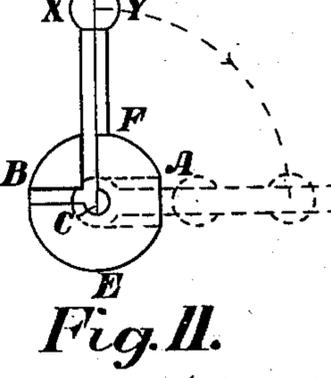
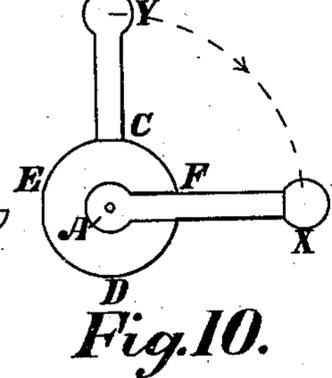
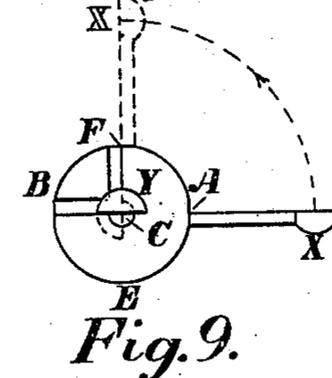
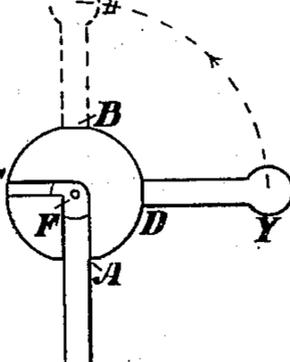
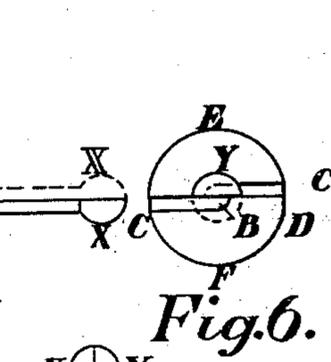
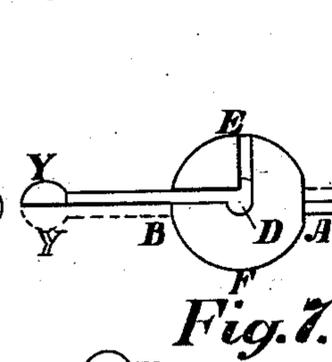
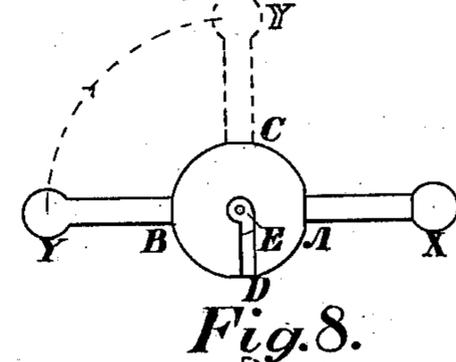
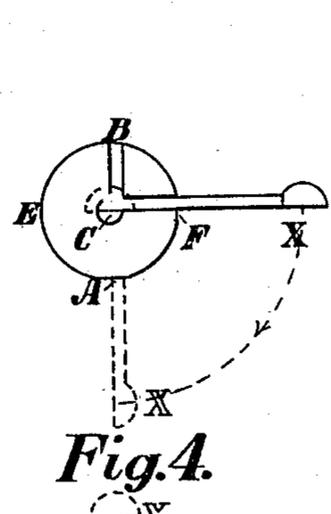
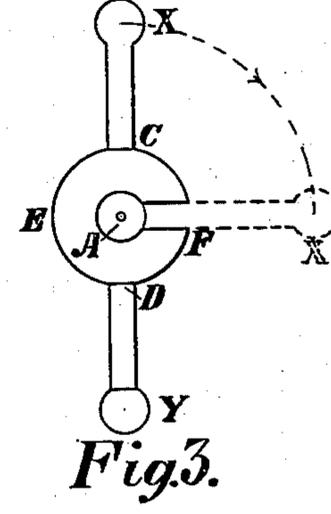
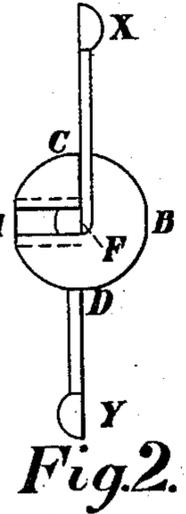
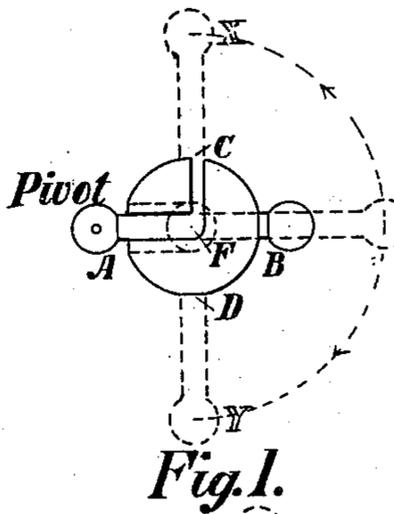
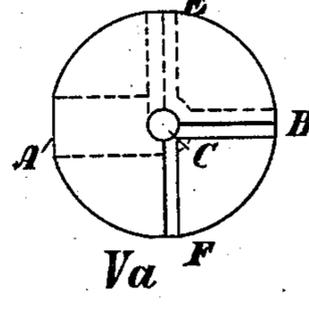
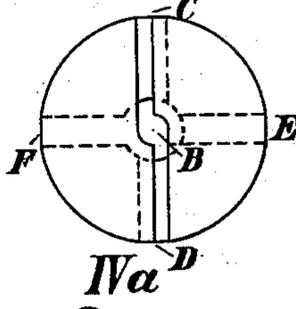
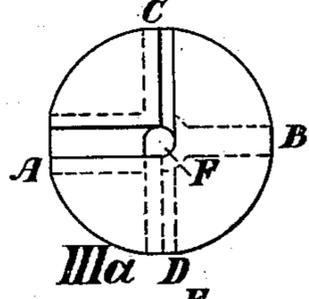
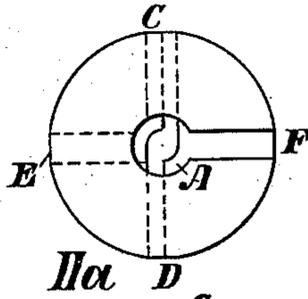
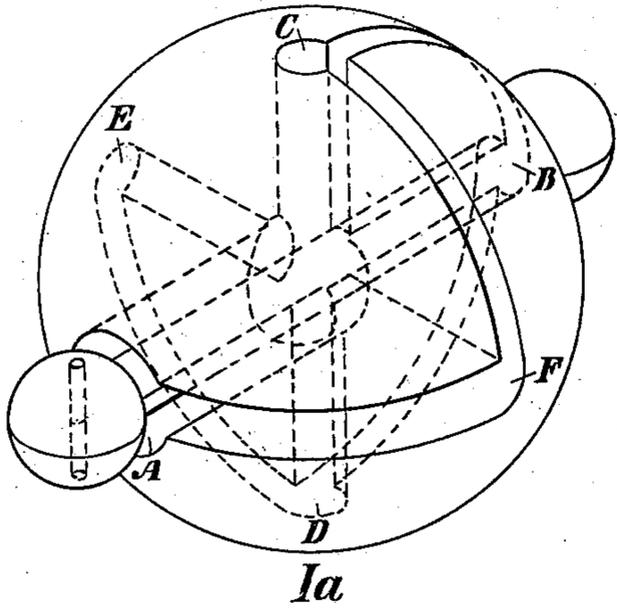


(Model.)

J. H. SHORTT.
PUZZLE.

No. 596,633.

Patented Jan. 4, 1898.



John Haggerty Shortt
Inventor

Witnesses
Henry Greenfield
George Leane

By his Attorney *J. M. Allaire Shortt*

UNITED STATES PATENT OFFICE.

JOHN HAGGERTY SHORTT, OF ROSEBANK, NEW YORK.

PUZZLE.

SPECIFICATION forming part of Letters Patent No. 596,633, dated January 4, 1898.

Application filed June 1, 1897. Serial No. 639,063. (Model.)

To all whom it may concern:

Be it known that I, JOHN HAGGERTY SHORTT, a citizen of the United States, residing at Rosebank, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Puzzles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention consists of two bars, preferably semicircular in cross-section and having projections on their ends, one end of one being pivoted to one end of the other, so that they may revolve independently in the plane in which their flat sides lie, in combination with a block, preferably spherical, which is pierced by openings and passages in such a manner that the bars may be put in a position where the stems of both bars pass completely through the block, though no opening of such size as to admit the projections on the ends of the bars passes through it, and the solution of the puzzle consists in making the bars occupy the above-mentioned position and removing them from such a position. The manner of accomplishing these solutions and the comparative dimensions and locations of the openings and passages in the block are shown by the accompanying drawings, in which—

Figure I^a is an isometric view of the block and bars, in this illustration being a sphere with circular openings and the bars having semicircular stems. Figs. II^a to V^a, inclusive, are views of the block in different positions, showing the openings A, B, C, D, E, and F, which intersect at the center of the block and are connected one with another by the passages A B, F C, C B, B D, and D E. Figs. 1 to 11, inclusive, are views of the block and bars in different positions. The full outlines of the bars show them in their original position in the figures, and the dotted outlines show them in their final positions in the same figures.

Similar letters refer to similar parts throughout the several figures.

The radii of the semicircular stems of the bars X and Y are equal to the radii of the cir-

cular openings B, C, D, E, and F, which are all equal. The projections on the ends of the bars are hemispherical, their radii being equal to those of the circular opening A. The central longitudinal axis of the opening A coincides with that of B produced, and the opening A is of such depth as to admit of the ends of the bars X and Y being drawn therein until their common center coincides with the point of intersection of the central axes of the several openings. The width of the passage between openings A and F is equal to two radii of the stem of either of the bars X or Y, and if a plane were passed midway between its sides it would pass through the central axes of openings A and F. The width of each of the remaining passages F C, C B, B D, and D E is equal to one radius of the stem of either of the bars X or Y. The plane which forms the side nearest A of the passage between openings F and C would, if produced, pass through the central axes of F and C. The plane which forms the side nearest E of the passage between C and B would, if produced, pass through the central axes of openings C and B. The plane which forms the side nearest F of the passage between openings B and D would, if produced, pass through the central axes of B and D, and the plane which forms the side nearest B of the passage between openings D and E would, if produced, pass through the central axes of D and E.

The bars X and Y, being in the position shown in Fig. I^a and by the full outlines in Fig. 1 of the drawings, are first drawn to the right until the center of their hemispherical pivoted ends coincide with the point of intersection of the central axes of the several openings. Then the bar X, swinging upon the pivot, passes from opening B to opening C, and bar Y similarly passes to opening D. Then both bars are revolved in the sphere until they occupy the position shown in Fig. 2. The bar X next passes to opening F, where it is shown by the dotted outline in Fig. 3. Next bar X passes to opening A. (See Fig. 4.) Now the bar Y is in position to pass from opening D to opening B. (See Figs. 5 and 6.)

The full outline of bar X in Fig. 7 shows it in the same position with regard to the sphere in which it is shown in Fig. 4 by the dotted outline, and the former figure shows bar Y

in position to pass between openings D and B. The bars X and Y now being in the position shown by Fig. 7 (full outlines) are next revolved in the sphere until they occupy the position shown by the dotted outlines in the same figure. The bar Y can now pass from opening B to opening C, where it is shown by the dotted outline in Fig. 8 and by the full outline in Fig. 9. Bar X is next moved from opening A to opening F, and this position makes it possible to pass bar Y from opening C to opening F. (See Figs. 9 and 10.) Now both bars can be moved into opening A and so removed from the sphere, as shown in Fig. 11. It being possible to accomplish similar results with other forms of bars and with a cube or other form of block instead of a sphere and with other forms and arrangements of the openings and passages, therefore

What I claim, and desire to secure by Letters Patent, is—

1. A puzzle comprising the two bars X, and Y, having projections on their ends and having one end of one held to one end of the other by a pivot; and a block having the openings A, B, C, D, E, and F, and the passages between said openings, all substantially as described.

2. A puzzle comprising two bars having

projections on their ends, and having one end of one held to one end of the other by a pivot so that each may revolve in planes, parallel to a plane perpendicular to such pivot; and a block pierced by intersecting openings, the point of intersection of the axes of said openings being within said block, one of said openings being of such size as to admit both ends of the bars where pivoted together, simultaneously, other of said openings being of such size as to permit the stem of each of said bars to revolve about its longitudinal axis, therein; and said openings being connected together by passages, one being of such size as to admit the passage of the stem of each of said bars in two or more different positions, and others being of such size as to admit the passage of the stem of each of said bars only in one position; the cavity at the intersection of the axes of openings being of such size as to admit of the revolution of the pivoted ends of the bars in all convenient directions.

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

JOHN HAGGERTY SHORTT.

Witnesses:

HENRY GREENFIELD,
GEO. M. KEANE.