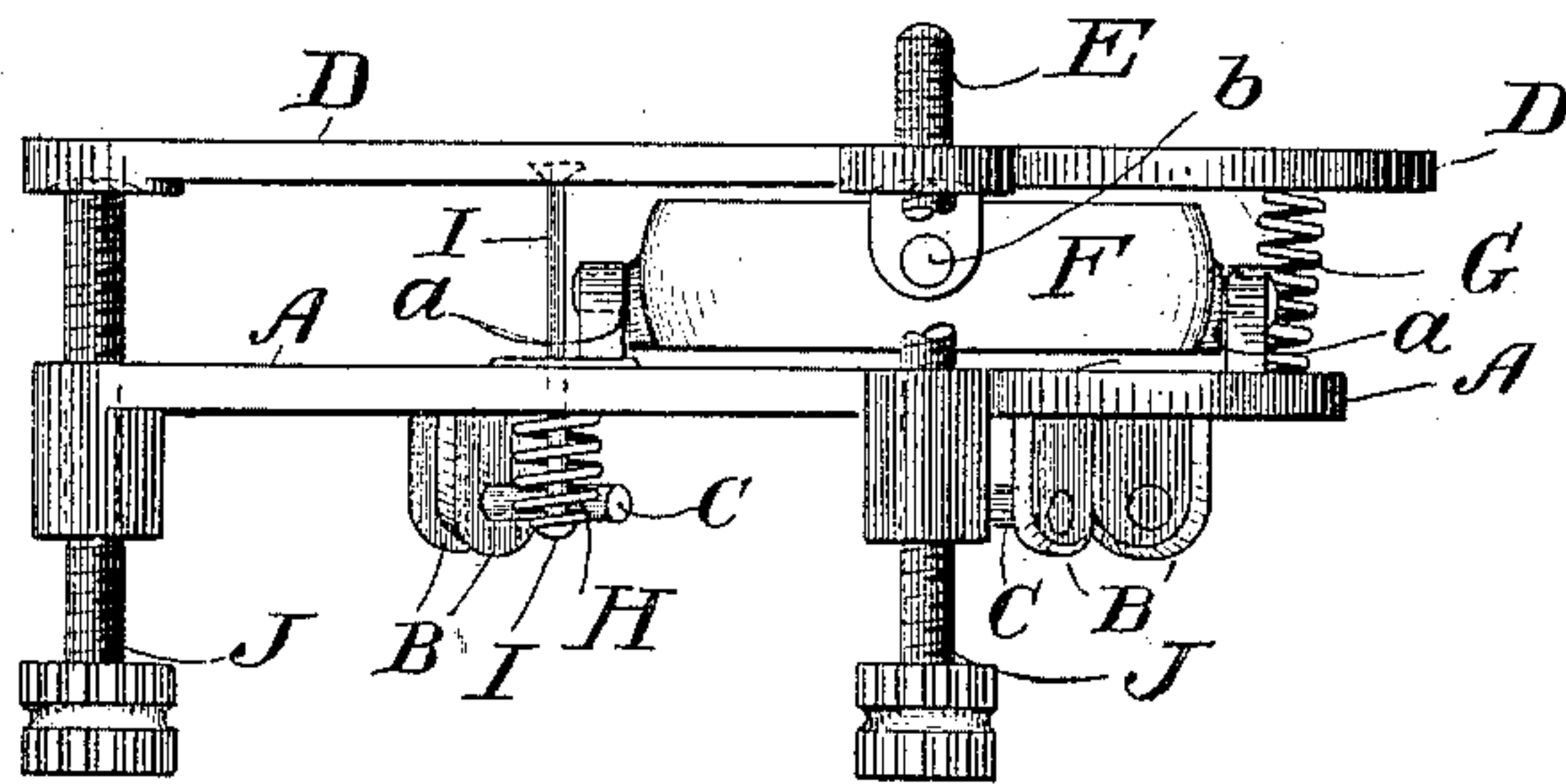
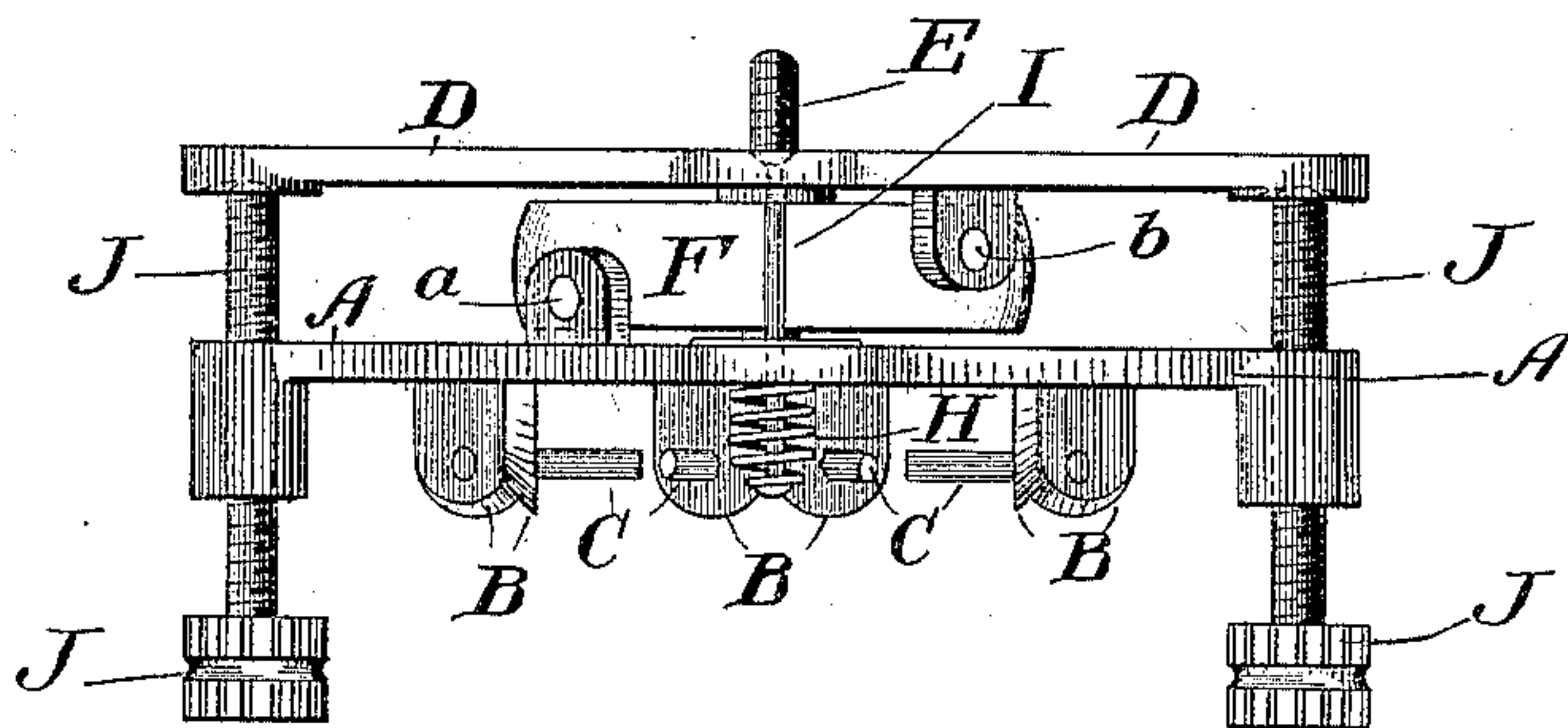


Fig 4



Witnesses
J. H. Williamson
E. S. Sumner

Inventors
Henry A. House
Henry A. House Jr.

By

M. Smith Jr.

city.

UNITED STATES PATENT OFFICE.

HENRY A. HOUSE AND HENRY A. HOUSE, JR., OF BRIDGEPORT, CONNECTICUT.

LEVELING ATTACHMENT FOR TRIPOD-HEADS.

SPECIFICATION forming part of Letters Patent No. 409,356, dated August 20, 1889.

Application filed June 4, 1888. Serial No. 275,938. (No model.)

To all whom it may concern:

Be it known that we, HENRY A. HOUSE and HENRY A. HOUSE, Jr., citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Leveling Attachments for Tripod-Heads; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has reference to leveling-instruments which are mounted on tripods or similar underpinning, but has particular reference to tripod-heads for use in connection with photographic cameras, and has for its object to provide means whereby the camera or other instrument may be adjusted to a horizontal plane independent of the tripod; and with these ends in view our invention consists in the details of construction and combination of elements, such as will hereinafter be fully set forth, and then specifically designated by the claims.

In the drawings accompanying this application, Figure 1 is a plan view of our improvement; Fig. 2, a bottom view; Fig. 3, an elevation taken in the direction of the arrow in Fig. 1, and Fig. 4 a front elevation.

Similar letters denote like parts in the several figures.

A is the tripod-head proper, from which depend the usual ears B, which latter are provided with the ordinary dowel-pins C, by which the tripod is secured in position to the head.

D is a platform which supports the camera, and E is the binding thumb-screw, which extends through said platform and secures the camera or other instrument to the latter.

F is a ring interposed between the head A and platform D, and to this ring at the points *a b*, respectively, are pivoted said head and platform in axial lines which are at right angles to each other, precisely after the manner of a gimbal, so that it will be readily understood that said head and platform will rock on their pivotal points in planes which are at right angles to each other, thus affording to the platform a universal rocking movement. Between said platform and head and at the

rear thereof is a coil-spring G, adapted by its resiliency to throw the front of the platform downward, while a second coil-spring H around a rod I, depending from said platform through the head, bears against the bottom of the latter for the purpose of facilitating the action of the spring G. We prefer to use these two springs, one auxiliary to the other, although a single spring would effect the result aimed at if made sufficiently stiff, our object being to use as light springs as possible, in order to facilitate the assembly of the component parts of our improvement and to present a light and not cumbersome appearance.

J are leveling-screws, which extend upward through threaded bearings in the front of the head A, and are preferably, respectively, in alignment with the pivots *a b*. These screws bear against the under side of the platform, so that it will be readily seen that in this instance said screws will adjust the platform in planes at right angles to each other, and this effects a very rapid adjustment.

The practical application of our improvement will be best understood from the operation in connection with a photographic camera, which is as follows: The camera having been secured on the platform by means of the screw E and the tripod properly secured to the head, the legs of said tripod are planted as usual, but without regard to the perpendicular adjustment of the camera. The leveling-screws are now operated and will quickly effect the perpendicular adjustment of the camera, owing to the fact that they operate to cause the platform to swing in planes which intersect each other. By backing the screws the platform is caused to swing in constant contact with said screws, owing to the force exerted by the springs G H, while the driving of said screws operates the platform against the resiliency of said springs. Heretofore it has been necessary to exercise great care in the placing and adjustment of the tripod-legs in order to level the camera, and it is sometimes well nigh impossible to locate said legs, especially on rocky and uneven ground, or when it becomes necessary to stand the tripod in a pond or stream for the purpose of getting shore views.

By the use of our improvement after the

tripod is once planted it is not disturbed, and the necessary adjustment of the camera is accomplished by the manipulation of the leveling-screws.

5 Another advantage residing in our improvement is that the camera may be readily elevated or depressed, according to the field of elevation desired to the lens.

10 The arrangement of the leveling-screws so as to operate the platform in planes at right angles to each other is especially advantageous, since the leveling of the platform is thus effected on two axes neither one of which in any way affects the other, and there-
15 fore the actions of these screws are independent of each other.

The screws may of course be located to operate on any part of the platform as long as their action is opposed to the resiliency of the
20 spring on opposite sides of the direct line of action of the latter.

We do not wish to be confined to the use of our improvement in connection with photographic cameras, as we are enabled to utilize
25 our invention in all instances where it becomes necessary to adjust instruments which are supported on tripods or any other underpinning, and we might add that a spirit-level could be carried by the platform to insure
30 great accuracy, as would be advisable in connection with a theodolite or other analogous instrument.

We claim—

1. As a new means for supporting instruments on tripods and the like, the combination, with the platform which supports the camera and the head for the tripod, of a ring interposed between said platform and head and pivoted thereto in axial lines which are at right angles to each other, substantially as
40 set forth.

2. The combination, with the head and platform pivoted to an intermediate ring in axial lines which are at right angles to each other, of a spring adapted to normally depress the
45 platform at one side and two leveling-screws adapted to rock said platform against the resiliency of said spring, as and for the purposes set forth.

3. The combination, with the head and platform pivoted to an intermediate ring in axial lines which are at right angles to each other, of a spring adapted to normally tilt said platform and two leveling-screws adapted to operate said platform on opposite sides of the
55 direct line of action of said spring, substantially as and for the purposes hereinbefore described.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY A. HOUSE.

HENRY A. HOUSE, JR.

Witnesses:

S. S. WILLIAMSON,

F. W. SMITH, JR.