A. LIETZ.

TRANSIT FRAME.

APPLICATION FILED JAN. 22, 1913.

1,136,883.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

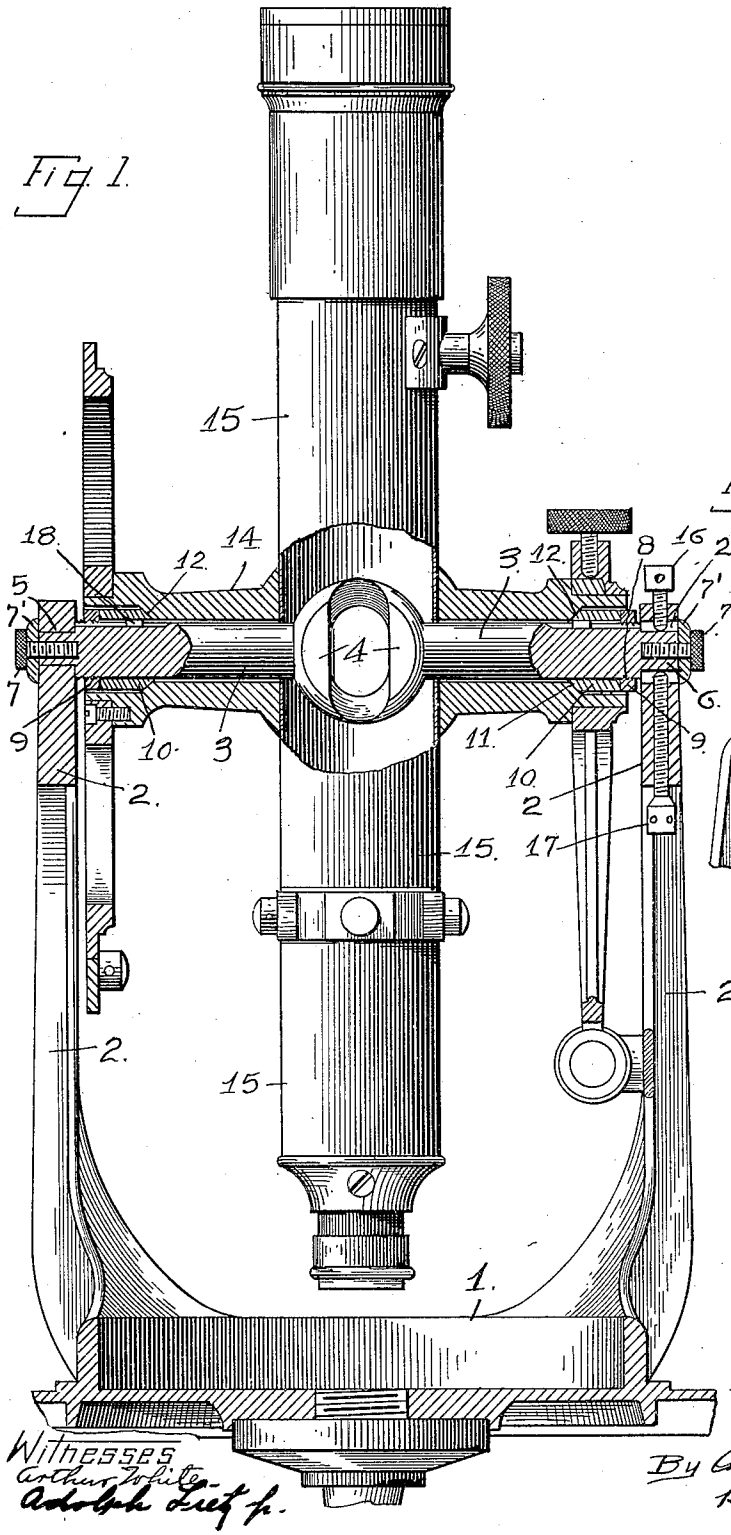
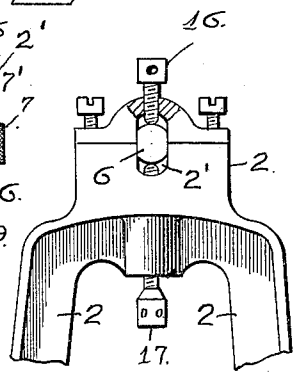


Fig. 2.



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Inventor
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

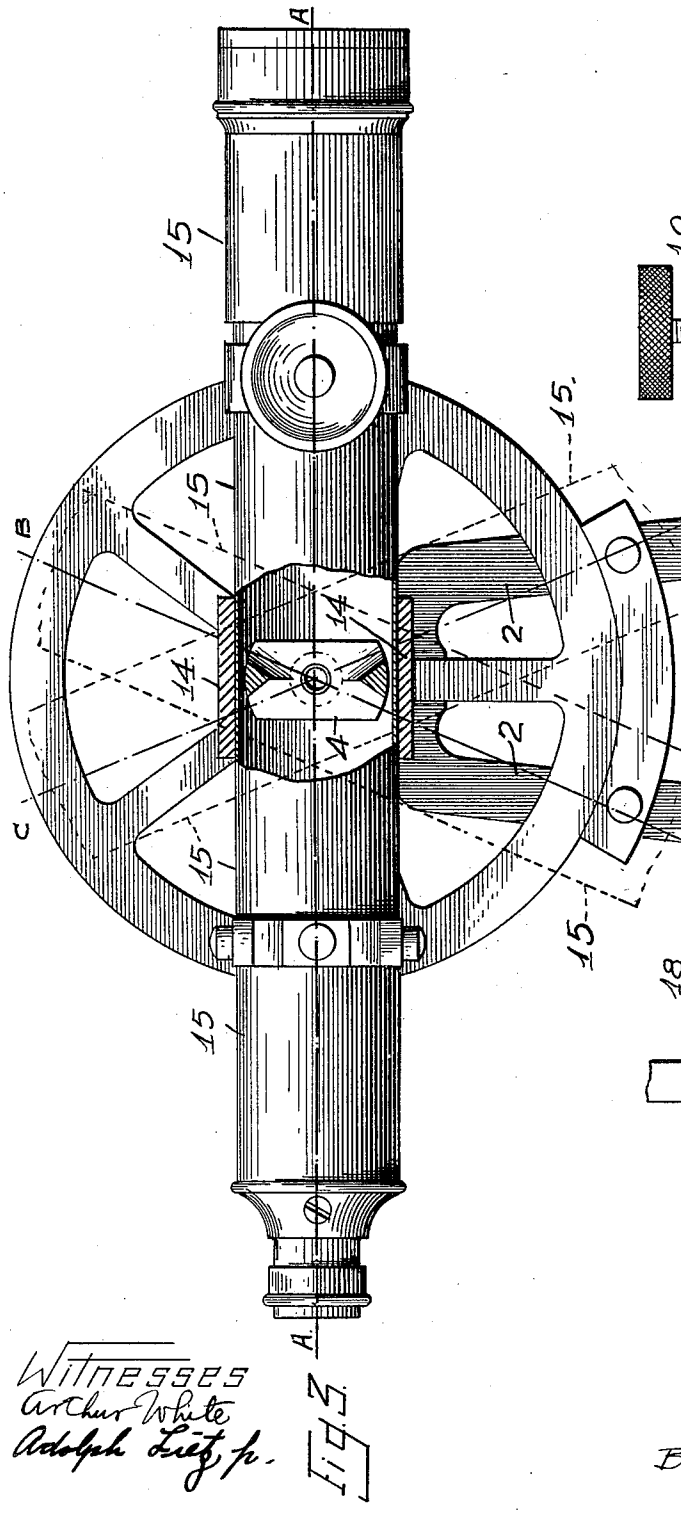


Fig. 3.

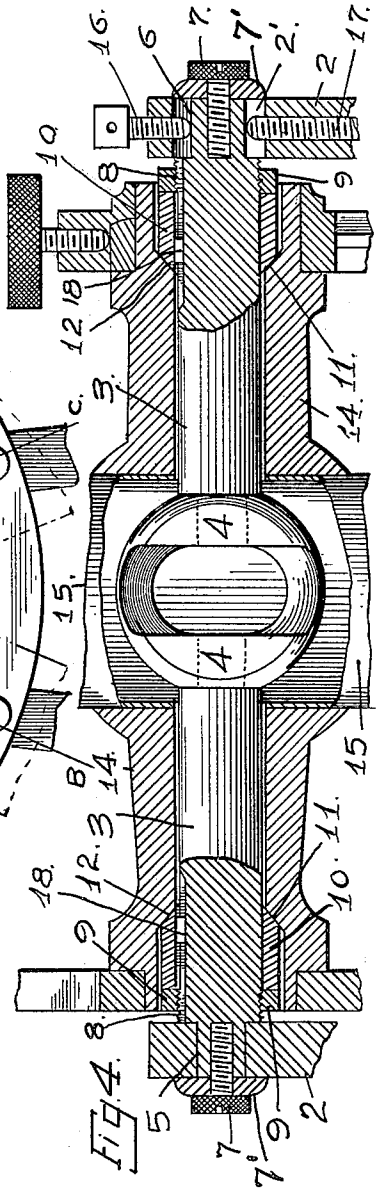


Fig. 4.

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UNITED STATES PATENT OFFICE.

ADOLPH LIETZ, OF SAN RAFAEL, CALIFORNIA.

TRANSIT-FRAME.

1,136,883. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed January 22, 1913. Serial No. 743,622.

To all whom it may concern:

Be it known that I, ADOLPH LIETZ, a citizen of the United States, residing at San Rafael, in the county of Marin, State of California, have invented a new and useful Improvement in Transit-Frames, of which the following is a specification.

My invention relates to transit frames wherein the axis upon which the telescope trunnions rotate is rigidly secured to and made a part of the standards provided for the support of the said trunnions and its objects are first, to provide rigid supporting standards and a rigid axis for the telescope for the purpose of giving stability thereto and preventing the deflection of the telescope from the line of collimation; second, to provide means for adjusting the rigid axis and maintaining the same in a horizontal position; third, to provide means for securing a lateral adjustment of the telescope; and fourth, to provide a continuous rigid axis for the support of the telescope that will not interfere with the line of collimation through the center of the said telescope in any operating position in which the said telescope may be placed. I accomplish these several features by means of the device illustrated in the drawings forming a part of this specification wherein like numerals of reference refer to similar parts throughout the said specification and drawings and in which—

Figure 1 is a broken sectional view of the upper portion of a transit showing the improved manner in which I propose to rotatably secure the telescope on a rigid axis and the manner in which the said axis is rigidly secured to the upper ends of the supporting standards. Fig. 2 is a broken side view of the upper portion of one of the standards disclosing the manner in which the horizontal position of the rigid axis is adjusted and secured. Fig. 3 is a side elevation of the upper portion of a transit with the near standard removed and the rigid axis shown in section through the aperture therein and the horizontal position of the telescope in full lines, the dotted lines disclosing extreme operating angles in which the telescope may be placed. Fig. 4 is an enlarged sectional view of the rigid axis showing the manner in which the same is secured to the standards and the manner in which the telescope trunnions are rotatably mounted upon the rigid axis.

The numeral 1 is used to designate the top plate of a transit and 2 the parallel vertical standards in the upper ends of which is rigidly secured the axis 3 having a central apertured portion 4. The axis 3 is provided at one end with a reduced cylindrical portion 5 and a reduced flattened portion 6 at the other end thereof. The reduced portion 5 of the axis 3 is adapted to enter a circular aperture at the upper end of one of the standards 2 while the other standard 2 is provided at its upper end with a slot 2′ for the engagement and retention of the flattened portion 6 of the said axis 3 so that the apertured portion 4 thereof will always be retained in a vertical position relative to the top plate 1. The upper portion of the standard 2 containing the slot 2′ is further provided with upper and lower vertical adjusting screws 16 and 17, respectively, which enter the slot and engage the reduced flattened portion 6 of the axis 3. By means of these screws 16 and 17 the end of the axis 3 adjacent thereto is adjusted to and maintained in a position that is relatively horizontal to the top plate 1. The axis 3 is rigidly secured to the standards 2 by means of the end screws 7, which bear against the washers 7′ and draw the upper portions of the said standards tightly against the shoulders between the reduced portions 5 and 6 respectively and the full diameter of the axis 3. In this manner the rigidity of the standards 2 and the axis 3 is secured.

The outer ends of the axis 3 are further provided with threaded portions 8 which engage the internally threaded collars 9 rotatably mounted thereon. Sleeves 10, having cone faces 11, are also provided at each end of the axis 3 and are feathered thereto by means of the feathers 18 so that while the said sleeves 10 are capable of longitudinal movement on the said axis 3, they are incapable of rotation thereon. The cone faces or bearing portions 11 of the sleeves 10 are adapted to engage and support similar internal faces 12 within the hollow trunnions 14 of the telescope 15. After the trunnions 14 of the telescope 15 have been rotatably mounted upon the bearing surfaces 11 of the sleeves 10, the internally threaded collars 9 are turned upon the threaded portions 8 of the axis 3, thereby moving the sleeves 10 and the trunnions 14 rotatably mounted thereon, until the telescope 15 is placed directly over the vertical

axis of the instrument. In this manner the lateral adjustment of the central line of collimation within the telescope is obtained and secured.

The aperture within the central piece 4 of the axis 3 is obtained by the intersection of two holes bored or drilled therethrough so that while the telescope is in the position indicated by the dotted lines B—B or C—C, Fig. 3 of the drawings, as indicated by the aforesaid dotted lines, the line of collimation has an uninterrupted path, the same as in the horizontal position indicated in full lines wherein the central dotted line A—A represents the line of collimation in that position.

It is obvious from the foregoing that I have provided a rigid, continuous axis for the support of the telescope, that will not interfere with the line of collimation therethrough in any operating position in which the said telescope may be placed. I have also provided means for increasing the rigidity of the supporting standards for transits, means adapted to adjust the telescope to a horizontal position relatively to the top plate on which the said telescope is mounted and also means for adjusting and maintaining the telescope laterally or to a position directly over the center of the vertical axis of the instrument.

The details of construction being so susceptible to change I do not wish to confine myself to the precise method shown herein, but rather to avail myself of any modification that may fall properly within the scope of my invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is —

1. A transit frame comprising a suitable top plate having parallel vertical standards secured thereto; an apertured axis rigidly secured to and uniting the upper ends of the standards and adapted to support a telescope rotatably mounted thereon.

2. A transit frame comprising a suitable top plate having parallel vertical standards integral therewith; an apertured axis rigidly secured to and uniting the upper ends of the standards and adapted to support a telescope rotatably mounted thereon; and means for vertically adusting one end of the apertured axis.

3. A transit frame comprising a suitable top plate having parallel, vertical standards integral therewith; a centrally apertured axis rigidly secured to and uniting the upper ends of the standards; suitable cone bearings slidably mounted upon either end of the axis and adapted to engage and support the trunnions of a telescope; and vertical screws secured to the top of one of the standards and adapted to raise and lower one end of the rigid axis.

4. A transit frame comprising a suitable top plate; vertical, parallel standards integral with the base plate and having a circular aperture in the upper portion of one standard and a vertical slot in the other standard; a centrally apertured axis having a cylindrical reduced portion at one end adapted to engage the circular aperture in one standard and a flattened reduced portion at the other end thereof adapted to engage the slot in the other standard; vertical screws projecting into either end of the vertical slot and adapted to engage the flattened, reduced portion of the axis therein; suitable cone bearings slidably mounted upon either end of the apertured axis and between the standards to which the axis is secured; and means for adjusting the distance between the cone bearings.

5. In a transit frame the combination of a suitable top plate; vertical, parallel standards integral with the base plate and having a circular aperture in the upper portion of one standard and a vertical slot in the upper portion of the other standard; an axis having a cylindrical reduced portion at one end and a flattened reduced portion at the other end thereof and an enlarged central piece with a central aperture produced by boring two intersecting holes whose axes intercept the center of the rigid axis; vertical screws projecting through the upper and lower ends of the vertical slot in one standard and adapted to engage the flattened reduced portion of the axis thereof; suitable cone bearings feathered to either end of the axis and between the standards to which the axis is secured; and collars threaded on either end of the axis and adapted to move the cone bearings longitudinally upon the said axis.

In witness whereof I hereunto set my signature in the presence of two subscribing witnesses.

ADOLPH LIETZ.

Witnesses:
ADOLPH LIETZ, Jr.,
CHAS. F. DUISENBERG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."