

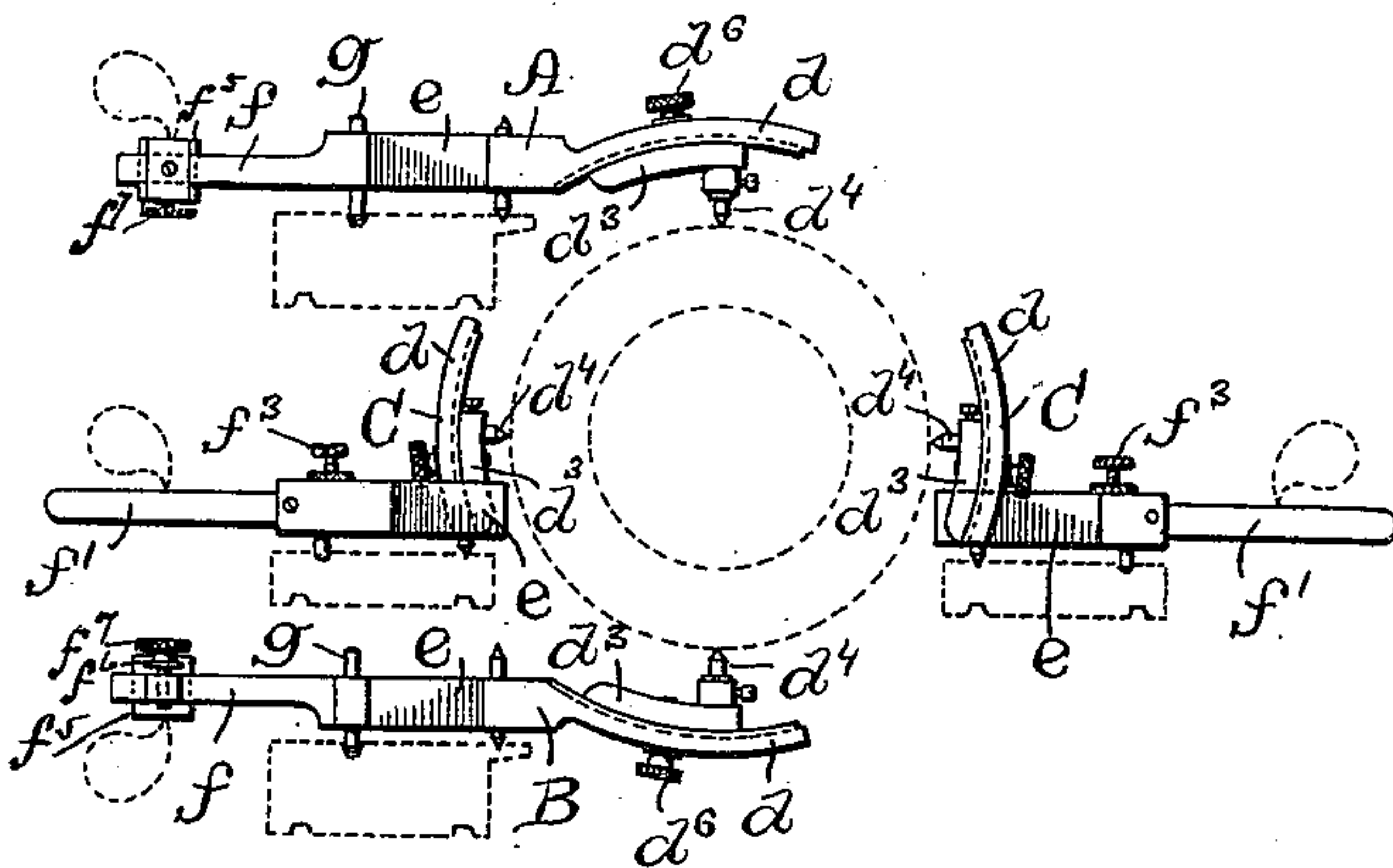
Patented Mar. 27, 1900.

DIAMOND HOLDER FOR PANTOGRAPH ENGRAVING MACHINES.

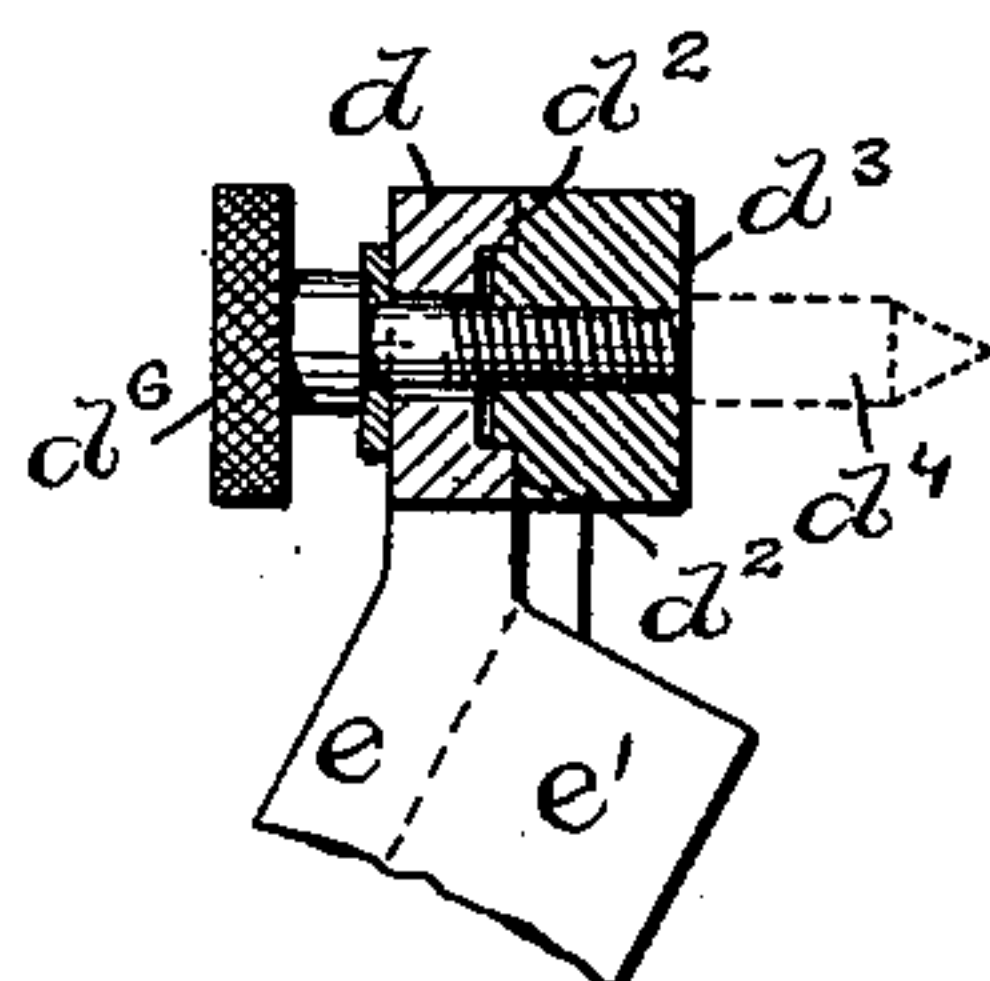
(Application filed June 13, 1898.)

(No Model.)

Fig. 1.



III-4.



FiF. 2.

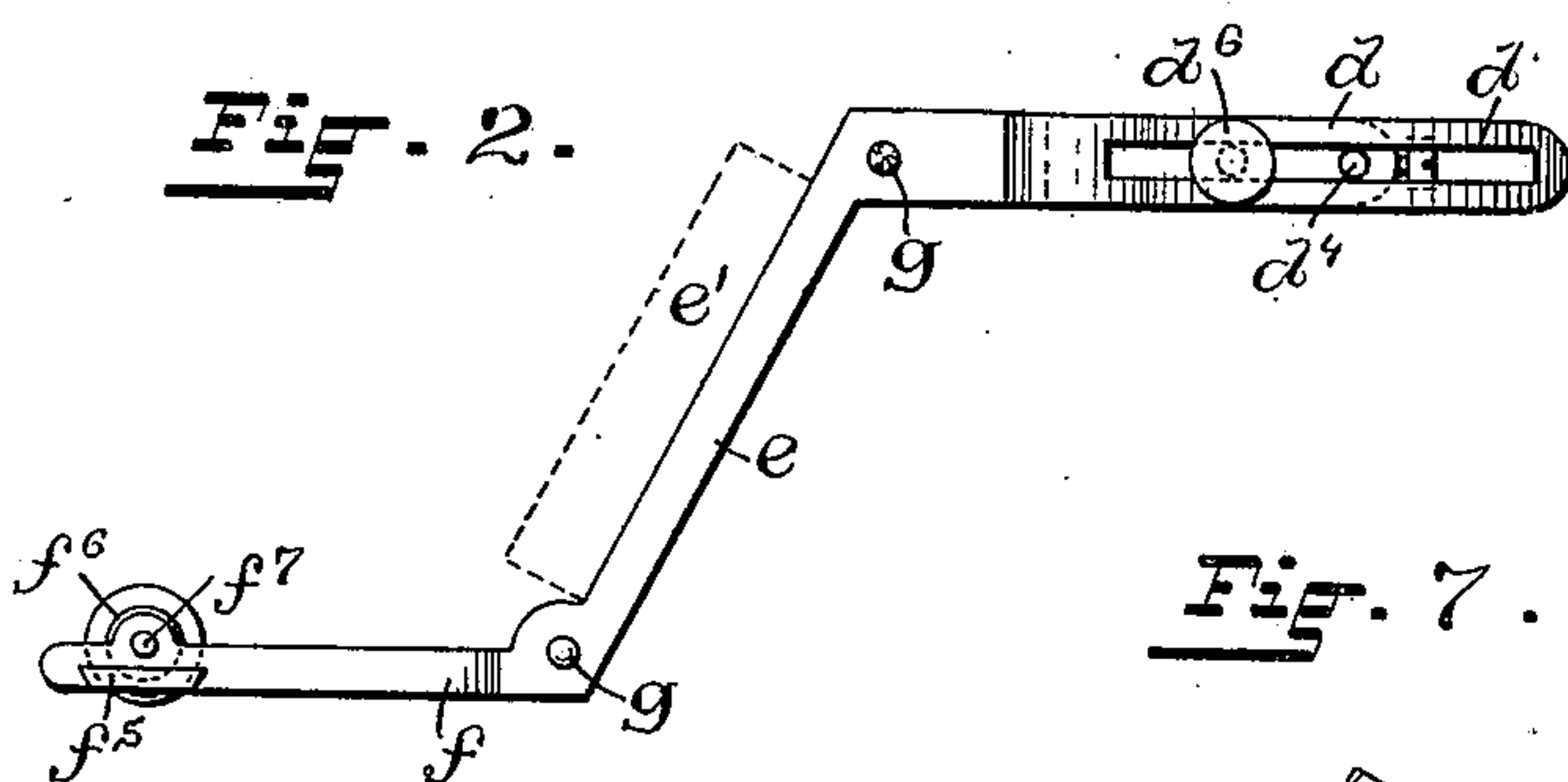
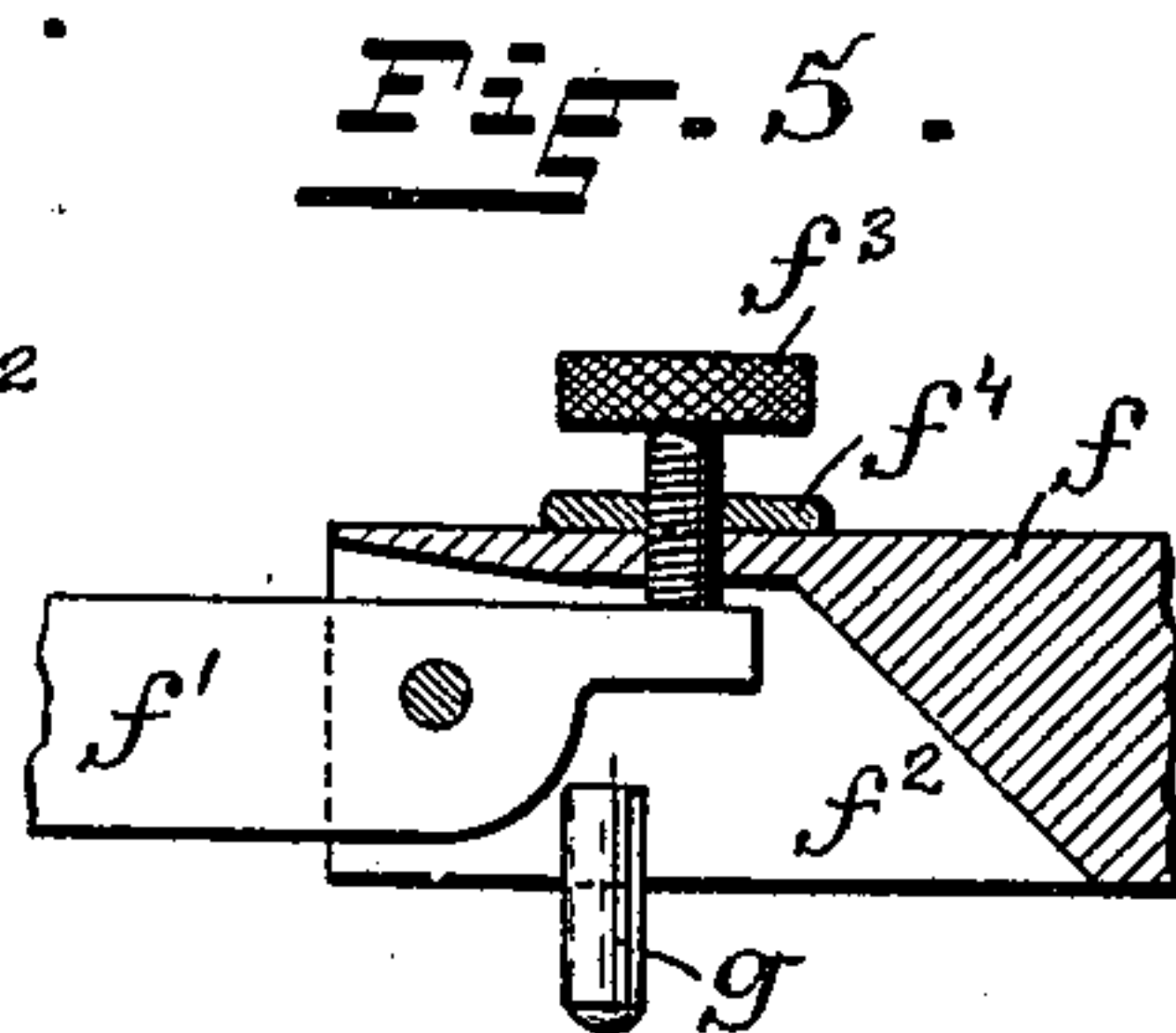


Fig. 7.



III. 3.

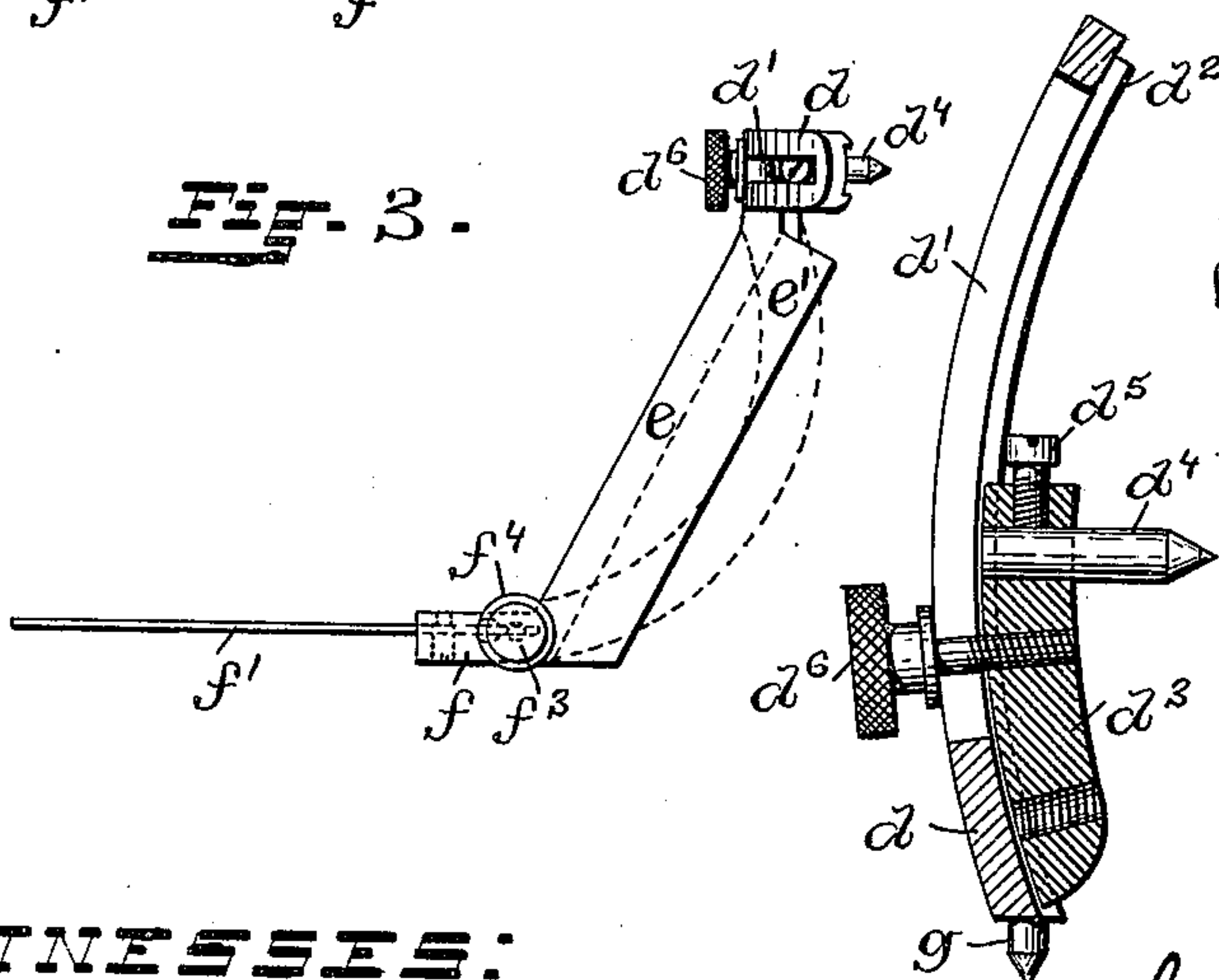
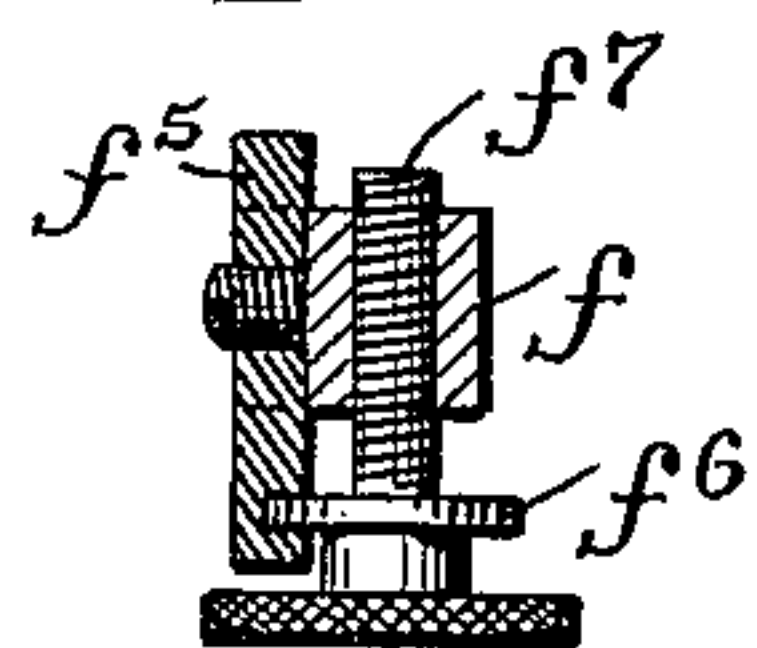



Fig. 6.



INVENTORS:

9- **INVENTORS:**
John Hope and
John Hope Jr
and Joseph A. Miller & Co.
Atty.

UNITED STATES PATENT OFFICE.

JOHN HOPE AND JOHN HOPE, JR., OF PROVIDENCE, RHODE ISLAND, ASSIGN-
ORS TO THE JOHN HOPE & SONS' ENGRAVING AND MANUFACTURING
COMPANY, OF SAME PLACE.

DIAMOND-HOLDER FOR PANTOGRAPH ENGRAVING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 646,177, dated March 27, 1900.

Application filed June 13, 1898. Serial No. 683,253. (No model.)

To all whom it may concern:

Be it known that we, JOHN HOPE and JOHN HOPE, Jr., of Providence, in the county of Providence and State of Rhode Island, have
5 invented a new and useful Improvement in Diamond-Holders for Pantograph Engraving-Machines; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accom-
10 panying drawings, forming part of this specification.

In pantograph engraving-machines used for engraving the surface of calico-printers' rolls the gravers consist of a metal rod hav-
15 ing a diamond secured at the pointed end. The diamond point cuts through the varnish covering the roll and scratches the copper sufficient to expose it to the action of acid, by which the depth of the scratched pattern is afterward increased. The operation of
20 these diamond gravers is most delicate, for their action depends entirely on gravity. Rock-bars operated by the attendant are used to hold the diamond points away from
25 the roll to be engraved; but only gravity acts to hold them in contact with the rolls. The work performed by these diamond gravers in the reproduction of a series of patterns on a
30 smaller scale is so important that any apparently-slight improvement in accurate reproduction of the pattern is of the highest value. As heretofore constructed the diamond grav-
ers were secured in a post offset to one side of the holder, as is shown in United States
35 Patent No. 502,039, granted July 25, 1893, to John Hope for tool-holders.

The object of our invention is to improve the construction, the adjustment, and the balance of the diamond-holder; and to this
40 end the invention consists in the peculiar and novel construction of the holders, whereby the diamond graver is more firmly held, the tailpiece more accurately adjusted to the rocking bars, and the holder more perfectly
45 balanced, as will be more fully set forth hereinafter.

Another object of the invention is to construct the holder so that the same may be re-

versed and used on the upper as well as on the lower part of the roll to be engraved. 50

Figure 1 is an end view of a group of four diamond-holders shown in their respective positions with relation to the roll to be engraved, the carriages supporting the holders and the rocking bars by which they are controlled being shown in broken lines. Fig. 2
55 is a top view of one form of a diamond-holder such as is used on the top and bottom of the roll to be engraved and indicated in Fig. 1 as A and B. Fig. 3 is a top view of the side hold-
60 ers, indicated in Fig. 1 as C-C. Fig. 4 is a transverse sectional view of the curved portion of the holder, showing the manner of securing the segmental block, in which the diamond graver is held, to the holder. Fig.
65 5 is a sectional view of the part of the holder to which the tailpiece is secured. Fig. 6 is a sectional view of the tailpiece of the holders A and B of Fig. 1. Fig. 7 is a longitudinal sectional view of the curved arm of the
70 diamond-holder, showing the adjustable bolster in which the diamond graver is secured.

Similar marks of reference indicate corresponding parts in all the figures.

In the drawings, d indicates the curved arm 75 of the holder; d' , a central slot; $d^2 d^2$, raised ways on each side of the concave face of the arm d ; d^3 , a curved bolster fitting onto and between the raised ways $d^2 d^2$; d^4 , the dia-
80 mond-pointed graver inserted into a hole in the bolster d^3 to extend radially from the same and secured by the clamp-screw d^5 ; d^6 , a screw extending through the central slot d' , connected by screw-thread engagement with the bolster d^3 and provided with a milled head
85 having a shoulder bearing on the convex side of the curved holder. By the screw d^6 the bolster, which can be adjusted longitudinally, is secured to the concave side of the arm d .
90 e is the oblique arm of the holder; f , the tail end of the holder; f' , the hinged tailpiece, and $g g$ pins projecting from the holder and forming the rocking support of the same. The pins $g g$, which are in the preferred form
95 pointed at both ends, project from the upper as well as the lower surface of the holder, so

that the holders may be reversed and used on the upper as well as on the lower bar of the pantograph engraving-machine.

Each holder requires an adjustable tail-piece, on which the rock-bar controlling the holder bears. These tailpieces must be constructed with reference to the position occupied by the holder.

By securing the diamond-pointed graver d^4 directly into the curved bolster d^3 instead of into a socket connected with or projecting from the curved bolster the gravers are more firmly held against tremor and jars closer to the holder. In the preferred form we make the bolsters d^3 of the lightest possible metal, so that the adjustment of the bolster on the curved arm will not materially affect the balance of the holder.

Referring to Fig. 1, it will be seen that in the holder A on the top of the roll the position requires that the curved arm d and the graver must overbalance the weight of the tail end f to bring the diamond graver into contact with the roll to be engraved and hold it in contact until lifted off by the action of the rock-bar. (Indicated in broken lines.) In the holder B on the bottom of the roll the tailpiece f must overbalance the weight of the curved arm d and the graver, and in the holders C C on the opposite sides of the roll the tailpieces f' f' must be so light that the weight of the bolster d^3 and the graver is sufficient to overbalance the weight of the tailpiece and hold the diamond gravers in contact with the roll until lifted off by the action of the rock-bars. (Shown in broken lines.)

To insure the prompt contact of the gravers and the holding of the same firmly on the roll, we overweight the oblique arm e by the mass of metal e' . (Shown in Figs. 3 and 4 on the right-hand side of the broken line as used in the holders C C and indicated in broken lines in Fig. 2 on the left-hand side of the oblique arm e as it may be used for the holder B.) The overbalancing of the holders may also be secured by constructing the parts of one end of the holder of a metal of high specific gravity and the other of low specific gravity, and to this end we have made the tailpieces f' of aluminium and the rest of brass or bronze and have also made the bolster d^3 of aluminium.

The adjustment of the tailpiece f' is shown in Fig. 5, in which the tailpiece is pivotally secured in the very narrow slot f^2 , extending in the tail end f , across the hole in which the pin g is secured. The screw f^3 , in screw-thread engagement with the metal of the end f , is provided with the milled head and bears on the end of the tailpiece f' . The lock-nut f^4 , provided with a milled periphery, secures the screw in the adjusted position.

The adjustment of the tail end f to the rock-bars is shown in Fig. 6 and consists in the plate f^5 , sliding in a dovetail groove formed

in the tail end f . The groove in the plate f^5 engages with the flange f^6 of the milled head of the screw f^7 , which is in screw-thread engagement with the tail end f .

In a pantograph engraving-machine the diamond-holder is supported on one of the carriages controlled by the stylus to move longitudinally to the roll to be engraved. The pins g g rest in grooves in the carriage, one of which is near the roll and the other farther from the roll. The pins g g are offset and connected by the oblique arm e , so as to secure a broad base for the support of the holder and at the same time permit the holders to be placed close together when a large number of small duplicate patterns are to be engraved simultaneously on the roll.

The overweighting of an oblique arm e causes the holder, which rocks on the pins g g , to bring the diamond-pointed gravers in contact with the roll to be engraved practically with uniform force. The added weight of the oblique arm diminishes the disturbing effect of the diamond-pointed graver and adds to secure the position of the holder on the carriage, while in despite of the greater weight of the holder the operative can control a large number of holders with the exertion of less force, because the weight is near the rocking support of the holder.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a diamond-holder for pantograph engraving-machines, the combination with the curved arm adapted to support the graver, the tailpiece and the pins supporting the holder, of the oblique arm, connecting the curved arm and the tailpiece, having the center of gravity of the material of the arm disposed to one side of a line from one pin to the other; whereby the holder is overbalanced on one side and the graver is held in contact with the work, as described.

2. In a diamond-holder for a pantograph engraving-machine, the combination with the holder, of supporting-pins projecting from the upper and lower surface of the holder, whereby the holder may be reversed, as described.

3. In a diamond-holder for pantograph engraving-machines, in combination, an oblique arm, supporting-pins, located on one side of the center of gravity of the holder, near the ends of the oblique arm, said pins projecting above and below the arm, a curved arm forming the support for the bolster carrying the graver, and a tailpiece; whereby the material of the oblique arm is disposed on one side of the supports so as to hold the gravers in contact with the roll to be engraved by the force of gravity exerted by the overweight of the oblique arm, as described.

4. In a diamond-holder for pantograph engraving-machines, in combination, a curved

arm having a longitudinal slot and ways on
the concave side of the arm, a bolster having
a graver secured therein by a clamp-screw to
project radially from the bolster, a tailpiece
5 having a plate adjustably secured to regulate
the contact with the rock-bar of the machine,
two pins obliquely disposed to support the
holder, and a connecting-bar having the ma-
terial disposed to overweight the holder on
10 one side of its support; whereby the graver is

held in contact with the work by gravity, as
described.

In witness whereof we have hereunto set
our hands.

JOHN HOPE.
JOHN HOPE, JR.

Witnesses:

JOSEPH A. MILLER, Jr.,
B. M. SIMMS.