

(No Model.)

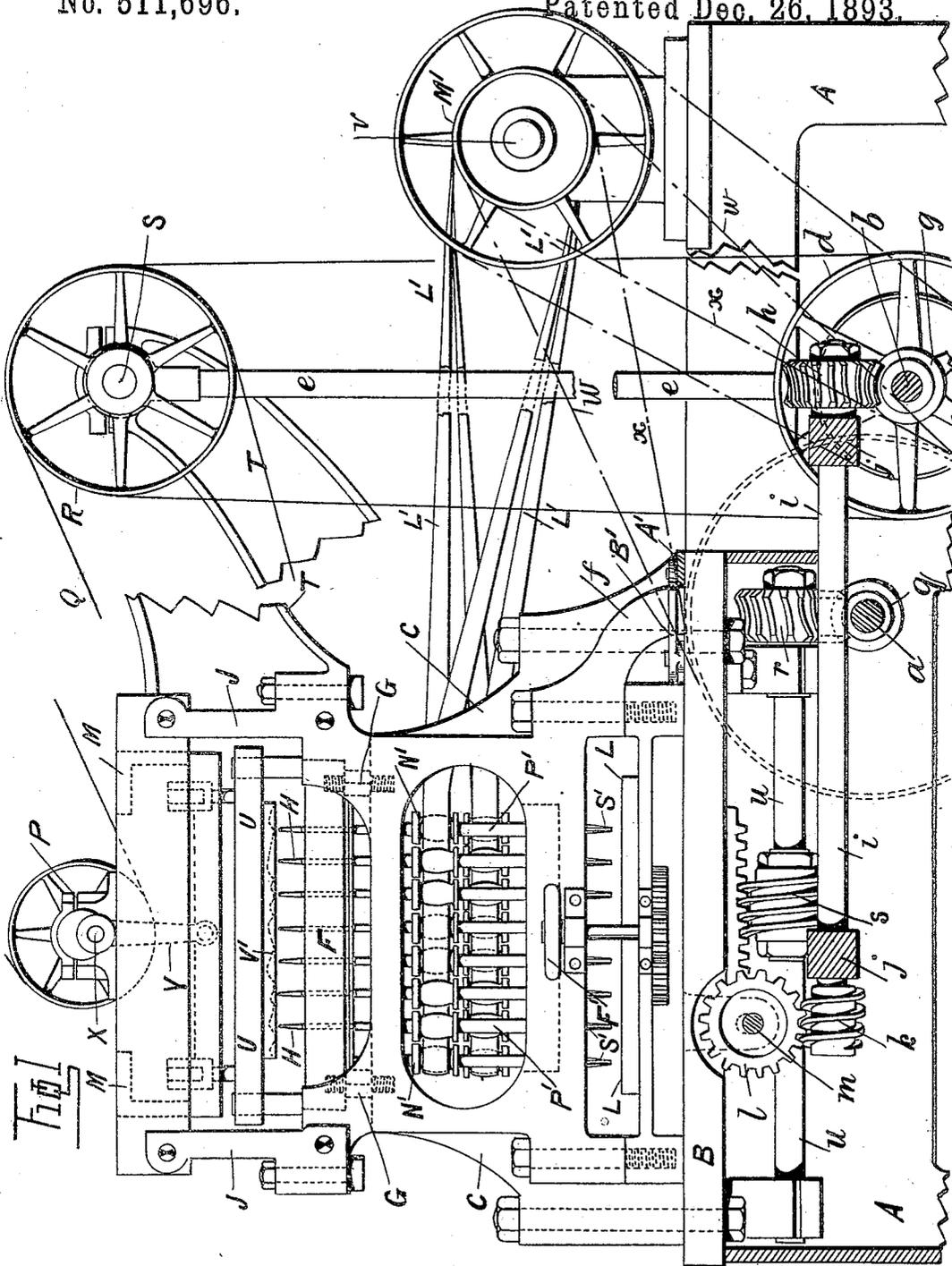
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C. HASS.

METHOD OF AND APPARATUS FOR REPRODUCING FACSIMILE
CARVINGS IN WOOD.

No. 511,696.

Patented Dec. 26, 1893.



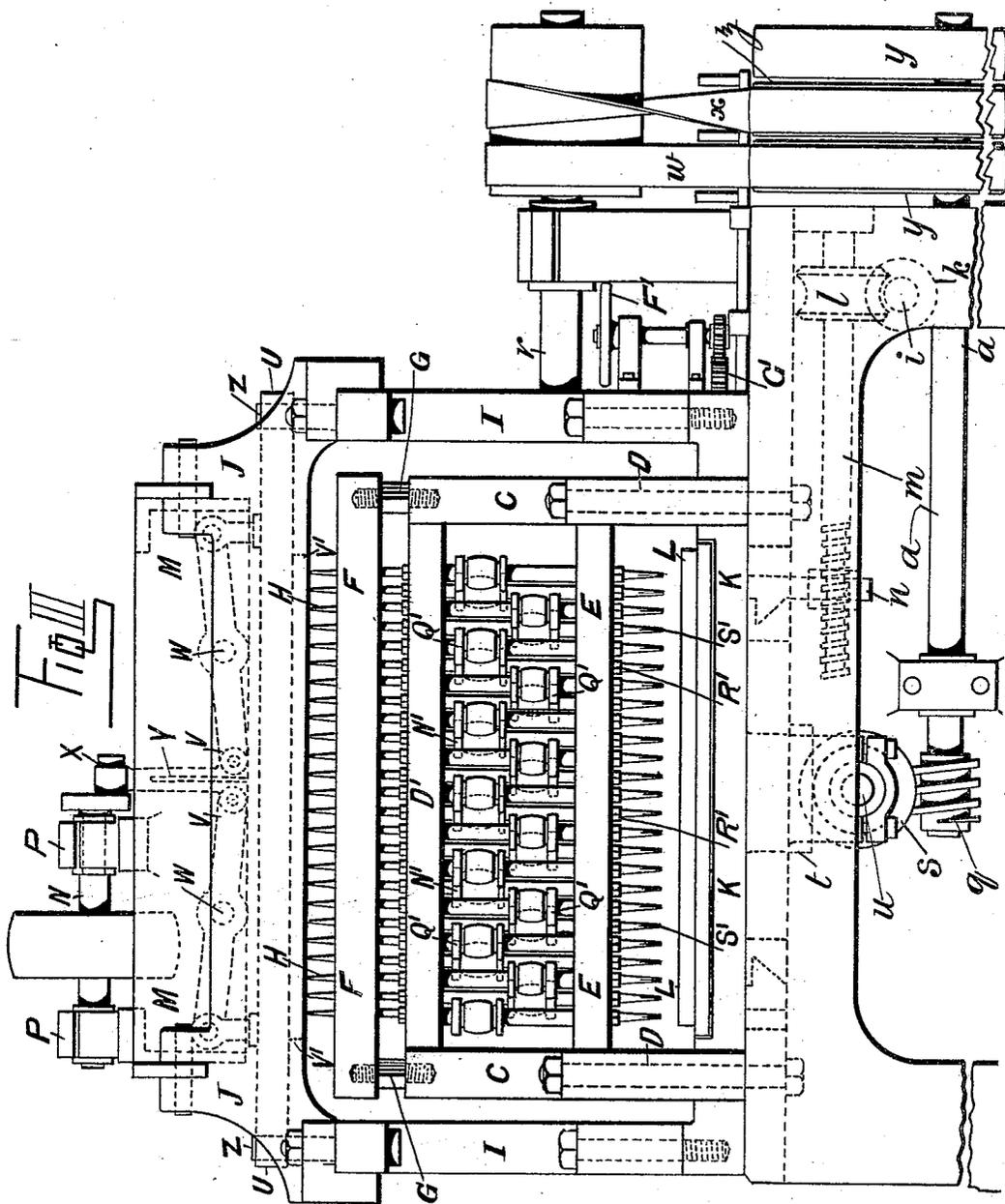
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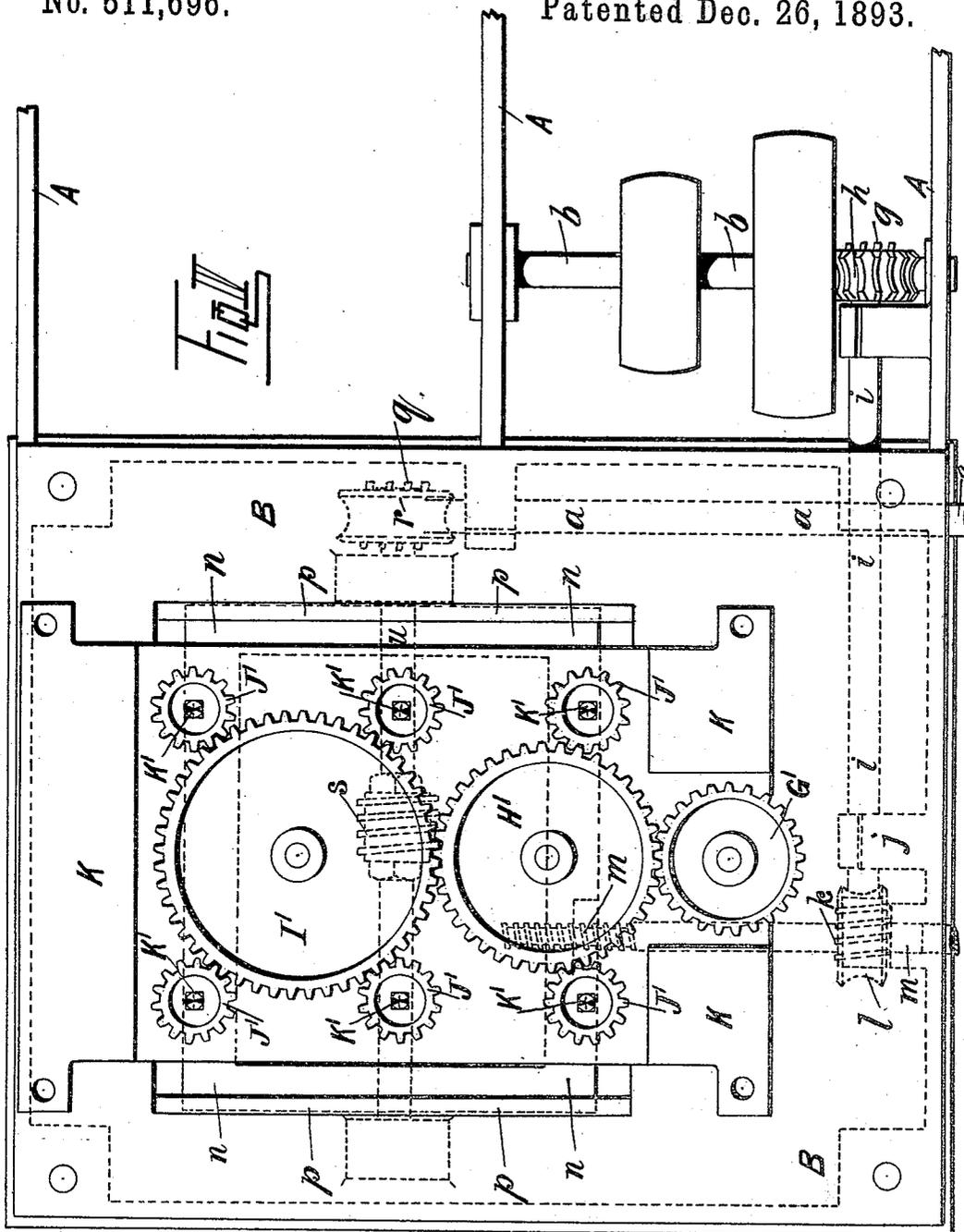
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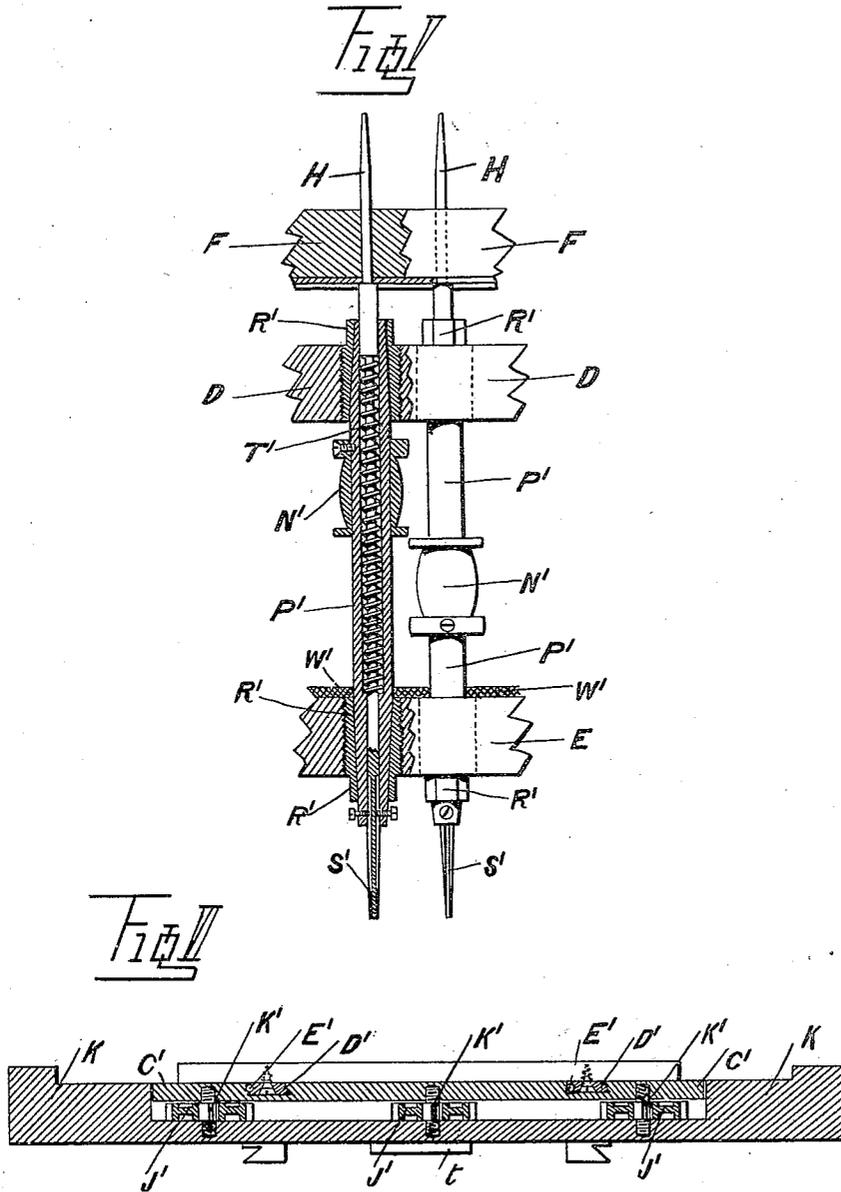
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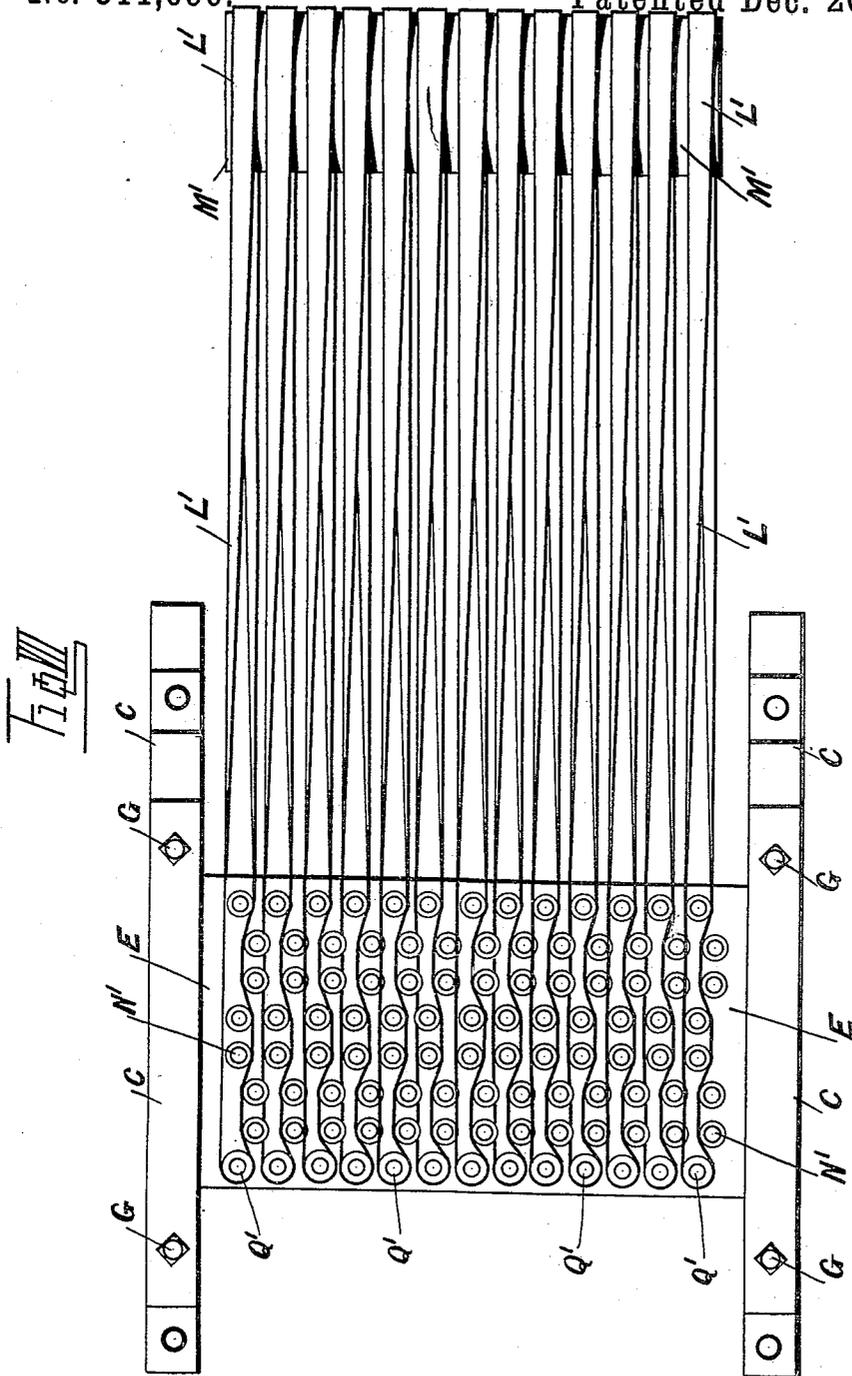
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UNITED STATES PATENT OFFICE.

CAESAR HASS, OF LONDON, ENGLAND.

METHOD OF AND APPARATUS FOR REPRODUCING FAC-SIMILE CARVINGS IN WOOD.

SPECIFICATION forming part of Letters Patent No. 511,696, dated December 26, 1893.

Application filed April 8, 1893. Serial No. 469,538. (No model.) Patented in England March 10, 1893, No. 5,240.

To all whom it may concern:

Be it known that I, CAESAR HASS, a citizen of the United States of America, and a resident of 298 Burdett Road, Limehouse, London, in the county of Middlesex, England, have invented a certain new and useful Improved Method of and Apparatus for Reproducing Fac-Simile Carvings in Wood and other Material, (patented in Great Britain on the 10th day of March, 1893, No. 5,240,) of which the following is a specification.

This invention has for its object the production of perfect and duly proportioned carved work from a pattern by means of a machine which if used directly would produce only an imperfect or distorted negative that is relatively incorrect but adapted to serve as a matrix from which a fac-simile of the original carving can be produced with said machine and negative.

According to my invention I construct a machine for carving wood, or like panels in relief, bas-relief, or other style by means of multiple cutters rapidly rotated in a particular manner and have imparted to them a vertical percussive movement by means of a rocking plate operated by a crank and necessary levers, said vertical percussive movement being regulated as to depth and contour of cut by a negative or reverse design of the original carving intended to be reproduced. The negative or reverse design is fastened to the under side of the before mentioned rocking plate and has in addition to its vertical movement for operating the cutters a transverse and automatic longitudinal motion over the top of the cutters that by means of worm and belt gearing the cutters may be operated over all parts of the design for cutting the wood or other material (panel) fixed below them, said panel having precisely similar transverse and longitudinal movements as the negative or reverse design being in fact fixed to the base plate of the movable structure that carries the before mentioned rocking plate.

I wish it to be particularly understood that in order to secure a correct copy of the original carving, it is necessary to obtain the negative or reverse design by the machine on which it is intended to be used; and for the following reasons:—That if a negative or re-

verse carving be obtained from the original carving in the well known manner and used in the machine before described the carving produced will differ from the original by the difference of the thickness of the cutter spindles used, that is to say all projections of the reproduced carving will be smaller than the original by the thickness of the cutter spindle and all depressions will be similarly enlarged resulting in a distorted representation of the original carving. It is therefore one of the peculiar features of my invention to use a distorted or as it were incorrect negative or reverse design to obtain a correct fac-simile of the original carving said negative being produced by using the original carving or positive casting of said original carving as a guide for determining the operation of the cutter spindles in the manner before described whereby a negative is produced with its depressions corresponding to the projections of the guide larger by the thickness of the spindles and its projections similarly smaller so that when said negative is used as a guide in the machine by which it was cut will result in the production of a perfect fac-simile of the original.

In order that my invention may be clearly understood I have appended the accompanying drawings in which—

Figure 1 is a side elevation of a machine constructed according to my invention with the side frame of the bed plate removed. Fig. 2, is a top plan of same. Fig. 3, is a front view of part of the machine showing the transverse disposition of the cutter spindles and dummies. Fig. 4 is a plan with top parts removed to more clearly show the gearing arrangements. Fig. 5 is a detail sectional view of the cutters. Fig. 6 is a detail of the plate upon which the wood or panel to be carved is fixed. Fig. 7, is a detail view showing the manner in which the multiple cutters are rotated by the belts.

In carrying my invention into practice I arrange upon a suitable lower frame A the bed plate B, to which is securely fixed by bolts D the side frames C, C, forming a superstructure for carrying the multiple spindles and cutters which revolve in bearings screwed into the top and bottom plates D' and E respectively. Arranged at a suitable distance

above the spindles is another plate F, also fixed to the side frames C, C, by the studs G, G, and through which pass the dummy pins H corresponding in number and position to the revolving spindles or cutters before mentioned.

The frames I, I, are connected at the top by the cross beams J, J, and at the bottom they rest upon and are fixed by bolts to the plate K upon which the wood L or other material to be carved is placed. The beams J, J, also support a casting M with its countershaft N rotated in bearings P by a belt Q from a pulley R fixed to the shaft S supported by brackets T attached in any suitable manner to the beam J or side frames I as may be convenient.

A rocking plate U is suspended from the casting M to which it is articulated by the levers V pivoted at W to which is imparted a rocking motion by the crank X and connecting rod Y when the countershaft N is set in motion, the plate U being guided by the studs Z uprising from the fixed frames I, I, to prevent any lateral movement of the plate U.

The whole of the structure formed by the side frames I, I, plate K, cross beams J, casting M and their attachments have a compound sliding movement by means of the worm gear operated by the shafts *a* and *b* as hereinafter fully described.

To prevent any undue strain or tilting action by the pull of the belt *c* upon the pulley R a stretcher bar *e* is arranged upon and between the shafts *b*, S, in such a manner as to allow of the small longitudinal and transverse movement imparted to frames I, I, the arm *f* serving as an additional support.

The longitudinal and transverse movements of the frames I, I, and their attachments are effected by a worm *g* fixed upon the shaft *b* gearing into a worm wheel *h* secured to one end of the shaft *i* mounted in bearings *j j* projecting inwardly from the lower frame A and a worm wheel *l* fixed to the screw spindle *m* working in a nut depending from a frame *n* upon which the plate K and its superstructure are arranged in such a manner as to be drawn transversely with the frame *n* in the guide grooves *p* and yet be free to move in a longitudinal direction upon the frame *n* under the action of worm *g*, worm wheel *r*, worm *s*, and rack *t* Fig. 1 fixed to the under side of the plate K, the necessary motion being communicated to the shafts *a* and *b* from the main shaft *v* by belts.

The frames I, I, and attachments are caused to automatically move backward and forward by reversing the direction of rotation of the shaft *a*. This is done by causing the straight and crossed belts *w*, *x*, to be alternately shifted from the fast pulleys *y*, *y*, to the loose pulley *z*, under the action of a slider A' operated by the bell crank B' or equivalent means from the movement of the side frame I itself.

The wood or other panel to be carved is

fixed upon the platen C' Fig. 6, by screwing it to the metal or other suitable battens D'' chamfered at one edge to fit a corresponding undercut in the groove of the platen C' into which it is fitted and secured by passing a wire E' between the batten and the groove the curve on each side of same serving to bind them in position. When the wire E' is removed the panel and battens D'' can be shifted a little to the left to release the chamfer from the undercut before mentioned, and lifted out. The depth to which the panel is to be cut is regulated by raising the platen C' by the hand wheel F', the pinion on the shaft of which gears into the wheel G' (see Fig. 4) that in turn operates the wheels H', I', to revolve the pinions J' fixed to the studs K' having right and left handed screws, and as they all rotate at the same circumferential speed the platen C' is equally lifted from all sides to the necessary height. The main shaft is set in motion, the belts L' pass around the drum M' and are interlaced between the pulleys N' of every alternate couple of spindles and around a dummy Q' as shown in Fig. 7, the number of belts L' used corresponding to the number of spindles arranged across the machine. The spindles P' revolve in conical bearings R' screwed into the plates D', E, before mentioned. Within the spindles P' and arranged to turn with them are the cutters S' which are forcibly depressed into the panel to be carved by the movement of the rocking plate U and the negative V' striking the pins H the depth to which they are forced corresponding to the varying undulations of the negative pattern. The cutters having a rapid rotary movement as well as a percussive striking action cut away the wood to the pattern required, determined of course by the formation of the negative guide produced and operated as before described. Said cutters are returned to their uppermost position by the spiral springs T' by which they are encircled and they abut up against preferably a zinc plate to deaden the sound. Between each row of spindles are inserted strips of felting W' soaked in oil to lubricate them in their bearings which are further kept cool by a strong current of air induced by a blower.

What I claim is—

1. The method of producing perfect and duly proportioned carvings from a pattern by means of a machine which if used directly would produce an imperfect or distorted negative, which consists in first producing by such machine a distorted negative and then using the same as a pattern for producing a perfect or duly proportioned copy of the original pattern, substantially as described.

2. In a carving machine, the combination with a rotary and percussive cutter having a dummy pin attached to its non-cutting end, of a rocking-plate having attached thereto a negative or distorted pattern in contact with the dummy-pin, and means for simultaneously

moving in opposite directions the rocking plate and the material to be carved, substantially as described.

3. In a carving machine, the combination
5 of the grooved platen C', the chamfered battens D'', the fastening wires E' inserted between the sides of the battens and the platen grooves, the screw studs K' connected with the platen and provided with pinions J', the
10 gears G'H'I' connecting said pinions, and the hand wheel F', substantially as described.

4. In a carving machine, the combination
of a vertically adjustable platen provided
with means for holding the material to be
15 carved, a number of rotary and percussive cutters, a corresponding number of dummy-pins attached to the non-cutting ends of said

cutters, a rocking plate having on its under side a negative or distorted pattern adapted to govern the vertical movements of the cut- 20
ters as to depth and contour of cut, and mechanism for simultaneously moving the platen and rocking plate in opposite directions, substantially as described.

In witness whereof I have hereto signed my 25
name, in the presence of two subscribing witnesses, this 20th day of March, 1893.

CAESAR HASS.

Witnesses:

ALEX RIDGWAY,

Notary Public, 19 Change Alley, E. C.

HAROLD J. MOORE,

19 Change Alley, London, E. C., Notary's Clerk.