(No Model.) 2 Sheets—Sheet 1.

W. H. GOLDING.

MACHINE FOR CUTTING PRINTERS' RULES.

No. 379,777. Patented Mar. 20, 1888.

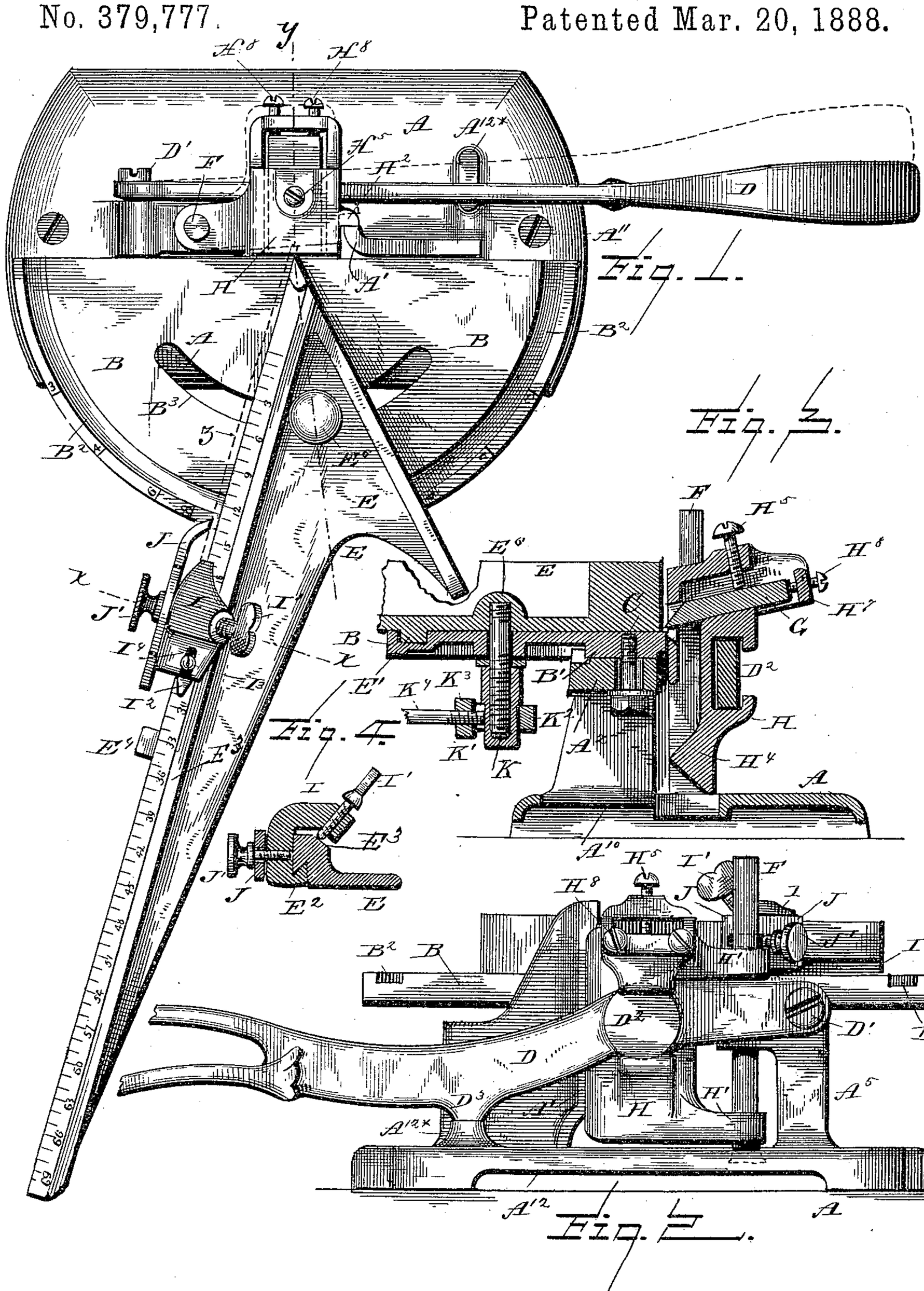

Fig. 1.

Fig. 2.

Fig. 4.

Fig. 3.

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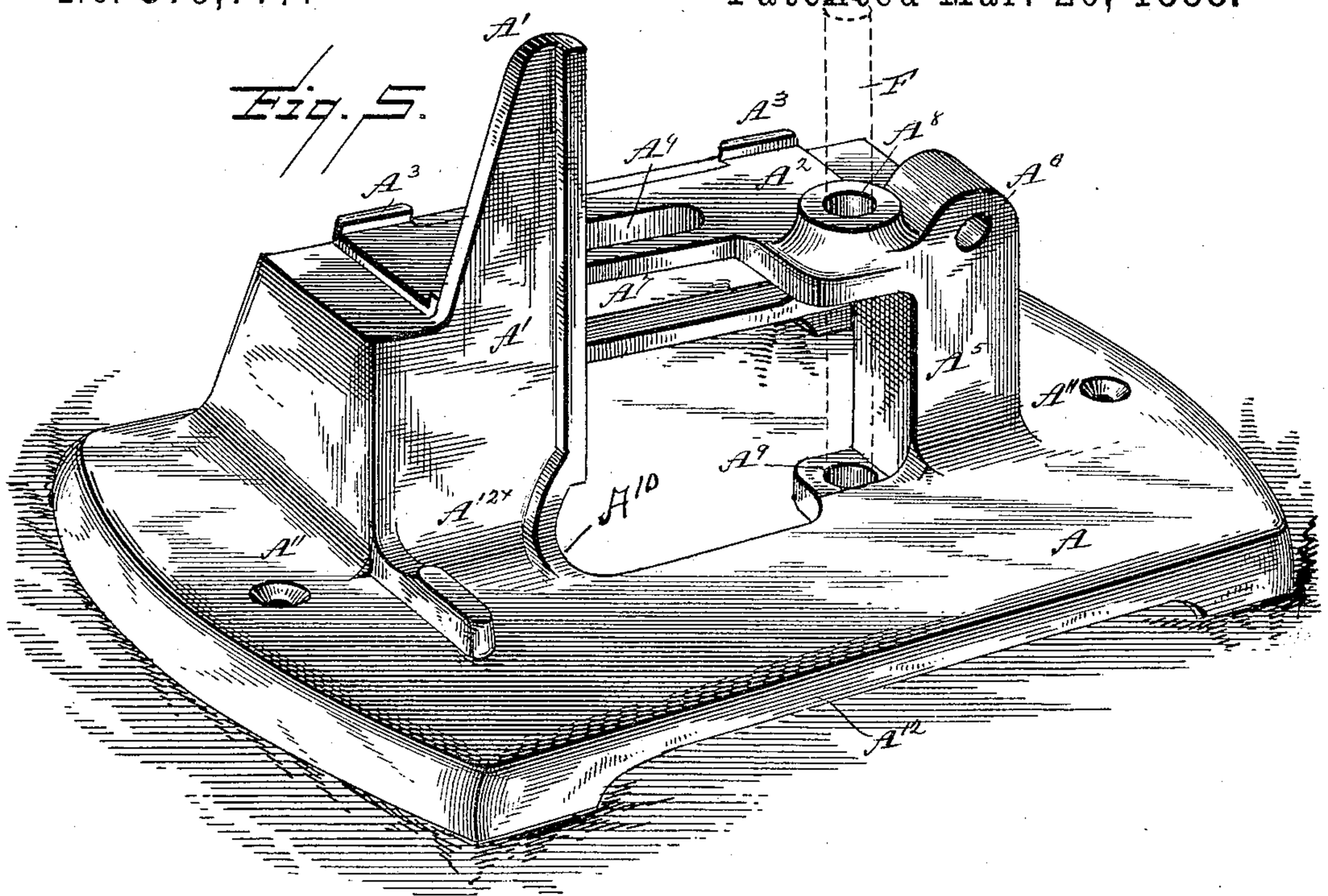
Fig. 5.



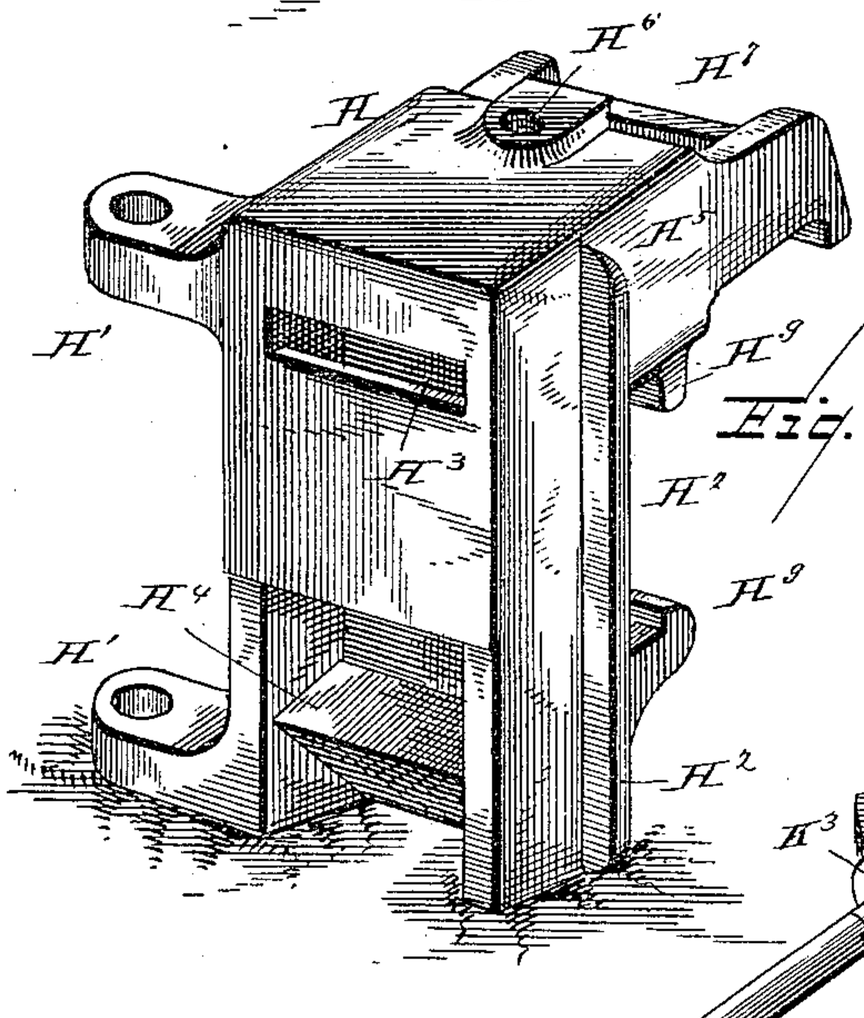
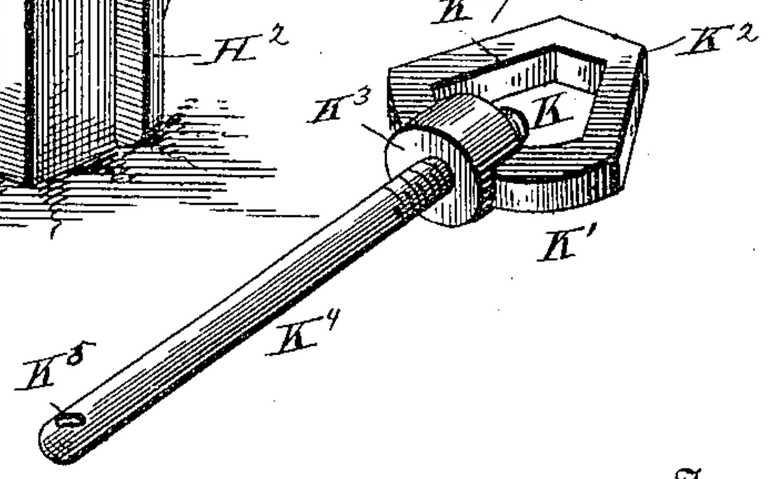


Fig. 6.

Fig. 7.



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MACHINE FOR CUTTING PRINTERS' RULES.

SPECIFICATION forming part of Letters Patent No. 379,777, dated March 20, 1888.

Application filed March 11, 1887. Serial No. 230,479. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HUGHSON GOLDING, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Printers' Leads, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to a machine for mitering printers' rules, and it has reference more particularly to that class of machines in which the rule is supported edgewise upon a segment-bed, while its end is cut by means of a knife mounted in a carrier-head, which is capable of both a vertical and a horizontal reciprocation.

Among the objects in view are to provide a solid bearing for the bed at the point where the greatest resistance to the operation of cutting is required; to mount the head or knife-carrier in such a manner that the cut of the knife shall be the same at the bottom as at the top of the rule, and so that the knife may be held firmly to its work to produce a smooth accurate joint, free from any inaccuracies produced by any trembling of the knife or carrier; to construct the frame-work of the machine in a low compact form, and at the same time provide a sufficient clearance for the tool of a planer employed in fitting the guide for the carrier; to provide means for adjusting and retaining the knife within the carrier, so as to present it squarely to its work; to construct a rule holder or guide in such a manner as to permit of a movement of the rule-gage along over the table, and so as to permit of adjustably securing said gage to the holder in a firm manner, and to provide said gage with a rule-clamp and with an adjustable indicator.

Other objects and advantages of the invention will appear in the following description, and the novel features will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a mitering-machine constructed in accordance with my invention. Fig. 2 is a front elevation. Fig. 3 is a vertical section taken on the line Y of Fig. 1. Fig. 4 is a section on the line X of Fig. 1. Fig. 5 is a perspective of the base or foundation casting. Fig. 6 is a like view of the cutter-head. Fig. 7 is a detail in perspective.

A (see Fig. 5) represents the base or foundation of the machine, which in this instance is formed of a single casting comprising in its make-up a cutter-head guide, A′, a bed, A^2, for the segment-table, which bed has vertical flanges A^3, within which a rib, B′, formed on the under surface of the segment-table, fits, and a slot, A^4, through which the segment-table securing-bolt C passes. The foundation also embodies a standard, A^5, perforated, as at A^6, for the pivot D′ of the cutter-head operating-lever. The bed A^2 is cut away, as at A^7, to permit of the entrance of the cutter-head, as hereinafter described, and is perforated vertically, as at A^8, for the passage of a standard, F, which is also seated in a perforation, A^9, at the lower portion of the upright A^5.

The foundation is provided with an opening, A^{10}, for the reception of chips. The front boundary of the opening A^{10} is extended, as shown, to provide the necessary clearance for the planer-tool when finishing the guide A′ to a straight line at a right angle to that in which the bed A^2 is planed. The foundation-casting is also of such a conformation as to permit of unobstructed access for the purpose of drilling or otherwise making the perforations A^8 A^9, and at the same time to permit of the foundation being formed as a single casting, the arrangement of the projections thereon being such as to permit the withdrawal of the pattern from the sand.

B represents the segment-table, and it is provided at its straight edge and projecting from its bottom with the rib B′, in which the bolt C is threaded, so that the table can be moved upon the bed A^2 of the foundation, in order to change the position of the center of the segment, so as to present the lead at different points along the cutting-edge of the knife G, so that when said knife becomes dull at one point it may be used at others before grinding or otherwise sharpening the same.

The table B is provided with a groove, B^2, formed on a regular curve or circle having a center in common with that of the segment. It is also slotted on a like curve, as at B^3, for the adjustable connection of the rule holder or guide, as hereinafter described.

H represents the knife-carrier, which is shown in plan in Fig. 1, in section in Fig. 3, in front elevation in Fig. 2, and in perspective in Fig. 6. From the body of the carrier there project two lugs, H′, each of which is perforated for the reception of the standard F, one of the lugs being arranged above and the other below that portion of the table A^2 which is perforated, as at A^8, for said standard when the parts are assembled. At the opposite side of the body of the carrier there projects a vertical rib or flange, H^2, which is intended to come into contact with the guide A′, whereby the vertical reciprocations of the knife when the parts are in contact are in a perfectly straight line in a plane perpendicular to the surface of the segment-table and near the straight edge thereof.

As clearly shown, the standard F projects above the bed, so as to provide a bearing for the upper lug of the carrier during the upper portion of its movements. The body of the carrier is hollow, its rear wall being slotted, as at H^3, for the projection of the edge of the knife and for the passage of chips beneath the knife into the interior of the head. In the lower portion of said interior there is formed an inclined table, shelf, or rib, H^4, which serves to deflect the falling chips through the opening A^{10} of the foundation, where they may be received in any suitable receptacle, or upon a table or bench, to which the machine may be secured by screws or bolts passing through perforations A^{11}, formed in the foundation-casting.

The chips may be removed from beneath the base through an opening formed by cutting away the same, as at A^{12}, by means of a rule or other suitable implement. Projecting from the front of the body portion of the carrier is a hollow knife-supporting bracket, H^5, the top of the carrier being perforated, as at H^6, for the passage of a set-screw for holding the knife in position. A front wall, H^7, is provided and adapted for the reception of two or more screws, H^8, for adjusting the knife for a desired depth of cut, as well as into parallelism with the bearings of the carrier. In the front wall of the carrier there are formed two lever-embracing lugs, H^9. When the parts are assembled, the lever D, which is pivoted at D′, passes between the lugs H^9, and is provided with a circular bearing, D^2, at the points thereof, coming into contact with the lugs, whereby a minimum friction and smoothness of operation between the lever and the head are secured. A foot, D^3, is formed on the lever to come into contact with a step, A^{12}, formed on the foundation-casting, when the lever is in its lowest position. The lever is perforated to fit loosely on its pivot D′, so as to be capable of a lateral movement, as indicated by dotted lines, Fig. 1, which, by reason of the pivotal mounting of the carrier upon the standard F, serves to give a similar movement to the knife therein.

E represents the rule holder or guide, and it has on its under surface a projecting curved rib, E′, (see Fig. 3,) to fit the groove B^2 of the segment-table. The top of the guide is graduated with a scale, indicating picas, whereby rules may be cut of different lengths without the use of quads for their measurement. The bottom of the guide is provided with a V-groove, E^2, and its upper corner, diagonally opposite said groove, is removed to form a beveled surface, E^3.

I represents the gage, and it consists of a casting adapted to fit against the vertical wall of the guide and at its lower portion to enter and fit the V-groove E^2 and to project over the guide, so as to present its set-screw I′ for perpendicular bearing upon a beveled face, E^3, of the guide. The object of this construction is to utilize the friction of the surfaces of the gage and guide which come into contact with each other, to render its connection therewith firm without relying wholly upon the friction of its set-screw I′ with the beveled surface E^3. In forming the V-groove E^2 the lower portion of the vertical wall of the guide is removed throughout its entire length, whereby the gage I may be moved along over the table B for cutting rules of short lengths.

J represents the rule-holder proper. It consists of a plate of metal slotted for the passage of a thumb-screw, J′, seated in the face of the gage, so as to be adjustable lengthwise upon the vertical face of the guide, and is bent at one end, so as to bear upon a rule, Z, dotted line, Fig. 1, arranged against the guide.

In order to support rules which are of a length approaching that of the guide or longer, a flange or lip, E^4, may be formed on the guide, as shown in Fig. 1. Adjustably secured to the gage I is an indicator, I^2, the screw I^3, passing through a slot, I^4, in the gage, serving to render the indicator adjustable. By means of the adjustable indicator variations caused by slight changes in the position of the knife may be neutralized.

As clearly shown in Fig. 1, the segment-table is provided with a scale which indicates the different angles at which the guide may be presented to the knife. The numbers on the scales show the position for producing a miter-joint on rules, designed to form figures of a desired number of sides. For example, to produce an octagon, the guide would be set with its vertical face at the line 8 of the scale.

As a means for adjustably retaining the guide in a desired position, a bolt, K, is screw-threaded in a boss, E^6, and passes through the slot B^3 of the segment-table, and is provided with a polygonal head.

Fig. 7 is a perspective of a lever, K′, which consists of a frame adapted to embrace the bolt-head, and having two opposite inclined walls, K^2, and an intermediate screw-threaded socket or boss, K^3, in which is fitted a rod, K^4, perforated, as at K^5, for the introduction of any suitable implement for tightening the frame upon the bolt-head. By means of this lever, comprising the frame and rod, the guide may be adjusted without the necessity of reaching under the bed and without the use of an or-

dinary wrench, while at the same time, if desired, the lever may be readily removed from the bolt.

Having described the construction, the operation is as follows: In mitering a rule the guide is set to a desired angle, as before described, and the rule is placed on edge against the guide, and either held by one hand of the operator or the rule-holder proper, J, may be clamped against the rule, as shown in Fig. 1. In setting a rule the knife and its operating-lever are swung away from the bed, as shown by dotted lines in Fig. 1, and successive reciprocations of the carrier and knife are made until the flange H^2 of the former is brought into contact with the guide A′, which determines the extent and character of the finishing cut. The bearing-point D^2 of the lever D is arranged opposite the knife, whereby the power is conveyed directly to the latter, and by reason of the long bearing provided on either side of the carrier and the firmness with which it is held in contact therewith there is no trembling of the knife during the operation of cutting, as would be the case if the carrier were only pivotally connected with the lever. Furthermore, in all positions of the knife and carrier the latter is positively connected at one side with the true vertical bearing F, which tends to hold the knife to its work, to overcome its springing away at the commencement of the cutting, and to prevent trembling thereof, so that a perfect joint is formed, the cut being the same at the bottom of the rule as at the top. It is understood, of course, that the variation of a hair's breadth in a vertical plane to the cut, especially at the top of the rule, will render the same defective in its function as a printing-surface, in that the line at the joint will be perceptible in any impression taken therefrom. If the segment-table were supported at points either side of its center, it would necessitate a thicker casting from which it is made, or it would be liable to spring during the act of cutting a rule. Any yielding of either the bed or of the table at this point contributes to an imperfect result, and a material advantage is therefore inherent in providing a continuous support for the table B along its straight edge. The continuous rib, fitting upon the bed A^2 and between its flanges A^3, also prevents any displacement of the bed to the front or rear in changing its position to bring a new portion of the knife into operation, and parallelism of the knife with the bed is preserved. After the carrier has been brought, in the operation of cutting, to a position where its flange comes into contact with the guide, the operation is completed. During the operation of cutting, the chips pass beneath the edge of the knife into and down the head, and are deflected by its shelf or rib H^4, as hereinbefore described.

Whenever it is desired to remove the knife for grinding, a single screw, H^5, is all that is necessarily changed in its adjustment, as the plate may then be removed without disturbing the adjusting-screws H^8.

Having described my invention and its operation, what I claim is—

1. In a machine of the class described, a foundation having a single guide and opposite apertured standard-bearings, in combination with a standard, F, a knife-carrier mounted thereon, and a lever for operating the carrier, whereby said foundation is adapted for the vertical and horizontal reciprocations of the knife-carrier, substantially as specified.

2. In a machine of the class described, a foundation provided with a single guide, opposite vertically-apertured standard-bearings, and a lever-support, in combination with a standard, a knife-carrier, and a carrier-operating lever loosely pivoted to the support and removably connected with the carrier, substantially as specified.

3. In a machine of the class described, a foundation provided with a single guide, opposite apertured bearings, a vertical standard, an upright for pivotal connection of a lever, and a bed, in combination with a knife-carrier pivoted to the standard, and a lever connected therewith pivoted to the upright and capable of lateral movement, substantially as specified.

4. A foundation for a machine of the class described, comprising a recessed bed, a single guide, opposite apertured lugs for a standard, an upright for a lever, and a base having an opening therein, the whole formed as a single casting, substantially as specified.

5. In a machine of the class described, a knife-carrier having at one side thereof a guiding-flange and at the opposite side perforated lugs for the bearing for one side of the carrier, in combination with a base having a standard for the perforated lugs and an oppositely-arranged guide, and a lever pivoted to the base and connected with the carrier, substantially as specified.

6. In a machine of the class described, a knife-carrier having a pivotal reciprocative bearing at one side thereof, in combination with a base having a standard for said bearing and a lever for operating the carrier, substantially as specified.

7. In a machine of the class described, a hollow knife-carrier provided with a chip-deflecting rib, lateral perforated lugs, an oppositely-located guiding-flange, a hollow knife-supporting bracket, and lever-embracing lugs, the whole formed as a single casting, substantially as specified.

8. In a machine of the class described, the combination, with the base or foundation having a single guide and a vertical parallel standard, of a knife-carrier pivotally mounted on the standard and provided with a guiding-flange, and a lever for reciprocating the knife-carrier vertically and horizontally, substantially as specified.

9. In a machine of the class described, the combination of a foundation having a guide and a vertical standard, a knife-carrier pivotally mounted on the standard and having a guiding-flange, a lever for operating the car-

rier, a rule-table, and a rule-guide, substantially as specified.

10. A rule-guide provided on its under surface with a V groove, a vertical face, a horizontal face having a scale thereon, and an adjacent inclined face, in combination with the gage adapted to embrace the vertical face, to pass over the horizontal face to fit the groove, and to present its binding-screw to the inclined face, substantially as specified.

11. The combination, with the rule-guide having a scale thereon, of a gage having an adjustable indicator, substantially as specified.

12. The combination, with a rule-guide, of a gage adjustably mounted thereon and of a rule-holder adjustably mounted on the gage, substantially as specified.

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

WILLIAM HUGHSON GOLDING.

Witnesses:
E. F. MERRILL,
W. G. EVERT.