

Nov. 29, 1960

N. KARPFF

2,962,251

TILTING TRIPOD-HEAD

Filed Nov. 24, 1958

4 Sheets-Sheet 1

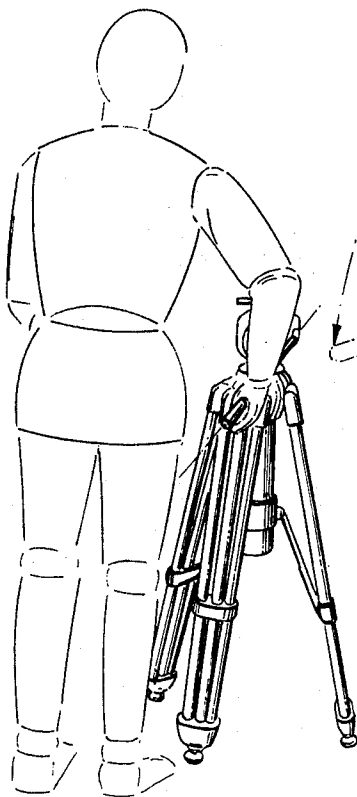


Fig. 1

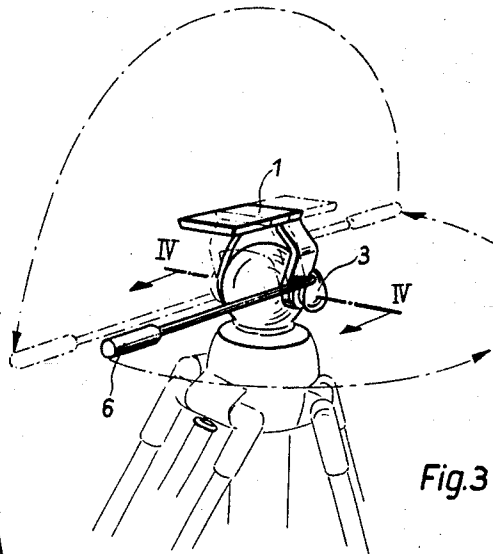


Fig. 3

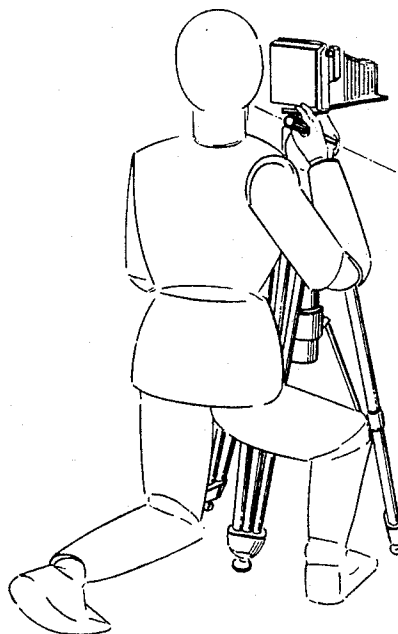


Fig. 2

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4 Sheets-Sheet 2

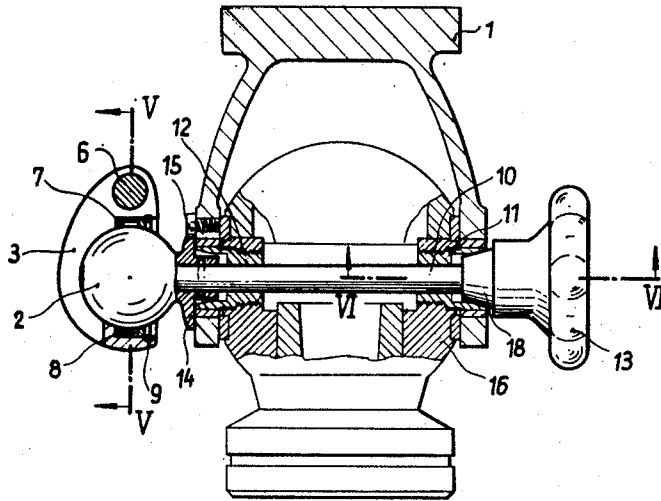


Fig. 4

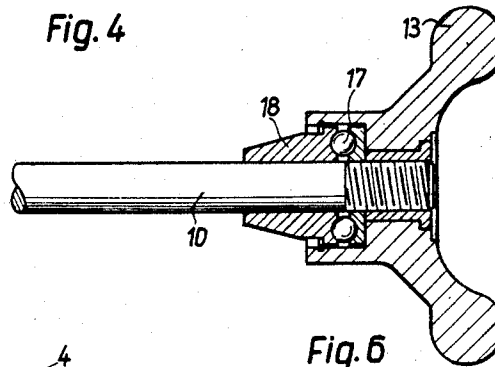


Fig. 6

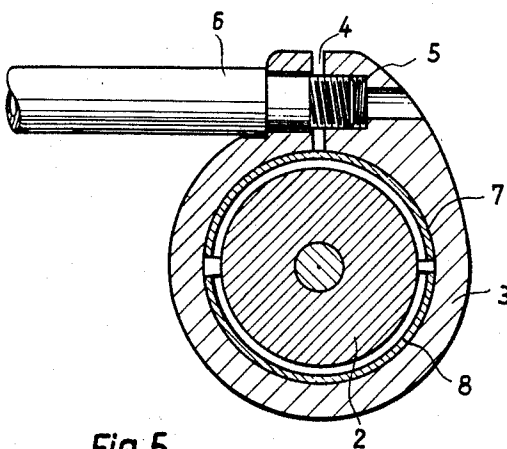


Fig. 5

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4 Sheets-Sheet 3

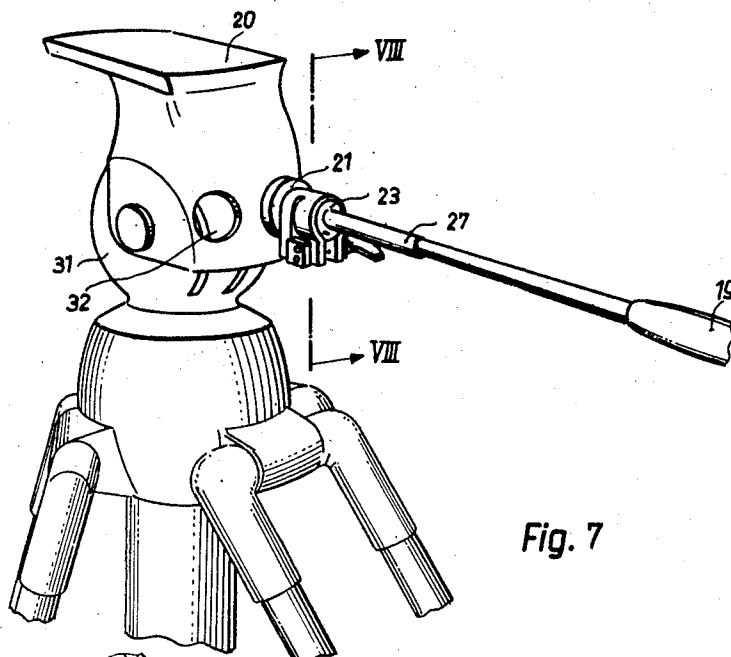


Fig. 7

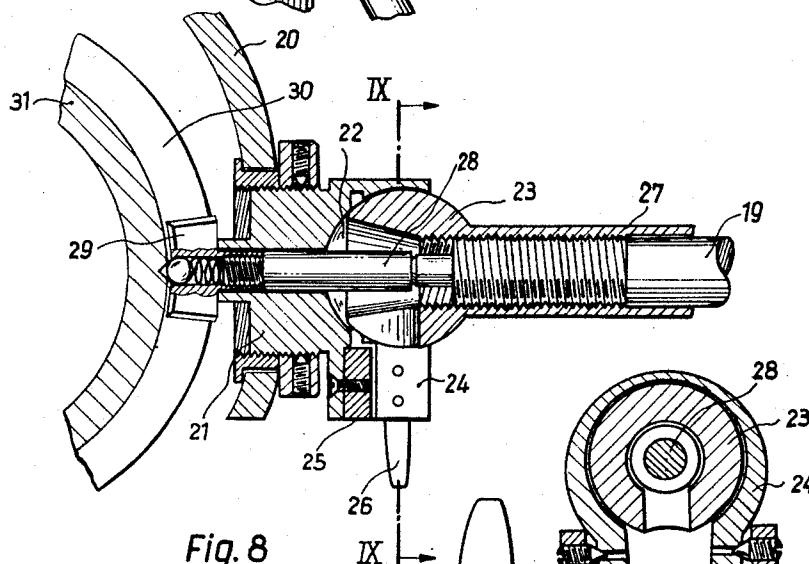


Fig. 8

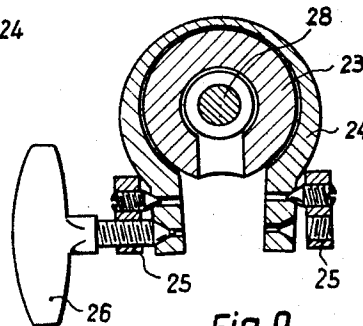


Fig. 9

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4 Sheets-Sheet 4

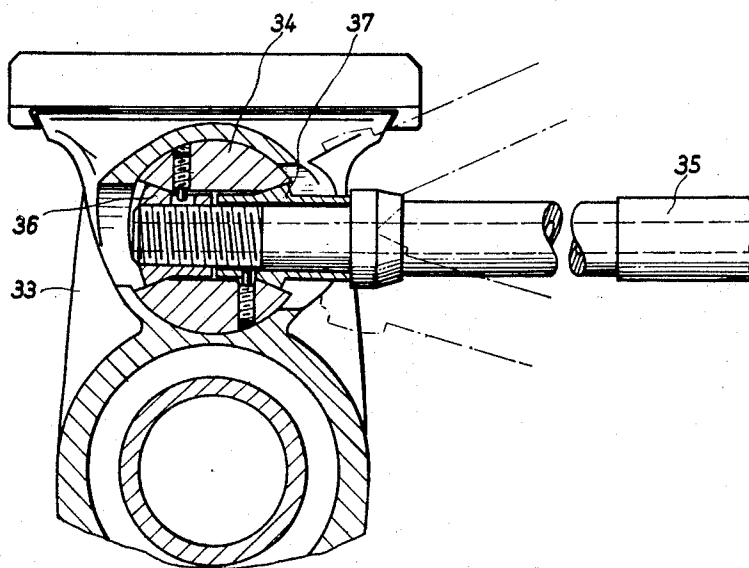


Fig.10

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2,962,251

TILTING TRIPOD-HEAD

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13 Claims. (Cl. 248—183)

This invention relates to a tilting tripod-head for mounting photographic cameras, geodetical instruments or the like, particularly a cinematograph tilting head, with a handle to facilitate the setting of the upper portion of the head carrying the camera in the vertical and/or horizontal direction.

In known tilting heads of this type, the handle is generally rigidly connected to the upper portion of the head. One consequence of this is that the photographer's hand which grips the handle must often assume a very inconvenient position to set the camera in the desired position. In addition, in its fixed position, the handle is often in the way of the photographer during his further work. Moreover, it would be desirable to be able to undertake adjustment of the upper portion of the head selectively from the right-hand or left-hand side thereof. In order to achieve the latter purpose, some known tilting heads are provided with a tapped hole on the right and on the left of the upper portion of the head, in which the handle can then be screwed as desired. This method takes up a considerable amount of time and does not overcome the first-mentioned disadvantages.

A further disadvantage in all these constructions is that the handle always projects awkwardly from the head when it is moved, particularly if it is mounted on a tripod, and therefore it has to be unscrewed.

The present invention aims to overcome all the above disadvantages. According to the invention the handle can be pivoted freely about at least one axis relatively to the whole tripod head and can be secured by turning. In a preferred embodiment, the handle is connected to the upper portion of the head through a ball-and-socket joint.

Three embodiments of the invention are illustrated by way of example in the accompanying drawings, in which:

Figs. 1 and 2 show diagrammatically the tilting head on a tripod, the handle always assuming the most convenient position in relation to the attitude of the photographer as indicated;

Fig. 3 shows the turning of the handle from the right-hand to the left-hand side;

Fig. 4 is a part-sectional side view of the tripod head along the line IV—IV in Fig. 3;

Fig. 5 is a section through the ball-and-socket joint for the handle, taken on the line V—V in Fig. 4;

Fig. 6 is a sectional view of the securing member for the inclination of the upper portion, taken on the line VI—VI in Fig. 4;

Fig. 7 is a general perspective view of an alternative embodiment of the universally-rotatable handle;

Fig. 8 is a section through the securing members for the handle and for the inclination of the upper portion, taken on the line VIII—VIII in Fig. 7;

Fig. 9 is a section through the ball-and-socket joint of the handle on the line IX—IX in Fig. 8;

Fig. 10 shows a further embodiment of the securing of the handle to the upper portion of the head through a ball-and-socket joint.

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A ball 2 is rigidly secured to one side of the upper portion or instrument support 1 of the head, preferably to the right-hand side. Mounted for free displacement on the ball 2, there is a socket 3 which at one point on the edge is slit at 4 perpendicular to the plane of the edge. A tapped hole 5 into which the handle 6 is screwed extends through the wall of the socket 3, perpendicular to the slit 4. To facilitate mounting of the socket 3, the latter is cylindrically turned on the inside at the part adjacent to the edge. In the space thus formed between the ball 2 and the cylindrical portion of the inner face of the socket 3, two loose half-rings 7 and 8 are inserted, the outer surfaces of which are cylindrical and the inner surfaces of which are curved to conform to the surface of the ball. These half-rings 7, 8 are prevented from falling out by a circular clip 9.

Such mounting of the handle 6 renders it possible to bring it into any desired position on the right-hand side relatively to the upper portion 1 of the head to which the ball 2 is fixed. By turning the handle 6 about its own axis, the slit portion of the socket 3 is drawn together and the latter therefore becomes secured to the ball 2. Then, the handle 6 is firmly connected to the upper portion 1 and permits any adjustment of the upper portion 1 of the head with the hand and arm in a convenient position. Fig. 3 shows how, by turning the head about its vertical axis through 180° and subsequent pivoting of the handle 6 in a vertical plane, likewise through about 180°, the handle becomes a left-hand handle in which position it also has the same universal mobility. During such turning, however, the supporting plate for the camera is displaced forwardly, as shown in Fig. 3. Should this be undesirable for any reason, the ball 2 can be mounted on the inclination shaft 10, as shown in Fig. 4, in which case the upper portion 1 with its side bars is mounted not directly on the inclination shaft 10 but on bearing bolts 11, 12 which are mounted on the inclination shaft 10. After the knob 13 has been unscrewed, the inclination shaft 10 can be withdrawn and inserted from the other side. Thus, the handle 6 becomes positioned on the left-hand side of the head.

In this embodiment, the side of the inclination shaft 10 on which the ball is rigidly secured is provided with a flange 14 which comprises a recess in which there is engaged a robust bolt 15 from the upper portion 1. As a result, the rigid connection between the ball 2 and the upper portion 1 is established. The bearing bolts 11, 12 for the upper portion 1, which are inserted in the lower portion 16, are of pincer-like construction and are recessed with a slight taper. By means of the screw-knob 13 a tapered member 18 is forced by a ball bearing 17 into one of the pincer-like split bolts, for example 11, which is thus splayed and as a result a desired positive inclination is first obtained followed by absolute locking using comparatively little force. Since the said pincer-like bearing bolt 11, or 12, may be mounted at will on the left or the right, changing over of the said member from left to right is possible, as clearly shown in Fig. 4.

An alternative embodiment both as regards the locking of the inclination and as regards the universally pivoted mounting of the handle is shown in Figs. 7 to 9. By turning the handle 19 about its longitudinal axis, locking of the upper portion 20 of the head can be achieved, whilst the universal turning of the handle 19 itself is determined by means of a separate setscrew. As shown in the drawing, a connecting piece 21, which comprises a socket 22 for the ball 23 connected to the handle 19, is screwed onto the recessed upper portion 20 of the tripod head. In order to secure the handle 19 in relation to the upper portion 20 of the head, the front portion of the connecting piece 21 forming the socket 22 for the ball 23 is constructed in the form of a clamp.

The downwardly bent ends of the clamp 24 are forced together by means of a wing screw 26 engaging in a clip 25, as a result of which, locking to the ball 23 is obtained. The handle 19 is screwed into a sleeve-like extension 27 of the ball 23. On rotation, it presses against a bolt 28 which terminates in a clamping wedge 29. On inclination of the upper portion 20, this clamping wedge 29 runs in a corresponding tapered groove 30 in the lower portion 31 of the head and is forced into the groove 30 by the handle 19 for locking. In order to ensure free pivotal movement of the handle 19, the bore in the ball 23 for the bolt 28 is widened out in a sharp taper towards the tilting head.

In order to render selective working possible, with the handle on the left-hand or on the right-hand side of the head, the whole clamping unit shown in Fig. 8 may be removed from the right-hand bore and inserted by means of a flanged ring, screwthread or the like, in the bore 32 provided therefor in the upper portion 20.

A third embodiment of the pivotal mounting of the handle on the upper portion of the head is shown in Fig. 10. In this case, the upper portion 33 comprises a widened portion which is spherically hollowed out. A ball 34 which is divided into two or more segments is introduced into the recess. The actual handle 35 is guided by means of a thread in tapered sleeves 36, 37. These are drawn together on tightening the handle 35 and force the ball segments 34 apart, thus effecting locking in relation to the upper portion 33.

I claim:

1. In a tripod for supporting cameras and other instruments, a tripod head comprising a base member connectable to said tripod, an upper member adapted to support an instrument, means for pivotally connecting said upper member to said base member, means for locking said upper member to said base member in a selected position of said upper member, a handle carried by said upper member for effecting pivotal movement thereof relatively to said base member when said locking means are inoperative, means for articulating said handle to said upper member for universal movement relatively thereto, whereby the handle can be swung to a convenient operating position relatively to said upper member without altering the said selected position of said upper member relatively to said base member, and means for making a rigid connection between said handle and said upper member in said convenient position of said handle relatively to said upper member.

2. The tripod head according to claim 1 wherein the means for articulating the handle to the upper member comprise a ball and socket connection.

3. The tripod head according to claim 2, wherein the ball is rigidly secured to the upper member and the socket is formed in a clamp attached to the handle.

4. The tripod head according to claim 3, comprising a screw-threaded portion at one end of the handle and a shoulder intermediate the length of the handle, said clamp comprising a split collar having a tapped hole in one lateral wall bounding the split, said handle extending freely through another lateral wall bounding the split and adapted to bear on said other wall with said shoulder, and said screwthreaded portion on the handle engaging in said tapped hole, whereby, when the handle is tightened, the two said walls are drawn towards one another to clamp the collar to the ball and thereby lock the handle to the upper member and, when the handle is loosened, the two said walls move apart to release the collar from the ball and thereby free the handle from the upper member.

5. The tripod head according to claim 4 wherein the collar is formed with a cylindrical bore accommodating two externally semi-cylindrical half rings which encircle the ball and which have concave inner surfaces conforming to the shape of the ball, said collar further com-

prising a circular clip for retaining the half rings within the bore.

6. The tripod according to claim 2, wherein the ball is rigidly secured to the upper member and the socket is formed in a clamp attached to the handle, further comprising fixed bushings in the base member, a pivot shaft rotatable in said bushings, a cavity in the end of each bushing, said pivot shaft being rigidly secured at one end to said ball and being provided with a screwthreaded portion at the other end, said upper member being mounted for pivotal movement on said bushings, a locking knob screwed on said screwthreaded portion of the pivot shaft, and a wedge slidable on said pivot shaft and located between the locking knob and the cavity end of one said bushing, whereby, when the locking knob is tightened, the wedge is forced into the cavity of said one bushing to splay the latter and thereby lock said upper member to said base member, and, when the locking knob is loosened, the upper member is free to pivot on said bushings relatively to said base member.

7. The tripod-head according to claim 2, wherein the ball is attached to the handle and the socket is formed in a clamp secured to the upper member.

8. The tripod-head according to claim 7, wherein the clamp comprises a split collar provided with two lateral walls bounding the split, a clip surrounding said lateral walls and having a tapped hole, and a thumbscrew engaging in said tapped hole in the clip, whereby, when said thumbscrew is tightened, the two said walls are drawn towards one another to clamp the collar to the ball and thereby lock the handle to the upper member and, when the thumbscrew is loosened, the two said walls move apart to release the collar from the ball and thereby free the handle from the upper member.

9. The tripod head according to claim 8, including a screwthreaded portion at one end of the handle, the ball being provided with a tapped hole for receiving said screwthreaded portion of the handle, a bolt axially aligned with said handle, a bore in said clamp for slidably receiving said bolt, a wedge member carried at one end of said bolt, said base member being provided with a tapered groove for receiving said wedge member, whereby, when said handle is turned in the ball in a direction to push on the bolt, said wedge member locks in said tapered groove thereby to lock said upper member to said base member and, when the handle is turned in the opposite direction, said wedge is unlocked and freely slidable in said groove to permit the upper member to be pivoted relatively to the base member.

10. The tripod head according to claim 2, wherein the socket is formed in the upper member and the ball comprises a number of unconnected segments loosely connected to the handle.

11. The tripod head according to claim 10, comprising a screwthreaded portion at one end of the handle and a shoulder intermediate the length of the handle, each said ball segment having a tapped hole in a direction radially of the handle with a stud being engaged in each tapped hole, a pin provided at the inner end of each stud, two wedge-shaped sleeves arranged on the handle so that the wedges taper outwardly in opposite directions, and an axially extending groove in each sleeve, the said pin being engaged in respective said grooves, one said sleeve abutting said shoulder and the other said sleeve being internally screwthreaded and screwed on the said screwthreaded portion of the handle, whereby, when the handle is tightened, the two sleeves are drawn towards one another and wedged between the segments to spread the latter against the walls bounding the socket in the upper member and thereby lock the handle to the upper member, and, when the handle is loosened, the two said sleeves were moved apart to release the segments from engagement with the socket walls and thereby free the handle from the upper member.

12. In a tripod for supporting cameras and other in-

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struments, a tripod-head comprising a base member connectable to said tripod, an upper member adapted to support an instrument, means for pivotally connecting said upper member to said base member, means for locking said upper member to said base member in a selected position of said upper member, a handle carried by said upper member for effecting pivotal movement thereof relatively to said base member when said locking means are inoperative, means for articulating said handle to said upper member whereby said handle can be swung to a convenient operating position relatively to said upper member without altering the said selected position of said upper member relatively to said base member, and means operated by turning the handle about its own axis for making a rigid connection between said handle and said upper member in said convenient position of said handle relatively to said upper member.

13. In a tripod for supporting cameras and other instruments, a tripod-head comprising a base member connectable to said tripod, an upper member adapted to support an instrument, means for pivotally connecting said upper member to said base member, means for locking said upper member to said base member in a selected position of said upper member, a handle carried by said

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upper member for effecting pivotal movement thereof relatively to said base member when said locking means are inoperative, means for articulating said handle to said upper member whereby the handle can be swung to a convenient operating position relatively to said upper member without altering the said selected position of said upper member relatively to said base member, and means for making a rigid connection between said handle and said upper member in said convenient position of said handle relatively to said upper member, said means for locking said upper member to said base member being operated by turning the handle about its own axis.

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