No. 885,293. PATENTED APR. 21, 1908.

F. H. RICHARDS.

CARVING MACHINE.

APPLICATION FILED JUNE 2, 1902.

3 SHEETS—SHEET 1.

Fig. 2

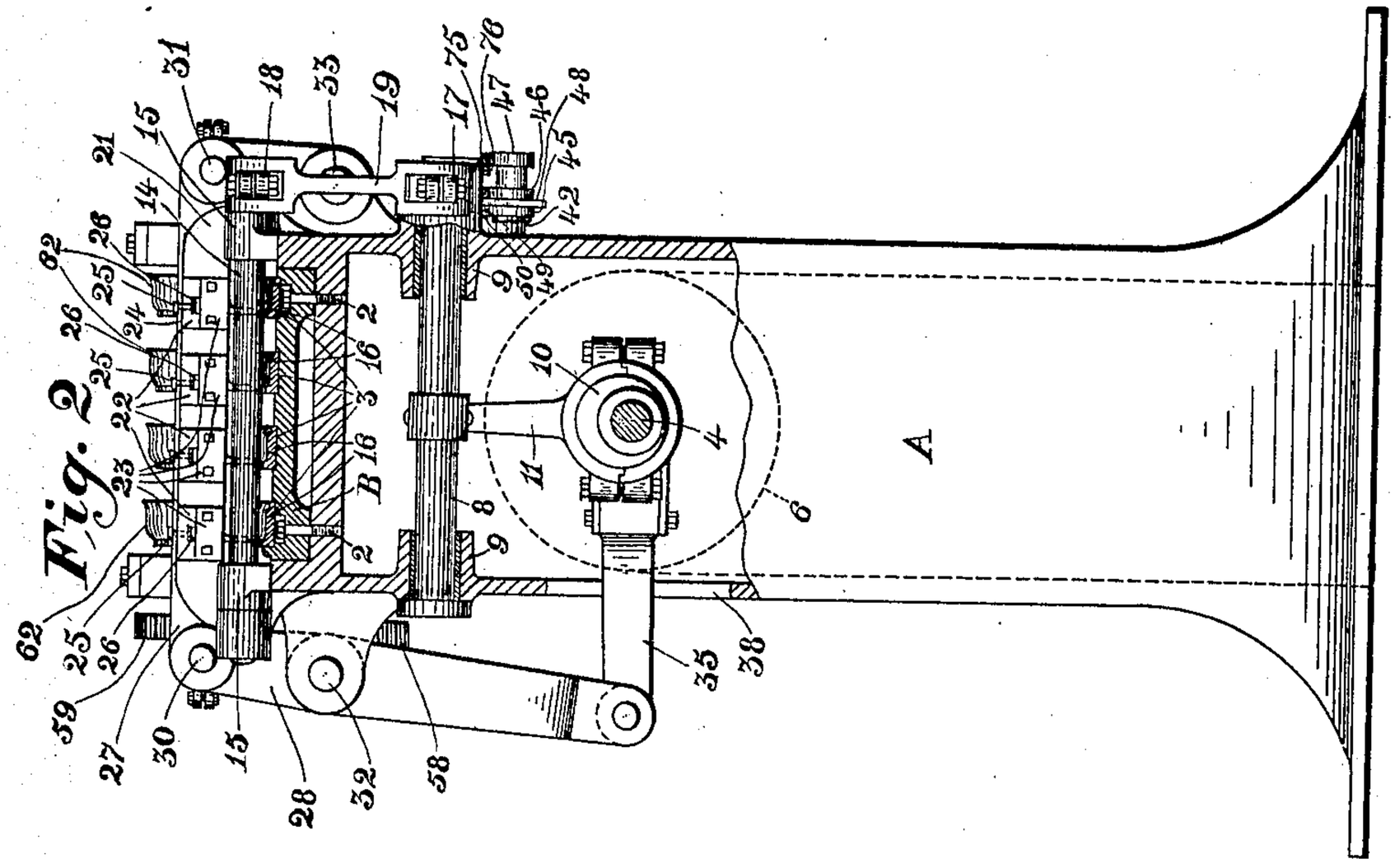
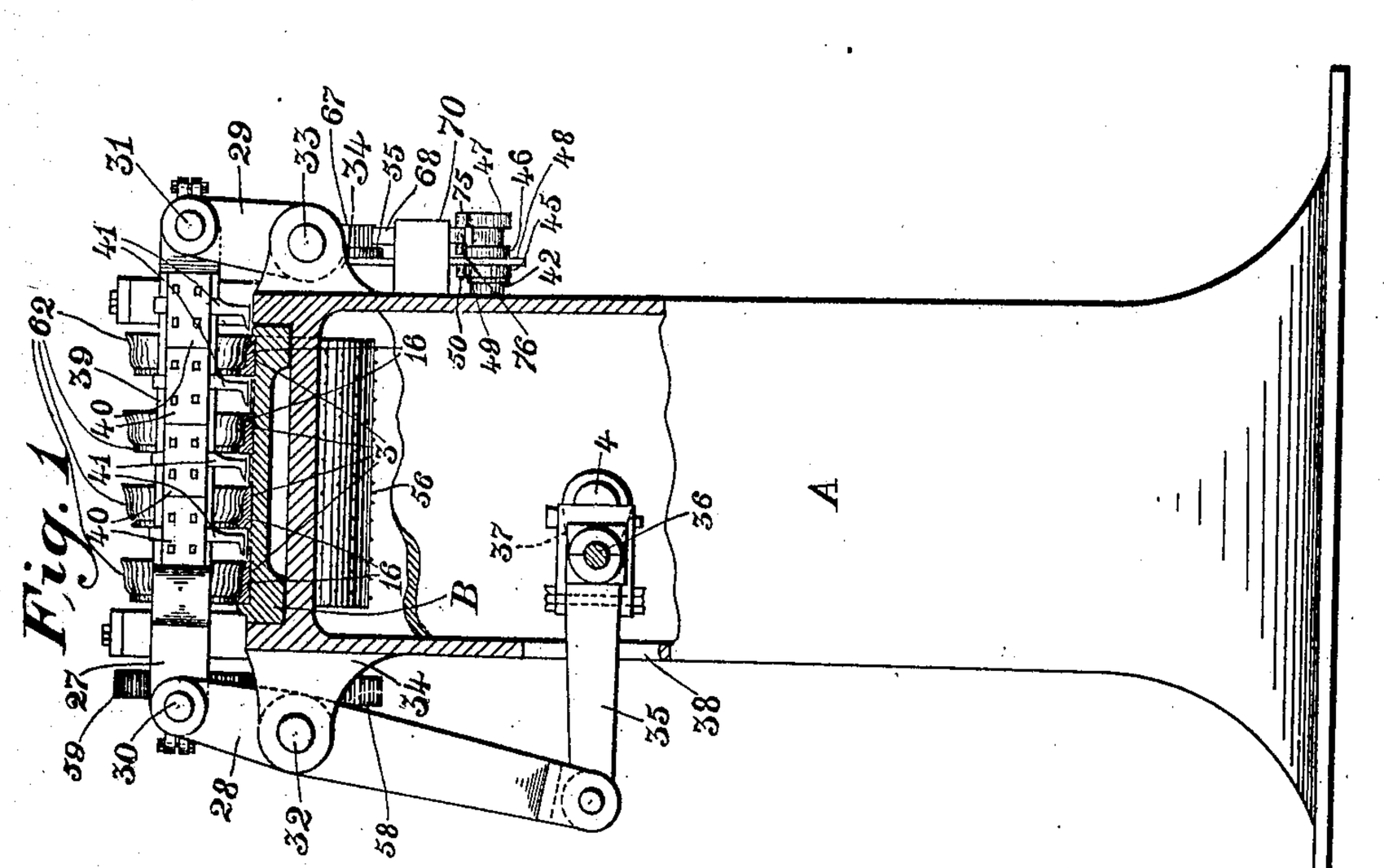


Fig. 1



Witnesses

H. Everett Wade

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3 SHEETS—SHEET 2.

Fig. 8

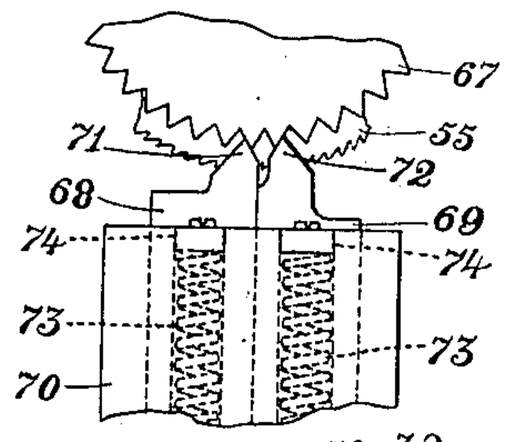


Fig. 3

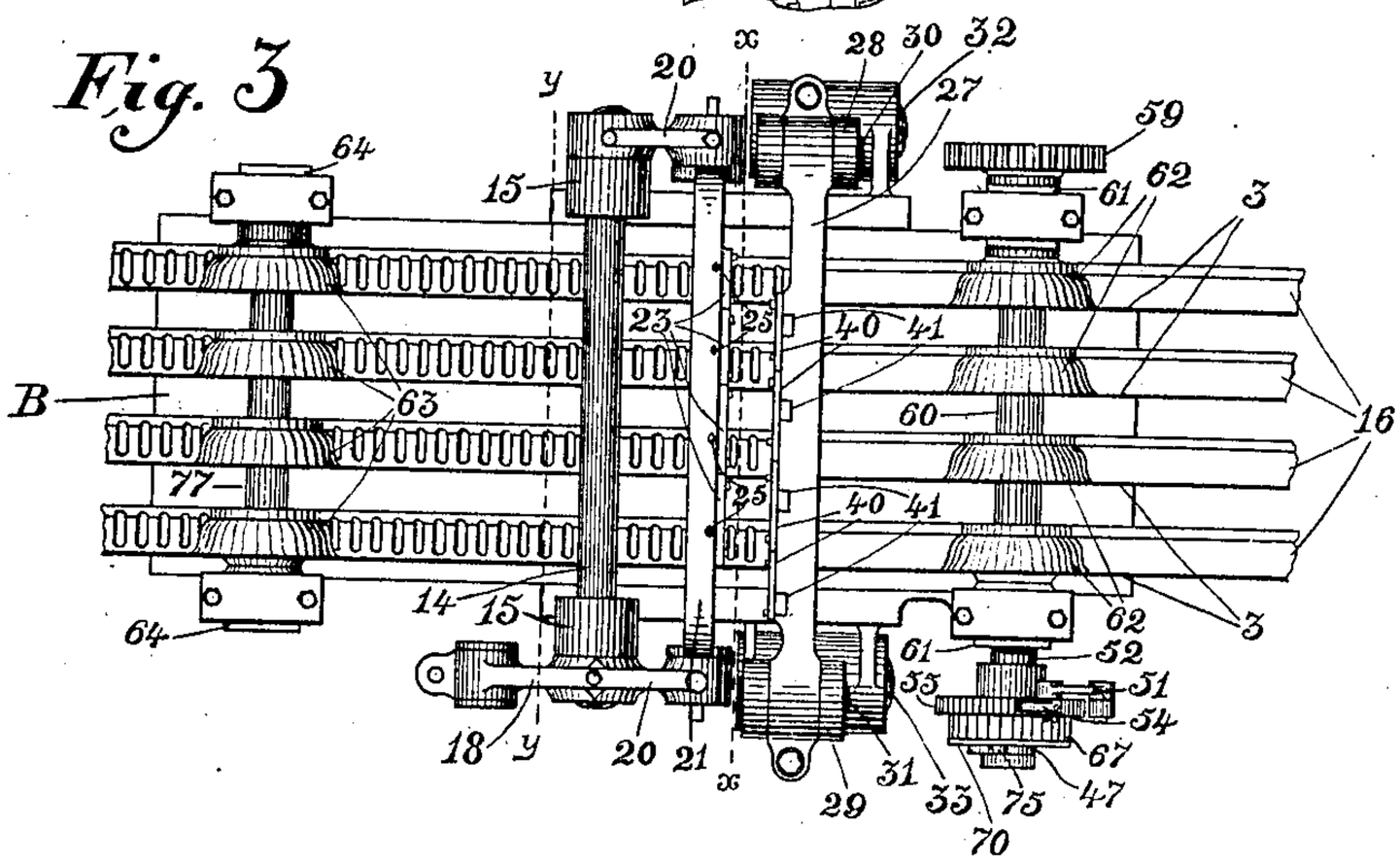
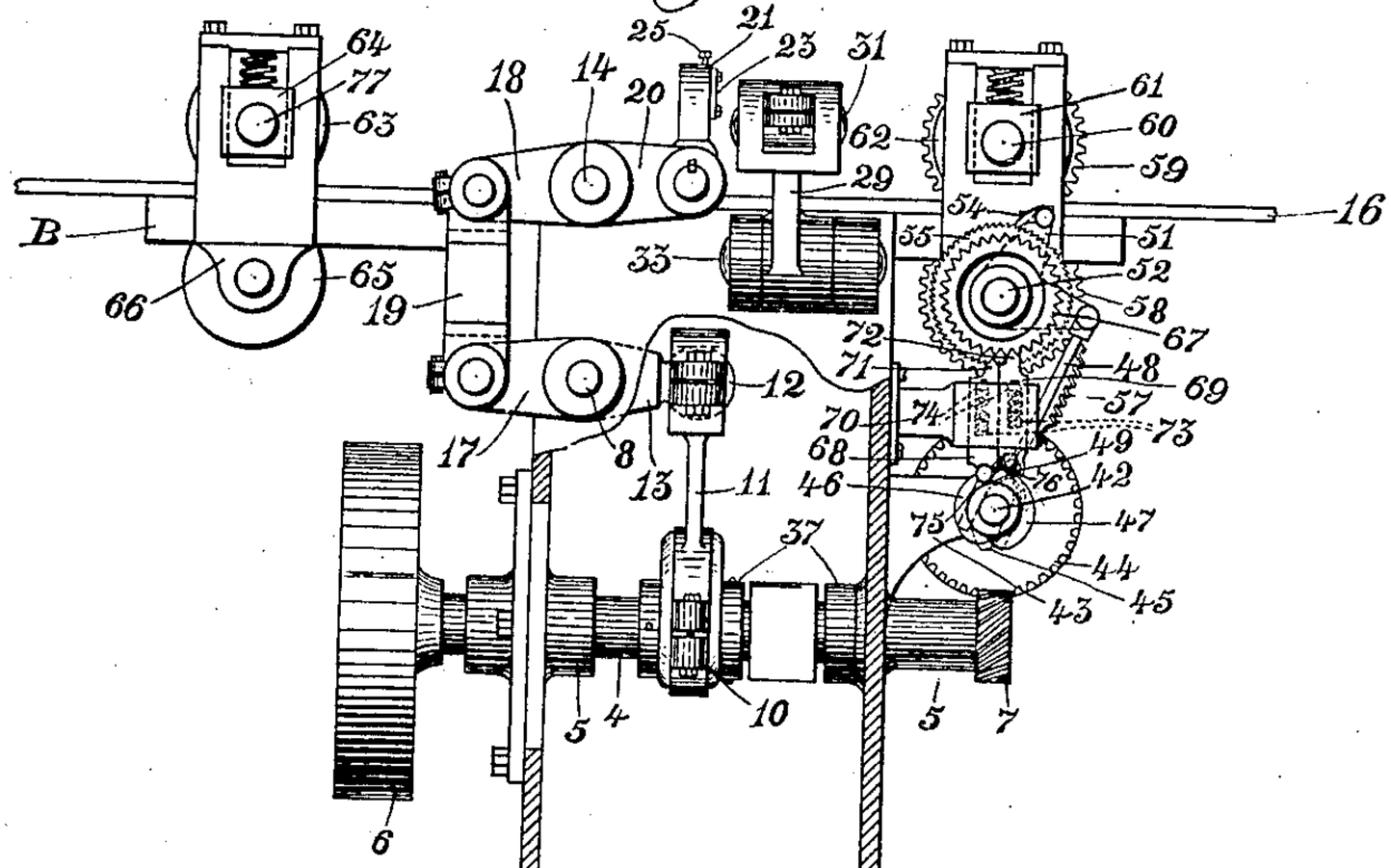


Fig. 4



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3 SHEETS—SHEET 3.

Fig. 5

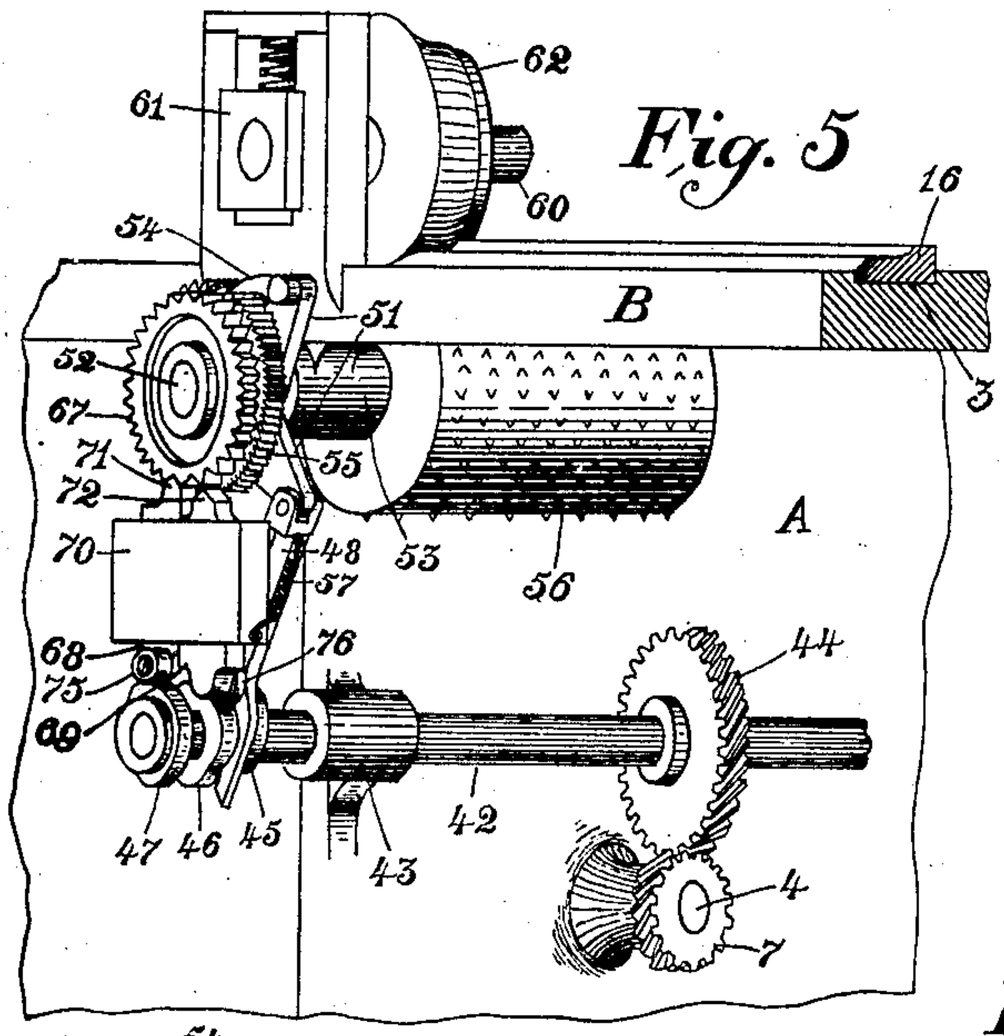


Fig. 10

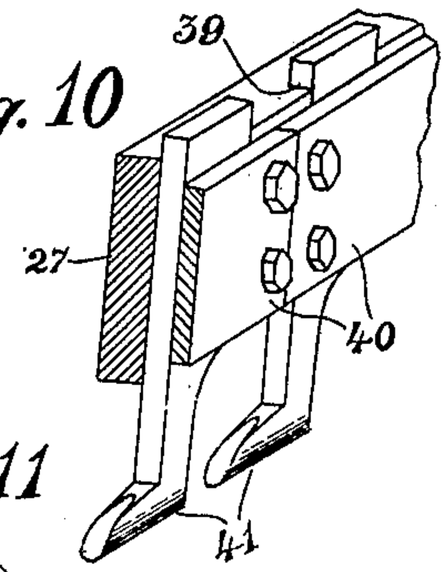


Fig. 11

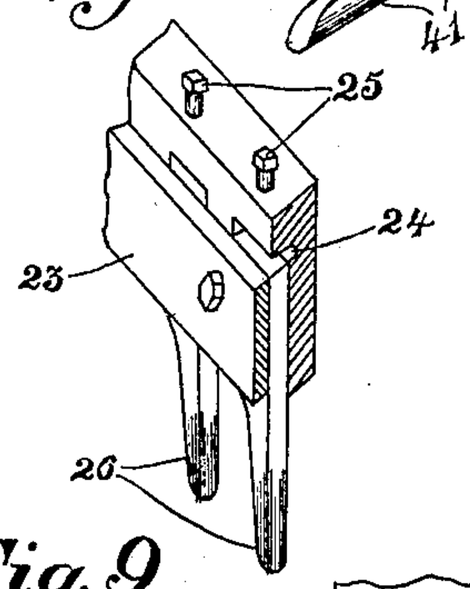


Fig. 6

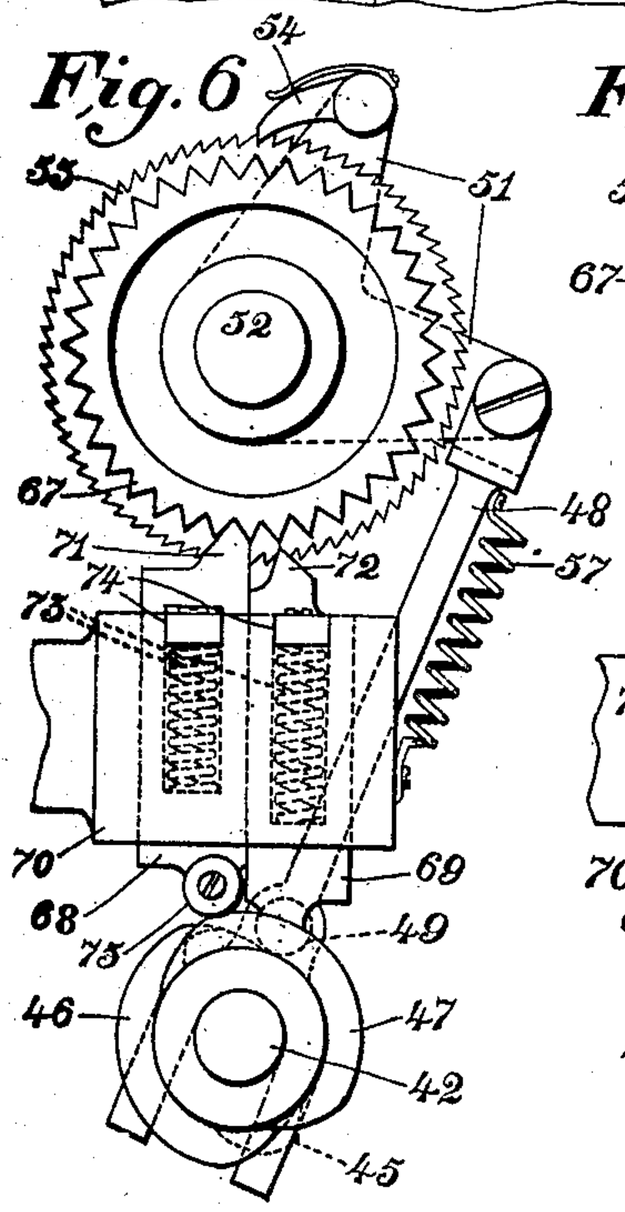


Fig. 7

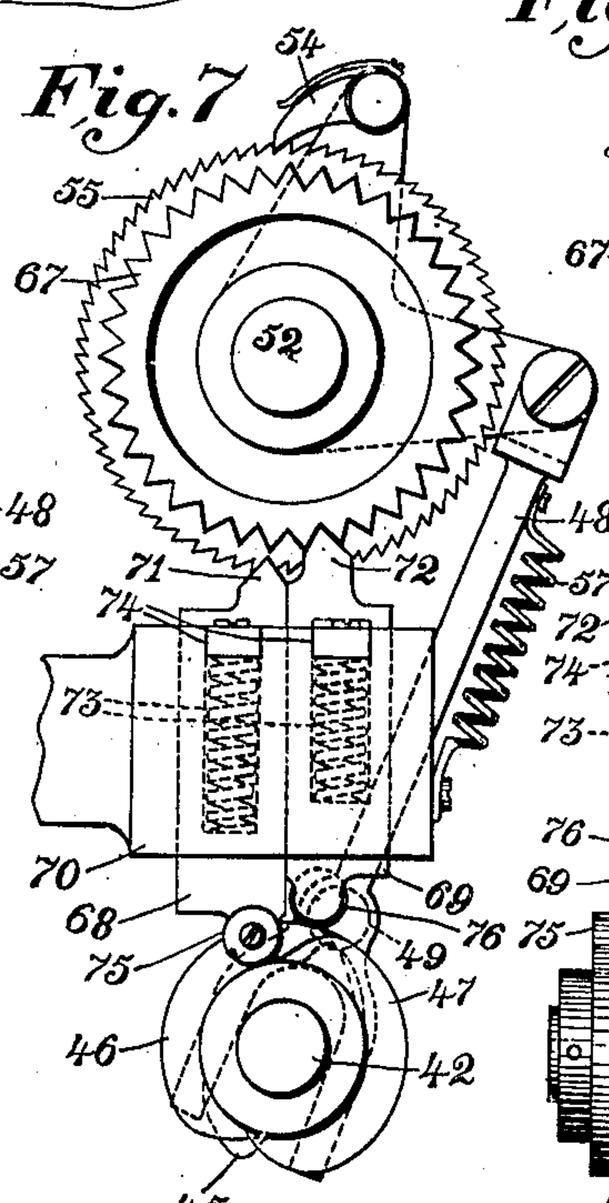
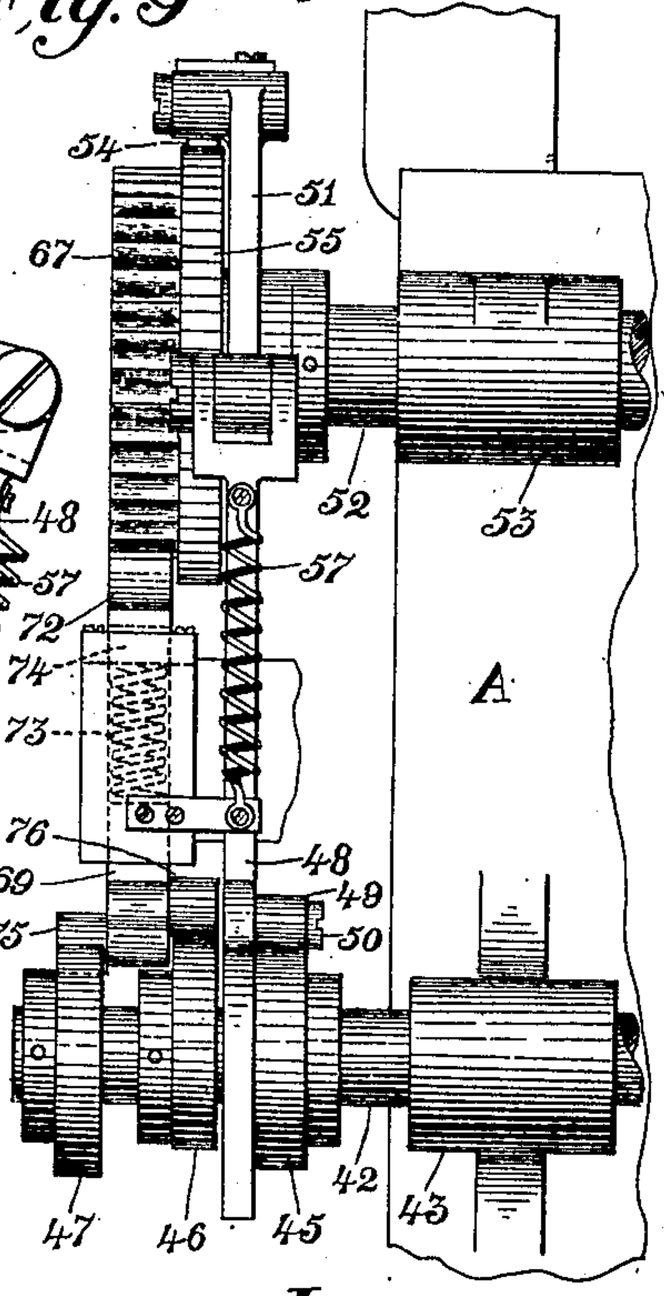


Fig. 9



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

CARVING-MACHINE.

No. 885,293. Specification of Letters Patent. Patented April 21, 1908.

Application filed June 2, 1902. Serial No. 109,904.

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Carving-Machines, of which the following is a specification.

My invention relates to carving machines and has for an object to provide improved mechanism for carving ornaments on wood, molding or the like, and particularly upon several strips of molding at one operation.

Some of the objects of my invention are to provide a compact machine of the above-named character, which is capable of a large output and which is composed of few and simple working parts arranged and combined to produce a smoothly working machine, to provide means whereby the feed of the stock to the machine is rendered accurate and steady and to provide means whereby the stock is precisionized during the working period of the cutters.

I have illustrated one embodiment of my invention in the accompanying drawings in which like reference characters denote like parts throughout the several views and wherein.

Figure 1 is a front elevation partly in section on line x—x of Fig. 3; Fig. 2, a similar view partly in section on line y—y of Fig. 3; Fig. 3, a plan view; Fig. 4, a side elevation with side wall broken away; Fig. 5, a detail in perspective of the feed mechanism; Fig. 6, a detail in elevation of the feed and precisionizing mechanism; Fig. 7, a similar view showing parts in second position; Fig. 8, a detail of mechanism shown in Figs. 6 and 7 showing parts in third position; Fig. 9, an end view in elevation of mechanisms shown in Figs. 6 and 7, and Figs. 10 and 11, details of cutters.

Referring to the machine illustrated in the drawings herein, the parts are shown assembled and supported upon a box-like frame A. A stock bed B is mounted upon the top of the frame A, and is removably secured thereto by the bolts 2—2. The stock bed B is provided with a plurality of parallel stock-guides 3—3, in its upper surface. I have shown four of these stock-guides of rectangular form, but a greater or less number may be used, and they may be otherwise shaped to conform to variously formed stock.

In practice a stock bed B is provided for each stock the base of which is differently configured or of different size, which stock beds are interchangeable in the machine. A horizontal shaft 4 is longitudinally mounted in bearings 5, in the frame A, and projects at either end without said frame. Upon one projecting end of the shaft 4 is mounted a power pulley 6, for driving the same, and upon the other projecting end of said shaft is mounted a spiral gear 7. Above the shaft 4 a shaft 8 is horizontally mounted transversely of the shaft 4, in bearings 9—9 in the frame A. The shaft 8 projects without the frame A, at its right hand end (see Fig. 2). An eccentric 10, having a curved face is mounted upon the shaft 4, within the frame A, and an eccentric rod 11 connects the eccentric 10 in a ball joint 12, with the end of an arm 13, fast on shaft 8. Upon the rotation of the shaft 4, the eccentric rod 11 imparts an oscillating movement through the arm 13, to the shaft 8, but as this motion is very slight the disalinement between the eccentric 10 and the ball joint 12, at the end of arm 13, is very slight and will be compensated for by said ball joint and the curvature given the face of eccentric 10. A shaft 14 is mounted in upstanding bearings 15, on the frame A, at either side of the stock bed B, directly above and parallel with the shaft 8.

The shaft 14 is mounted above stock-guides 3 at sufficient height therefrom to clear the stock members 16, lying in said stock-guides. The shaft 14 extends without its bearing 15 at its right end, (see Fig. 2). On the projecting portion of shaft 8 is rigidly mounted an arm 17, and rigidly mounted on the projecting portion of shaft 14, is an arm 18.

The arms 17 and 18, at their free ends, are pivoted to link 19. It will therefore be seen that the oscillating movement of the shaft 8 will be imparted to the shaft 14, in the same degree, if the arms 17 and 18 are of the same length between the shafts and the pivots or of greater or lesser degree, if the pivot on arm 18 is a greater or less distance removed from the shaft than that upon arm 17. Attention is called to this means of varying the degree of movement of the shaft 14, as by substituting a longer or a shorter arm 18, the degree of oscillation may be increased or decreased. At either end of the shaft 14 are rigidly carried arms 20, that upon its right end (see

Fig. 2) may be a continuation of the arm 18. To the extremities of the arms 20 is rigidly secured a beam 21 extending transversely across and above the stock-guide 3. The oscillation of shaft 14 is transmitted to the arm 20, carrying the beam 21 toward and away from the stock-guide. The face of the beam 21 should be substantially perpendicular to the stock-guides at its point of nearest approach thereto. Upon the face of the beam 21 are formed a series of tool beds 22, corresponding to the stock-guides below, and each tool bed 22 is provided with a tool clamp 23. The beam 21 is recessed to provide for the tool beds 22 and clamps 23 leaving a horizontal flange 24 at its upper edge, in which flange 24 are mounted adjusting screws 25 registering with the tool beds 22, and adapted to abut the rear end of a tool 26 held on the bed 22 by the clamp 23, and provided for fine longitudinal adjustment of said tool as well as to take, in a large measure, the thrust which will be applied to the tool. It is seen that the tools 26 carried by the beam 21 as the beam moves toward the stock bed B will each incise a stock member 16, lying in each of the stock-guides 3. In the machine illustrated the cutting edges of the tools 26 are disposed transversely of the beam and make very short cuts in the stock member 16. The movement of the beam 21 will be proportioned to the desired length of cut of the tool 26.

A beam 27 is mounted transversely of and parallel to the stock bed B, on arms 28 and 29, to which it is pivoted at 30 and 31. The arms 28 and 29 are of equal length, and are pivoted at 32 and 33 to projections 34 of the frame A. The beam 27 and the arms 28 and 29, together with the frame A, form an articulated parallelogram, having the frame A for a stationary base. As the distance between pivots 32 and 33 is the same as between pivots 30 and 31, it will follow that an oscillating movement given arms 28 and 29 will give the beam 27 a movement across the stock-guides 3 constantly parallel thereto. If said oscillating movement be short enough and the arms 28 and 29 be perpendicular of the beams 27 at the center of said movement, the movement of said beam will be practically in a straight line, parallel to the stock bed, the arc formed being practically imperceptible. The arm 28 is extended below the pivot 32, and is connected by a connecting rod 35, with the wrist-pin 36 of a crank 37 on shaft 4, which connection produces the movement of the beam 27, above described. The connecting rod 35 works in an aperture 38, in the frame A. A tool bed 39 is provided on one face of the beam 27 and tool clamps 40 are disposed thereon, corresponding to the stock-guides 3 below. Tools 41, bent at their lower end and provided with horizontally directed cutting edges, are clamped to the tool bed 39 by the tool clamps 40 and incise the stock members 16 transversely when the beam 27 is moved by the crank 37. The crank 37 and eccentric 10 are set upon the shaft 4 to cause the tools 41 and tools 26 to incise the stock simultaneously, and to remain without the profile of the stock simultaneously.

A shaft 42 is mounted above the spiral gear 7 and perpendicular of the shaft 4 in bearings 43, projecting from the frame A, and carries a fast spiral gear 44 meshing with the spiral gear 7. Shaft 42 is driven from the spiral gears 44 and 7 by and at a speed equal to that of shaft 4. The shaft 42 projects beyond the bearing 43 at its left hand end (see Fig. 5) and is provided upon its projecting portion with cam wheels 45, 46 and 47. The cam wheel 45 is a two-lobed peripheral cam, and a bifurcated arm 48 grasping shaft 42 with its bifurcated portion, carries a roller 49 mounted upon a stud 50, said roller mounted to travel upon the face of the cam 45. The cam 45 imparts to the arm 48, through the roller 49, an upward movement during one-quarter of a revolution of the shaft 42, or the shaft 4, and a return movement during the remaining three-quarters. The arm 48 is connected with a pawl-carrying arm 51, oscillatably mounted upon a shaft 52 mounted transversely of the stock bed B, in bearings 53 depending from said stock bed B. The arm 51 carries a pawl 54, which engages a ratchet wheel 55 fast on shaft 52, and rotates the same one tooth during the upward movement of arm 48, but which returns idly upon the surface of said ratchet wheel 55 during the downward movement of the arm 48. A feed roll 56 is mounted fast on shaft 52 and its periphery extends through the stock bed B, slightly above the floors of the stock-guides 3, to all of which stock-guides 3 the said roller 56 is common, and a spring 57 is provided to retract the arms 51 and 48, and prevent a disengagement of the bifurcated portion of the arm 48, with the shaft 42. A gear 58 fast on the shaft 52, meshes with a gear 59 fast on the shaft 60 mounted in resilient bearings 61, and carrying a plurality of presser rolls 62 fast thereon registering with the several stock-guides 3, and having faces substantially conforming to the stock members 16 which are to be operated upon and active gripping peripheries of equal diameter with the feed roll 56.

A shaft 77 carrying a plurality of presser rolls 63 registering with the several stock-guides 3, and conforming with the faces of the stock members, is mounted in resilient bearings 64, upstanding from the outward or ejecting end of the stock bed B. An idle roll 65 is mounted in bearing 66 depending from the stock bed B directly below the bearings 64, which roll 65 extends through the stock bed B slightly above the floors of the stock-

guides 3 being common to all of said stock-guides.

A toothed precisionizing wheel 67 is mounted fast on the shaft 52 which wheel 67 has half as many teeth as the ratchet wheel 55 or if the pawl 54 advances the ratchet wheel 55 more than one tooth at a time there should be one tooth on the wheel 67 to correspond with as many teeth on the ratchet wheel 55 as said ratchet wheel is moved in two advances of the pawl 54.

Two reciprocatable pallet bars 68 and 69 are vertically mounted in a projection 70 of the frame A, and are respectively formed with pallet teeth 71 and 72 at their upper extremities. The pallet teeth 71 and 72 are adapted to engage the teeth of the precisionizing wheel 67 in the manner and by the means following. Each of the pallet bars 68 and 69 is provided with an internal compressible spring 73 the upper end of which bears against cross-bars 74 of the projection 70 tending to draw the pallet bars downwardly. The pallet bars 68 and 69 respectively carry at their lower extremities loose rollers 75 and 76 respectively held against the faces of cams 47 and 46 on shaft 42. The cams 47 and 46 are patterned and set to move the pallet bars 68 and 69 or collateral movement preventers as I may choose to call them in the claims, in such a manner and relation that they will, at all times during the movement of the feed roll and during the times when said roll is passive, remain in close proximity to two opposed faces on the teeth of the wheel 67. These movements of the pallet bars are controlled by the cams to follow the normal movement of the wheel 67 and prevent overthrow thereof which might be caused by momentum of the stock and also to hold the feed roll steady during its period of rest when the cutters are at work upon the stock or being withdrawn. The pallet teeth not only will rectify overthrow, but will also rectify any short feed which may arise by the pawl 54 becoming worn, or by reason of a defective tooth in the ratchet wheel 55. The pallets thus precisionize the stock in both longitudinal directions and also hold the same locked in its precise position for the operation of the carving tools upon it.

It is obvious that various changes and substitutions may be made in the constructional details of the illustrated machine and that other embodiments may be devised especially designed for particular classes of work without departing from the spirit of my invention.

Having described my invention, I claim—

1. In a carving machine, the combination with a box-like frame, of a plurality of parallel stock-guides on said frame adapted to bear stock members, an oscillatable multiple cutter mounted to oscillate toward and away from said stock-guides, the plane of oscillation of said multiple cutter being parallel to the length of said stock-guides, an articulated parallelogram transverse of said stock-guides the lower side of which parallelogram is formed by said frame, a second multiple cutter forming a movable upper side of said parallelogram, and power-driven mechanism adapted to oscillate said cutters to incise the contradistinctive incisions of separate repeats of a pattern upon said stock members.

2. In a carving machine, the combination of a plurality of parallel stock-guides lying in the same plane, a multiple cutter registering with all of said stock-guides and oscillatable in a plane perpendicular to the plane of mounting of said stock-guides and parallel to the length of said stock-guides, and a second multiple cutter registering with all of said stock-guides and oscillatable in a plane perpendicular to the plane of mounting of said stock-guides and transverse of said stock-guides, said cutters patterned and arranged to incise the contradistinctive incisions of separate repeats of a pattern on stock lying in said stock-guides.

3. In a carving machine, the combination with stock feeding means, of a plurality of stock guides the floors whereof are substantially parallel, a beam substantially parallel with said floors and extending transversely of said stock guides, incising tools mounted upon said beam, one for each stock guide, and means for reciprocating said beam endwise in a direction about parallel with said floors.

4. In a carving machine, the combination with stock feeding means, of a plurality of stock guides the floors whereof are substantially parallel, a beam substantially parallel with said floors and extending transversely of said stock guides, incising tools mounted upon said beam, one for each stock guide, means for reciprocating said beam endwise in a direction about parallel with said floors, a second beam provided with incising tools and extending across said stock guides, and means for reciprocating said second beam vertically to the stock guides.

5. In a carving machine, the combination with feeding means, of a plurality of independent stock guides whose floors lie in substantially the same plane, a plurality of sets of carving tools, one tool in each set for each of said guides, and the tools in each set being mounted to incise the stock in different directions, and means for operating said tools so that the tools in one set may supplement the cuts made by the tools in the other set.

6. In a carving machine, the combination of a plurality of independent stock guides whose floors lie in substantially the same plane, a plurality of carving tools, one at each of said guides, a single member whereby said tools are operated, a second plurality of carving tools, one at each of said guides

and mounted to penetrate the stock in a different direction from the first plurality and to supplement the cut made in the stock thereby, a single member whereby said second plurality is operated, and means associated with each of said stock guides for feeding the stock.

7. In a carving machine the combination of a plurality of parallel stock guides adapted to bear stock members, a multiple cutter oscillatable toward and away from said stock guides in the plane of the length of said stock guides, and a second multiple cutter registering with all of said stock guides and oscillatable in a plane perpendicular to the plane of mounting of said stock guides and transverse of said stock guides, means for intermittently moving the stock, and means independent of the moving means for precisionizing the stock during the operation of the cutters.

8. In a carving machine, the combination of a stock-guide, an oscillatable cutter and a cutter oscillatable in a transverse plane, an intermittent feed, and mechanism connected with said cutters and feed and timed relative to each for operating said cutters simultaneously to incise the contradistinctive incisions of separate repeats of a pattern on stock lying in said stock-guide alternately with the feeding action of said feed, and means operative upon the feed at its intermissions for precisionizing the stock in both directions and for locking the same against movement in either direction during the operation of the cutters.

9. In a carving machine, the combination of a stock-guide, a cutter oscillatable in a plane parallel to said stock-guide and a cutter oscillatable in a plane transverse of said stock-guide, an intermittent feed, and power-driven mechanism operatively connected with said cutters and feed and timed and constructed for operating said cutters simultaneously to incise the contradistinctive incisions of separate repeats of a pattern on stock lying in said stock-guide alternately with the feeding action of said feed, and power driven mechanism operative upon the feed at its intermissions for precisionizing the stock in both directions and for locking the same from movement in either direction during the operation of the cutters.

10. In a carving machine, the combination of a stock-guide, an oscillatable cutter, a cutter oscillatable in a transverse plane, said cutters being set at intervals along the stock-guide, a feed roll, a ratchet and pawl device for intermittently actuating said feed roll, power driven mechanism operatively connected with said cutters and ratchet and pawl device for operating said cutters simultaneously to incise the contradistinctive repeats of a pattern on stock lying in said stock-guide alternately with the feeding action of said feed roll, stock precisionizing means operative independently of the feed movement and comprising a toothed wheel fast with said feed roll, and a pallet for engaging said wheel, precisionizing the feed roll in both overthrow and short throw and locking the same in position against movement in either direction, and means actuated by said power driven mechanism for actuating said pallet.

11. In a carving machine, the combination of a stock-guide, a cutter oscillatable in a plane parallel to said stock-guide, a cutter oscillatable in a plane transverse of said stock-guide, said cutters being respectively set at different longitudinal positions along the stock-guide, a feed roll, a ratchet and pawl device for intermittently actuating said feed roll, power driven mechanism operatively connected with said cutters and ratchet and pawl device for operating said cutters simultaneously to incise the contradistinctive repeats of a pattern on stock lying in said stock-guide alternately with the feeding action of said feed roll, stock precisionizing means operative independently of the feed movement for precisionizing the feed roll in both overthrow and short throw and locking the same in positions against movement in either direction, and means actuated by said power driven mechanism for actuating said pallet.

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Witnesses:
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