(No Model.) 3 Sheets—Sheet 1.

J. H. FERGUSON.

MACHINE FOR TENONING AND DOVETAILING.

No. 368,761. Patented Aug. 23, 1887.

Fig. 1.

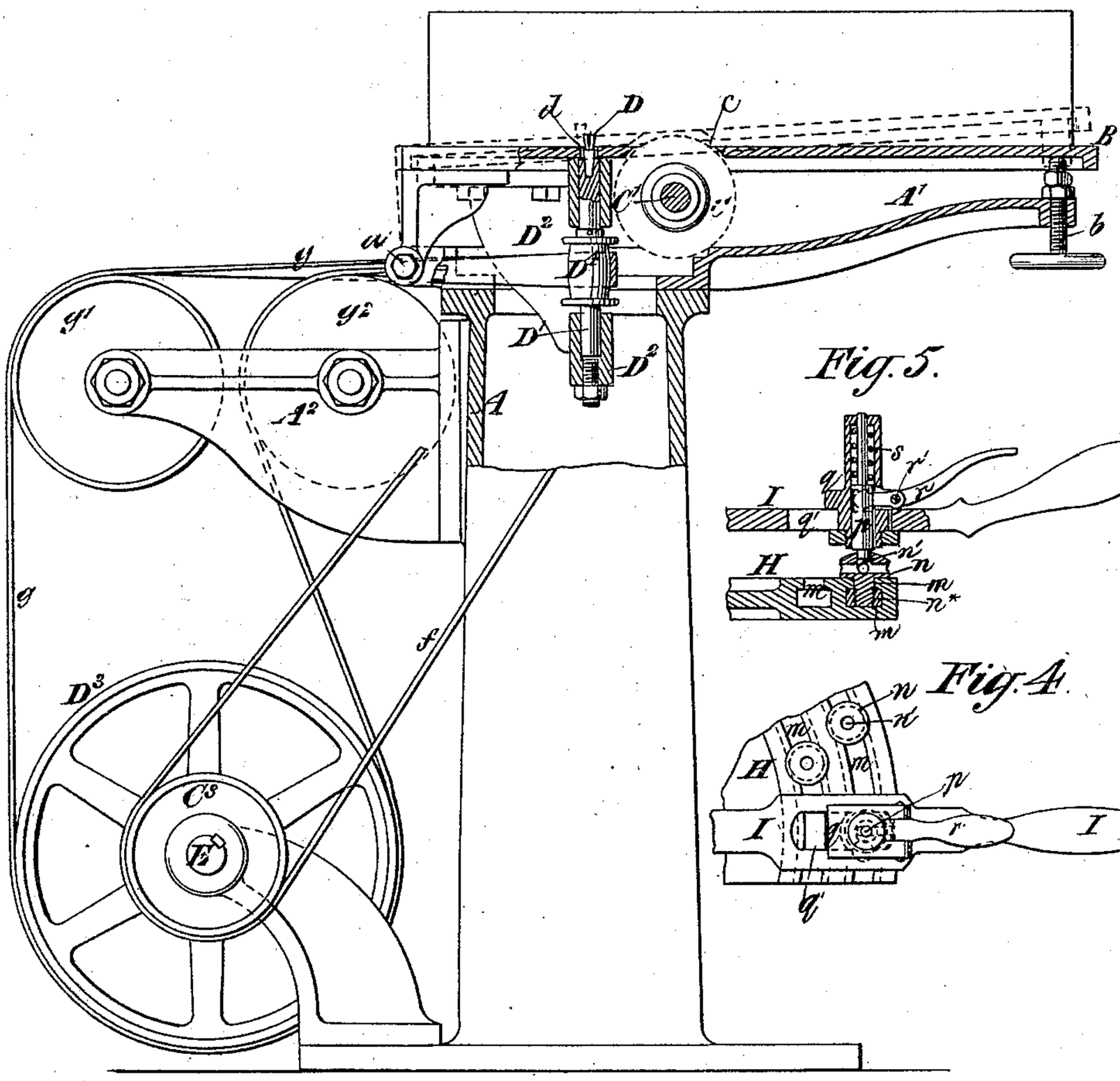
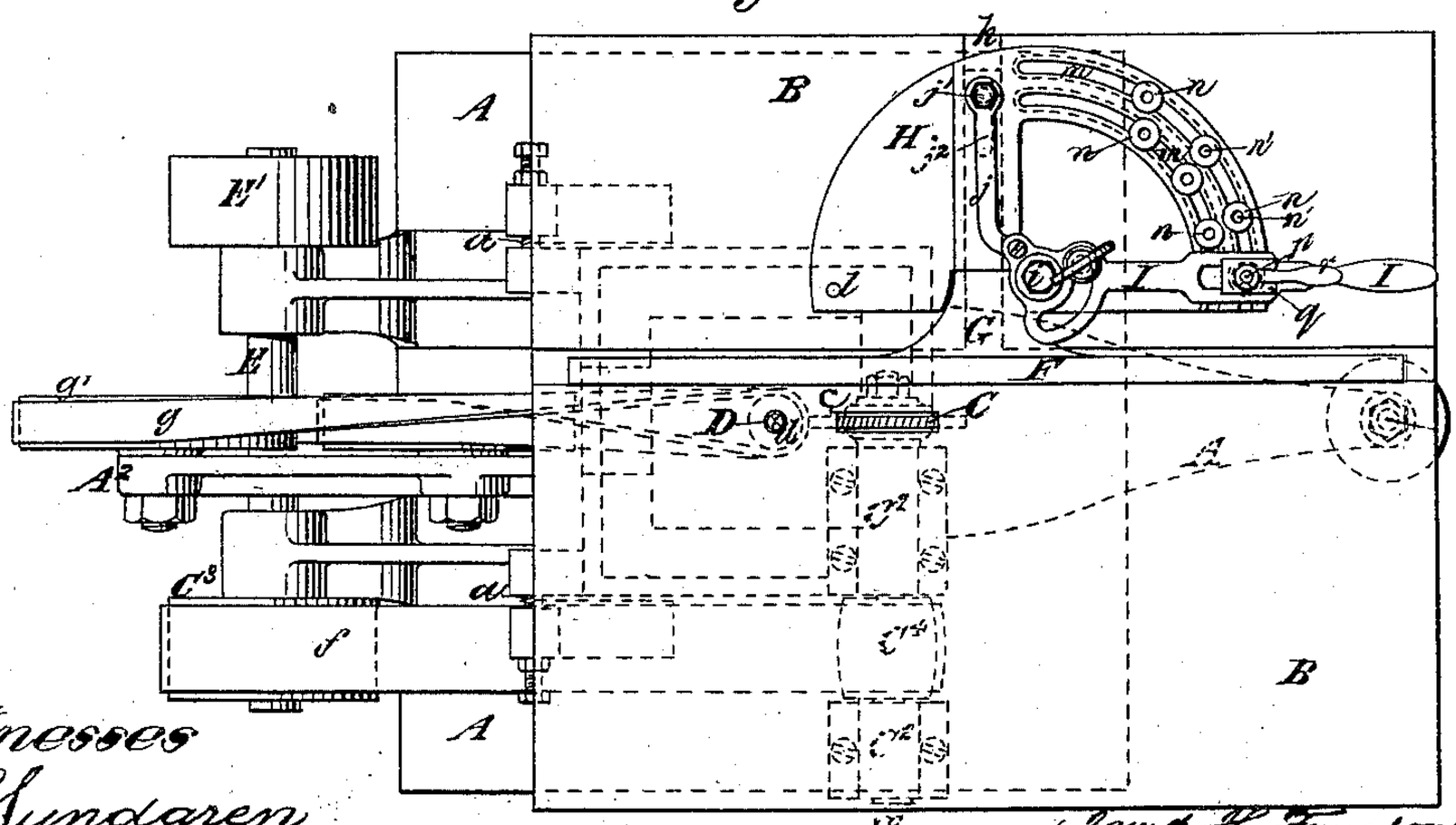


Fig. 5.

Fig. 4.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

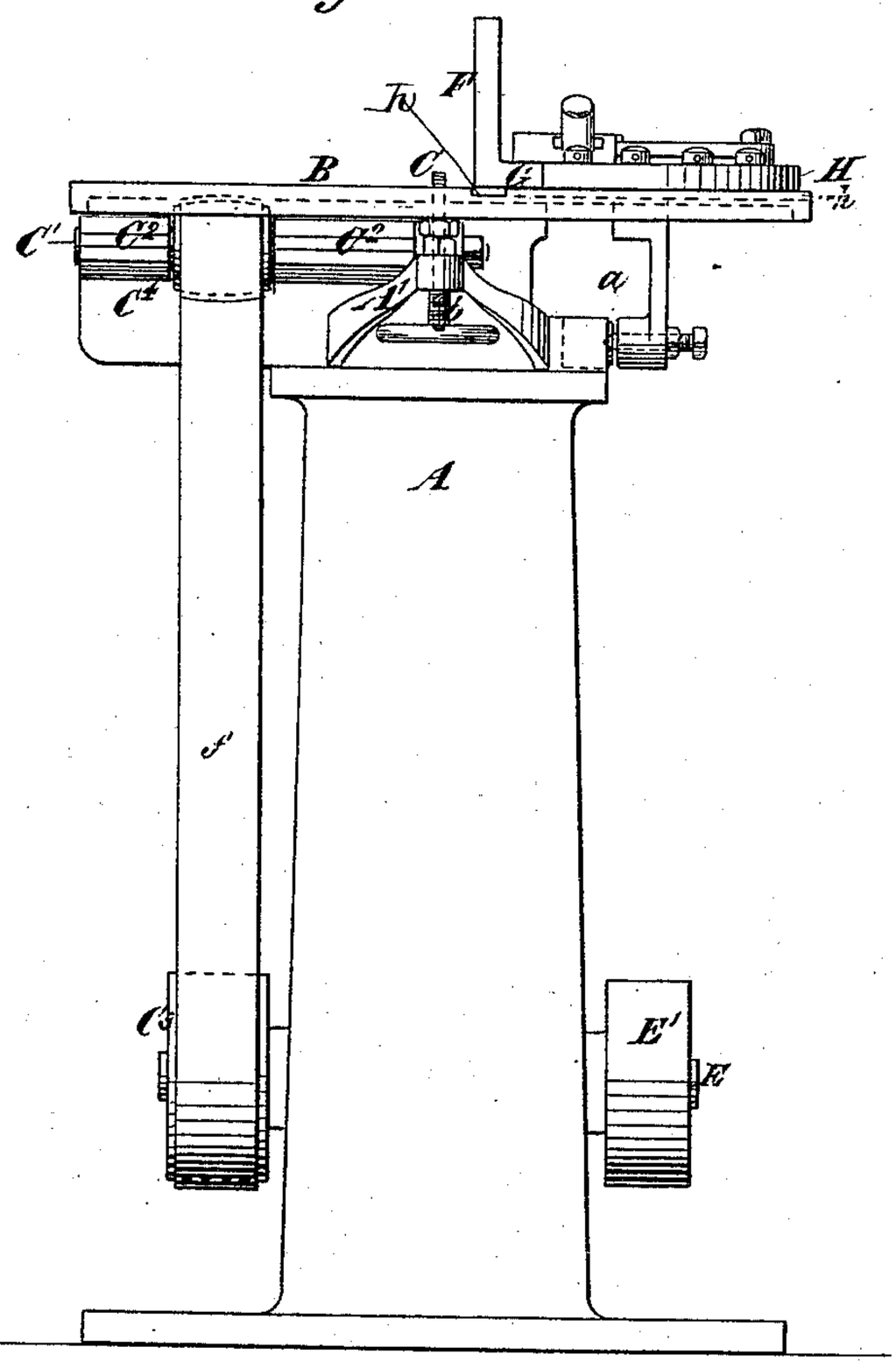


Fig. 6.

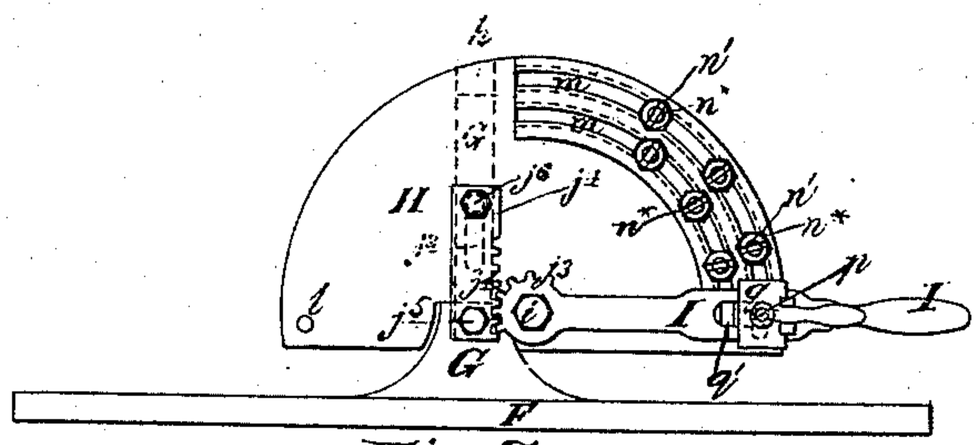
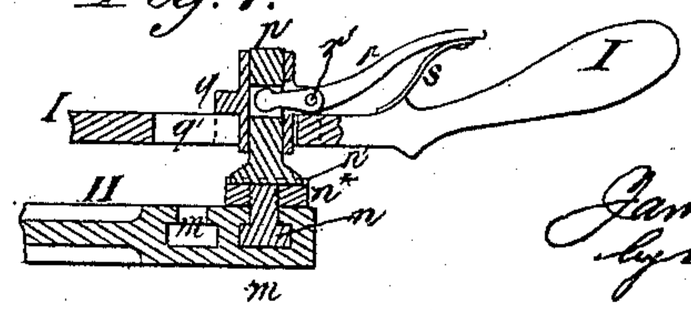


Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

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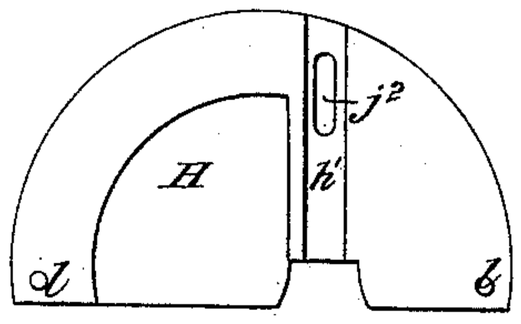
MACHINE FOR TENONING AND DOVETAILING.

No. 368,761. Patented Aug. 23, 1887.

*Fig. 5.**



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UNITED STATES PATENT OFFICE.

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MACHINE FOR TENONING AND DOVETAILING.

SPECIFICATION forming part of Letters Patent No. 368,761, dated August 23, 1887.

Application filed December 29, 1886. Serial No. 222,876. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. FERGUSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Machines for Tenoning and Dovetailing, of which the following is a specification, reference being had to the accompanying drawings.

One object of my invention is to provide in machines for tenoning and dovetailing a gage which may be easily, quickly, and exactly adjusted to the various distances from the line of the cut according to the different cuts to be made in one piece or in different pieces of work; and for this purpose my invention consists in the novel means of adjusting the gage, as hereinafter described and claimed.

Another object of my invention is to afford in a machine for tenoning and dovetailing convenience for the separate use of two cutters—one for cutting a parallel-sided groove and the other for beveling the edges of a groove thus cut; and for this purpose my invention consists in the combination, as hereinafter described and claimed, with a stand and a work-table or bed-plate movable relatively thereto, of a grooving-cutter and a dovetailing-cutter arranged in line one before the other, the former of which is attached to the stand and the latter of which is carried by the movable work-table or bed-plate.

Figure 1 in the drawings is a side elevation, partly in section, of a tenoning and dovetailing machine embodying my invention. Fig. 2 is a plan of the same. Fig. 3 is a front elevation of the same. Fig. 4 is a plan view of a portion of the gage corresponding with Fig. 2, but on a larger scale. Fig. 5 is a vertical section corresponding with Fig. 4. Fig. 5* is an inverted plan of the semicircular guide-plate of the gage corresponding with Fig. 2. Fig. 6 is a plan illustrating a modification of the gage; and Fig. 7 is a vertical section, on a larger scale, of a part of the gage shown in Fig. 6.

Similar letters of reference designate corresponding parts in all the figures.

A designates a stand which supports all the working parts of the machine.

B designates the work-table or bed-plate on which the work is performed, hinged at its rear end to the standard at *a*, so that its front end may be raised up, as shown in dotted outline in Fig. 1, by any suitable means—as, for instance, by any adjustable supporting-screw, *b*, screwed through a fixed bracket, A′, provided on the stand A.

C designates a rotary cutter for cutting straight parallel-sided grooves working through a slit, *c*, in the table B and carried by a horizontal spindle, C′, which works in journal-boxes C^2, fixedly secured to the stand A.

D designates the dovetail-cutter, working through a hole, *d*, in the table B, and held in a chuck in an upright spindle, D′, which works in journal-boxes in a hanger, D^2, which is fixedly secured to the under side of the table B. The grooving-cutter C is so arranged on its spindle C′ and the bearings for the upright spindle D′ of the dovetail-cutter D are so arranged that the cutters are in a line, one before the other, so that as the work is moved forward parallel with said line the cutter C will first cut a plain parallel-sided groove, and the cutter D will cut away the sides of said groove to produce the dovetail form.

E designates the main shaft of the machine, arranged in suitable bearings on the standard A, having a driving-pulley, E′, and carrying pulleys C^3 D^3, for driving the two cutter-spindles, by means of belts *f g*, which run from said pulleys to pulleys C^4 D^4 on the respective cutter-spindles, the belt *g*, which drives the spindle D′, running also over guide-pulleys $g' g^2$, which are carried by a fixed bracket, A^2, secured to the stand A.

F G designate the gage, consisting of a straight upright plate, F, and a straight horizontal part, G, at right angles to F. The greater portion of the length of the part G is fitted to slide in a groove, *h*, in the upper face of the table B, and a corresponding groove, *h′*, in the under side of a guide-plate, H, which is represented of semicircular form, and which is secured firmly in any suitable manner—as by dowel-pins *l*—to the top of the said table. The adjustment of the gage obtained by the sliding of the part G in the grooves *h* is effected by a hand-lever, I, which is pivoted by a pin, *i*, to the plate H. In the example represented in Fig. 2 the connection of the said hand-lever I with the gage

is made by a rod, *j*, which is connected to the part G by a pin, *j'*, which is screwed into the said part G, and which passes through a slot, j^2, (shown dotted in Fig. 2,) provided for it in the guide-plate H; but in the example represented in Fig. 6—the said lever I—the connection is made by a toothed sector, j^3, provided on it and gearing with a rack, j^4, rigidly secured to the part G by means of two screws, j^5 j^6, the latter of said screws passing through the slot j^2, which is like the corresponding slot in Fig. 2, and is shown dotted in Fig. 6 also.

In the plate H there are provided inverted-T-shaped ways or grooves *m*, which run in arcs concentric with the axis of the pin or lever fulcrum *i*, and in which are arranged any desirable number of adjustable stops *n* *n**, either one of which is capable of receiving a locking-pin, *p*, which is carried by the hand-lever I for the purpose of securing it in various positions for the adjustment and locking of the gage. This locking-pin is fitted to slide up and down in a guide-block, *q*, (see Figs. 4, 5, 6, and 7,) which is carried by the said lever, and the said pin has applied to it a locking-spring, *s*, to press the said pin down into the notches or holes *n'* provided for it in each of the stops *n* *n**, and has also applied to it an unlocking lever, *r*, which has its fulcrum *r'* in the guide-block *q*. In the example shown in Figs. 4 and 5 the locking-spring *s* is spiral and applied within the guide-block, and in the example shown in Figs. 6 and 7 it is a bent leaf-spring attached to the unlocking lever and bearing on the hand-lever I.

The stop-pieces *n* *n**, which are fitted to be adjustable along the ways or grooves *m*, are each composed of a bolt, *n*, and a nut, *n**, the neck of the bolt always fitting the narrow upper part of the groove *m*. In the example shown in Figs. 4 and 5 the nut *n** fits the wide lower part of the groove *m*, and the bolt *n* has a head which overlaps the narrow mouth of the groove, and in the center of the head is the hole *n'*, to receive the round lower end of the locking-pin *p;* but in the example shown in Figs. 5 and 6 the bolt *p* is inverted and its head fits the wide lower part of the groove, and the nut is screwed onto the end of the bolt which projects above the groove, and in this case there is a nick or notch, *n'*, across the nut to receive the lower end of the pin *p*, which is flat. To provide for the adjustment of these stops *n* *n**, their nuts or bolts, as the case may be, are unscrewed, and then the stops, being loose in the grooves, can be shifted therein wherever desired. To secure them it is only necessary to screw down the bolts or nuts tight upon the top of the plate H.

A single groove, *m*, in the plate H would provide for a very considerable nicety of adjustment of the stops *n* *n** and consequent nicety of adjustment of the gage; but an exact adjustment is more easily obtained by having provided in the said plate two or more grooves, *m*, each fitted with adjustable stops. To provide for the use of the one locking-pin *p* for the stops in two or more grooves, the guide-block *q*, which holds the said pin, is fitted to slide in a slot, *q'*, in the hand-lever I, so that when the locking-pin is held up above tops of the stops by grasping the hand-lever and stop-lever together in the hand the hand and locking-pin lever may be moved in lines corresponding with the grooves, and by sliding the hand toward or from the fulcrum *i* the locking-lever, guide-block, and locking-pin may be moved in the slot *q'* to present the said pin to the stops in either groove. In this way the locking-pin may be shifted from a stop in one groove to another at any requisite distance from it in another groove.

Generally in the use of the machine represented for dovetailing the table B will be depressed, as shown in bold outline in Fig. 1, so that the cutter C for cutting the parallel-sided groove or rabbet will protrude through the upper surface of the table, in which case the work placed on the table will be presented first to the cutter C to have cut in it the parallel-sided groove or rabbet, and will be afterward presented to the cutter D to have the side or sides of the rabbet or groove cut to the bevel which produces the dovetail; but there are some cases when it will be desirable to use the cutter D alone—as, for instance, to finish the dovetailing to the end of a groove which does not extend to the end of a piece of work. In such case, after the work has been moved far enough along the table and gage to have the groove or rabbet cut as far as necessary by the cutter C, the table is raised up, as shown in dotted outline in Fig. 1, to bring its upper surface and the superincumbent lower face of the work above the said cutter, and the work being then fed forward to the cutter D will have the dovetail thereby completed to the end of the groove or rabbet.

It is obvious that by simply taking out the dovetail-cutter D from its chuck in the spindle D', the upper end of which is below the upper face of the table B, the machine represented may be used for tenoning or tonguing and grooving by the use of the cutter C alone.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a dovetailing-machine, of a fixed stand, a rotary grooving-cutter and its horizontal spindle supported in bearings on said stand, a work-table adjustable up and down on said stand, and a dovetail-cutter and its upright spindle supported in bearings carried by said work-table in line with said grooving-cutter, whereby said cutters may be made to co-operate to produce a dovetail groove, or the dovetail-cutter may be used separately, substantially as herein set forth.

2. The combination, with the work-table or bed-plate of a dovetailing or tenoning machine, of a plate having provided in it one or more arc-formed ways and secured to the said table or bed-plate, an adjustable gage fitted to slide in or relatively to the said plate, a hand-lever

pivoted to the said plate concentric with said ways and connected with the gage, adjustable stops fitted to said ways and formed with holes or notches, and a locking-pin attached to said lever for engaging with the hole or notch in either one of said stops to lock the lever, substantially as herein described.

3. The combination, with the gage and its guide-plate provided with a plurality of curved ways for the reception of stops, of stops placed in said ways, a hand-lever pivoted to said plate and connected with the gage, and a locking-pin attached to said lever and movable lengthwise thereof to permit it to engage with the stops in either of said ways, substantially as herein described.

4. The combination, with the gage and its guide-plate provided with curved ways, the stops fitted to said ways, and the gage-adjusting lever fulcrumed to said plate and connected with the gage, of the guide-block q', fitted to slide lengthwise on the said lever, the locking-pin q, fitted to said slide, a locking-spring, s, applied to said locking-pin, and an unlocking-lever, r, fulcrumed to said block and connected with the locking-pin, all substantially as and for the purpose herein described.

JAMES H. FERGUSON.

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