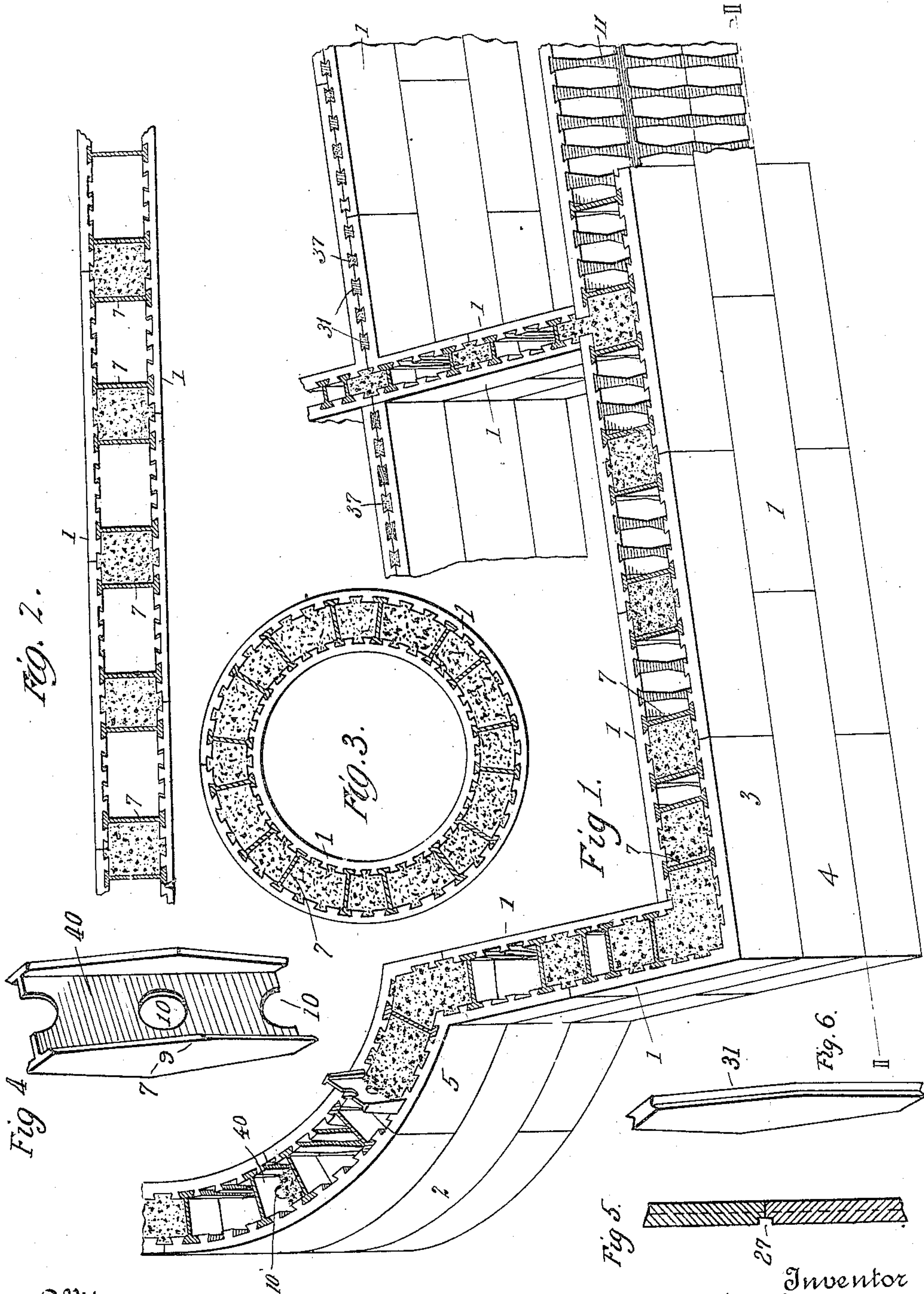


W. H. O'BEIRNE.
INTERLOCKING CONCRETE PANELS.
APPLICATION FILED MAR. 12, 1910.

Patented May 30, 1911.
2 SHEETS—SHEET 1.

994,027.



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Fig. 7.

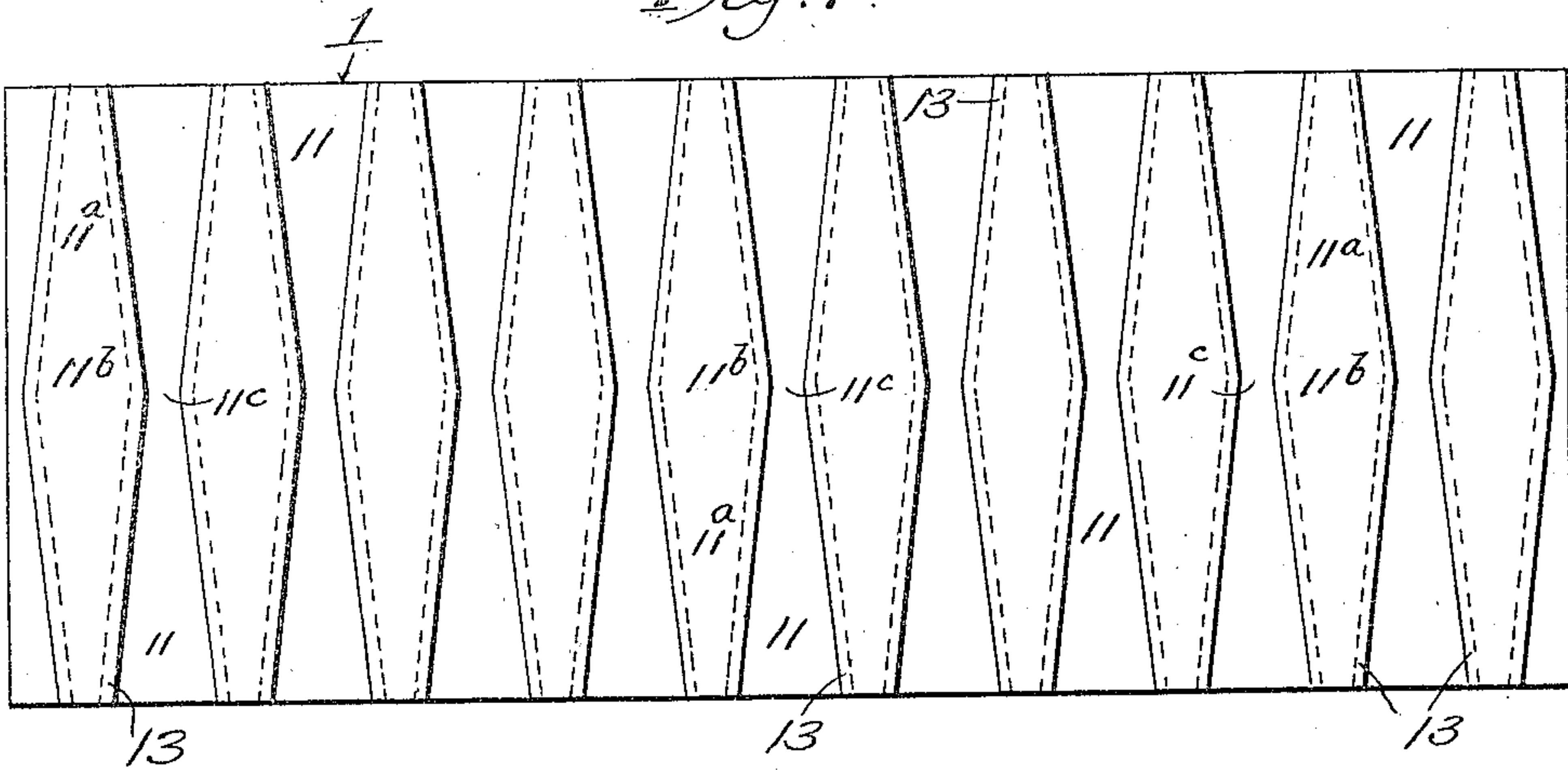


Fig. 8.

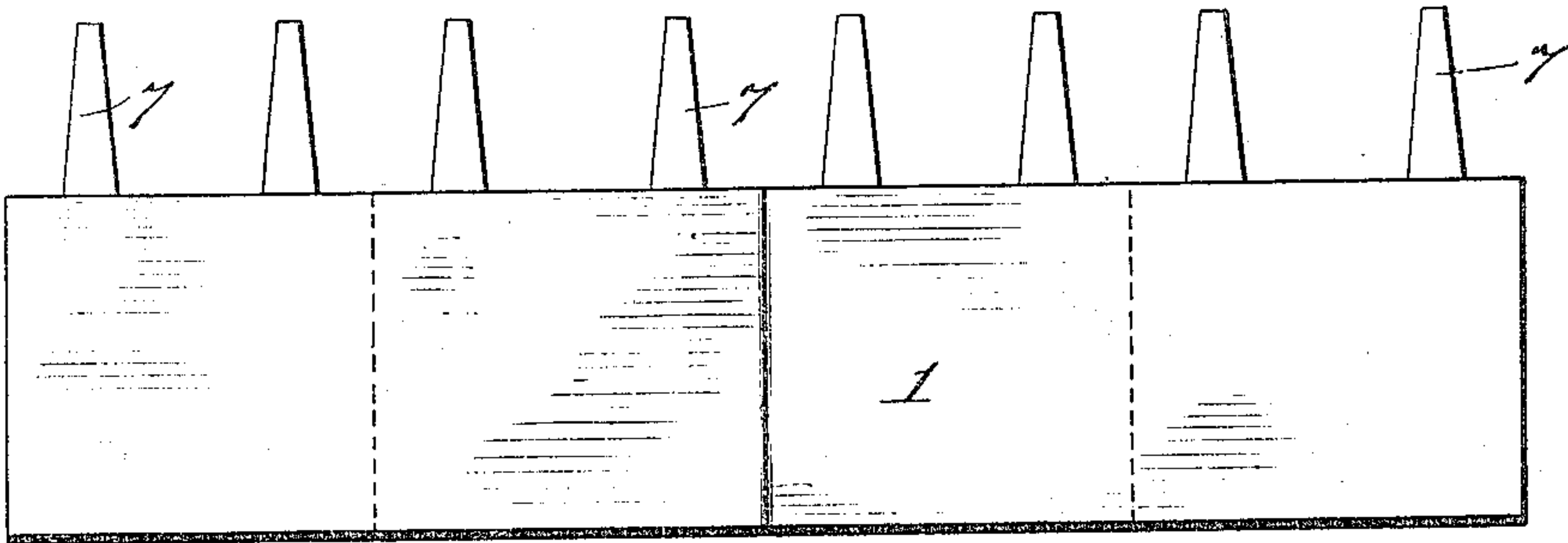
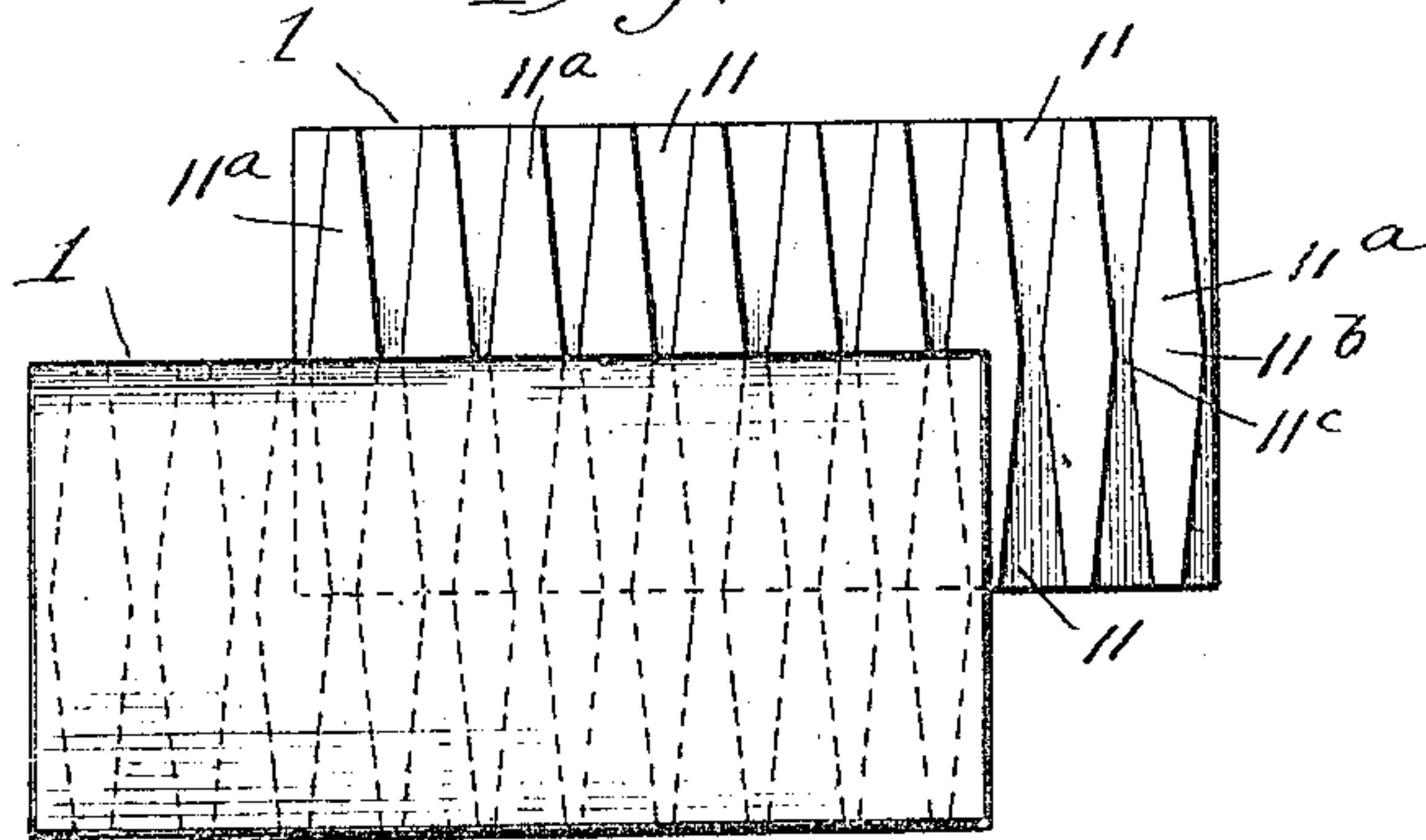


Fig. 9.



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UNITED STATES PATENT OFFICE.

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INTERLOCKING CONCRETE PANELS.

994,027.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed March 12, 1910. Serial No. 548,826.

To all whom it may concern:

Be it known that I, WILLIAM H. O'BEIRNE, a citizen of the United States, residing at Pauls Valley, in the county of Garvin and State of Oklahoma, have invented certain new and useful Improvements in Interlocking Concrete Panels, of which the following is a full, clear, and exact description.

This invention relates to improvements in the construction of concrete walls and the novel elements of which the wall is composed as hereinafter set forth and claimed.

The novel construction of the panels of my invention enables the construction of a wall very quickly, accurately and strongly by workmen of no especial skill. It enables the construction of walls the faces of which are composed of such panels in close interlocked relation, the flanges of superposed panels engaging and fitting the grooves of the subadjacent panels. It enables the construction of walls with the outstanding flanges of the panels in facial contact with separated spaces which may be filled with concrete. It enables the construction of walls wherein the two faces of the walls are separated from each other or out of contact and bridged by locking keys providing an intervening space which may be filled with concrete, the keys constituting division partitions providing separate spaces, all of which may be filled with concrete, or any number thereof, according to the election of the builder and the requirements of the strength of the wall.

Referring to the accompanying drawings illustrating my improved panels in several manners of utilization thereof in the construction of walls,—Figure 1 is a sectional perspective illustrating three characters of wall which may be constructed with the panels of my invention. Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section of a reservoir wall constructed in accordance with my invention. Fig. 4 is a perspective view of a key for locking together opposed panels in a wall construction and having a web for spacing the inner and outer faces apart for the introduction of a filling of concrete therebetween. Fig. 5 is a broken sectional view of two panels in superposed relation, the edges being fashioned to provide a pointing groove. Fig. 6 is a perspective view of a modified form of locking key and spacer. Fig. 7 is an elevation or face view of the

panel. Fig. 8 is a side elevation showing the locking key and spacer elements of the wall projecting above the concrete panels to receive superposed or abutting panels. Fig. 9 is a detail of two of the panels interlocked together without intervening locking spacer elements, where it is desired to form a wall composed of the panels in contact without intervening spaces to be filled with concrete.

Referring particularly to Fig. 7 of the drawing, which illustrates one of my improved panels, the reference numeral 1 designates the panel which is provided with a series of outstanding facial flanges 11^a which are undercut, as illustrated by the dotted line 13, and which diverge from the opposite edges of the panel to relatively wide waists 11^b at the middle line of the panel. Intervening the several flanges 11^a are grooves 11^c having relatively wide mouths opening at opposite edges of the panel and converging to constricted waists 11^c at the middle line of the panel. The area of the constricted waists 11^c of each groove is substantially equal to the area of each end of each of the flanges 11^a, so that when the outstanding facial flanges of one panel are interlocked with those of another like panel, as shown in Fig. 9 of the drawing, the flanges of each panel enter the grooves of the other only to the middle line of each panel, leaving one-half the length of the flanges exposed for connection of additional abutting panels, whereby a structure composed solely of said panels facing each other and interlocked with each other, as shown in Fig. 9, may be constructed. The proportions of the flanges and intervening grooves are important, because to successfully construct a wall in the manner just stated, it is essential that one-half the length of the flanges be exposed for connection of abutting panels so that the flanges of the latter accurately interlock, leaving no looseness. And such looseness would allow relative movement between the panels, and, therefore, prevent the construction of a successful wall.

In constructing a wall composed of panels the facial flanges of which are interlocked and the panels in contact, as shown in Fig. 9, the panels will be so arranged, as illustrated in said figure, that the joints will lap in a horizontal direction, and thus each panel will be connected to and locked to adjacent opposed panels, and the wall can be thus built without locking or tying the pan-

els together otherwise than by interlocking the facial flanges thereof.

The panels may be utilized in the construction of a wall with the flanges 11^a of the opposed panels in contact, and spaces provided which may be filled by concrete. When that is desired instead of having the flanges 11^a of one panel interlock directly with those of another (as shown in Fig. 9) the narrow locking keys 31 shown in Fig. 6 may be employed to engage the grooves 11 of the opposed panels, as shown by the narrowest wall illustrated in Fig. 1. These elements 31 are of the same form and proportions as the facial flanges 11^a, that is to say, they diverge from their ends to a relatively wide waist, and the ends thereof are of substantially the same area as the constricted waists 11^c of the grooves 11, so that they will enter said grooves only to the waist-line thereof, and thus leave one-half the length of the keys 31 exposed to engage abutting panels, just as shown in Fig. 9 with respect to the exposed length of the flanges 11^a. The locking elements 31 have flanges which engage in the grooves of opposed panels, as shown in Fig. 1, and these elements may be disposed in alternate grooves, leaving the intermediate ones to be filled with concrete as illustrated by 37 in Fig. 1.

Where it is desired that the panels which constitute the inner and outer faces of the wall shall be separated a distance from each other to provide greater spaces to be filled with concrete, where a particularly strong wall is desired, locking keys 7 having flanges 9 beveled, as at 8, and diverging from their ends to the waist-line thereof to engage the walls of the groove 11 are used. These keys 7 have spacer webs 40 which span the space between the inner and outer faces of the wall as shown in Fig. 1. The proportion of the flanges 9 of this element are the same as with respect to the flanges of the element 31, and the facial flanges 11^a of the panels, that is to say, the ends thereof are of substantially the same area as the constricted waists of the grooves 11, and the diverging edges thereof fit against the walls of the grooves, so that when utilized to lock together the opposed panels of the wall structure, said flanges enter only to the middle or waist-line of the grooves of the panels, leaving one-half the length of the elements 7 exposed for the connection of abutting panels, as clearly illustrated in Fig. 8.

In Fig. 1 is illustrated a wall in which the face panels are interlocked together and separated from each other by the elements 7. A space is thus left between the panels constituting the inner and outer faces of the wall which may be filled with concrete 29, Fig. 1, and it is obvious, as shown in said figure, that the concrete may be filled in at desired intervals only, or the entire inter-

vening space may be filled with concrete, as shown in Fig. 3, depending upon the strength of wall desired.

It is obvious that the contour of the panels may vary, depending upon the character of wall to be constructed. In Fig. 1 the panels 1 are straight throughout their length; the panels 2 convex; the panels 3 L-shaped, and the branches thereof of equal length; the panels 4 are also L-shaped, and the branches thereof of unequal length, and the panels 5 have a convex branch and a straight branch. In Fig. 3 is illustrated a reservoir wall constructed according to my invention in which the panels of the exterior face of the wall are convex and those of the interior face concave. Where the concrete is desired to fill the entire intervening space between the panels, the spacing webs 40 of the spacers 7 may be provided with perforations 10 so that the concrete in adjacent divisions may be connected together in a solid mass throughout the structure. These perforations also may be utilized for receiving strengthening wires for the filled in concrete or for receiving and supporting an electrical conduit. Where it is desired the edges of the panels may be fashioned as shown in Fig. 6 to provide pointing grooves 27 between the panels.

When walls are constructed employing either the keys 31 or the keys 7 the panels constituting the faces of the wall are arranged in lapped joint relation as shown in Figs. 1 and 2, so that the facing panels are locked together in a horizontal direction.

What I claim is:—

1. As an article of manufacture, a concrete panel provided with a series of outstanding facial flanges having undercut edges diverging from the opposite edges of the panel to relatively wide waists at the middle line of the panel and separated from each other by a plurality of grooves having relatively wide mouths opening at opposite edges of the panel and converging to constricted waists at the middle line of the panel, the area of the constricted waists of the grooves being substantially equal to the area of the end of the flanges so that the outstanding facial flanges of one panel may be interlocked with those of another like panel by entering the grooves of the latter only to the middle line of the panel so as to leave one-half the length of the flanges exposed for connection of additional flanges, whereby a structure composed of such flanges facing each other may be constructed with lapped joints.

2. In a concrete wall structure the combination with opposed concrete panels provided with outstanding facial flanges diverging from the opposite edges of the panel to the middle line of the panel and separated from each other by a plurality of grooves

having relatively wide mouths opening at opposite edges of the panel and converging to the middle line of the panel, of a wall key comprising a central web, laterally disposed flanges thereon, said flanges diverging from the ends of the key to the middle line thereof and adapted to engage the grooves in the concrete panels, substantially as described.

10 3. In a concrete wall structure the combination with opposed concrete panels provided with outstanding facial flanges diverging from the opposite edges of the panel to the middle line of the panel and separated
15 from each other by a plurality of grooves

having relatively wide mouths opening at opposite edges of the panel and converging to the middle line of the panel, of a wall key comprising a central apertured web, laterally disposed flanges thereon, said flanges 20 diverging from the ends of the key to the middle line thereof and adapted to engage the grooves in the concrete panels, substantially as described.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

WILLIAM H. O'BEIRNE.

Witnesses:

H. B. JONES,

E. C. HENDERSON.