

Aug. 13, 1968

L. R. DE OLIVEIRA

3,396,504

ADJUSTABLE KEYSTONE ASSEMBLY OF MOLDED REFRACTORY MATERIAL
FOR ARCHES, WALLS AND THE LIKE

Filed April 11, 1966

3 Sheets-Sheet 1

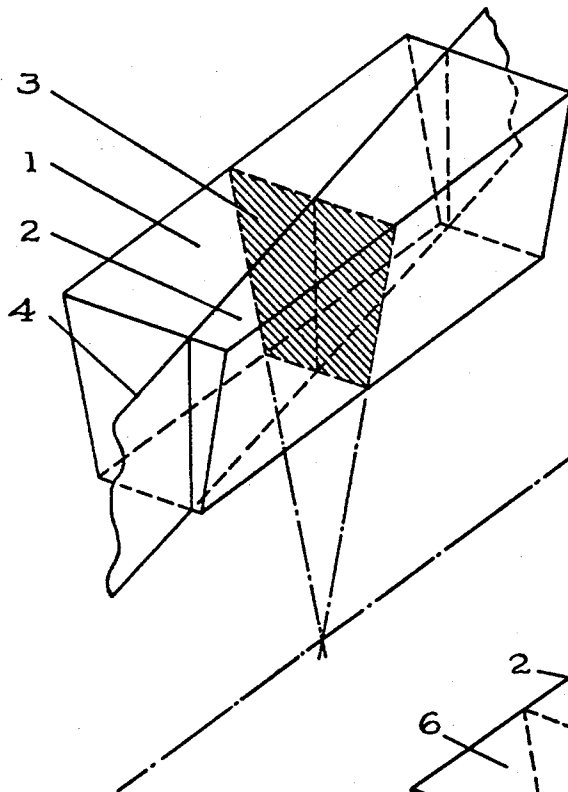


FIG. 1.

FIG. 2.

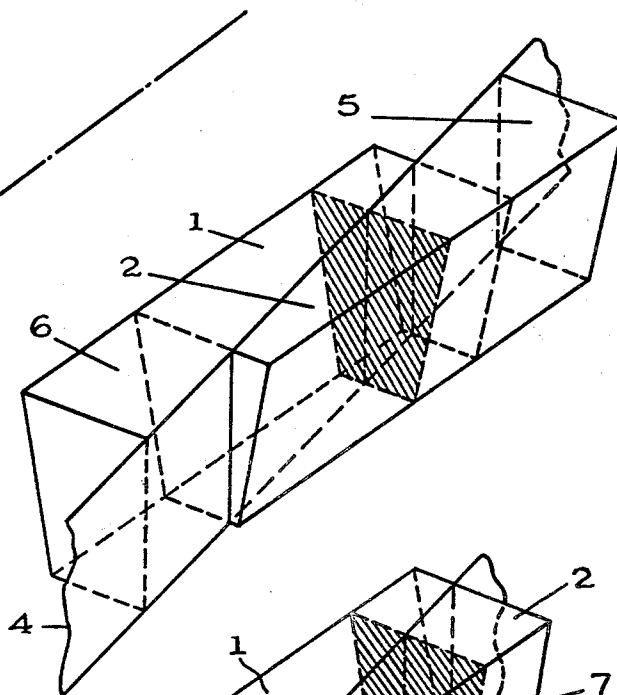
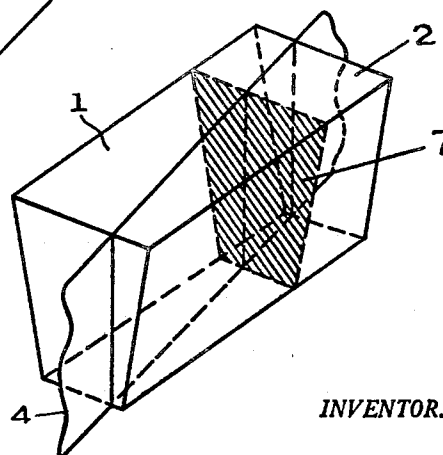


FIG. 3.



INVENTOR.

LUIZ ROBERTO De OLIVEIRA
BY

Emory L. Groff
ATTORNEY

Aug. 13, 1968

L. R. DE OLIVEIRA

3,396,504

ADJUSTABLE KEYSTONE ASSEMBLY OF MOLDED REFRACTORY MATERIAL
FOR ARCHES, WALLS AND THE LIKE

Filed April 11, 1966

3 Sheets-Sheet 2

FIG. 4.

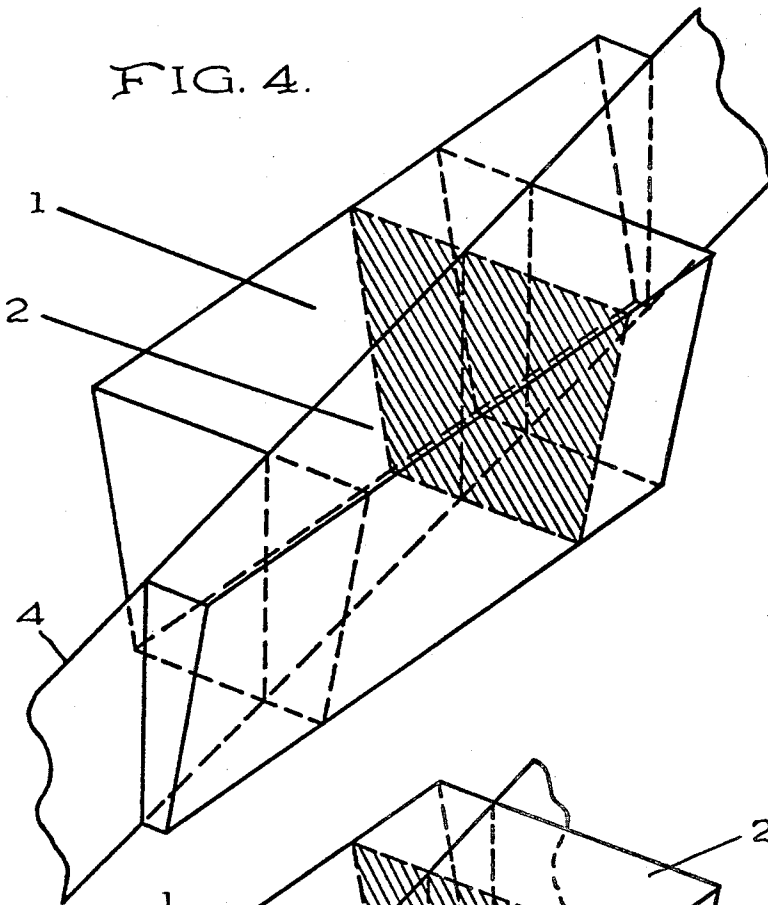
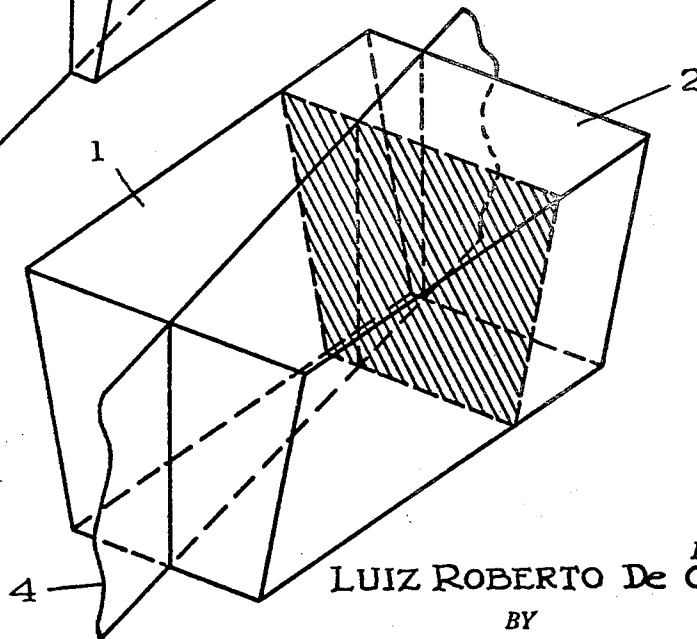


FIG. 5.



INVENTOR.
LUIZ ROBERTO De OLIVEIRA

BY

Emory L. Groff Jr.
ATTORNEY

Aug. 13, 1968

L. R. DE OLIVEIRA

3,396,504

ADJUSTABLE KEYSTONE ASSEMBLY OF MOLDED REFRACTORY MATERIAL
FOR ARCHES, WALLS AND THE LIKE

Filed April 11, 1966

3 Sheets-Sheet 3

FIG. 6.

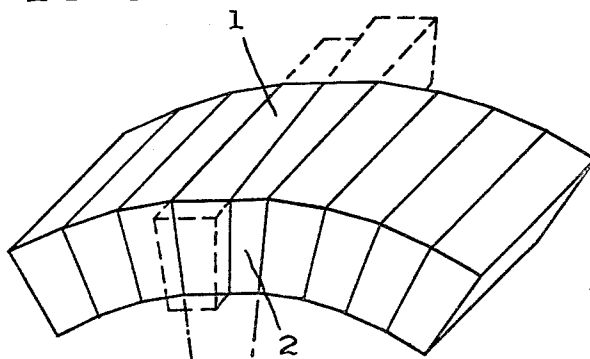


FIG. 7.

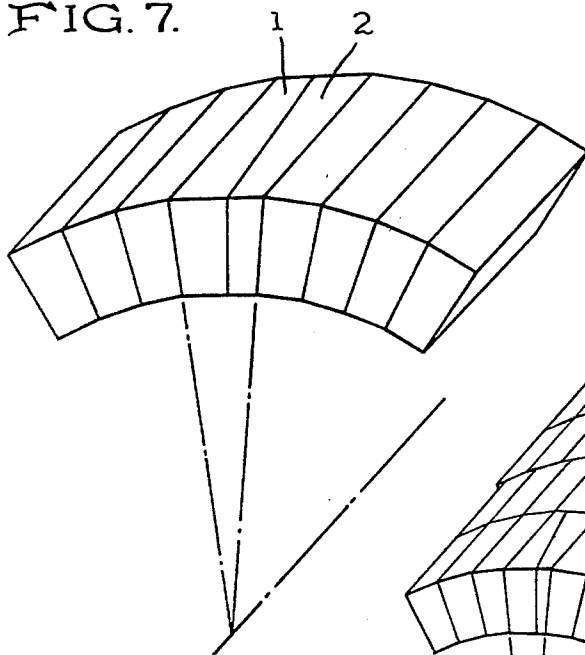
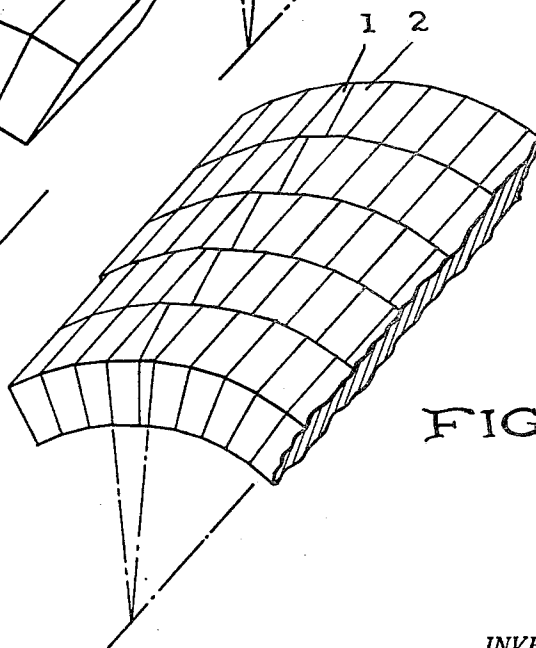


FIG. 8.

INVENTOR.
LUIZ ROBERTO DeOLIVEIRA

BY

Emory G. Groff
ATTORNEY

1

3,396,504

ADJUSTABLE KEYSTONE ASSEMBLY OF MOLDED REFRACTORY MATERIAL FOR ARCHES, WALLS AND THE LIKE

Luiz Roberto De Oliveira, Belo Horizonte, Minas Gerais, Brazil, assignor to Magnesita S.A., Contagem, Minas Gerais, Brazil, a corporation of Brazil

Filed Apr. 11, 1966, Ser. No. 541,603

Claims priority, application Brazil, Sept. 29, 1965,

173,585

3 Claims. (Cl. 52—575)

ABSTRACT OF THE DISCLOSURE

A two piece adjustable keystone for closing the final opening in a course of blocks forming an arch. Each of the pieces are of trapezoidal shape in cross section and have a wide end, a narrow end and a vertical side face. When the blocks are arranged with their vertical side faces abutting each other and the wide end of one block adjacent the narrow end of the other block, the blocks may be slid relative to each other to provide a keystone which can be adjustably fitted to openings of various widths.

In the construction of arches, arcuate walls, ceilings and the like, with premolded standard bricks or blocks, ordinarily the last block to be set in place must have dimensions different from the standard blocks. These last blocks are commonly referred to as keystones. Generally, a different shaped keystone is required for particular applications depending upon the geometrical contour of the arch or wall being constructed and/or the width of the opening to be closed.

At present, in the majority of cases, the keystones are made from standard appropriately shaped and cut blocks. In certain other cases, the necessity of providing a block of special design is eliminated by controlling the thickness of the mortar joints between the standard shaped blocks which requires a certain degree of skill and care. These two methods almost invariably weaken the construction. In other cases, special blocks having variable thicknesses are used, from which those adaptable for each particular case are selected. This method is also, as a rule, inconvenient and inefficient.

The object of the present invention is to overcome the aforesaid disadvantages by providing a more flexible, cheaper, stronger and more efficient finished arch or wall by use of a novel adjustable keystone block assembly which can be readily adapted to fit openings of varying widths.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the invention consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

FIGURE 1 is a perspective view of a block showing diagrammatically the plane on which the block is cut longitudinally to form a typical pair of blocks comprising my invention;

FIGURE 2 shows a pair of blocks after cutting and slid one relative to the other;

2

FIGURE 3 shows the blocks of FIGURE 2 assembled with their projecting end portions severed;

FIGURE 4 shows a pair of blocks slid one relative to the other in a direction opposite to the direction of sliding illustrated in FIGURE 2;

FIGURE 5 shows the blocks of FIGURE 4 assembled with their projecting end portions severed;

FIGURE 6 shows a pair of blocks in place in an arch with their projecting ends shown in dotted lines;

FIGURES 7 and 8 show a single arch and series of arches respectively with the keystone blocks of my invention in assembled position.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

The block comprising my invention is essentially made up of two sections 1 and 2 as shown in FIG. 1. These sections are obtained by the cutting of a prism shaped block 3 having a trapezoidal cross-section, on the plane diagrammatically indicated at 4. The plane on which the cutting or sectioning is made is not parallel to the edges corresponding to the vertices of the trapezoid but is perpendicular to the upper and lower faces of the prism corresponding to the bases of the trapezoid such that the two bases of the prism are intersected throughout their height. Preferably, but not necessarily, the two resulting pieces 1 and 2 should be of equal dimensions.

In order to fit the blocks to the particular arch or wall opening to be closed, the two pieces 1 and 2 are slid one relative to the other along the plane 4 in FIG. 2, and the two projecting extreme ends 5 and 6 in FIG. 2 which are not superimposed are cut off by appropriate means, thus forming a new straight prism as shown in FIG. 3, having the bases of its transverse section 7 in FIG. 3 of less width than the bases of the original prism 3 shown in FIG. 1.

FIGS. 4 and 5 further illustrate the formation of a keystone assembly whose bases in this instance are of greater width than the bases of the original prism shown in FIG. 1. As indicated in FIG. 4, the pieces 1 and 2 are slid one relative to the other opposite to the direction in which they were slid to form the keystone assembly shown in FIG. 3 and the projecting end portions are appropriately severed.

The projecting end portions of the blocks may be cut off in situ after they are fitted in place as in the construction of a single arch. Alternatively, they may be fitted, marked and removed, then cut to proper length and replaced in position in the opening.

It will be apparent from the foregoing that the keystone assembly of my invention provides an easily adaptable means of closing the final opening in an arch or the like since openings of varying widths frequently encountered in such structures can be fitted accurately by simply sliding one piece of the keystone relative to the other as described above to obtain a tight fit and the ends can be severed to conform to the length of the other blocks in the arch.

I claim:

1. An adjustable keystone assembly for closing the final opening in an arch comprising a pair of trapezoidal shaped blocks each of said blocks tapered from end to end and having opposed complementary side faces which are in abutting relationship when the blocks are as-

3

sembled, each of said blocks also having a wide end and a narrow end, the wide end of one block disposed adjacent the narrow end of the other block when assembled, whereby upon sliding said blocks longitudinally one relative to the other along their abutting complementary side faces their combined width may be varied to close the final opening in said arch.

2. An adjustable keystone assembly according to claim 1 wherein the opposed complementary side faces are vertical throughout the height of the respective blocks.

3. An adjustable keystone assembly according to claim 2 wherein the overall dimensions of each block are equal.

4

References Cited

UNITED STATES PATENTS

2,360,285	10/1944	Sherman	52—86
3,220,367	11/1965	Stein	52—89
3,252,436	5/1966	Hall	52—89

FOREIGN PATENTS

399,658	7/1924	Germany.
---------	--------	----------

10 FRANK L. ABBOTT, *Primary Examiner*.

JAMES L. RIDGILL, *Assistant Examiner*.