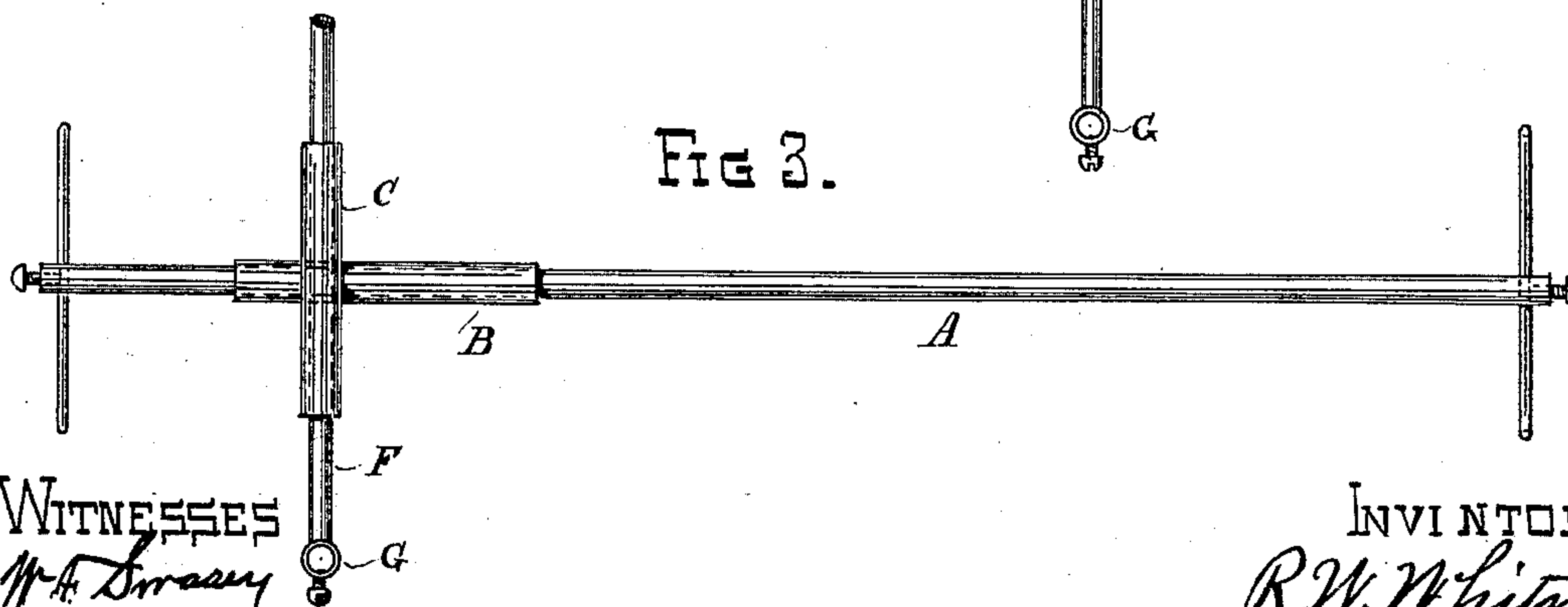
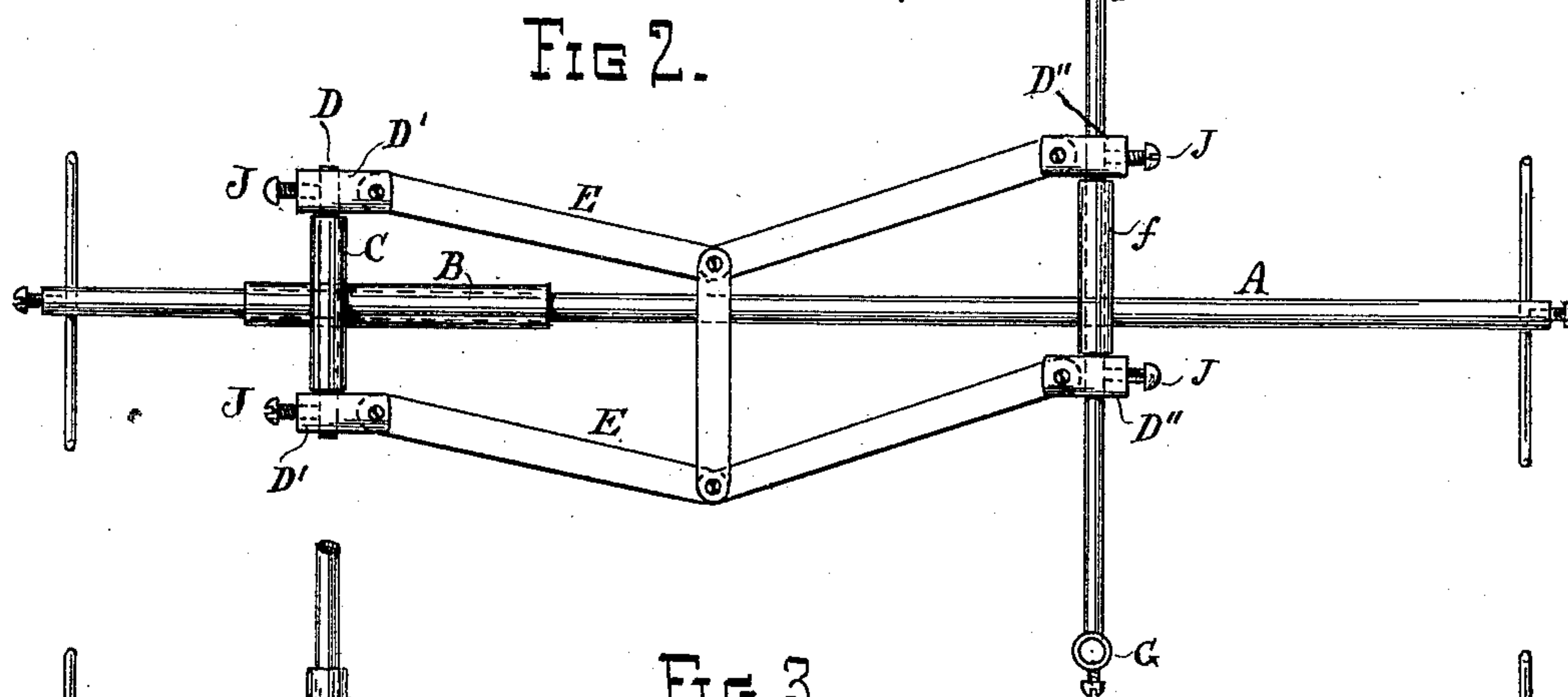
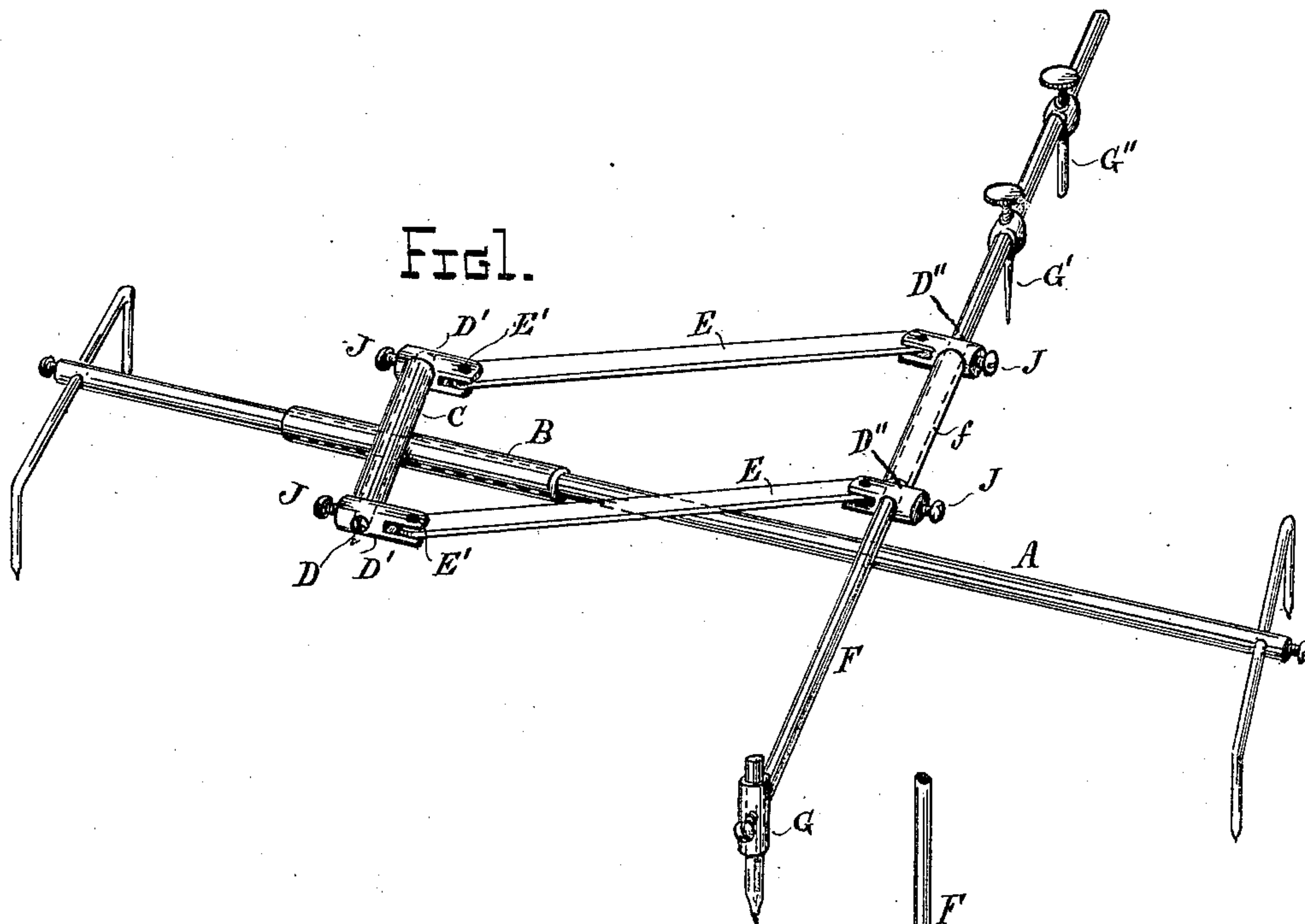


(No Model.)

R. W. WHITNEY.
INSTRUMENT FOR COPYING DRAWINGS.

No. 420,484.

Patented Feb. 4, 1890.



WITNESSES
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UNITED STATES PATENT OFFICE.

RUEL W. WHITNEY, OF SAN FRANCISCO, CALIFORNIA.

INSTRUMENT FOR COPYING DRAWINGS.

SPECIFICATION forming part of Letters Patent No. 420,484, dated February 4, 1890.

Application filed August 23, 1889. Serial No. 321,747. (No model.)

To all whom it may concern:

Be it known that I, RUEL W. WHITNEY, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented certain new and useful Improvements in Copying or Drawing Instruments or Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of instruments or machines used in drawing or copying, and is intended to produce a copy of the exact size as the original, which I am not aware has ever been done before by any drawing-instrument.

Following is an exact description of the invention, like letters referring to like parts throughout.

Figure 1 is a perspective showing the instrument made with two arms. Fig. 2 is a plan showing the instrument made with four arms. Fig. 3 is a modified form of my invention.

A is a rod mounted upon suitable bearings at each end.

B is a sleeve working upon the rod A.

C is a sleeve attached to the sleeve B, but at right angles to it.

D is a rod running through the sleeve C.

D' D' are projecting pieces attached to the rod D, in the long end of each of which is a slot parallel with the rod D, and in the short end two screws J J, for the purpose of fastening them to the rod D.

E E are bars or arms, one end of which is fitted into the slot in the long end of the projecting pieces D' D'.

E' E' are pins connecting the arms E E with pieces D' D', thereby forming hinge-joints.

F is a rod to which are attached two pieces D'' D'', which are the same in construction as D' D', and into which one end of the arms E E is fastened by pins to form a hinge-joint similar to that formed by connecting D' D' with E E.

In the short ends of D'' D'', I place screws J J, similar to those in D' D', and between D'' D'', I place a sleeve f, the same in length as that between D' D', the object being to keep D'' D' and D' D' the same distance apart. The rod F passes through D'' D'' and the

sleeve f, the same as the rod D passes through D' D' and the sleeve C, the only difference being that while the rod D is always kept in the same position the rod F may be moved back and forth through D'' D'' and the sleeve f by loosening the two screws J J. The object of having the rod F movable is that the pencil may be brought near the bar A when small pictures are to be copied. The tracers and step or foot can also be moved on the rod F toward the rod A by loosening the screws holding them. Thus the pencil and tracer can always be adjusted to about the same relative position with the bar A when the two arms E E are parallel with it; but this is not absolutely necessary to its operation. When made in this manner, the rod F will always be at right angles to the rod A, no matter in what position the arms E E may be.

While the hinge-joints formed by connecting D'' D'' with E E will allow of motion only in one direction, those formed by connecting D' D' with E E form, in connection with the rod D and sleeve C, a universal joint.

G is a pencil-holder attached to rod F, in which is inserted a small screw for the purpose of holding the pencil in position.

G' is the tracing-point, removably attached to rod F.

G'' is a step or foot removably attached to rod F for the purpose of allowing the tracing-point to come very close to the paper, but without touching it.

I have described my invention as having two arms E E, as shown in Fig. 1; but it is evident that four or even more arms, as shown in Fig. 2, might be used by making the connection as shown in the drawings, and yet the operation be the same.

A modified form of my invention is shown in Fig. 3, in which the rod F is substituted for the rod D. In this case the sliding of the sleeve B upon the rod A is the same as in the other cases, and, pushing the rod F through the sleeve C, takes the place of the swinging arms E E.

To operate my drawing or copying instrument, place it upon a table or drawing-board, pushing the points into the table or board to hold the rod firmly. Then place the picture to be copied on one side of the rod A, no matter

in what position it may rest upon the board.
Upon the other side of the rod place the pa-
per upon which the copy is to be produced.
Take hold of the rod F at any convenient
5 point, when the sliding of the sleeve B upon
the rod A allows the pencil to be moved toward
the end of the rod, and the swinging arms E
E will allow of it being moved in all other di-
rections, the copy produced being the exact
10 size of the original.

Having thus fully described my invention,
what I claim, and desire to secure by Letters
Patent, is—

The combination of rod A, sleeves B and C,
rod D, projecting pieces D' D' D'' D'', bars 15
E E, rod F, pencil-holder G, and tracing-point
G', with step or foot G'', substantially as
shown and described.

In testimony whereof I affix my signature
in presence of two witnesses.

RUEL W. WHITNEY.

Witnesses:

W. F. SWASEY,
N. C. BOVEE.