

Oct. 24, 1939.

H. A. SEDELMAYER ET AL

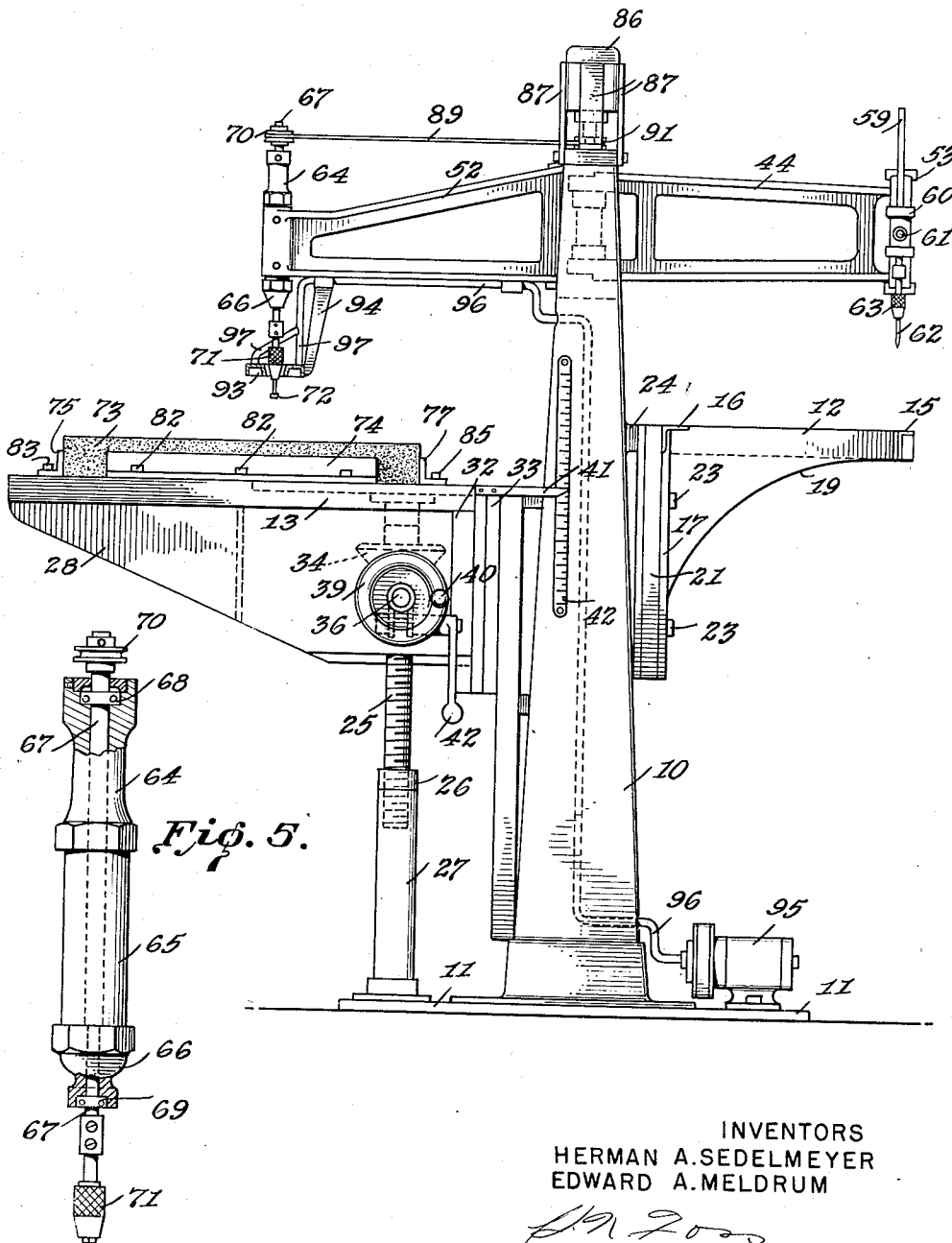
2,177,347

ROUTING MACHINE

Filed Aug. 19, 1938

4 Sheets-Sheet 1

Fig. 1.



INVENTORS
HERMAN A. SEDELMAYER
EDWARD A. MELDRUM

H. A. Sedelmayer
BY *G. J. Kramer* ATTORNEYS

Oct. 24, 1939.

H. A. SEDELMAYER ET AL

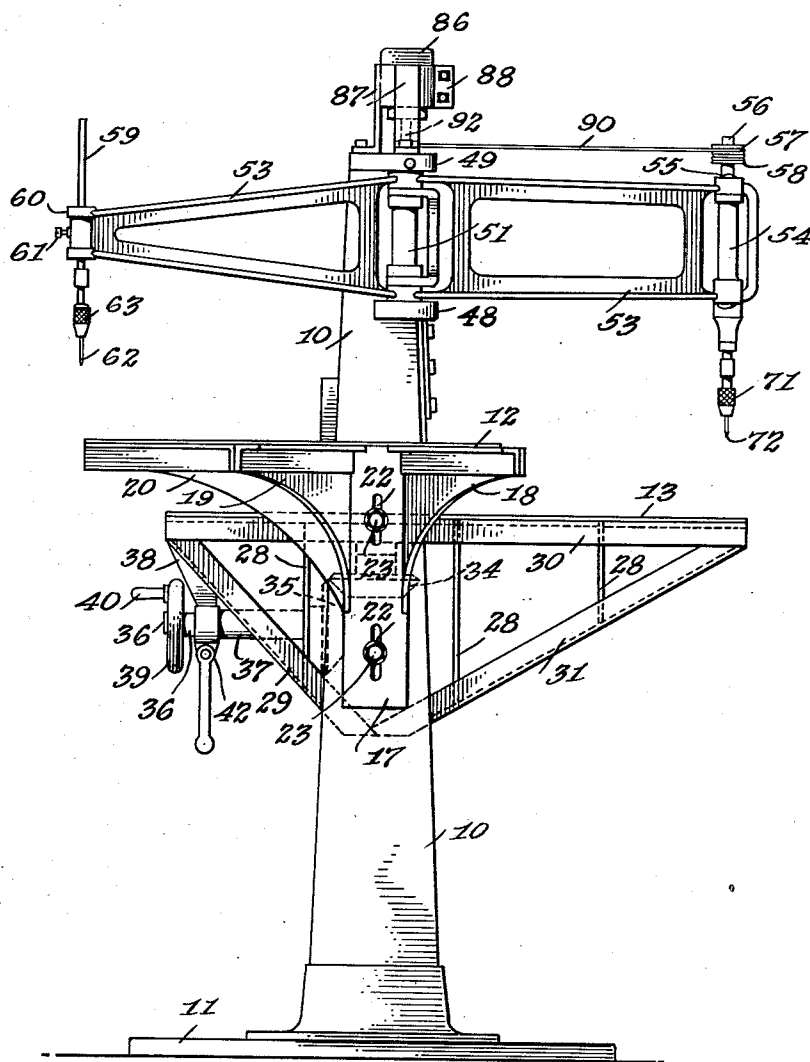
2,177,347

ROUTING MACHINE

Filed Aug. 19, 1938

4 Sheets-Sheet 2

Fig. 2.



INVENTORS

HERMAN A. SEDELMAYER

EDWARD A. MELDRUM

BY *G. J. Kramer* ATTORNEYS

Oct. 24, 1939.

H. A. SEDELMAYER ET AL

2,177,347

ROUTING MACHINE

Filed Aug. 19, 1938

4 Sheets-Sheet 3

Fig. 3.

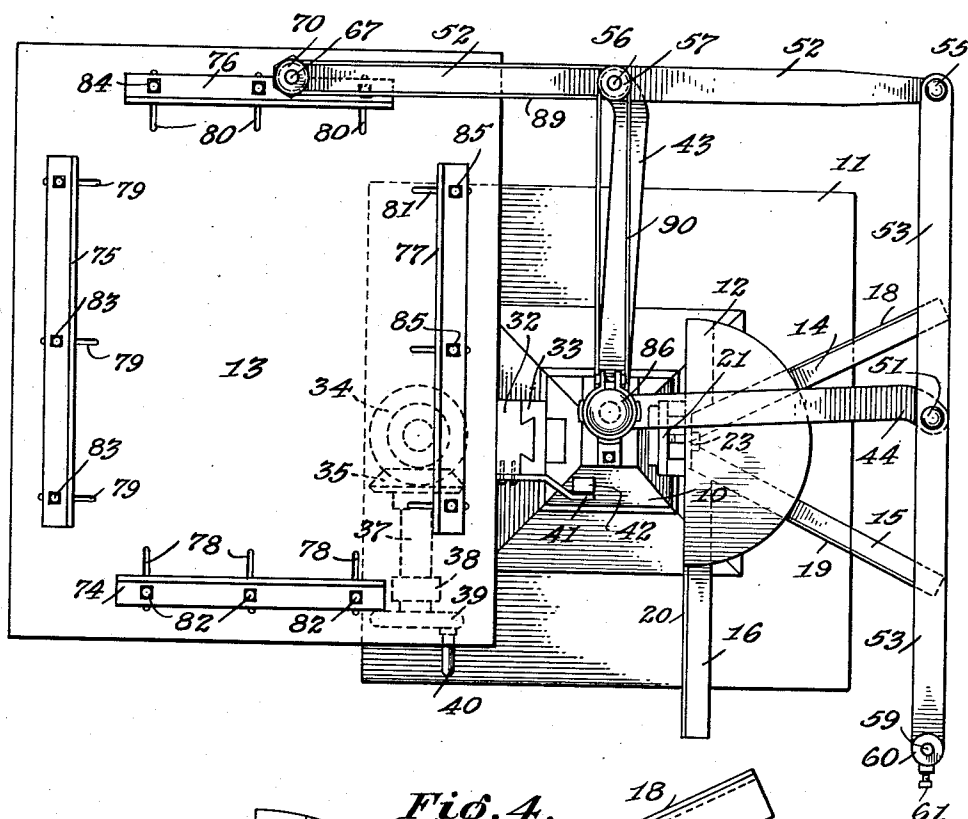
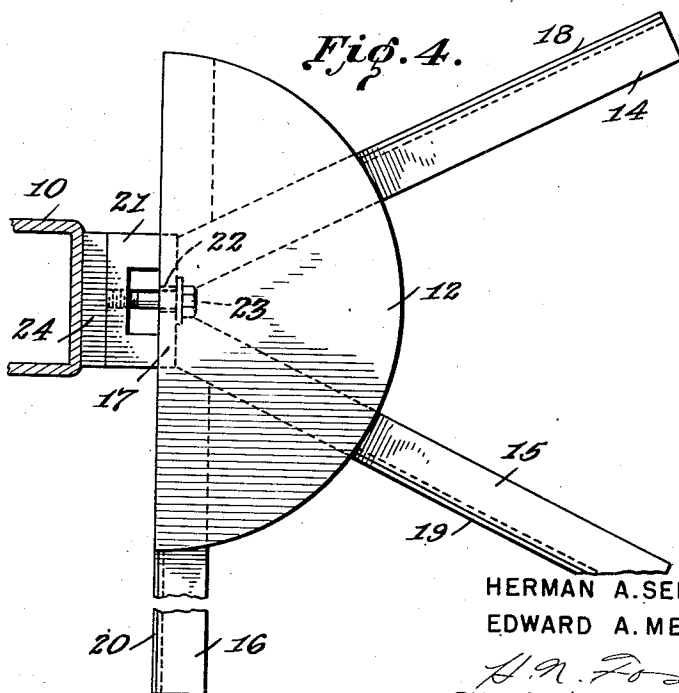


Fig. 4.



INVENTORS

HERMAN A. SEDELMAYER
EDWARD A. MELDRUM

H. A. Seidmeyer
BY *G. A. Kramer* ATTORNEYS

UNITED STATES PATENT OFFICE

2,177,347

ROUTING MACHINE

Herman A. Sedelmeyer, Ross, and Edward A.
Meldrum, Menlo Park, Calif.

Application August 19, 1938, Serial No. 225,732

2 Claims. (Cl. 90—13.1)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described and claimed, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to us of any royalty thereon.

We hereby dedicate the invention herein described to the free use of the People in the territory of the United States to take effect on the granting of a patent to us.

This invention relates to a machine for constructing relief maps.

One of the objects of this invention is the provision of a machine of the type mentioned which makes it possible to construct from a two dimensional contour map, a relief map out of a pre-cast block of material, such as plaster of Paris, obviating the necessity of first building up a negative form of laminated sections and casting the relief map from such form.

The following description, considered together with the accompanying drawings, will disclose this invention more fully, its arrangements, constructions, and operations of parts, and further objects and advantages will be apparent.

In the drawings:

Figure 1 is a side elevational view;

Figure 2 is an end elevational view; and

Figure 3 is a plan view of an illustrative embodiment of this invention.

Figure 4 is an enlarged plan view of the tracing table.

Figure 5 is an enlarged detail of the router assembly, partly in section.

Figure 6 is a perspective view of the pantograph assembly.

Figure 7 is an elevational view of the upper part of the machine showing the manner in which the pantograph assembly is attached to the pedestal.

Figure 8 is an enlarged elevational view of the motor and the means employed for attaching it at the top of the pedestal.

Referring with more particularity to the drawings, in which like numerals designate like parts, a pedestal 10 consisting of an upright frame is mounted on a heavy base plate 11 and supports a semi-circular tracing table 12 and a routing table 13, substantially as shown. The tracing table 12 is disposed on radially mounted horizontal L-beams 14, 15 and 16, which beams are secured together at the top of a vertical bracket 17. Web plates 18, 19, and 20 support the said beams on the bracket 17, substantially as shown.

The bracket 17 is adjustably mounted on a vertical channel 21 by means of the vertical slots 22, 22 in the bracket 17, and the bolts 23, 23 tapped through the channel 21, said channel being secured to the pedestal 10. A projecting shoulder 24 offsets the top of the channel 21 so that it is in a truly vertical position.

The routing table 13 is supported on a screw threaded ram 25 engaging the threaded end 26 of a pipe stanchion 27, which stanchion is fixed to the base 11. Vertical plate guides 28, 28 are provided to brace the table 13 to the angles 27, 30, and 31, which angles are secured to a vertical dovetailed beam 32. Said beam is slidably mounted in a vertical channel 33 fixed to the side of the pedestal 10 to guide the routing table in its vertical movements. A bevel gear 34 fixed coaxially to the ram 25 meshes with the bevel gear 35 fixed to the horizontal shaft 36. Said shaft 36 is mounted in a pipe bearing 37 fixedly mounted on a bracket 38 suspended from the routing table 13. A wheel 39 is fixed to the outer end of the shaft 36 and carries a handle 40 for manually imparting rotation to the bevel gear 35 through the shaft 36. A pointer 41 projects from a convenient point on the routing table 13 and slides with the vertical movements of said routing table over a vertically disposed scale 42 attached to the pedestal 10.

The shaft 36 is provided with a locking device 42 of any desired type. The type shown in the drawing is merely suggestive and is of the simple vise-type, well-known in the art.

At the top of the pedestal 10, above the tables 12 and 13, two arms 43 and 44, of equal length, are pivotally mounted on a common shaft 45, the pivoted end of the arm 44 serving as a bearing for the forked bearings 46 and 47 of the arm 43, both of which are mounted on the shaft 45 between the pedestal bearings 48 and 49, substantially as shown. The other ends of each of said arms 43 and 44 terminate to form a bearing 50 and 51, respectively, upon which arms 52 and 53 are pivotally secured, respectively, between their ends. Said arms 52 and 53 are also pivotally secured together at one of each of their ends, the arm 52 carrying a bearing 54 which is straddled by the bifurcated end of the arm 53, a pin-connection 55 holding the two ends together pivotally, the connecting pin 56 of the bearing 50 is extended upward to which is secured two sheaves 57 and 58.

The arm 53 is extended to receive a tracing assembly, which assembly is simply composed of a vertical rod 59 slidably mounted through a sleeve

bracket 60 and adjustably secured therein by means of a set-screw 61. The lower part of the rod 59 carries a tracing point 62 removably secured to said rod by means of a simple ratcheted jaw vise assembly 63, such as that employed by ordinary drilling braces.

Correspondingly, the extended end of the arm 52 carries a router assembly, shown in detail in Figure 5. This assembly consists of a body in three attached sections, namely, the upper section 64, middle section 65, and lower section 66 vertically secured to said arm 52. A shaft 67 is rotatably mounted through said body. Recessed collar bearings 68 and 69 are provided to hold rod 67 in a fixed vertical relation with respect to the body member. The rod 67 extends a short distance above the upper section 64 to which is secured a sheave 70. The rod 67 also projects a substantial distance below the lower section 66 and carries a ratcheted jaw vise assembly 71, similar to the one employed on the tracing assembly hereinabove described, and it is adapted to removably secure a router point 72. This router point is designed to carve the precast material of which the relief map is to be made. The relative position of this material is shown in place in Figure 1 and is designated by the numeral 73. This material is held in place on the routing table by means of four angles 74, 75, 76 and 77 adjustably mounted on said routing table by means of the slots 78, 79, 80 and 81 and the bolt-nut assemblies 82, 83, 84 and 85, all respectively.

The routing point is actuated by rotation of the shaft 67 which rotation is accomplished by two belt connections to a motor 86 preferably electric mounted on top of the pedestal 10 by means of brackets 87, 87, 87, secured to a clamping ring 88 encircling the housing of said motor. One of these two belts 89 connects the sheave 70 with the sheave 57, and the other belt 90 connects the sheave 58 with a sheave 91 attached to the powered shaft 92 of said motor.

To dispose of dust and particles created by the router point in cutting the material 73, a suction arrangement is provided consisting of an annular inverted channel 93 disposed around the assembly 71, by means of a bracket 94. This channel is connected to a vacuum machine 95 mounted on the base 11 through a flexible hose 96, connected with a plurality of lead pipes 97 communicating with said channel 93, as shown in Figure 1.

The operation of this invention is as follows: The precast block of plaster board or other suitable material 73 is securely clamped on the routing table 13 by means of the angles 74, 75, 76 and 77. A topographical map (not shown) of the relief surface desired is secured on top of the tracing table 12. The motor 86 is then started and the tracer point 62 is guided along the contour lines of the topographical map, the routing table 13 being elevationally adjusted for corre-

sponding elevations of the contour map by rotating the wheel 39. The scale ratios are easily adjusted by means of the pointer 41 and the scale 42. Any step-like formation may be overcome by finishing and filling the carved material with modeling clay.

Having thus described our invention, we claim:

1. A machine for fabricating relief maps comprising a vertical support, a pantograph assembly on said support, said assembly consisting of two short lever arms co-hinged on said support, two co-hinged longer lever arms, each pivoted to one of said short arms, a tracing pointer carried at the end of one of said longer arms, a rotatably actuatable routing tool assembly including a pulley for actuating the tool on the end of the other longer arm, a prime mover bracketed on said support above the common pivot of said short arms, the power takeoff of said prime mover having a pulley concentric with the common pivot of said short arms, two coactable idling pulleys rotatably mounted at the pivot point of the lever carrying said routing tool and its corresponding short lever arm, a belt connecting the pulley of said prime mover to one of said idling pulleys, another belt connecting the other idling pulley to the pulley of said routing tool assembly, two tables adjustably disposed on opposite sides of said support, one table being adapted to support a topographic map, and the other table being adapted to support material for fabricating the relief map, a scale vertically secured to said support, and a pointer fixed to said last mentioned table movable over said scale whereby said last mentioned table may be elevationally adjusted in correspondence to selected contours of the topographic map on said first mentioned table.

2. In a routing machine of the type mentioned having two tables adjustably disposed on opposite sides of a vertical support, a pantograph assembly over said tables, said assembly consisting of two short lever arms co-hinged on said support, two co-hinged longer lever arms, each pivoted to one of said short arms, a tracing pointer carried at the end of one of said longer arms, a rotatably actuatable routing tool assembly including a pulley for actuating the tool on the end of the other longer arm, a prime mover bracketed on said support above the common pivot of said short arms, the power takeoff of said prime mover having a pulley concentric with the common pivot of said short arms, two coactable idling pulleys rotatably mounted at the pivot point of the lever carrying said routing tool and its corresponding short lever arm, a belt connecting the pulley of said prime mover to one of said idling pulleys, and another belt connecting the other idling pulley to the pulley of said routing tool assembly.

HERMAN A. SEDELMAYER.
EDWARD A. MELDRUM.