

Nov. 2, 1943.

H. W. WHITLOCK

2,333,134

PRINCIPAL POINT SELECTOR

Filed March 24, 1943

Fig. 1.

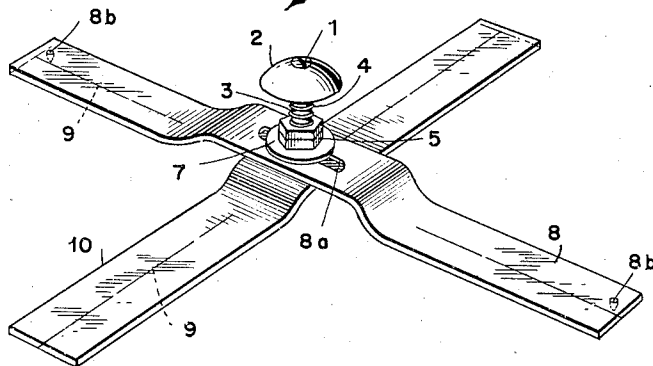
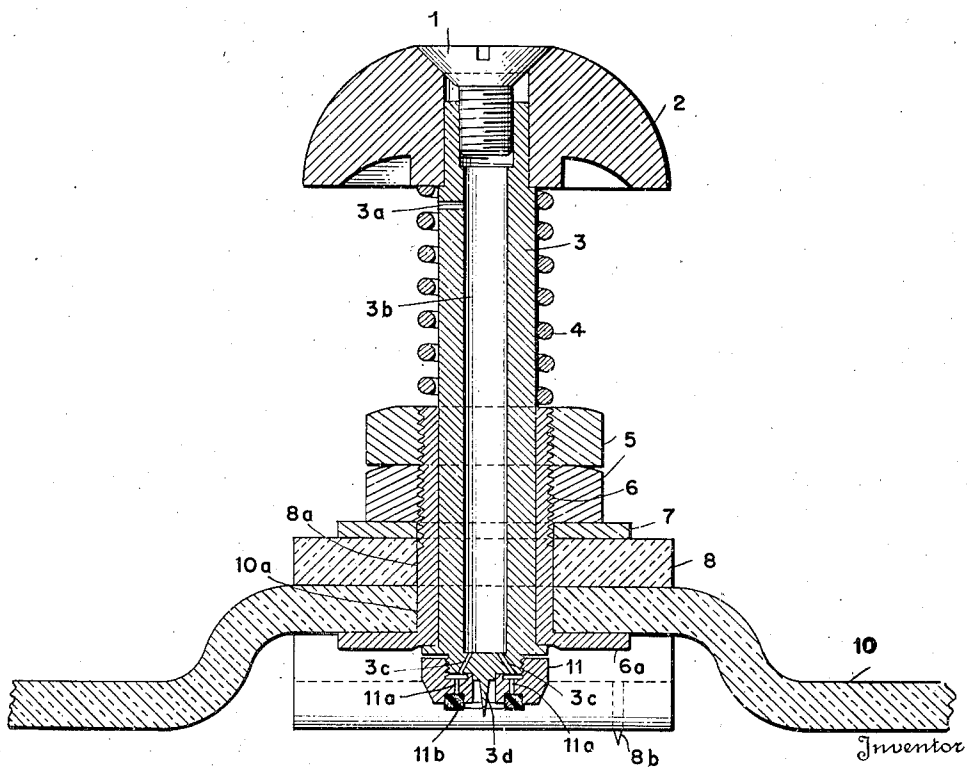


Fig. 2.



H. W. WHITLOCK

H. R. Foss
G. L. Richards

By

Attorneys

UNITED STATES PATENT OFFICE

2,333,134

PRINCIPAL POINT SELECTOR

Howard W. Whitlock, San Diego, Calif., assignor
to Claude R. Wickard, as Secretary of Agriculture
of the United States, and his successors in
office

Application March 24, 1943; Serial No. 480,324

3 Claims. (Cl. 33-189)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalty thereon.

My invention relates to the compilation of maps by photogrammetric methods from aerial photographs, and its object is to provide an instrument for use in selecting and marking on aerial photographs the principal points required by such methods.

A principal point selector embodying my invention is illustrated by the accompanying drawing, in which,

Figure 1 is a perspective view, and

Figure 2 is a partial vertical section showing the construction of the center assembly.

As illustrated, my invention comprises a top cross-arm 8, a bottom cross-arm 10 and a center assembly.

The cross-arms 8 and 10 are preferably made of a transparent plastic material. Each cross-arm is uniform in breadth and thickness throughout its length, the end portions being straight and operating in the same plane and the central portions being shaped to provide a raised level section. The raised section of top cross-arm 8 has a height sufficient to allow it to overlie the raised section of bottom cross-arm 10. A longitudinal centerline 9 is etched on the bottom surface of the end portions of each cross-arm, a round opening is centered in the raised section of bottom cross-arm 10, and top cross-arm 8 has an elongated slot 8a centrally located lengthwise of its raised section and is also provided at each end with a fastening prick 8b which prevents it from shifting when placed on a plane surface.

The center assembly has a central shaft 3 arranged for sliding operation in a collar 6. The collar 6 fits in and extends upwardly through the round opening 10a in the bottom cross-arm 10 and in turn through the elongated slot 8a of top cross-arm 8. A flange 6a, at the lower end of the collar 6, and lock nuts 5, which engage threads at the upper end of the collar 6 and are provided with a bearing surface by the washer 7, hold the collar 6 in place while permitting movement of the cross-arms 8 and 10, as required in the operation of the instrument.

The central shaft 3 is hollow for the greater part of its length, thus forming the ink reservoir 3b. Internal screw threads at the upper

end of this hollow space receive the screw 4 which acts as a cover for the ink reservoir 3b and also secures the handle 2 against a shoulder on the upper end of the central shaft 3. A lateral opening 3a in the central shaft 3 serves as an air vent for the ink reservoir 3b. A compression spring 4, disposed around the central shaft 3 and acting between the handle 2 and the top lock nut 5, holds the central shaft 3 yieldingly in an upward position. The tendency of the spring 4 to force the central shaft 3 out of the collar 6 is restrained by a flange at the lower end of the central shaft 3. Below this flange the central shaft 3 is threaded to receive an inking device 11 which has a central opening and a concentric annular insert 11b of ink-absorbing material. Openings 3c and 11a through the central shaft 3 and inking device 11, respectively, provide channels through which ink is supplied from the ink reservoir 3b to the ink-absorbing insert 11b. A needlepoint 3d on the lower end of the central shaft 3 projects through a central opening in the inking device 11 and extends downward slightly below the level of the ink-absorbing insert 11b.

In the assembled arrangement of the instrument, the top cross-arm 8 is placed across the bottom cross-arm 10, and the center assembly passes through the elongated slot 8a in the top cross-arm 8 and fits in the round opening 10a in the bottom cross-arm 10. The elongated slot 8a and the opening 10a fix the position of the center assembly so that the needlepoint 3d is always located at the point of intersection of the centerlines 9 of the cross-arms 8 and 10. The elongated slot 8a also makes possible both limited rotation and lateral adjustment of the bottom cross-arm 10 after the top cross-arm 8 has been fixed in place by the fastening pricks 8b.

The function performed by my principal point selector is a preliminary step in the compilation of maps from aerial photographs by photogrammetric methods. Normally this step is accomplished by drawing axial connecting lines between collimation marks located at the four edges on each aerial photograph, piercing the intersection of these lines, which is the principal point, with a pointed instrument, and then marking the principal point by circling it in ink with a bow compass. With my instrument this step can be performed much more rapidly by lining up the centerline 9 of the top cross-arm 8 with one pair of collimation marks and pressing down slightly so that the fastening pricks 8b hold it in place, bringing the centerline 9 of the bottom cross-

arm 10 in line with the other pair of collimation marks, and then depressing the handle 2, which causes the needlepoint 3d to pierce the aerial photograph at the intersection of the centerlines 9, the principal point, and also brings the ink-absorbing insert 11b into contact with the aerial photograph so that an identifying circle is marked around the principal point.

A principal point must be selected and marked for each aerial photograph used in the compilation of a map by photogrammetric methods. As the number of aerial photographs for any one map may be quite large, the step is an often repeated one. The facility with which the step may be performed with my principal point selector results in a considerable saving in time.

Having thus described my invention, I claim:

1. An instrument of the character described comprising a cross-arm adapted at its end portions to rest on a plane surface and having a raised section midway of its length, a second cross-arm extending transversely at the raised section of the first named cross-arm and adapted at its end portions to rest on the same plane surface, a longitudinal centerline on the end portions of each cross-arm, means rendering the central longitudinal section of each cross-arm transparent, a pointed element located at the intersection of the longitudinal centerlines of the cross-arms, and means for placing an identifying mark on the plane surface adjacent to points indicated by said pointed element.

2. An instrument of the character described comprising a cross-arm adapted at its end portions to rest on a plane surface and having a raised section midway of its length, a second cross-arm extending transversely at the raised section of the first named cross-arm and adapted at its end portions to rest on the same plane

surface, a transparent section centrally located lengthwise of the end portion of each cross-arm, reference lines on said transparent section delineating the longitudinal centerlines of the cross-arms, a pointed element located at the intersection of the longitudinal centerlines of the cross-arms, means for securing the pointed element on the cross-arms, means for vertically moving the pointed element in and out of contact with the plane surface, yieldable means urging said pointed element upward out of contact with the plane surface, and means for placing an identifying mark on the plane surface adjacent to points indicated by said pointed element.

3. An instrument of the character described comprising a transparent cross-arm adapted at its end portions to rest on a plane surface and having a raised section midway of its length, a second transparent cross-arm extending transversely at the raised section of the first named cross-arm and adapted at its end portions to rest on the same plane surface, means to prevent movement of the second named cross-arm relative to the plane surface, means for limited rotation and lateral adjustment of the first named cross-arm, a longitudinal centerline on the bottom surface of the end portions of each cross-arm, a pointed element located at the intersection of the longitudinal centerlines of the cross-arms, means for securing the pointed element on the cross-arms, means for vertically moving the pointed element in and out of contact with the plane surface, yieldable means urging said pointed element upward out of contact with the plane surface, and means for marking a circle in ink on the plane surface around points indicated by the pointed element.

HOWARD W. WHITLOCK.