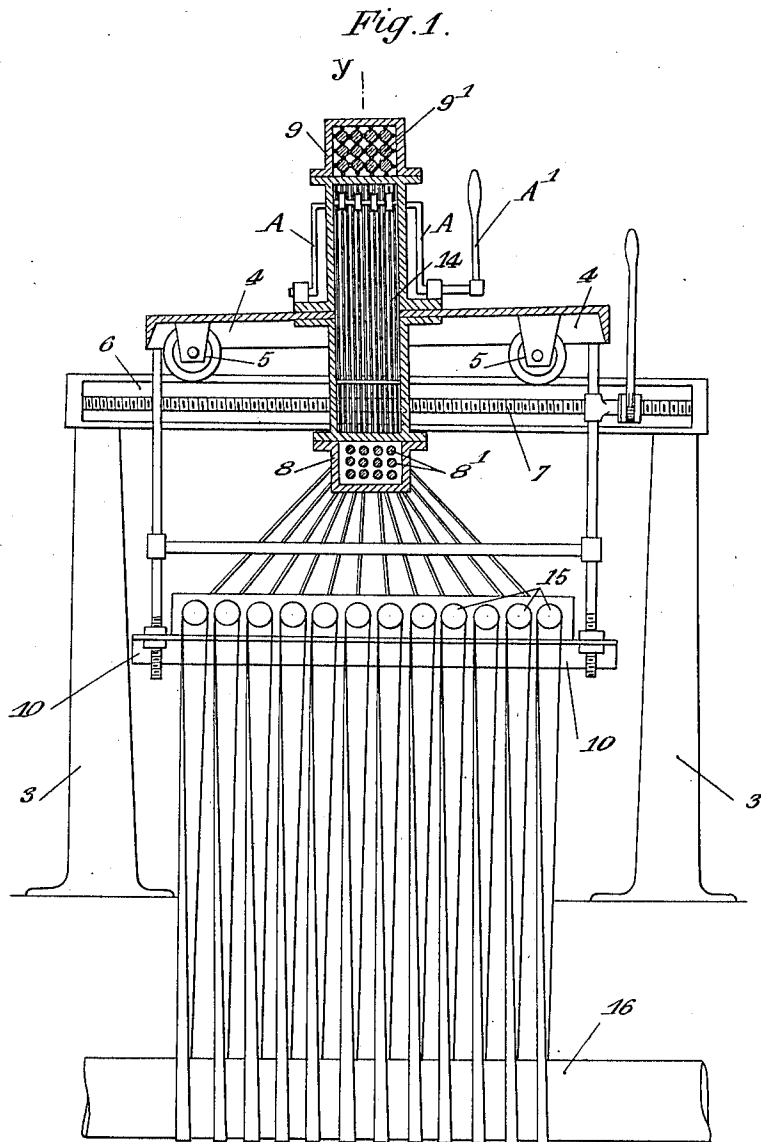


T. SELMERSHEIM.
MACHINE FOR REPRODUCING THE CONFIGURATION OF OBJECTS.
APPLICATION FILED JULY 2, 1910.

1,021,005.

Patented Mar. 26, 1912.

3 SHEETS—SHEET 1.



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Fig. 3.

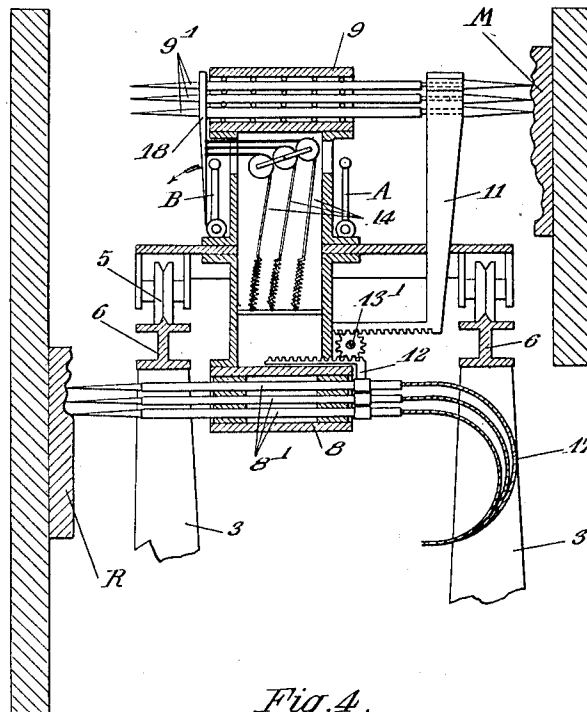
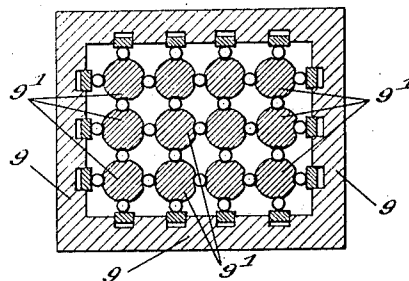


Fig. 4.



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UNITED STATES PATENT OFFICE.

TONY SELMERSHEIM, OF PARIS, FRANCE.

MACHINE FOR REPRODUCING THE CONFIGURATION OF OBJECTS.

1,021,005.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed July 2, 1910. Serial No. 570,132.

To all whom it may concern:

Be it known that I, TONY SELMERSHEIM, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Machines for Reproducing the Configuration of Objects, of which the following is a specification.

This invention relates to sculpture reproducing machines of the type in which the guide which follows the surface of the model and the tool which works on the blank to be carved such as a block, panel or the like of any material, are carried on a carriage displaceable horizontally and vertically in front of the said model and blank, or inversely, in such a manner as to effect a series of parallel strokes and are pressed by hand or by means of a spring perpendicularly to the table supporting the model and the blank in such a manner as to penetrate into the depressions of the model during each stroke.

The machine in accordance with the present invention is broadly characterized by the fact that it comprises several tools with their respective guides which participate together in the longitudinal and vertical movements of the carriage but are independent one of the other in their movements of depression or along their axes, the guides and their respective tools being arranged at successive levels sufficiently close together for the parallel furrows formed to abut or partially overlap so that a single stroke is sufficient for treating a strip of a certain width with all the necessary modulation and fineness which the selection of sufficiently fine tools and guides will permit.

The invention further relates to a method of mounting the guides and tools permitting of concentrating the operative points on a small surface.

The accompanying drawing shows by way of example a machine with twelve tools and a double guide for each, one being a direct guide and the other an inverting guide for identical or symmetrical reproduction.

Figure 1 is a front elevation partly in section on the line X—X in Fig. 2. Fig. 2 is a section on the line Y—Y in Fig. 1. Fig. 3 is a side elevation similar to Fig. 1 showing the arrangement for symmetrical reproduction, and Fig. 4 illustrates to a

larger scale the method of guiding the guides in their casing.

The model M and the blank R to be carved are carried on a vertical framework 1 mounted on a frame 2 by screw bolts 5 in such a manner that it can be moved vertically by degrees for the successive strokes of the machine. In front of the framework 1 there is arranged a frame 3 with rails 6 upon which a carriage 4 runs in a horizontal plane; this carriage is carried and guided by rollers 5 and operated by a nut and worm 7 mounted on the frame 3, or in any other suitable manner. This carriage 4 comprises a casing 8 in which rotary spindles 8' are mounted, the tools being secured to the ends of these spindles, a casing 9 in which the guides 9' are mounted and a platform 10 upon which the transmission gearing for the bits is mounted. Each spindle 8' slides freely axially in its bearings in the casing 8 and each guide 9' also slides freely axially in the casing 9, but the corresponding guides and tools are integrally connected in pairs in this axial movement by means of the device represented in Fig. 2. Upon each of the guides 9' there is fixed an angle piece 11 and each spindle 8' rotates in a sleeve in an angle piece 12 in which it is supported axially by suitable means, and the angle pieces 11 and 12 of the guide and tool of one and the same pair are united by a clamping member 13. In this manner the guide and tool of the same pair are rigidly connected one with the other and constitute an indeformable frame in this movement of depression, while the various pairs are independent of each other. The method of mounting indicated permits of previous adjustment by means of the member 13 of the respective positions in depth of a tool and its corresponding guide.

Counter springs 14 attached at one end to the carriage 4 and at the other to the different members 11 of the movable frames, tend to return the latter toward the left hand (Fig. 2) and to apply the guides to the surface of the model. The return movement of the whole of the twelve frames is produced by means of a double lever A operated by the handle A' and bearing by means of a cross piece against the angle pieces 11. The necessary movement of rotation is imparted to the spindles carrying the bits

through small guide pulleys 15 which receive movement from belts or cords from a drum 16, each of them being connected with the corresponding spindle 8' by means of a flexible transmission 17.

In order to obtain a sufficiently gentle movement of the movable frames it is advantageous to employ the arrangement shown in Fig. 4 for mounting the guides in their casing. Each guide comprises four longitudinal grooves serving as ball races and presents transversely the section illustrated, in such a manner that each guide serves itself as a path for the travel of the adjacent guides. The parts of the casing which serve as guides may be constituted by separate bars movable relatively to the box and adjustable toward and from the interior of the box by any suitable means.

The carriage as a whole is inclined (Fig. 1) by an angle such that the horizontal furrows formed by the four tools of one and the same row adjoin exactly or partially overlap in such a manner that in a single stroke a strip of four times or almost four times the effective diameter of the tools is treated. As there are three rows in a single stroke three worked strips separated by untreated spaces will be obtained; by displacing the panel vertically these spaces in the blank will be brought opposite the rows of tools for treatment in their turn.

In some cases it is desirable to reproduce a model symmetrically, that is to say, in such manner that the reproduction will bear the same relation to the original as the image of an object in a mirror bears to the object itself. In such case the blank and the model are so placed as to face in opposite directions, and the original and the reproduction will be symmetrical with respect to a central vertical line, the parts on the right of this line in one appearing as the parts on the left of the corresponding line in the other, when viewed from the front. An arrangement for symmetrical reproduction of this character is represented in Fig. 3, in which the angle pieces 11 and 12 of each frame instead of being rigidly connected by the part 13 are each provided with a rack and connected one with the other by a pinion 13' of a fixed spindle. In this manner the movements of the guides are reproduced equally as regards extent but in opposite directions to the movements of the spindles carrying the tools. Counter springs 14 are then fixed to rods 18 mounted upon the guides at the opposite end to the angle pieces 11. As regards the return movement of the guides and tools as a whole this is here produced by a lever B similar to the lever A and resting upon the rods 18.

The machine can be adapted without difficulty for the performance of similar work of the same general character in various

other ways, and the details of construction of the mechanism shown and described can also be considerably varied without departing from my invention.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A machine for reproducing the configuration of objects, comprising a carriage movable horizontally in front of a model to be reproduced and a panel to be carved, a row of axially-movable rotary tools arranged on said carriage at such an inclination to the direction of movement thereof as to cause the several tools to operate in lines separated by approximately the operative diameter of the tools, a row of guides similarly arranged on the carriage and each adapted for axial movement, means for connecting each tool with a corresponding guide to transmit the axial movement of one to the other, and means for pressing each guide against the model.

2. In a machine for reproducing the configuration of objects, the combination of a carriage movable horizontally, a row of axially-movable tools arranged thereon at an inclination to the direction of movement of the carriage, a row of axially-movable guides similarly arranged on the carriage, a member movable longitudinally with each guide and having a bearing in which the guide rotates, a member movable longitudinally with each tool and having a sleeve in which the tool rotates, and connections between said members.

3. In a machine for reproducing the configuration of objects, the combination of a carriage movable horizontally, a row of axially-movable tools and a row of guides thereon, one guide for each tool, said guides being movable toward and away from the model independently of one another, connections between each guide and the corresponding tool, a spring connected to each guide and tool to move the latter in one direction, and means for moving the tools collectively in the opposite direction.

4. In a machine for reproducing the configuration of objects, the combination of a carriage movable horizontally, a row of axially-movable tools arranged thereon at an inclination to the direction of movement of the carriage, a guide corresponding to each tool and connected thereto, said guides being movable toward and away from the model independently of one another, and a flexible transmission device for rotating each tool.

5. In a machine for reproducing the configuration of objects, the combination of a carriage movable horizontally, a row of axially-movable tools arranged thereon at an inclination to the direction of movement of the carriage, a row of independently movable guides, one for each tool, connections

between each guide and the corresponding tool, a common operating drum parallel with the direction of movement of the carriage, and a transmission device mounted on the carriage and including a flexible transmission for each tool.

6. In a machine for reproducing the configuration of objects, a carriage movable horizontally, a plurality of superposed rows of tools mounted in a casing with bearings arranged rectangulary, similarly superposed rows of guides arranged in corresponding tiers mounted in a casing in rectangular arrangement, independently movable connections between the guides and the corresponding tools, a spring for each tool guide couple and a lever for drawing back the tools collectively, the guide and tool casings being inclined at a suitable angle to the direction of movement of the carriage for grading the levels of the tools or guides in each row.

7. In a machine for reproducing the configuration of objects, a carriage movable horizontally, a tool with tool holder bearing arranged rectangulary with an inclination to the direction of movement of the carriage, tool holding spindles capable of rotating

and sliding axially in the bearings, a casing with guides likewise inclined, guides capable of sliding axially, longitudinal grooves in these guides, rows of balls between the guides, and between the guides and the walls of the casing, independently movable connections between the guides and the corresponding tools, a spring for each tool and guide and a lever for drawing back the tools as a whole.

8. In a machine for reproducing the configuration of objects, a carriage movable horizontally, superposed rows of tools in tiers, corresponding rows of guides likewise in tiers, sliding freely axially, a member fixed upon a bearing of each guide and provided with a rack, a member for each tool with a sleeve in which the tool is able to rotate without sliding axially and provided with a rack and a pinion with a fixed spindle for connecting the two racks, and a spring for each tool guide couple.

In testimony whereof I affix my signature in presence of two witnesses.

TONY SELMERSHEIM.

Witnesses:

G. PROTTE,
DEAN M. MASON.