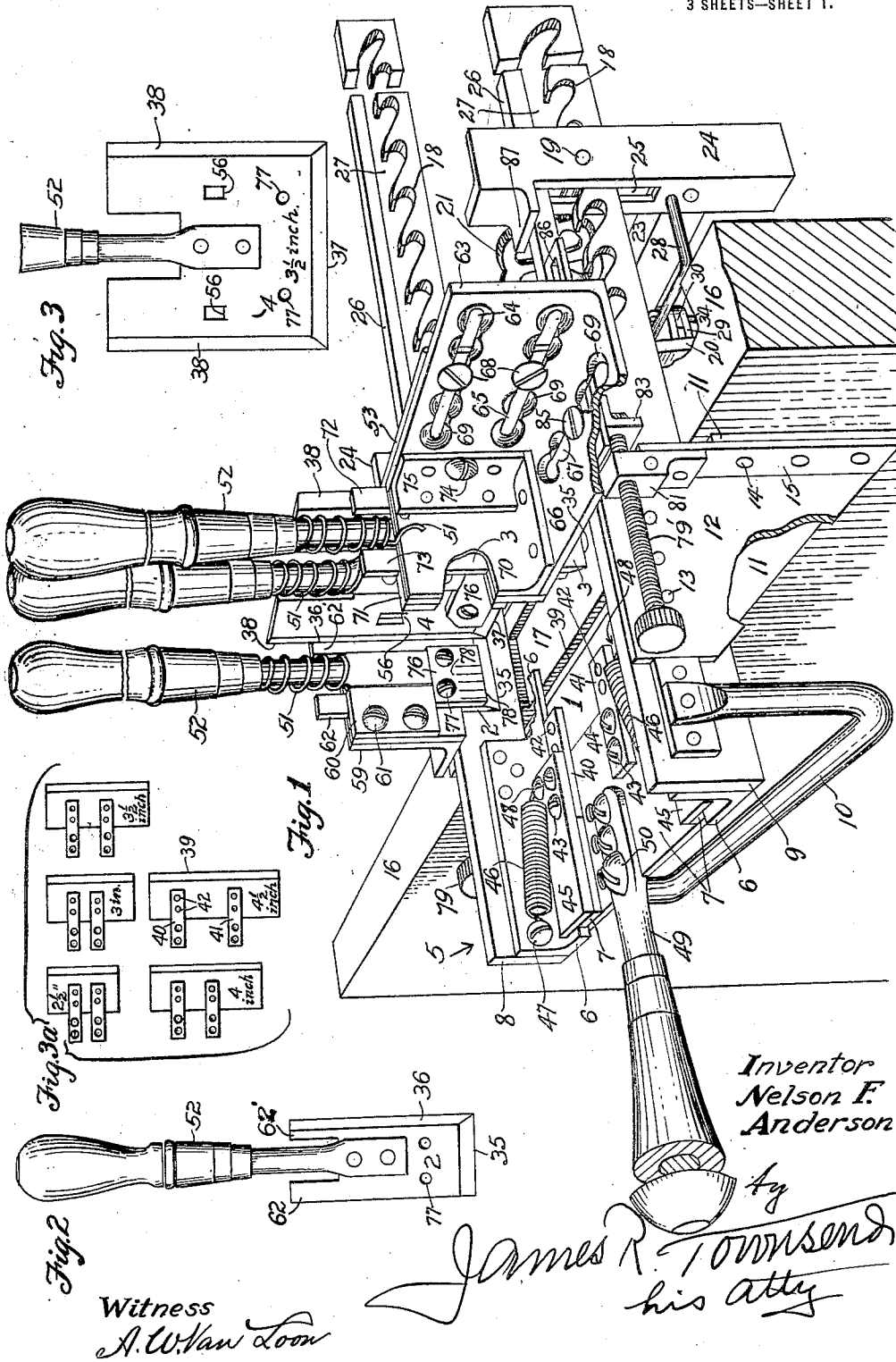


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APPLICATION FILED APR. 12, 1920.

1,430,874.

Patented Oct. 3, 1922.
3 SHEETS—SHEET 1.

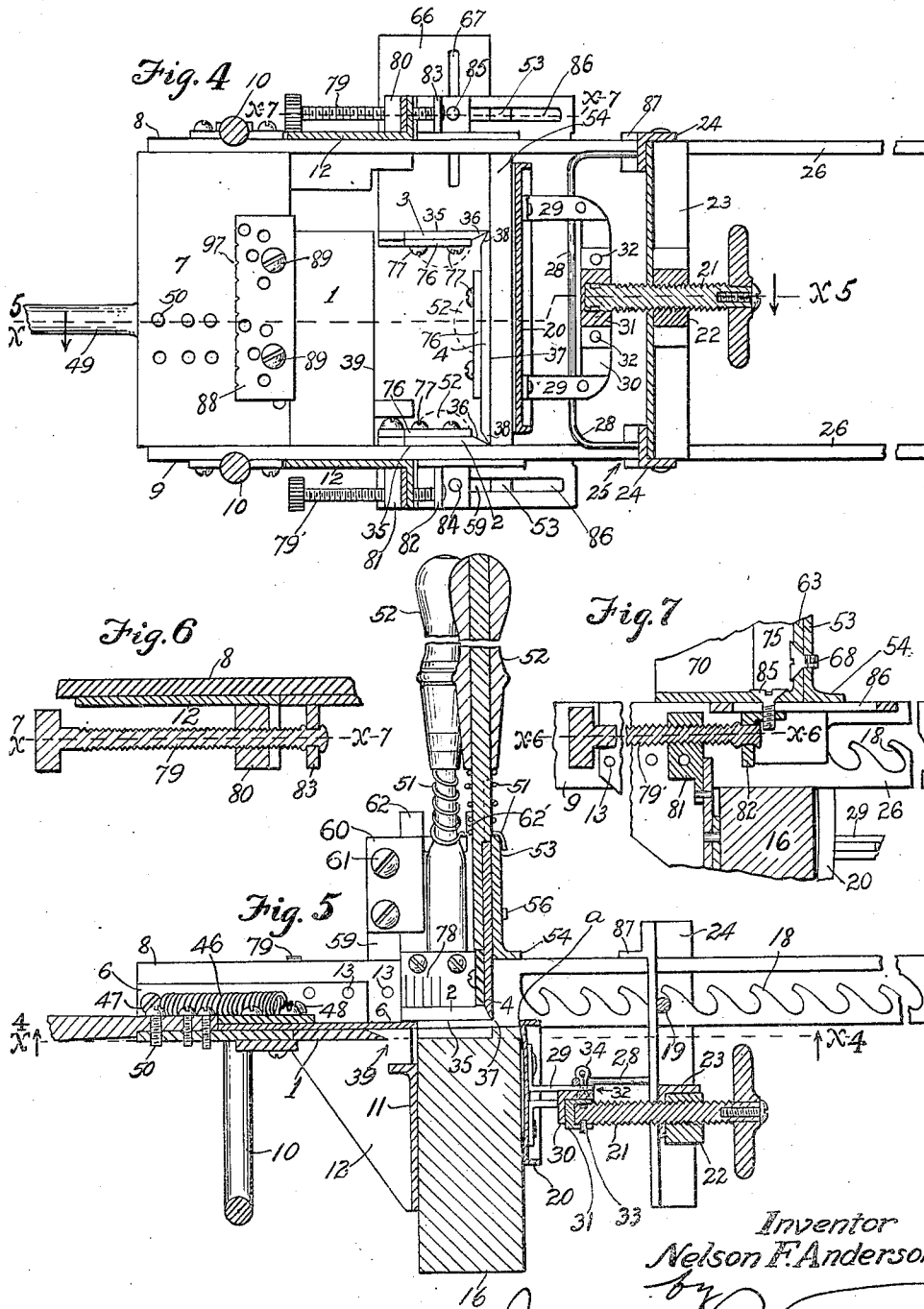


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Witness

A. W. Van Loon

Inventor
Nelson F. Anderson

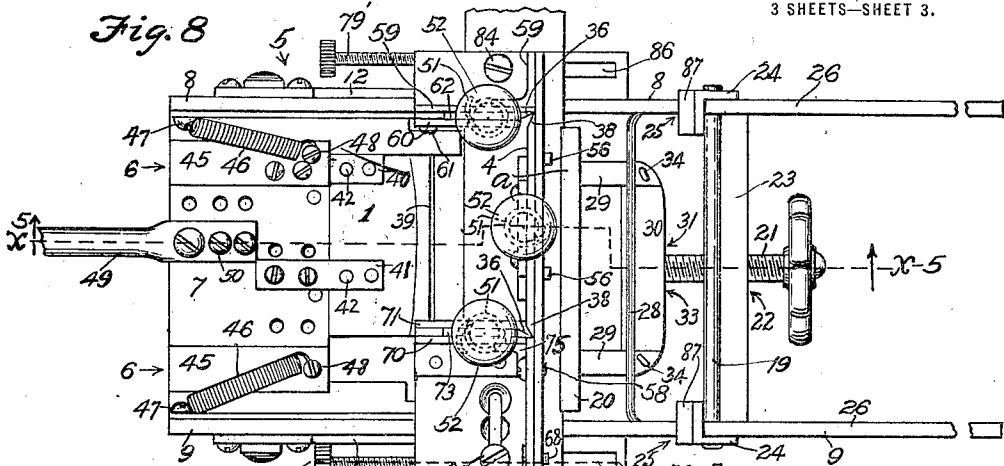
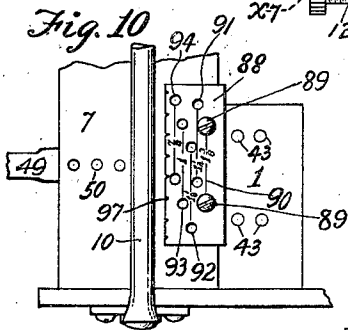
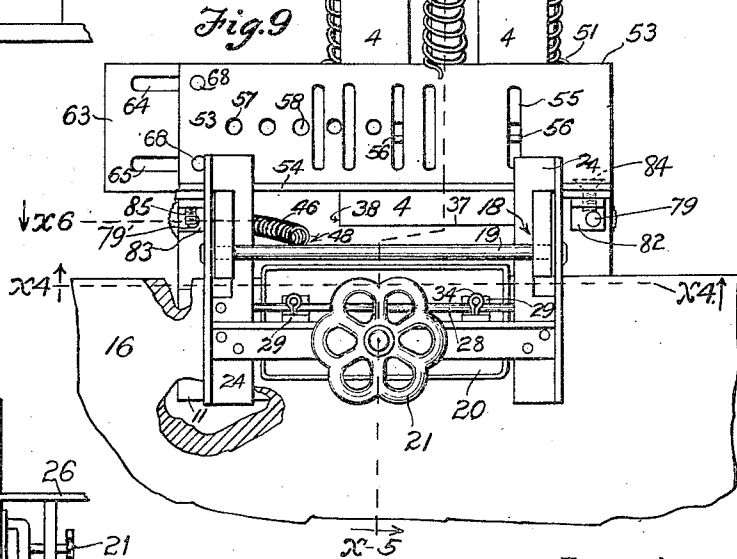
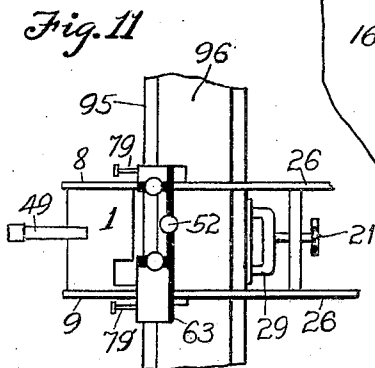
by James R. Townsley
his atty.

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3 SHEETS—SHEET 3.



Witness
A. W. Van Leen

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UNITED STATES PATENT OFFICE.

NELSON F. ANDERSON, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR MAKING DOOR BUTT MORTISES.

Application filed April 12, 1920. Serial No. 373,436.

To all whom it may concern:

Be it known that I, NELSON F. ANDERSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Machine for Making Door Butt Mortises, of which the following is a specification.

An object of this invention is to provide means whereby gains may be cut in door jambs, window jambs, doors, windows and other parts where it is desired to mount butt hinges for hinging the parts together.

In practical carpentry it is usually necessary to cut a large number of gains of the same size to receive the butts to hinge the doors or other closures or swinging parts to jambs or other supports; and an object of my invention is to provide a practical device which can be set to any certain size within a given range, and can then be easily and quickly applied to the part to be mortised and then can be utilized for cutting the gain and, after the gain is cut can be readily and quickly detached and applied to another part for cutting a similar gain.

The machine comprises, in combination, a frame having four guideways, and four chisels arranged as above indicated; and means whereby the guideways may be relatively adjusted to bring the chisels into such position that when the chisels are operated they will make their appropriate cuts to produce the mortise.

An object of the invention is to make provision whereby the positioning of the chisels can be done with extreme accuracy and with the greatest expedition, and to allow the machine to be adjusted to the different parts which are to be mortised without disarranging the adjustment of the chisels so that all of the mortises which are cut with one adjustment of chisels will be uniform.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detail description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is a perspective view of a mortising machine constructed and provided with a set of cutters for cutting a mortise for a three and a half inch butt. The machine is shown in accordance with this invention ap-

plied to the edge of a door on which it has been used to cut a butt mortise. Portions are broken away for clearness of illustration and to contract the view.

Fig. 2 is a view of one of the end chisels, detached.

Fig. 3 is a view of the rear chisel, detached.

Fig. 3^a is a top view of a set of five depth cutters on a reduced scale.

Fig. 4 is a bottom plan of the machine in section on line x^4 , Fig. 5 at the bottom of the mortise shown in Fig. 1, looking up.

Fig. 5 is a fragmental vertical longitudinal section on irregular line x^5-x^5 , Figs. 4, 8 and 9.

Fig. 6 is a fragmental plan detail on line x^6 , Fig. 9, of one of the micrometer gages.

Fig. 7 is a fragmental vertical section on line x^7 , Fig. 6, along the axis of the micrometer gage screw.

Fig. 8 is a fragmental top plan of the machine.

Fig. 9 is a fragmental rear elevation of the machine in place on a door.

Fig. 10 is a fragmental inverted plan of the front portion of the machine, to show the adjustable gage plate.

Fig. 11 is a diagrammatic plan of the machine attached to a door jamb for mortising the same.

It is not deemed necessary to show all the cutters of each set; it being understood that in practice each machine will be provided with two end cutters, as shown in Figs. 1, 4, 8 and 9, a set of five depth cutters corresponding in length to the five different length of butts as indicated in Fig. 3^a, and a set of five back cutters corresponding in length to the depth cutters, respectively, so that the same machine may be fitted to cut mortises of five different lengths; this being deemed most practicable for general use.

The depth cutter 1, the two end cutters 2, 3 and the back cutter 4 are mounted on a frame 5 which is adapted to be connected to a piece in which a gain is to be cut. Said frame carries means to guide the depth cutter in one plane, means to guide the end cutters in parallel planes normal to the plane of the depth cutter; and means to guide the back cutter in a plane normal to the planes of the depth cutter and the two end cutters.

The means to guide the depth cutter comprises ways 6 on the frame and a carrier 7,

comprising a plate moving along said ways; said ways are inward extensions from rails 8, 9 which are rigidly fixed together by the cross bars 10, 11 that hold the rails in parallelism with each other, thus forming a frame for the guide ways. Angle iron brackets 12 are riveted by rivets 13 to said rails and are riveted by rivets 14 through the flanges 15 of said brackets to the cross bar 11. The depth cutter guides 6 are normal to the cross bar 11, which is shown as a metal plate forming the fixed side of a clamp, and adapted to engage one side of the piece 16 in which the gain or butt mortise 17 is to be cut.

The leaves of butt hinges are practically all of the same thickness within a length of from three to five inches, and it is advisable to provide a different size machine for butts less than two and one-half inches long. The machine shown in the drawings is intended for use on butts from two and one-half to four and one-half inches long. The two and one-half inch butts being only a fraction thinner than the three inch butts, it is deemed advisable to avoid any complications of adjustment in constructing this machine with respect to the depth of cut. Therefore the machine shown is arranged to cut the gains to one depth only except as the frame is given a higher level by shims, not shown, when a mortise for a two and one-half inch butt is to be cut.

It is understood, however, that the machine is not limited as to size. A smaller size may be provided if desired to cut mortises for small butts; and a larger size may be made to cut mortises for larger butts.

The rails 8, 9 are extended to a desired length and the extensions are provided with catches 18 to retain a cross rod 19 of an adjustable clamp which cooperates with the cross bar 11 and comprises a clamp plate 20.

The clamp plate 20 is adjustably carried by a clamp screw 21 supported by a nut 22 fixed to a bar 23 which connects the posts 24 of the clamp frame. Said posts are provided with slots 25 through which the rear ends 26 of the rails 8, 9 extend, and said extensions 26 are provided with the adjusting ways 27 to accommodate the cross rod 19 and allow it to be adjusted from one to another of the catches 18 to allow the clamp to accommodate doors and other pieces 16 of different thicknesses.

The clamp frame is provided with a keeper 28 projecting toward the clamp plate 20 and engaging the brackets 29 which project from the clamp plate and support the swivel bar 30 to which the swivel socket 31 is fixed by any suitable means as by rivets 32.

A thrust screw 33 extending into the annularly grooved end of the screw 21 serves to adjust the clamp plate 20 as the screw 21 is turned. Cotter pins 34 serve to secure

the swivel bar 30 to the bracket 29 and also serve as a stop for the keeper 28; said keeper prevents the plate 20 from revolving responsive to the rotation of the clamp screw 21.

The end cutters 2 and 3 are chisels, each provided with a cutting edge 35 at the lower end, and with a bevel edge 36 extending from top to bottom at the rear edge of the chisel. The back chisel 4 is provided at its bottom with the cutting edge 37 and at its lateral edges with the bevel edges 38. The cutting edge 35 and edge of the bevel 36 of each end cutter are at the outer face of such butts; and the bevel edges 36, meeting the bevel edges 38 form guide-ways for the same. The beveled edges 38 and cutting edge 37 of the back cutter are at the back face of the back cutter. The cutting edges of the end cutters and back cutters unitedly form three sides of a rectangle.

The depth cutter 1 is provided at its inner end with the cutting edge 39 and is provided with lugs 40 and 41 fixed as by rivets 42 to the depth cutter 1. Said lugs 40, 41 are detachably secured to the carrier 7 by screws 43; and the outer edge 44 of the depth cutter 1 is engaged by the inner edge of the carrier 7, which edge is of the same thickness as the back edge of the cutter 1 and drives the cutter 1 toward the back of the mortise when actuated in cutting a mortise. Said carrier 7 is supported upon the guide 6 by a guide plate 45 that is fixed by any suitable means as by welding, brazing or the like to the main body of the carrier 7.

The springs 46 fixed respectively at one end to the frame rails 8, 9 by screws 47 and at the other end to the carrier by screws 48, tend to normally hold the depth or bottom cutter in the open position shown in Figs. 1 to 8, and a handle 49 is fastened to the carrier by screws 50 and is adapted to be driven forward for making the depth cut.

Springs 51 normally retract the end and back cutters or chisels that are provided with handles 52 by which said end and back cutters are operated to make their respective cuts.

The end and back cutters 2, 3 and 4 are adjustably and detachably mounted upon the frame rails by means of an adjustable carriage which is shown constructed, in part, of a cross-plate or transverse member 53 that is preferably an angle plate having a flange 54 at its lower edge to give it rigidity and provided with vertical guide means which are preferably slots as at 55, to accommodate lugs 56 projecting rearwardly from the back cutter 4.

Said member 53 is also provided with adjusting holes 57 to accommodate gage screws 58.

The carriage is provided at one end with

a standard 59 which is rigid to the transverse member 53 and forms a support and guide for one of the end cutters. The inner faces of the transverse member 53 and the standard 59 are at right angles to each other, and a guide plate 60 is detachably connected to the standard 59 by screws 61. The guide plate 60 forms a guide for the lugs 62, 62', and the body; and the bevel edge 36 of the end cutter 2 forms a guide for one of the bevel edges 38 of the back cutter 4. The guideway formed by 59 and 60 for the end cutter 2 is in fixed relation to the transverse member 53, and is movable therewith along the frame.

The other end cutter 3 is mounted in adjustable relation to the transverse member 53 and the guideway formed by standard 59 and plate 60. To this end an angle iron comprising the vertical flange 63, provided with slots 64, 65, and the horizontal flange 66, provided with a slot 67, is fastened to the upright flange of the transverse member 53, by screws 68 through said slots 64, 65, which are provided with countersinks 69 with which the heads of the screw 68 engage to prevent any slippage or vibration when the screws are screwed home.

Upon the upright flange 63 of the adjustable angle member of the carriage, there is fixed a standard 70 provided with a guide plate 71, and analogous to the standard 59 and guide plate 60, and forming a third guideway, the same being for the lugs 72, 73 of the end cutter 3.

The bevel edge 36 of the second end cutter 3 cooperates with the bevel edge 38 of the back cutter 4 in the same way that the bevel edge 36 of the first end cutter 2 cooperates with the beveled edge of the back cutter. A binding screw 74 extends through a reinforcement 75 and the upright flange 63, and screws into the transverse member 53 to bind the standard 70 and the transverse member 53 together tightly, and to prevent any vibration.

The reinforcement 75 in the corner is conformed to the standard 70 and the upright angle 63; and is fixed to both the standard and upright. The lower ends of the springs 51 rest upon the carriage, and their upper ends support the handles 52 so that when the cut has been made by driving down the cutters 2, 3 and 4, the cutters will be returned to and will be normally held in open position as indicated in Figs. 1 and 5.

On the inner face of each of the cutters 2, 3 and 4, a depth gage 76 is fixed by screws 77 at the lower part of the cutter, and having its lower edge graduated as indicated at 78 and arranged at such a level above the edge 35 as to allow said edge to be driven into the wood to the required depth and no further.

The distance between the edge 35 and the gage plate 76 is equal to the depth of the grain to be cut; and when the edge 35 is sufficiently sharpened or ground off to materially reduce the depth, the stop shoulder formed by the lower edge of the plates 78 may be ground away an amount equal to the retraction of the edge 35.

A convenient means of determining the exactitude of the depth is furnished by laying the butt that is to be mortised in, upon a surface; and then placing the cutter upright with its edge resting on said surface and its shoulder upon the face of the butt. If the depth of the gage is not sufficient, the gage will ride on the butt. If it is too great it will not touch the butt. Care should be taken to make the edge and the gage rest upon the surface and the butt, respectively when this test is made.

The carriage is adjustable along the frame so as to accommodate the machine to different widths of butts. To this end micrometer adjusting screws 79, 79' are screwed through nuts 80, 81 that are fixed to the cross bar 11 and its brackets 12. Said screws 79, 79' engage purchases 82, 83, fixed to the carriage, so that by operating the adjusting screws, the carriage may be moved along the frame in one or the other direction according to the adjustment required. The purchases 82, 83 are fixed to the carriage by clamp screws 84, 85. The screws 84, 85 extend through slots 86 that extend along the carriage in parallelism to each other, and to the rail extensions 26; so that by loosening screw 84 and unscrewing the screw 85 until its head is withdrawn from the walls of the countersink of the slot 67, the carriage may be moved along the frame by operating the micrometer adjusting screw 79, 79'. In this adjustment for the width of the cut, the operator will observe the positions of the graduation marks 78, with respect to the edge of the piece in which the mortise is to be cut.

The posts 24 of the clamp frame are provided with runners 87 that run smoothly along the smooth tops of the rail extensions 26 for a distance between catches; and the slot is wide enough above the tops of the catches 18 to allow the rod 19 to be passed over the catches, and from catch to catch by simply lifting the clamp frame and shifting it so that the adjustment is desirably made. The clamp plate 20 is shorter than the width between the rails 26, and normally extends up below the bottom of the rails with an overhanging edge *a* so as to protect the back wall of the mortise and prevent it from being split off when the back chisel or cutter 4 is driven home.

The piece-engaging face of the clamp plate 20 is concave or hollowed out so that

in practice only its upper and lower portions contact with the piece 16 in which the mortise is to be cut; the purpose being to insure the application of pressure of the clamp plate on the edge of the piece to be mortised, so as to provide a certain support for the back wall of the mortise; so that even though the mortise is extended almost entirely across the piece, there will be no danger of splitting off the back wall of the mortise.

It is understood from inspection of Fig. 3^a which represents different lengths of depth cutters 1, that a like set of back cutters 4 must also be provided in order to adapt the machine to cut mortises of the different lengths. The set of back cutters is practically like the set of depth cutters shown.

In practice the operator will adjust the clamp frame on the rails so as to allow the machine to be brought into position indicated in Fig. 1. The clamp screw 21 will be screwed home, and the cutters 2, 3 and 4 will then be operated respectively to make the two end cuts and the back cut. Then the depth cutter 1 will be operated to cut out the chip, thus completing the mortise. Then the operator will loosen the clamp screw and the machine may then be shifted to and clamped into position for cutting the next cut; after which the operation described is repeated.

The springs 46 are arranged to retract the depth cutter out of the path of end cutters adapted to cut a mortise of the greatest width required; and when the machine is applied to cut mortises of the narrow widths, the end cutters simply extend beyond the front side of the piece to be mortised, and are operated when the depth cutter is retracted.

The top of the cross bar 11 is below the greatest depth to which a cut is to be made.

By reference to Fig. 10 it will be seen that the depth at which the depth cutter 1 cuts, is gaged by gage plate 88 which is fastened by suitable means, as two screws 89 to the carrier 7. Said screws are adapted to pass through holes which are arranged on parallel lines as at 90, 91, 92, 93 and 94. This plate is only used in gaging the cut on a door or window or the like where there is no casing 95, to be passed over, and said plate must be entirely removed when the machine is applied to cut a mortise in a door or window-jamb 96, as shown in Fig. 11.

The front edge of plate 88 is provided with notches 97 to indicate that that edge is never to be placed toward the edge of the cutter, so as to maintain an accurate gaging of the depth cutter.

To change the machine to cut a mortise for a different size of butts, loosen screws 74 and 68 and 85, thus allowing the gage piece 63 to be adjusted, laterally.

Remove guide plates 60 and 71, thus releasing the end cutters. The back cutter may then be removed and replaced with one of the required edge length, and then the end cutters may be secured by clamp plates 60 and 71 and the plates 63 brought into position juxtapose, the bevel edges of the back and end cutters as shown. Then the screws 68, 74 and 85 will be tightened and the machine is again ready for use.

The cross bar 10 serves in conjunction with the cross bar 11 to hold the rails in rigid relation to each other and the cross bar 10 is preferably a U-shaped rod fixed at its ends to the rails and extending below the rails so as to form a convenient handle for carrying the machine and moving it from one place to another on the piece to be mortised.

I claim:

1. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; said rails having extensions provided with catches; a clamp frame adapted to be held by said catches; a clamp plate movable with respect to said clamp frame; means connected to the clamp frame and adapted to move the clamp plate and clamp the piece against the cross-piece; guides for cutters; cutters for said guides; a cross-plate fixed to one of said guides; and means adjustably fixing another of said guides to said cross-plate; said cross-plate and guides being adjustable along said rails.

2. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; said rails having extensions provided with catches; a clamp frame adapted to be held by said catches; a clamp plate adjustably connected to said clamp frame; means adapted to move the clamp plate and clamp the piece against the cross-piece; guides for cutters; cutters for said guides; a cross-plate fixed to one of said guides; and means adjustably fixing another of said guides to said cross-plate; said cross-plate and guides being adjustable along said rails.

3. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; means to clamp such piece against the cross-piece; cutters; guides for said cutters; a cross-plate adjustably mounted upon said rails and adjustably secured to said cross-piece; one of said guides being fixed to said rails, another of said guides being fixed to said cross-plate, and a third one of said guides being adjustably fixed to said cross-plate.

4. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; means to clamp such piece against the cross-piece; cutters; guides for said cut-

ters; a cross-plate adjustably secured to said cross-piece; one of said guides being fixed to said rails, another of said guides being fixed to said cross-plate, and a third one of said guides being adjustably fixed to said cross-plate; said cross-plate and guides secured thereto being adjustable longitudinally of said rails.

5. In a mortising machine comprising a frame having rails and a cross-piece to engage adjacent faces of a piece to be mortised, said rails having extensions provided with catches; posts having slots through which the extensions extend; a rod secured to said posts and adapted to engage said catches; a clamp plate; and means mounted on said posts and adapted to move said clamp plate and clamp the piece against the cross-piece.

6. In a mortising machine comprising rails adapted to rest upon the piece to be mortised; a cross-piece adapted to fit against the piece to be mortised; means to clamp such piece against the cross-piece; a guide-way that is fixed to said rails; a cross-plate having a guide-way fixed thereto; a third guide-way which is adjustably fixed to said cross-plate; and means adjustably secured to said cross-piece and adapted for use in micrometrically adjusting along the rails, the guide-ways that are fixed to the cross-plate.

7. The combination with a frame having a cross bar and having rail extensions that are rigid to said cross bar and are provided with ways and catches in said ways; of means for guiding cutters to cut a mortise in a piece; a clamp frame comprising posts and a rod connecting said posts, said rod being adapted to be held by said catches; a clamp plate movable with respect to said clamp frame; and means connected to said clamp frame and adapted to force said clamp plate against said piece.

8. In a mortising machine having rails and a cross-piece to engage adjacent surfaces of a piece to be mortised; guide-ways for cutters; cutters for said guide-ways; a plurality of said guide-ways and their respective cutters being arranged at angles to each other; means to clamp the piece against the cross-piece; a cross-plate carrying a plurality of said guide-ways; and means secured to said cross-piece and adapted to adjust said cross-plate and the plurality of guide-ways thereon longitudinally of said rails.

9. A mortising machine comprising a frame having cutters adapted to cut a mortise, said frame being provided with a cross bar adapted to clamp against one side of a piece to be mortised; said frame having rail extensions provided with catches; a clamp frame comprising posts and a rod connecting said posts, said rod being adapted to engage said catches for adjustment of said clamp frame with relation to a piece to be mortised;

a clamp frame; and means connected to the clamp frame to adjust the clamp plate into clamping position.

10. A mortising machine comprising a frame constructed with rails rigidly connected together and provided with catches; means on the frame to engage a piece to be mortised; a clamp frame; a clamp plate; brackets extending from said clamp plate; a keeper carried by said clamp frame to engage said brackets to prevent rotation of the clamp plate; and a screw carried by the clamp frame and operating said clamp plate to clamp the piece to be mortised.

11. In a mortising machine having rails and a cross-piece to engage adjacent surfaces of a piece to be mortised; cutters; guide-ways for said cutters, a plurality of which are arranged at angles to each other; means straddling said rails and adapted to clamp the piece to be mortised against the cross-piece; a cross-plate carrying a plurality of said guide-ways and means secured to said cross-piece and adapted to adjust said cross-plate and the plurality of guide-ways thereon longitudinally of said rails.

12. A mortising machine comprising a frame provided with rails and a cross-piece to engage a top and one side of the piece to be mortised; a guide-way that is fixed to said rails; another guide-way that is fixed with respect to lateral movement on said rails and is adjustable longitudinally on the rails; a third guide-way which is adjustable both transversely and longitudinally of such rails; means to hold the third guide-way in fixed relation to the rails; means cooperating with the rails and cross-piece to clamp the sides of the piece to be mortised; and cutters in said guide-ways.

13. A mortising machine comprising a frame provided with rails and a cross-piece to engage a top and one side of the piece to be mortised; a guide-way that is fixed to said rails; another guide-way that is fixed with respect to lateral movement on said rails and is adjustable longitudinally on the rails; a third guide-way which is adjustable both transversely and longitudinally of such rails; means to hold the adjustable guide-ways in fixed relation to the rails; means cooperating with the rails and cross-piece to clamp the sides of the piece to be mortised; and micrometer screws adapted to adjust the movable guide-ways along the frame.

14. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; said rails having extensions provided with slots; posts having slots through which the rails extend; means secured to said posts and adapted to engage said slots; a clamp plate; means mounted on said posts and adapted to move said clamp plate and clamp said piece against said cross-piece;

guide-ways for cutters; cutters for said guide-ways; and means secured to said cross-piece adapted to adjust certain of said guide-ways longitudinally of said rails.

5 15. A mortising machine comprising a frame provided with rails and a cross-piece to engage adjacent faces of a piece to be mortised; means to clamp the piece against the cross-piece; guides for cutters; said
10 guides being adjustable along the rails; a cross-plate fixed to one of said guides; cutters for said guides, and means adjustably fixing the other guide to said cross-plate.

15 16. In a mortising machine having rails and a cross-piece to engage adjacent faces of a piece to be mortised; said rails having extensions provided with catches; posts having slots through which said extensions
20 extend; means on said posts adapted to engage said catches; a clamp-plate; brackets extending from said clamp-plate; means mounted on said posts to move said clamp-plate and clamp the piece to be mortised;
25 and a keeper on said posts adapted to engage said brackets to prevent said clamp-plate from revolving while being moved into and out of clamping position.

17. In a mortising machine having rails and a cross-piece to engage adjacent faces
30 of a piece to be mortised; said rails having extensions provided with ways and catches

in said ways; posts having slots through which said extensions extend; a rod connecting said posts adapted to engage said catches; a clamp-plate which extends above
35 the edge of said piece; means mounted on said posts to move said clamp-plate and clamp the piece to be mortised; and means on said posts adapted to prevent said clamp-plate from revolving while being moved
40 into and out of clamping position.

18. In a mortising machine having rails and a cross-piece to engage adjacent faces of a piece to be mortised; said rails having extensions provided with ways and catches in
45 said ways; posts having slots through which said extensions extend; a rod connecting said posts adapted to engage said catches; a clamp-plate; brackets projecting from said clamp-plate; means mounted on said posts
50 to move said clamp-plate and clamp the piece to be mortised; and means on said posts adapted to engage said brackets to prevent said clamp-plate from revolving while being moved into and out of clamping position. 55

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 3rd day of April, 1920.

NELSON F. ANDERSON.

Witness:

JAMES R. TOWNSEND.