

(No Model.)

2 Sheets—Sheet 1.

W. R. FOX.
MITER CUTTING MACHINE.

No. 435,219.

Patented Aug. 26, 1890.

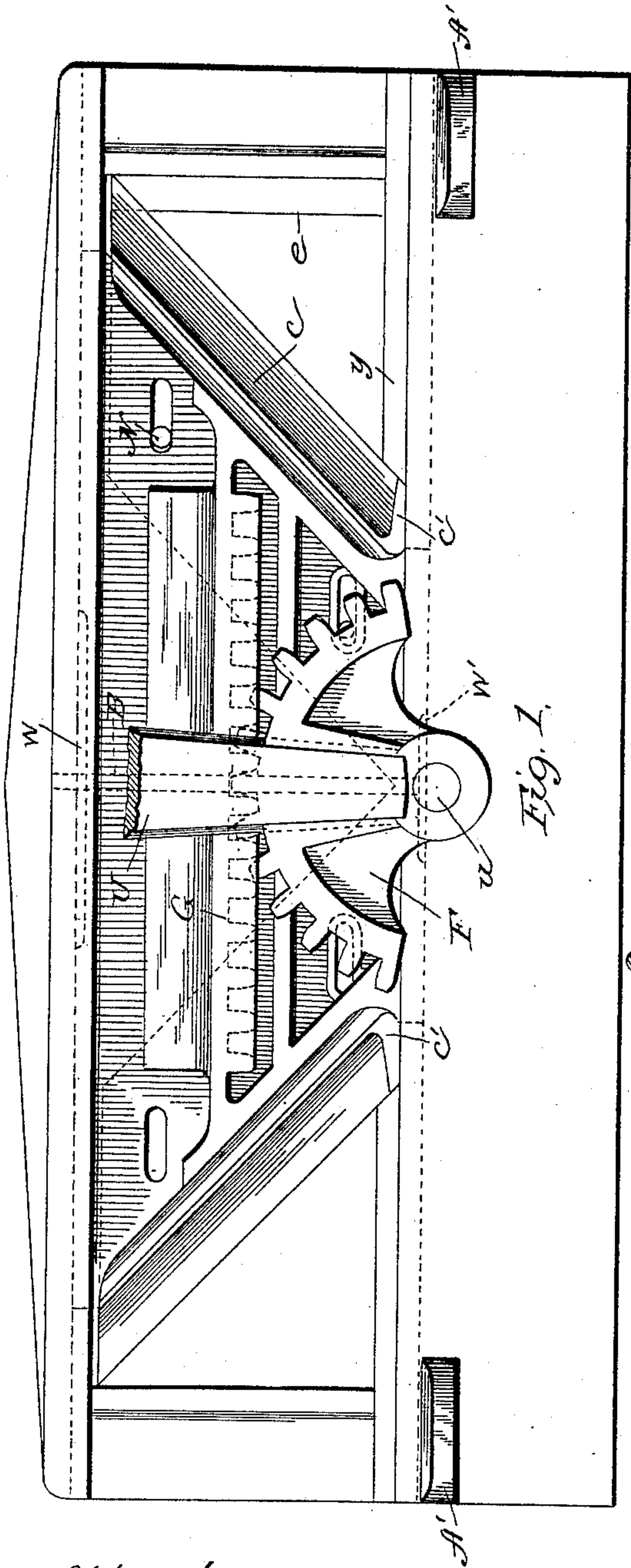


Fig. 1.

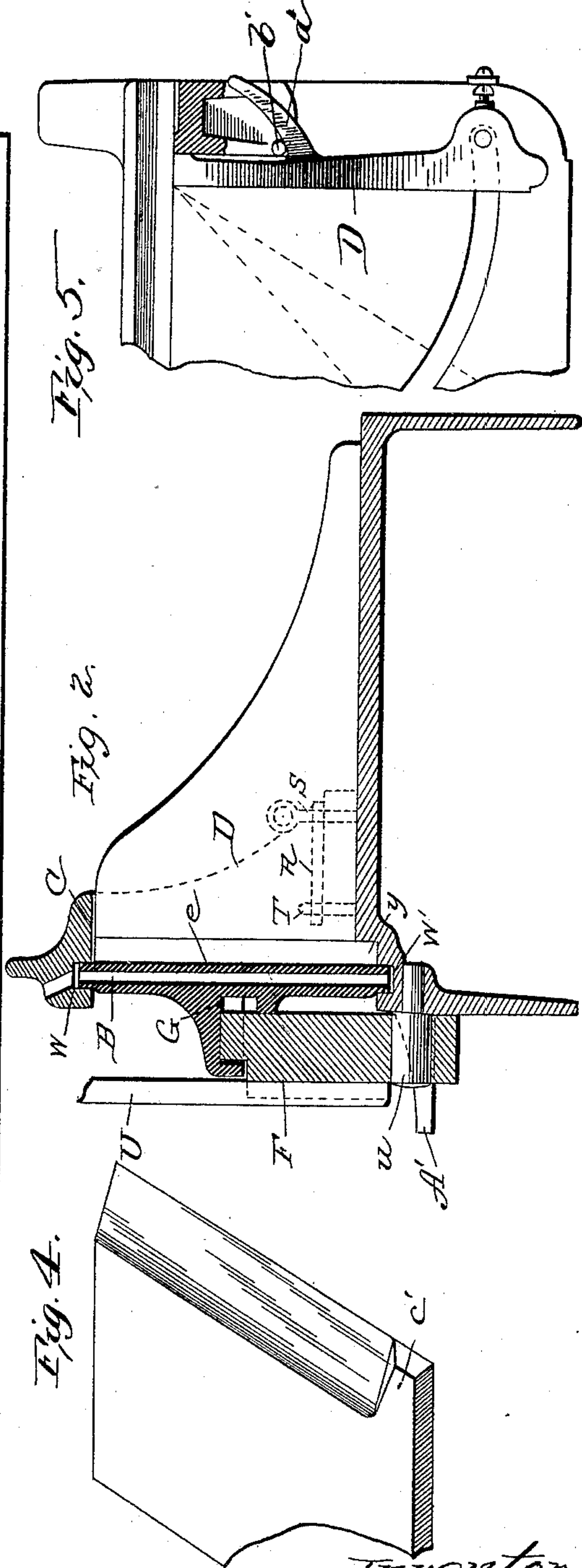


Fig. 2.

Fig. 4.

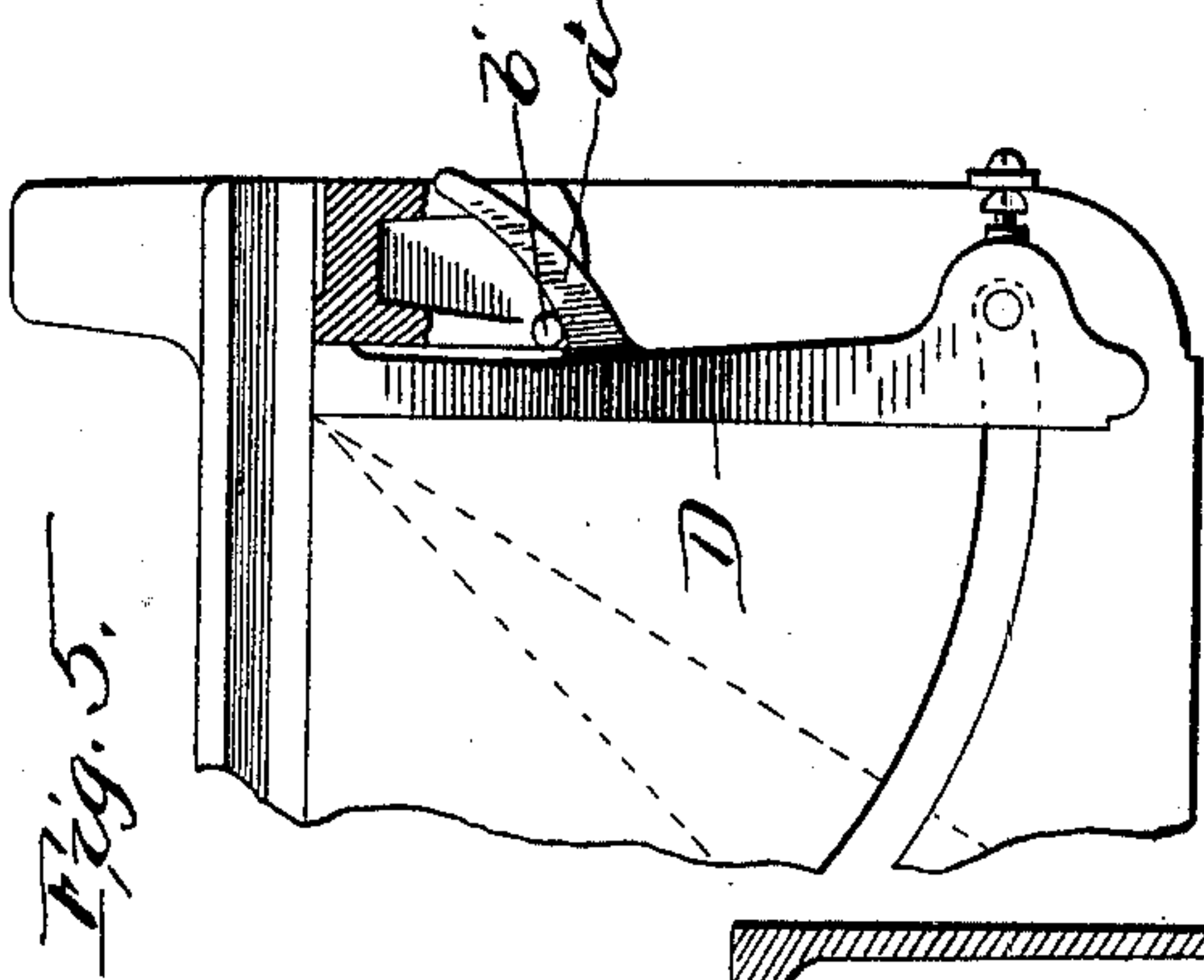


Fig. 5.

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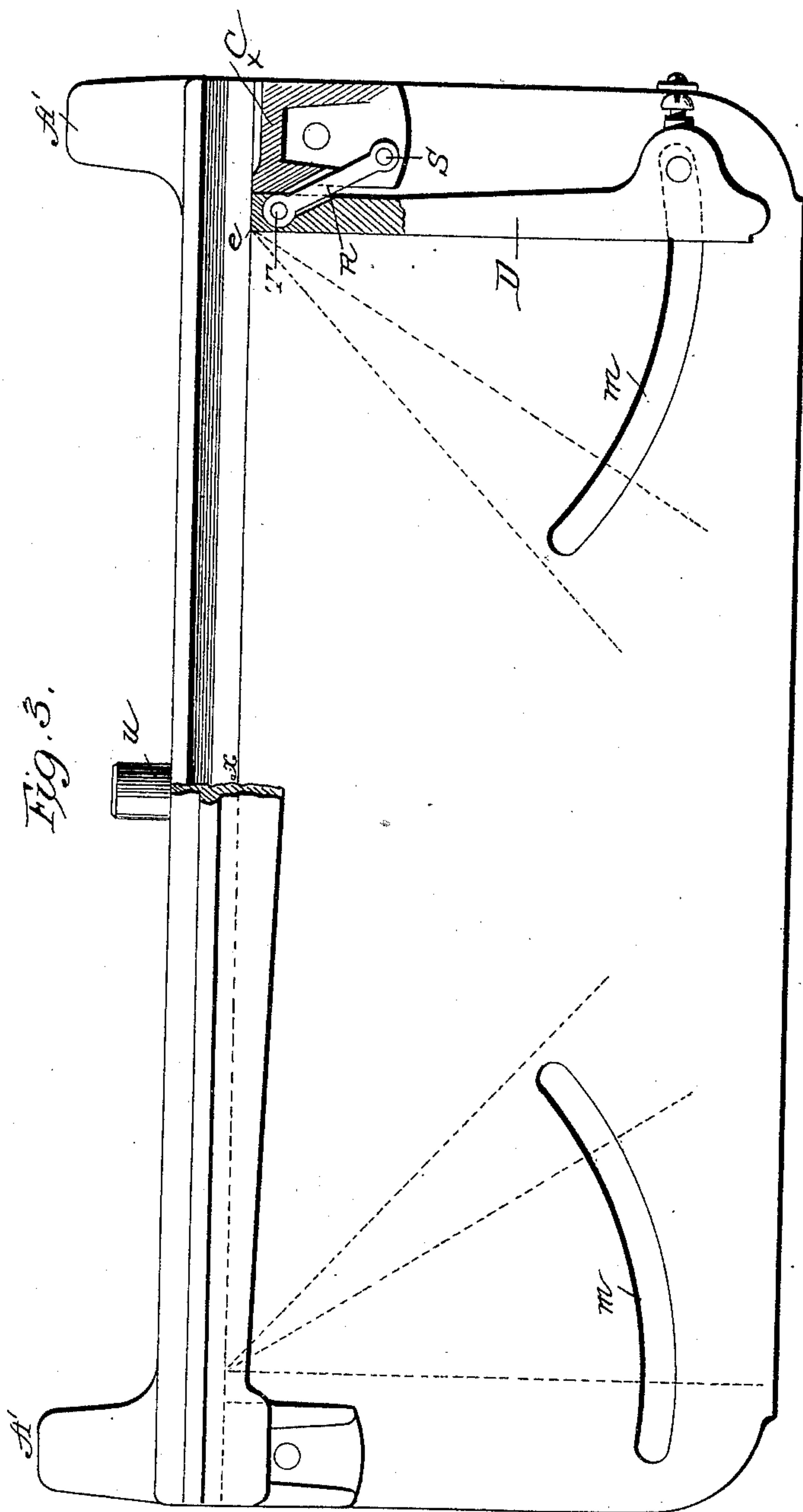
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN.

MITER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,219, dated August 26, 1890.

Application filed December 9, 1889. Serial No. 333,036. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Improvement in Miter-Cutting Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention hereinafter described relates to miter-cutting machines or trimmers, and in some points is an improvement upon the kind of trimmer shown in Letters Patent of the United States, granted to me December 4, 1888, No. 393,970.

Several points in which the improvement consists are all hereinafter explained and are illustrated by the accompanying drawings, in which—

Figure 1 shows an elevation of the back of the machine. Fig. 2 represents a side elevation in section; Fig. 3, a plan or top view with the parts removed. Fig. 4 is a perspective view of the knife-blade, and Fig. 5 is a broken plan view of a modification.

Heretofore, as in my aforesaid patent, for example, two racks are used with the intervening pinion, one rack being fixed upon the bed-piece and the other being upon the carriage on which the knife is moved. This rack is shown in Fig. 1 at G, and its position is also indicated in Fig. 2. In place of the rack upon the bed-piece, I provide a segment F. This is pivoted on a stud *u* upon the bed, and is adapted to engage with the rack on the carriage and to move the carriage in either direction the required distance. The segment is moved in either direction by means of the handle U.

In order to limit the motion of the lever-handle U, I provide stops. They consist of lugs, which may be cast upon the frame and extend laterally to the rear in the same vertical plane in which the handle or lever U oscillates, in imparting movement to the knife. They are located in respect to vertical arrangement at a point where they are adapted to arrest the motion of the lever U when the knife has reached the outer limit of its movement. While I have shown the stops in connection with the segment and single rack, it will be apparent that they may be used without change in connection with the loose pinion

and the double rack, as shown in my aforesaid patent.

I provide an oil-chamber in the carriage, as shown more clearly in Fig. 2. The carriage moves in grooves, one in the bed-piece and the other in the upper part of the frame of the machine. The carriage is recessed at top and bottom, the recess in the upper part being marked W, and that in the lower part W', and these are connected by a vertical passage B. The chamber is preferably filled with wicking or some porous material to retain the oil which, as the carriage moves, lubricates the ways.

Another part of the invention relates to the construction of the knife, which is shown at *c*. This is fixed to the carriage by bolts N passing through slots. As shown in the drawings, there is a knife on each end of the carriage, and the machine is double acting. The knife is beveled on the rear side, as shown in shaded lines in Fig. 1; but the bevel does not extend fully to the lower end of the knife, which at the lower end is left at its full thickness, the bevel-surface terminating at its lower end in a curve, which is below the upper face of the bed, so that the cutting-edge extends below said upper surface, but leaves the full thickness of the knife to move in the groove or way on the bed. This full thickness is shown at *c'*, and that part of the groove in which it moves is shown at *y*, in Figs. 1 and 2. The construction described serves a twofold purpose: first, the full thickness of the lower part of the knife forces the chips out of the way and keeps the way clear for the carriage; second, it strengthens the knife and lessens the tendency to be drawn into the bed, whereby the bed would be cut, and both the bed and the knife injured.

An important part of my invention relates to the gage and to the means by which the gaging-corner is maintained in the same relative position in respect to the knife, whatever may be the angle at which the gage is set. In my said patent this relative position is maintained by two bearing-surfaces, against which the free end of the gage is supported at any required angle; and in the present case, while I utilize the post as one of the bearings for the gage, I provide the other bearing in rear

of the gage, instead of at the gaging end and in line therewith. The gage-corner *e* is shown more clearly in Fig. 3. The position of the gage D is shown in full lines, and other radial lines from the point *g* illustrate the different positions of the gage. The outer end of the gage is adjustably held by means of the slot *m* and bolt and set-screw in the manner well known. The other end of the gage next to the knife is loosely held by means of a directing connection, consisting of a link R. This may be located near the bottom of the gage by a countersink therein, or it may be located at the point shown in Fig. 2 a little way raised from the lower end of the gage, being let in from the side. The shear-edge *e* is at one corner of the gage end, and the opposite corner or side of the gage bears laterally against the post C, to which it is connected by the link R, which is pivoted to the gage at T and to the post at S. The gage turns on the pivot T as it is swung to change the angle, while lateral movement of the gage is permitted by means of the link-connection to the pivot S, thus keeping the corner *e* always in line with the cut, this line being indicated at *x x*. It will be seen that a peculiar movement of the gage-corner is necessary to effect the desired purpose—namely, to allow it to turn freely, and at the same time automatically maintain its position along the line of the cut—and by placing this connection in rear of the gage, instead of in front, as in my patent aforesaid, a different arrangement is required to effect the same result—that is, I must provide for the turning of the edge *e* in the arc of a circle, and at the same time counteract the curve described thereby by causing the edge to move toward the post, thereby keeping it on the line of the cut. This is done by making the edge describe a circle the center of which is the pivot T, and at the same time limiting the outward tendency of the edge by the link-connection to the frame. If the pivot T were a fixed pivot, when the inner end of the gage is swung to the left the shearing-edge *e* would be swung over the line *x x* and into the path of the knife; but the lateral movement caused by the other corner swinging in the same path on the pivot T bearing against the edge of the post pushes the pivot T out from the post, causing it to swing on the pivot S as a center, thus keeping it on the same straight line or in the same plane.

A modification of this arrangement is shown in Fig. 5, in which, instead of the pivoted link forming the directing connection for maintaining the shearing-edge in the same relative position to the line of the cut, I provide the gage with an extension *a'* in its rear face, which serves by reason of its curved

face bearing on the post *b'* or a pin thereon to allow the shearing-edge lateral movement on the line of the cut. The pivot S may be made removable, and the gage swinging out on its front pivot used for trimming curved or irregular pieces of wood.

The forms of directing connections shown are convenient ones, but, as any mechanic will understand, may be varied without departing from the spirit of the invention.

I claim as my invention—

1. In combination with the bed of a miter-cutting machine and a carriage, a knife carried thereby, said knife having a beveled cutting-edge and a lower unbeveled portion of the full thickness of the blade, this portion of the knife being below the upper face of the bed, thus strengthening the knife on its lower bearing-edge and preventing the tendency of the knife to draw into the bed, substantially as described.

2. In a miter-cutting machine, a carriage moving in upper and lower ways, and a knife carried thereby having a beveled cutting-edge and a lower portion of full thickness moving in the lower guideway, substantially as and for the purpose set forth.

3. In a miter cutter or trimmer, a gage having a shearing-edge, as *e*, a post forming a bearing for said edge, and a connection between the rear of the gage and the frame automatically adjustable in the movement of the gage, so as to cause the shearing-edge to move toward or from the post along the line of the cut, substantially as described.

4. In combination with a gage D, having a shearing-edge *e*, the post C, and a link R in rear of the gage and pivoted thereto at one end, its pivot forming the center of a circle described by the edge *e*, and at the other end pivoted to the frame, said pivot forming the center of a circle described by the pivot of the link, substantially as described.

5. The described miter-cutter, consisting of a bed provided with ways, a carriage moving therein carrying cutters, a segment pivoted to the bed and provided with a handle, a rack on the carriage engaging said segment, a gage at each end of the bed having a shearing-edge, posts forming bearings for said gages, and a connection between the rear of each gage and the frame automatically adjustable in the movement of the gage, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM R. FOX.

Witnesses:

GEO. G. WHITWORTH,
CHAS. F. ROOD.