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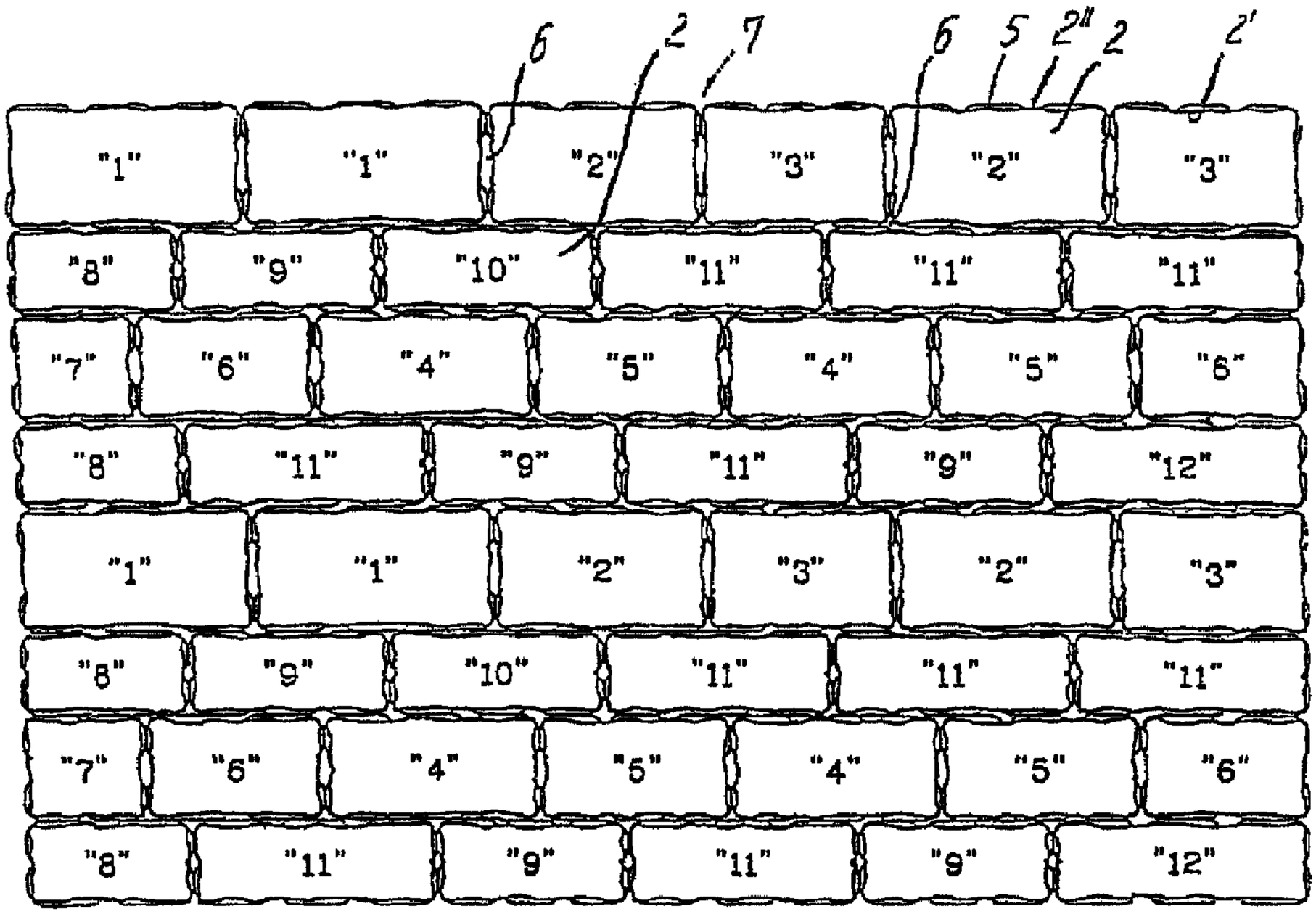
(54) Titre : ENSEMBLE DE CONSTRUCTION CONSTITUE DE PAVES DE PIERRE EN BETON
(54) Title: CONSTRUCTION KIT MADE OF CONCRETE PAVING STONES



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(57) Abrégé/Abstract:
The invention relates to a construction kit made of concrete paving stones comprising substantially prismatic stone bodies of a uniform height and upright lateral surfaces. A plurality of stone paving stones (2) arranged in rows and having the same width in

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(57) Abrégé(suite)/Abstract(continued):
addition to the same or different lengths can be placed manually or placed by means of a machine with continuous or offset joints in said joint areas. A plurality of rows of paving stones that are arranged next to each other in a parallel position is used to form a rectangular or square packet that can be placed using a machine. The paving stones (2) have side surfaces (4) which have head pieces (2') that are defined by a wavy line along part of their height and base pieces (2'') in sections, comprising domed areas (5) or projections jutting out laterally in relation to the head pieces (2') extending along another part of their height. When the packets are assembled for placement in the vicinity of the end stones that make up a row of paving stones, they form a line of continuous joints or provide substantially winding-shaped joints (7) if so desired by replacing different sized end stones from adjacent packets that have been moved towards each other.

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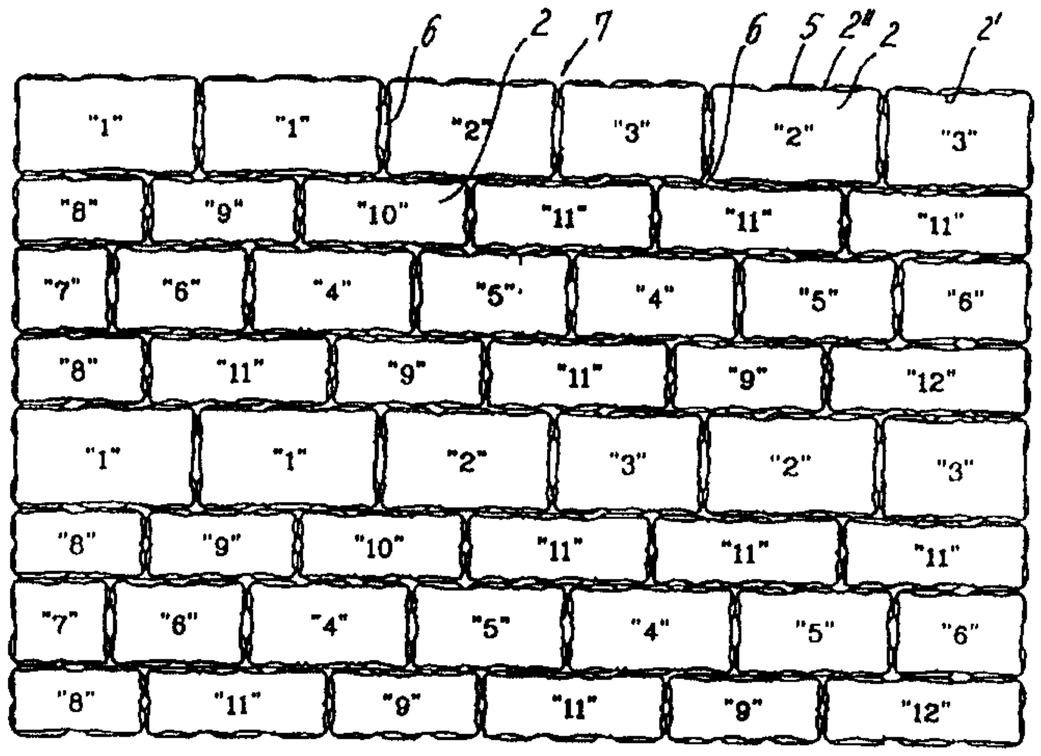
(54) Title: CONSTRUCTION KIT MADE OF CONCRETE PAVING STONES

(54) Bezeichnung: BAUSATZ MIT PFLASTERSTEINEN AUS BETONWERKSTOFF

(57) Abstract

The invention relates to a construction kit made of concrete paving stones comprising substantially prismatic stone bodies of a uniform height and upright lateral surfaces. A plurality of stone paving stones (2) arranged in rows and having the same width in addition to the same or different lengths can be placed manually or placed by means of a machine with continuous or offset joints in said joint areas. A plurality of rows of paving stones that are arranged next to each other in a parallel position is used to form a rectangular or square packet that can be placed using a machine. The paving stones (2) have side surfaces (4) which have head pieces (2') that are defined by a wavy line along part of their height and base pieces (2'') in sections, comprising domed areas (5) or projections jutting out laterally in relation to the head pieces (2') extending along another part of their height. When the packets are assembled for placement in the vicinity of the end stones that make up a row of paving stones, they form a line of continuous joints or provide substantially winding–shaped joints (7) if so desired by replacing different sized end stones from adjacent packets that have been moved towards each other.



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CONSTRUCTION KIT MADE OF CONCRETE PAVING STONES

The invention relates to a construction kit with paving stones made of concrete material, with substantially prismatic stone bodies having the same height and upright side surfaces.

It is known that when paving stones that are assembled in laying packets are laid by means of machines, through-extending joints form in the laid composite of stones in the joint areas of the placed packets. Such joints have an unfavorable effect on the visual appearance of the placed composite of stones.

The problem of the invention is to provide a construction kit of the type specified above which can be assembled with other construction kits to form laid composites with the help of machines, and which permits forming simple continuous or offset joints selectively between adjacent construction kits.

According to the present invention, there is provided a paving formation comprising a plurality of assemblies of concrete paving stones arranged directly next to one another,

- where each paving assembly is formed from a number of paving stones arranged in a plurality of parallel rows and having, for each row, an identical width and identical or different lengths,
- where the rows of each paving assembly have an identical length, resulting in rectangular or square, machine-grippable paving assemblies of always identical width and height,
- where the adjacent paving assemblies in the paving formation form linearly continuous joints in the region of the end stones of the paving stone rows or by exchanging row end stones of different

length but identical width which belong to adjacent paving assemblies and have been brought close to one another, it is possible to form essentially meander-like joints,

- where the paving stones are designed as essentially prismatic stone bodies with identical heights and with vertical side faces,
- where the side faces of the paving stones have, over parts of their height, head parts which are bounded in particular in the form of a wavy line, and the side faces have, over portions thereof, foot parts extending over a further part of their height and provided with convexities or protrusions which project laterally transversely beyond the head parts,

characterized in that

- the paving formation comprises a first and a second paving assembly,
- where the first paving assembly comprises paving stone rows which have paving stones of at least two different widths,
- where the second paving assembly comprises paving stone rows which have paving stones of at least two further different widths, and
- where the two widths of the paving stones of the first paving assembly and the two widths of the paving stones of the second paving assembly differ from one another.

Preferably, there is also provided a construction set of paving stones forming rows wherein the paving stones are made of concrete material, and wherein the paving stones form a mechanically engageable laying set, wherein each of the paving stones comprises:

a) a bottom surface;

b) a plurality of circumferential surfaces comprising:

i) a base part having a plurality of projections formed as irregular dome like projections disposed adjacent to each other with a spacing in between; and

ii) a head part disposed adjacent to said base part and having a waveline shaped outer surface wherein said circumferential surfaces are coupled to said bottom surface; and

c) a top surface comprising:

i) an outwardly extending projection; and

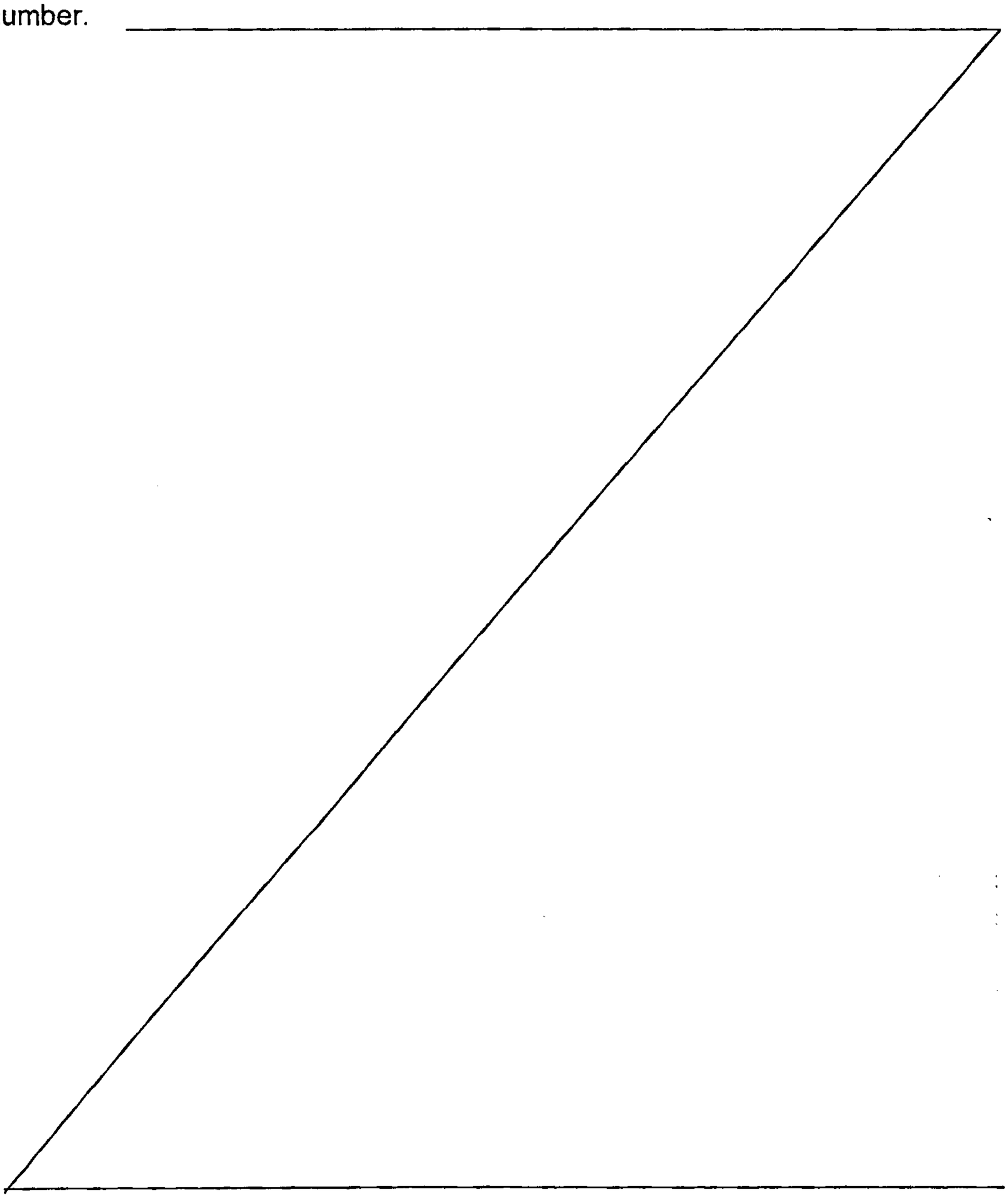
ii) at least one flat central upper region surrounded by said outwardly extending projection wherein said at least one flat central upper region has an even surface allowing the paving stones to be positioned one on top of the other, wherein said top surface is coupled to said plurality of circumferential surfaces, and wherein when the paving stones are placed adjacent to each other in the construction set, said irregular dome like projections on said base part and said outwardly extending projection on said top surface are arranged in corner areas of adjacent paving stones so as to form passage openings allowing water to drain through said corner areas of said adjacent paving stones.

In a preferred embodiment of the construction kit, provision is made that the head and/or base pieces of the paving stones are provided with broken or rounded corners and/or edges in order to exclude or minimize the risk of breakage in said regions, and to assure that walking on the laid composite is possible without any obstructions.

It was found that it is preferred, furthermore, if the top surfaces defining the limitation of the head pieces, which are the treads of the paving stones, are arched outwardly in a curved way. In this way, the paving stones impart the appearance of natural stones, and the laid composite has the visual appearance of some type of natural stone paving. The curves of paving stones with large surface areas, viewed from the top, are usefully kept flatter, and the curves of paving stones having a small surface area viewed from the top, are usefully kept flatter, and the curves of paving stones having a small surface area viewed from the top, are usefully provided with a more pronounced curvature.

Preferably, provision is made that the outward dome-like projection or attachments arranged on the base pieces of the stone bodies are arranged on the side surfaces of the base pieces with spacings between each other, and that the dome-like projections or attachments form support elements for adjacent

stone bodies, whereas the outward dome-like projections or attachments, jointly with outward dome-lie projections or attachments of adjacent stone bodies create intermediate spaces in the joint areas that serve as water passage openings. The sizes of the cross sections of the water passage openings are substantially determined in this connection by the length and width of the domed areas or attachments, as well as by their spacings from each other, and by their number.



The invention is illustrated with the help of exemplified embodiments shown in the drawings, in which:

FIG. 1 is a top view of a construction kit,

FIG. 2 is a top view of a paving stone of a construction kit according to one embodiment,

FIG. 3 is a part section according to line III-III in FIG. 2,

FIG. 4 is a top view of a paving stone of a modified embodiment,

FIG. 5 is a section according to line V-V in FIG. 4,

FIG. 6 is a top view of another paving stone,

FIG. 7 is a construction kit according to FIG. 1 viewed from the bottom (core concrete side), schematic view,

FIG. 8 is a bottom view of a construction kit of another embodiment, (core concrete side), schematic view,

FIG. 9 is a schematic representation of a number of construction kits in a laid composite,

FIG. 10 is a schematic representation of a number of construction kits a modified laid composite,

FIG. 11 is a schematic top view of a number of construction kits according to FIG. 1 in a laid composite, with replaced row end stones,

FIG. 12 is a laid composite according to FIG. 11 with row end stones marked for replacement,

FIG. 13 is a schematic top view of a number of construction kits according to FIG. 8 in a laid composite,

FIG. 14 is a laid composite according to FIG. 13 with row end stones marked for replacement,

Fig. 15 is a schematic top view of a number of construction kits according to FIGS. 7 and 8 in the laid composite,

FIG. 16 is a laid composite according to FIG. 15 with row end stones marked for replacement,

FIG. 17 is a schematic top view showing by way of example a laying composite with construction kits, and

FIG. 18 is a top view of a partial piece of a construction kit.

The construction kit 1 shown in FIG. 1 is formed by a number of paving stones 2 made of concrete material. FIGS. 2 and 3 show that the paving stones 2 are designed with a prismatic shape. Said paving stones have a head piece 2' with a waveline-shaped surface 3, and a base piece 2", which is provided in the surface 4 with a number of dome-like projections 5 or attachments. The dome-like projections 5 are formed on the base piece 2" over parts of the length of the circumferential surface with a spacing from each other. The paving stones 2 are arranged in rows for forming the construction kit 1, as shown in FIG. 1 and FIGS. 7 and 8, whereby the paving stones 2 of each row have the same width, with identical or different length. The lengths of the rows of paving stones of each construction kit 1 are overall designed according to a pattern which, in the exemplified embodiment according to FIGS. 7 and 8, is selected to measure, for example 1200 mm x 760 mm. It is understood that the raster measure of the construction kits can be selected in any other desired size. The construction kits 1 so formed as laying packets can be safely seized and laid with the help of machines.

FIGS. 7 and 8 show the bottom views of the paving stones 2 referred to as the core concrete sides, which are assembled in rows of any desired length, but with identical widths to form a laying packet. The numerals 12 connected by the hyphens 11 represent measurement data in millimeters. The numerals in quotation marks represent types of stones. In FIG. 7, the paving stones all having the same low width but different lengths are assembled to form a construction kit, and in FIG. 8 the paving stones all having the same large width and different lengths are assembled to form a construction kit.

The dome-like projections 5 on the surfaces 4 of the base pieces 2" serve in the construction kit 1, the latter being assembled to form a laying packet, for mutually supporting adjacent paving stones 2, or rows of paving stones. By dimensioning the dome-like projections 5 accordingly, the latter permit the

formation of passage openings 6 (FIG. 18) for water within the zones of the joints 7, via which water can drain off into the underground.

In FIG. 9, the construction kits 1 conforming to the pattern in FIG. 7 are combined with construction kits 1 according to FIG. 8 to form a laying composite, whereby the construction kits 1 in the laid composite show lines of continuous joints 7 in the transverse and longitudinal zones of adjacent construction kits 1. In FIG. 10, a modified laying composite is formed by combining construction kits of FIGS. 7 and 8. In connection with said laying composite too, provision is made for through-extending joints in the transverse and longitudinal regions of adjacent construction kits. The construction kits 1 of the

center zone of the laying composite in FIG. 10 correspond with the construction kit 1 of FIG. 7, and the two lateral sections of the laying composite correspond with the construction kits 1 of FIG. 8.

FIGS. 11 and 12 represent a laying composite formed by the construction kits 1 of FIG. 7. In this connection, the construction kits 1 each are picked up by means of a machine in the form of a rectangular laying composite and then laid, and the laying pattern according to FIG. 11 is then obtained by subsequently replacing the row end stones 2 (shown by dashed lines in FIG. 12). Instead of the through-extending continuous joints 7, meander-shaped joints 7 are obtainable within the rows of the paving stones by replacing the dashed row end stones. A laying pattern that is continuously closed is obtained in this way.

The same considerations apply to the laying patterns of FIGS. 13 and 14. In the present laid composite, construction kits according to FIG. 8 are employed, whereby a laying pattern of FIG. 14, with meander-like joints 7, is again obtainable by exchanging paving stones at the ends of the rows of adjacent construction kits 1 (shown in the exemplified embodiment by dashed lines), said laying pattern of FIG. 14 being closed within itself. It is not possible for the viewer to recognize

that the laid composite is created with a number of construction kits laid by a machine.

In the exemplified embodiment according to FIGS. 15 and 16, constructions kits of FIG. 7 and FIG. 8 are employed next to each other. The joints 7 are provided with a meander-like shape by replacing end stones of the rows (shown dashed in FIG. 16).

Deviating from the above, FIGS. 4 and 5 show a paving stone 2 for a construction kit 1 which, instead of the head pieces 2' defined by a wavy line, has the head pieces 2' with the rectangular shape, whereas the base pieces 2", in the laid condition, have the attachments for creating water passage openings 6 in the surfaces 4.

It was found to be advantageous if the paving stones 2 have the outwardly extending projections 13 within the zone of their top sides 2"', as it is shown particularly in FIGS. 4 and 5. Said outwardly extending projections 13 have a radius of about 1443 mm. Provision is made in this connection that viewed from the top, paving stones 2 with large surface areas have the relatively flat outwardly extending projections 13, whereas the paving stones 2 with small cross section sizes have the outwardly extending projections 13 with a strong curvature.

FIG. 6 shows another paving stone 2 by a top view. Said paving stone is provided with the side surfaces 14 with parallel faces, said surfaces supporting rib-like attachments 5 that are spaced from each other. Said attachments 5 serve as spacer means versus adjacent paving stones and for forming water passage openings within the areas of the joints. In the present embodiment, too, the top side of the paving stone 2 has an outwardly pointing projection 13.

FIG. 17 shows a laying pattern in connection with which a laying pattern that is closed within itself can be obtained without requiring any replacement of end

stones of the rows by associating the construction kits 1 with each other in a suitable way.

Furthermore, provision is made for joining the head pieces 2' and the base pieces 2" of the paving stones sections 15 with slanted surfaces acting as third side surface limitations, as shown in FIGS. 3 and 18.

WHAT IS CLAIMED IS:

1. Paving formation comprising a plurality of assemblies of concrete paving stones (2) arranged directly next to one another,

- where each paving assembly is formed from a number of paving stones (2) arranged in a plurality of parallel rows and having, for each row, an identical width and identical or different lengths,
- where the rows of each paving assembly have an identical length, resulting in rectangular or square, machine-grippable paving assemblies of always identical width and height,
- where the adjacent paving assemblies in the paving formation form linearly continuous joints in the region of the end stones of the paving stone rows or by exchanging row end stones of different length but identical width which belong to adjacent paving assemblies and have been brought close to one another, it is possible to form essentially meander-like joints (7),
- where the paving stones (2) are designed as essentially prismatic stone bodies with identical heights and with vertical side faces (4),
- where the side faces (4) of the paving stones (2) have, over parts of their height, head parts (2') which are bounded in particular in the form of a wavy line, and the side faces (4) have, over portions thereof, foot parts (2") extending over a further part of their height and provided with convexities (5) or protrusions which project laterally transversely beyond the head parts (2),

characterized in that

- the paving formation comprises a first and a second paving assembly,
- where the first paving assembly comprises paving stone rows which have paving stones (2) of at least two different widths,
- where the second paving assembly comprises paving stone rows which have paving stones (2) of at least two further different widths, and

- where the two widths of the paving stones (2) of the first paving assembly and the two widths of the paving stones (2) of the second paving assembly differ from one another.

2. Paving formation according to Claim 1, characterized in that the head parts (2') and/or foot parts (2") of the paving stones (2) have broken or rounded corners and/or edges.

3. Paving formation according to Claims 1 and 2, characterized in that an upper bounding surface of the head parts (2') of the paving stones (2) is curved outwards to form an arc.

4. Paving formation according to Claim 1, characterized in that the convexities (5) or protrusions arranged on the foot parts (2") of the paving stones (2) are arranged at distances from one another on the side faces of the foot parts (2"), in that the convexities (5) or protrusions form supporting bodies for adjacently arranged paving stones (2), and in that the convexities (5) or protrusions, together with convexities (5) or protrusions of adjacently arranged paving stones (2), give rise, in the joint regions, to interspaces which serve as water channel openings (6).

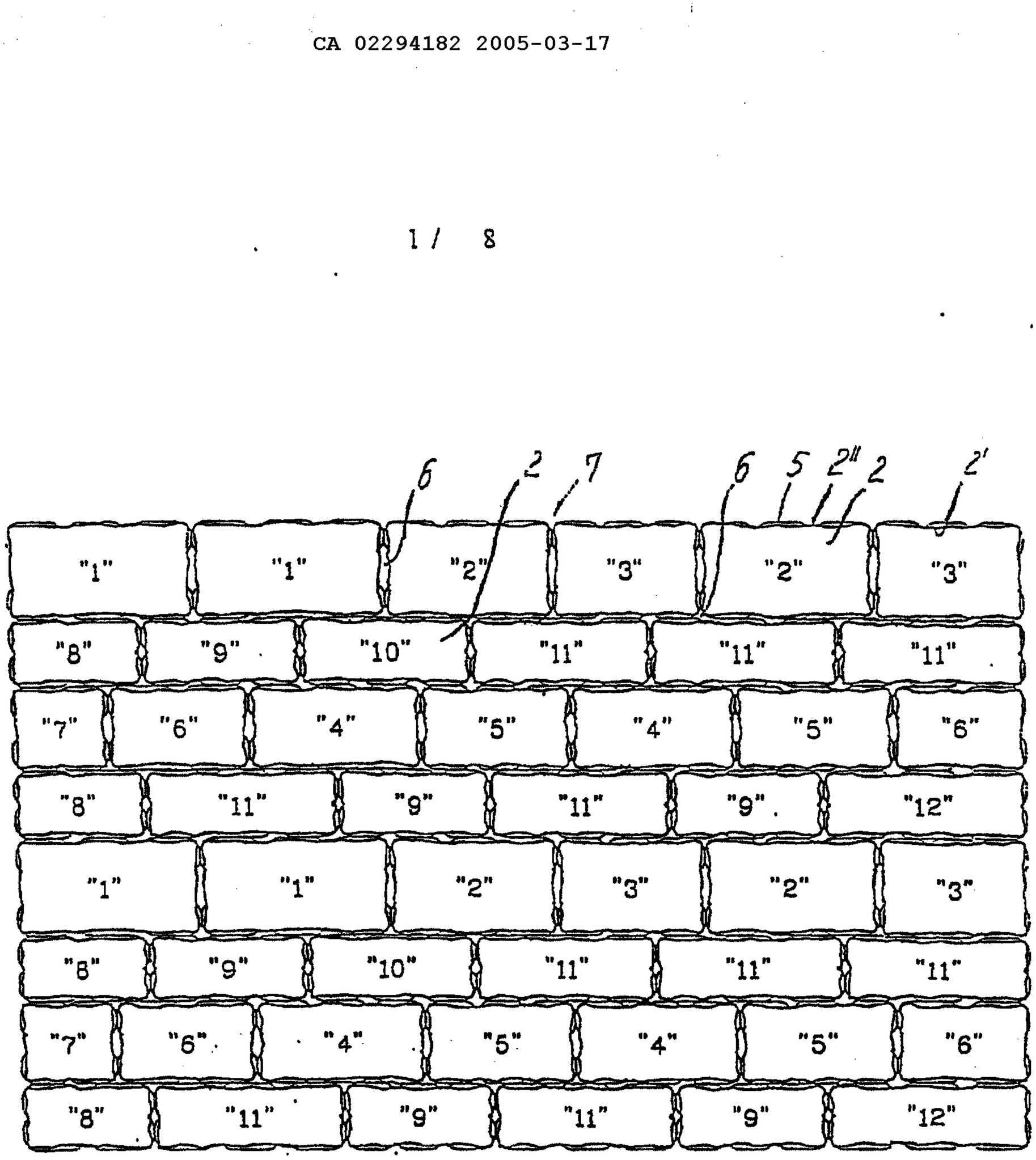

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Fig.1

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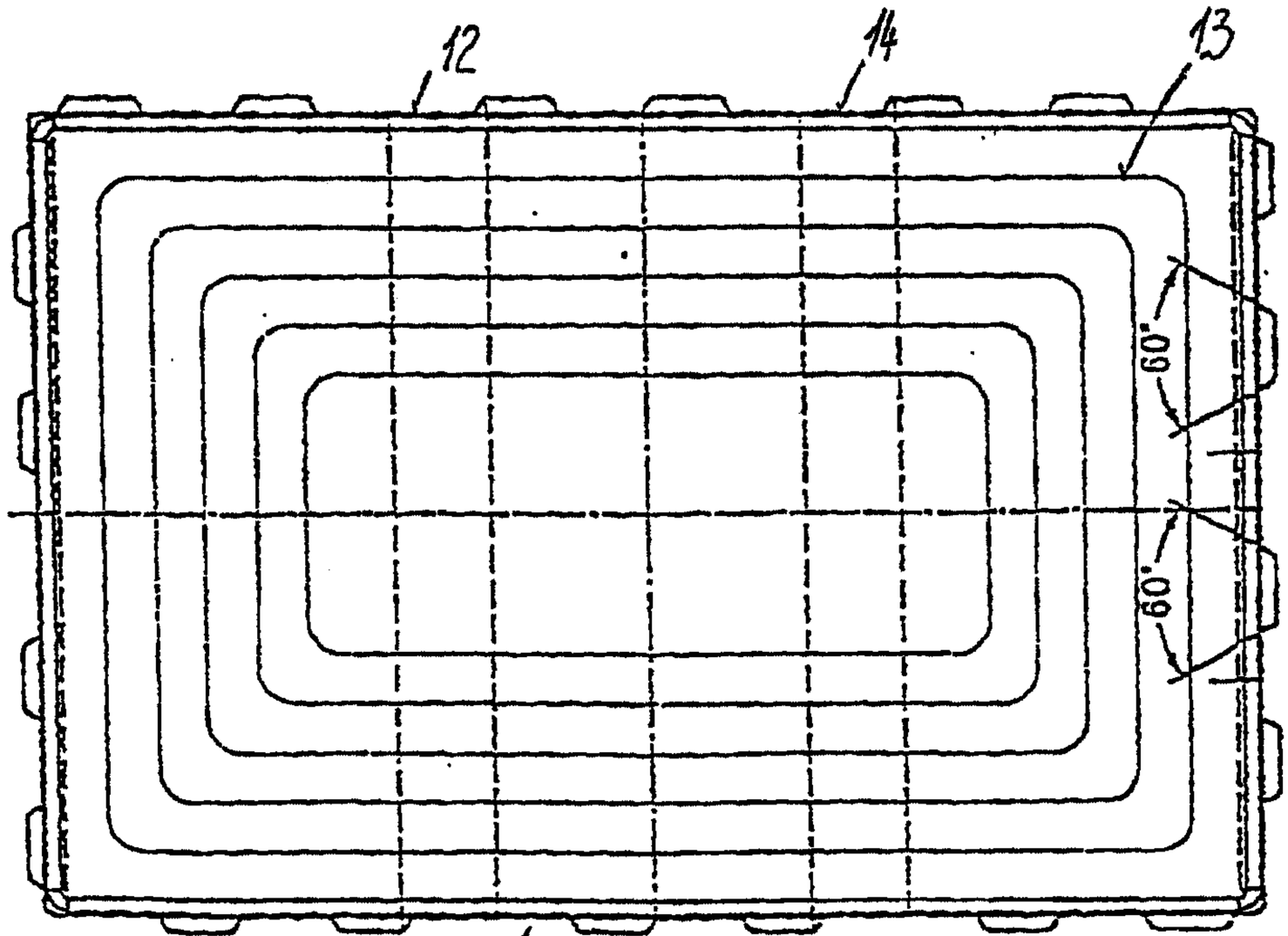
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13
60°
60°

2

Fig.6

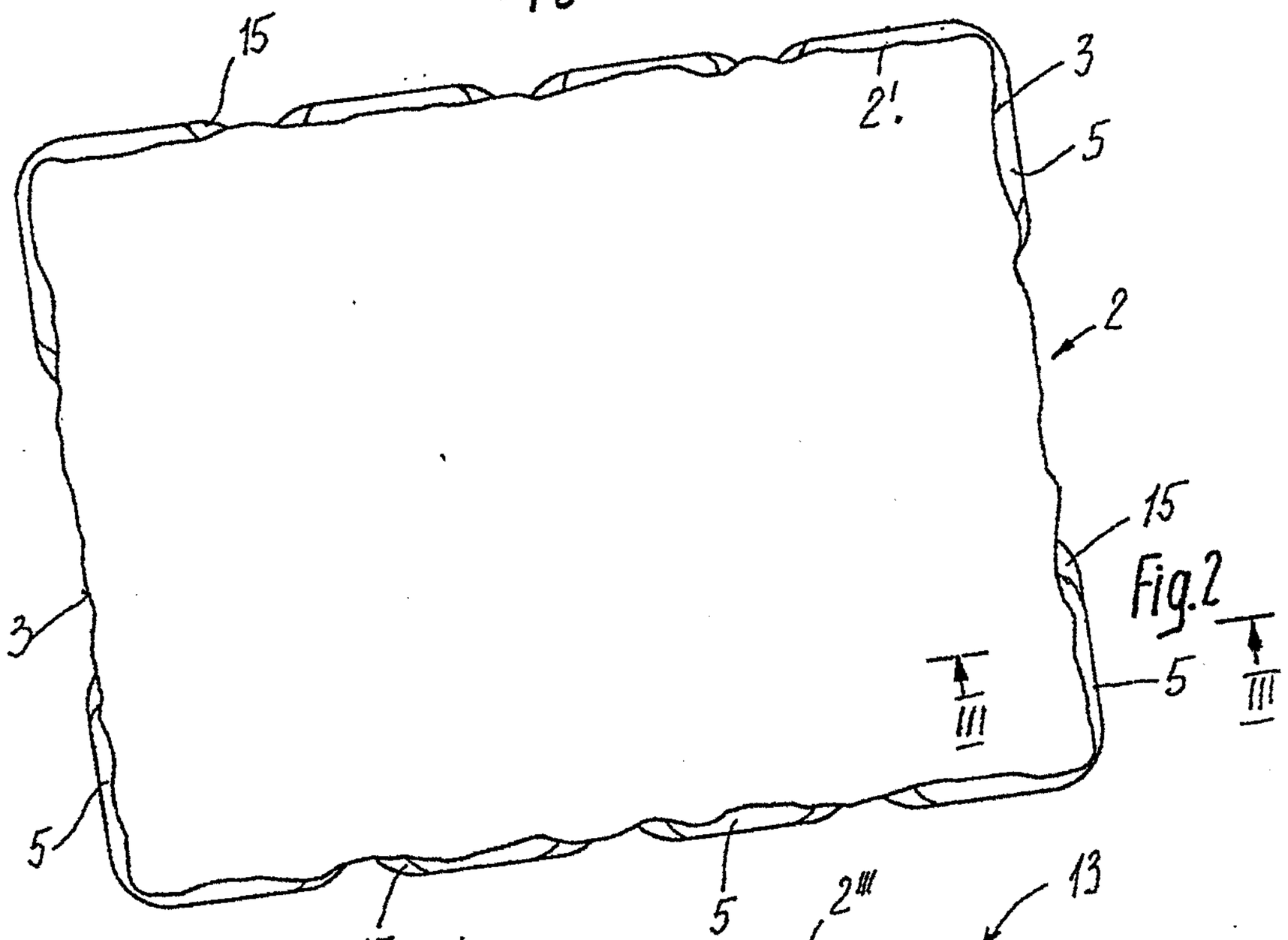

Fig.2

Fig.3

Fig.5

Fig.4

2 7

"1" 12–22	"1" 12–22	"2" 12–20	"3" 12–18	"2" 12–20	"3" 12–18
"8" 8–16	"9" 8–18	"10" 8–20	"11" 8–22	"11" 8–22	"11" 8–22
"7" 10–12	"6" 10–16	"4" 10–20	"5" 10–18	"4" 10–20	"5" 10–18	"6" 10–16
"8" 8–16	"11" 8–22	"10" 8–18	"11" 8–22	"9" 8–18	"12" 8–24
"1" 12–22	"1" 12–22	"2" 12–20	"3" 12–18	"2" 12–20	"3" 12–18
"8" 8–16	"9" 8–18	"10" 8–20	"11" 8–22	"11" 8–22	"11" 8–22
"7" 10–12	"6" 10–16	"4" 10–20	"5" 10–18	"4" 10–20	"5" 10–18	"6" 10–16
"8" 8–16	"11" 8–22	"10" 8–18	"11" 8–22	"9" 8–18	"12" 8–24

1 12 11 2 7

Fig.7

12

1 2 7

Fig.8

"21" 22–28	"22" 22–22	"22" 22–22	"21" 22–28	"23" 22–20
"33" 16–16	"27" 20–16	"30" 18–16	"32" 16–22	"33" 16–16	"31" 16–280
"24" 20–24	"25" 20–20	"23" 22–20	"26" 20–18	"25" 20–20	"27" 20–16
"29" 18–18	"30" 18–16	"26" 20–18	"28" 18–24	"29" 18–18	"28" 18–24

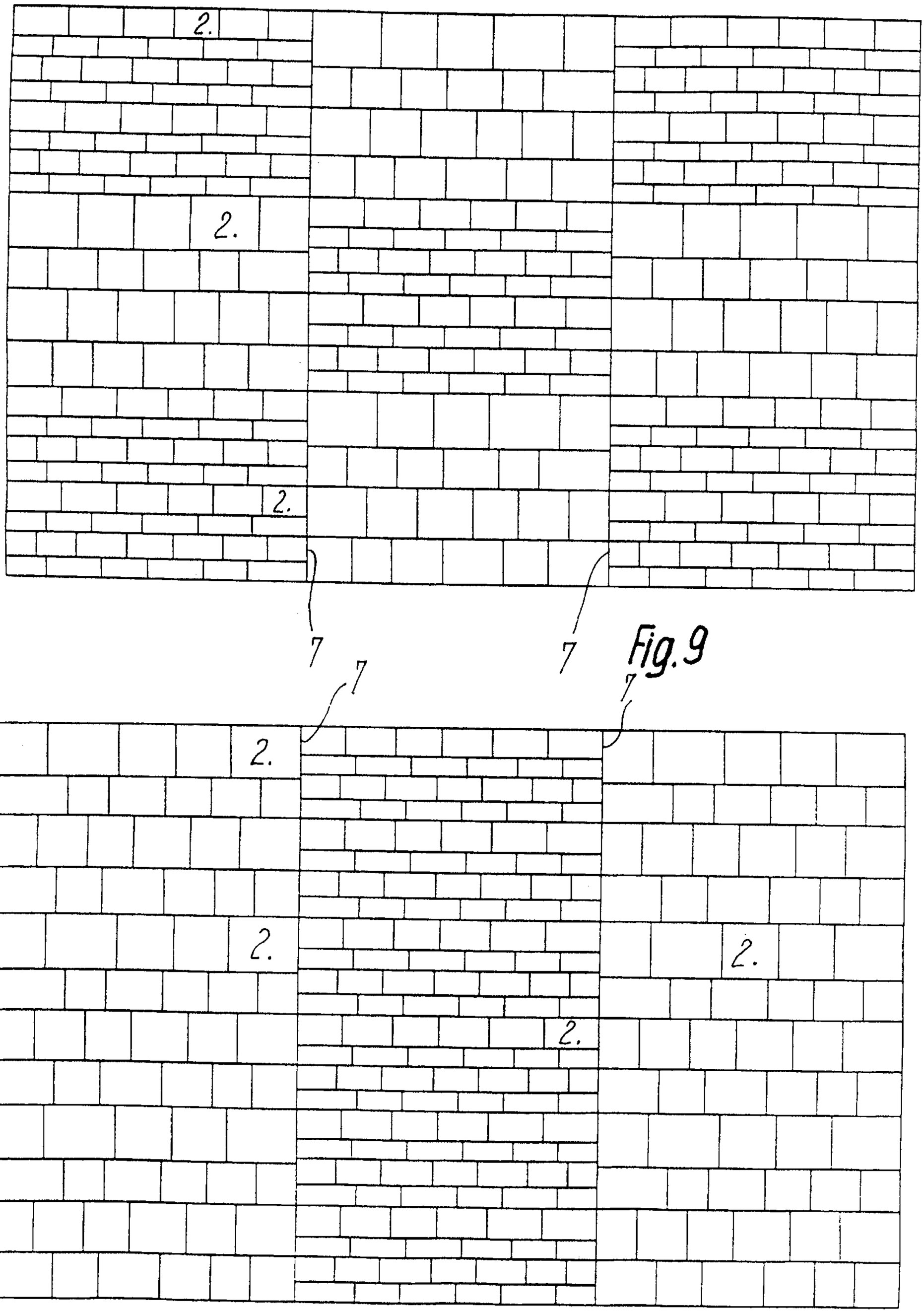

Fig.9

Fig.10

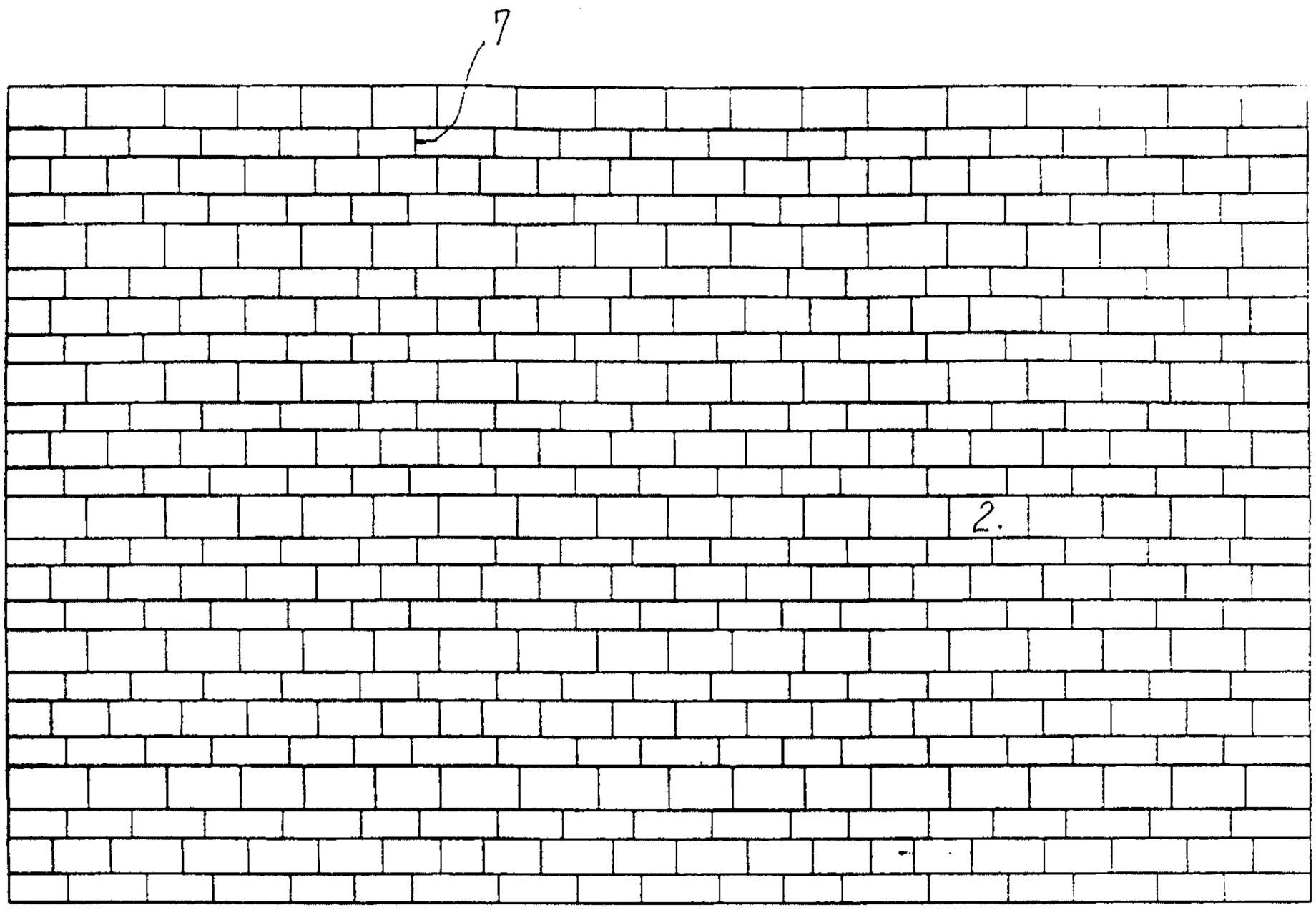

Fig.11

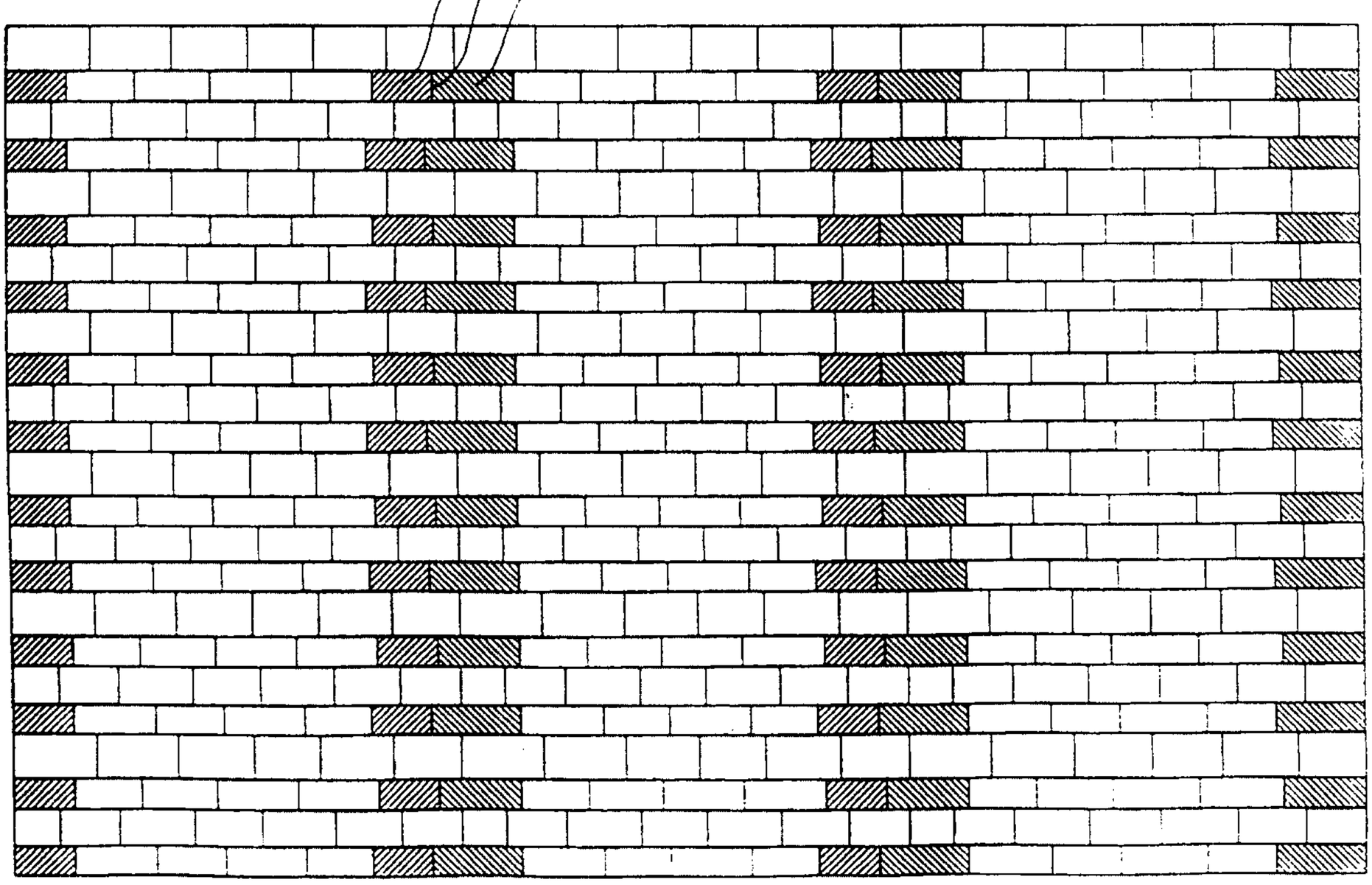

Fig. 12

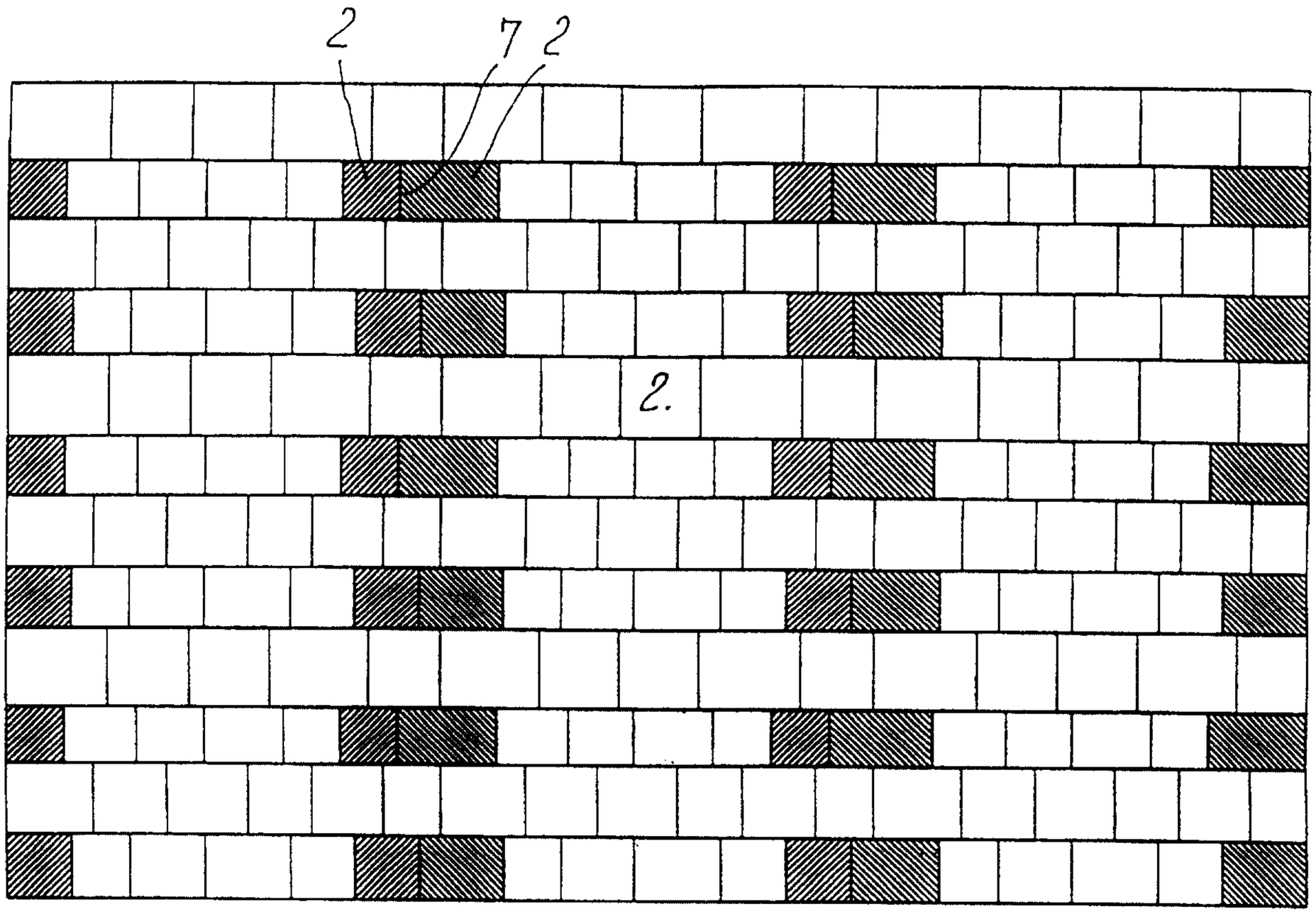

Fig. 14

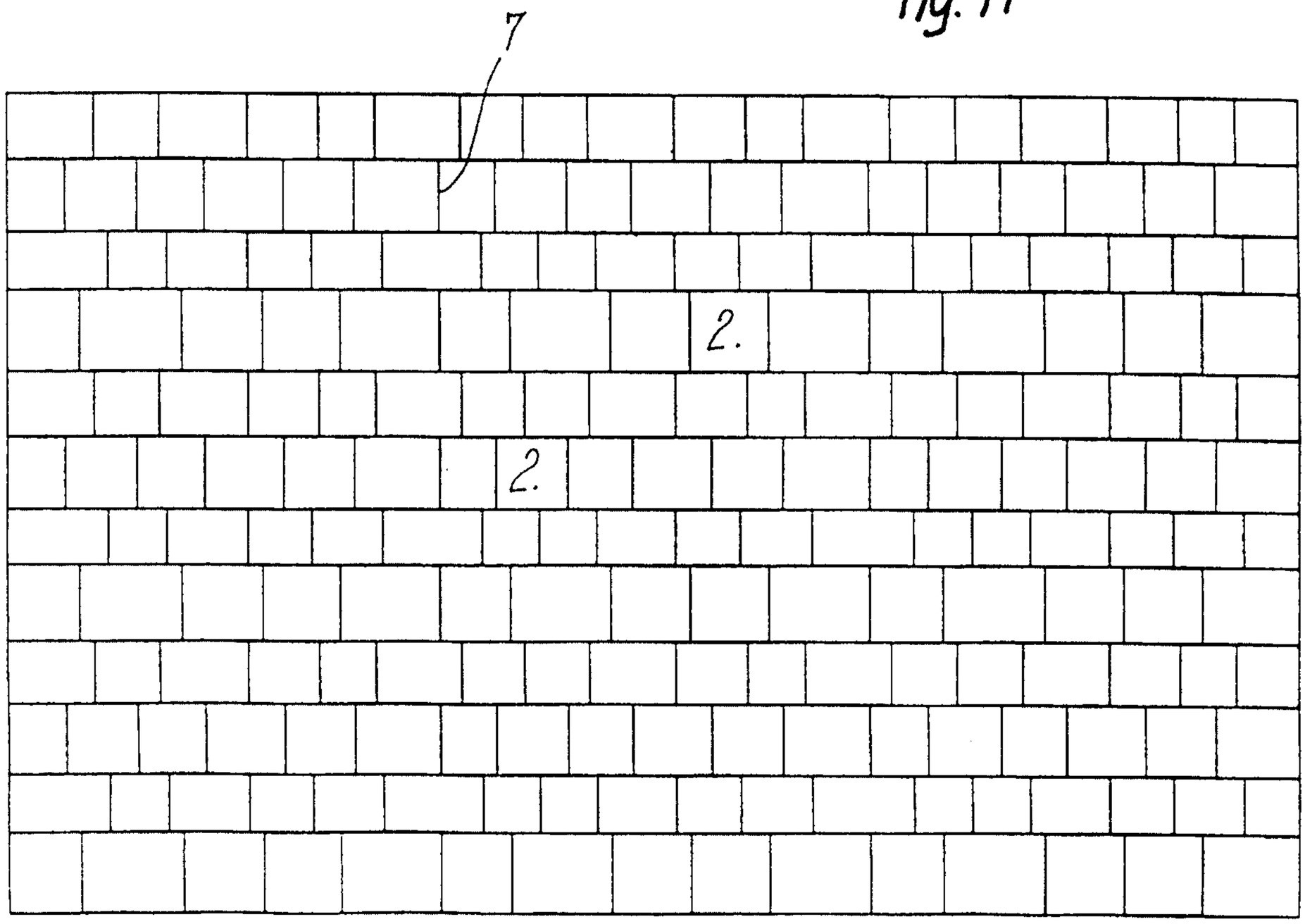

Fig. 13

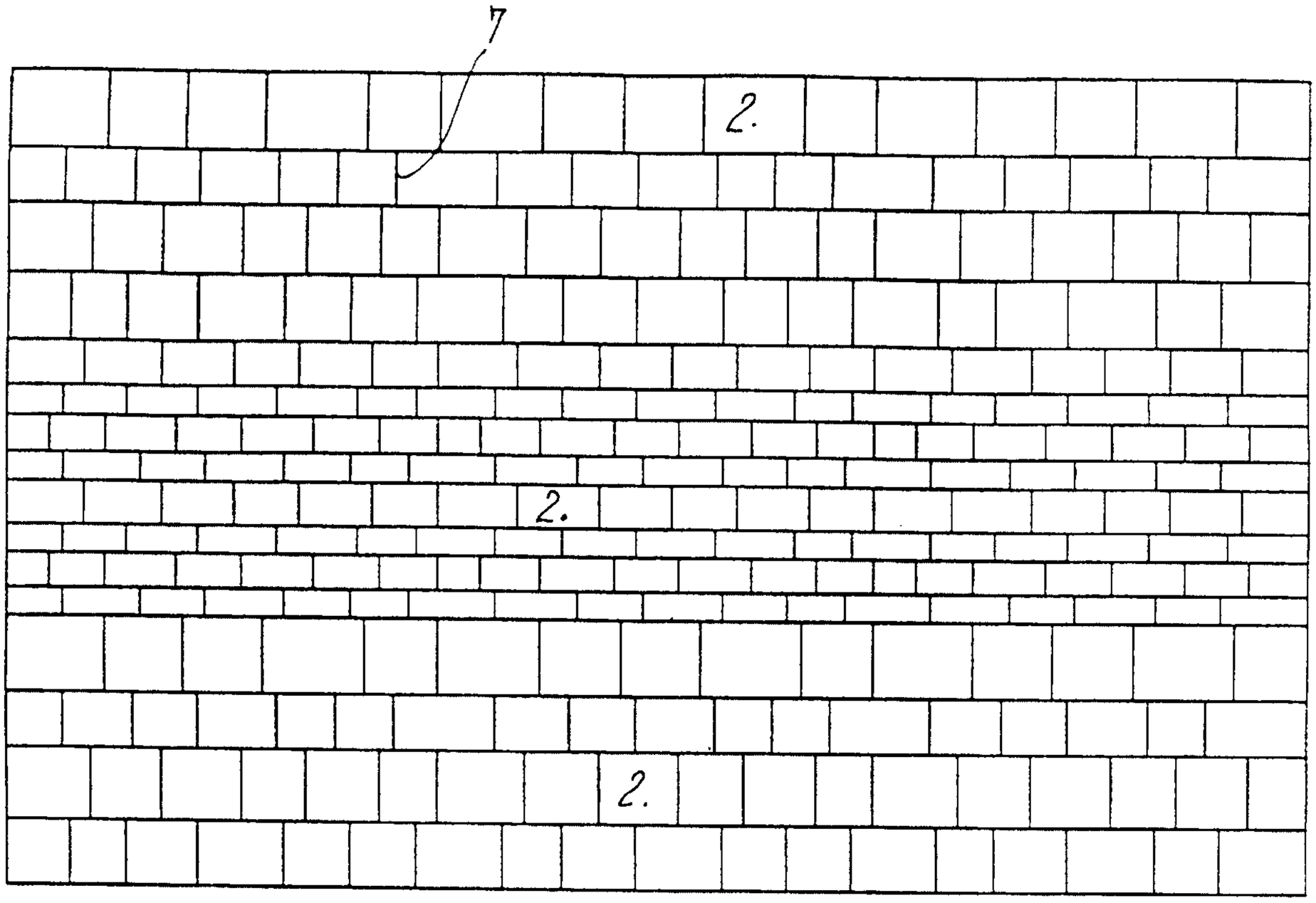

Fig. 15

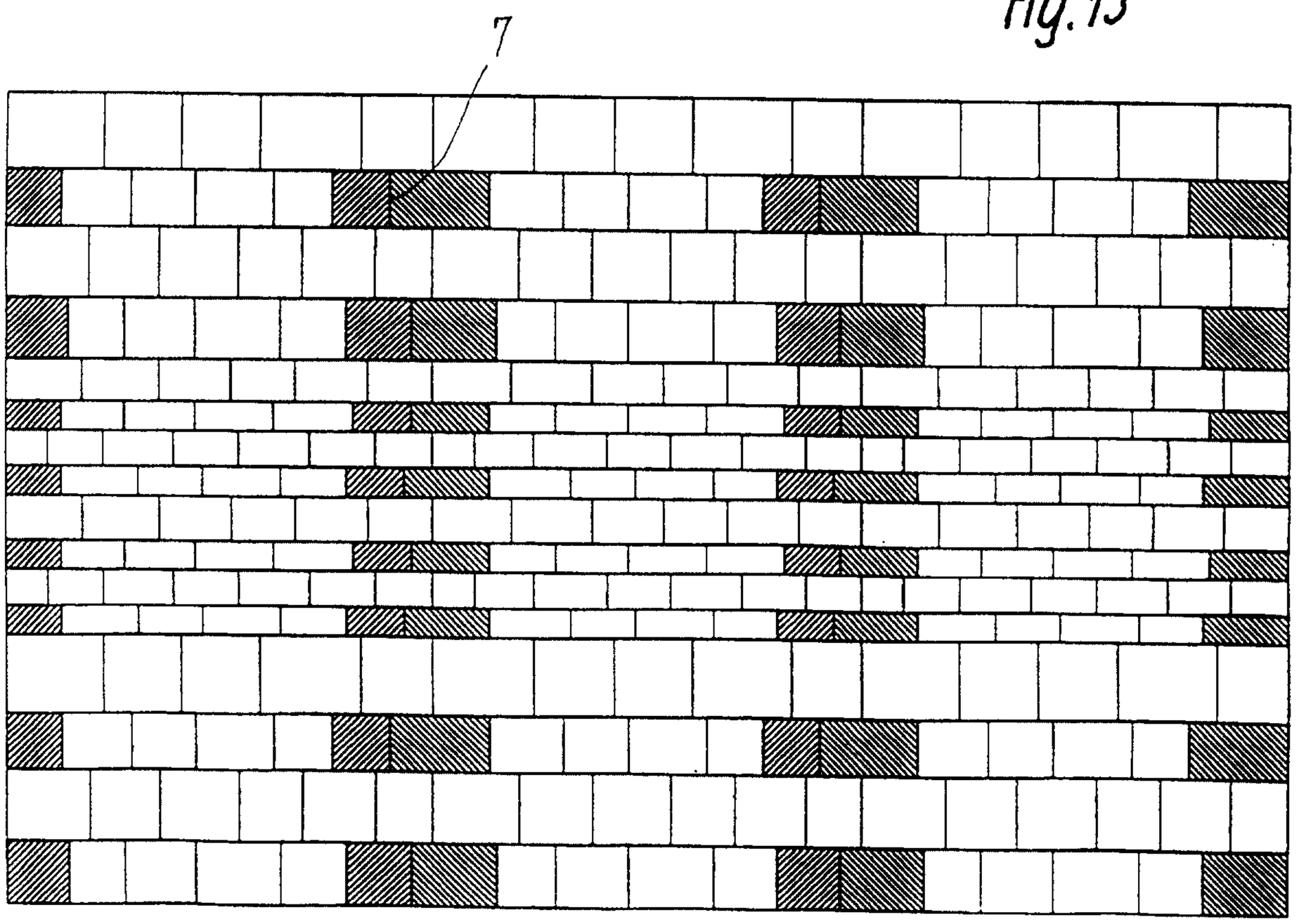

Fig. 16

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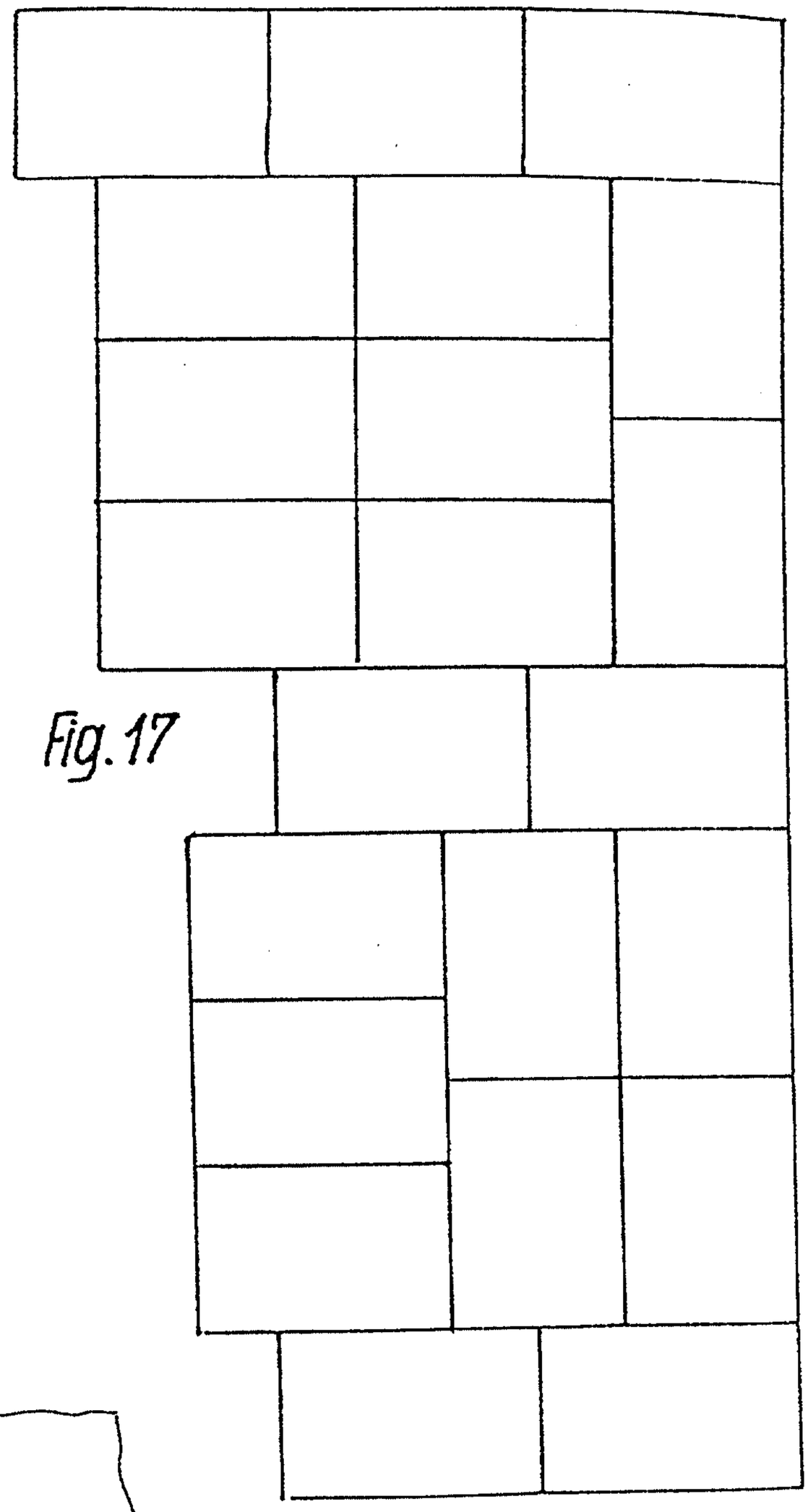


Fig. 17

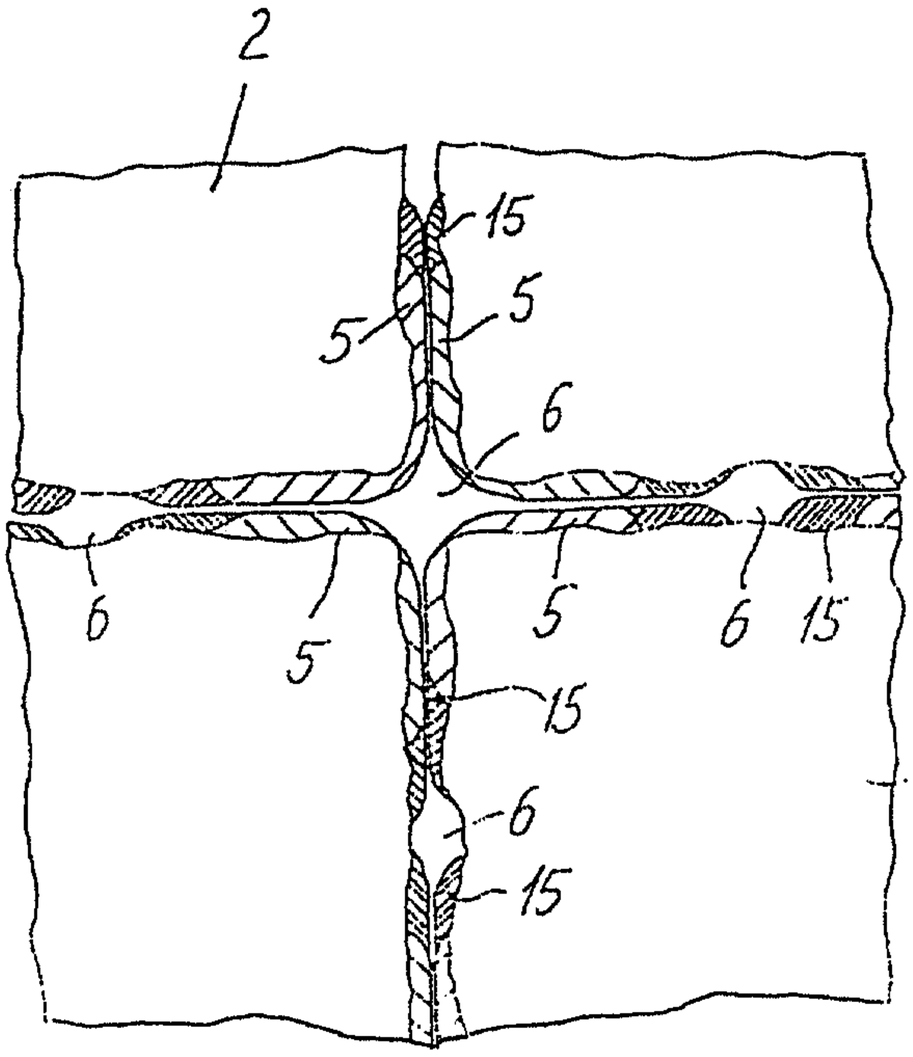
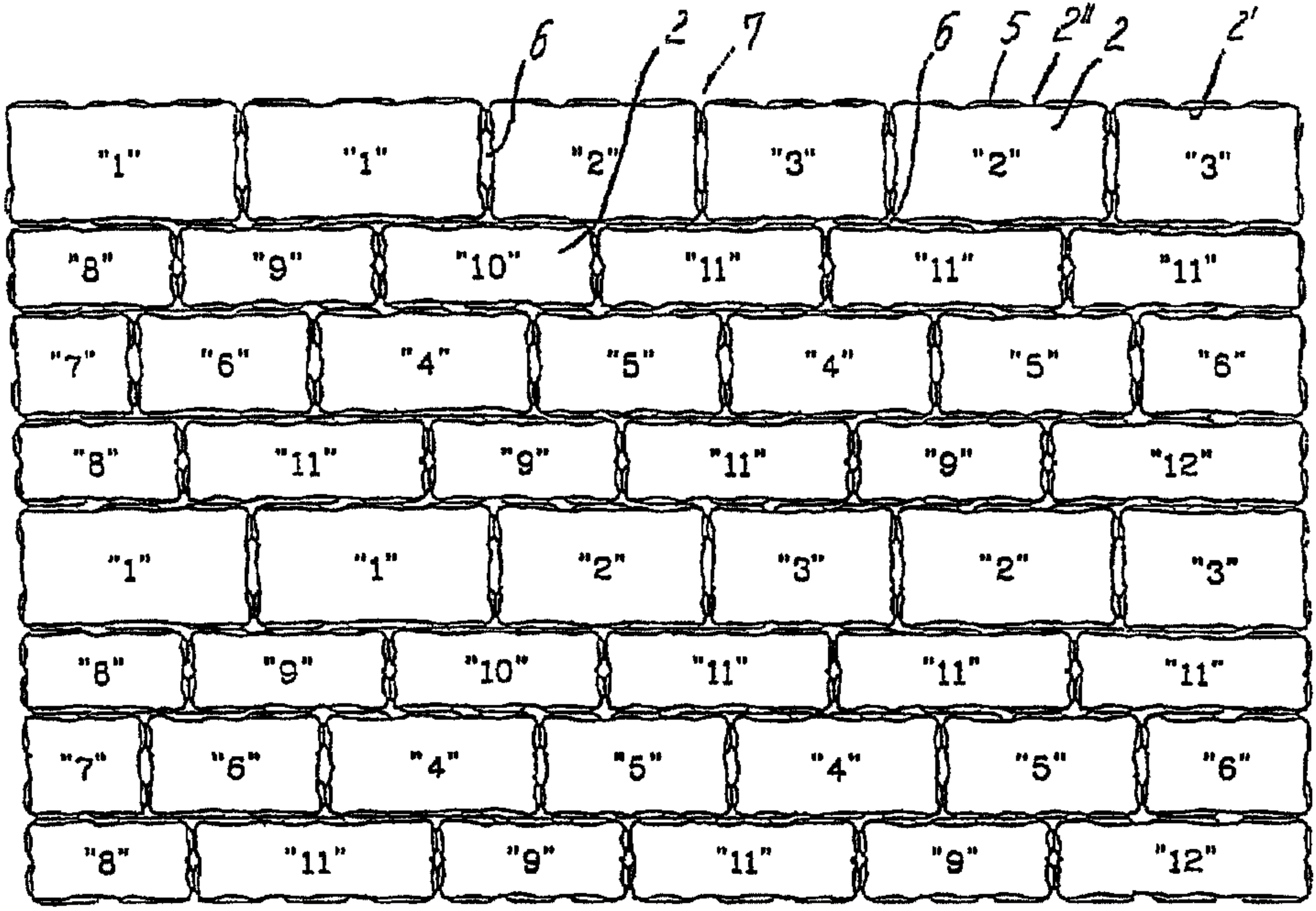


Fig. 18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