No. 867,602. PATENTED OCT. 8, 1907.

F. H. RICHARDS.

CARVING MACHINE.

APPLICATION FILED JAN. 10, 1903.

4 SHEETS—SHEET 1.

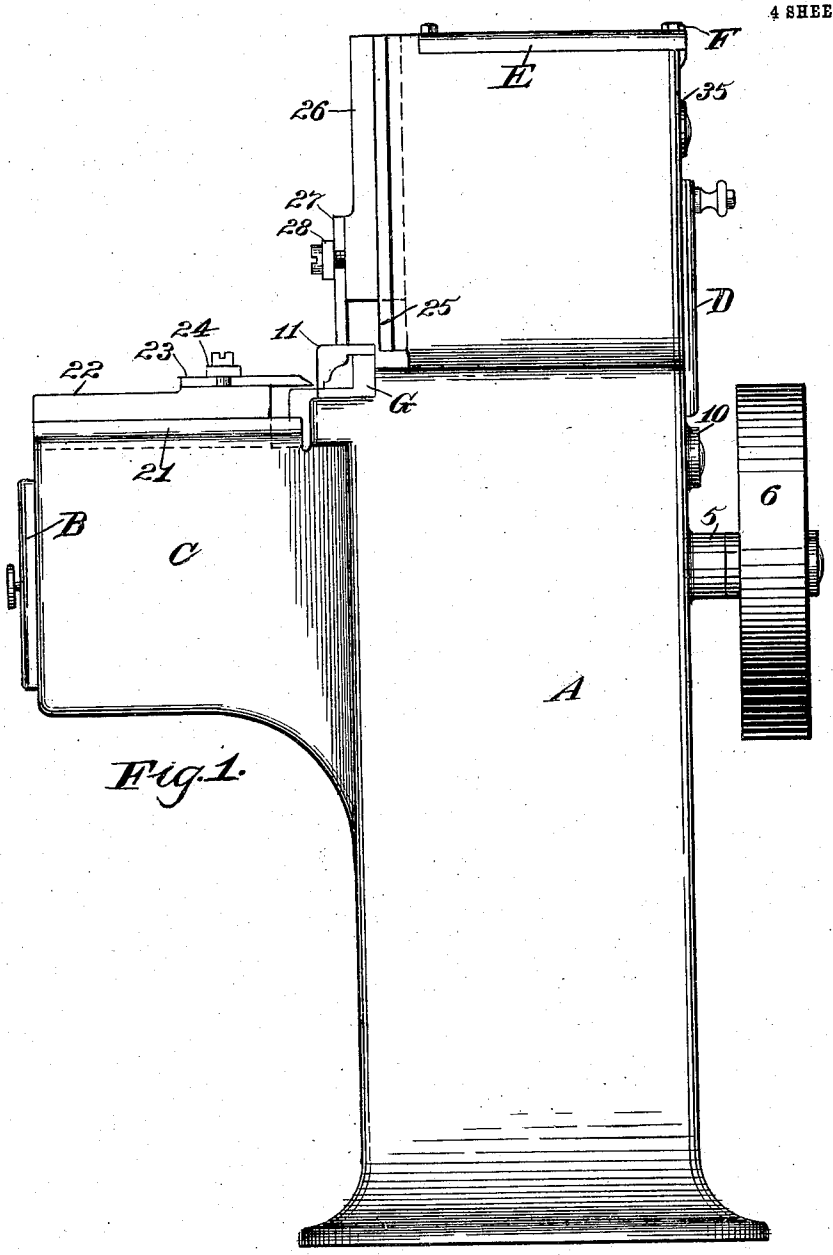


Fig. 1.

Witnesses:
J. E. Davidson.
Marcus B. Hopkins.

Inventor:
F. H. Richards.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 867,602. PATENTED OCT. 8, 1907.

F. H. RICHARDS.

CARVING MACHINE.

APPLICATION FILED JAN. 10, 1903.

4 SHEETS—SHEET 2.

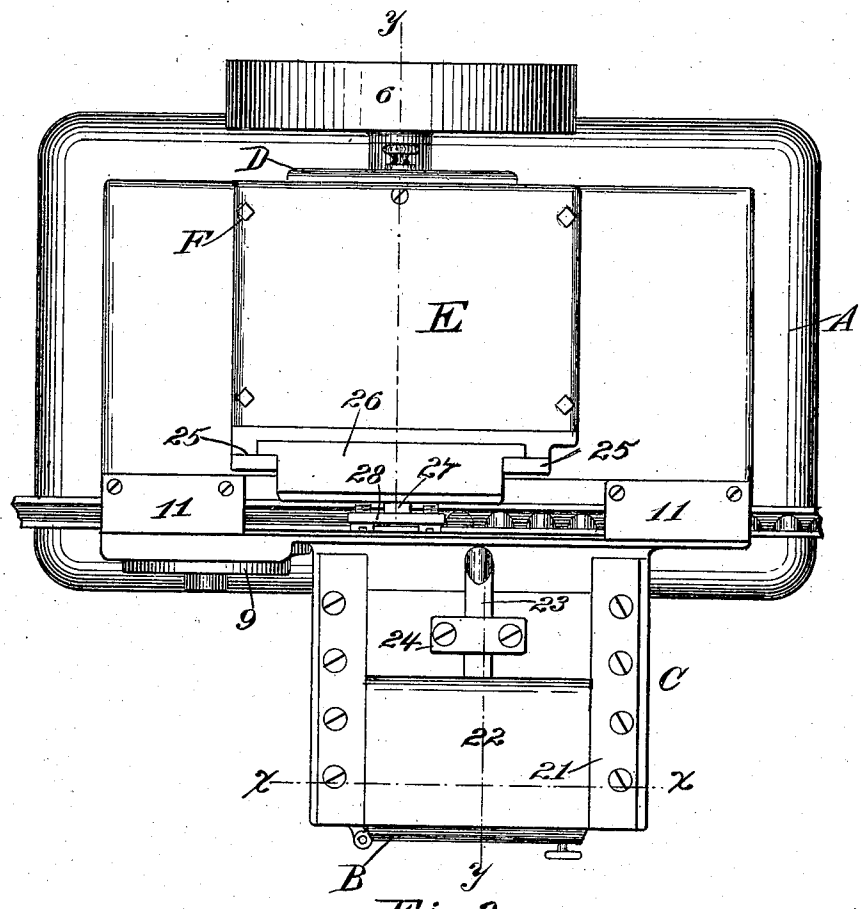


Fig. 2.

Witnesses:
J. E. Davidson.
Marcus C. Hopkins

Inventor:
F. H. Richards.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 867,602. PATENTED OCT. 8, 1907.

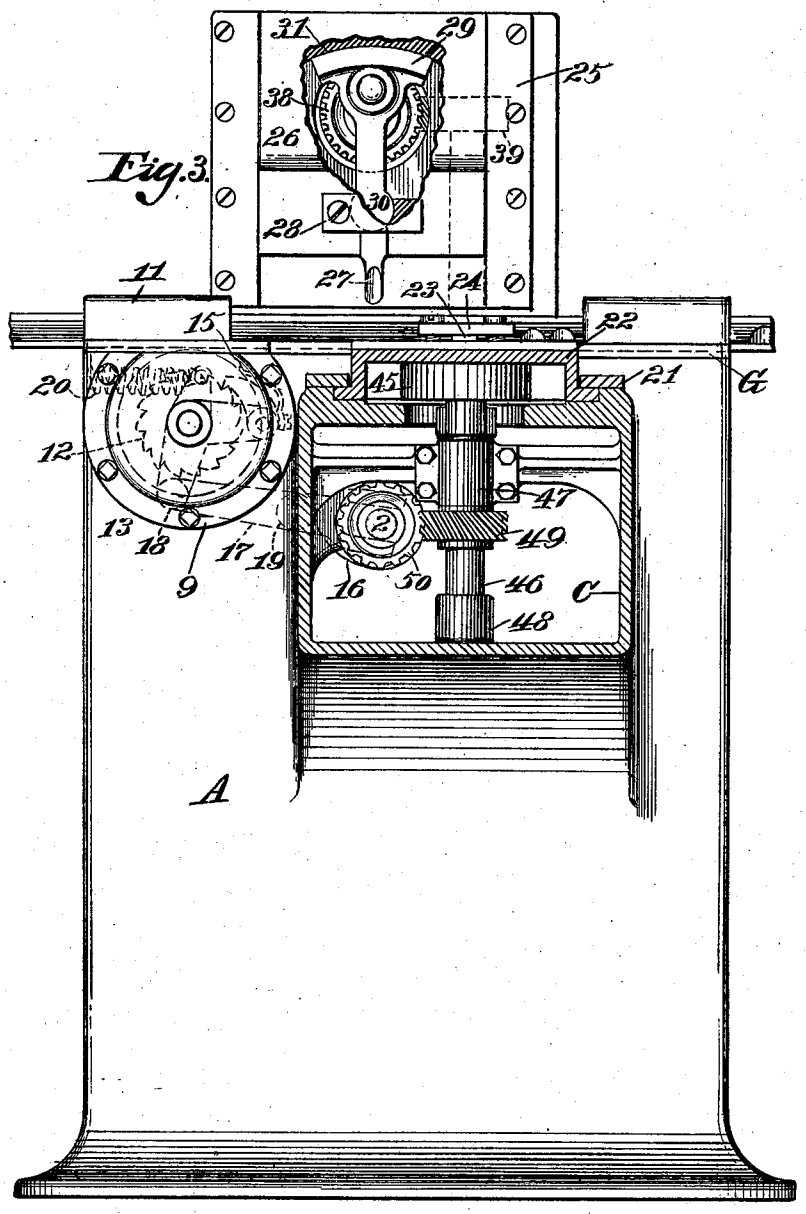
F. H. RICHARDS.

CARVING MACHINE.

APPLICATION FILED JAN. 10, 1903.

4 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
J. E. Davidson
Marcus B. Hopkins

Inventor:
F. H. Richards.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 867,602. PATENTED OCT. 8, 1907.

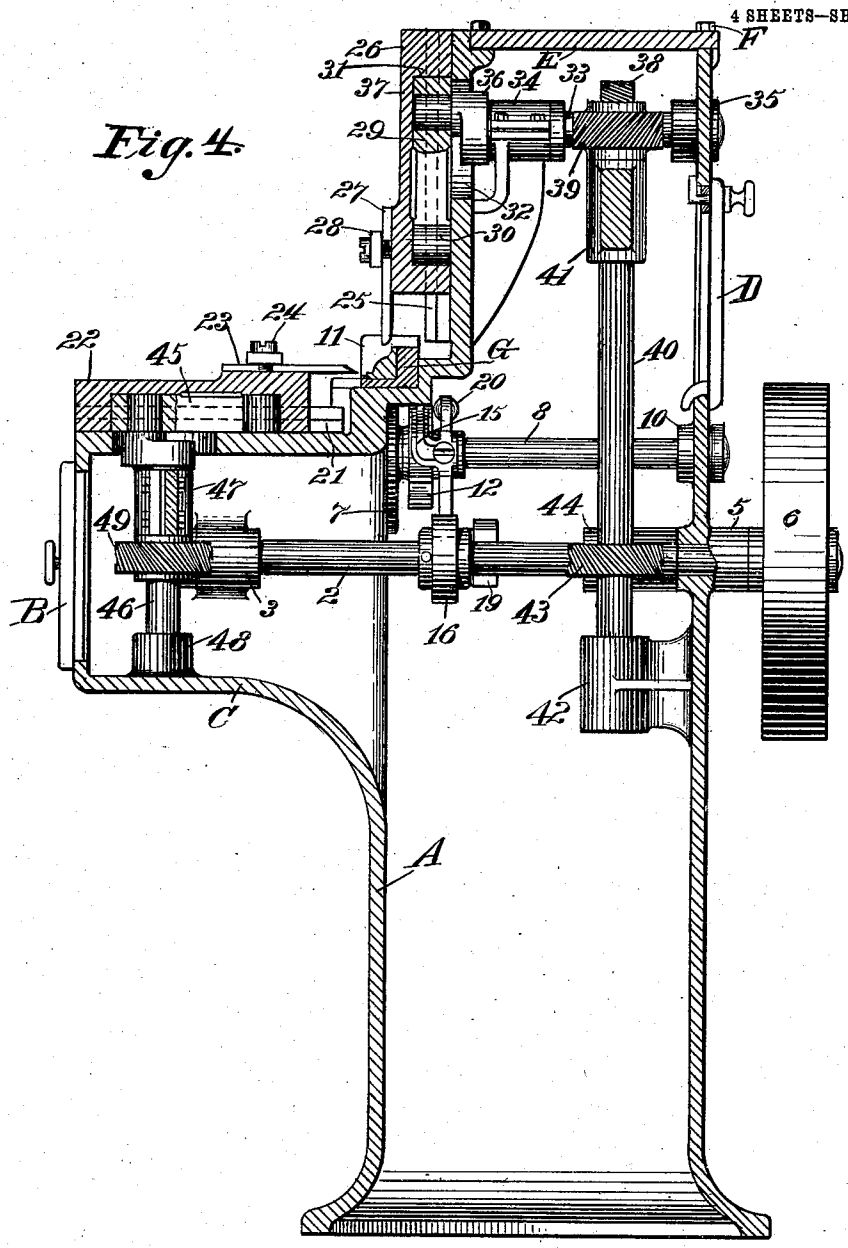
F. H. RICHARDS.

CARVING MACHINE.

APPLICATION FILED JAN. 10, 1903.

4 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
J. E. Davidson.
Marcus B. Hopkins

Inventor:
F. H. Richards.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

CARVING-MACHINE.

No. 867,602. Specification of Letters Patent. Patented Oct. 8, 1907.

Application filed January 10, 1903. Serial No. 138,470.

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 present invention relates to machines for carving wood, moldings or the like, and more particularly relates to a machine of the above-named class in which the carving instrumentalities operate intermittently upon the stock alternately with the intermittent feed of the stock.

This invention consists in the mechanism providing for operating the carving instrumentalities and in the structural details, peculiarly efficient parts employed and the combination of elements making up the tool-driving mechanism, and also in the arrangement and relative position of the parts to form an efficient and compact practical machine.

Some of the objects of my invention are to supply a practical carving machine of few working parts, simple construction, and compact arrangement and design.

I have illustrated my present invention in the accompanying drawings, in which like characters designate like parts throughout the several views.

Figure 1 is a front elevational view of my machine; Fig. 2, a plan; Fig. 3, a left side elevation showing a portion of the frame broken away on the line X—X of Fig. 2; and Fig. 4, a vertical cross-section on the line Y—Y of Fig. 2.

Referring to the drawings, the machine is mounted and assembled in and on a box-like frame A, access to which is had through an aperture closed by a door B in an extended portion C of the frame A, an aperture closed by a door D in the side wall of the frame A and through the top of the machine which is made with an opening closed by a removable plate E secured to the frame by bolts F, F.

The top of the extended portion C of the frame A and the side wall of the frame A proper above said extended portion C form substantially a right angle, and in the angle so formed a stock guide G is mounted on the frame A proper. A driving shaft 2 is mounted horizontally crosswise of the machine in a bearing 3 projecting from one side wall of the extended portion C of the frame A, a bearing 4 projecting from one end wall of the frame A proper, and a bearing 5 in a side wall of the frame A proper, said driving shaft 2 projecting through said bearing 5 without the frame A and provided at its projecting portion with a driving pulley 6. All of the power for operating the machine is applied through the driving shaft 2 and is transmitted therefrom to the several mechanisms to be driven. The feed roll 7 having a roughened or otherwise suitably finished periphery is mounted fast on a shaft 8 which is mounted in a bearing 9 and a bearing 10 in the side walls of the frame A proper. The shaft 8 is mounted in such manner that the periphery of the feed roll 7 will project upwardly through an aperture (not shown) in the floor of the stock guide G to just above the floor of said stock guide. The feed roll 7 is adapted to grip the stock from underneath and feed the same along the stock guide G.

In order to insure a positive grip of the stock by the feed roll 7, a retaining block 11 is mounted on the stock guide G which forms a bridge over the stock directly over the feed roll 7, the inner surface of said bridge conforming to the surface of the stock and preventing the rise of the stock from the periphery of the feed roll 7, and consequently the loss of grip upon said stock by said feed roll. A ratchet wheel 12 is mounted fast on the shaft 8. A pawl lever 13 is pivoted upon the shaft 8 adjacent the ratchet wheel 12 by a spring 15. A heart-shaped or similarly configured cam 16 is mounted fast on the driving shaft 2.

A connecting rod 17 is pivoted at 18 to one free end of the pawl lever 13 and is bifurcated at one end to embrace the driving shaft 2 adjacent the cam 16. An idle roll 19 is mounted upon the connecting rod 17 and is adapted to contact the periphery of the cam 16. A spring 20 is interposed between an arm of the lever 13 and the frame A in such manner as to maintain the parts in position to establish the contact of the idle roll 19 with the cam 16 at all times. The function of the cam 16 is to force the connecting rod 17 through the medium of the idle roll 19 outwardly and allow the same to return during substantially a half of a revolution of the driving shaft 2 and thereby rotating the feed roll 7 forwardly a predetermined amount and returning the pawl lever and pawl to their original positions accomplishing the desired amount of feed.

Horizontal guideways 21 are formed on the top of the projecting portion C of the frame A substantially perpendicular of the stock guide G, and in said guideways 21 is mounted a tool carriage 22 upon which is secured a tool 23 by means of a clamp 24. The tool carriage 22 is adapted to reciprocate toward and from the stock guide G carrying the tool 23 into and out of the stock lying in the said stock guide G.

Upon the side wall of the frame A proper above the projecting portion C of the frame A vertical guideways 25 are formed, in which guideways 25 a tool carriage 26 is mounted to reciprocate toward and from the stock guide G. The tool carriage 26 carries a tool 27 affixed thereon by a clamp 28. The tool carriage 26 in reciprocating carries the tool 25 into and out of stock lying in the stock guide G, but the guideways 25 are not positioned in the same plane with the guide 21, or it may be accomplished by merely mounting the tool 27 in a different plane from that of the tool 23, for the purpose of preventing the edges of the tools 23 and 27 from coming in contact when the tool carriages 22 and

26 are simultaneously operated. It will be seen that the tools 23 and 27 simultaneously incise contradistinctive portions of the contours of separate repeats of the pattern, the tool 27 effecting an incision and the tool 23 during a subsequent operation registering with and making an incision meeting with that previously made by the tool 27.

The tool carriage 26 is recessed in its underside and a link 29 is pivoted at 30 therein, the free end of the link 29 abutting a wall 31 of the recess in said tool carriage 26, which wall 31 forms an arc centered at the pivot point 30, and constitutes a bearing for one end of the link. This arrangement renders it possible to shift some of the strain and jar which would be brought to bear upon the link 29 onto the carriage 26 through the wall 31. An aperture 32 is provided in the side wall of the frame A directly under the tool carriage 26, which aperture is at all times closed by said tool carriage 26. A shaft 33 is horizontally mounted in a bearing 34 extending from one side wall of the frame A and a bearing 35 in the other side wall of the frame A, said shaft 33 carrying at one end a crank 36 the wrist pin 37 of which crank 36 projects through the aperture 32 and is journaled in the free end of the link 29.

It will be seen that upon the rotation of the shaft 33 the crank 36 will impart a reciprocating motion to the tool carriage 26, the link 29 compensating for the lateral movement of the crank 36 and imparting movement only in the direction of the guideways 25. A spiral gear 38 is mounted fast on the shaft 33 and meshes with and is driven by a spiral gear 39 fast on a vertical shaft 40, which vertical shaft 40 is mounted in a bearing 41 projecting from an end wall of the frame A, and a bearing 42 projecting from a side wall of the frame A. A spiral gear 43 is mounted fast on the shaft 40 and meshes with and is driven from a spiral gear 44 fast on the driving shaft 2.

The tool carriage 22 is provided with a recessed underside in the same manner as the tool carriage 26 and a link 45 is pivoted in the same manner therein as the link 29. The tool carriage 22 is driven in the same manner as the tool carriage 26 from a vertical shaft 46, which is mounted in a bearing 47 projecting from a side wall of the extended portion C of the frame A and a bearing 48 in the bottom of said extended portion C. A spiral gear 49 is mounted fast on the shaft 46 and meshes with and is driven from a spiral gear 50 fast on the driving shaft 2.

The gear trains transmitting motion to the tool carriages 22 and 26 from the driving shaft 2 are identically timed so as to effect a simultaneous operation of said tool carriages, and the said connections are timed with relation to the operative points of cam 16 to effect the carving operation of the tool carriages alternately with the feeding operation.

It is obvious that various changes may be made in the details of construction and arrangement to suit the exigencies of each particular case without departing from the spirit of my invention.

Having described my invention, I claim—

1. In a carving machine, the combination of a support, a guideway thereon, a tool carriage mounted to reciprocate in such guideway, said tool carriage being recessed in its underside and having within said recess a pivot bearing and a sector shaped bearing, a link pivoted to said pivot bearing and having a face for engaging said sector shaped bearing, a shaft mounted in said support, a crank on said shaft extending through said support and into said recess and engaging said link.

2. In a carving machine, the combination of supports, guideways thereon, a tool carriage mounted to reciprocate in each guideway and transversely one to the other, said carriages each having a pivot bearing and a sector shaped bearing concentric with the pivot bearing, a driver, a pair of cranks driven thereby and extending through said supports, one beneath each tool carriage, and links connected to said cranks, each link in engagement with the pivot bearing and the sector shaped bearing in the carriage.

3. In a carving machine, the combination of a support, a guideway on said support, a tool carriage mounted to reciprocate in said guideway, said tool carriage having a sector-shaped recess in its underside, a shaft mounted in said support, a crank on said shaft projecting without said support and into said recess in said toolcarriage, and a link connecting said crank and said tool carriage within said recess in said tool carriage, the crank end of said link slidably abutting the sector-shaped end wall of said recess in said tool carriage.

4. In a carving machine, the combination of a support, a guideway on said support, a tool carriage mounted to reciprocate in said guideway, said tool carriage having a sector-shaped recess in its underside, a shaft mounted in said support, a crank on said shaft projecting without said support and into said recess in said tool carriage, and a link pivoted to said tool carriage within said recess at a point corresponding to the axis of the sector formed by said recess and connected at its free end with said crank, the free end of said link conforming to and slidably abutting the arc-shaped end wall of said recess.

5. In a carving machine the combination of a support, a guideway thereon, another guideway on said support and transverse to said first mentioned guideway, tool carriages respectively mounted to reciprocate in said guideways, said tool carriages recessed in their under surfaces, counter-shafts mounted in said support relative to said guideways, cranks on said counter-shafts projecting beyond said support and into said recesses and tool carriages, links connecting said cranks with their respective tool carriages within the recesses in said tool carriages, each link having a ball and socket and segmental slide connecting with its respective carriage, a driving shaft mounted in said support and traverse to said counter-shafts and operative connections between said driving shaft and said counter-shaft.

6. In a carving machine, the combination of a support, transversely directed guideways in said support, tool carriages mounted to reciprocate in said respective guideways, said tool carriages each having a sector-shaped recess in their under surface, shafts mounted in said support perpendicularly of said respective guideways, cranks mounted on said respective shafts projecting without said support and into the respective recesses in said tool carriages, links pivoted to said respective tool carriages within the said recesses at points corresponding to the axes of the sectors formed by said recesses and journaled at their free ends to said cranks within said recesses, the free ends of said links conforming to and slidably abutting arc-shaped end walls of said recesses, and a driving shaft mounted in said support operatively connected with said before-mentioned shafts.

7. In a carving machine, the combination of a support, transversely directed guideways on said support, tool carriages mounted to reciprocate in said respective guideways, shafts mounted in said support perpendicularly of said respective guideways, cranks on said respective shafts projecting without said support and beneath said carriages, links connecting said cranks with the undersides of their respective tool carriages, an intermittent feed suitably mounted upon said support in operative relation to said tool carriages, and a driving shaft mounted in said support and operatively connected with said before-mentioned shafts and said intermittent feed.

8. In a carving machine, the combination of a support, transversely directed guideways on said support, tool carriages mounted to reciprocate in said respective guide-

ways, said tool carriages having sector-shaped recesses in their under surfaces, shafts mounted in said support perpendicularly of said respective guideways, cranks mounted on said respective shafts projecting without said support and into said sector-shaped recesses in said tool carriages, links pivoted to said respective tool carriages within said recesses at points corresponding to the axes of the sectors formed by said recesses and connected to said respective cranks at their free ends, the free ends of said links conforming to and slidably abutting the arc-shaped end walls of said sector-shaped recesses in said tool carriages, an intermittent feed mounted on said support in operative relation to said tool carriages, and a driving shaft mounted in said support operatively connected with said above-mentioned shafts and said intermittent feed.

9. In a carving machine, the combination of a support, a guideway on said support, a tool carriage mounted to reciprocate in said guideway, said tool carriage having a sector-shaped recess in its under surface, the median line of said sector-shaped recess being parallel with said guideway, a shaft mounted in said support perpendicularly of said guideway, a crank on said shaft projecting without said support and into said recess in said tool carriage, and a link pivoted to said tool carriage within said recess at a point corresponding to the axis of the sector formed by said recess and connected at its free end with said crank within said recess, the free end of said link conforming to and slidably abutting the arc-shaped end wall of said recess in said tool carriage.

FRANCIS H. RICHARDS.

Witnesses:
FRED. J. DOLE,
JOHN O. SEIFERT.