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K. DUGAN

2,414,255

INTERLOCKING STRUCTURE

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Fig. 1.

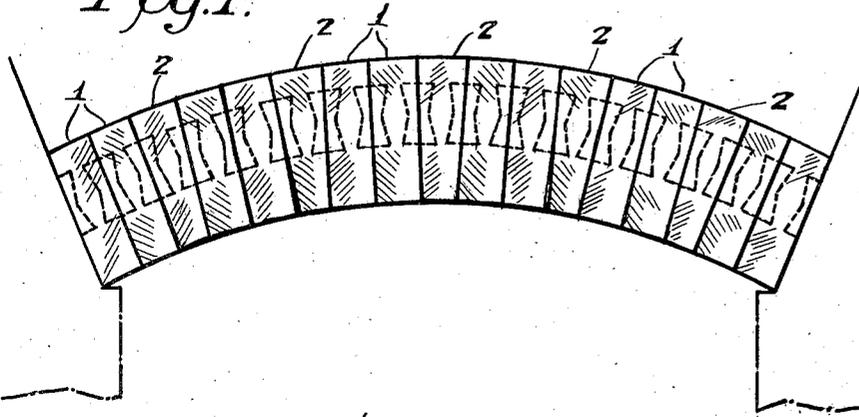


Fig. 2.

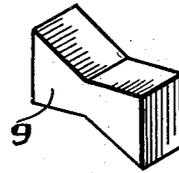
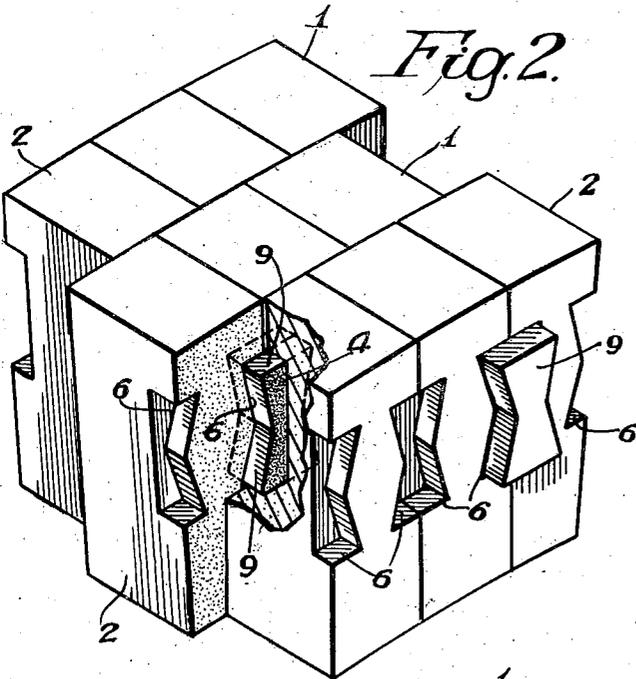


Fig. 4.

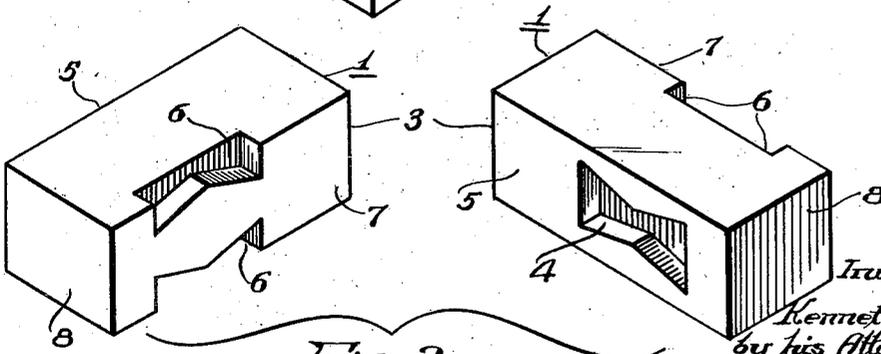


Fig. 3.

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UNITED STATES PATENT OFFICE

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INTERLOCKING STRUCTURE

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2 Claims. (Cl. 72-55)

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A principal object of this invention is to provide an improved structural system involving the use of bricks or other structural units together with means for effecting a positive interlock between the units in the structure, said system finding an application of particular importance in the arches and roofs of open hearth and other furnaces. In such arches the system is calculated to materially increase the useful life of the structure by retarding premature disintegration or failure of localized areas which may be caused for example by a defective unit or units, by dislodgement of one or more of the units from the structure, or by uneven disintegration due to heat. The hereindescribed system, which constitutes my invention, functions to offset the effects of such local failures so that the useful life is more closely related to the durability of the structure as a whole than to that of any localized area thereof.

The system functions also as a safety factor by precluding accidental collapse of the roof structure.

In the attached drawing,

Fig. 1 is an end view of an arch constructed in accordance with the invention;

Fig. 2 is an enlarged view in perspective of a section of the arch;

Fig. 3 shows views in perspective of the opposite sides of the same building unit, and

Fig. 4 is a view in perspective of the preferred form of locking element.

With reference to the drawing, the arch shown in Fig. 1 is superficially of conventional form, being built up of a number of longitudinal courses 1 and 2 in accordance with the usual practice, these courses differing from each other only in that the component bricks of the courses 2 are tapered in accordance with the degree of curvature desired in the finished structure. In the present instance every third course contains the tapered units, although there is no restriction as to the number or distribution of such courses in the arch.

In accordance with the invention, the individual units 3, whether tapered or not, are formed as shown in Fig. 3 with a recess 4 in one face 5 thereof, and with a pair of recesses 6, 6, in the opposite face 7, the latter recess intersecting the side edges as illustrated. Preferably the recess 4 is of the double dovetail form illustrated and is placed symmetrically with respect to the longitudinal center line of the face 5 but closer to one end 8 of the unit than to the other. The recesses 6 are of the same depth as the recess 4 and are

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correspondingly placed in the face 7 as regards relative proximity to the one end 8 of the unit, and each has the form of one longitudinal half of the recess 4.

The system further comprises a plurality of key elements 9, see Fig. 4, which are shaped individually to fit the recess 4 but is greater in thickness than the depth of the said recess so that when inserted in the latter the element will project beyond the face 5 of the unit. The key is dimensioned so that the extent of such projection will not exceed the depth of the recess 4. Similarly, if one of the key elements is inserted in a recess 6, it will project for not more than half its thickness from the plane of the face 7 of the unit, and will project also from the adjoining face of the unit, which is also intersected by the recess 6, to an extent not exceeding one-half the width of the key.

The units are adapted to be laid in the courses, as illustrated in Fig. 2, so that each unit symmetrically overlies the joint between two units in the adjoining course, and so also that the recesses 4 of all of the units of one course will lie on one and the same side of that course. Each of the recesses 4 will therefore register with a corresponding recess in the adjoining course composed of two mating recesses 6 in the abutting edges of two of the units of the said adjoining course. This is well illustrated in Fig. 2.

In the aforescribed structure, each unit is directly and positively interlocked through medium of the keys 9 with the two immediately adjoining units of the same course, and also with two immediately adjoining units of each adjoining course. Each unit, in effect, finds a positive support on each of the units with which it is in abutting relation. A unit in one of the intermediate courses will find a support on each of six other units.

The forms of the recesses 4 and 6, and of the key elements 9, are of functional importance. Each unit finds a support not only on the flaring lower halves of the associated keys but also on the top surfaces of the keys which it overlies. If the lower half of any of the keys should be destroyed or broken the remaining upper half of the key will still function to support the units, and its form is such as to preclude accidental displacement of the remnant of the key from between the units. The under surface of the arch which is exposed to the heat of the furnace may be burned away or disintegrated over the major part of its depth or thickness without destroying the unifying effect of the interlocking system.

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Similarly, and by reason of the unification of the units in structure and of the character of the unifying means, localized defects can have little or no adverse affect upon the structure as a whole.

I claim:

1. A structural system comprising a plurality of similar building units adapted to be assembled in laterally contiguous and abutting courses with each of the units in one course overlapping two adjacent units in each adjoining course, each of said units comprising a pair of laterally opposite flat faces extending longitudinally of the course, and having within one of said faces a recess entirely within the confines of said face, and in the laterally opposite face two recesses respectively disposed at the opposite upright end edges of said face and each corresponding in form approximately to one vertical half of the

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recess first named as divided by a plane normal to the face of said unit in which the said first named recess is formed, the said recess first named and contained entirely within the one face being set opposite to and in registration with two laterally contiguous half recesses of two other building units thereby forming a composite recess entirely confined at the perimeter, said recesses being shaped to afford side walls in said composite recess diverging upwardly with respect to said plane, and a key element of similar contour but of greater thickness than the depth of said individual recesses and half recesses and fitting said composite recess to interlock the said building units.

2. A structural system in accordance with claim 1, wherein the said recesses are disposed toward the upper ends of the building units.

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