April 25, 1939. O. E. TRAUTMANN 2,155,569

TELESCOPE OR THE LIKE

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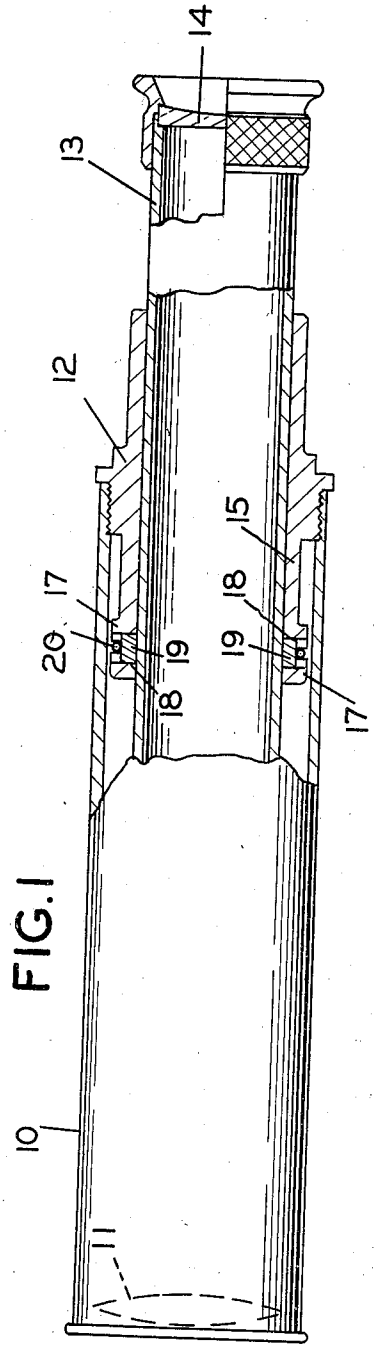

FIG. 1

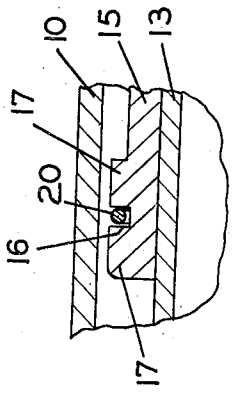

FIG. 3

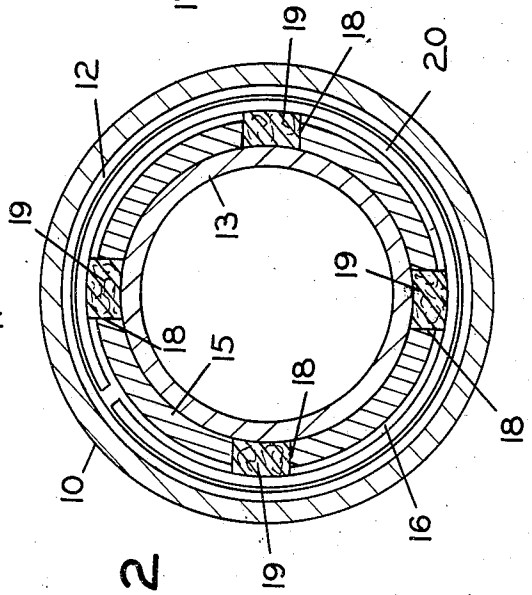

FIG. 2

OTTO E. TRAUTMANN
INVENTOR.

BY W. A. Ellestad
B. O. Diggins

ATTORNEYS

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TELESCOPE OR THE LIKE

Otto E. Trautmann, Irondequoit, N. Y., assignor to Bausch & Lomb Optical Company, Rochester, N. Y., a corporation of New York

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4 Claims. (Cl. 88—32)

The present invention relates to telescopes and more particularly to telescopes of the draw tube type.

One of the objects of the present invention is to provide a telescope of the draw tube type in which the movement is smooth and uniform under all conditions. Another object is to provide such a telescope which is simple and inexpensive to manufacture yet rugged and efficient in operation. A further object is to provide a draw tube telescope having a friction creating system which is insensitive to external conditions of temperature, moisture or the like. These and other objects and advantages reside in certain novel features of construction, arrangement and combination of parts as will hereinafter be more fully set forth and pointed out in the appended claims.

Referring to the drawing:

Fig. 1 is a side elevation of a telescope embodying this invention, with parts broken away to show internal structure.

Fig. 2 is a vertical section therethrough showing the friction elements.

Fig. 3 is an enlarged fragmentary section showing the reducing sleeve and spring.

A preferred embodiment of the present invention is illustrated in the drawing wherein 10 indicates an outer telescope tube in one end of which is mounted an objective lens system as indicated at 11. A reducing sleeve 12 is threaded in the other end of the outer tube 10 and an inner tube 13 carrying a suitable ocular system 14 is slidably mounted in the reducing sleeve 12.

The reducing sleeve 12 has a portion 15 which extends within the tube 10 in spaced relation thereto and an annular groove 16 having raised side walls 17 is formed near the inner end of the portion 15. One or more, in the present example four, radial slots 18 extend through substantially the same plane of the portion 15 at the groove 16 and friction blocks 19 are slidably mounted in these slots. A resilient split ring 20, held in place by the side walls 17, surrounds the friction blocks 19 and urges them into contact with the inner tube 13.

These friction blocks 19 are preferably of a material which is hard and non-porous and which is unaffected by heat or moisture. Metal blocks can be used but I prefer blocks of a non-metallic substance such as fiber, laminated material, Bakelite or hard resinous material. Hard woods such as lignum vital or ebony can also be used. The use of these blocks 19 produces a smooth, even resistance to the relative movement of the two tubes 10 and 13 which is unaffected by temperature or moisture. As the blocks 19 wear away, the spring ring 20 pushes them further through the slots 18 and thus the relative sliding action between the two tubes 10 and 13 is smooth and uniform throughout the life of the instrument.

From the foregoing it will be apparent that I am able to attain the objects of my invention and provide a draw tube telescope in which the sliding action between the tubes is smooth and uniform under all conditions of weather and temperature throughout the life of the instrument. While I have described my invention as applied to a telescope, it is obvious that it could be applied with advantage to the draw tube of a microscope and to various other instruments. Various modifications can, of course, be made without departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. In a telescope an outer tube, a lens mounted in said tube adjacent one end thereof, a reducing sleeve mounted in the other end of said tube, a smooth-walled inner tube slidably mounted within said sleeve, a lens mounted in said inner tube, said sleeve having a slot therein within said outer tube, a friction element slidably mounted in said slot and a spring ring surrounding said sleeve for urging said element against said inner tube.

2. In a telescope an outer tube, a lens mounted in said tube adjacent one end thereof, a reducing sleeve mounted in the other end of said tube, a smooth-walled inner tube slidably mounted in said sleeve, a lens mounted in said inner tube, said sleeve having one or more slots extending radially therethrough, a friction member slidably mounted in each slot and means for resiliently urging each element into frictional contact with said inner tube.

3. A telescope or the like comprising an outer tube, a lens carried by said outer tube, a second tube slidably mounted in said outer tube, a lens carried by said second tube, said outer tube being provide with a plurality of substantially coplanar slots extending radially therethrough, a friction element slidably mounted in each slot, and a spring ring surrounding said outer tube and engaging said elements to urge them into frictional engagement with said second tube.

4. A telescope or the like comprising two telescoping tubes, an objective lens carried by one tube, an eyepiece lens carried by the other tube, said tubes being movable relative to each other

for focusing said lenses, one of said tubes being provided with a plurality of slots extending therethrough, a friction element adapted to engage the adjacent wall of the other tube slidably mounted in each slot, each friction element having a shape substantially complemental to said adjacent wall of said other tube, and spring means carried by the slotted tube for engaging the friction elements to urge them into frictional engagement with the wall of the other tube.

OTTO E. TRAUTMANN.