No. 609,995. Patented Aug. 30, 1898.

J. J. MURPHY.

ARITHMETIC PUZZLE.

(Application filed Oct. 21, 1897.)

(No Model.)

Fig. 2.

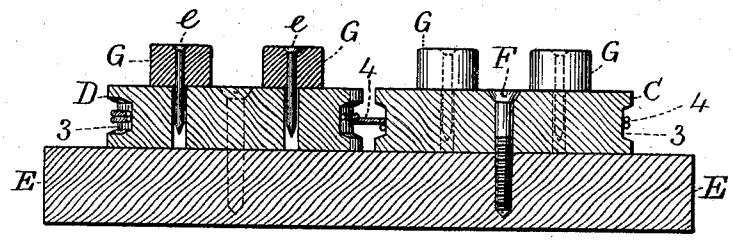
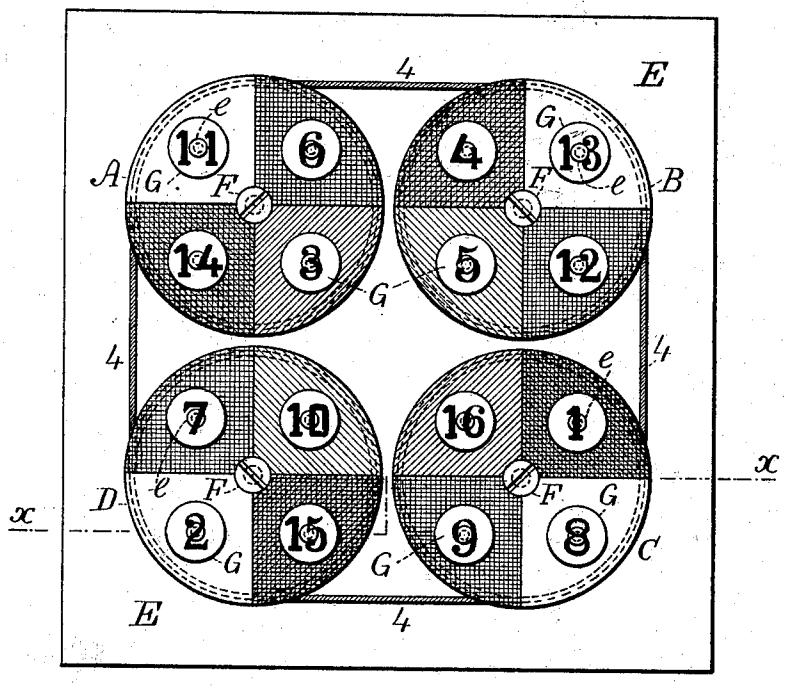


Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES J. MURPHY, OF NEW YORK, N. Y.

ARITHMETIC PUZZLE.

SPECIFICATION forming part of Letters Patent No. 609,995, dated August 30, 1898.

Application filed October 21, 1897. Serial No. 655,943. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. MURPHY, a citizen of the United States, residing in the city, county, and State of New York, have invented an Arithmetic Puzzle, of which the following is a specification.

This puzzle is based upon the principles of arithmetical progression, and it contains sixteen removable numbered pins arranged in groups of four each upon movable bases, the object being to arrange the numbered pins in such a position that the sum of any four similarly-placed numbered pins will be the same—that is to say, by taking sixteen pins numbered from "1" to "16" they can be arranged in such an order that the sum of any four similarly-placed pins will be thirty-four, the puzzle being to place these pins in such an order that this object is accomplished; and this is rendered still more difficult by the bases upon which the pins are supported being fitted so that they can be turned around progressively, and in so doing the addition of the numbers upon any four similarly-placed pins will produce thirty-four. It is to be understood that the numbered pins are to be detached from the bases, and the puzzle is in properly placing the numbered pins upon the bases to accomplish the object before mentioned.

I employ circular bases divided into quarters, and either colored with different colors or marked with distinguishing characters, so that all of the bases can be turned around similarly to bring certain colors or marks on the bases together, and in this operation, while the relative positions of the numbered pins are changed, the sum of any four numbers in similar positions upon the bases is not changed, in all instances being thirty-four.

In the drawings, Figure 1 is a plan view representing the puzzle complete and with the numbers in the positions for accomplishing the before-mentioned enumerations; and Fig. 2 is a section of the puzzle at the line *x x*, Fig. 1.

The bases A B C D are preferably circular, and they are attached to the bottom base E, preferably by screws F, so that they can be turned around progressively, and these bases are divided up into quarters, as illustrated in the drawings, and preferably colored. I sometimes employ white, blue, red, and black; but letters may be put upon the quarters, or any other suitable designation, in order that when the bases are turned the similar designations can be brought inward as the bases stand in a rectangle, and in order to cause these bases to be turned in the proper direction and simultaneously I prefer to groove the edges of the bases, as seen at 3, and to pass around in these grooves a cord or string leading from one to the other successively all the way round, and the ends of the cord 4 are to be connected together so as to be substantially endless, and the disposition of the colored or designated quarters of the bases is to be in the manner illustrated, so that when either one of the bases receives a quarter-revolution all the others will be similarly moved to bring the similarly-colored quarter-circle sections together in the middle.

In each of the quarter-circle sections upon the bases A B C D is a hole for the reception of a pin *e*, projecting downward through the peg G, so that the pegs are easily removed from the circular bases, and each peg is to have a numbered surface, and the numbers upon the pegs commence with "1" and run up to "16," there being sixteen pegs, four to each base.

It will be apparent that when the puzzle is sold the pegs can be in a separate receptacle; and the puzzle consists in arranging the pegs with the numbers in the order represented in the drawings, which will be found to be difficult and to need the exercise of considerable thought and skill, because they are to be arranged so that the sum of the numbers upon any four similarly-placed pegs will be thirty-four.

It is not necessary that a key should accompany each puzzle to show the possibility of the numbers being arranged as shown in the drawings to meet the requirements of the puzzle; but it will be found that to add up the outer corner numbers they will foot up thirty-four. To add up the numbers on the four pegs that are nearest toward each other toward the middle they will foot up thirty-four. To add up adjacent pairs on two bases or alternate pegs in two horizontal or vertical lines on two bases the sum is the same, or to add

together the numbers in either of the lines either vertically or horizontally they foot up thirty-four. To add together the numbers of any two pegs that are parallel with any other two pegs in similar positions they will foot up thirty-four. To add together the numbers on any one of the bases they foot up thirty-four, and this condition is not changed when the bases have received quarter-revolutions progressively. Hence in properly placing the numbered pegs reference has to be had not only to the position in which those pegs may be standing, but to the positions in which they will be standing when the bases have been turned around.

This puzzle not only affords considerable amusement and recreation to adults as well as children, but it also is an exercise in mental arithmetic and a source of amusement in consequence of the mistakes that are liable to be made before the numbers will be properly placed.

If the numbers commence at "2" to "17," inclusive, the result will be the same, but the sum will be thirty-eight, and if they commence at "5" to "20" the sum will be fifty. I do not therefore limit myself to the numbers shown.

I claim as my invention—

1. The herein-described puzzle consisting of movable numbered pegs and bases for the reception of such numbered pegs arranged quadrangularly with the numbers in the positions shown, so that the sum of the numbers on any four pegs similarly placed will be thirty-four, substantially as set forth.

2. The herein-described puzzle, consisting of four circular rotatable bases and their central connections and sixteen movable numbered pegs adapted to being arranged upon the movable bases, so that the sum of the numbers upon any four similarly-placed pegs will be the same, substantially as set forth.

3. The herein-described puzzle, consisting of a bottom base and four circular bases and central attaching-screws, and an endless cord passing around such bases, so that they turn together, each base being divided into quarter-circle sections with corresponding colors or designations and perforations and movable numbered pegs adapted to being arranged upon the bases, so that the sum of the numbers upon any four of the similarly-placed bases corresponds, substantially as set forth.

Signed by me this 19th day of October, 1897.

JAMES J. MURPHY.

Witnesses:

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S. T. HAVILAND.