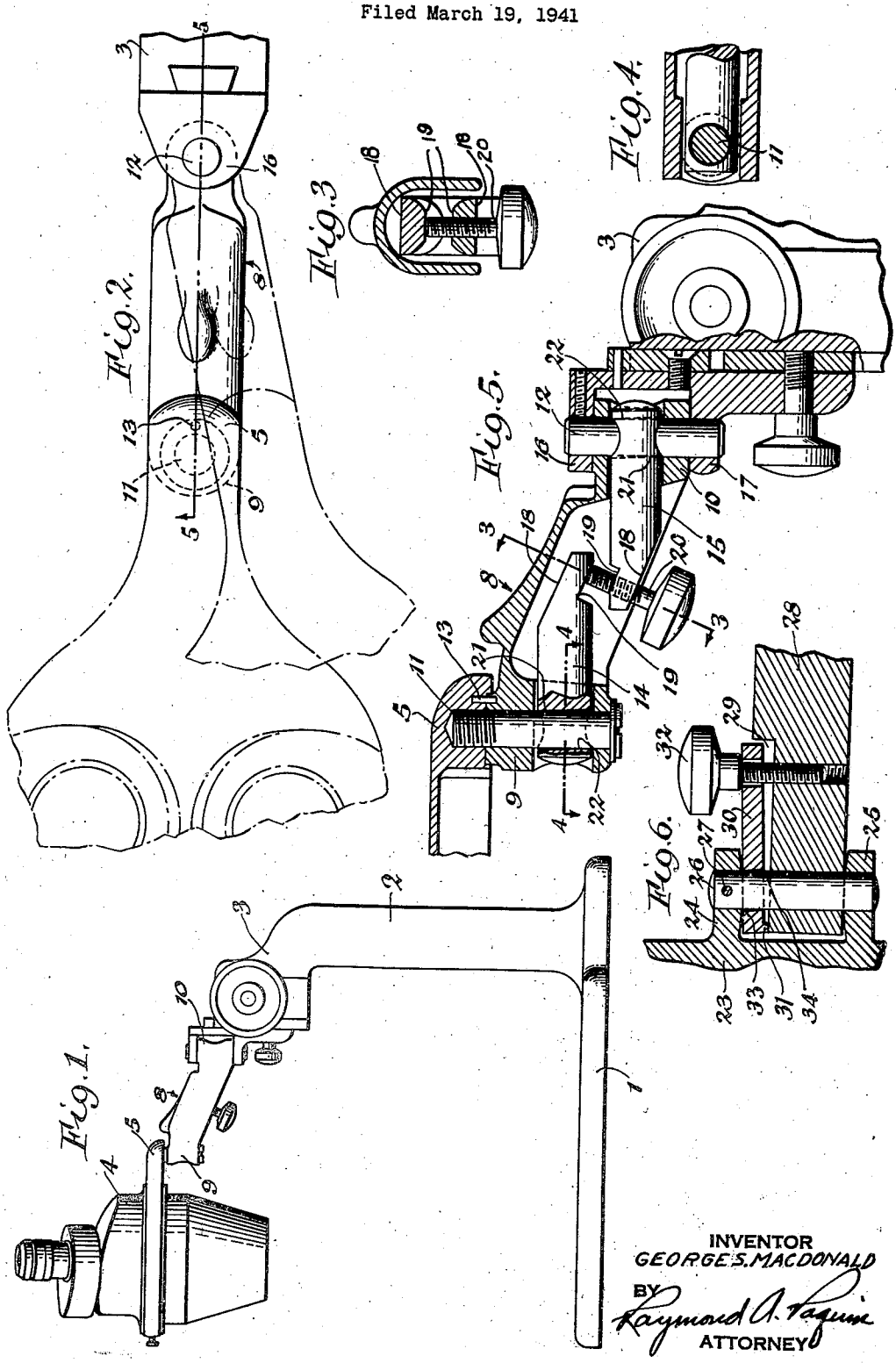
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MICROSCOPE

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MICROSCOPE

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This invention relates to improvements in instruments such as microscopes and the like and more particularly for means for supporting the parts in adjustable relation with each other.

An object of the invention is to provide new and improved means for connecting the parts of instruments such as microscopes or the like which will allow the parts to be adjusted relative to each other and to be locked in said adjusted position with a minimum of effort and be anchored against movement until said locking device is released.

Another object of the invention is to provide an adjustable supporting device for instruments which will allow movement of the instrument to desired adjusted position and then allow locking of said instrument in said desired position.

Another object of the invention is to provide an adjustable support for instruments comprising a plurality of spaced pivot connections and means for simultaneously locking said pivot connections against movement.

Another object of the invention is to provide simple, efficient and economical means for adjustably supporting the various parts of an instrument or the like relative to each other, with means for locking said supporting means in desired adjusted position.

Another object of the invention is to provide a supporting bracket for instruments, which bracket is pivoted at its opposite ends to support the parts of the instrument in adjusted relation and a single means for simultaneously locking both of said pivot connections against further movement and for simultaneously unlocking said pivot connections to allow adjustment thereof.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing and it will be understood that many changes in the details of construction and arrangement of parts may be made without departing from the spirit of the invention as expressed in the accompanying claims. I therefore do not wish to be limited to the exact details of construction shown and described as the preferred forms of the invention have been shown by way of illustration only.

Referring to the drawing:

Fig. 1 is a side view showing a microscope embodying the invention;

Fig. 2 is a fragmentary enlarged top plan view showing the adjusting and locking device shown in Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 5 looking in the direction of the arrows;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 5 looking in the direction of the arrows;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2; and

Fig. 6 is a sectional view showing a modified form of the invention.

In the construction of various instruments such as microscopes or the like adapted for use in inspecting various points of large objects, it is necessary that the body of the instrument be adjustably connected with the upright or stand to allow said body to be adjusted to desired position and then locked or anchored against movement from said desired position until the inspection has been made when the lock is released and the instrument moved into another position where it is again locked and this procedure repeated until all desired points have been inspected. It is necessary that such a device be so constructed that it may be locked with a minimum of effort and so that it cannot creep or be moved out of adjusted position while the locking device is being tightened to lock the members in adjusted position. An important feature of the present invention is that it prevents such creeping, which was a serious difficulty with prior art structures. It is important that such a device be capable of adjustment, locking and unlocking with a minimum of effort and time to allow its practical use on a large number of objects.

In the past instrument bodies have been connected to the upright or stand through means of a pivotally supported bracket which bracket was pivoted at one end to the stand and at the other end to a pivot connection on the body of the instrument and said pivot connections were formed by set screws or the like extending through the pivot connections with knurled heads adapted to be tightened to lock the body in adjusted position. With this construction it is necessary to lock each of the pivot connections separately and required considerable tightening of the screws, and also in the tightening of the connections it was very liable that the adjustment of the instrument would be disturbed by the creeping or movement of one of the pivot connections while the other was being tightened. It is therefore one of the principal objects of the invention to provide a simple, efficient and economical arrangement for adjustably supporting microscopes or the like which will allow easy and quick adjustment of the instrument securing or locking

or unlocking of the pivot connections without disturbing the adjustments of the instrument.

Referring more particularly to the drawing wherein similar reference characters designate corresponding parts throughout the several views, the microscope shown embodying the invention comprises a base 1 having an upright 2.

The body portion 4 is adjustably connected to the upper end 3 of the upright 2 by means of the supporting structure 8 which is pivotally secured at its forward end 9 to the bracket 5 supporting the body tube 4 and the support 8 is pivotally secured at its other end 10 to the upper extremity 3 of the upright 2.

The adjustable support 8 is pivotally connected by the pivot member 11 to the bracket 5 which supports the body 4 and on the pivot member 12 to the upper end 3 of the upright 2. The pin 13 limits the amount of pivotal movement between the body 4 and bracket 5 and the member 8. This pin 13 is secured to one of said parts and rides in a slot in the other to limit the range of pivotal adjustment between the members as stated above.

The pivot member 11 passes through a transverse opening adjacent the end 9 of the member 8 and through an aligned opening in the lock member 14 and has a threaded end in threaded engagement with the threaded portion on the bracket 5. It is pointed out that this pivot member 11 is non-rotatably secured to said bracket 5 by means of the threaded connection described above. The pivot member 12 passes through a similar transverse opening in the end 10 of the member 8 and also passes through an aligned opening in the lock member 15 and has its ends driven into tight contact with the walls of the openings in the upper and lower portions 16 and 17 respectively of the upper end 3 of the upright 2. It is pointed out that this member 12 is non-rotatably secured by the driven fit as set forth above with said upper and lower member 16 and 17 so that it is not pivotal therein.

The openings in the lock members 14 and 15 through which project the pivot members 11 and 12 respectively are slightly larger than the diameter of said pivot members 11 and 12 so that said lock members can engage and lock with said pivot members 11 and 12 as hereinafter described.

The lock member 14 has the angle face 18 to allow it pivotal movement in the opening in the member 8 without touching the inner walls thereof and also has the cut-out portion 19 which is adapted to be contacted by the set screw 20 which screw is threaded through a threaded opening adjacent the end of the lock member 15 which also has the angle face 18 and cut-out 19. It will be noticed that the cut-out portions 19 may interfit with each other thereby allowing greater latitude of adjustment of the lock members.

In using the construction the set screw 20 is loosened to allow the lock members 14 and 15 and member 8 to be pivoted on the pivot members 11 and 12 to adjustably position the bracket 5 to move the body 4 of the microscope to desired position. Then by merely tightening the set screw 20 the set screw, being threaded in one of said lock members and having its end bearing against the other member, causes the ends 19 of the lock members 14 and 15 to separate and thereby causes the said lock members to bind on the pivot members 11 and 12 at the points 21 and 22 to prevent rotation of said lock members and member 8 on said pivot members and lock the parts in adjusted relation. To again adjust the instrument the set screw is merely loosened and the instrument re-adjusted and the set screw tightened as described above.

It has been found that by employing this construction the instrument parts may be locked in adjusted position very simply and easily with a minimum of effort and that the locking connection between the parts cannot be easily disturbed by accidentally hitting the instrument or by jars or shocks but that the instrument will retain its adjusted position until the set screw is loosened.

While the locking arrangement is shown applied to two separate pivotal connections controlled by one set screw, it will be understood that instead the locking arrangement may be applied to a single pivotal connection by having the threaded portion of set screw 20 extending through and in threaded engagement with a threaded opening in the body of the member 8 instead of through the threaded portion of the locking member 15. In such a construction the end of the set screw would bear against the portion 19 to rock or pivot said lock member to cause it to bind on the pivot post as described above to lock the support or bracket against pivotal movement on said pivot post.

In the form of the invention shown in Fig. 6 another modified form of the invention applied to a single locking connection is shown. In this construction the member 23 has two projections or flanges 24 and 25 thereon and the arm 28 is pivoted on a pin 26 extending through openings in said members 24 and 25. Said pin member 26 is non-rotatably secured therein by the pin 27 although it could be a driven fit or screwed therein or other similar connections as long as it is non-rotatably secured. The arm 28 also has an opening therein through which passes the pivot member 26. In this form the arm has a groove or slot 29 in which is positioned the lock member 30 having an opening therein slightly larger than the pin 26 and having an offset end portion 31 adapted to contact the upper surface of the arm 28 and act as a pivot bearing for said member 30. By tightening the set screw 32 the locking member 30 is adapted to engage and bind on the pivot member 26 at two points 33 and 34 as described for the previous forms above and to lock the arm 28 against rotation on said pivot member 26. The member 30 is shown in unlocked position.

It will be understood that instead of having the projection 31 on the lock lever 30 to act as the bearing center for said lever, this might be positioned in line with the center of the pivot pin 26 and might be in the form of upward projections on the member 28 or downward projections on the lever 30 on opposite sides of said pivot pin 26.

The form of locking member shown in this application has been found to be very simple, efficient and effective and it may be locked or unlocked with a minimum of effort thereby making a construction much easier to control and adjust than was possible with previous constructions.

While the invention has been shown as applied to microscopes, it will be understood that this is merely for the purpose of illustration and that it may be employed in any other desired type of instrument or device, where the same principle may be applied.

From the foregoing it will be seen that I have

provided simple, efficient and economical means of obtaining all of the advantages of the invention and particularly of providing a new and improved locking arrangement for locking the parts of an instrument in adjusted position.

Having described my invention, I claim:

1. In a device of the character described, an adjustable arm, said arm having pivot connections adjacent the opposite ends thereof, locking means adjacent each end of said arm for locking said arm against pivotal movement on both of said pivot connections and means operatively associated with said locking means for simultaneously locking both of said pivotal connections.

2. In a device of the character described, an arm, pivot members extending through said arm adjacent the opposite ends thereof, locking means adjacent each end of said arm and engaging said pivot members and single means engaging said locking means to simultaneously lock the same on said pivot members to prevent pivotal movement of said arm on said pivot members.

3. In a device of the character described, an arm having a recess therein and a transverse opening therethrough, a pivot post extending through said transverse opening, a lock member in said recess and having an opening adjacent one end thereof aligned with the transverse opening in the arm, said pivot post extending through the opening in said lock member, and screw means having a portion engaging said lock member to move the same to cause said lock member to bind on said pivot post and prevent movement of said arm to lock said arm in desired adjusted pivoted position.

4. In a device of the character described, a body member, a bracket, a pivot pin extending through said bracket to pivotally mount said bracket on said body, a recess in said bracket, a lever in said recess and pivotally mounted adjacent one end thereof on said pivot pin, and screw means in the recess having an end thereof engaging said lever for pivoting said lever on said pivot pin to cause said lever to bind on said pivot pin and lock said bracket against pivotal movement on said pivot pin.

5. In a device of the character described, a body member, a bracket, a pivot pin extending through said bracket to pivotally mount said bracket on said body, a recess in said bracket, a lever in said recess and pivotally mounted adjacent one end thereof on said pivot pin and having an extension portion in said recess, and threaded means in said recess adapted to bear against said extension portion for pivoting said lever on said pivot to cause said lever to bind on said pivot pin and lock said bracket against pivotal movement on said pivot pin.

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