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SWIVEL LEVER FOR RAISING THE CARRIAGE IN AN EPISCOPE

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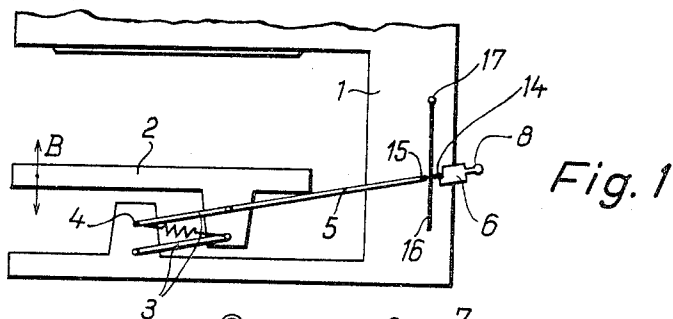


Fig. 2

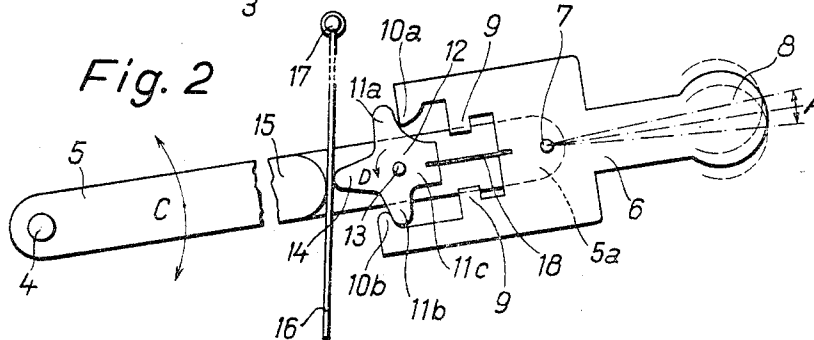


Fig. 3a

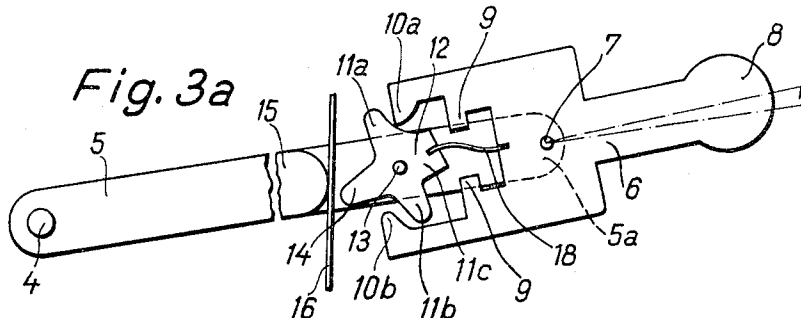
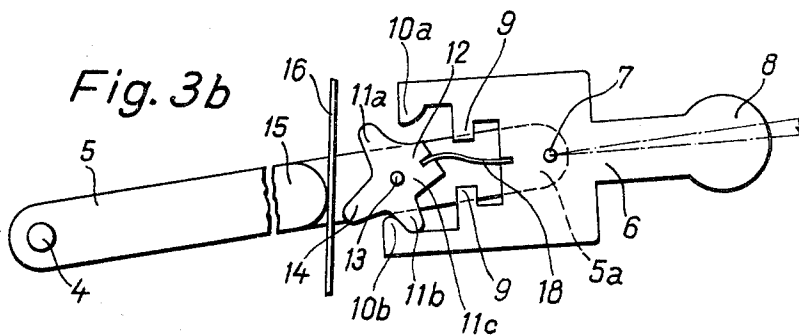


Fig. 3b



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SWIVEL LEVER FOR RAISING THE CARRIAGE IN AN EPISCOPE

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3 Claims

ABSTRACT OF THE DISCLOSURE

In an episcopes or the like the one-armed swivel lever for raising the carriage is provided with a locking device adapted to lock or clamp the lever in different positions relative to the apparatus housing. By seizing the lever and moving it in one of its two directions the clamping effect is automatically released before the lever swings in this particular direction. Upon release of the lever the clamping effect is automatically restored.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to levers adapted to raise and lower the carriage in episcopes and the like.

Description of the prior art

With episcopes, for example, it is known to arrange a one-armed lever by means of which the carriage can be raised to a projection position or can be lowered to a position where the object to be projected can easily be removed and exchanged for another object. In order to secure the lever in its positions relative to the apparatus housing it is known to provide a releasable spring-actuated clamping or locking device by means of which the lever, and therewith the carriage can be set to any desired height.

However, it is a disadvantage of these prior art devices that in order to raise or lower the carriage three different acts must be performed. First, the clamping device must be released, in most cases against the force exerted by a spring. Second, the lever must be shifted, and third the clamping effect has to be restored.

It is, therefore, the object of the present invention to provide a novel design which simplifies the operation of the carriage lever to an extent where practically only one act remains to be performed in order to move the carriage from one position to another one.

SUMMARY OF THE INVENTION

According to the invention this object is attained by pivotably mounting a handle on the free end of the lever. This handle can be tilted from a central rest position through relatively small angles in the two opposite directions. The handle is a two-armed lever of which the outer arm is adapted to be seized and manually operated. The second arm is bifurcated so as to form two arms which are in an operative connection with two tripping noses on a clamping element. The latter is also pivotably mounted on the lever with the noses being arranged on opposite sides from the pivot. Between these noses the element is provided with a protruding portion which actually exerts the clamping force on a rail that with its upper end is mounted in the housing. The lever itself has a jaw, and between the jaw and the protruding portion the rail is guided, so that the lever counterbalances the force exerted by the clamping element. The two handle arms are in an operative connection with the tripping noses of the clamping element in such a way that upon tilting of the handle,

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either in an upward or downward direction, one of the arms trips the allocated nose. This occurs always in a direction that causes the clamping element to be pivoted in a direction in which the protruding portion is moved away from the rail, thus releasing the clamping force.

A spring is suspended between the clamping element and the handle. This spring tends to keep the handle in its central rest position and the clamping element in its clamping position.

DESCRIPTION OF THE DRAWINGS

The invention will be more readily comprehended from the following description when taken in conjunction with the appending drawings, wherein

FIG. 1 shows schematically a carriage arrangement with lever in an episcopes,

FIG. 2 is a sectional view of the lever end with mounted handle and clamping element,

FIGS. 3a and 3b show different positions of the handle.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 is shown the lower part 1 of the housing of an episcopes. The upper part has been omitted for sake of simplicity and because episcopes are generally well known.

By means of a parallelogram linkage 3 the object carriage 2 can be raised and lowered. The operating lever serves as a swivel lever 5 which is a part of the parallelogram linkage and is pivotable about the axis 4. On the free end of lever 5 the handle 6 is mounted so as to be pivotable about the axis 7 in the directions of the double-headed arrow A. These directions as well as the swivel directions of lever 5 are in accordance with the directions of displacement of carriage 2. This means that if for example handle 6 is tilted in an upward direction lever 5 will also swivel upwards, as a consequence whereof carriage 2 will then also be displaced upwards.

Handle 6 is provided with a gripping member 8 and with a bifurcated portion 9 comprising the two arms 10a and 10b. The latter are in operative connection with two tripping noses 11a, 11b which are disposed on opposite sides of a clamping element 12 that is mounted tiltably about an axis 13 on lever 5. Clamping element 12 is further provided with a portion 14 protruding at an angle of 90° relative to the tripping noses 11a, 11b from the clamping element 12. This protruding portion 14 together with jaw 15 on lever 5 and rail 16, guided between these two, constitute a clamping device. Rail 16 is pivotably mounted on housing 1 so that it can follow the lateral displacement of jaw 15 and portion 14, which displacement occurs during swiveling of lever 5.

Between handle 6 and body 11c of clamping element 12, which body also serves as an abutment, there is suspended a leaf spring 18 in such a way that on the one side it keeps portion 14 in engagement with rail 16, while on the other side it maintains the central position of handle 6.

The above described swivel lever and additional elements function as follows:

For raising the carriage 2 the gripping member 8 of handle 6 has to be seized and tilted in an upward direction. This causes the handle 6 to pivot in a counter clockwise direction about axis 7, thereby bringing arm 10a to act upon tripping nose 11a of clamping element 12 (FIG. 3a). The resulting pivoting movement of clamping element 12 in the direction of arrow D entails a release of the clamping force since protruding portion 14 is moved away from rail 16. The pivoting movement of clamping element 12 is limited by the arm 10a when it abuts against the body 11c.

As a result of further displacement of gripping member 8 in the same direction lever 5 is now caused to

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swivel, whereby the carriage 2 is raised. After release of gripping member 8 the handle assumes again its central position under the influence of spring 18 (FIG. 2). At the same time, the clamping element 12 moves into its clamping position. The connecting line between the effective top of protruding portion 14 and the pivot of clamping element 12 (i.e. axis 13) and rail 16 subtend such an angle that a wedge is formed by portion 14 which exerts a clamping effect on rail 16 if a load is placed on lever 5 or carriage 2 respectively.

In order to lower carriage 2 the gripping member 8 has to be tilted downwards. This causes arm 10b to act upon tripping nose 11b whereby clamping element 12 is turned in the same direction as described above, i.e. in the direction of arrow D until arm 10b abuts against body 11c (FIG. 3b). This means that at the beginning of this downward motion again the clamping device is released first. Further displacement of gripping member 8 in the same direction causes the lever 5 to be swung downwards, thus lowering the carriage 2. Release of gripping member 8 leads to an automatic restoration of the clamping effect.

After having thus described the present invention in detail it is pointed out that it is susceptible to various modifications without leaving the scope of the invention. This is especially true of the clamping device which may readily and with equal result be replaced by a suitable ratchet device.

What I claim is:

1. A swivel lever for raising the carriage in episcopes and the like, which carriage is in its various elevated positions lockable relative to the housing, said lever comprising in combination:

a handle being pivotably secured to the free lever end, a clamping element being also pivotably mounted on said lever within the range of said handle so as to

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be releasable thereby upon tilting said handle in an upward or downward direction,

a rail mounted loosely in vertical direction in said episcopes or the like, said rail being guided between a protruding portion of said clamping element and a jaw of said lever,

spring means inserted between said clamping element and said handle, said means tending to keep said element in its clamping position and said handle in its central rest position from where it may be tilted to the one or the other side, thereby releasing the clamping effect of said clamping element.

2. A swivel lever according to claim 1 wherein said clamping element comprises two tripping noses positioned on opposite sides from its pivot, between which noses projects said protruding portion at right angles and wherein said handle comprises two arms of which each one faces one of said noses, said arms being adapted to cooperate with said noses when said handle is tilted.

3. A swivel lever according to claim 1 wherein said spring means is a leaf spring.

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