

E. H. PEARCE & J. HULLS.
APPARATUS FOR BEVELING SMALL PIECES OF GLASS.
No. 369,074. Patented Aug. 30, 1887.

FIG. 1.

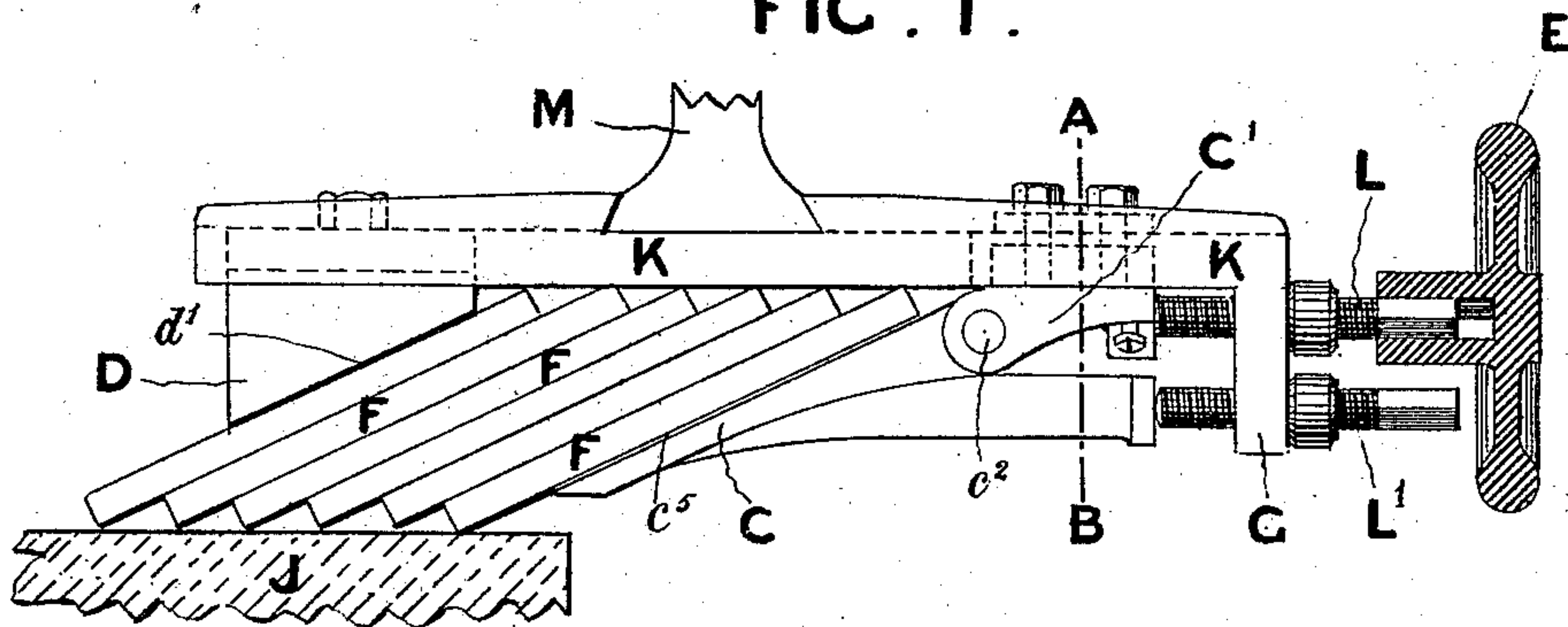


FIG. 3.

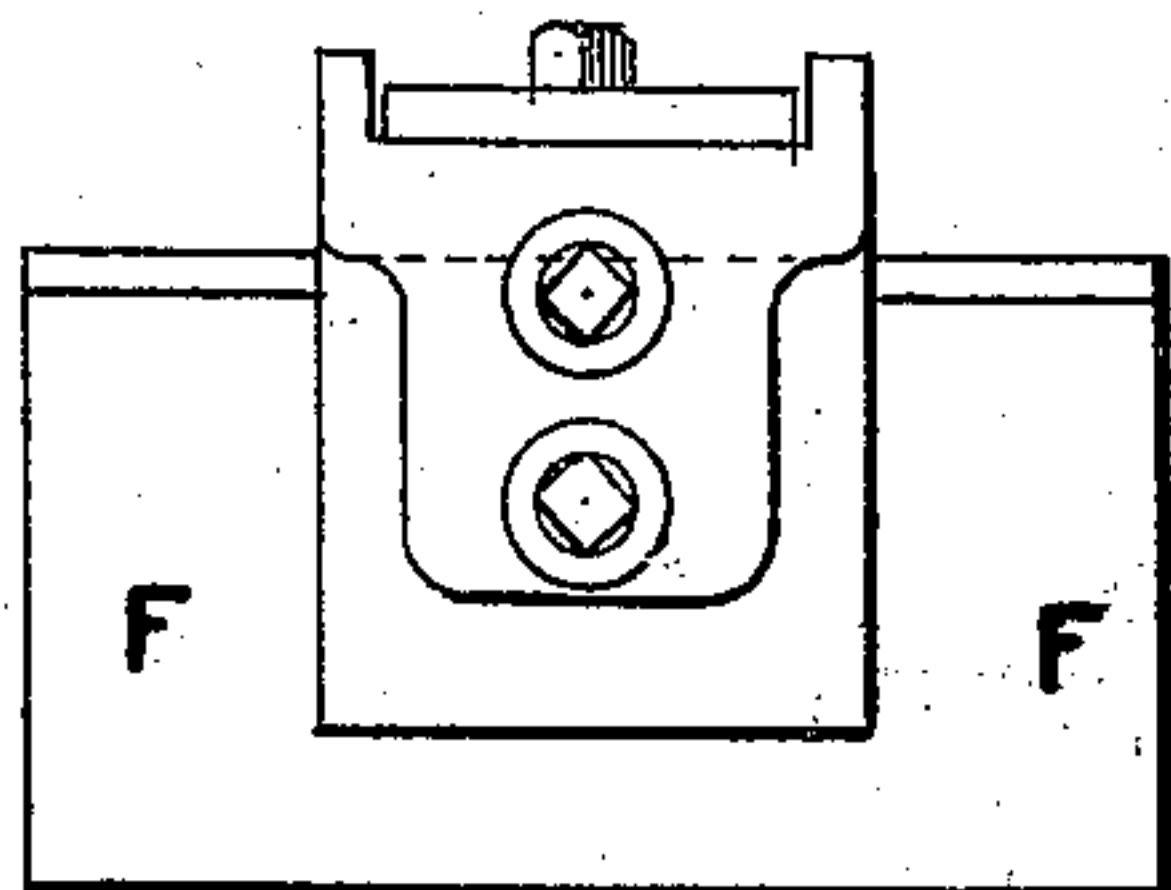


FIG. 2.

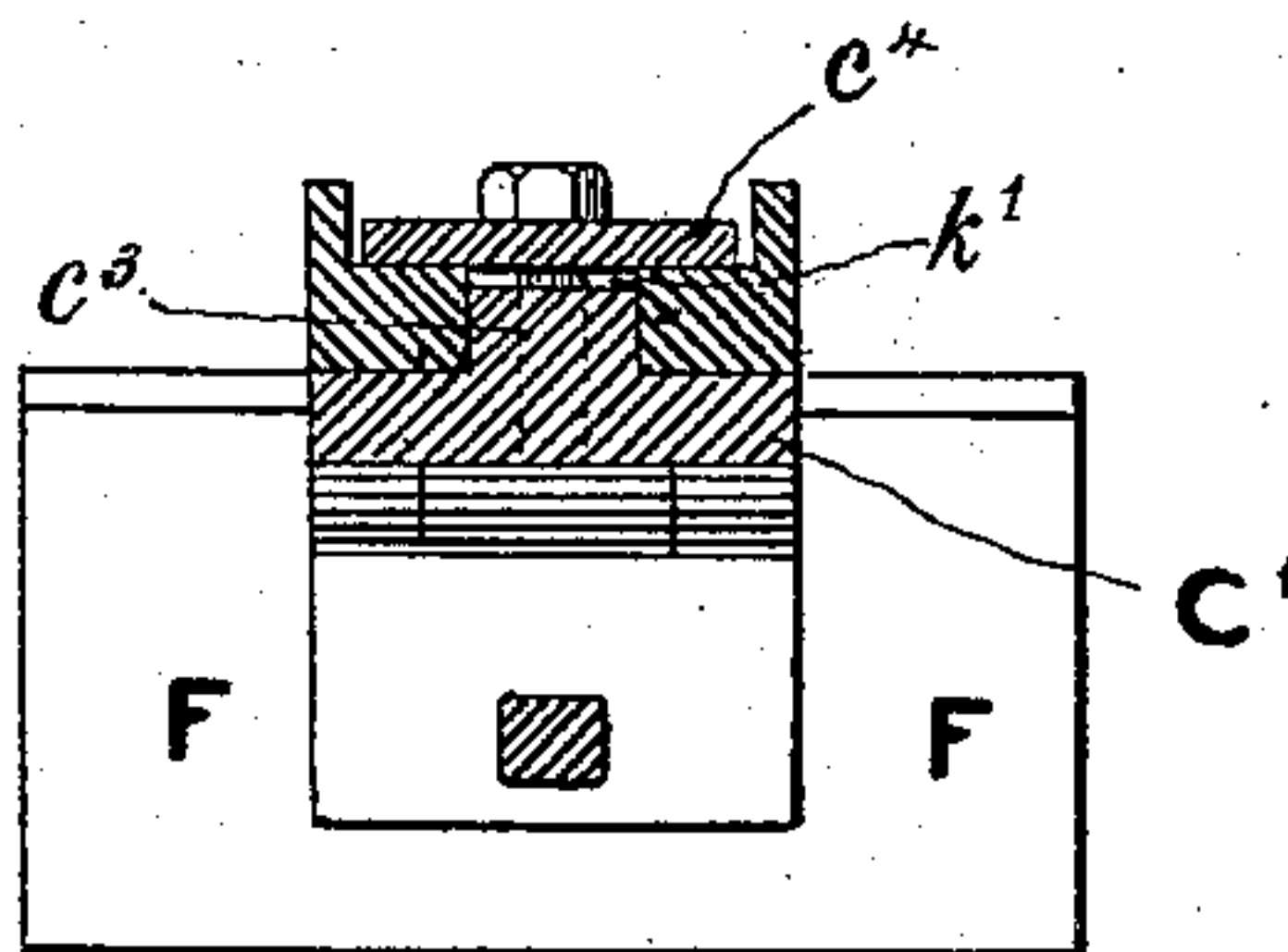


FIG. 4.

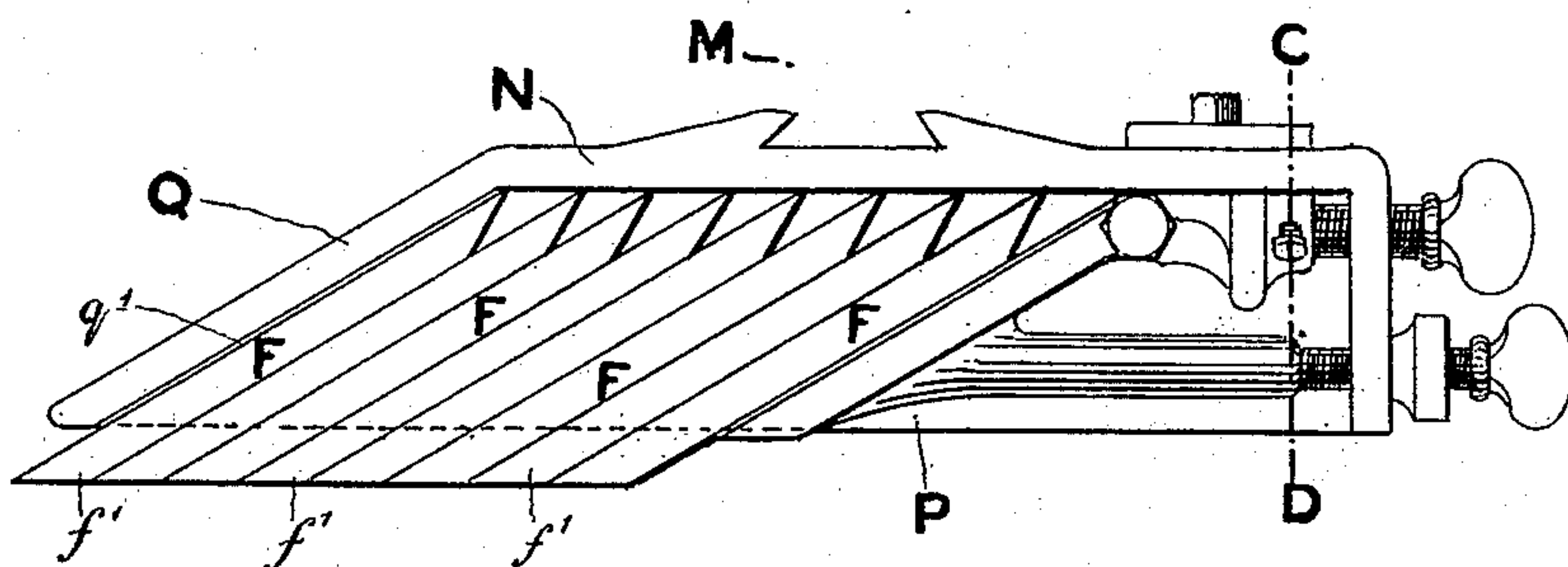


FIG. 6.

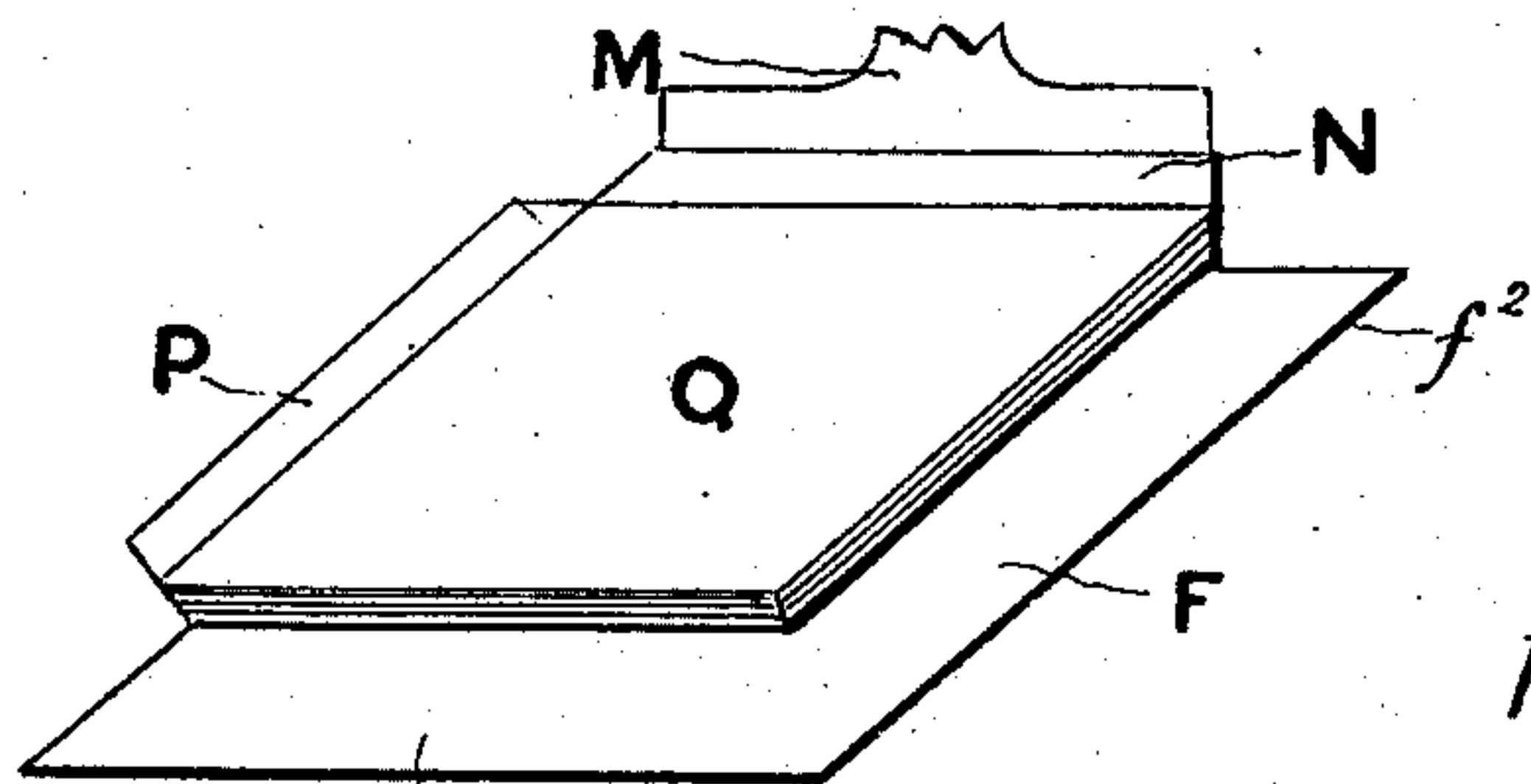
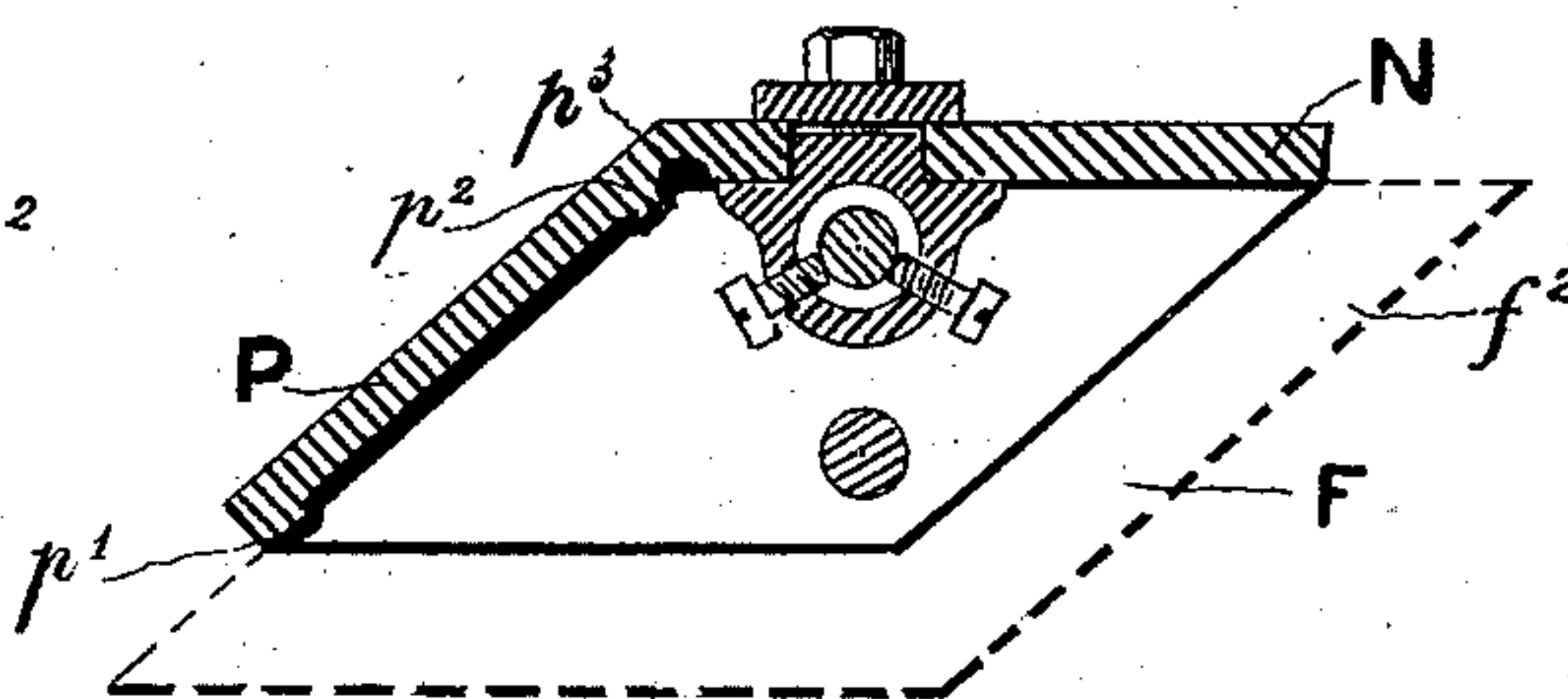


FIG. 5.



Witnesses.
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(No Model.)

2 Sheets—Sheet 2.

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FIG. 7.

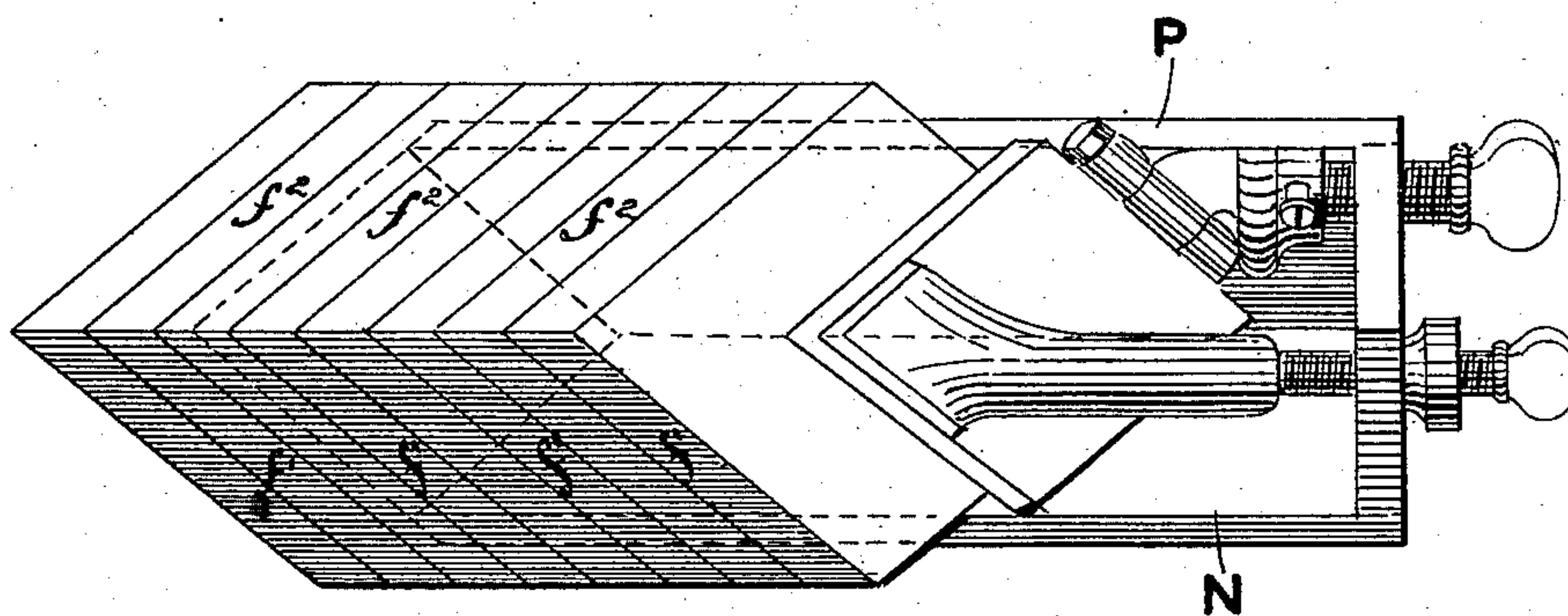
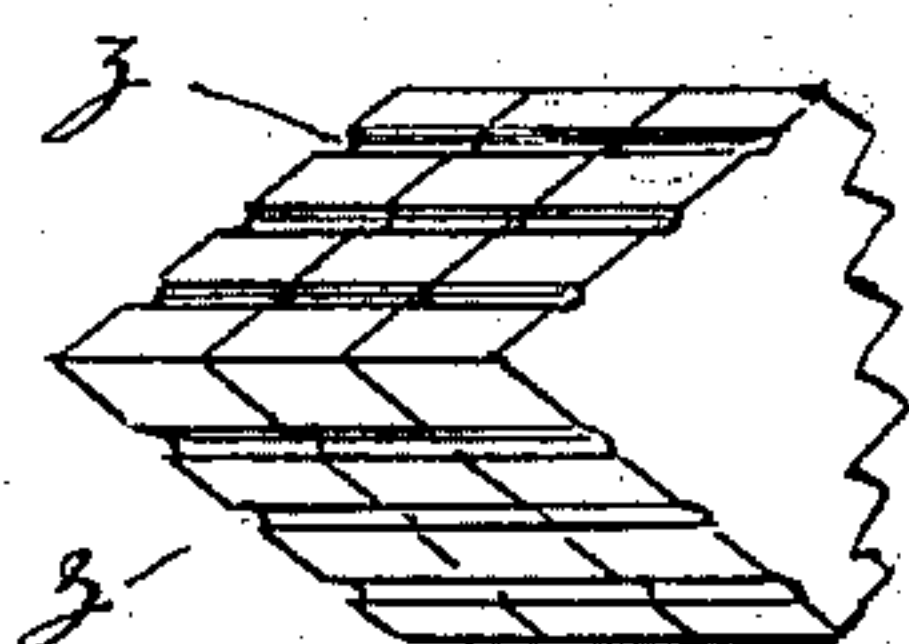


FIG. 11.



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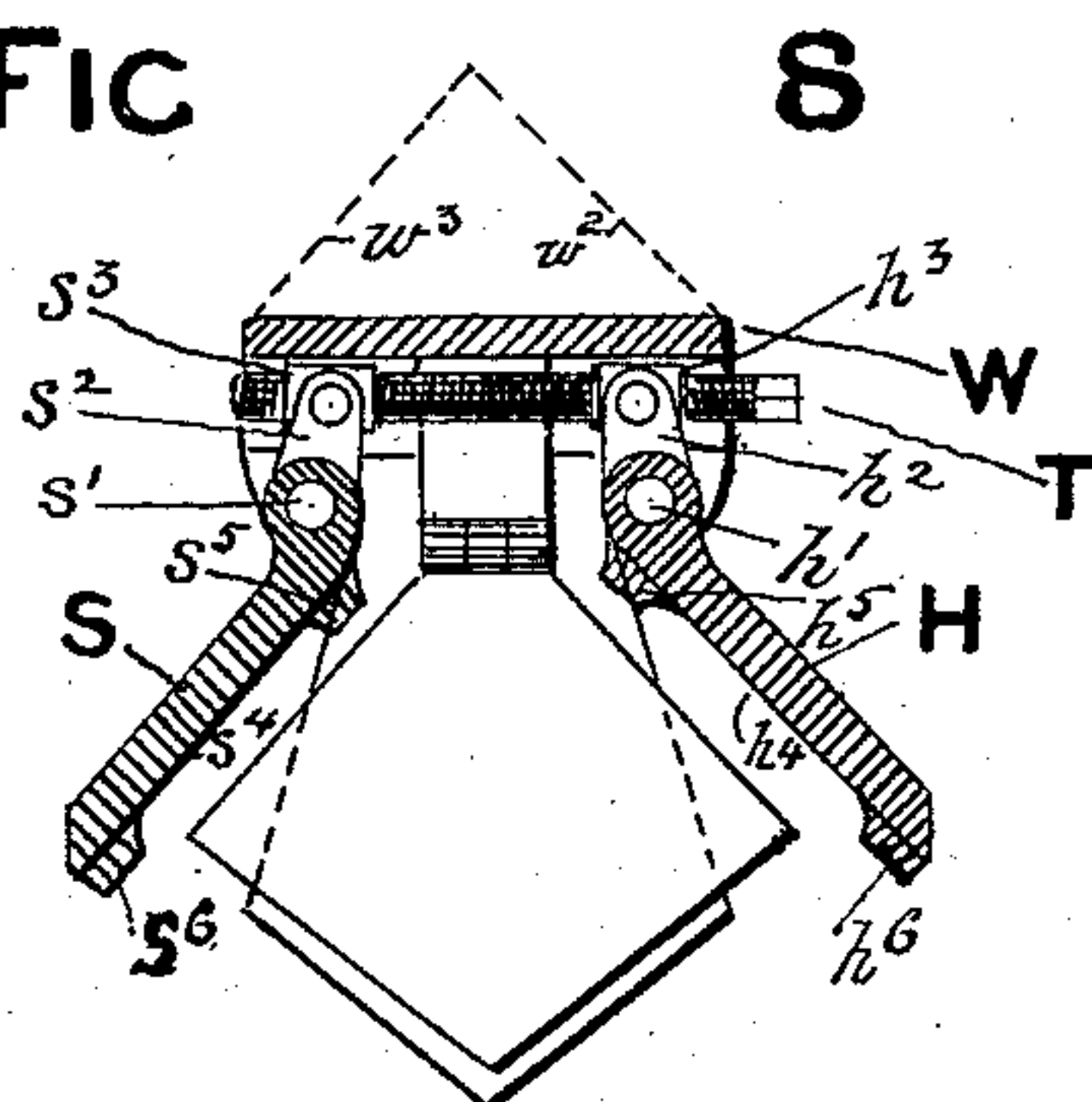


FIG. 12.

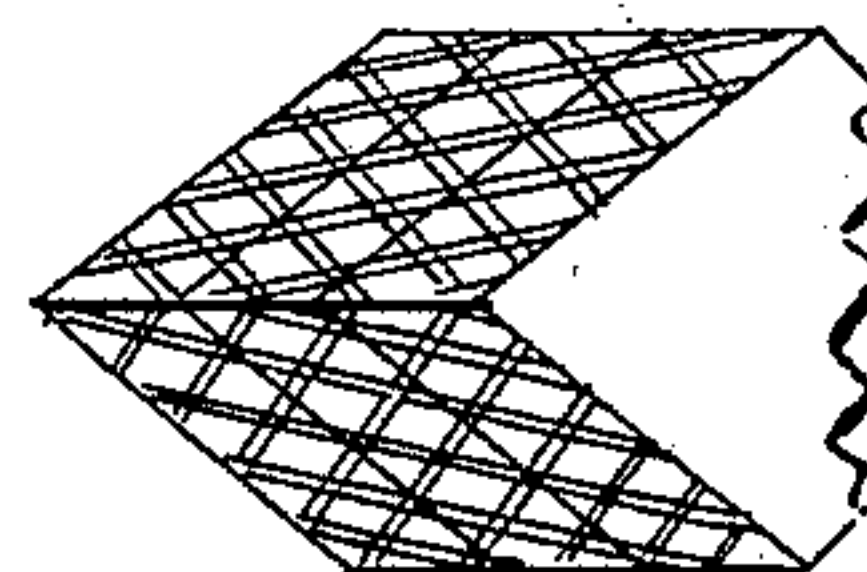


FIG. 9.

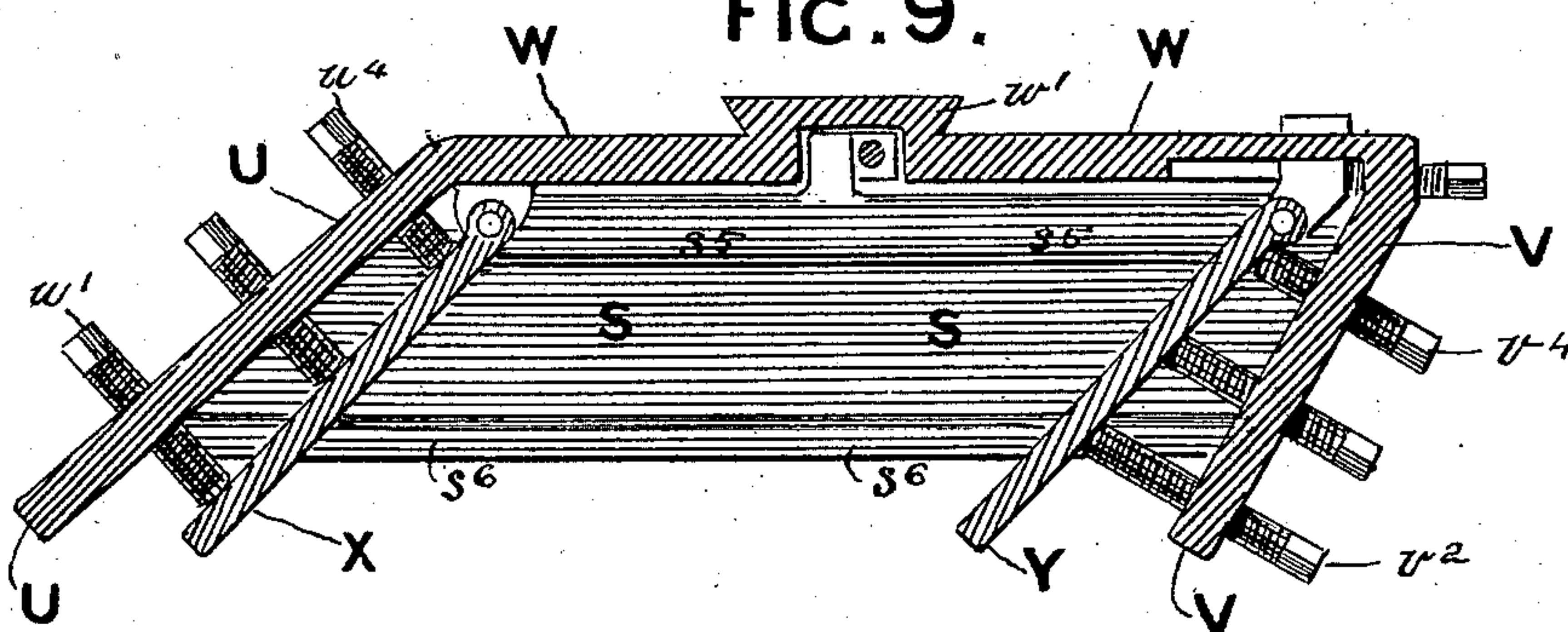
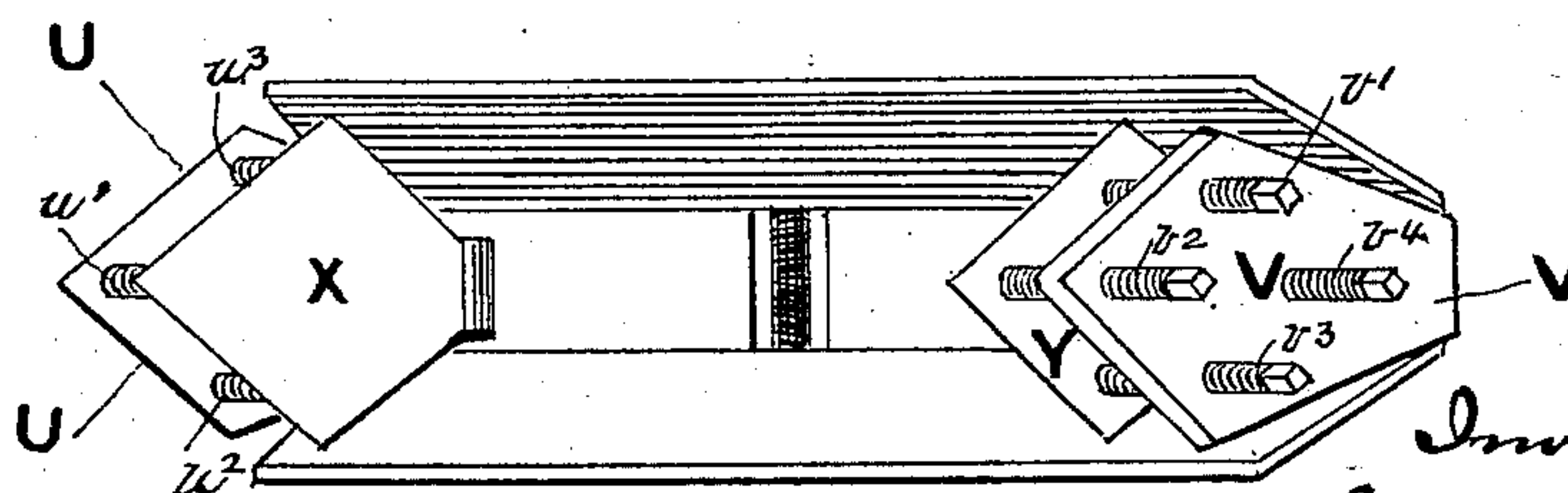


FIG. 10.



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UNITED STATES PATENT OFFICE.

EDWARD HENRY PEARCE, OF BIRMINGHAM, COUNTY OF WARWICK, AND
JONATHAN HULLS, OF BALSALL HEATH, COUNTY OF WORCESTER,
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APPARATUS FOR BEVELING SMALL PIECES OF GLASS.

SPECIFICATION forming part of Letters Patent No. 369,074, dated August 30, 1887.

Application filed May 31, 1887. Serial No. 339,834. (No model.) Patented in England January 31, 1887, No. 1,495.

To all whom it may concern:

Be it known that we, EDWARD HENRY PEARCE, of Birmingham, in the county of Warwick, England, manufacturer, and JONATHAN HULLS, of Balsall Heath, in the county of Worcester, England, manager, and both subjects of the Queen of Great Britain, have invented a certain new and useful Improved Apparatus for Beveling Small Pieces of Glass, (the same having been patented in England by Letters Patent dated January 31, 1887, No. 1,495;) and we do hereby declare that the following is a sufficient description of the invention to enable those skilled in the art to which it appertains to carry the same into practical effect.

Our invention has for its object an improved apparatus for beveling small pieces of glass, which is specially intended to economize time by manipulating a number of pieces at one time, instead of each piece separately, as the custom hitherto has been.

We make a case or cramp sufficiently long to take in any desired or convenient number of sheets or squares of glass laid back to face, and secured therein with an inclination corresponding to the bevel required to be produced upon the edge or edges thereof. When one set of edges are beveled, the pieces are turned to another set of edges and treated in a like manner. The cramp or case for holding the pieces generally consists of a base and two ends, which are adjustable by a screw or screws in a dovetail or other slide, so as to set to any width of opening, according to the number of pieces to be ground, or their thickness, and the ends may have fitted thereto changeable blocks, giving the various angles to which the pieces are to be ground, or the ends may be adjustable by set or other screws and hinged plates to answer the same purpose, or a case may be kept for each particular bevel; but in any case the principle of grinding is the same.

To facilitate the fixing of the squares, hexagons, octagons, or other pieces we may form the base or a false base with a V groove or trough therein, which assists the glasses to fix themselves in a fairly true line without carefully setting, but otherwise the ends or end or a

false end or set-screws are or is adjustable in a groove to tighten up any desired number in the frame. The face of the V-groove may be lightened out in the pattern, so as to only present two or more guide-lines, like the edge of a straight-edge, for the glasses to rest against. The back is provided with a joint and a quadrant, with stops or other provisions by which the two faces are alternately presented to the grinder at the required angle for grinding. An adjustable stop is also provided to indicate when the required amount of bevel has been ground upon any side of the said pieces of glass.

We manipulate the case or cramp by an attachment to the back—such, for instance, as a knuckle-joint or ball-and-socket jointed rod—which may be arranged to any angle quickly, and this is attached to the arm of a machine, which may be trailed backward and forward across the face of the grinder by any suitable arrangement of gear mounted upon a stout standard. The standard may itself turn, or the arm only, or the case may be worked by hand. The case or cramp is also free to rise and fall as the pieces are ground in a suitable elevating-slide having means for an adjustable pressure, whether by a spring or springs or balance-weights or screw, and thus the cramp or case, when once fixed, will continue its motion automatically until completed, and the case or cramp may be changed from one grinder to the other, so as to smooth and finish, as desired.

A plate and set-screws may connect the rod and cramp, so as to allow of fine adjustment when necessary. The cramp, as worked in its inverted condition, may have the glasses set upon an extra surface plate instead of piled upon the base of the cramp, as before explained.

Our arrangement would generally be used for small squares of glass; but other shapes with flat sides may be ground thereby—such as hexagon, octagon, and other shapes—when carefully fixed to a gage. The fixing would be very simple indeed, especially when a connecting side bar is fitted to the two ends of the cramp or case, so as to place each piece

of glass on the base and against the side piece, which would entirely prevent the need of nice adjustment, which occupies so much time.

In order that the invention may be well understood and carried into practice without difficulty, we have appended two sheets of drawings, upon which examples of its application are shown, and which will be a sufficient guide to others to enable any ordinary conditions to be met.

Figure 1 is a side elevation of a case or cramp in which the glass is fixed on one of the flat straight edges ready for beveling. Fig. 2 is a section on line A B. Fig. 3 is an end elevation of the right-hand end with the wheel E removed. Fig. 4 is a side elevation of an angular case with a number of pieces of glass, F F F, secured therein on the angle, so that two sides of each piece may be beveled before they are turned round, and which have already been ground on two edges of each piece and are now changed to the opposite edges, which are also shown ground to a bevel—this only requiring the glasses to be reversed once to complete the four sides. Fig. 5 is a sectional elevation looking to the right hand, and thus showing the pieces of glass, F. Fig. 6 is an elevation of the left-hand end. Fig. 7 is a perspective view of Fig. 4. Fig. 8 is a section of an angular case so made as to allow the sides H and S to be adjusted to any angle as well as the inner ends thereof. Fig. 9 is a vertical longitudinal section of the adjustable case shown in section by Fig. 8. Fig. 10 is an inverted plan of the case shown by the two previous figures. Figs. 11 and 12 represent in perspective parts of the glass plates having grooves and checker-marks on their surfaces.

Figs. 1, 2, and 3 show the manner of holding the glasses when they are fixed four times to grind four edges, such as in the case of squares. The end piece, G, is solid with the base K. We call K the "base" because the glasses are usually fixed therein when the case is inverted, it being now shown as it appears when grinding upon a horizontal grinder, J. The ends D are either made solid with the base K or they may be made removable, as shown at Fig. 1, by the use of bolts, studs, set-pins, or other means. The advantage of having them loose is that the same case in other respects will do for a number of bevels, whether little or great, or for even square edges by simply changing the block D to one of a different bevel, because the flap C is adjustable to any bevel within a reasonable range, because it is hinged to the sliding block C' at c^2 . This sliding block is made with a neck, c^3 , and cover-plate c^4 to slide in a slot, k' , cast or made in the base K.

The action is as follows: When the case is inverted, the glasses F F F are placed upon the base K so as to lean against the bevel-block D, resting upon any suitable rubber or other soft face, d' , then the sliding hinged flap C is brought up against the back glass with its

rubber or other soft face c^5 bearing thereon, where it is secured by the set-screws L and L', both of which are operated by a changeable handle or hand-wheel, E. The case or cramp is attached to the arm M of any suitable machine which is capable of moving the glasses with a radial reciprocating or other movement upon the grinder J; but this attachment may be made in a number of ways—such, for instance, as with a bored socket and turned pin or a planed surface and flat flanged joint fastened by screws or a vacuum-joint, so the case could be removed from one grinder to a smoother a sufficient number of times to complete the finish without changing.

Figs. 4, 5, 6, and 7 illustrate an angular case or cramp, which is shown with the glasses F F F fastened therein. In this case there are two bases—viz., the side N being one and P another. The end Q is in this case either cast or fixed fast to the base, the rubber or other soft face q' , against which the glasses bed, and a hinged sliding flap, R, is secured against them by suitable screws, as in the previous case. The advantage of this angular case is that when one lot of edges, $f' f' f'$, are ground the case simply requires turning to the base P, when the edges f^2 may likewise be ground, thus only necessitating two fixings to grind four edges of each piece. The glasses are easily set upon the projecting edges or lines p' and p^2 , the metal being cut away at the corner p^3 , and also at similar parts of side N, so as to minimize the bearing-surface upon the edges of the pieces F to be fixed therein. In angular cases or cramps the slightest alteration in the inclination of the pieces F necessitates an alteration in the angle of the sides N and P to each other, and to meet this difficulty we make adjustable cases—such as are shown at Figs. 8, 9, and 10, where the sides H and S are hinged to a base-piece, W, at h' and s' , and each side has an arm, h^2 , or s^2 , or their equivalent, which carries swivel-nuts h^3 and s^3 , so that the angle of the sides H and S is easily altered by the right and left handed screw T. The sides are cast or formed with recesses h^4 and s^4 , which leaves the projecting strips h^5 and h^6 and s^5 and s^6 , against which the glass rests—i. e., generally on these four strips—which are made quite true. The ends U and V are cast or made fast to the base-piece W, and hinged ends X and Y are set to any bevel by the set-screws u' , u^2 , u^3 , and u^4 at one end and v' , v^2 , v^3 , and v^4 at the other end. One of the ends in this case Y, slides in a slot in the base W, as previously explained in regard to Figs. 1, 2, and 3. Sufficient space is left between the edges of the ends X and Y to allow the sides H and S to be brought inward when necessary. The base W may have a dovetail, w' , to fix to the arm of a machine, or it may have a double base, w^2 and w^3 , as shown by dotted lines in Fig. 8, which is equivalent to the two backs P and N. (Shown at Figs. 5 and 6.) The flat base is, however, sufficient, because a quadrant may be attached to the arm M, by which

the case can be turned from one base to any desired angle, or just to the two angles, against suitable regulating-stops. While these glasses are still in the case they may be grooved, as shown by *z z*, Fig. 11, or checkered, as shown at Fig. 12, which is easily accomplished over suitable cutting-stones, whether V-edged, round, or other shaped. In the checkering it is merely necessary to fix to M a dividing plate and slide similar to a slide-rest or dividing-machine, so that various lines may be truly divided over the cutting-stone, and thus figured edges of almost any description or design may be obtained thereby. These cases may be used entirely by hand, or partly by hand, and the glasses may have their edges ground to any angle from square to the longest slant.

What we claim, then, is—

In a case for holding plates of glass in an inclined position during grinding, a base, in combination with an end block sliding thereon, an inclined flap hinged to said block, and adjusting-screws operating against said flap and said block, said base being provided with an inclined end piece opposite to said flap, in order that the plates of glass may be clamped between them, substantially as set forth.

In testimony that we claim the foregoing as our own we affix our names in the presence of two witnesses.

EDWARD HENRY PEARCE.
JONATHAN HULLS.

Witnesses:

GEORGE PRICE,
GEORGE BARKER.