July 19, 1960 R. D. PARKHURST 2,945,303

APPARATUS FOR THE PRACTICE AND STUDY OF MATHEMATICAL TABLES

Filed Feb. 10, 1959

3 Sheets-Sheet 1

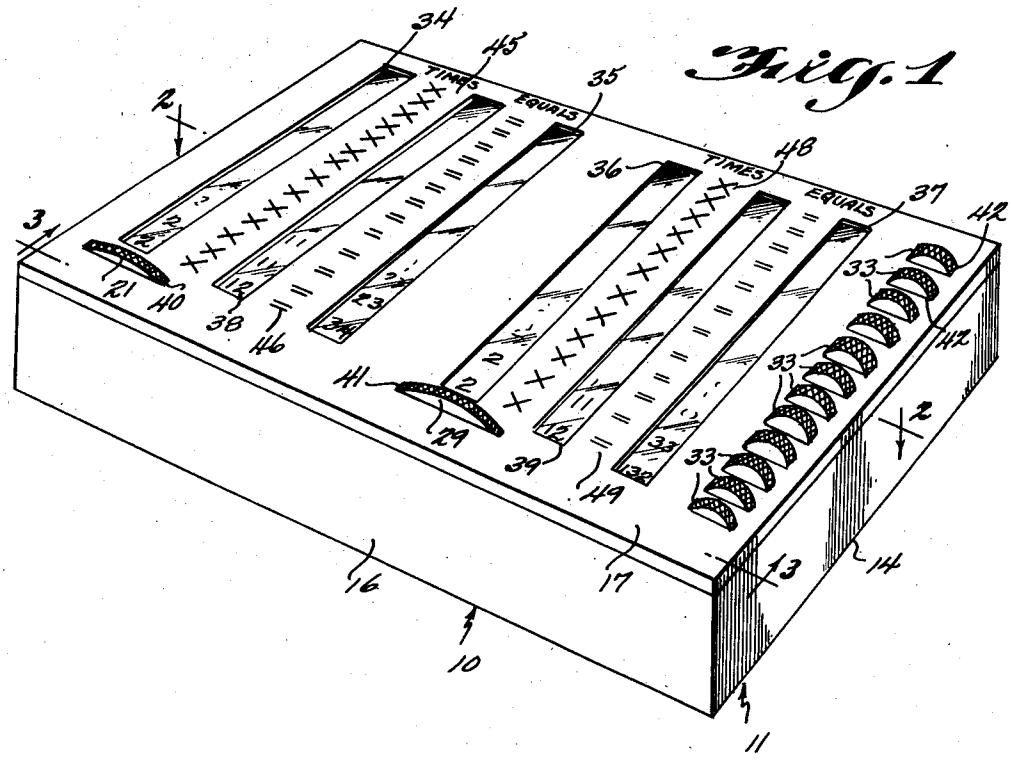


Fig. 1

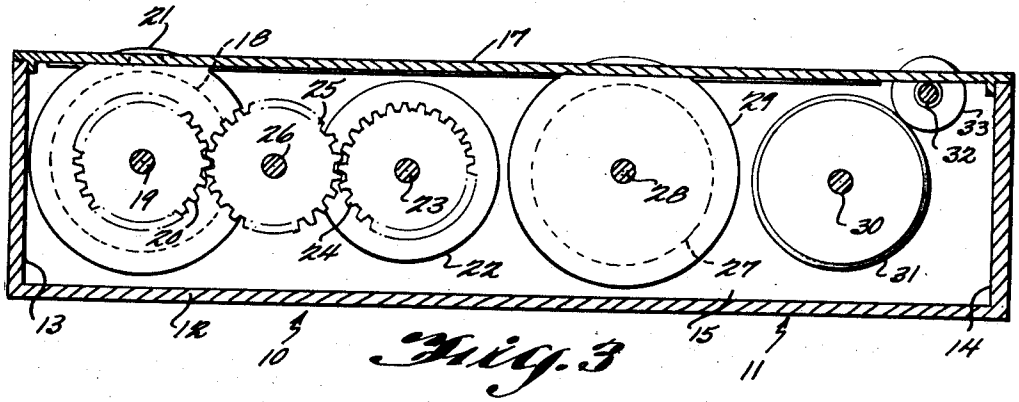


Fig. 3

INVENTOR
ROBERT D. PARKHURST

BY

Kimmel & Crowell
ATTORNEYS

July 19, 1960 R. D. PARKHURST 2,945,303

APPARATUS FOR THE PRACTICE AND STUDY OF MATHEMATICAL TABLES

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3 Sheets-Sheet 2

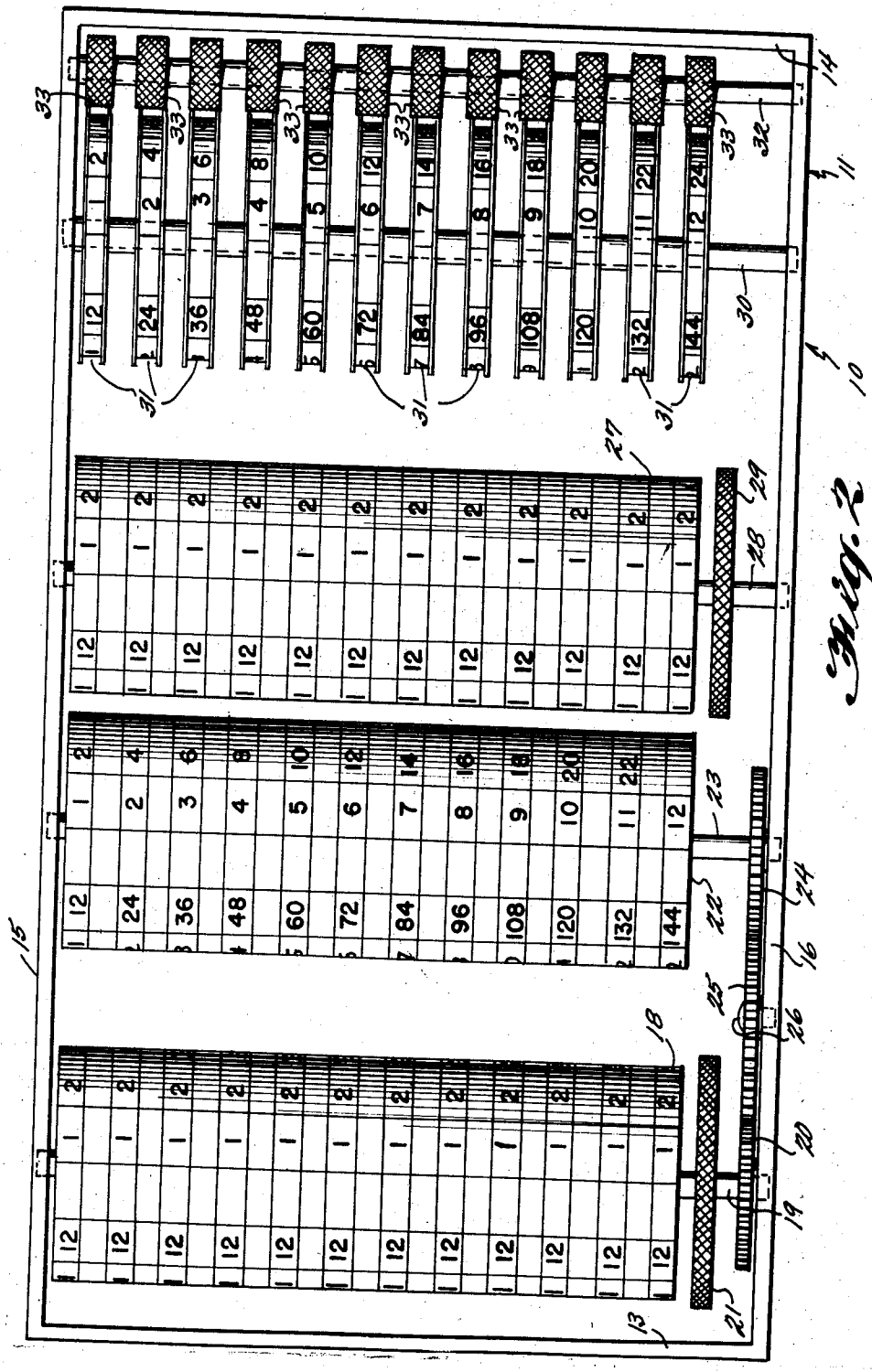


Fig. 2

July 19, 1960 R. D. PARKHURST 2,945,303

APPARATUS FOR THE PRACTICE AND STUDY OF MATHEMATICAL TABLES

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3 Sheets-Sheet 3

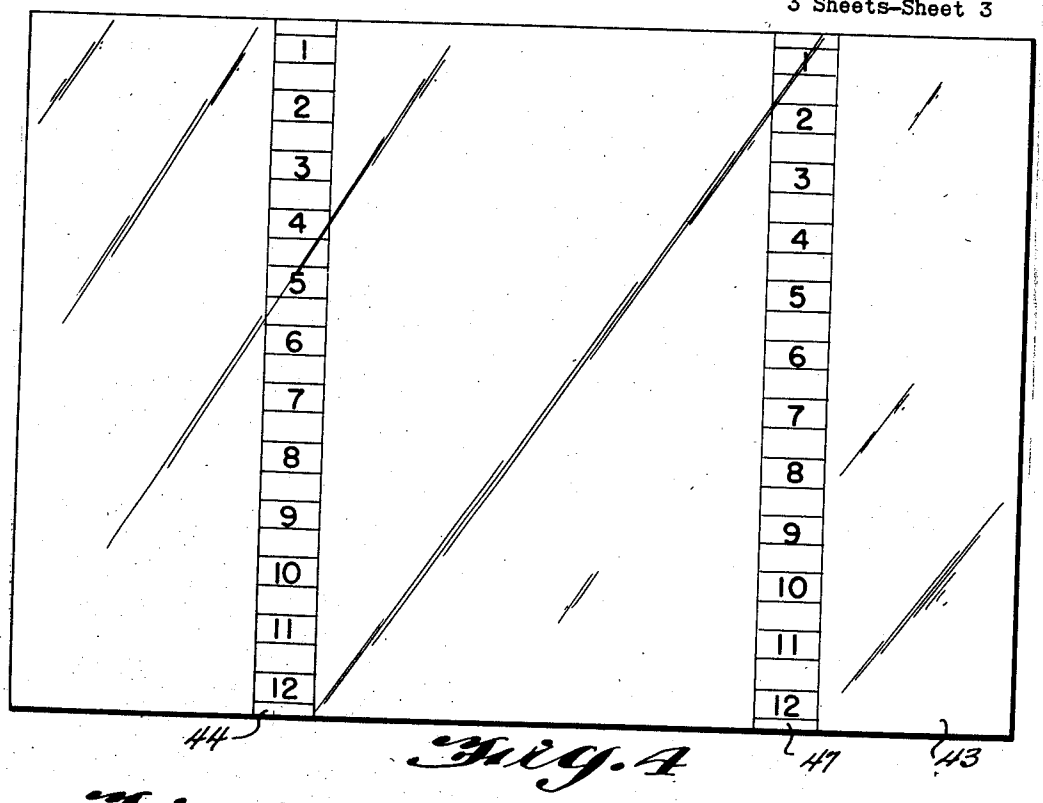
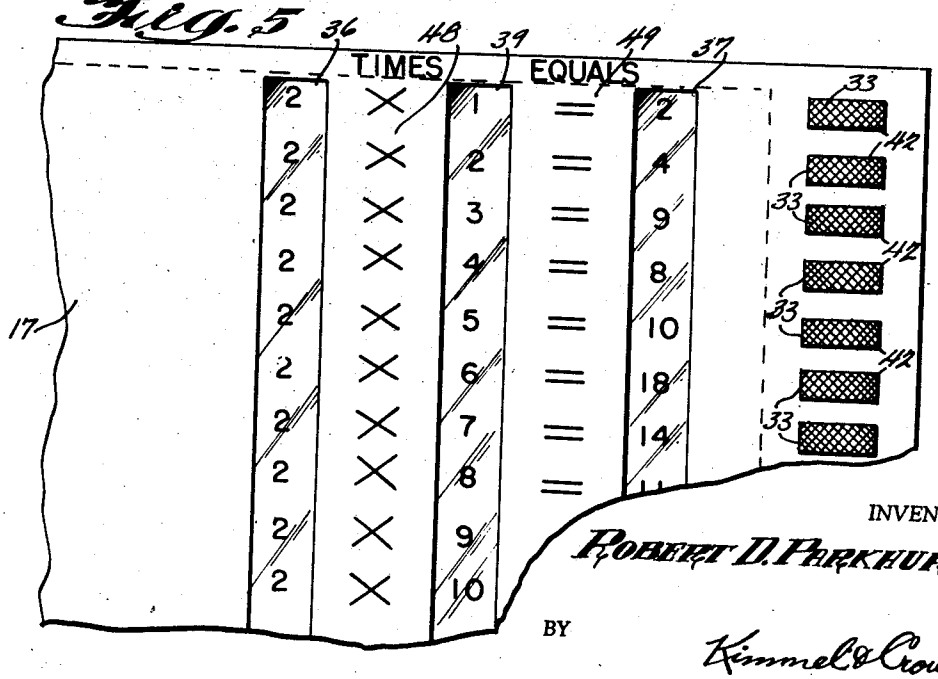


Fig. 4

Fig. 5



INVENTOR

ROBERT D. PARKHURST

BY

Kimmel & Crowell

ATTORNEYS

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2,945,303

APPARATUS FOR THE PRACTICE AND STUDY OF MATHEMATICAL TABLES

Robert D. Parkhurst, 2217 Chevrolet Ave., Flint, Mich.

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3 Claims. (Cl. 35—9)

The primary object of the machine is to provide an apparatus for the study and practice of mathematical tables, such as multiplication tables, to assist in committing the tables to memory.

Another object of the invention is to provide a device of the class described above having means for blanking out the answers when it is to be determined how thoroughly the tables have been learned.

A further object of the invention is to provide an apparatus of the class described above wherein problems of the mathematical tables may be presented with adjacent means provided to permit the display of possible answers to the problem.

Other objects and advantages will become apparent in the following specification when considered in light of the attached drawings, in which:

Figure 1 is a perspective view of the invention;

Figure 2 is a top plan view of the invention taken along the line 2—2 of Figure 1, looking in the direction of the arrows with the cover removed;

Figure 3 is a longitudinal sectional view taken along the line 3—3 of Figure 1, looking in the direction of the arrows;

Figure 4 is a plan view of the plastic sheet secured to the underside of the cover; and

Figure 5 is a fragmentary top plan view of the problem and answer practice section of the apparatus.

Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures, the reference numeral **10** indicates generally an apparatus for the study and practice of mathematical tables constructed in accordance with the invention.

The apparatus **10** includes a generally rectangular open topped box, generally indicated at **11**, having a bottom wall **12** carrying a pair of spaced parallel opposite end walls **13, 14** at opposite ends thereof. A pair of oppositely disposed spaced parallel side walls **15, 16** are positioned in opposite sides of the bottom wall **12** connecting the opposite ends of the end walls **13, 14**. A generally rectangular top wall **17** is supported on the upper edges of the end walls **13, 14** and the side walls **15, 16** and secured thereto by any suitable means.

A drum **18** is mounted on a shaft **19** having its opposite ends journalled in the side walls **15, 16** parallel to the end wall **13**. A spur gear **20** is fixed to the shaft **19** adjacent the side wall **16**, as can clearly be seen in Figure 2. A knurled hand wheel **21** is fixed to the shaft **19** intermediate the spur gear **20** and the drum **18**, for reasons to be assigned. The knurled hand wheel **21** has a diameter greater than the diameter of the drum **18**.

A second drum **22** is fixedly mounted on a shaft **23** parallel to the shaft **19** and has a spur gear **24** fixed to the shaft **23** in aligned relation to the spur gear **20**. The shaft **23** is journalled at its opposite ends in the side walls **15, 16**. A spur gear **25** is journalled on a stub shaft **26** secured to the side wall **16** and is meshed with the spur gears **20, 24**, as is shown in Figure 3.

The spur gears **20, 24** are of equal diameter so that the drums **18, 22** will rotate equally and in the same direction.

A drum **27** is mounted on a shaft **28** journalled in the side walls **15, 16** and a knurled hand wheel **29** is also fixed to the shaft **28** to provide means for turning the drum **27** along with its shaft **28**.

A shaft **30** has its opposite ends mounted in the side walls **15, 16** parallel to the shaft **28** and has a plurality of wheels **31** individually journalled thereon in axially aligned parallel spaced apart relation.

A shaft **32** has its opposite ends fixed in the side walls **15, 16** and has a plurality of axially aligned spaced apart parallel rubber hand wheels **33** journalled thereon with the peripheral surface of each of the hand wheels **33** frictionally contacting the peripheral surface of a respective one of the wheels **31**.

The cover **17** is provided with an elongated generally rectangular slot **34** overlying the central portion of the drum **18** and a second generally rectangular slot **35** overlying the central portion of the drum **22**. The cover **17** is further provided with a generally rectangular elongated slot **36** overlying the center of the drum **27** and a generally rectangular elongated slot **37** overlying the wheels **31**. The cover **17** is further provided with an elongated generally rectangular slot **38** arranged intermediate and parallel to the slots **34, 35** and with another elongated generally rectangular slot **39** arranged intermediate and parallel to the slots **36, 37**.

A relatively short longitudinally extending slot **40** is formed in the cover **17** to permit the knurled hand wheel **21** to extend therethrough. Another relatively short longitudinally extending slot **41** is formed in the cover to permit the knurled hand wheel **29** to extend therethrough. The cover **17** is provided with a plurality of generally rectangular apertures **42** through which the rubber hand wheels extend.

A generally rectangular transparent plastic sheet **43** is secured to the underside of the cover **17** by any suitable means to serve as window closures for the slots **34, 35, 36, 37, 38, 39** and to carry indicia underlying the slots **38, 39**. The drum **18** is provided with a plurality of rows of multipliers, when used for multiplication tables, and the plastic sheet **43** is provided with a plurality of multiplicands indicia **44** arranged to underlie the slot **38** and to align with the rows of multipliers on the drum **18**. The drum **22** is provided with a plurality of rows of sums arranged to align with the rows of the multipliers and the multiplicands. The drums **18, 22** and the indicia **44** includes all of the multiplication tables from 1×1 equals 1 to 12×12 equals 144.

The cover **17** is provided with a row of mathematical symbols **45** indicating the multiplication operation positioned between the slot **34** and the slot **38**. Another row of mathematical symbols of equal signs **46** is positioned between the slot **35** and the slot **38** so that with the drums **18** and **22** in a selected position, twelve (12) complete multiplication problems are completely illustrated along with their answers. The hand wheel **21** provides means for rotating the drums **18, 22** so that each of the rows of multipliers, as well as each of the rows of the sums, will be separately visible through the slots **34, 35**, respectively.

The drum **27** is marked identically to the drum **18** and is arranged to be rotated by the hand wheel **29** to the desired position. The plastic sheet **43** is provided with a second row of indicia **47** which is arranged to underlie the slot **39** in the cover **17**.

The drums **18, 22** and **27** are each provided with a blank row showing no indicia so that the device can be set with no problems and no answers visible during test-

ing of the student to see how well the tables have been learned.

The wheels **31** each are identical to one circular row of the drum **22** so that with the drum **27**, indicia **47** and all of the wheels **31**, all of the multiplication tables from 1×1 equals 1 to 12×12 equals 144 may be formed. A row of mathematical symbols **48** indicating the multiplication operation are printed on the cover **17** between the slots **36, 39**. A second row of mathematical symbols **49** indicating the equal sign is printed on the cover **17** between the slots **37, 39**. By setting the drum **27** to the desired multiplier, the student can then practice rotating the wheels **31** through the rubber hand wheels **33** until the answer exposed through the slot **37** is his selection for the correct answer to the problem presented by the data exposed through the slots **36, 39**. The correctness of the answer can then be checked by rotating the drums **18, 22** by means of the hand wheel **21** until the identical problem with the correct answer is exposed on the left side of the apparatus **10**.

Obviously, additional mathematical tables, such as subtraction, division, addition as well as simple algebraic problems, may be provided with the apparatus by changing the indicia on the drums, the plastic sheet and on the cover, to provide the desired practice and test material.

Having thus described the preferred embodiment of the invention, it should be understood that numerous structural modifications and adaptations may be resorted to without departing from the scope of the appended claims.

What is claimed is:

1. Apparatus for the study and practice of mathematical tables comprising a generally rectangular container, a pair of spaced parallel drums, each carrying indicia, journalled in said container, means connecting said drums for simultaneous equal turning, a cover secured to said container, said cover having an elongated slot overlying each of said drums, said cover carrying an indicia panel intermediate said slots with said indicia panel cooperating with said rows of indicia carried by said drums to provide a plurality of mathematical problems and answers upon rotation of said drums, a third drum having indicia thereon journalled in said container, said cover being provided with a third slot overlying said third drum, a plurality of axially aligned wheels arranged in spaced relation with respect to said third drum, and an indicia panel interposed between said wheels and said third drum to provide, in cooperation with said indicia on said third drum, and said wheels a plurality of mathematical problems.

2. A device as claimed in claim 1 wherein means are provided in said container for individually rotating said wheels.

3. A device as claimed in claim 2 wherein hand operated means are provided for rotating said drums.

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