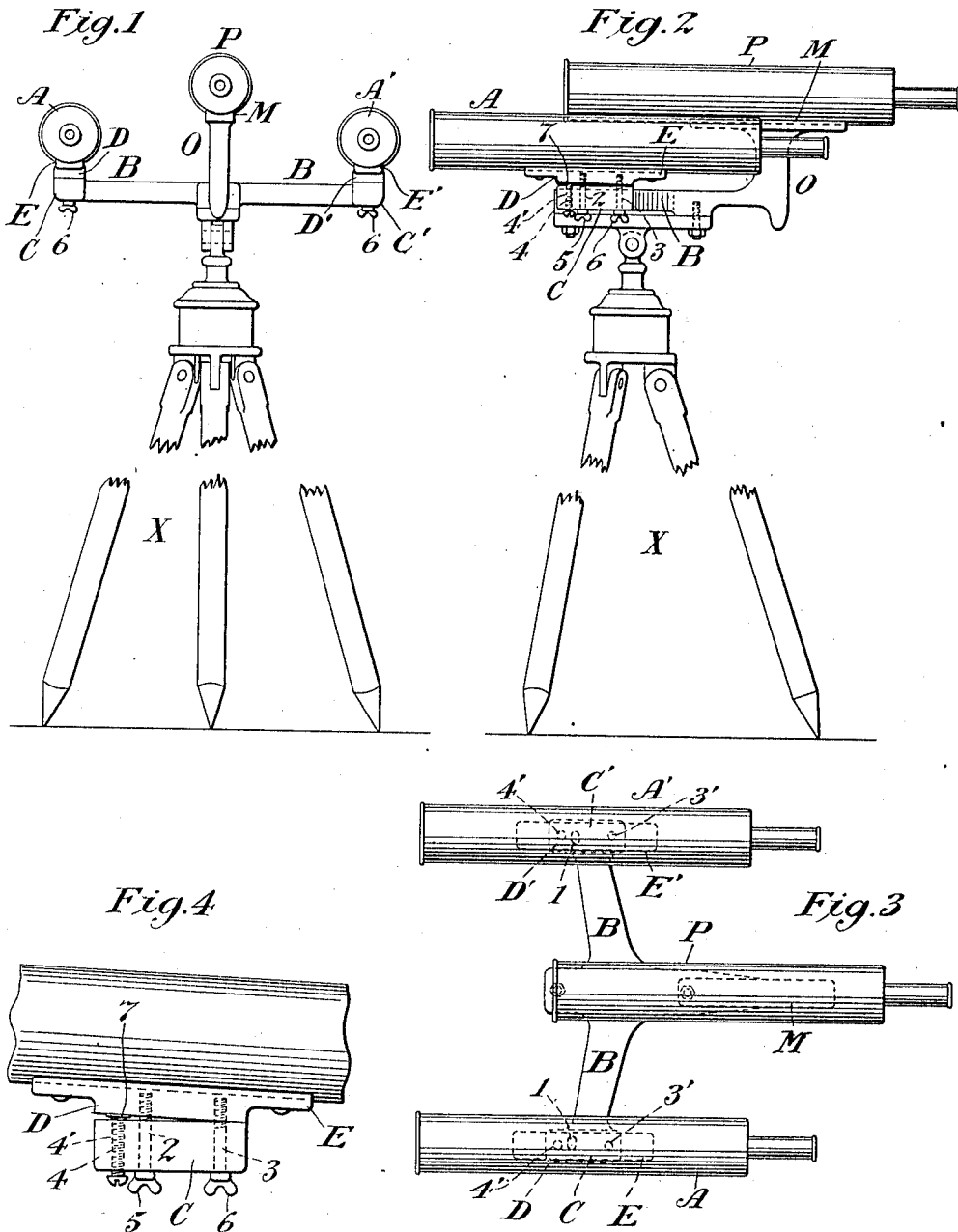


E. G. MURPHY.
TELESCOPE.
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Patented Dec. 31, 1912.



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UNITED STATES PATENT OFFICE.

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TELESCOPE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDGAR GARDNER MURPHY, a citizen of the United States, temporarily residing at the city of New York, borough of Manhattan, in the county of New York and State of New York, and a resident of the city of Montgomery, in Montgomery county, State of Alabama, have invented new and useful Improvements in Telescopes, of which the following is a specification.

My invention relates to improvements in telescopes in which two or more telescope tubes are mounted upon a common tripod-stand and are so arranged as to command the same and coincident field of view; and the objects of my invention are: first, to provide, in the use of the telescope, especially in the teaching of observational astronomy, a means whereby the instructor may so control the two or more telescopes in the finding of the object and in keeping the same in the field of view, that one or more students may simultaneously with him view the object and at the same time be freed from any care or labor, except that of actual observation; and second; to provide a means by which the instructor is enabled to make instruction coincident with observation.

Figure 1 is a vertical rear elevation of my invention. Fig 2 is a side elevation. Fig. 3 is a top plan view. Fig. 4 is a side elevation of platform C and support D, giving view of mechanism for adjusting support D.

Similar letters refer to similar parts throughout the several views of the drawing.

In detail, B designates a Y shaped telescope mounting which is provided with telescope tube support O, having a superimposed grooved top or "cradle" M, mounted on said mounting B at its apex angle, and with platforms C and C' on the arms of mounting B at either side, all integral parts of said mounting B and parallel with each other; D and D' designate telescope tube supports provided with grooved superimposed tops or "cradles" E and E', respectively; P, A and A' designate three telescope tubes which are mounted on supports O, D and D', respectively. Support O is higher than supports D and D' which are of the same height, thus placing telescope tube P at a higher elevation than telescope tubes A and A'. Supports D and D' are each provided with screw studs 2 and 3 respec-

tively, 2 near their forward end, and 3, near their rear end. Platforms C and C' are provided with slots 1, preferably near their forward end, which slots are wide enough to permit the insertion and movement from side to side of screw studs 2. Supports D and D' are loosely mounted on platforms C and C' respectively, screw studs 3 being inserted through the rear end at hole 3' of platforms C and C', and after being fastened down to said platforms C and C' by thumb nuts 6, screw studs 3 are used as pivots for said supports D and D'. Screw studs 2 are inserted through slots 1 and are provided with thumb nuts 5 at the lower end. Set screws 4, provided with flat ends 7, are threaded through platforms C and C' at point 4', flat ends 7 engaging supports D and D' near their forward end.

The supports D and D' are thus adjustable laterally and vertically, that is they may be moved from side to side, guided by screw studs 2 through slots 1 of platforms C and C', and up and down, guided by set screws 4 with flat ends 7 engaging supports D and D'. When the correct position is obtained the telescope tubes A and A' on said supports D and D', respectively, may be firmly locked by means of thumb nuts 5 and 6 on screw studs 2 and 3, respectively.

The individual telescope tubes, P, A and A', are thus mounted and combined by means of mounting B as inter-related units upon a single tripod-stand X of the conventional type, and are controlled and directed as one instrument, all having together, after being locked in their individual adjustment to each other by means of set screws 4 and screw studs 2 and 3 respectively, as aforesaid, a free common motion in altitude and in azimuth.

When the telescope tubes P, A and A', on supports O, D and D', respectively, are fitted with object lenses of the same focal length and the same aperture, and eye pieces of the same power, the field of view in all the telescopes may be made coincident and identical, (through the mounting B with the adjustment obtained by means of screw studs 2 and 3 and the mechanism hereinbefore described) and this mounting will thus enable the telescopes to command the same object or objects at the same moment. The observer at the central telescope P may thus guide or control the direction of the telescope tubes, A and A', all commanding a

coincident field of view, by a single motion of the hand.

The distinctive arrangement of the supports O, D and D' is based upon careful experiment. If, in my invention, the lateral spread of the telescope tubes P, A and A' be too great, the dangers of vibration and instability upon the central or fundamental turning point of the instrument are invited; if, on the other hand, the telescope tubes P, A and A' be placed too near together, the physical proximity of the heads of the observers becomes annoying. In order, therefore, to secure the requisite distance at the eye pieces, the mounting B is Y shaped, thus throwing the side telescope tubes A and A' slightly forward of the central telescope tubes P, as shown in Figs. 2 and 3. However, when the telescope tubes P, A and A' are directed to an object at a very high elevation this arrangement alone would involve a much lower position for the eye piece of telescope tube P than for those of telescope tubes A and A'. I have therefore eliminated this difficulty by providing the central telescope tube P to be mounted at a higher elevation than the telescope tubes A and A', as shown in Figs. 1 and 2.

The tallest of three observers, therefore, may use the central telescope tube P and guide and control all three telescope tubes, P, A and A'. However, it should be noted, that inasmuch as all the telescope tubes P, A and A', when adjusted and locked by means of screw studs 2 and 3, are in rigid placement, the instrument may if desired be guided or controlled by either one of the side telescope tubes, A or A', instead of by the central telescope tube P. The relation of the tubes P, A and A' to each other having first been arranged and adjusted, their fields of view are coincident whichever telescope tube be employed as the controlling instrument. An instructor, therefore, if taller than his pupils, may use the central tube P and guide and control the three telescope tubes P, A and A' and simultaneously his pupils may use the side telescope tubes A and A' and follow the object found by the instructor; or, if shorter than his pupils, the instructor may guide and control the instrument in the same manner by using one of the side telescope tubes A or A'.

Although in theory my invention may be constructed so that all of the telescope tubes should be rigidly mounted on the Y shaped mounting B and rigidly placed in positions exactly parallel to each other, nevertheless by experience I have found that very frequently the individual telescope tubes, intended and manufactured to be identically similar, vary to some slight extent, and I have therefore provided the method of adjusting the side telescope tubes A and A', by means of the mechanism hereinbefore de-

scribed in order to overcome said defects, if any, so that all of said telescope tubes when properly adjusted will command the same and coincident field of view. Such adjustments have been provided also for the further purpose of so changing, at need, the inclination of the telescope tubes A and A' to each other and to P that all the telescopes may be made to command the same field of view in viewing objects at different distances from the position of the observers.

I do not intend to limit my invention to a mounting to permit exactly three telescope tubes to be mounted thereon, the number shown in the drawing and above described, but the same principles as herein described may be applied where two, three or more telescope tubes may be mounted thereon.

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

1. In an instrument for the observation of terrestrial and celestial objects, a Y shaped mounting, two or more telescope tubes having object lenses of the same aperture and focal length and eye pieces of the same power mounted thereon, one rigidly at the apex angle thereof, and the other or others on either arm thereof, said mounting being provided with means for adjusting the latter so that all of said telescope tubes will command the same and coincident field of view and may be guided and controlled as one instrument, substantially as described.

2. In an instrument for the observation of terrestrial and celestial objects, a Y shaped mounting, two or more telescope tubes having object lenses of the same aperture and focal length and eye pieces of the same power mounted thereon, one rigidly at the apex angle thereof and at a higher elevation than the other or others, and the other or others on either arm of said mounting, said mounting being provided with means for adjusting the latter so that all of said telescope tubes will command the same and coincident field of view and may be guided and controlled as one instrument, substantially as described.

3. In an instrument for the observation of terrestrial and celestial objects, a single mounting, two or more telescope tubes having object lenses of the same aperture and focal length and eye pieces of the same power mounted thereon, one rigidly near the center thereof, and the other or others on either side, said mounting being provided with means for adjusting the latter, so that all of said telescope tubes will command the same and coincident field of view and may be guided and controlled as one instrument, substantially as described.

4. In an instrument for the observation of terrestrial and celestial objects, a single

mounting, two or more telescope tubes having object lenses of the same aperture and focal length and eye pieces of the same power mounted thereon, one rigidly near the center thereof, and at a higher elevation than the other or others, and the other or others on either side, said mounting being provided with means for adjusting the latter so that all of said telescope tubes will command the same and coincident field of view and may be guided and controlled as one instrument, substantially as described.

5. In an instrument for the observation of terrestrial and celestial objects, Y shaped mounting B, provided at its apex angle with telescope tube support O having superimposed grooved top or "cradle" M and with platforms C and C' at the end of either arm thereof, said support O and said platforms

C and C' being integral parts of said mounting B; telescope tube supports D and D' having superimposed grooved tops or "cradles" E and E', respectively, loosely mounted on said platforms C and C' respectively; means for the adjustment of said supports D and D' both vertically and laterally; and three telescope tubes having object lenses of the same aperture and focal length and eye pieces of the same power mounted on said supports O, D and D', respectively; substantially as described.

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

EDGAR GARDNER MURPHY.

Witnesses:

EDGAR W. SHAW,
ANNIE BROMLEY.

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