

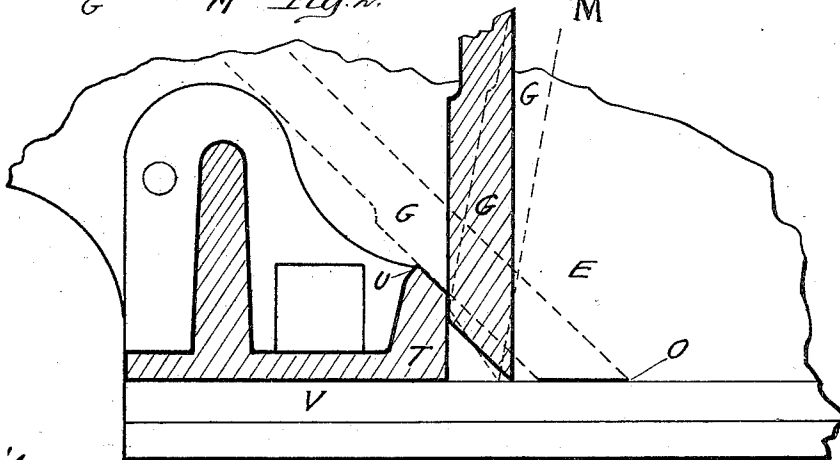
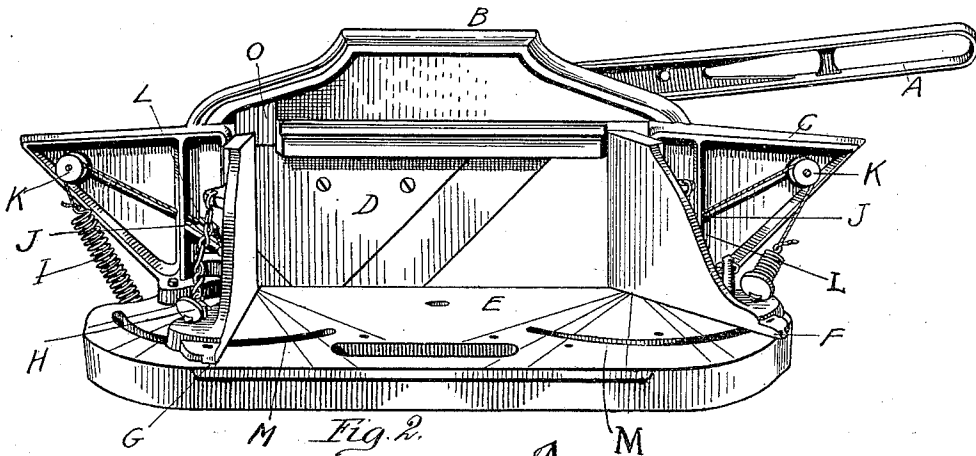
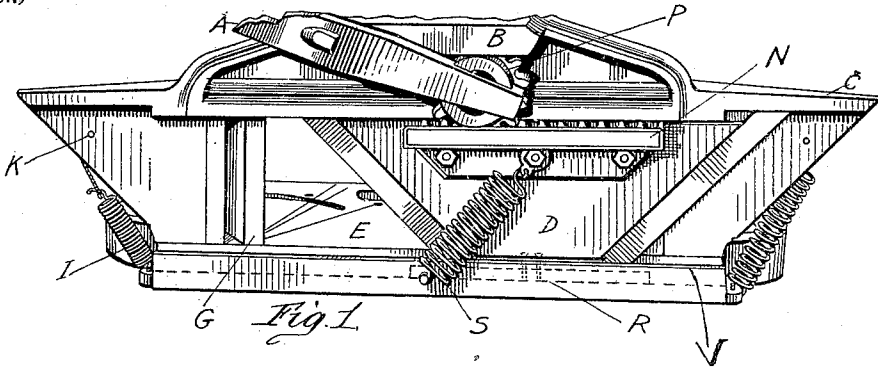
No. 652,136.

Patented June 19, 1900.

J. W. OLIVER.
MITER CUTTING MACHINE.

(Application filed June 26, 1899.)

(No Model.)



Witnesses.
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Fig. 3

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UNITED STATES PATENT OFFICE.

JOSEPH W. OLIVER, OF GRAND RAPIDS, MICHIGAN.

MITER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 652,136, dated June 19, 1900.

Application filed June 26, 1899. Serial No. 721,953. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. OLIVER, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Miter-Cutting Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in miter-cutting machines, and more particularly to that class of machines having a knife traveling in ways, and gages for measuring the required angles to be cut upon the stock placed upon the bed of the machine.

The invention consists, first, in the arrangement of the gage with reference to the knife so as to enable the operator to cut the stock at acute angles, right angles, or obtuse angles by merely changing the position of the gage and moving the stock to correspond thereto; second, to furnish suitable means, in combination with the gage, for retaining the gage in its required position; third, the combination, with the traveling knife, of a pinion, racks, and a lever so arranged as to not only move the knife, but to hold the same down upon the stock and counteract the lifting force exerted by the inclined knife while passing through the stock.

The objects of my invention are, first, to give an increased range of angles cut by the knife; second, to economize time in cutting the stock; third, to give steadiness and accuracy to the moving knife when in operation. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a rear elevation of a miter-cutting machine constructed in accordance with my invention. Fig. 2 shows a front elevation of the same; and Fig. 3 shows a plan of the base or bed of the machine and a section of the gage and supporting-post against which the gage rests, the dotted lines showing different positions of the gage.

Similar letters refer to similar parts throughout the several views.

A shows the handle or lever, which in the example of my invention shown in the drawings operates the knife.

B shows the upper rack, P the pinion, and N the lower rack.

The end lever A is secured to the pinion P and the teeth or cogs of the pinion P engage with the cogs on the upper and lower racks and the movement of the handle or lever A gives the reciprocating movement to the knife D, said knife D being secured to the rack N and moving therewith. I prefer to use a single knife with two inclined cutting edges, as shown in Fig. 1. The inclined position of the knife-edge as the knife is driven through the stock causes an upward pressure upon the knife and its supporting-frame, which upper pressure is counteracted by the pinion, which in operation presses down upon the rack N, said rack N being securely attached to the knife or knife-frame. Another advantage of my construction consists in the fact that the racks are placed at the top of the knife-frame and the chips and shavings cut by the knife from the stock cannot fall upon the rack.

C represents the frame of the machine.

E represents the bed of the machine. In this bed of the machine I provide a slot V, in which slot moves the knife-shoe R, said shoe being secured to the knife, so as to move with it.

In order to prevent the handle or lever A from falling over by its own weight, I provide a spring S, which spring S has its upper end attached to the knife or knife-frame and the lower end to the bed of the machine. This spring S by its tension has a tendency to draw the knife-frame toward the central position; but by its elasticity it allows the knife to be moved by means of the lever freely in either direction.

In the drawings, F shows the right-hand gage, and G the left-hand gage. These gages rest upon the machine-bed, and each gage is provided with a beveled edge, as shown in Figs. 1 and 3. The beveled edges rest against the bearing O, which bearing retains the edges of the gages in position to make a shear cut with the edge of the knife.

T T represent the posts which form rests for the gages and also, in the example of my invention shown in the drawings, form a part of the frame of the machine. Each post is provided with an angular bearing or its equivalent, the preferred form of such bearing being shown by U in Fig. 3. The object of the angular form of the post is to allow the gage

to swing back beyond a right angle, so as to cause it to measure or gage obtuse angles. The form of this angular bearing may be changed or modified without departing from the spirit of my invention. Any form of post which will support the gage at its end nearest the knife and will allow the gage to be turned beyond a right angle, so as to enable the operator to cut the stock at an obtuse angle, is within the terms of my invention.

The reference-letters M indicate curved slots in the bed of the machine, which slots conform to the movements of the gages, it being evident that inasmuch as the bearing edge of each gage travels as the gage is swung in different positions to measure different angles this slot will not be on the curve of an exact circle, but approximately that of an ellipse. However, if the slot is of considerable width, so as to allow of lateral movement of a bolt or tongue moving therein, it might be made on the arc of a circle, although I prefer the form above described.

H is a thumb-screw adapted to retain the gage when set in any required position—that is, in position to gage any required angle at which the stock is to be cut.

In order to retain the gage in position so as to continually bear against the post T and to retain the beveled edge in close proximity to the line of bevel of the knife-edge, I provide the spring I, secured at one end to the bed or to the frame of the machine, and at its other end secured to the cord J. This cord J passes over pulleys K and L and is attached to the gage at a point near the beveled edge of the latter. This spring by its tension holds the gage always in contact with the post T, whether the gage is swung to a right angle, an acute angle, or an obtuse angle.

One advantage obtained by constructing the knife in one piece with the two beveled edges is that it cheapens the construction, and another and a more important is that it facilitates the removal of the knife from the machine when it becomes necessary to replace the same with a new knife or becomes desirable to remove the knife for sharpening. The knife, as above described, is held in place in the slots or ways in the machine by means of the pinion P, disposed in the slot in the upper part of the frame, which forms a bearing or way for the knife, and the slot in the bed of the machine, which forms a way for the lower part of the knife or shoe, extending entirely through said bed, permits the knife to be entirely removed from the machine. This pinion P, however, can be revolved, so as to carry the knife, with its knife-rack, outwardly until the knife-rack becomes detached from the pinion, and then the knife can readily be removed by the hand of the operator and after being sharpened can be replaced by merely pressing the same into the machine, turning the pinion so as to make an engagement with the rack on the upper part of the knife, thereby greatly facilitating

the operation of sharpening the knives and also the removal of the knife and the replacing when sharpened.

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

1. In a miter-cutting machine, the combination with a bed and an upright frame thereon, of a knife arranged to travel in ways formed in said bed and frame, a coiled spring attached at its upper end to the knife and at its lower end attached to the bed at a point central to the travel of the knife and operating to normally hold the knife centrally between the gages, laterally-adjustable gages having beveled edges arranged in close proximity to the line of movement of the cutting edge of the knife and bearing on said frame, posts arranged to form bearings for the gages near the inner edges of the latter, said posts having a plurality of bearing-faces to permit the gages to be adjusted at varying angles, substantially as described.

2. In a miter-cutting machine, the combination with a bed and an upright frame thereon, of an approximately V-shaped knife arranged to travel in ways formed in said bed and frame, gages having vertical beveled edges, bearings against which said beveled edges of the gages rest in close proximity to the knife, angular posts arranged to form rests for the gages, means for retaining the gages in contact with said posts, a coiled spring attached at its upper end to the knife and at its lower end attached to the bed at a point central to the travel of the knife and operating to normally hold the knife centrally between the gages, substantially as described.

3. In a miter-cutting machine, the combination with a bed and an upright frame thereon, of a knife arranged to travel in ways formed in said bed and frame, a horizontal rack attached to the frame above the knife, a corresponding rack fixed to the knife below and parallel to the upper rack, a pinion loosely arranged between and gearing with said racks, and a lever rigidly attached at one end to the pinion, gages having vertical beveled edges arranged in close proximity to the line of travel of the knife, posts angular in cross-section and disposed to form abutments for the gages, and a spring for normally holding the knife centrally between the gages, substantially as described.

4. In a miter-cutting machine, the combination with a bed and an upright frame thereon, of a knife arranged to travel in ways formed in said bed and frame, gages having vertical beveled edges arranged in close proximity to the line of travel of said knife, posts angular in cross-section arranged to form abutments for said gages, cords attached to the gages, pulleys forming guides for said cords, and coiled springs each attached at one end to one of said cords and at the other end to the bed of the machine, said cords and springs operating to normally hold the gages

in contact with the posts, substantially as described.

5 5. In a miter-cutting machine, the combination with the bed and upright frame, of a knife moving in ways on the frame and provided with an inclined cutting edge, a rack secured to the knife, a rack fixed to the frame above the rack on the knife, a pinion interposed between and engaging said racks, and

means for rotating the pinion, substantially as described and for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH W. OLIVER.

Witnesses:

DORA B. PARKER,
STUART E. KNAPPEN.