

Nov. 28, 1939.

J. D. BOYLE

2,181,116

PUZZLE

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Fig. 1

Fig. 2

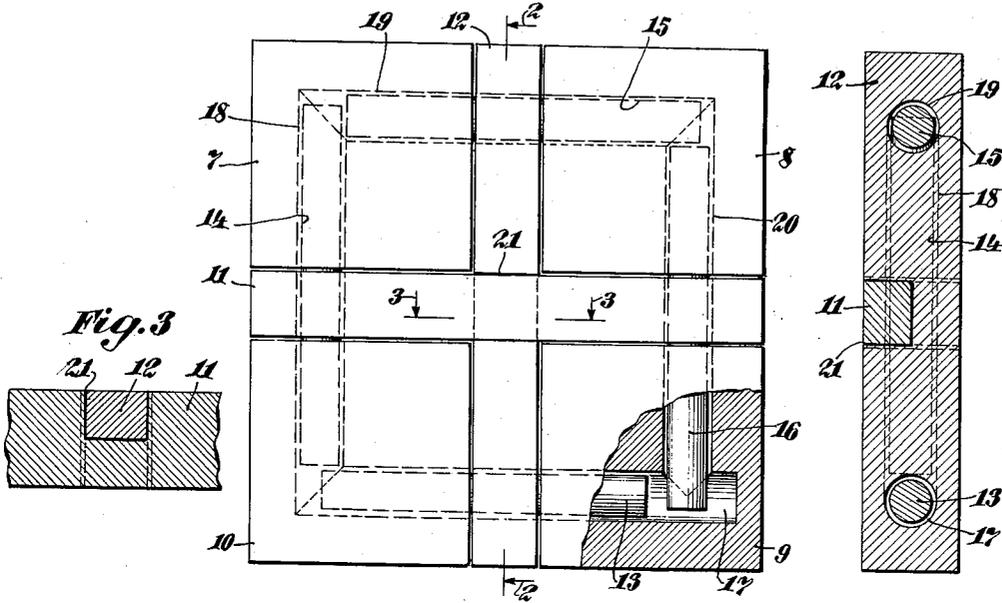


Fig. 3

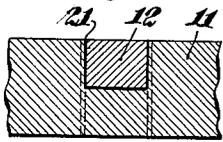


Fig. 4

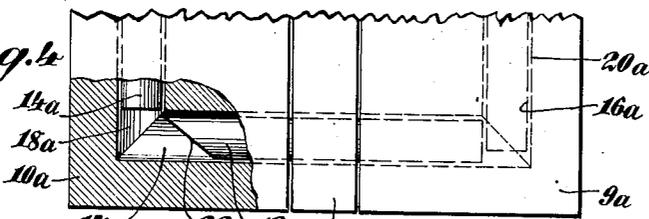


Fig. 5

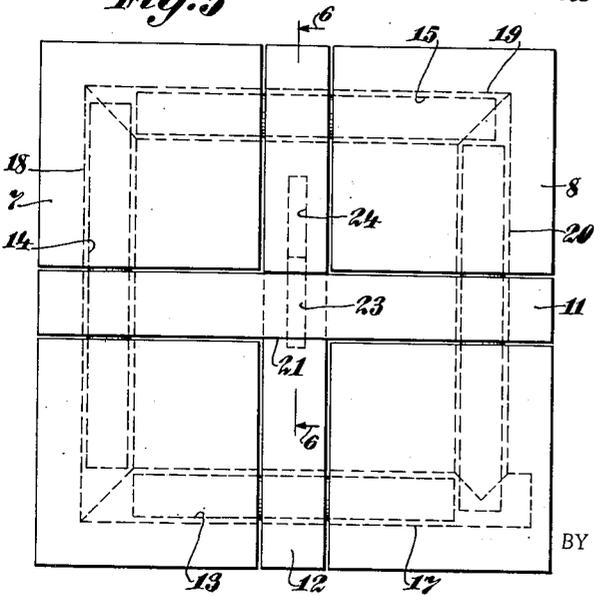
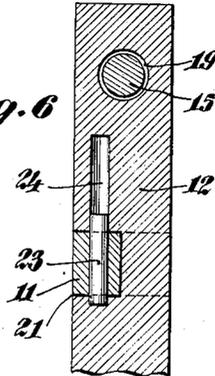


Fig. 6



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PUZZLE

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5 Claims. (Cl. 273-156)

The invention herein disclosed relates to puzzles of the type involving the problem of taking apart and putting together certain related elemental units.

The objects of the invention are to provide a puzzle of the type mentioned, which while relatively simple and inexpensive will be interesting and attractive and present a truly absorbing problem.

Other desirable objects and the novel features of construction, combination and relation of parts by which the objects are attained will appear or are hereafter set forth in the detailed description following.

The drawing accompanying and forming part of the specification illustrates certain practical embodiments of the invention, but it should be understood that structure may be modified and changed as regards this disclosure, all within the true intent and board scope of the invention as hereinafter defined and claimed.

Fig. 1 is a face view of one of the puzzles partly broken and shown in section.

Figs. 2 and 3 are cross-sectional views as on lines 2-2 and 3-3 of Fig. 1.

Fig. 4 is a broken part sectional detail illustrating a modification.

Fig. 5 is a face view illustrating another embodiment.

Fig. 6 is a broken sectional detail as on line 6-6 of Fig. 5.

In Fig. 1 the puzzle is shown as made up of four equal rectangular blocks 7, 8, 9, 10, fitting into the corner angles between the cross bars 11, 12, to form a square assembly and normally held in that relation by the pin tumblers 13, 14, 15, 16.

Passages for the tumblers are provided in the blocks and intervening cross bars as indicated at 17, 18, 19, 20.

In this particular construction, the tumbler 13, is shorter than the other three tumblers and the passage 17, in which this tumbler operates is slightly longer than the other three passages. The latter result is effected by boring or extending passage 17, past the point of full intersection with the adjoining passage 20, permitting the shorter tumbler to have a further seating movement in block 9.

The bars 11, 12, are mortised or reversely notched at 21, where they cross each other to interlock them in the crossed relation.

In the position of parts shown in Fig. 1, the left end of tumbler 13, is disposed beneath tumbler 14, supporting the latter in an upraised position, where it holds tumbler 15, to the right.

Tumbler 15 then overstands the upper end of tumbler 16, holding it in the lower position shown, where it blocks the recession of tumbler 13, into the full depth of passage 17.

To release the parts, the puzzle is held on edge and turned to slide the bottom plunger 13 to the right as far as it will go, to thus drop plunger 14, down into the bottom of its passage. Then upon rotating the puzzle left-handedly a quarter turn in Fig. 1, tumbler 15, can be dropped down into the bottom of its passage. With a further quarter turn to the left tumbler 16, can be dropped to the bottom of passage 20, thus to clear the way for the shorter tumbler 13, to drop to the foot of the deeper passage 17. When this is accomplished, block 10 may be rotated on plunger 14, in the direction to thrust cross bar 12, rearwardly in the illustration about tumbler 15, as a center and this slight additional movement of the cross bar enables the block 10 to then clear the end of tumbler 13, in its retracted position. When this key block is released, the other parts can be separated without further difficulty.

Instead of making one tumbler passage longer, the passages may be all of equal length as indicated at 17a, 18a, 20a, Fig. 2 and one tumbler 13a, be shortened to the extent of bevelling one end of the same at 22.

In this second form of the invention, after revolving the puzzle to drop the tumblers one after the other, and thus finally get plunger 13a to the bottom of its passage 17a, the key block 10a may be rotated as before to effect separation of the cross bars to the extent where the bore in block 14a, working against the inclination 22 of tumbler 13a, will rotate the latter bit-by-bit until the bevelled face affords clearance sufficient for block 14a, to revolve clear of such tumbler. This bevel ended tumbler thus introduces an additional element of chance, requiring either that it be in position to release the key block or that it be forced around by working on the key block until the incline is in line with the motion of releasing the block.

To provide a further element of chance, the cross bars may be locked together by a pin 23, Figs. 5 and 6, which when the puzzle is turned in one direction, can slide into an opening 24, in one bar fully receiving the pin, clear of the other cross bar. This construction therefore requires both that the device be turned in a direction to serially release the block securing tumblers and to drop the cross bar holding pin 23, in its socket 24, to enable sufficient separating movement of

the cross bars for the key block to be released from the key tumbler.

- Many changes in design and appearance may be made, for example, the blocks may be in the form of cubes, discs, balls or other shapes instead of the parallelepipeds shown. In some instances, the cross bars may be omitted and the members directly connected by the several tumblers. Also a greater or less number of connected members may be used. Thus with three connected elements, the assembly may be of generally triangular shape instead of the square design shown. Also several independently keyed assemblies may be combined to form a larger unit assembly.

What is claimed is:

1. A puzzle comprising crossed bars oppositely notched and interlocked at the point of crossing, blocks engaged in the angles between the crossed bars, said blocks and bars having registering tumbler passages, tumblers sliding in said passages and movable into positions to block the movement of adjoining tumblers and one of said tumblers being of a length and having permissible movement to release one of the blocks.
2. A puzzle comprising crossed bars oppositely notched and interlocked at the point of crossing, blocks engaged in the angles between the crossed bars, said blocks and bars having registering tumbler passages, tumblers sliding in said passages and movable into positions to block the movement of adjoining tumblers and one of said tumblers being of a length and having permissible movement to release one of the blocks and a concealed pin slidable in opposite directions to release or to confine the bars in crossed relation.

3. A puzzle comprising crossed bars oppositely notched and interlocked at the point of crossing, blocks engaged in the angles between the crossed bars, said blocks and bars having registering tumbler passages, tumblers sliding in said passages and movable into positions to block the movement of adjoining tumblers and one of said tumblers being of a length and having permissible movement to release one of the blocks, said tumbler being shorter than the other tumblers and the passage in which said tumbler operates being longer than the other tumbler passages.

4. A puzzle comprising crossed bars oppositely notched and interlocked at the point of crossing, blocks engaged in the angles between the crossed bars, said blocks and bars having registering tumbler passages, tumblers sliding in said passages and movable into positions to block the movement of adjoining tumblers and one of said tumblers being of a length and having permissible movement to release one of the blocks, said tumbler having an inclined end face.

5. A puzzle comprising crossed bars oppositely notched and interlocked at the point of crossing, blocks engaged in the angles between the crossed bars, said blocks and bars having registering tumbler passages arranged with the ends of the passages in intersecting relation, pin tumblers in said passages, the ends of adjoining tumblers being engageable at the intersecting ends of the passages to enable one tumbler to block the movement of an adjoining tumbler and one of said tumblers being of a length and having permissible movement to release a block normally held by said tumbler.

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