(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 616 091 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
29.03.2000 Bulletin 2000/13

(51) Int. Cl.[7]: **E04B 2/26**

(21) Application number: **93600014.0**

(22) Date of filing: **26.07.1993**

(54) **Building blocks**

Bausteine

Blocs de construction

(84) Designated Contracting States:
DE ES FR GB IT SE

(30) Priority: **04.08.1992 GR 92010353**

(43) Date of publication of application:
21.09.1994 Bulletin 1994/38

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(56) References cited:
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WO-A-92/09762
FR-A- 2 562 932

EP 0 616 091 B1

Printed by Xerox (UK) Business Services
2.16.7/3.6

Description

[0001] The invention relates to blocks for masonry construction, which may be used for the construction of load bearing elements, such as walls and beams, as well as for partitioning masonry walls.

[0002] A block for masonry construction, comprising two opposite longitudinal webs, extending vertically and along a longitudinal direction and at least one transverse web, extending vertically and in the transverse direction and connecting the two opposite longitudinal webs is already known from WO 79/00198. This block has three pairs of faces, the faces of each pair being opposite to each other, with the faces of the first of the three pairs of faces extending horizontally, the faces of the second of the three pairs of faces being parallel to the transverse web, and the faces of the third of the three pair of faces being parallel to the longitudinal webs. The horizontally extending faces have first interlocking means for interlocking blocks placed one on the top of the other, and at least one of second pair of faces having second interlocking means for interlocking blocks being placed one next to the other. The first interlocking means of the blocks disclosed in WO 79/00198 consists of a single longitudinally disposed male element in one face and a complementary female element in the opposite face, which extend across the breadth of the block. The blocks do not provide interlocking means for corner and cross walls; and the configuration of channels disposed on the first pair of faces, across the transverse webs, necessitate the use of special production pallets and blockmakers.

[0003] A further block for masonry construction is disclosed in document WO 92/09762. The block disclosed in this document comprises tongues in its upper face, and a base slab with grooves for receiving the tongues of the block located below. The shape of the tongues and the corresponding grooves is such, so that there is a need of special inserts, in order to effect positive interlocking of blocks. The block does not include means for interlocking blocks placed one next to the other. The presence of the base slab, on which the grooves are formed, does not allow the use of the blocks in case of use of vertical reinforcements.

[0004] An object of the present invention is a block, with effective interlocking, and minimum weight. The blocks are to be used for reinforced masonry construction, for the construction of other load bearing elements, such as beams and for non-reinforced partitioning wall construction.

[0005] The object of the invention is achieved by the blocks according to claim 1.

[0006] The blocks of the invention provide stable interlocking of blocks placed one on the top of the other. They may be used for the construction of non-reinforced masonry as well as of masonry with vertical and/or horizontal reinforcement. Further they may be used for the construction of beams.

[0007] Dependent claims 2 to 10 define further features, which provide additional advantages.

[0008] Claim 2 is directed to blocks having a base slab for non-reinforced masonry construction and claim 3 to blocks with open upper and lower faces in order to allow for the vertical reinforcement to pass through the blocks.

[0009] The block of claim 4 comprises only one web in the transverse direction connecting the two opposite webs. Such a block has at least one of the vertical faces open, so that during reinforced masonry construction, it is possible to place it around the vertically disposed reinforcement, by moving it transversely with respect thereto. The blocks of claim 4 have a U or double I section.

[0010] According to claim 5, the transverse webs connecting the webs extending in the longitudinal direction are recessed in their plane, to house longitudinal reinforcements.

[0011] The second interlocking means of the blocks in accordance with claim 6 are grooves and tongues disposed in vertically extending series.

[0012] Claim 7 defines that one longitudinal face of the block is provided with an expanded polysterene slab for thermal insulation.

[0013] According to claim 8 the grooves are deeper than the tongues, to allow for the application of wires or shear connectors or for interlocking at an angle.

[0014] Claims 9 and 10 define the third interlocking means of tongues and grooves, disposed vertically for interlocking blocks placed at an angle.

[0015] The blocks may be manufactured from cement; pumice; expanded or processed lightweight aggregates, natural aggregates; chemical and or active mineral additives.

[0016] Examples of embodiments of the invention are described in detail below with reference to drawings 1-57.

Figure 1 shows in perspective a typical building block, with high internal/external webs, for partitioning masonry.

Figure 2 is a plan view, from the underside of the block, of Figure 1.

Figure 3 is a transverse section of the block, of Figure 1.

Figure 4 is a longitudinal section of the block, of Figure 1.

Figure 5 is a top plan view of the block, of Figure 1.

Figure 6 is a longitudinal section, of the half block.

Figure 7 is a transverse section, of the half block.

Figure 8 and 9 is a plan from the upper side and lower side respectively, of the half block.

Figure 10 and 11 is a plan from the upper side and lower side respectively, of the half block with one plain side, for free wall ends and corners.

Figure 12 and 13 is a plan from the upper side and lower side respectively, of the block with one plain, side, for free wall ends and comers.

Figure 14 shows in perspective a typical building block, with low internal cross webs, for * * reinforced masonry walls.

Figure 15 is a longitudinal section of the block in Figure 14, with two adjacent cross webs, vertical notches for producing hald block, with a reveal for openings.

Figure 16 is a plan of the block in Figure 14, with two adjacent cross webs, vertical notches for producing half block, with a reveal for openings.

Figure 17 is a transverse section of the block in Figure 14.

Figure 18 is a longitudinal section of the block in Figure 14.

Figure 19 is a plan of the block in Figure 14.

Figure 20 is a longitudinal section of the block with one plain side, for free wall ends and corners.

Figure 21 is a plan of the block with one plain side, for free wal ends and corners.

Figure 22 is a longitudinal section for the half block.

Figue 23 is a plan for a half block.

Figure 24 is longitudinal section for the pilaster block.

Figure 25 is a plan for the pilaster block.

Figure 26 is a transverse section for the pilaster block.

Figure 27 is a transverse section for the linterl/bond beam block.

Figure 28 is longitudinal section for the lintel/bond beam block.

Figure 29 is a plan for the lintel/bond beam block.

Figure 30 is a tranverse section for the lintel and slab end blocks.

Figure 31 is a longitudinal section for the lintel and slab end blocks.

Figure 32 shows in perspective a typical lintel and slab end block.

Figure 33 is a tranverse section of the highly insulated block, for external /common use walls.

Figure 34 is a longitudinal section of the highly insulated block, for external /common use walls.

Figure 35 is a plan of the highly insulated block, for external/common use walls.

Figure 36 is a longitudinal section of a block, of shape U.

Figure 37 is a longitudinal section of a block, of shape double I.

Figure 38 is a transverse section of a block, of shape U.

Figure 39 is a plan of a block, of shape U.

Figure 40 is a plan of a block, of shape double I.

Figure 41 is a transverse section of a block, of shape double I.

Figure 42 shows a perspective view of a block, of shape U.

Figure 43 shows a perspective view of a block, of shape double I.

Figure 44 is a longitudinal section fo a block, of shape double I.

Figure 45 is a transverse section of a block, of shape double I.

Figure 46 is a plan of block, of shape double I.

Figure 47 shows in perspective a block for lintel and slab end.

Figure 48 is a transverse section of a block for lintel and slab end, of Figure 47.

Figure 49 is a longitudinal section of a block for lintel and slab end, of Figure 47.

Figure 50 is a transverse section of a block for the rolling shutters.

Figure 51 is a longitudinal section of a block for the rolling shutters.

Figure 52 is a transverse section of a block for the reinforced concrete beams.

Figure 53 is a longitudinal section of a block for the reinforced concrete beams.

Figure 54 is a plan of a block for the reinforced concrete beams.

Figure 55 is a transverse section of an highly insulated block, of double I shape, for external/common use walls.

Figure 56 is a longitudinal section of an highly insulated block, of double I shape, for external/common use walls.

Figure 57 is a plan of an highly insulated block, of double I shape, for external/common use walls.

[0017] The blocks according to the invention comprise two opposite longitudinal webs extending in use vertically and along a longitudinal direction and at least one transverse web, extending vertically and in the transverse direction and connecting the two opposite longitudinal webs. The blocks have three pairs of faces, with the faces of each pair being opposite to each other. The faces of the first of the three pairs of faces extend in use horizontally, the faces of the second of the three pairs of faces are parallel to the transverse web, and the faces of the third of the three pair of faces are parallel to the longitudinal webs. The horizontally extending faces have first interlocking means for interlocking blocks placed one on the top of the other.

[0018] The block shown in figures 1 to 13, has webs 12,11,10,9,9A in the longitudinal and transverse direction, and a base slab 13. Tongues 15,2 and grooves 3 are provided on the base slab for interlocking the blocks placed one on the top of the other.

[0019] Transverse webs 8,9,10,11 are erected above the base slab 13. The webs have tongues 6 on their edges located opposite to the base slab and grooves 7,8 located on the same level as grooves 3. The grooves 3 are deeper than tongues 6, to allow for the installation of wires/shear connectors and bonding mortars. These tongues and grooves form the first interlocking means for the blocks placed one on top of the other. The webs 12,11,10,9,9A form vertical cavities through block's height, intersected by the horizontal base slab

13.

[0020] The block has also vertically disposed grooves 4,4A,4B, coacting with vertically disposed tongues 5, in at least one of the outer transverse webs 9 on the transverse faces 28,29, for interlocking of blocks placed one next to the other. Internal grooves 4A,4B are deeper than tongues 5 on the same face, for applying mortar.

[0021] The tongues 6 are equally spaced from both second 28,29 and third pair of faces 26,27 of the block, and are of the same shape and dimensions. Tongues 6 are engaged with recesses 3 for the interlocking of blocks when laid one on top of another. The block may be laid reversed with base slab 13 tongues 15,2 and grooves 3 lying on the upper side, and tongues 6 grooves 7,8 lying on the lower side respectively.

[0022] The block can also be surface bonded with a thin mortar reinforced with synthetic fibers

[0023] Block with a plain transverse face 28 (see figures 10 to 13), i.e. without tongues or grooves are used at wall ends, walls at an angle, and openings with or without reveal.

[0024] The blocks according to the invention may be joined one next to another, one on the top of another or at an angle, a valuable advantage for wall corners and crossings.

[0025] The cellular blocks shown in figures 14 to 35 have webs 12,12A,9A,9B,10A,10B. At least two of the webs are disposed in the longitudinal direction and at least further two in the transverse direction. The blocks may have a base slab 13 or such a slab may be omitted (see for example figures 17 to 19). The surfaces of the blocks coinciding with the block's horizontal faces 25,24. comprise tongues 15A,6A,6C,14B, grooves 3B,3A,3C,7,7A,7B,7C,15B,8A, on the webs 12,12A,9A,9B,10A. These said tongues and grooves form the first interlocking means for blocks placed one on top of the other. The transverse webs may be recessed -see for example recess 16 in figures 17 to 19- for effective concrete bonding, and installation of longitudinal reinforcements.

[0026] Webs 12,12A,9A,9B,10A,10B form vertical cavities through the block's height, which may be optionally intersected by a horizontal base slab 13.

[0027] The block has vertically disposed grooves 4,4A,4B and tongues 5,5A on at least one transverse web 9B on the second pair of faces 28,29. These said tongues and grooves form the second interlocking means for blocks placed one next to the other.

[0028] One inner tongue 5 extend further out than the others, on at least one transverse face 28,29, for interlocking with grooves 17, on either or both faces 26,27, disposed vertically in the longitudinal face webs 12,12A. These said tongues and grooves form the third interlocking means for blocks placed at an angle in the horizontal plane.

[0029] Twin transverse webs at middle block's length (see figures 15,16) are provided with vertical notches so that the blocks may be cut on site, to produce two half blocks, one with plain transverse end face 28, and another half with vertically extending tongues and grooves 5,5A,4,4A,4B as cited. Figure 15,16 refer for illustration purposes, to a block with reveal, on one of the end side faces, for wall ends to doors, windows e.t.c

[0030] Figure 30,31,32 show the block for the lintel and slab end, with one longitudinal web 12A on the external face of the unit higher than the opposite face 12, acting as shuttering to the poured concrete. Tongue 6C is utilized for the continuation of masonry work on upper floor, and for insertion into groove 7C for stacking/palletizing convenience.

[0031] This block could be with or without a base slab 13, for exposed base face above openings windows/doors e.t.c. or concealed base face, within the masonry.

[0032] The configuration of the consecutive alternation of interlocking tongues and grooves on horizontal faces extending in the transverse direction, as described, are superior to other arrangements, for the creation of architectural facade niches and/or shallow projections, to be accommodated, through provision,within the same mould frame.

[0033] The cellular blocks shown in Figures 36 to 57 of U, I and double I shape. These blocks have at least one transverse web 9A,10B connecting two opposite face webs 12,12A in the longitudinal direction, creating unit blocks with one to two open transverse faces 28,29. This provision facilitates erection of the blocks around steel reinforcements to high lifts. The horizontal faces 25,24 of the block are recessed vertically to form grooves 3A,3B,15C,7A,7C,8A and tongues 15,15A,6D,6C,14C. The said tongues and grooves form the first interlocking means for the blocks placed one on top of the other.

[0034] Grooves 4,4A,4B and tongues 5,5A,5B are disposed vertically, and provided on one or both transverse faces 28,29, to form the second interlocking means for the blocks placed one next to the other.

[0035] One inner tongue 5 extend further out than the others, on the same face 28,29, for interlocking with grooves 17, on either or both faces 26,27, disposed vertically in the longitudinal face webs 12,12A. These said tongue and grooves form the third interlocking means for blocks placed at an angle, in the horizontal plane.

[0036] A recess 16 is formed in the plane of transverse webs 10B, for effective interlocking with the concrete, and installation of longitudinal reinforcements.

[0037] A base slab 13 is provided for lintel, beam, rolling shutter, and lintel/slab end units. Rolling shutter unit is connected to lintel unit through bolt holes 23.

[0038] Inner vertical grooves/notches 22 of the appropriate shape, are provided on the inner faces of the longitudinal webs (figures 42 to 57), to ease cutting on site, and/or efffective interlocking with the poured-in concrete.

[0039] Blocks U and double I shape can be easily used for the erection of columns with corners or

crossed, high lifts.

[0040] The configuration of the consecutive alternation of interlocking tongues/grooves across the longitudinal webs, as cited previously, are superior to other arrangements, for the creation of architectural niches/shallow projections, within the same mould frame.

[0041] The tongues and grooves of the presented embodiments comprise oblique faces of complementary shape and orientation, so that the shape of the tongues and grooves may be truncated pyramidal or conoidal. Further their shape and layout, although not necessarily identical, secure the alignment, rigidity and insulation of the vertical/horizontal joints of the block units.

[0042] All of the referred blocks could be further insulated with a highly and uniformly insulating slab 19, (see figures 33,35,55,57), made from a preformed insulating element, such as expanded polystyrene, of an appropriate density. The insulating slab is inserted during production, on one longitudinal side of the block and secured through wedge shaped transvserse and longitudinal web's connections, securing structural integrity to all effects with the interlocking features unaffected.

[0043] The blocks can be produced, with suitable mobile or stationary blockmakers with built-in tray/pallet. The choice of suitable materials and grooves/notches, or other provisions not described herein, provide for easy cutting on site, with available means and methods.

[0044] The blocks described are preferred embodiments of the invention and do not limit the protection sought as defined by the appended claims.

Claims

1. Block for masonry construction, comprising two opposite longitudinal webs (12,12A) extending, in use, vertically and along a longitudinal direction and at least one transverse web (9,10,9A,9B,10A,10B), extending vertically and in the transverse direction, the at least one transverse web connecting the two opposite longitudinal webs (12,12A), whereby the block has three pairs of faces, the faces of each pair being opposite to each other, the faces (24,25) of the first of the three pairs of faces extending, in use, horizontally, the faces (28,29) of the second of the three pairs of faces being parallel to the transverse web, and the faces (26,27) of the third of the three pair of faces being parallel to the longitudinal webs, the horizontally extending faces having first interlocking means for interlocking blocks placed one on the top of the other, and at least one of second pair of faces having second interlocking means for interlocking blocks being placed one next to the other, wherein

   the first interlocking means comprises alternating series of tongues (6,6A,6B,6C14B,14C) and grooves (7,8,7A,7B,8A) on one of the first pair of faces, and respective alternating series of grooves (3,3B,3A,15B,3C,15C) and tongues (2,15,15A) on the other of the first pair of faces, whereby

   each of the said series of tongues and grooves of the first interlocking means extend along the longitudinal direction,

   each of the said tongues and grooves of the first interlocking means comprise two longitudinally disposed faces, those of which not forming the third pair of faces being, in use, oblique with respect to the horizontal,

   the tongues and grooves on the one face of the first pair of faces, are of a shape, which is complementary to the respective grooves and tongues on the other face of the first pair of faces, in order to effect the interlocking of blocks placed one on the top of the other.

2. Block **according to claim 1**, whereby the block comprises a base slab, with one of the two surfaces of the base slab coinciding with one face of the first pair of faces, and whereby the grooves are formed on the said face of the first pair of faces, and the webs being erected from the other of the two surfaces of the base slab.

3. Block **according to claim 1**, whereby the faces of the first pair of faces are open faces, in order for the block to house vertically disposed reinforcement

4. Block **according to claim 1**, whereby the two opposite webs and the one web connecting them, form a block with a U or I section.

5. Block **according claim 1**, whereby the transverse webs connecting the webs extending in the longitudinal direction, are recessed in their plane, in order that the block receives longitudinal reinforcements.

6. Block **according to claim 1**, whereby one or both faces of the second pair of faces comprise vertically disposed alternating series of tongues and grooves.

7. Block **according to any of the claims 1 to 6**, whereby one face of the third pair of faces is provided with an expanded polysterene slab for thermal insulation.

8. Block **according to any of the claims 1 to 6**, whereby the grooves of the first interlocking means are deeper then the tongues.

9. Block **according to any of the claims 1 to 6,** whereby the second interlocking means comprises grooves and tongues, with one of the said tongues

projecting further than the other of the said tongues.

10. Block **according to any of the claims 1 to 7,** whereby the block comprises third interlocking means (5) to interlock blocks placed at an angle in the horizontal plane.

Patentansprüche

1. Block für den Mauerwerkbau, der zwei gegenüberliegende Längsrippen (12, 12A) umfaßt, die sich in Verwendung senkrecht und in einer Längsrichtung erstrecken, und der mindestens eine Querrippe (9, 10, 9A, 9B, 10A, 10B) umfaßt, die sich senkrecht und in Querrichtung erstreckt, wobei die mindestens eine Querrippe die zwei gegenüberliegenden Längsrippen (12, 12A) verbindet, wobei der Block über drei Paare von Flächen verfügt, wobei die Flächen eines jeden Paares einander gegenüberliegen, wobei sich die Flächen (24, 25) des ersten der drei Paare von Flächen in Verwendung horizontal erstrecken, wobei die Flächen (28, 29) des zweiten der drei Paare von Flächen parallel zur Querrippe sind, und wobei die Flächen (26, 27) des dritten der drei Paare von Flächen parallel zu den Längsrippen sind, wobei die sich horizontal erstreckenden Flächen erste Verblockungsmittel aufweisen, um Blöcke zu verblocken, die übereinander angebracht werden, und wobei mindestens eine des zweiten Paares von Flächen zweite Verblockungsmittel aufweist, um die Blöcke zu verblocken, die nebeneinander angebracht werden, worin

das erste Verblockungsmittel an eine des ersten Paares von Flächen sich abwechselnde Reihen von Zungen (6, 6A, 6B, 6C, 14B, 14C) und Aussparungen (7, 8, 7A, 7B, 8A) umfaßt, und an der anderen des ersten Paares von Flächen jeweilige sich abwechselnde Reihen von Aussparungen (3, 3B, 3A, 15B, 3C, 15C) und Zungen (2, 15, 15A) umfaßt, wobei
sich jede der Reihen von Zungen und Aussparungen vom ersten Verblockungsmittel in der Längsrichtung erstreckt,
wobei jede der Zungen und Aussparungen des ersten Verblockungsmittels zwei in Längsrichtung angeordnete Flächen umfassen, wobei jene, die nicht das dritte Paar von Flächen bilden, in Verwendung in Bezug auf die Horizontale quer liegen,
wobei die Zungen und Aussparungen an der einen Fläche des ersten Paares von Flächen dergestalt sind, daß sie komplementär zu den jeweiligen Aussparungen und Zungen auf der anderen Fläche des ersten Paares von Flächen sind, um die Verblockung der übereinander angebrachten Blöcke zu bewirken.

2. Block nach Anspruch 1, wobei der Block eine Grundplatte umfaßt, wobei eine der zwei Oberflächen der Grundplatte mit einer Fläche des ersten Paares von Flächen zusammenfällt, und wobei die Aussparungen auf dar Fläche des ersten Paares von Flächen gebildet werden und die Rippen von der anderen der zwei Oberflächen von der Grundplatte aufgebaut werden.

3. Block nach Anspruch 1, wobei die Flächen des ersten Paares von Flächen offene Flächen sind, damit der Block ein senkrecht angeordnetes Verstärkungsglied aufnimmt.

4. Block nach Anspruch 1, wobei die zwei gegenüberliegenden Rippen und die sie verbindende eine Rippe einen Block mit einem U- oder I-Abschnitt bilden.

5. Block nach Anspruch 1, wobei die Querrippen, die die sich in Längsrichtung erstreckenden Rippen verbinden, in ihrer Ebene eingeschnitten sind, damit der Block sich in Längsrichtung erstreckende Verstärkungzglieder aufnimmt.

6. Block nach Anspruch 1, wobei eine oder beide Flächen des zweiten Paares von Flächen senkrecht angeordnete, sich abwechselnde Reihen von Zungen und Aussparungen umfassen.

7. Block nach irgendeinem der Ansprüche 1 bis 6, wobei eine Fläche des dritten Paares von Flächen für die Wärmeisolierung mit einer expandierten Styroporplatte bereitgestellt wird.

8. Block nach irgendeinem der Ansprüche 1 bis 6, wobei die Aussparungen der ersten Verblockungsmittel tiefer als die Zungen sind.

9. Block nach irgendeinem der Ansprüche 1 bis 6, wobei das zweite Verblockungsmittel Aussparungen und Zungen umfaßt, wobei eine der Zungen weiter als die anderen der Zungen ragt.

10. Block nach irgendeinem der Ansprüche 1 bis 7, wobei der Block ein drittes Verblockungsmittel (5) umfaßt, um Blöcke zu verblocken, die in einem Winkel in der horizontalen Ebene angebracht werden.

Revendications

1. Bloc pour construction en maçonnerie, comprenant deux plaques longitudinales opposées (12, 12A) s'étendant en utilisation verticalement et le long d'une direction longitudinale et au moins une plaque transversale (9, 10, 9A, 9B, 10A, 10B) s'étendant verticalement et dans la direction transversale, la au moins une plaque transversale reliant les

deux plaques longitudinales opposées (12, 12A), de sorte que le bloc a trois paires de faces, les faces de chaque paire étant opposées l'une à l'autre, les faces (24, 25) de la première des trois paires de faces s'étendant, en utilisation, horizontalement, les faces (28, 29) de la seconde des trois paires de faces étant parallèles à la plaque transversale, et les faces (26, 27) de la troisième des trois paires de faces étant parallèles aux plaques longitudinales, les faces s'étendant horizontalement ayant des premiers moyens d'interverrouillage pour interverrouiller des blocs placés l'un sur le sommet de l'autre, et au moins l'une des secondes paires de faces ayant des seconds moyens d'interverrouillage pour interverrouiller des blocs placés à proximité l'un de l'autre,
dans lequel

les premiers moyens d'interverrouillage comprennent des séries alternées de saillies (6, 6A, 6B, 6C, 14B, 14C) et de retraits (7, 8, 7A, 7B, 8A) sur l'une de la première paire de faces, et des séries alternées respectives de retraits (3, 3B, 3A, 15B, 3C, 15C) et de saillies (2, 15, 15A) sur l'autre de la première paire de faces, de sorte que
chacune desdites séries de saillies et de retraits des premiers moyens d'interverrouillage s'étend le long de la direction longitudinale,
chacun desdits saillies et retraits des premiers moyens d'interverrouillage comprend deux faces disposées longitudinalement, celles d'entre elles qui ne forment pas la troisième paire de faces étant, en utilisation, obliques par rapport à l'horizontale,
les saillies et retraits sur ladite une face de la première paire de faces, sont d'une forme qui est complémentaire aux retraits et saillies respectifs sur l'autre face de la première paire de faces, afin d'effectuer l'interverrouillage de blocs placés l'un sur le sommet de l'autre.

2. Bloc selon la revendication 1, où le bloc comprend une semelle de base, avec l'une des deux surfaces de la semelle de base coïncidant avec une face de la première paire de faces, et où les retraits sont formés sur ladite face de la première paire de faces, et les plaques étant dressées à partir de l'autre des deux surfaces sur la semelle de base.

3. Bloc selon la revendication 1, où les faces de la première paire de faces sont des faces ouvertes, afin que le bloc loge des renforcements disposés verticalement.

4. Bloc selon la revendication 1, où les deux plaques opposées et ladite une plaque les reliant forment un bloc avec une section en U ou en I.

5. Bloc selon la revendication 1, où les plaques transversales reliant les plaques s'étendant dans la direction longitudinale, sont en creux dans leur plan, afin que le bloc reçoive des renforcements longitudinaux.

6. Bloc selon la revendication 1, où l'une ou les deux faces de la seconde paire de faces comprennent des séries alternées disposées verticalement de saillies et de retraits.

7. Bloc selon l'une quelconque des revendications 1 à 6, où une face de la troisième paire de faces comporte une semelle en polystyrène expansé pour l'isolation thermique.

8. Bloc selon l'une quelconque des revendications 1 à 6, où les retraits des premiers moyens d'interverrouillage sont plus profonds que les saillies.

9. Bloc selon l'une quelconque des revendications 1 à 6, où les seconds moyens d'interverrouillage comprennent des retraits et des saillies, l'une desdites saillies étant plus en proéminence que l'autre desdites saillies.

10. Bloc selon l'une quelconque des revendications 1 à 7, où le bloc comprend des troisièmes moyens d'interverrouillage (5) pour interverrouiller des blocs placés en faisant un certain angle dans le plan horizontal.

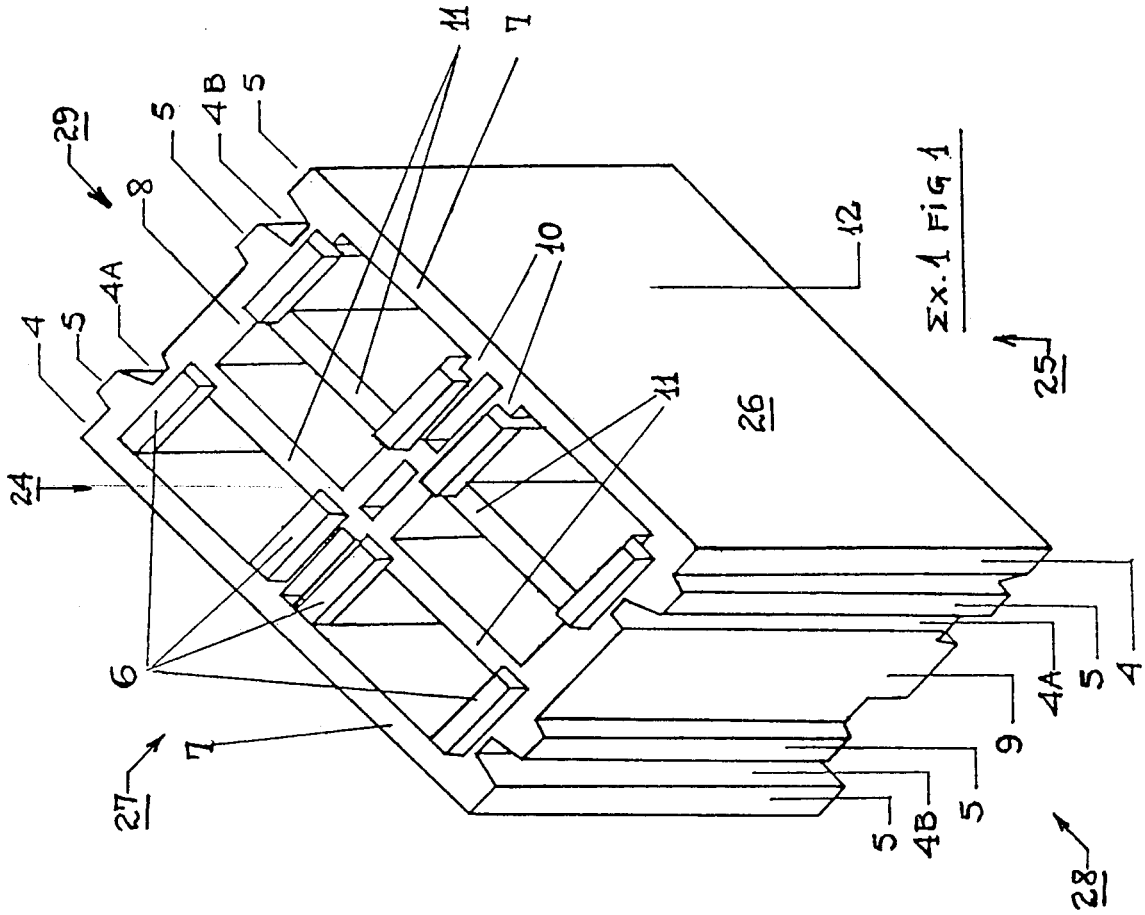


Fig.1

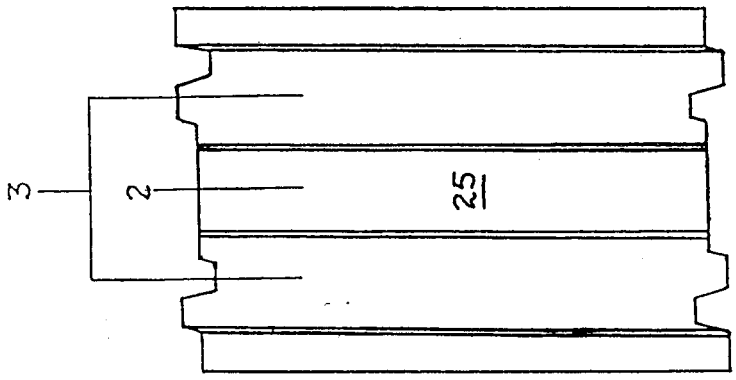
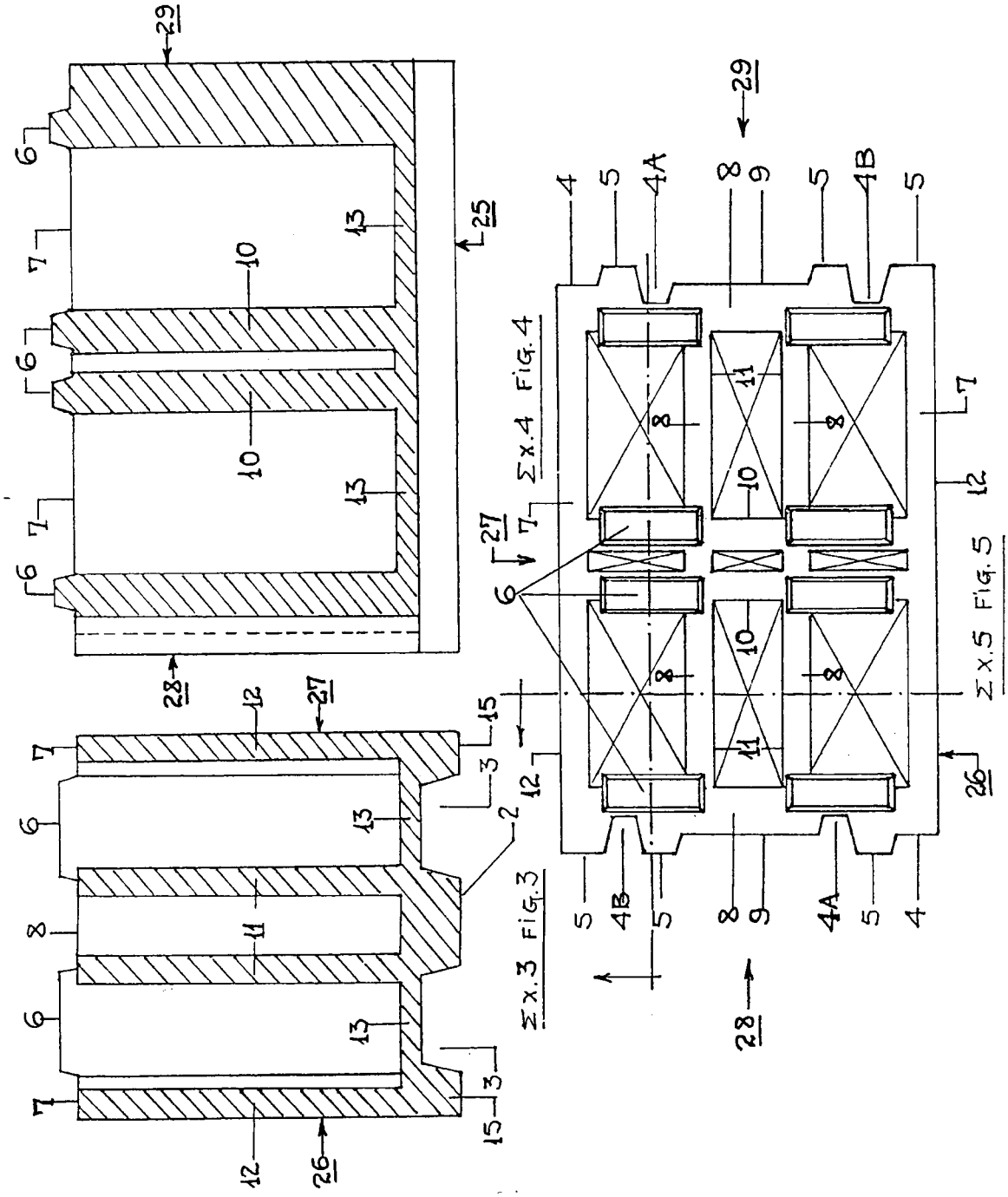


Fig.2


29
25
28
27
26
12
15
3
2
10
11
13
4
5
4A
4B
8
9
6
7
Σx.3 FIG.3
Σx.4 FIG.4
Σx.5 FIG.5

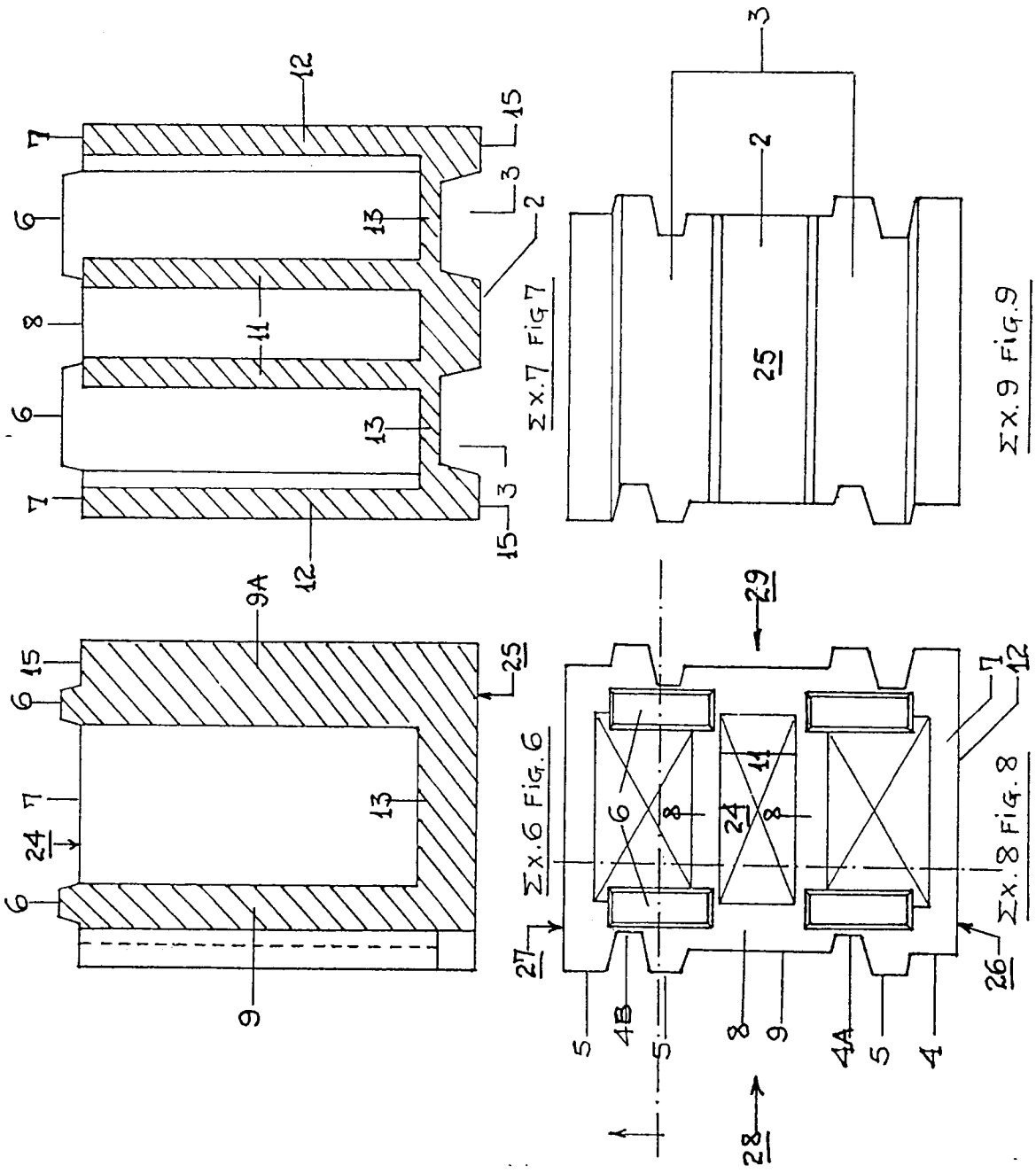
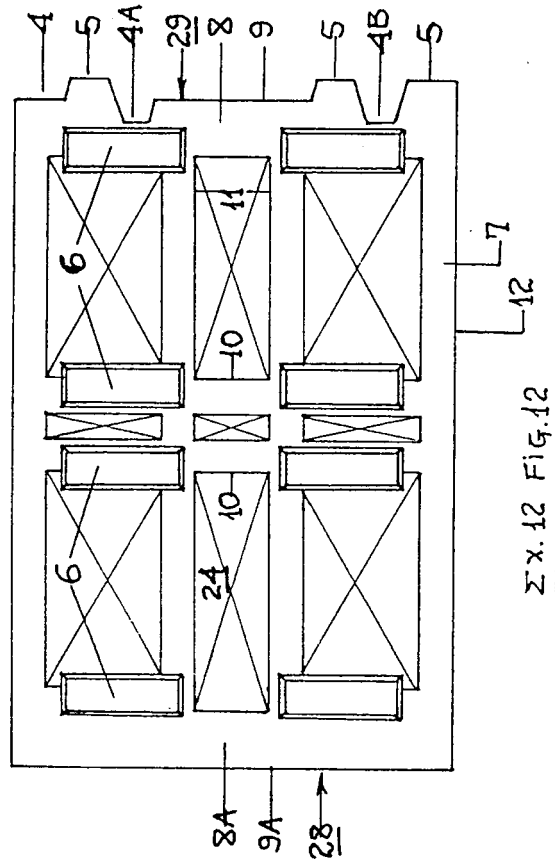


Fig.7

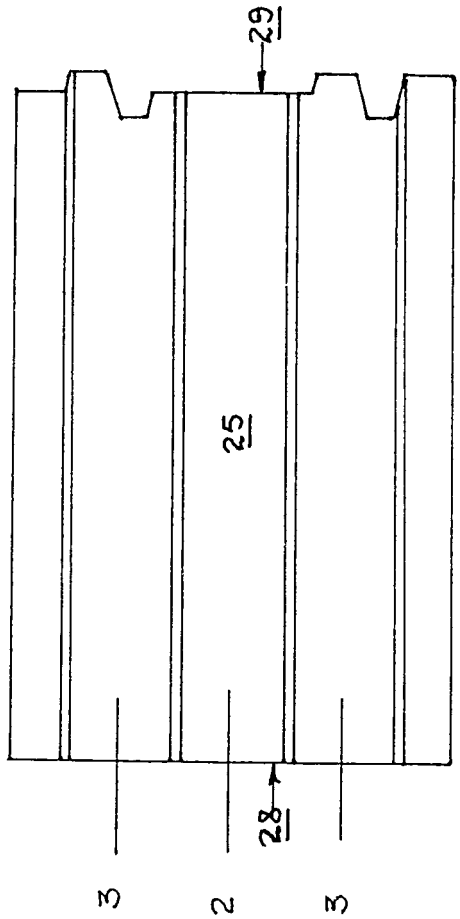
Fig.9

Fig.6

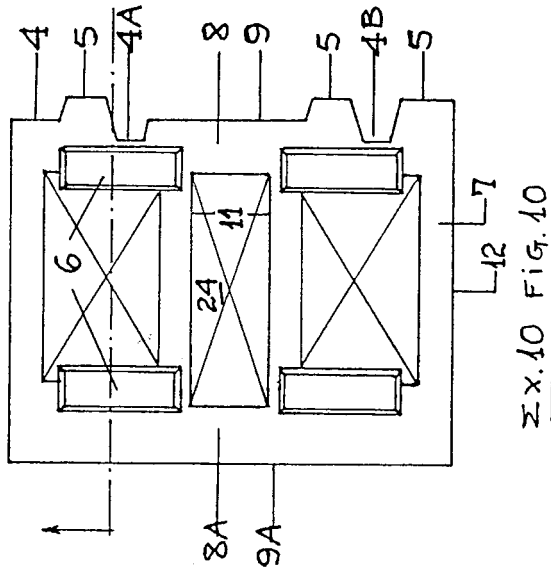
Fig.8



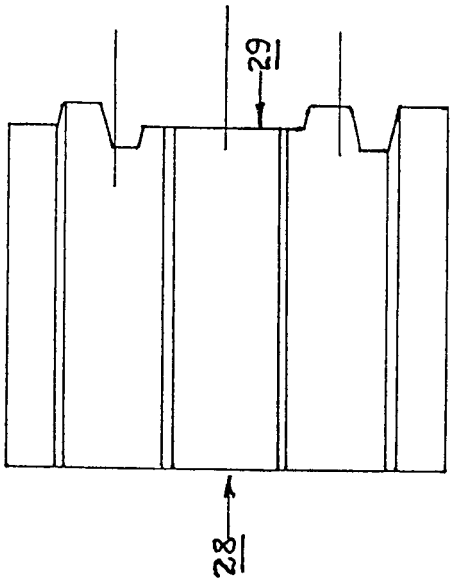
Σx.12 Fig.12



Σx.13 Fig.13



Σx.10 Fig.10



Σx.11 Fig.11

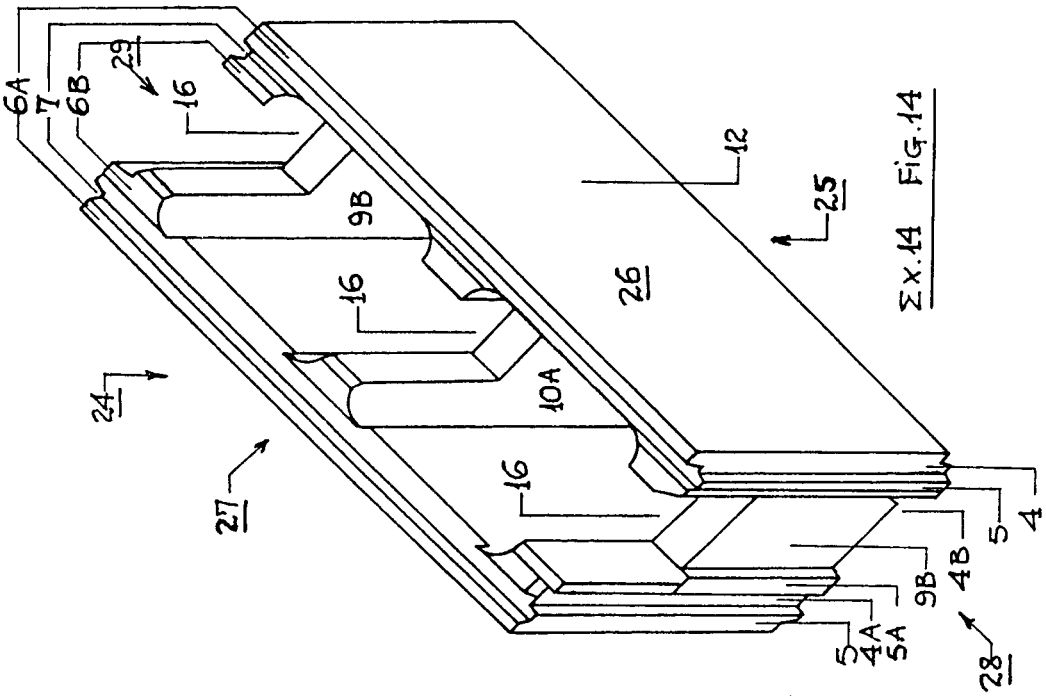


Fig.14

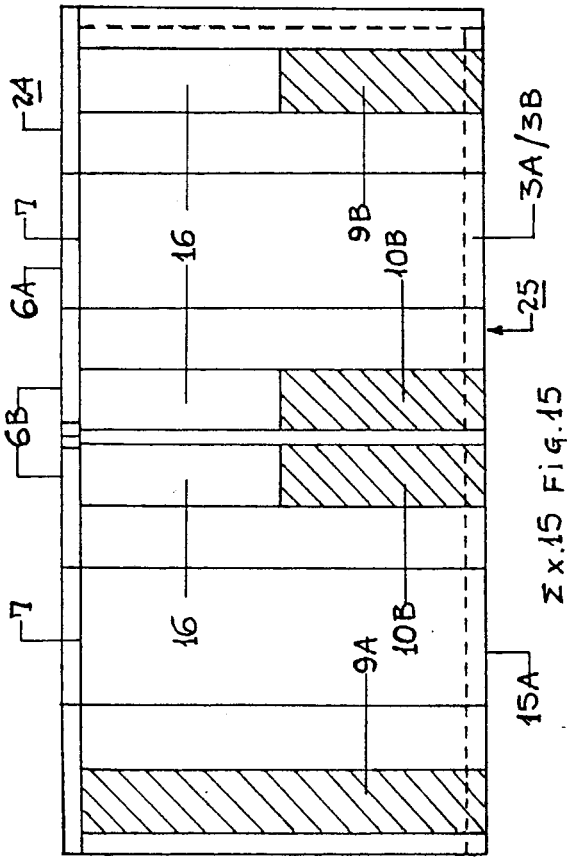


Fig.15

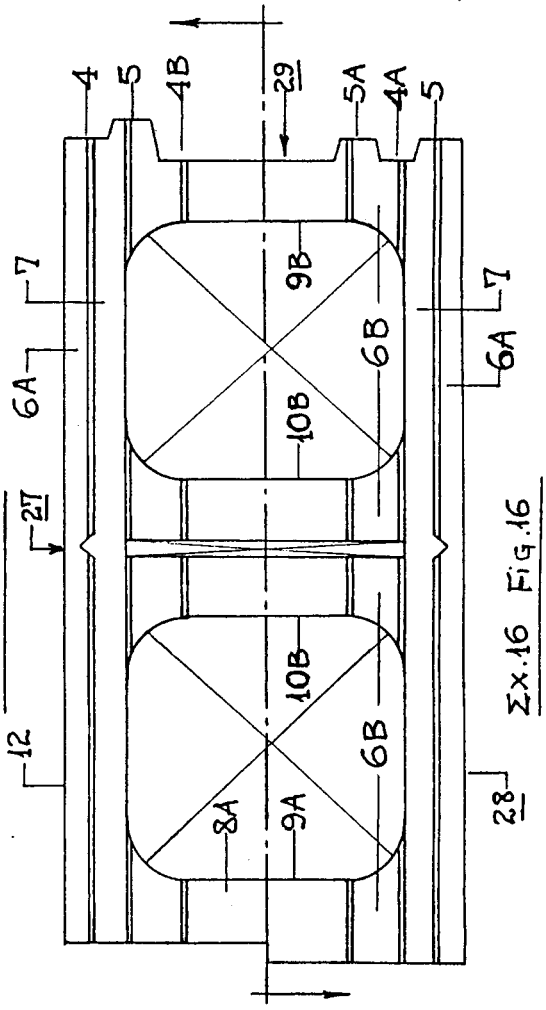


Fig.16

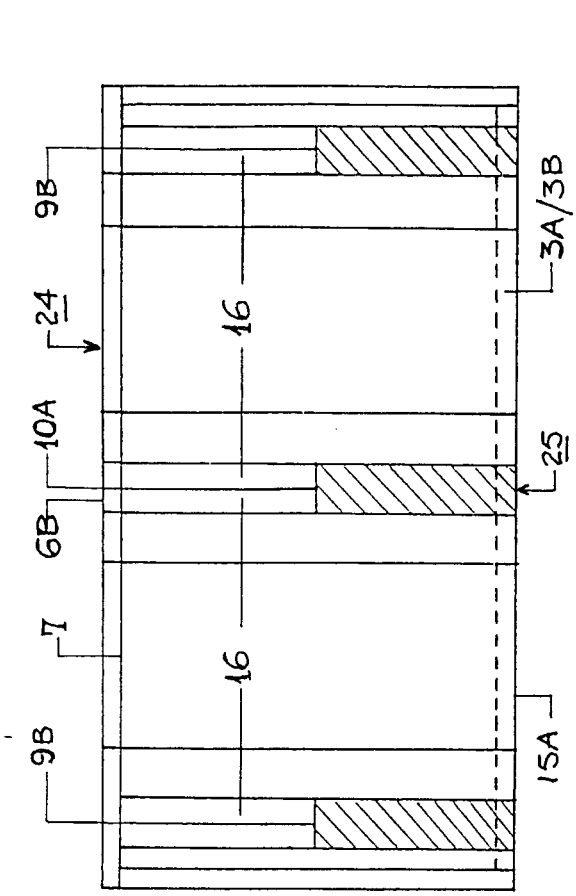


Fig.18 Zx.18

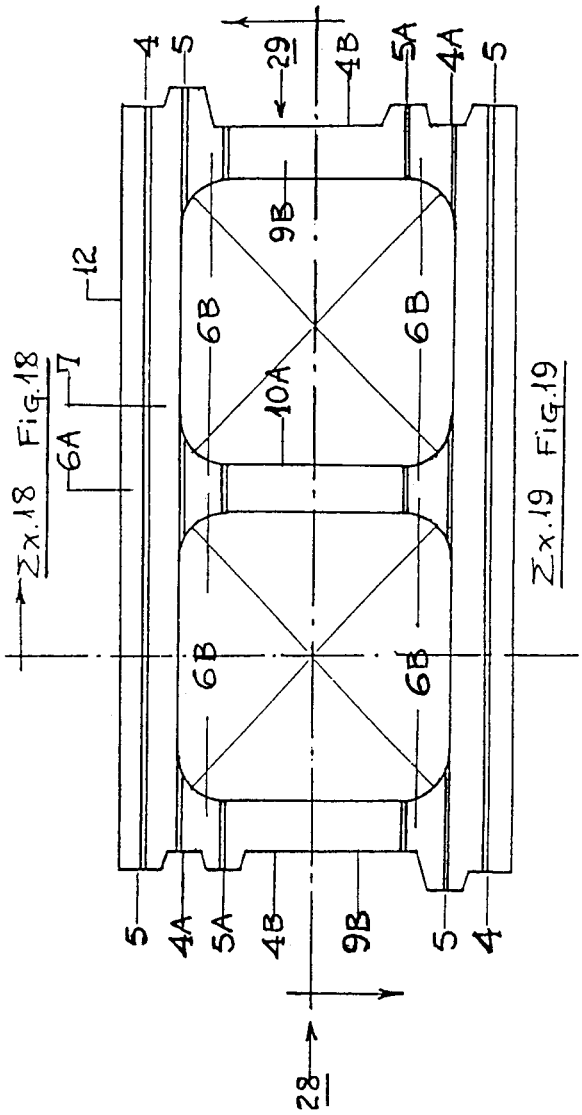


Fig.19 Zx.19

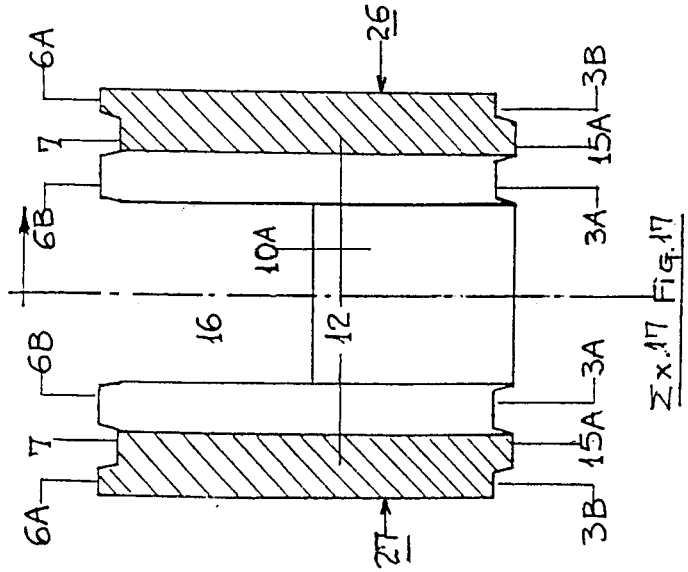


Fig.17 Zx.17

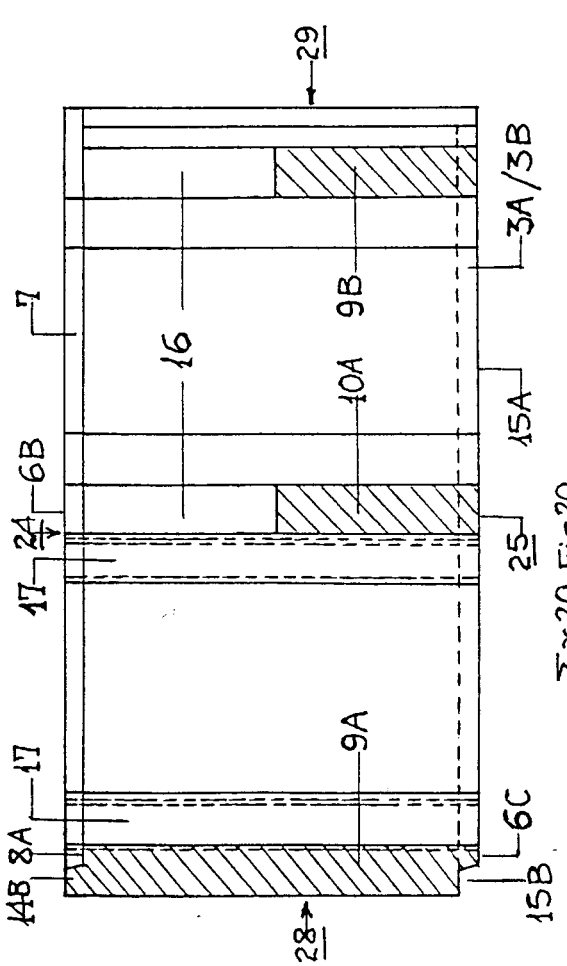


Fig.20

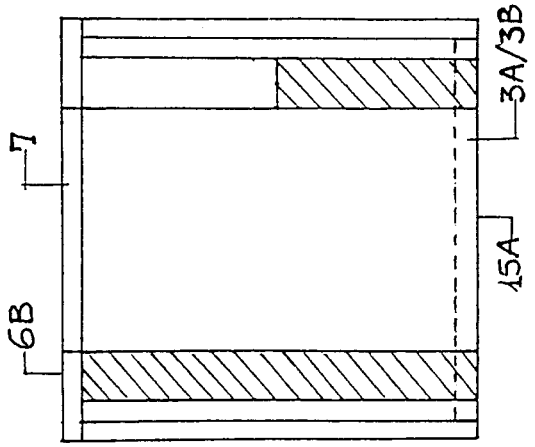
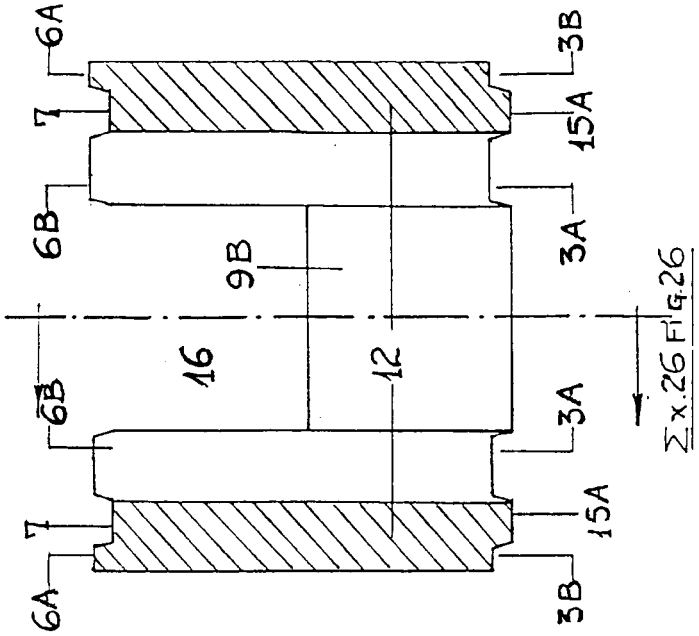


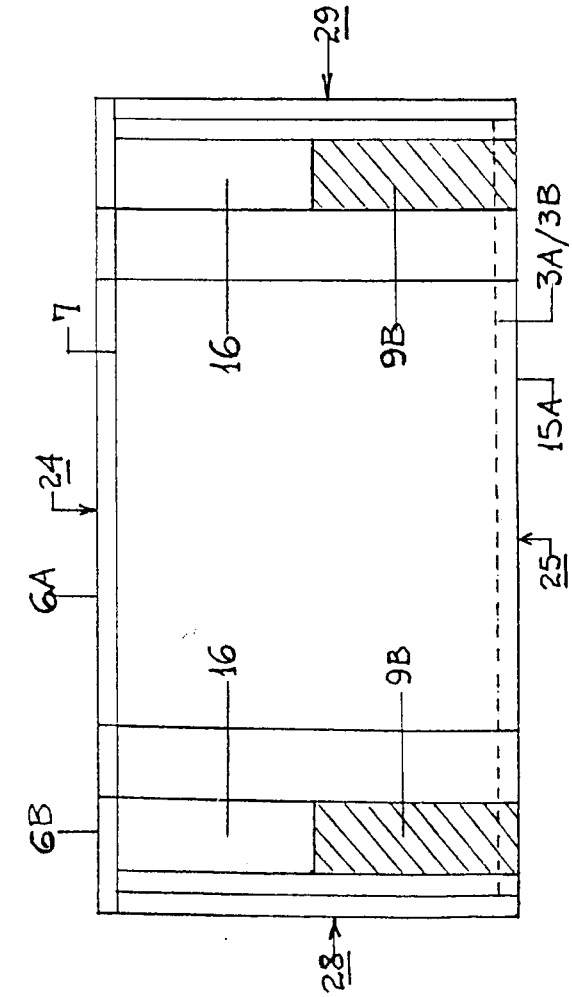
Fig.22

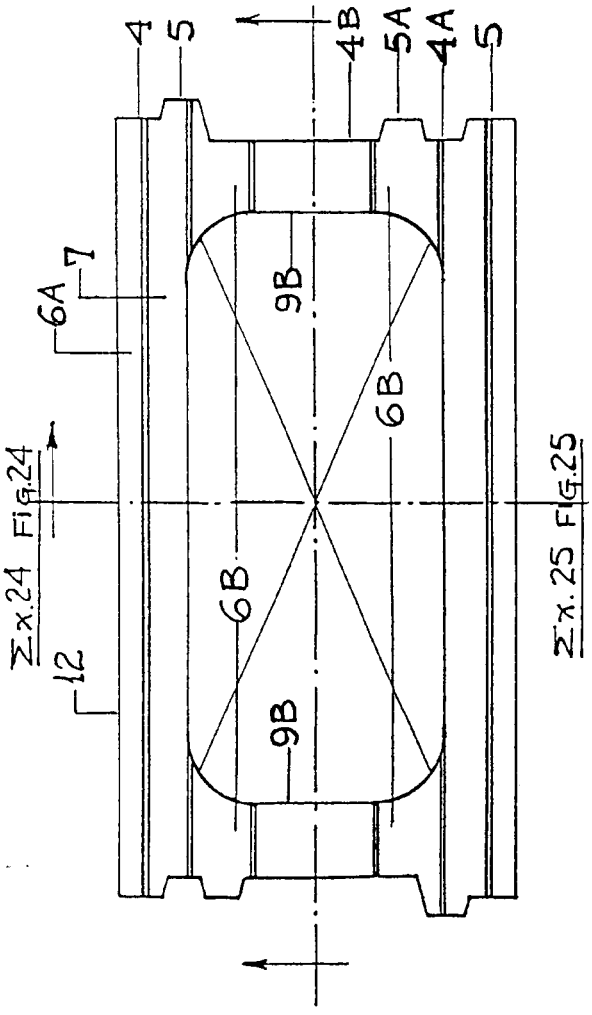
Fig.21

Fig.23



Σx.26 Fig.26





Σx.24 Fig.24

Σx.25 Fig.25

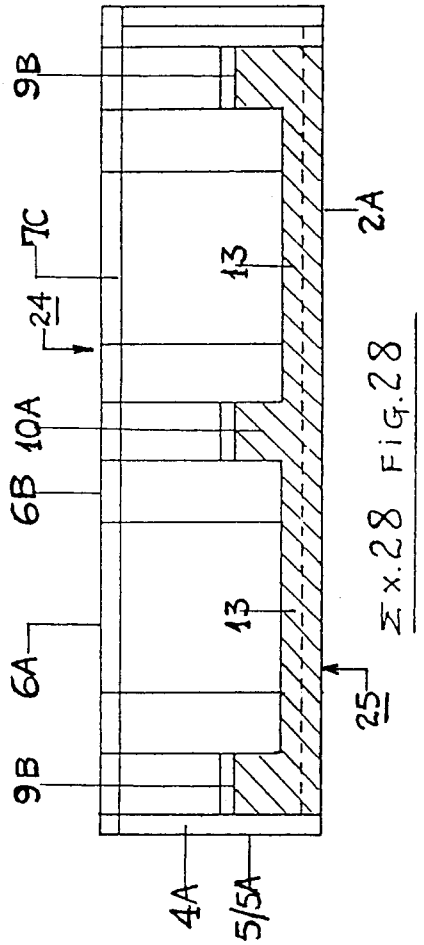


Fig.28

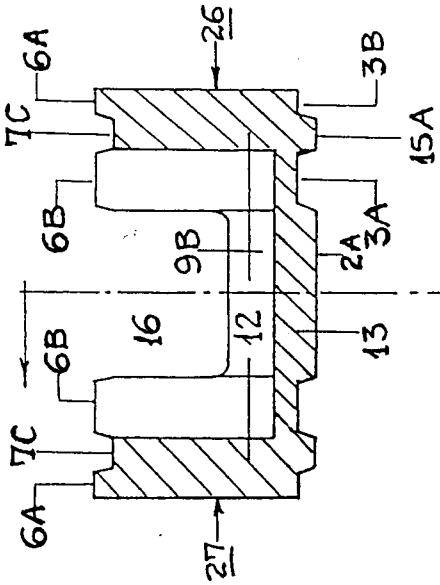


Fig.27

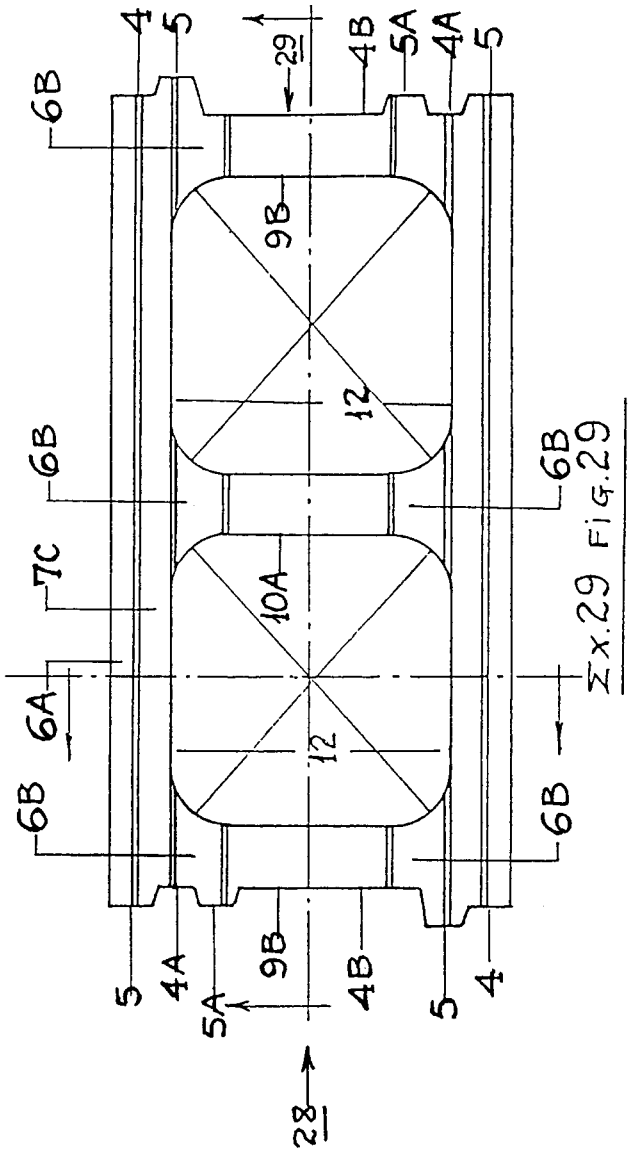


Fig.29

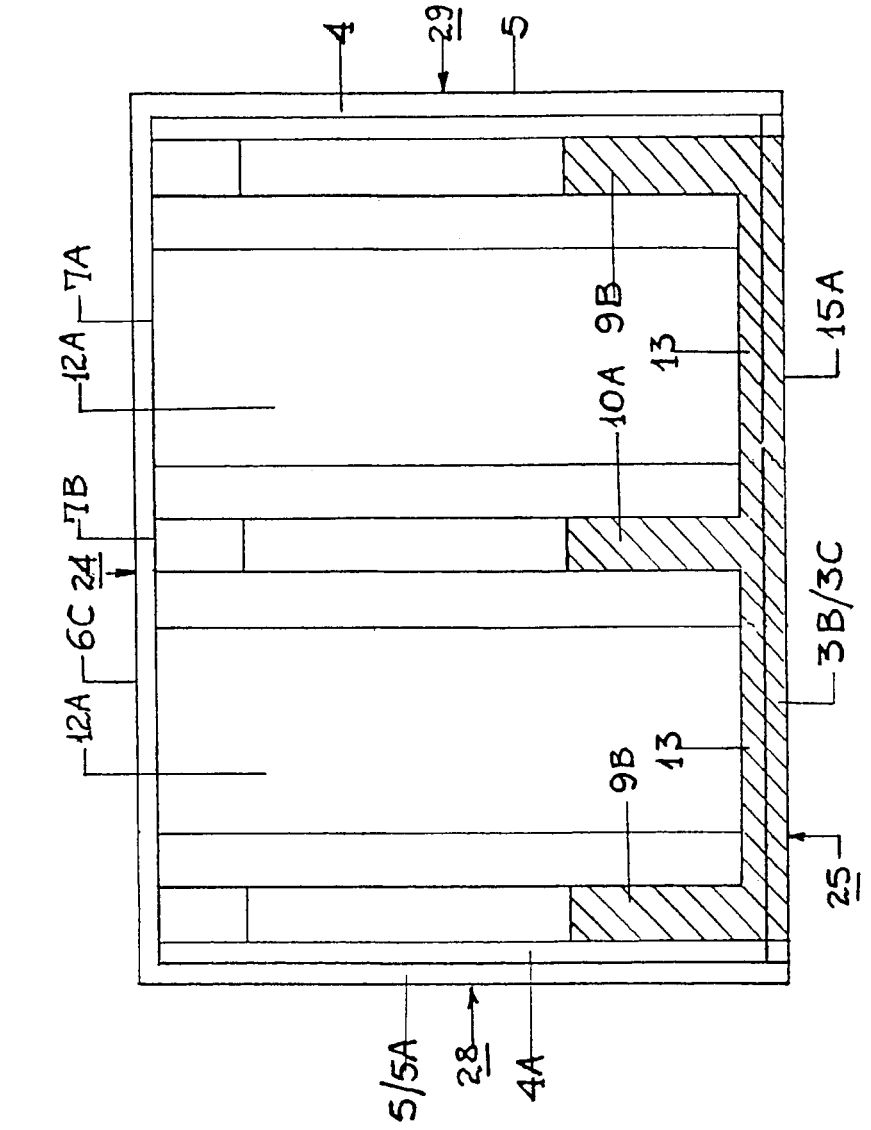

4
29
5
7A
12A
7B
6C
24
12A
10A
9B
13
15A
3B/3C
9B
13
25
5/5A
28
4A

Fig.31

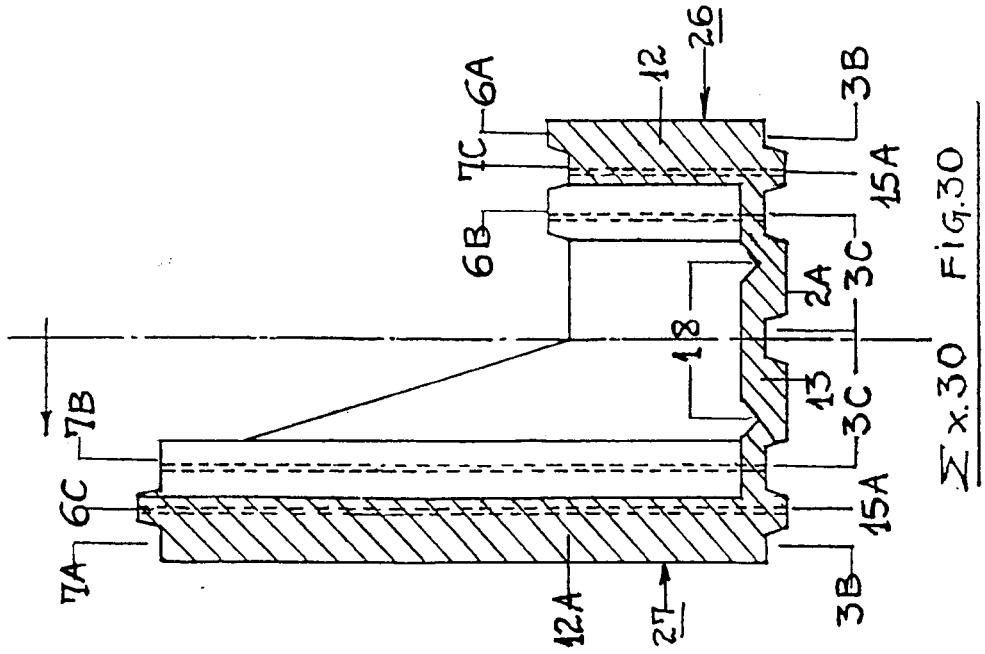
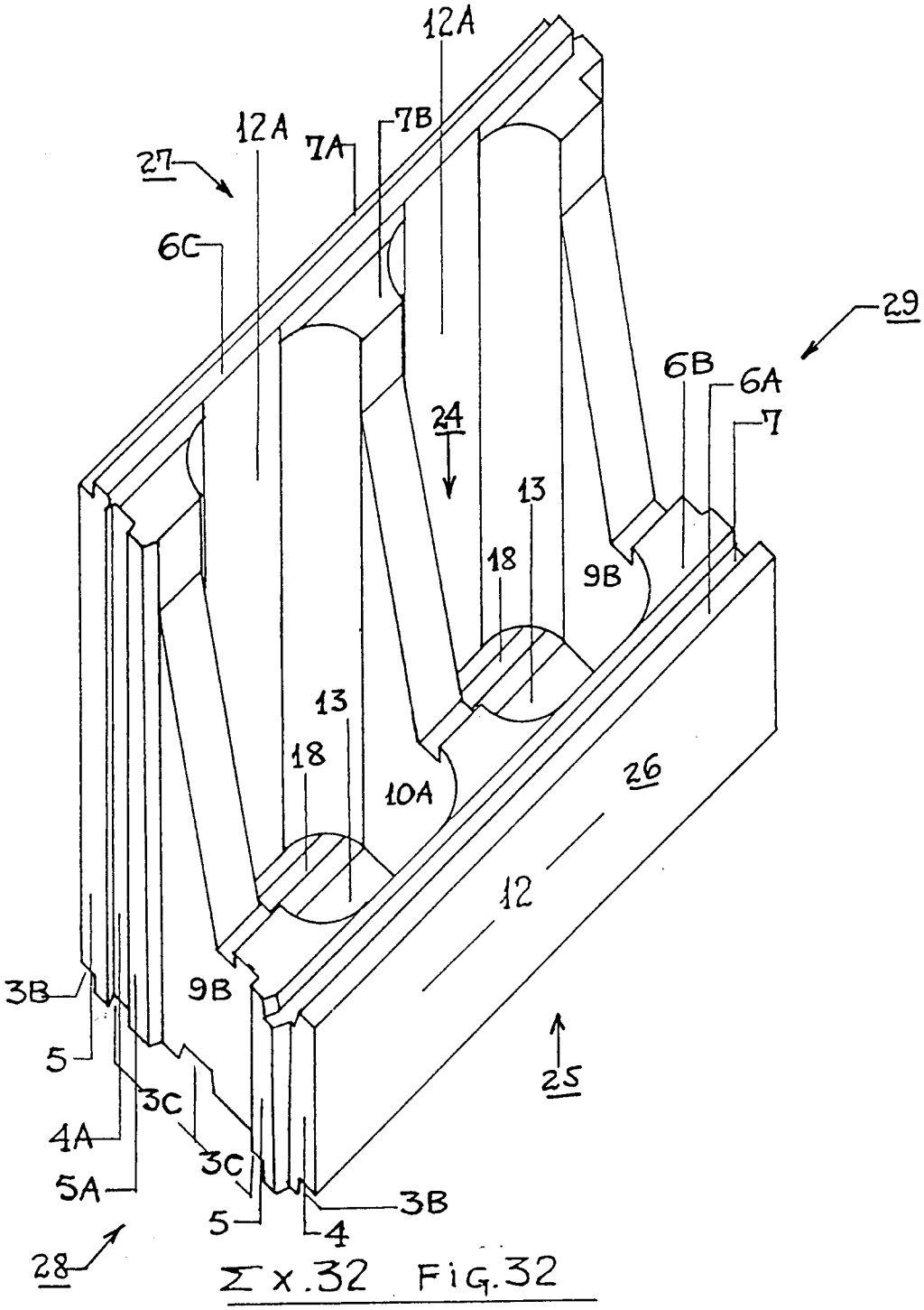
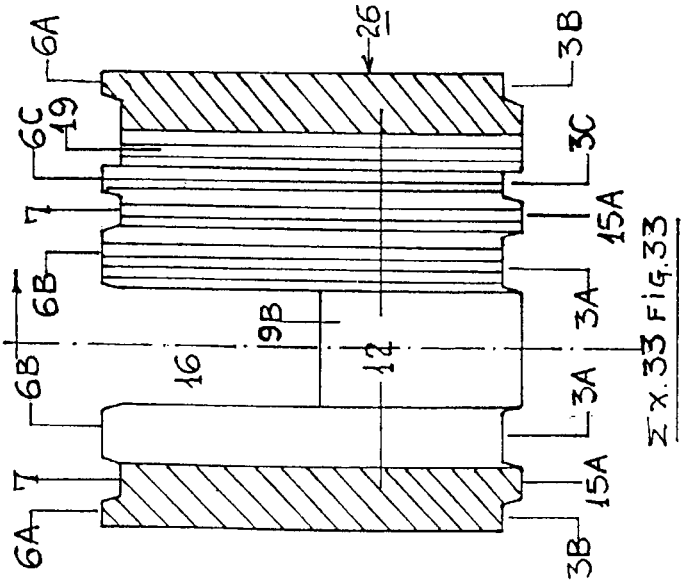
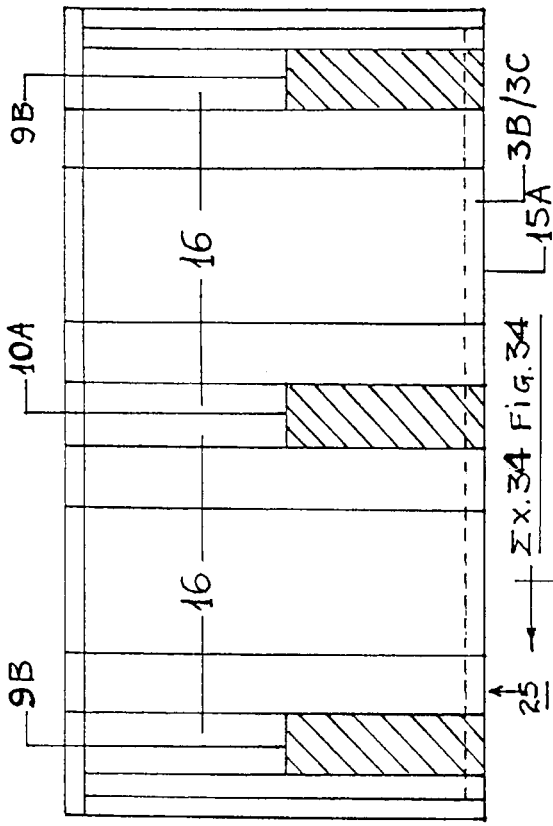

26
12
6A
7C
3B
15A
6B
2A
3C
18
13
3C
7B
6C
15A
7A
12A
27
3B

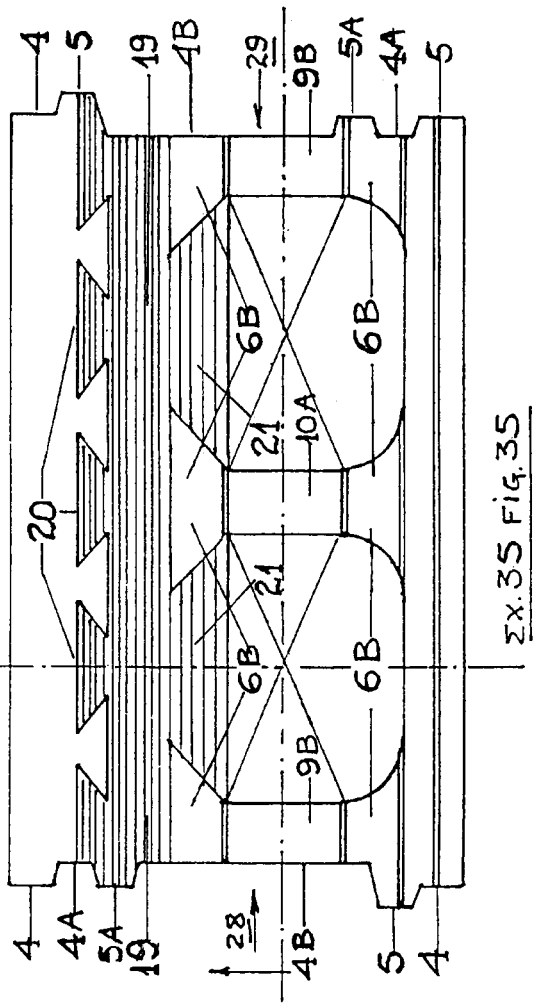
Fig.30

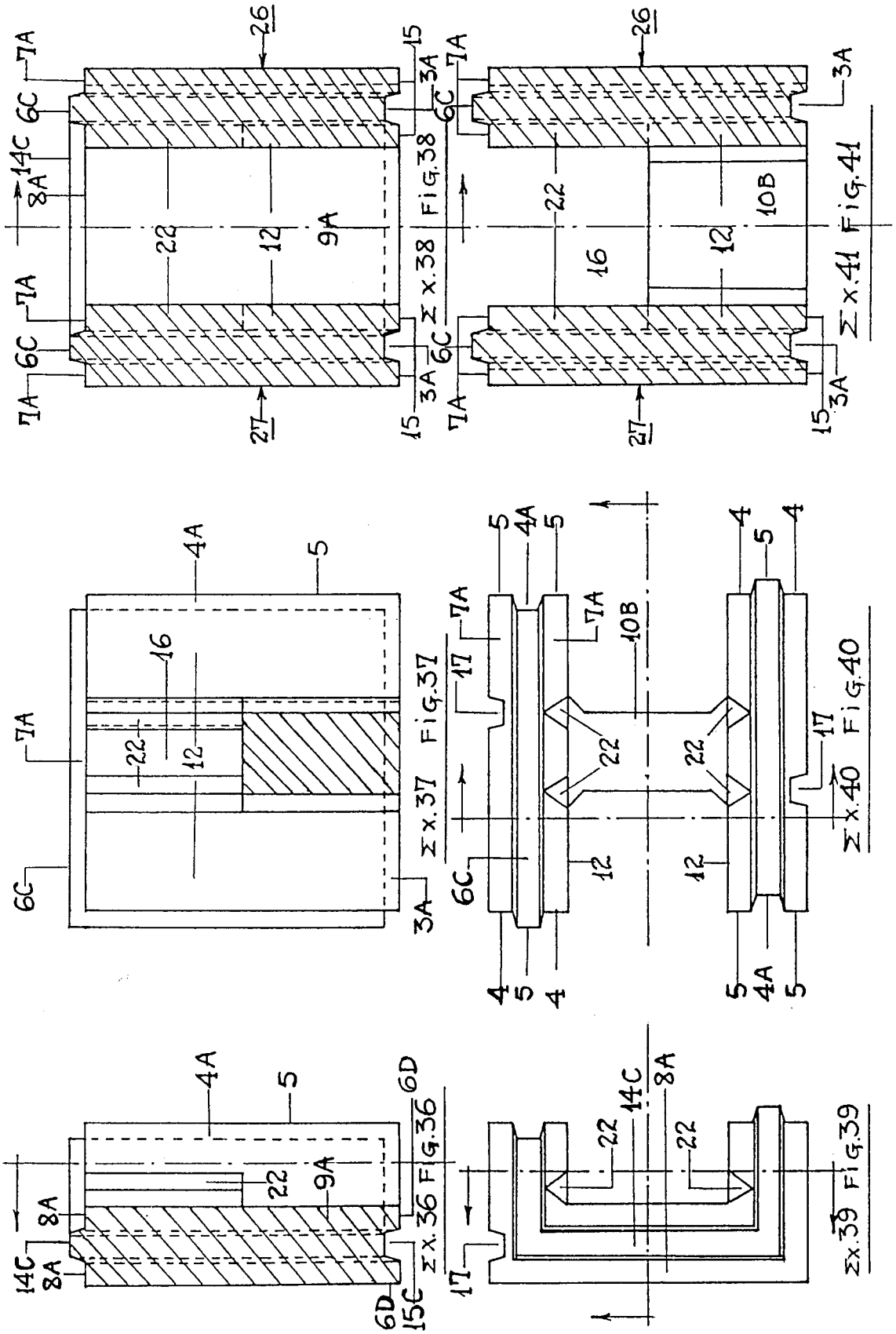

12A
12A
7A
7B
27
6C
29
6B
6A
7
24
13
18
9B
13
18
10A
26
12
3B
9B
5
3C
4A
3C
5A
5
3B
4
28
25

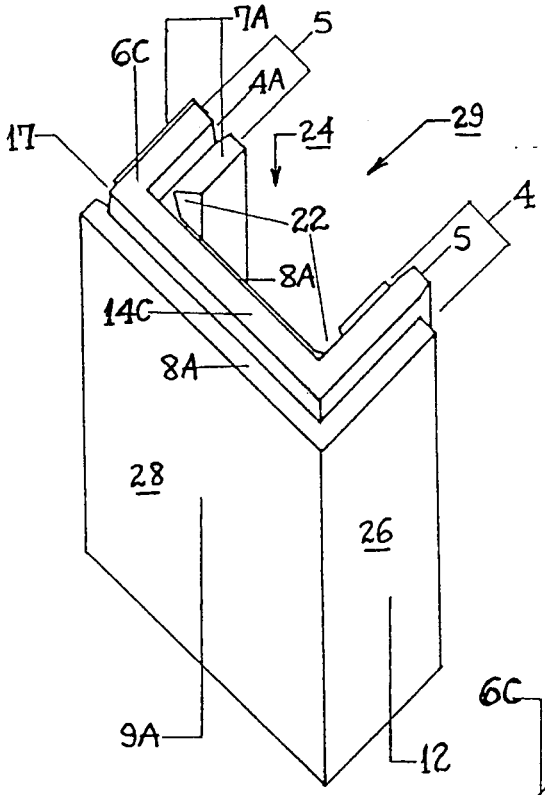
Σx.32 FiG.32


6A
6C
19
7
6B
6B
7
6A
26
3B
3C
15A
3A
3A
15A
3B
9B
16
12
Zx.33 Fig.33

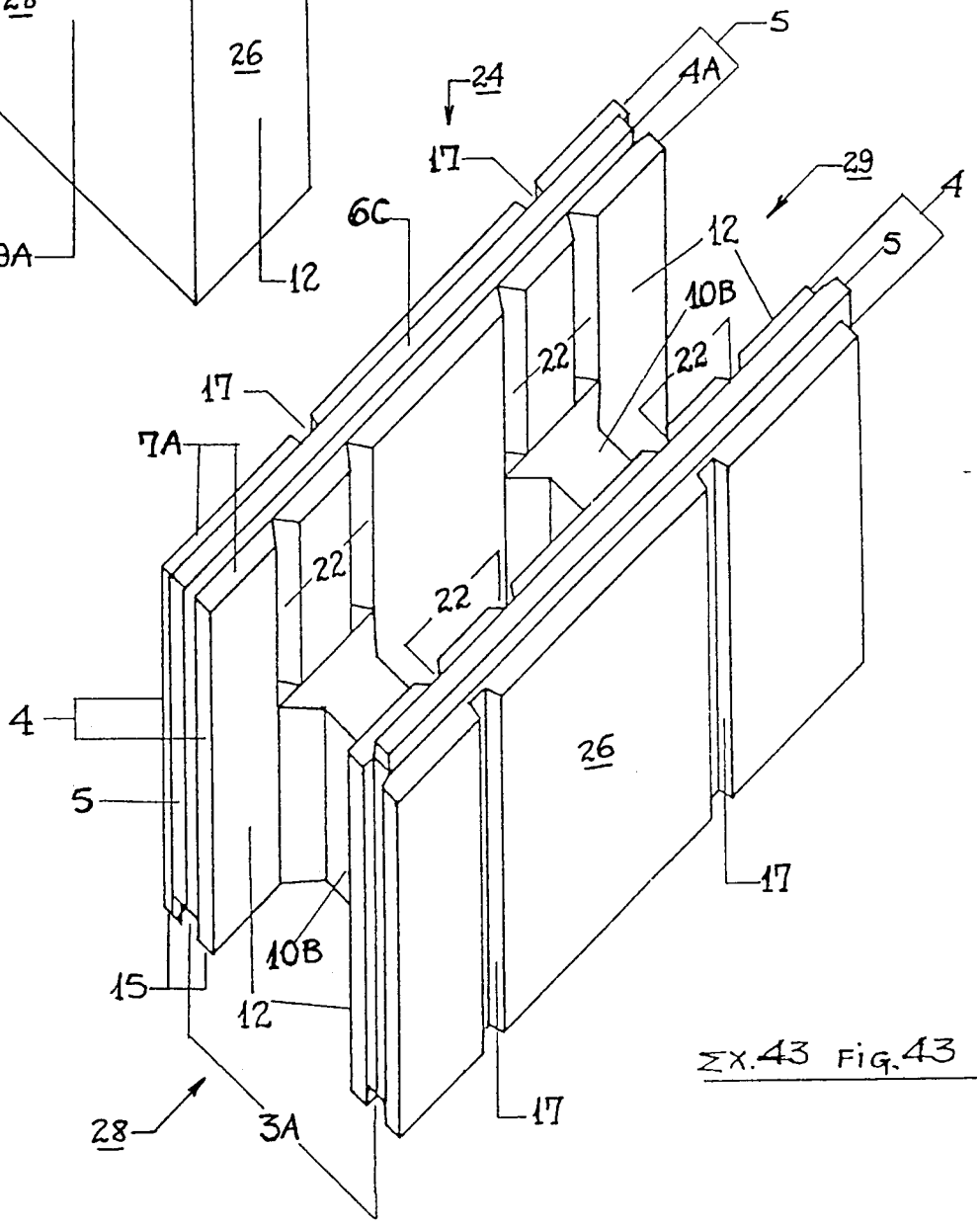

9B
16
10A
16
9B
3B/3C
15A
25
Zx.34 Fig.34


4
5
19
4B
29
9B
5A
4A
5
6B
6B
21
10A
20
21
6B
6B
9B
Zx.35 Fig.35
4
4A
5A
19
28
4B
5
4


26
15
3A
7A
6C
14C
8A
22
12
9A
Σx.38
FIG.38
16
10B
Σx.41
FIG.41
27
4A
5
Σx.37
FIG.37
17
Σx.40
FIG.40
6D
15C
Σx.36
FIG.36
Σx.39
FIG.39



EX.42 FIG.42



EX.43 FIG.43

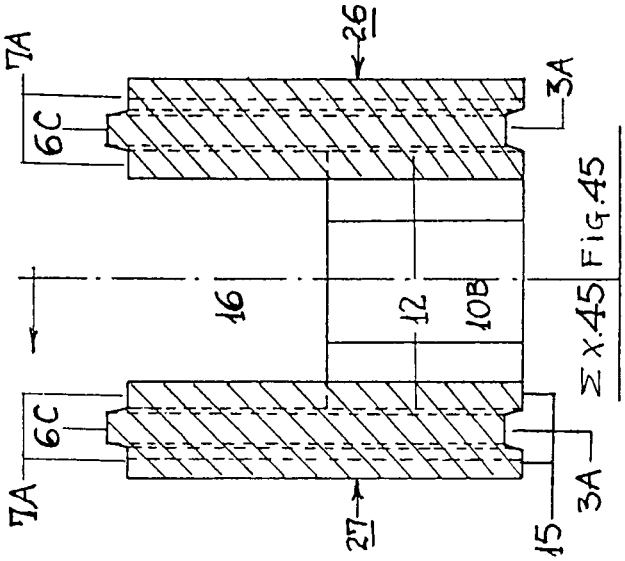
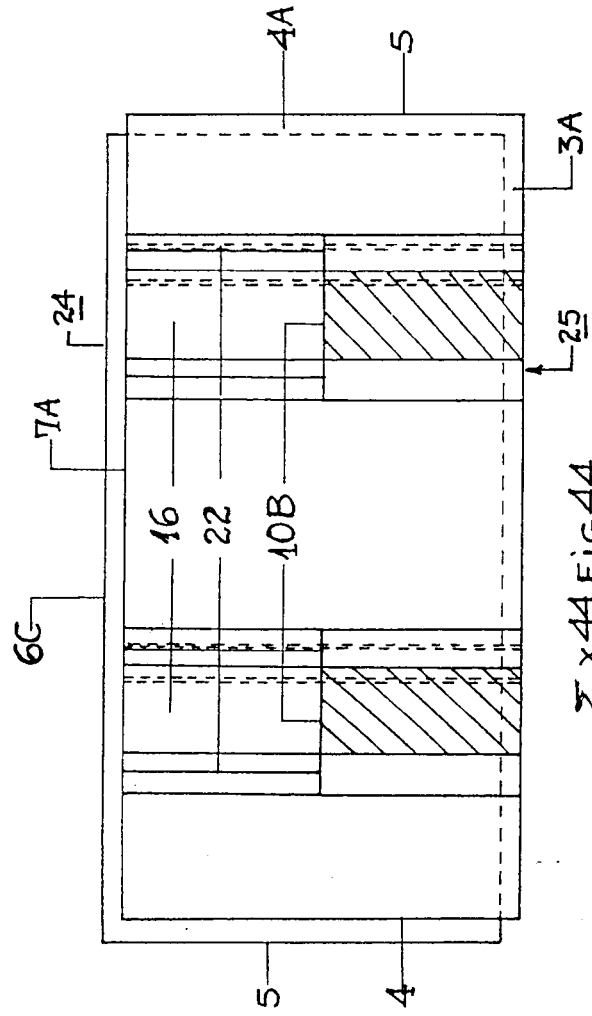
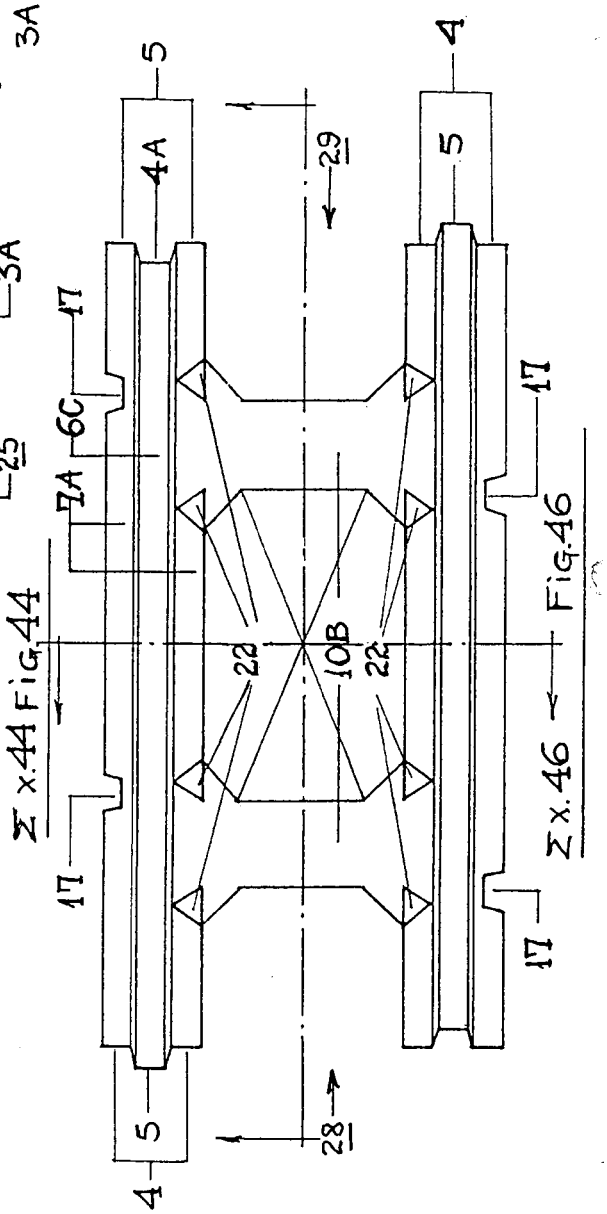


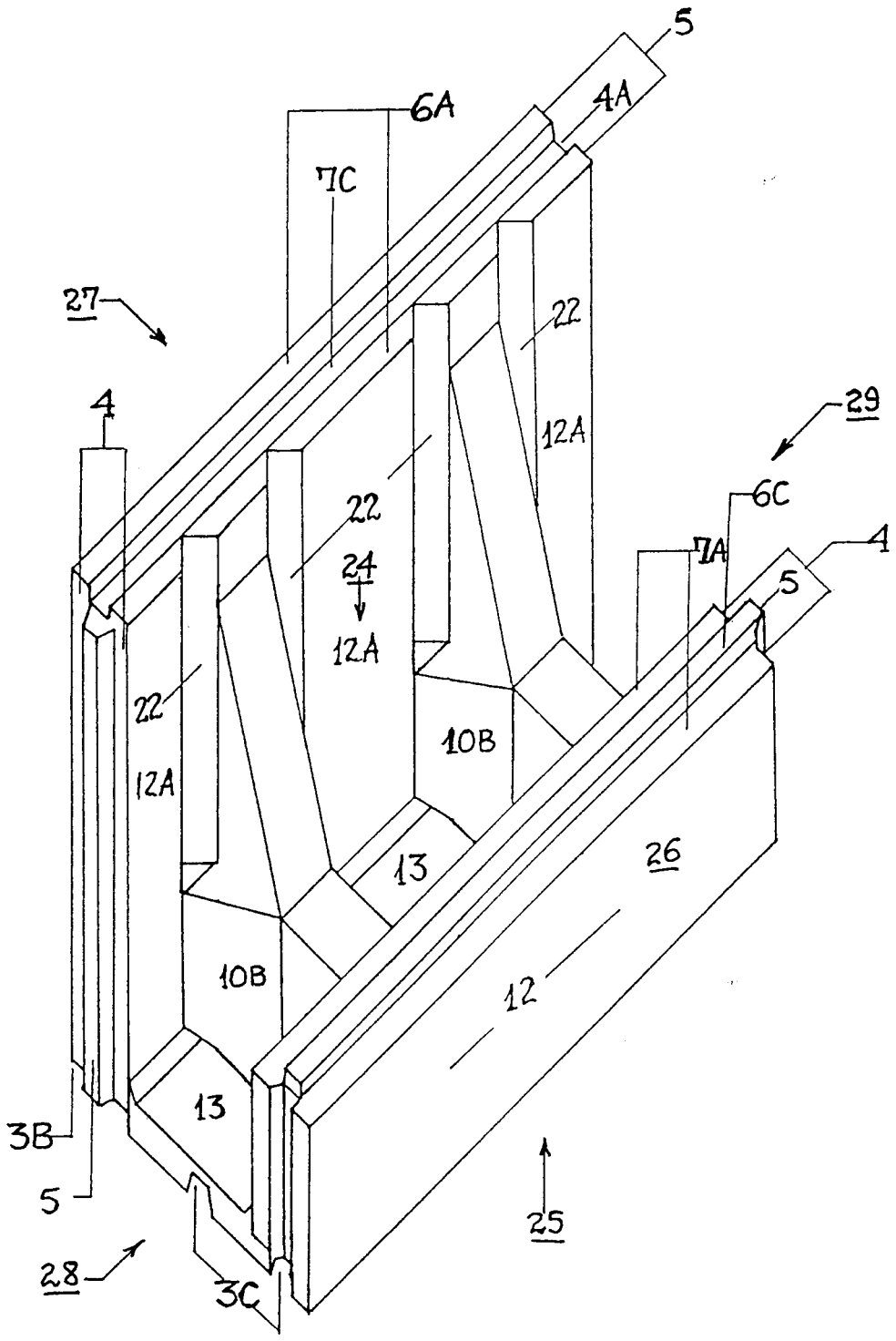
Fig.45



Σ x.44 Fig.44



Σ x.46 Fig.46


5
6A
4A
7C
27
22
4
29
12A
6C
22
24
7A
4
5
12A
22
10B
12A
13
26
10B
12
13
3B
5
25
28
3C

Ex.47 FIG.47

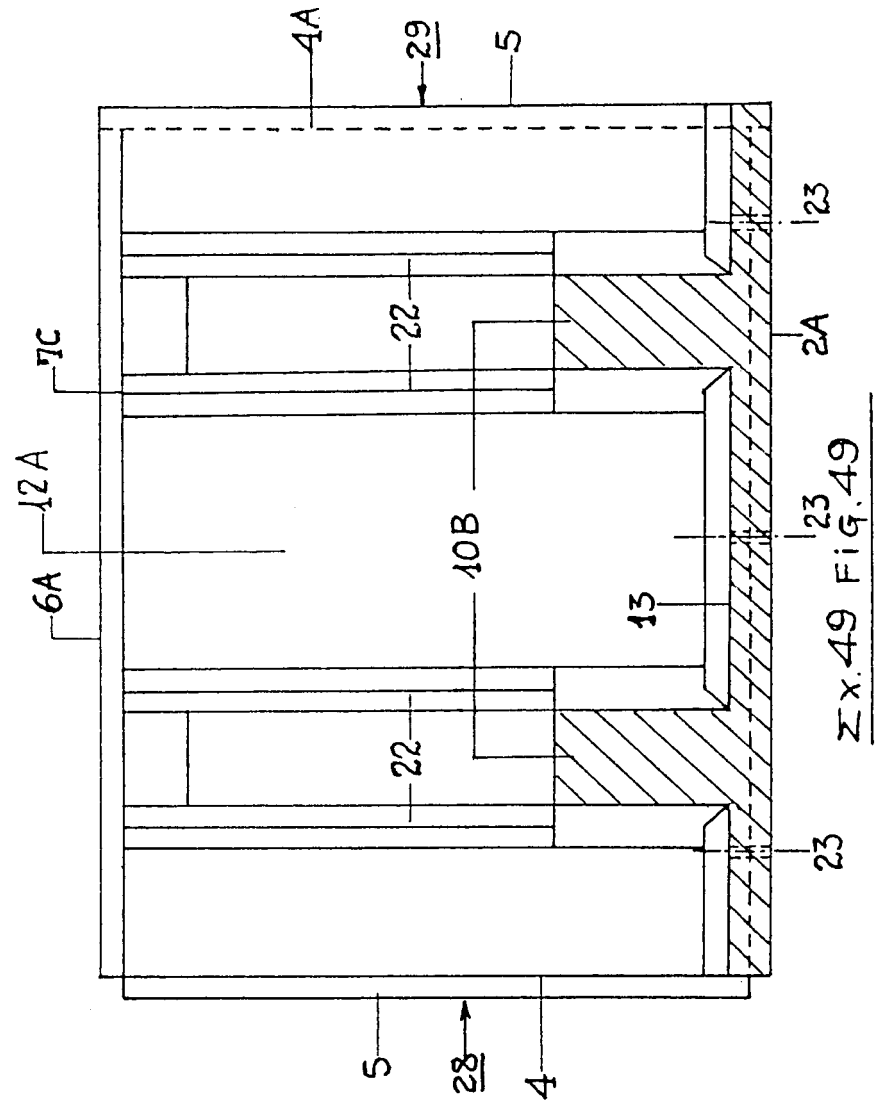

4A
29
5
23
22
2A
7C
12A
10B
6A
13
23
22
23
5
28
4

FIG.49

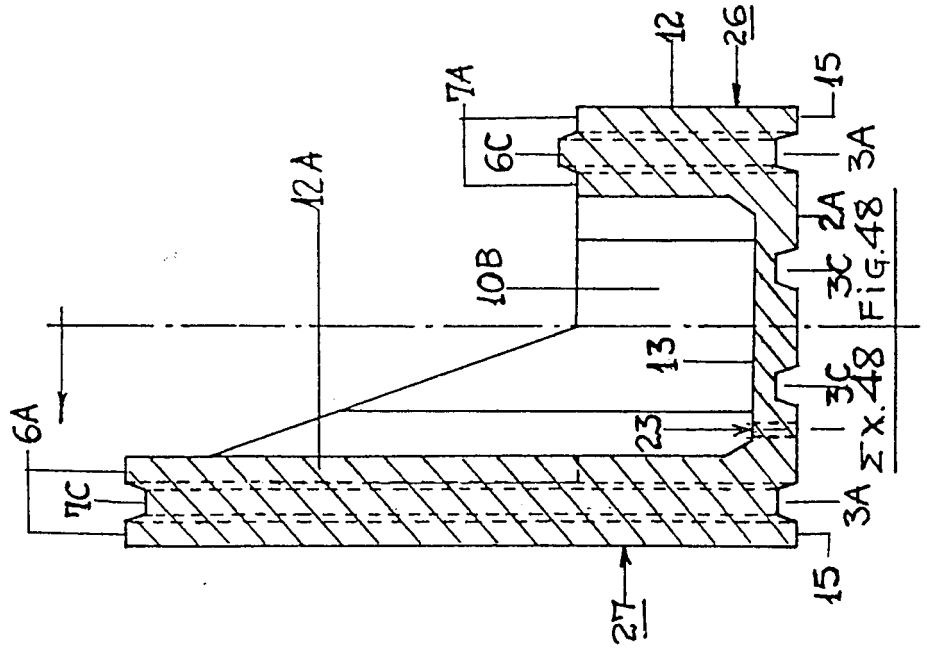

12
26
15
7A
6C
3A
12A
2A
10B
3C
13
3C
6A
23
7C
3A
27
15

FIG.48

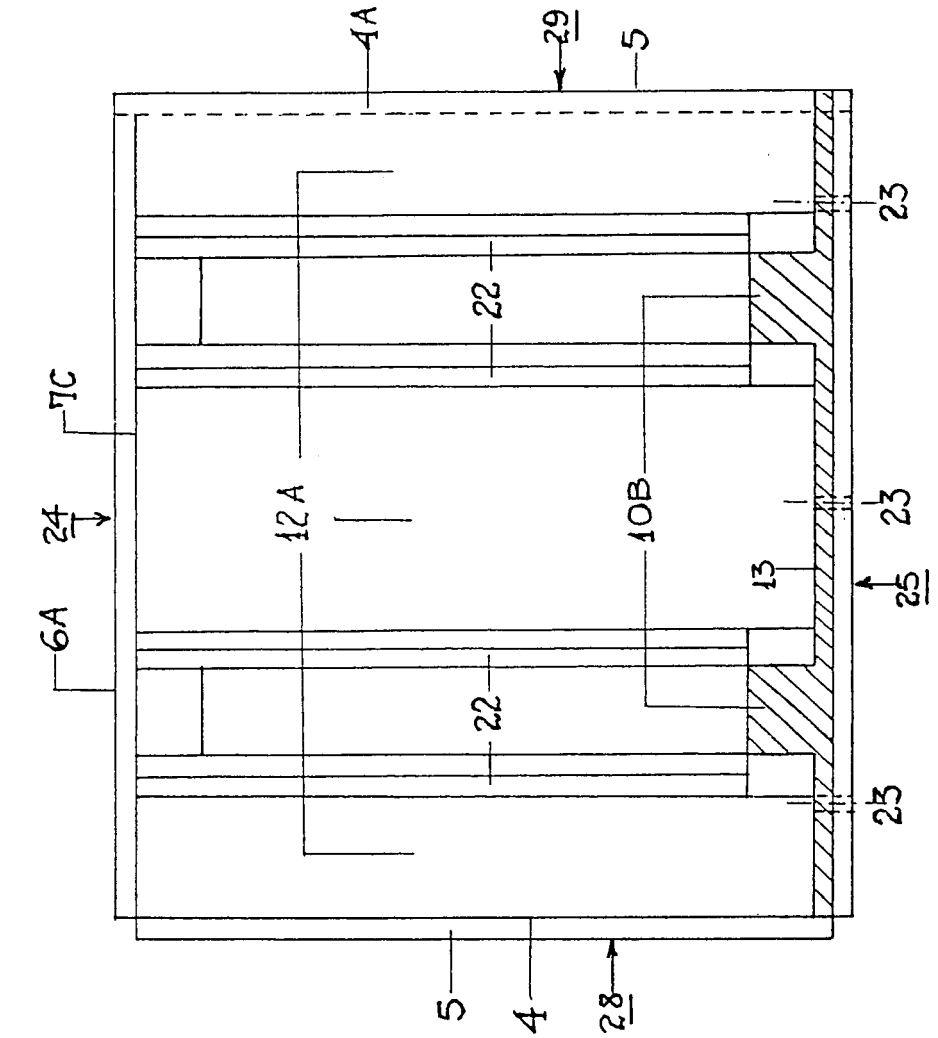
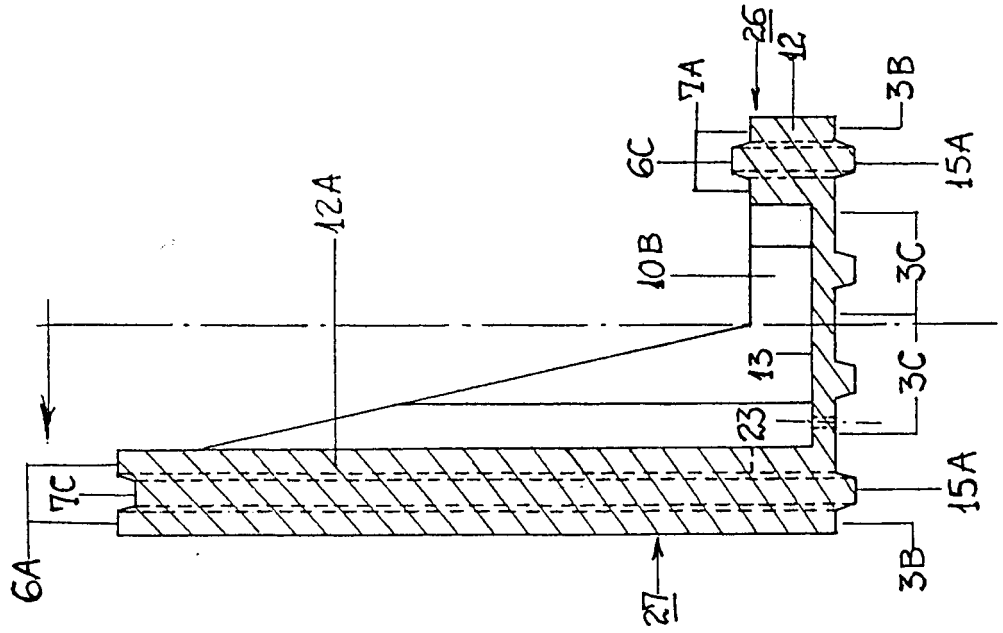

4A
29
5
23
22
7C
24
12A
10B
23
13
25
6A
22
23
5
4
28

Fig. 51


26
12
7A
3B
6C
15A
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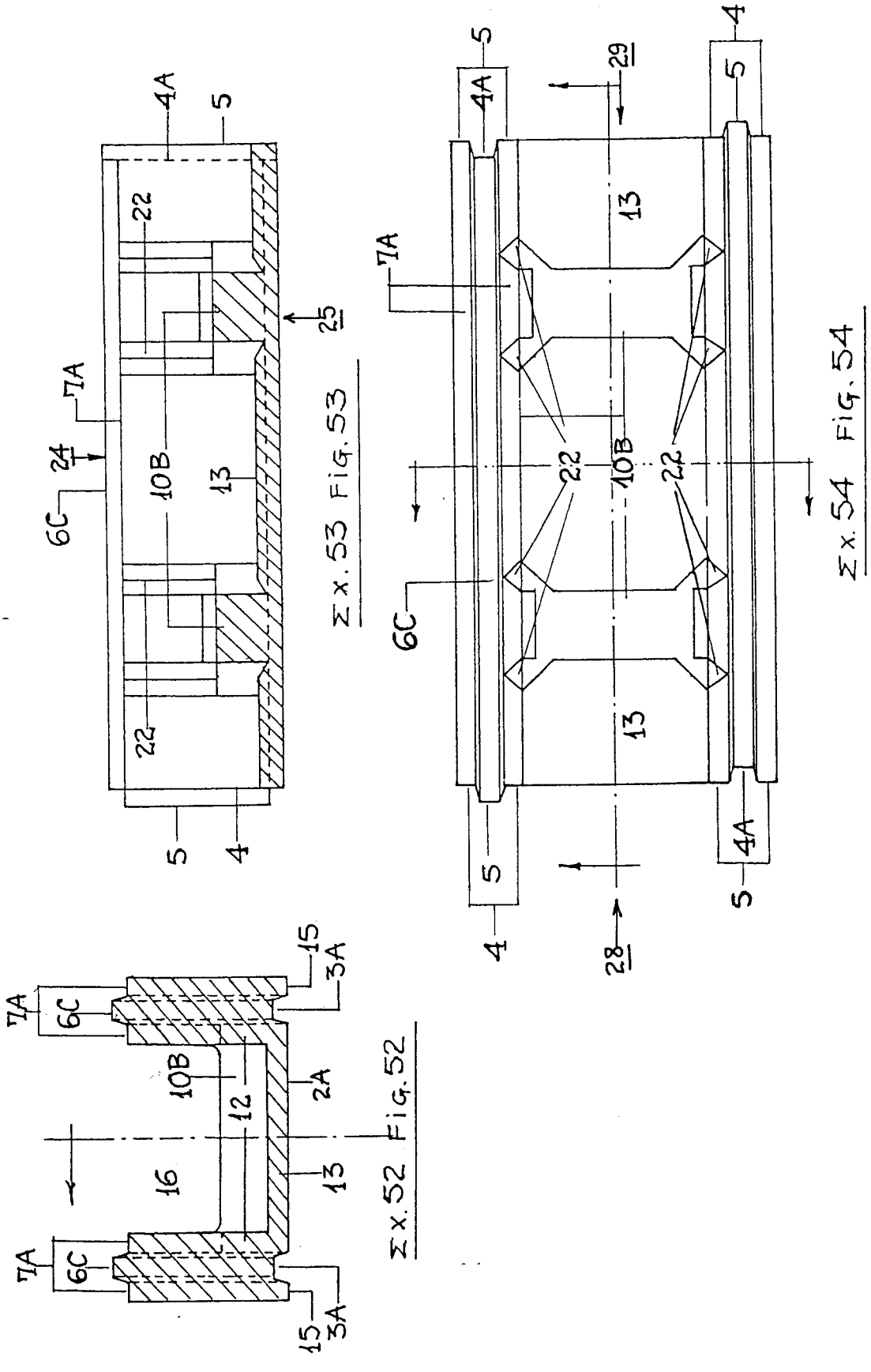
10B
3C
13
3C
23
7C
15A
6A
3B
27

Fig. 50


4A
5
22
25
7A
24
6C
10B
13
22
5
4
Fig. 53
5
4A
29
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7A
22
10B
22
6C
13
4
5
28
4A
5
4
Fig. 54
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3A
7A
6C
10B
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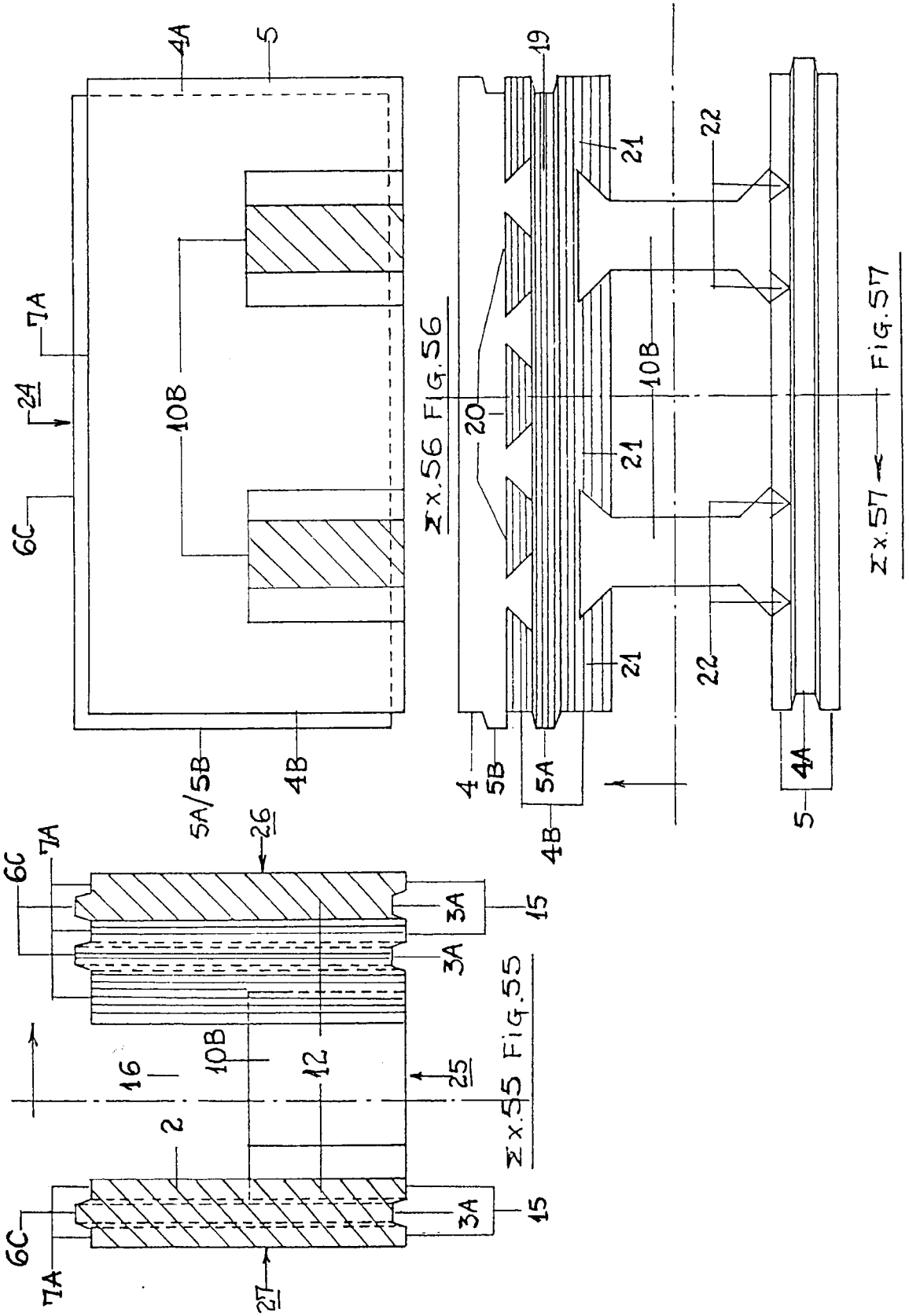
2A
16
13
7A
6C
15
3A
Fig. 52


4A
5
7A
24
10B
6C
5A/5B
4B
26
3A
15
16
12
25
2
27
Fig.55
Fig.56
Fig.57
19
20
21
22
4
5B
5A