

No. 630,219.

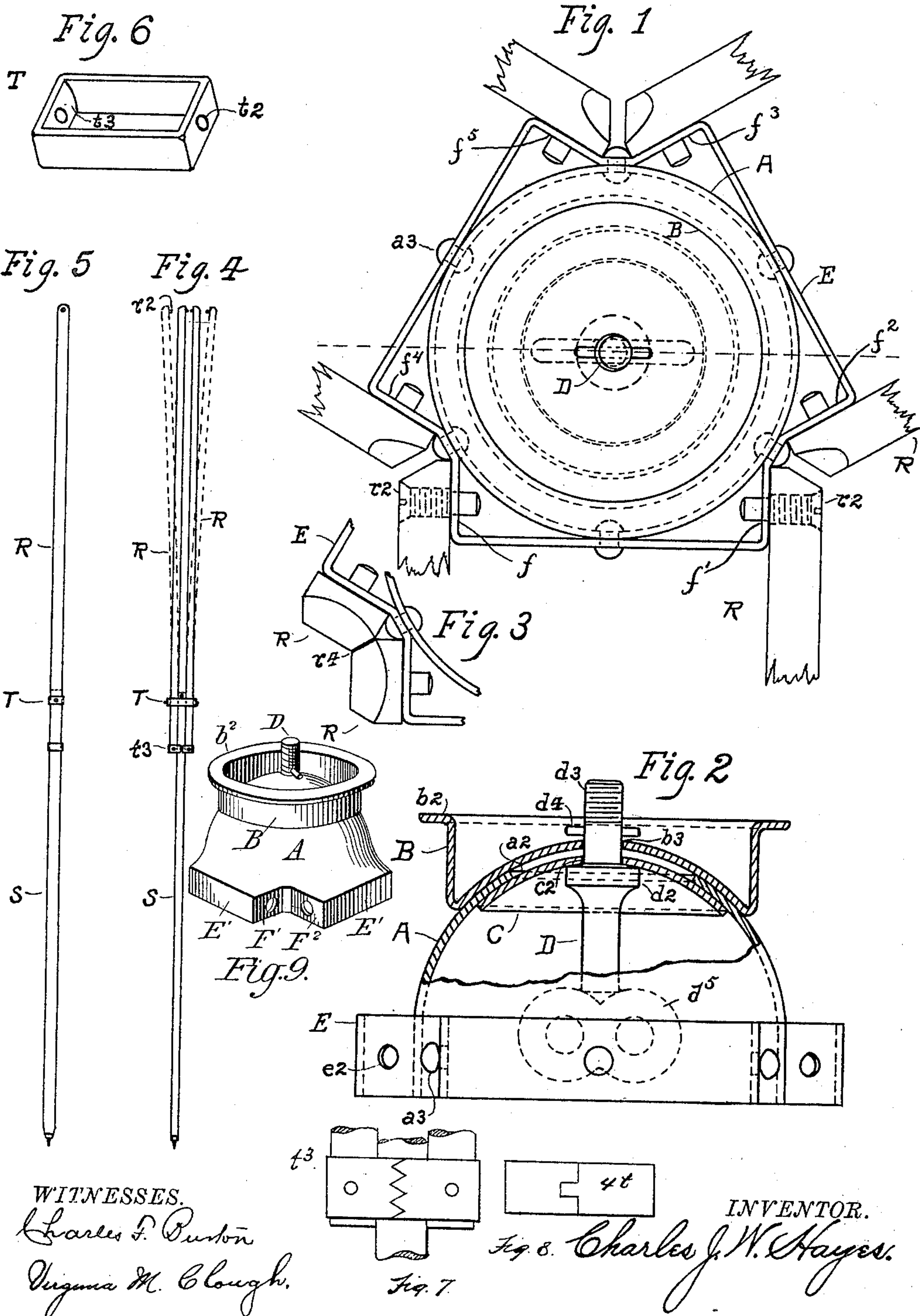
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C. J. W. HAYES.

TRIPOD HEAD.

(Application filed June 13, 1898.)

(No Model.)



WITNESSES.

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Fig. 8. Charles J. W. Hayes.

UNITED STATES PATENT OFFICE.

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TRIPOD-HEAD.

SPECIFICATION forming part of Letters Patent No. 630,219, dated August 1, 1899.

Application filed June 13, 1898. Serial No. 683,270. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. W. HAYES, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Tripod-Heads; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to tripods, and has for its object an improved tripod-head and tripod-leg which can be easily and cheaply constructed and which has advantages that will be pointed out in the description which follows.

In the drawings, Figure 1 is a plan view of the tripod with some of the parts indicated by dotted lines. Fig. 2 is an elevation partly in section. Fig. 3 is a plan of one corner of the frame and shows the upper ends of the tripod-legs in the position they occupy in the tripod as set up. Fig. 4 is a front view of a tripod-leg. Fig. 5 is a side view of the same. Fig. 6 is a detail of a ring or band which holds the sliding parts of the leg together. Figs. 7 and 8 are enlarged views of forms of clip. Fig. 9 is a perspective showing a modification.

The frame which supports the tripod-head is preferably made of band metal or narrow sheet metal bent in the form of a triangle with three reëntering angles, there being a reëntering angle at the apex of each angle of the frame. Those sides of the reëntering angles which lie adjacent to each other are parallel, so that there are formed in the entire frame three pairs of parallel faces, and each pair of parallel faces is used as the support for a tripod-leg. Thus in Fig. 1 f and f' are one pair of parallel faces, f^2 and f^3 are a second pair of parallel faces, and f^4 and f^5 are a third pair of parallel faces. Within the nine-sided frame thus formed is riveted the cylindrical part of a shell-like cup-shaped piece that is in part hemispherical and in part cylindrical. The cup-shaped piece is indicated at A. The hemispherical part of it is that part which lies above the frame E, and the cylindrical part of it is that part which lies

within the frame E and which is secured to the frame by rivets or screws.

Instead of using a separate part for the band the main cup may be pressed to shape to provide the attaching faces, as is shown in Fig. 9, where the base of the cup is shown pressed to shape to form faces F' F^2 E' E^2 .

Through each of the parallel faces of the frame E is a hole (shown at e^2 in Fig. 2) for the reception of a trunnion that projects from the upper part of the tripod-leg. Through the top of the hemispherical part of the cup A is a hole which subtends a conical angle of about thirty degrees or such number of degrees as may be desired to enable the upper part of the joint to move sufficiently over the lower part of the joint. The apex of the conical angle is at the center of the spherical part of the cup A. Within the cup A is a second shell-like cup C which forms a part of a hemisphere and which fits with approximate closeness to the inside of the cup A. This cup C is considerably less than a hemisphere, but is larger than the hole through the cup A and enough larger so that it will underlap the shell of the cup A at whatever angle the central stem D (to be hereinafter described) is placed. Outside of the cup A is a third shell-like cup B, which also has a portion formed as a part of a sphere and which overlaps the hole through the cup A. The outer edges of the cup B are turned upward and the extreme upper edge bent outward to form a flange B^2 , on which rests the object to be supported by the tripod—as, for instance, the box of a camera.

A central stem or thumb-screw D, with a shouldered part d^2 on that portion which is within the cup C, passes through perforations c^2 in the cup C and through perforations b^3 in the cup B. A pin d^4 passes through the stem D and holds the cups C and B in place on the stem, with the cup A interposed between them. The upper end of the stem D is threaded at d^3 to engage with a properly-located nut that is secured to the box or instrument that is to be carried by the tripod. The stem D is turned on its own axis by means of the winged portion d^5 .

Each of the three legs which support the tripod is made in three main pieces. The

upper portion is composed of two pieces R R, each of which has a trunnion r^2 at its upper extremity, and the lower ends of the two pieces are held together by a band T, which
 5 surrounds not only the two pieces R R, but also the lower part S of the tripod-leg. This band is rectangular in form and the inner faces of the two short sides are rounded slightly, so that when the pieces R R are
 10 sprung apart to engage the tripod-head they will not be cut by the edges of the band T. The rounded character of the two sides of the inner face of the band is indicated at T^3 in Fig. 6. Through each of the short sides of
 15 the rectangular ring T is a hole t^2 , through which headless screws are inserted into the pieces R R to hold the band T in place and to prevent the parts R R from slipping out from proper relation to one another. The
 20 holes t^2 should be slightly larger than the body of the screw to allow the parts R R to rock.

On the lower end of each of the leg-pieces R is fastened a guide t^3 . The ends of the
 25 guide t^3 project over the side surfaces of the lower part S of the leg, and the guide attached to one of the leg-pieces B meets or nearly meets the similar guide which is attached to the other leg-piece R. The meeting ends of
 30 the two guide-pieces are preferably serrated or crenelated, and projections on the one part of the guide intermesh in the notches of the other. The guide-pieces t^3 and the band T coact to hold the three pieces of the leg
 35 firmly in the position to which they may have been adjusted in the following way: The band T surrounds the three pieces R R S and holds them together; but this band does not confine them tightly. The extreme lower ends of the
 40 leg-pieces R R bear loosely against the adjacent faces of the leg-piece S when the upper end of the side pieces R R are not spread and pinch tightly against those faces when the upper ends of the leg-pieces are spread. The
 45 interlocking serrations on the guides t^3 prevent one of the side pieces R from shifting longitudinally, as they might do under the loose bond of the band T. Through that part of the leg-piece S which extends above the
 50 band T is a rivet or pin, the ends of which project in position to engage against the band and prevent the leg-piece S from being drawn out downward from between the pieces R R.

The upper ends of the parts R R of the
 55 tripod-legs are chamfered off for a short distance to allow them to take the position indicated in Fig. 3, which is the position they take when the legs are at the proper position to support the tripod-head. In order to en-
 60 gage the head with the tripod-legs, the legs must be turned out, so as to be nearly on a horizontal plane with the bottom of the head. When dropped from this horizontal plane, they begin to assume the position shown in
 65 Fig. 3, and after having been dropped below forty-five degrees or thereabout the parts R of adjacent legs interlock, as shown in Fig.

3, and cannot be disengaged from the head without returning them to approximately the horizontal position. This result is produced
 70 by shaping the end of the tripod-leg to correspond with the size of the faces $f f'$ and the location of the pivot-holes for the trunnions. From the center of the trunnion to the end of the leg the distance is somewhat less than
 75 half the width of the leg, the end is cut diagonally, and the corners chamfered off; but the side chamfer does not extend so far toward the inner face as does the diagonal end cut. When the legs are substantially in the plane
 80 which passes through the bottom of the tripod-head, as shown in Fig. 1, either of the leg-pieces R may be forced outward until the trunnion clears the hole. The end of the leg-piece will just clear the end of the adjacent
 85 leg-piece. When the leg is turned down, however, the corner-faces of adjacent leg-pieces lie closer together and even come into contact as the leg assumes a vertical position.

What I claim is—

1. In a tripod-head, the combination of a hemispherical cup with walls thin in relation to its other dimensions and provided with a perforation for the passage and radial move-
 90 ment of a binding-screw, and provided with means for attaching it to the tripod-legs; a socket-piece also with walls thin in relation to its other dimensions and provided with a
 95 perforation for the journaling therein of the stem of the binding-screw, and adjustable over the outside surface of the cup on said stem; a binding-screw passing through the cup and the socket, and having a threaded part adapted to engage and attach the camera,
 100 and provided with a shoulder bearing upon the inner spherical surface of the cup, and between which and the camera the parts are clamped by turning the screw; and means provided which in conjunction with the stem and shoulder of the binding-screw hold the
 105 parts together when the camera is detached, substantially as described.

2. In a tripod-head, the combination of a hemispherical cup with walls thin in relation to its other dimensions and provided with a
 115 perforation for the passage and radial movement of a binding-screw, and provided with means for attaching it to the tripod-legs; a socket-piece provided with a perforation for the journaling therein of the stem of the bind-
 120 ing-screw, and adjustable over the surface of the cup on said stem; a bearing-piece provided with a perforation for the journaling therein of the stem of the binding-screw and arranged to bear with its periphery against
 125 the spherical surface of the cup and cover the perforation therein; and adjustable over said surface on the stem of the binding-screw; a binding-screw passing through the bearing-piece, the cup and the socket, and having a
 130 threaded part adapted to engage and attach the camera and clamp the parts in adjustment, and provided with a shoulder to bear against the bearing-piece nearer its center

than the bearing-piece bears against the cup; and means provided which in conjunction with the stem and shoulder of the binding-screw hold the cup, socket, and bearing-piece together when the camera is detached, substantially as described.

3. In combination with a tripod-head, provided with engaging faces provided with holes for the reception of the trunnions of tripod-legs, legs having the upper ends cut diagonally to permit free passage of one leg-piece, by the end of an adjacent leg-piece, and with scarfed corners of which the faces are farther removed from the center of the trunnion-pin, than is the diagonal face, whereby the corner-faces of adjacent leg-pieces interlock, substantially as described.

4. In a tripod-head, the combination of a section of a spherical shell having its edge blended from the spherical form to that of a triangular band with three reëntering angles for the attachment thereto of the tripod-legs, and provided with a perforation in its apex for the passage and radial movement of the binding-screw; a socket-piece provided with a perforation for the journaling therein of the stem of the binding-screw; a binding-screw passing through the shell and the socket, and having a threaded part for engagement with the camera, and provided with a shoulder between which and the camera the parts are clamped by the action of the screw; and

means provided whereby the parts are held together through the medium of the stem of the binding-screw when the camera is detached, substantially as described.

5. In a tripod-leg, the combination of three parts held together, with the two of the three forming the upper part, and the third the lower part of the leg, a band arranged to hold the three parts together, guide-pieces at the lower ends of the two parts which form the upper half of the leg, arranged to project over the side surfaces of the lower part of the leg and to coact with the band to clamp the three parts, substantially as described.

6. In combination with a three-part tripod-leg, one of which parts is adapted to slide between the other two, an encircling band, and guides provided with intermeshing edges secured to each of the outer parts of the leg, and projecting over the middle part and arranged to guide the middle one of the three parts of the leg, and to allow the outer parts to press against the middle part and thereby act to clamp the parts in position, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES J. W. HAYES.

Witnesses:

CHARLES F. BURTON,
MARION A. REEVE.