No. 879,605. PATENTED FEB. 18, 1908.

A. C. YOUNG.

TRANSIT HEAD.

APPLICATION FILED JAN. 29, 1907.

Fig. 1.

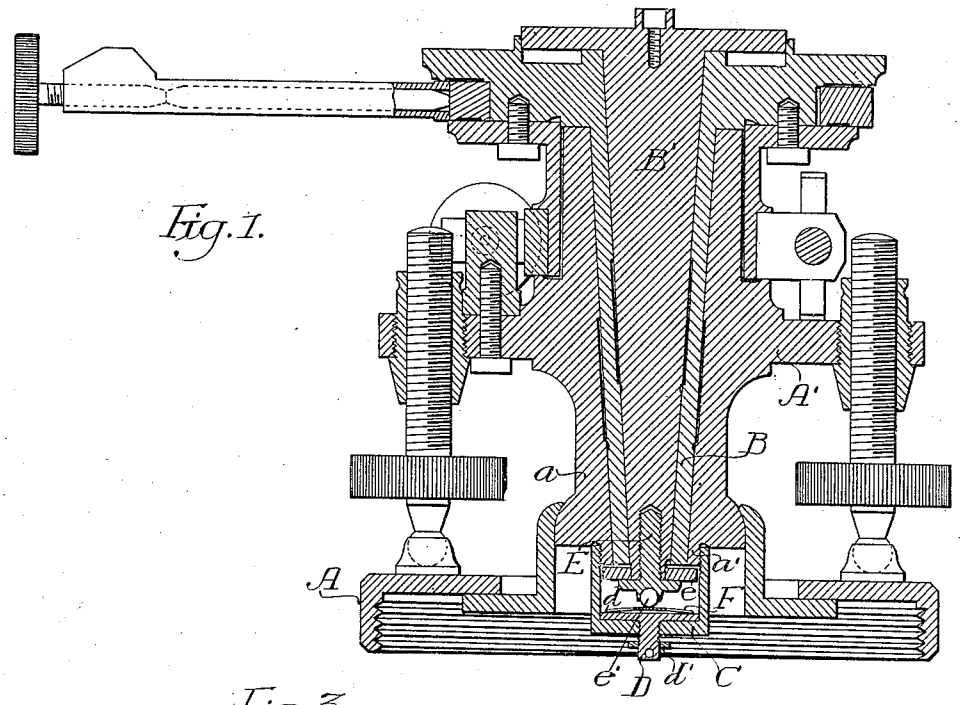


Fig. 3.

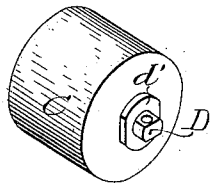


Fig. 4.

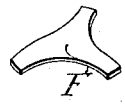
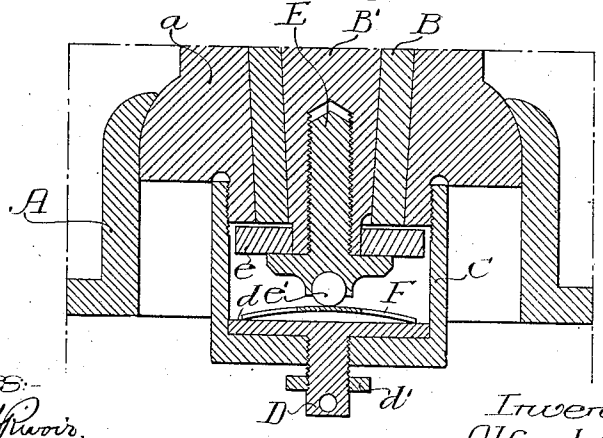


Fig. 2.



Witnesses:-
William A. Purvis.
Titus H. Howes.

Inventor:
Alfred C. Young.
by his Attorneys.
Howson & Howson

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALFRED C. YOUNG, OF PHILADELPHIA, PENNSYLVANIA.

TRANSIT-HEAD.

No. 879,605. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed January 29, 1907. Serial No. 354,737.

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 Transit-Heads, of which the following is a specification.

The object of my invention is to provide a transit or level head with means whereby certain of its conical bearings may be prevented from jamming or becoming relatively nonrevoluble in case of a sudden jar or blow, or from binding on account of the contraction or expansion caused by sudden or extreme changes of temperature; the device being so constructed, that in the event of parts of the bearing binding or sticking because of the presence of foreign bodies between them they, may be conveniently and quickly loosened.

Another object of the invention is to provide a novel device whereby the wear and tear on the flanges of the inside and middle centers and their cones may, be reduced to a minimum.

I further desire to provide a means whereby the spring used in connection with one of the parts of the bearing above referred to, may be adjusted as desired.

These objects I attain as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1, is a vertical section of a transit head, showing my invention as applied thereto; Fig. 2, is a vertical section on an enlarged scale of a portion of the transit head shown in Fig. 1; Fig. 3, is a perspective view of the adjusting cap employed as part of my invention, and Fig. 4, is a perspective view of the spring contained within the cap shown in Fig. 3.

Referring to Figs. 1 and 2 of the above drawings, A represents the lower parallel plate of a transit head, A′ the upper parallel plate, B the outer spindle and B′ the inner spindle; all of which can be constructed and assembled in a manner well known in the art to which my invention belongs. In the present instance, however, the lower portion *a* of the casting of which the upper parallel plate A′ forms an integral part, is threaded, as indicated at *a′*, for the reception of a cylindrical cap C. A screw D passes through a threaded opening in the center of the end of this cap and has within the same a head *d* which is formed as a circular plate of a diameter substantially equal to the internal diameter of the cap.

On that portion of the screw D outside of the cap C is a jam nut *d′*, whereby said screw may be immovably held in any adjusted position. Under operating conditions the chain or string for carrying the plumb bob is usually attached to the screw D; this latter being provided with a hole at its lower end for this purpose.

There is in the lower end of the spindle B′ an axially extending threaded hole or recess for the reception of a screw E, and this latter is headed so as to confine a washer *e* between the end of the inner spindle and the adjacent portions of the outer spindle B of the casting A. Held in the head of the screw E so as to be revoluble is a ball *e′* and interposed between this ball and the head *d* of the screw D is a spring F. This, as shown in Fig. 4, preferably consists of a star shaped piece of spring material so formed as normally to be convex to a flat surface.

When the various parts, above noted, are assembled, the screw D is so turned as to cause the spring F to exert an upward pressure upon the ball *e′* and hence upon the inner spindle B′, thereby tending to a certain extent to take a portion of the weight of the latter from its bearing. There is consequently less wear on said bearing and less tendency for its parts to stick together.

Under operating conditions it frequently happens that foreign bodies, such as sand or dirt, get between the adjacent surfaces of the inner and outer spindles B′ and B, causing undue friction between their parts and sometimes even preventing their relative movement. In such case, the forcible turning of the screw cap C will, by moving the inner spindle upward, reduce the friction between it and the outer spindle, or if these two parts be jammed or stuck together, will separate them so as to permit any work in hand being carried to completion.

Even under the worst conditions, a relatively small upward movement of the inner spindle B will suffice to do away with the friction or sticking of the parts, while by the adjustment of the screw D any desired part of the weight of the spindle B′ and its associated parts may be taken from the bearing, thereby also tending to reduce the friction and wear of these parts.

Under conditions of use it frequently hap-

pens that the legs of the tripod are permitted to strike a solid body while the instrument is being carried, or the latter may be set up rather roughly, so as to tend to cause the inner spindle to be forcibly moved downward within the outer spindle. In such case the spring under the end of the inner spindle opposes the relative longitudinal movement of two spindles and if these should by any means stick together, they may easily be loosened by proper manipulation of the screw cap C.

I claim:—

1. A transit head having a spindle and a bearing therefor, a cap adjustably mounted on the body of the transit head so as to be movable toward and from the end of the spindle, a spring carried in the cap, and an anti-friction device between the said spring and the end of the spindle, consisting of a ball, with a screw carrying said ball and threaded into the spindle substantially as described.

2. A transit head having a bearing and a spindle therein, a screw mounted in the end of the spindle and carrying a ball bearing, a cap threaded to the lower end of the body of the transit head, and a spring therein acting upon the ball bearing, substantially as described.

3. A transit head having a spindle, a bearing therefor, a cap closing the end of the spindle, an adjustable screw having a relatively large head within the cap and its body projecting from said cap, with a spring confined between said head of the screw and the end of the spindle, substantially as described.

4. A transit head having a spindle and a bearing therefor, a cap adjacent to the lower end of the spindle, a screw extending through the end of the cap, a second screw mounted in the end of the spindle, a ball revolubly held in the end of said second screw, and a spring interposed between the said ball and the screw of the cap, substantially as described.

5. A transit head having a spindle, a cap mounted adjacent to the end thereof, a screw having its head within the cap and its threaded portion extending through the head of said cap so as to serve for the attachment of a plumb line, with a spring between said screw and the end of the spindle, 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,
ADELE NETTLETON.