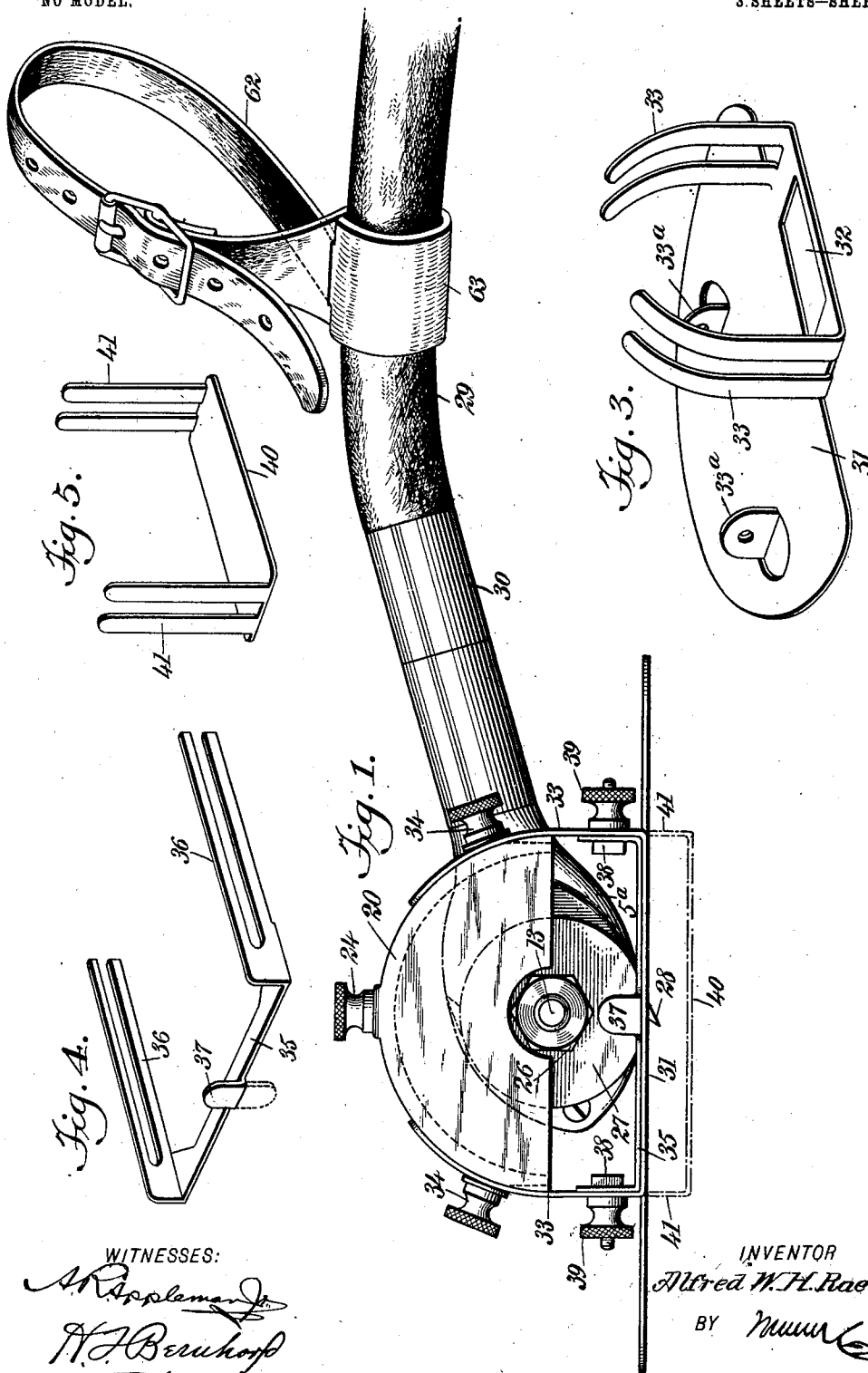


A. W. H. RAETTIG.
WOOD CARVING MACHINE.
APPLICATION FILED JAN. 23, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



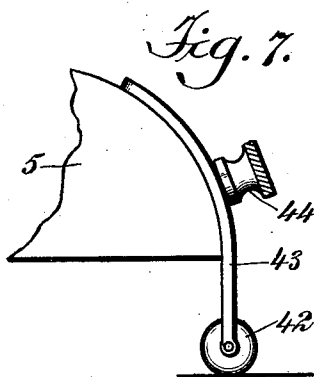
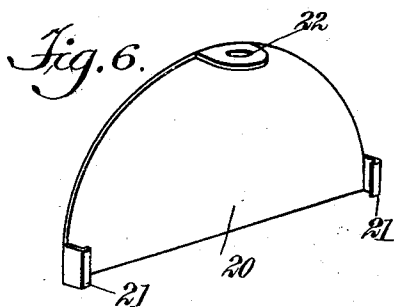
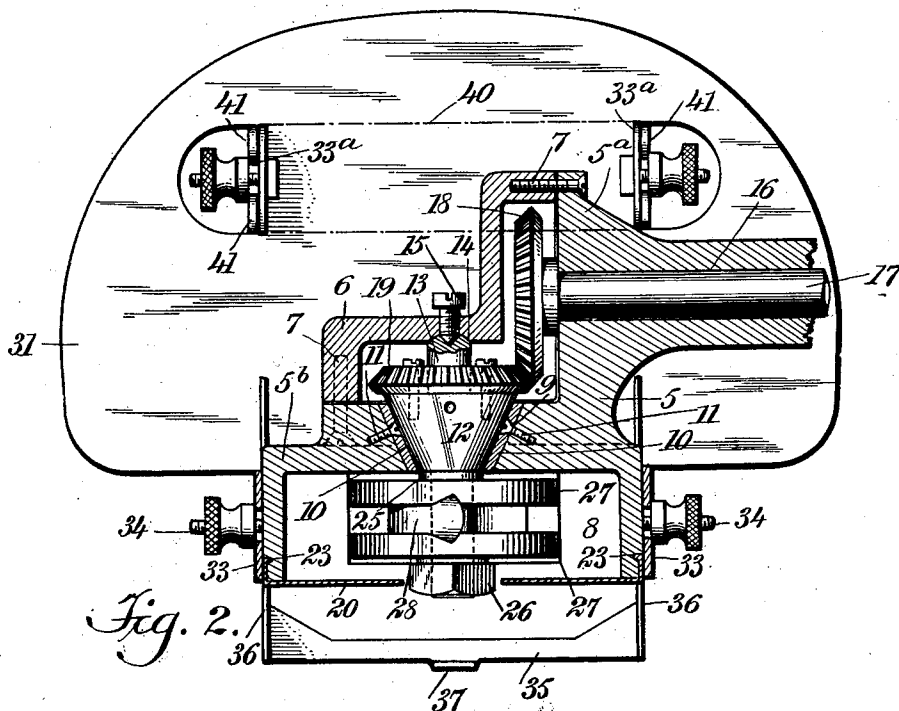
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BY *Mum*
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NO MODEL.

3 SHEETS—SHEET 2.



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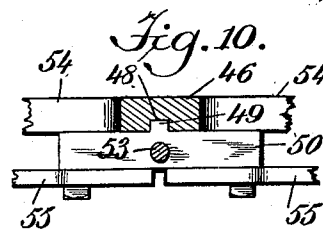
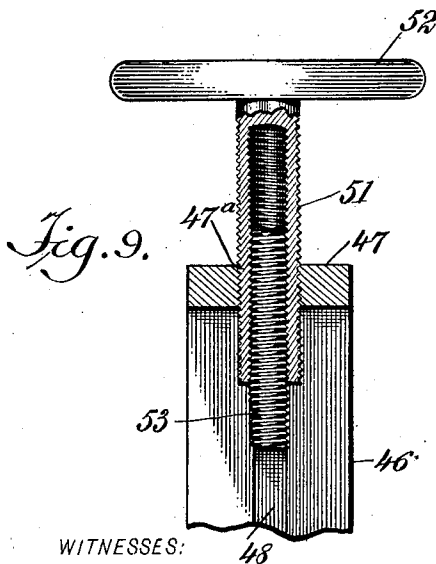
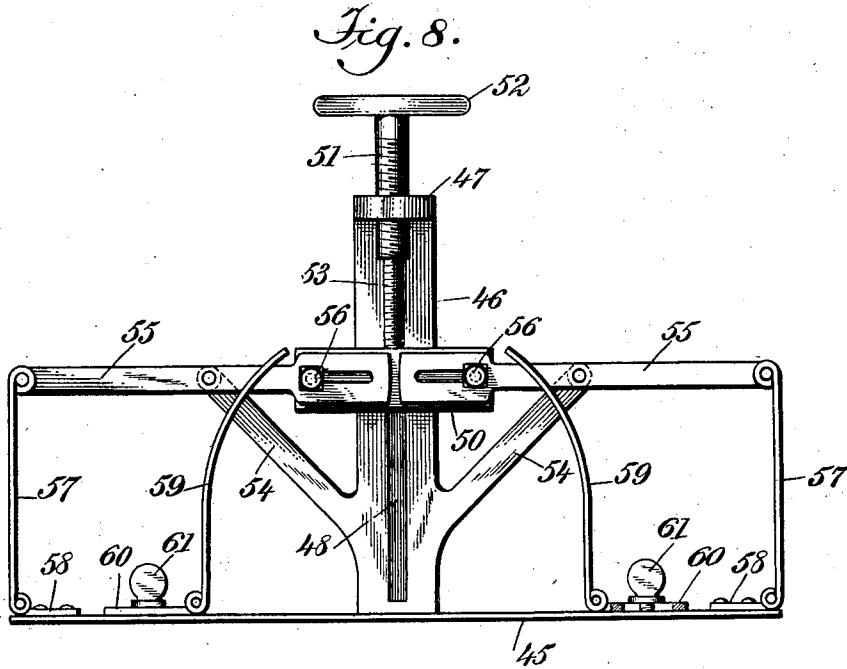
No. 733,744.

PATENTED JULY 14, 1903.

A. W. H. RAETTIG.
WOOD CARVING MACHINE.
APPLICATION FILED JAN. 23, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ALFRED W. H. RAETTIG, OF NEW LONDON, WISCONSIN.

WOOD-CARVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 733,744, dated July 14, 1903.

Application filed January 23, 1903. Serial No. 140,213. (No model.)

To all whom it may concern:

Be it known that I, ALFRED W. H. RAETTIG, a citizen of the United States, and a resident of New London, in the county of Wau-paca and State of Wisconsin, have invented a new and Improved Wood-Carving Machine, of which the following is a full, clear, and exact description.

This invention relates to improvements in wood-carving machines designed to be manipulated and guided by hand in a way to rapidly and accurately impart a desired shape to irregular pieces of wood of all kinds, such as crooked stair-rails, crooked moldings, straight work, and, in fact, an unlimited variety of carving and woodwork.

Further objects and advantages of the invention will appear during the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a view in side elevation of a wood-carving machine constructed in accordance with my invention. Fig. 2 is a central horizontal section through the machine, illustrating certain parts in plan. Figs. 3, 4, and 5 are views of different styles of gages which may be used in connection with the machine. Fig. 6 is a detail perspective of a thumb-plate. Fig. 7 is a fragmentary view in elevation illustrating a part of the machine and one of the gage and starting wheels which may be used in lieu of the gages shown by Figs. 2 to 4, inclusive. Figs. 8, 9, and 10 are views of another style of adjustable gage adapted to be employed in connection with the machine in lieu of the other styles of gages heretofore mentioned, Fig. 9 being a vertical section of one form of regulating-screw and Fig. 10 being a sectional plan view of the cross-head.

In carrying my invention into practice I provide a suitable frame having the form shown more particularly by Fig. 2. The frame consists of two members 5 6, assembled and fastened detachably together. The member 5 constitutes the main part of the frame, and it has two portions 5^a 5^b disposed at right angles to each other in a way to form a re-

entrant angle or recess in one side thereof, said recess adapted to receive the member 6, which is of angular form, the latter being fastened in place in any suitable way—as, for example, by the screws 7. The member 5 has its portion 5^b enlarged and provided with a cutter-receiving chamber 8, and this part 5^b of the frame member is constructed with a conical opening 9, which receives a conical bushing 10, the latter being secured in place by screws 11 and arranged flush with the chamber 8 and with the side formed by the angle or recess. This bushing 10 may be made of any suitable material to withstand wear, and it serves as a bearing for an enlarged conical portion 12 of a cutter shaft or spindle 13. This spindle passes through the member 5 of the frame in a way to have an end portion thereof housed within the chamber 8, while the other end portion is adapted to fit in a socket 14, provided in the frame member 6. The conical portion 12 fits snugly in the bushing 10, and one end portion of this shaft or spindle is engaged by a pointed adjusting-screw 15, the latter being mounted in a tapped opening in the frame member 6, said screw being accessible for the purpose of adjustment and engaging with the cutter-shaft 13 in a way to move its conical portion 12 within the bushing 10, whereby the cutter-shaft may be adjusted to compensate for wear.

The portion 5^a of the frame member 5 is provided with a passage 16, which serves as a bearing for a shaft 17, the latter being disposed at right angles to the cutter-shaft 13. (See Fig. 2.) This shaft 17 is provided at its inner portion with a bevel-gear 18, adapted to be fastened to said shaft in any suitable way—as, for example, by screwing the gear on the shaft and pinning it thereto. The cutter-shaft 13 is provided with a miter or bevel gear 19, which may be secured by screws to the enlarged end of the conical portion 12 of said shaft. The gear 19 meshes directly with the gear 18 on the shaft 17, and the motion of this shaft is thus transmitted to the cutter-shaft.

I do not desire to limit myself to the special type of bevel-gearing herein shown and described, as I am aware that other forms of gearing may be substituted therefor.

The cutter-receiving chamber 8 of the machine-frame is open on one side of said frame, and this open side of the chamber is normally closed by a removable cap or thumb plate 20. (See Figs. 1, 2, and 6.) This plate conforms to the shape of the frame, and at its lower corners said plate is provided with the inwardly-extending lips 21, and it is also provided with a perforated lug 22 at the top edge thereof. The plate is fitted to the open side of the casing in a way for the lips 21 to fit into notches 23, while the lug 22 rests on the top of the casing and receives the clamping-screw 24, the latter serving to firmly clamp the thumb-plate to the casing and allow the ready removal thereof.

I may employ any suitable style of rotary cutter adapted to be securely fastened in a removable way to that portion of the shaft 13 which lies within the chamber 8. As shown by Fig. 2, the cutter-shaft 13 is provided with a collar 25 adjacent to the small end of the conical portion 12, and against this collar is clamped the cutter-head by a clamping-nut 26, which is screwed on a threaded extremity of said shaft 13. In Figs. 1 and 2 the cutter-head consists of the disks 27 and the knives 28. The disks are fitted on the shaft for one of them to lie against the collar 25, and the knives 28 are provided with shanks, which are disposed between and in engagement with the opposing faces of the disk, whereby the nut 26 serves in connection with the collar 25 to clamp the disks 27 and the knives 28 firmly in place on said shaft. The particular style of knives is not material, because the working edges thereof will vary according to the nature of the work which it is desired to perform on the wood or other material. I also reserve the right to employ other styles of cutter-heads in lieu of the special cutter-head herein described. The cutter-shaft and the cutter thereon are driven by the shaft 17 and the train of gears, and said shaft 17 is in turn propelled from any suitable source of power—such, for example, as the flexible shaft 29. (Shown by Fig. 1.) Said shaft is coupled in any suitable way to the shaft 17 and is fitted by a sleeve 30 to the bearing 16 of the frame member 5. Any style of flexible shaft may be employed, and I have found that the shaft known as the "Stowe" flexible shaft operates efficiently to rotate the cutter-head.

My improved machine may be used in connection with many different styles of gages, some of which are indicated by the drawings. The gage shown by Fig. 3 consists of a flat plate 31, having a slot 32, the upstanding curved arms 33, and the upstanding lugs 33^a. This gage-plate may be attached firmly to the machine, so as to be movable or adjustable therewith, and this is accomplished by placing the machine-casing between the curved arms 33 in a way for said arms to fit snugly against the outside of the casing, as shown by Figs. 1 and 2. The gage is clamped firmly and adjustably to the casing by the set-screws 34,

which pass through the spaces between the arms 33 and are received in threaded openings in the frame member 5. The plate 31 of the gage lies directly below the machine proper, while the cutter-head is over the slot 32, the gage and the machine being relatively adjusted for the working ends of the cutters to project through the slot 32 and operate on the work. It is evident that the machine may be raised or lowered between the arms 33 to make the cutters project more or less through the slot 32, and thereby regulate the depth of cutting.

The machine may also be equipped with a lateral gage. (Shown by Fig. 4 and in position by Figs. 1 and 2.) This gage 35 is provided with slotted arms 36 and with a guide-lug 37. This guide-lug may extend upwardly from the gage 35, as shown by full lines in Figs. 1 and 4, but, if desired, the lug may project downwardly from said gage, as indicated by dotted lines in Fig. 4. The gage is attached to the machine by fitting the slotted arms 36 between the upstanding arms 33 of the main gage, (shown by Fig. 3,) and this lateral gage 35 is held securely in place by means of bolts 38, which receive the binding-nuts 39. The lateral gage is disposed at one side of the cutter-head, as shown by Fig. 2, and it may be adjusted toward or from the machine by slipping the slotted arms 36 across the bolts 38 and the arms 33 of the main gage.

Under certain conditions of service I may employ the under gage shown by Fig. 5. This gage 40 is provided with upstanding fingers 41, arranged to form spaces between themselves. In applying the gage 40 it is placed below the main gage 31, and its arms 41 are fitted against the lugs 33^a, after which suitable bolts and nuts may be adjusted and tightened to clamp the under gage securely in a horizontal position below the main gage 31. This under gage is adapted to lie in a plane below the main gage and the machine, and it is useful in holding the machine in a level position when the cutter is to operate on a surface of the work above that surface on which the under gage 40 is adapted to travel.

The gages hereinbefore described may be omitted, and in lieu thereof the machine may be provided with two wheels, substantially as indicated by Fig. 7. Each wheel 42 is loosely journaled at the lower end of an arm 43, the latter being curved to fit snugly against the outside of the casing and to be clamped thereon by a thumb-screw 44. Two of the arms and the wheels are provided—one on each side of the machine—the said arms being adjustably clamped to the machine-frame by the thumb-screw. In using the machine with a roller-gage it may be tilted in a fore-and-aft direction and in a way to raise one wheel out of engagement with the work, while the other wheel is permitted to travel on the surface of the work. Under these conditions the machine may be manipulated to start and stop the cutter in operating on the work, and the

arm 43 may be adjusted to regulate the depth of the cut made by the rotary head.

Another form of the gage is represented by Figs. 8, 9, and 10, the same having a flexible steel plate 45, which may be bent or curved to conform to any desired contour of the work under treatment. This plate is provided with a vertical post 46, secured in any suitable way to the middle portion of said plate, said post having a head 47 and a longitudinal guideway 48. In this guideway is fitted the lug 49 of a cross-head 50, the latter being slidably fitted on said post and guided in its up-and-down movements by the lug 49, which travels in the guideway 48. The head 47 has a threaded opening 47^a, in which is screwed the hollow member 51 of a regulating-screw, said screw member having a hand-wheel 52 at its upper end. The screw member 51 is hollow and internally threaded to receive the male threaded member 53 of the adjusting-screw, said member 53 being attached in a suitable way to the cross-head 50, whereby the two-part screw has its members connected telescopically, and said screw may be manipulated by the wheel 52 for the purpose of raising or lowering the cross-head 50. The post 46 is provided with the upstanding arms 54, on which are fulcrumed levers 55, which have slidable and pivotal connection at 56 with the cross-head 50. These levers are pivoted at their outer ends to the links 57, which in turn are pivoted to the plates 58, secured firmly to the side edge portions of the flexible gage-plate 45. This gage-plate is provided with slotted arms 59, which are attached to adjustable plates 60 by thumb-screws 61. The arms 59 are similar to the arms 33 of the main gage 31, and said arms 59 are applied to the casing of the machine in a way to clamp the gage adjustably to said machine. It is evident that the two-part screw may be adjusted in one direction for the purpose of flexing the plate 45, and thereby impart a desired curvature to said plate; but the movement of the screw in an opposite direction deflects the plate in another direction and makes it present a concave under face.

In using the improved machine one or more gages of the proper character are applied to the machine, as hereinbefore described, said gage assuming such relation to the machine that the rotary cutter will project through the slot 32 in the gage-plate 31 or through a similar slot (not shown) provided in the flexible plate 45. The shaft 29 is operated to rotate the shaft 17, which in turn drives the train of gears to rotate the cutter-shaft 13, thus driving the cutter or cutter-head. The operator grasps the machine by placing the hand over the frame and the thumb against the plate 20, and the entire machine is manipulated and controlled by moving the hand as desired. To steady the shaft 29, I prefer to employ an arm-strap 62, which is provided with a loop 63, that fits on the shaft 29, and

is also equipped with any suitable take-up device, such as a buckle, in order to shorten the strap and attach it firmly to the operator's arm.

The lug 37 of the lateral gage is adapted to ride against a suitable guide-strip, which may be secured temporarily to the work. The gage 31 or the flexible plate 45 serves to regulate the depth of cutting.

It is to be understood that the casing of my machine is made in a form and of such dimensions as to be easily grasped by and held in the hand of an operator, thus placing the machine under the direct control of the operator and facilitating its manipulation.

The machine can be used for offhand or carving work or worked to a drawing on wood or other material or according to a suitable pattern. I prefer to use a light frame or casing, such as a casing made of aluminium or other suitable material.

Although I have shown a telescopic screw in Figs. 8 and 9 as the means for adjusting the flexible base-plate of the gage, it is to be understood that any equivalent means may be employed to secure the desired flexible movement of said base-plate.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A hand-controlled wood-carving machine, comprising a casing having a form suitable to be grasped by the hand of the operator and provided with two chambers, the partition between the chambers having a conical opening therein, a shaft provided with a conical portion fitting in the said conical opening and having its ends projecting into the said chambers, with one end engaging a socket on the inner face of the casing, means for engaging the said end of the shaft to adjust the same, a cutter on one end of the shaft in one of the chambers, a gear-wheel on the other end of the shaft in the other chamber, and a driving-shaft having a gear-wheel on its end in the chamber in which the gear-wheel on the cutter-shaft is arranged, said gear-wheel meshing with the gear-wheel on the cutter-shaft, as set forth.

2. A hand-controlled wood-carving machine, comprising a casing adapted to be grasped by the hand of the operator and provided with two chambers, the partition separating the chambers having a conical opening therein, one of the said chambers being angular and adapted to receive the driving-gear and the other to receive a cutter, a cutter-shaft having a conical portion fitting in the conical opening of said partition and having its ends projecting into the said chambers, the end projecting into the angular chamber fitting in a socket on the inner face thereof, means for adjusting the shaft to take up the wear, a gear-wheel on the cutter-shaft in the angular chamber, a drive-shaft having a gear-wheel on its end within the said angular cham-

ber and meshing with the gear-wheel on the cutter-shaft, and a cutter on the other end of cutter-shaft in the other chamber, as set forth.

3. A hand-controlled wood-carving machine, comprising a casing having two chambers, the partition separating the chambers having a conical opening therein, one of the said chambers being provided with a socket on its inner face in alinement with the conical opening, a cutter-shaft having a conical portion fitting in the said conical opening and having its ends projecting into the said chambers, with one end fitting in the socket of the said chamber, an adjusting-screw engaging the end of the shaft in the said socket, a cutter on one end of the shaft in one chamber, and means for operating the cutter-shaft, as set forth.

4. In a machine of the class described, a frame consisting of an angular member having shaft-bearings at right angles to each other and provided with a chamber, and another member secured removably to said angular member and forming therewith a second chamber, combined with cutter and driving shafts mounted in the respective portions of the angular member, gearing mounted in the chamber formed by the two members and connecting said shafts, and a rotary cutter on the cutter-shaft in the chamber of the angular member.

5. A machine of the class described having a casing comprising a main member having portions at right angles to each other, one of the said portions being formed with a chamber open at one side, a second member angular in form and detachably secured over the angle of the main member and forming therewith a chamber, and a plate detachably secured to the main member and covering the open side of the chamber therein, as set forth.

6. A machine of the class described, com-

prising a casing, a rotary cutter mounted therein, a main gage attached to said casing and having a slotted plate disposed below said casing, and a lateral gage clamped adjustably to the main gage. 45

7. A machine of the class described, comprising a casing, a rotary cutter journaled therein, a main gage clamped to the casing and having a slot through which the cutter is arranged to work, and an under gage disposed below the main gage and fastened adjustably thereto. 50

8. In a wood-carving machine, the combination with a casing, a rotary cutter mounted therein, and means for operating the same, of a gage having a slot through which the cutter projects and provided with arms and with upstanding and apertured lugs, means for engaging the arms of the gage to secure the same to the casing, a second gage provided with arms, and means for securing the said second gage to the lugs of the first-named gage, as set forth. 55 60 65

9. In a wood-carving machine, the combination with a casing, a rotary cutter mounted therein, and means for operating the cutter, of a gage having a slot through which the cutter projects and provided with spaced arms, set-screws for clamping the arms of the gage to the casing, a second gage provided with spaced arms extending between the spaced arms of the first gage, and bolts and nuts for clamping the arms of the said gages together, as set forth. 70 75

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

ALFRED W. H. RAETTIG.

Witnesses:

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JNO. R. NIBLO.