Oct. 25, 1960 A. H. CANDEE 2,957,243

DEVICE FOR DEMONSTRATING MECHANICAL MOVEMENTS

Filed March 31, 1958

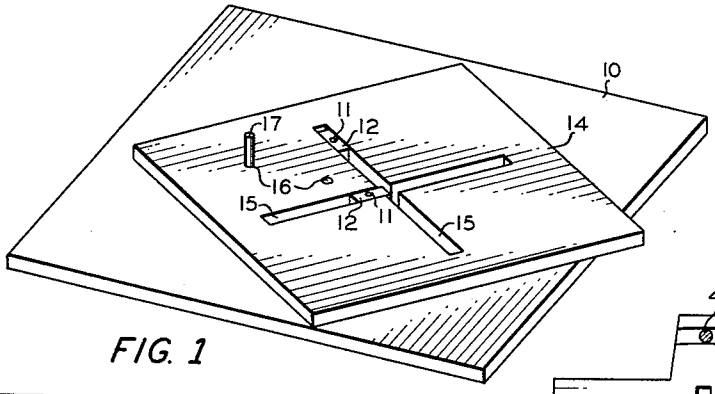


FIG. 1

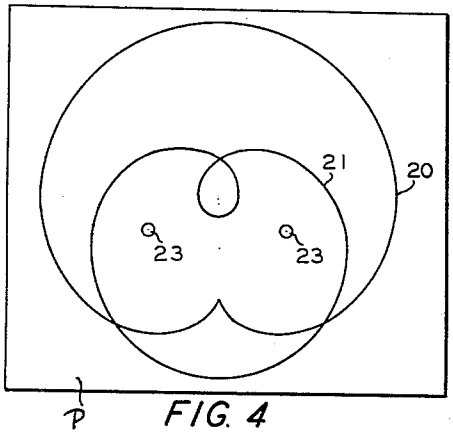


FIG. 4

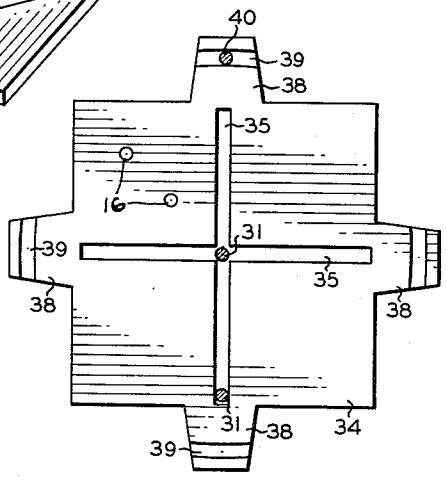


FIG. 3

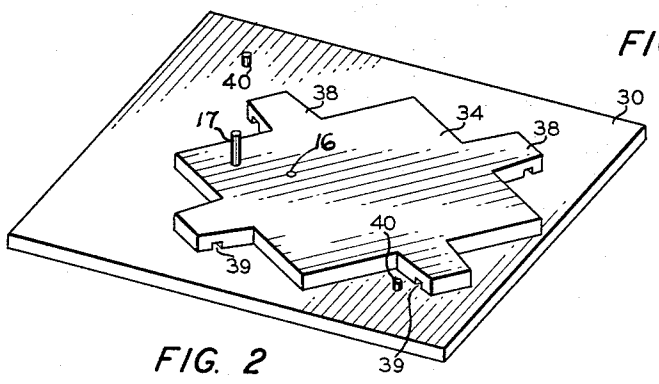


FIG. 2

INVENTOR.
Allan H. Candee

BY B. E. Ahlsinger

ATTORNEY

United States Patent Office 2,957,243 Patented Oct. 25, 1960

2,957,243

DEVICE FOR DEMONSTRATING MECHANICAL MOVEMENTS

Allan H. Candee, 404 Hillside Ave., Rochester, N.Y.

Filed Mar. 31, 1958, Ser. No. 725,120

6 Claims. (Cl. 33—31)

The present invention relates to devices for drawing curves and for demonstrating mechanical movements. In a more particular aspect, the invention relates to a device which may be employed for demonstrating a mechanical motion, either as a toy for amusement purposes, or as a scientific instrument.

One object of the invention is to provide a device for demonstrating the relative plane motion of two bodies, one of which is relatively stationary, and the other of which moves relative to the first under control of inter-engaging guideways and guide pins connected respectively to the two members.

Another object of the invention is to provide a device of this character which can be used as a toy to amuse children.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims particularly when considered with the accompanying drawing.

In the drawing:

Fig. 1 is a perspective view of a device made according to one embodiment of this invention;

Fig. 2 is a perspective view of a device made according to another embodiment of this invention;

Fig. 3 is a bottom plan view of the movable, upper member of the device shown in Fig. 2, showing also, in section, the engaging pins of the bottom member; and

Fig. 4 is a view showing two curves such as may be drawn by the device of the present invention when used either as an instrument or as a toy.

Basically the device of the present invention comprises two flat plates, one of which is a relatively stationary member and which carries two projecting pins or pivots, and the other of which is a relatively moving member which is formed with two slots or grooves of uniform width that cross each other and that are adapted to slide over the pins or pivots of the first member. Each of the two slots or grooves of the moving member can slide back and forth over its respective pin of the stationary member while the moving member changes both position and direction in what is in effect a continuous rolling motion. A describing point, such as a pencil or pen, carried by the moving member will then draw a curve on a sheet of paper or the like attached to the stationary member.

Referring now to the drawing by numerals of reference, 10 denotes the stationary member or plate. In it are fixed two pivot pins 11. Pivoted on the pins 11 are rectangular blocks 12.

The movable plate is denoted at 14. It is provided with two slots 15, which are straight, and which are of uniform width from end to end, and which extend at right angles to each other. The two blocks 12 engage in the two slots 15. The two blocks 12 are of sufficiently greater length than the width of the slots 15 so that the respective slots will remain engaged by their respective

blocks even when the open center or crossing point of the two slots 15 passes by the pin.

Cylindrical holes 16 may be provided in the member 14 to hold a pencil lead, a pen, or a scriber 17. By placing a piece of paper P between the two plates 10 and 14, over the pins 11 and under the blocks 12, the plate 14 may be moved relative to the plate 10 to trace a curve on the paper which will show the path of movement of any point in the plate 14 relative to the plate 10. Two such curves are shown in Fig. 4. The curve 20 is such as might be traced by the pencil or scriber 17 when located as shown in Fig. 1; whereas the curve 21 is such as might be traced by the pencil or scriber when placed in the other hole 16. The holes in the paper, through which the pivot pins 11 pass, are denoted at 23.

Fig. 2 shows another embodiment of the invention in which the guide blocks are omitted. In this case it is necessary to provide some other means to insure that a groove or slot continues to slide on its own pin when the crossing point of the two grooves passes by the pin. This is accomplished in the embodiment of Figs. 2 and 3 by providing short additional curved grooves, and additional guide pins.

In the embodiment of Figs. 2 and 3, 30 denotes the stationary plate. Two pins 31 are secured thereto which are adapted to engage in the straight grooves 35 formed in the underface of the upper, moving plate 34. The grooves 35 do not extend completely through the plate 34. The moving plate 34 is provided with four projecting portions 38 which extend laterally beyond its four sides. Each of these projecting portions is provided on its underface with a short longitudinally-curved groove 39. The grooves 39 are adapted to slide on two added pins 40, that are secured in the lower stationary plate 30, as the upper plate 34 moves on the lower plate. The two pins 40 are in the same straight line with the pivot pins 31.

The grooves 39 must be suitably curved. Since these supplementary grooves are comparatively short, it is satisfactory to form them as circular arcs. The radius to the center of each pin 40 can be determined as follows. If we let A equal the distance in Fig. 3 between the two pivot pins 31, and let B equal the distance from the pin 40 to the pin 31 which is furthest from it, then the circular radius to be used for the groove 39 is equal to B^2+A.

Although it is simplest, so far as a toy is concerned, to have the sliding grooves or slots straight and crossing at right angles, they may be curved on circular arcs, and may cross at other than a right angle. The curves, which are traced by the scriber will vary, of course, with the shape of the grooves or slots in the moving block and with the position of the pivot pins.

While the invention has been described in connection with different embodiments thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains, and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention, what I claim is:

1. A device of the character described comprising a pair of plates, one of which is movable relative to the other, one of said plates having two guideways in it which cross one another and which are of uniform width from end to end, the other of said plates having two spaced pins secured to it which are disposed in said two

guideways, respectively, means for insuring that each guideway moves only over its respective pin during movement of the movable plate, and a scriber secured to said one plate.

2. A device of the character described comprising a pair of plates, one of which is movable relative to the other, the movable plate having two guideways in it which cross one another and which are of uniform width from end to end, the other of said plates having two spaced pins secured to it, a block mounted on each pin to engage in one of said guideways, the two blocks being of greater length than the width of said guideways and being disposed to engage in separate guideways, and a scriber secured to the movable plate.

3. A device of the character described comprising a pair of plates, one of which is movable relative to the other, the movable plate having two guideways in it which cross one another and which are of uniform width from end to end, the other plate having two spaced pins secured to it which are adapted to engage in said two guideways, respectively, the movable plate having a plurality of guide grooves in it disposed in equiangularly spaced relation, and said other plate having two pins disposed in a straight line with the two first-named pins and engaging in said guide grooves, and a scriber secured to said movable plate.

4. A device of the character described as claimed in claim 3 in which said guide grooves are curved longitudinally on circular arcs and are disposed radially outwardly of said guideways.

5. A device of the character described as claimed in claim 4 in which said guideways are straight.

6. A device of the character described as claimed in claim 5 in which said ways cross one another at right angles.

References Cited in the file of this patent

UNITED STATES PATENTS

148,119	Helfrich	Mar. 3, 1874
235,543	Lundovist	Dec. 14, 1880
386,619	Wilson et al.	July 24, 1888
873,291	Beck	Dec. 10, 1907
932,768	Dexter	Aug. 31, 1909

FOREIGN PATENTS

6,524	Italy	Sept. 30, 1875