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(54) Wall studs and connectors therefor

(57) A stud 10 comprises two parallel lengths 12a, 12b of timber held apart by a plurality of connectors 14 formed from sheet metal. Each connector 14 comprises two coplanar, head portions 16a, 16b connected by a shank 18. The head portions 16a, 16b comprise nails, integrally formed by punching, which are embedded in the wood so that the head portions are flat against coplanar faces of the timber lengths 12a, 12b. Material adjacent the edge of the shank may be bent through a right angle to form reinforcing flanges 24 extending along the length of the shank. Lugs 30, may be formed integrally with the flanges 24 at their ends to assist in construction of the stud by ensuring that the timber is correctly separated, before the nails are embedded in the wood.

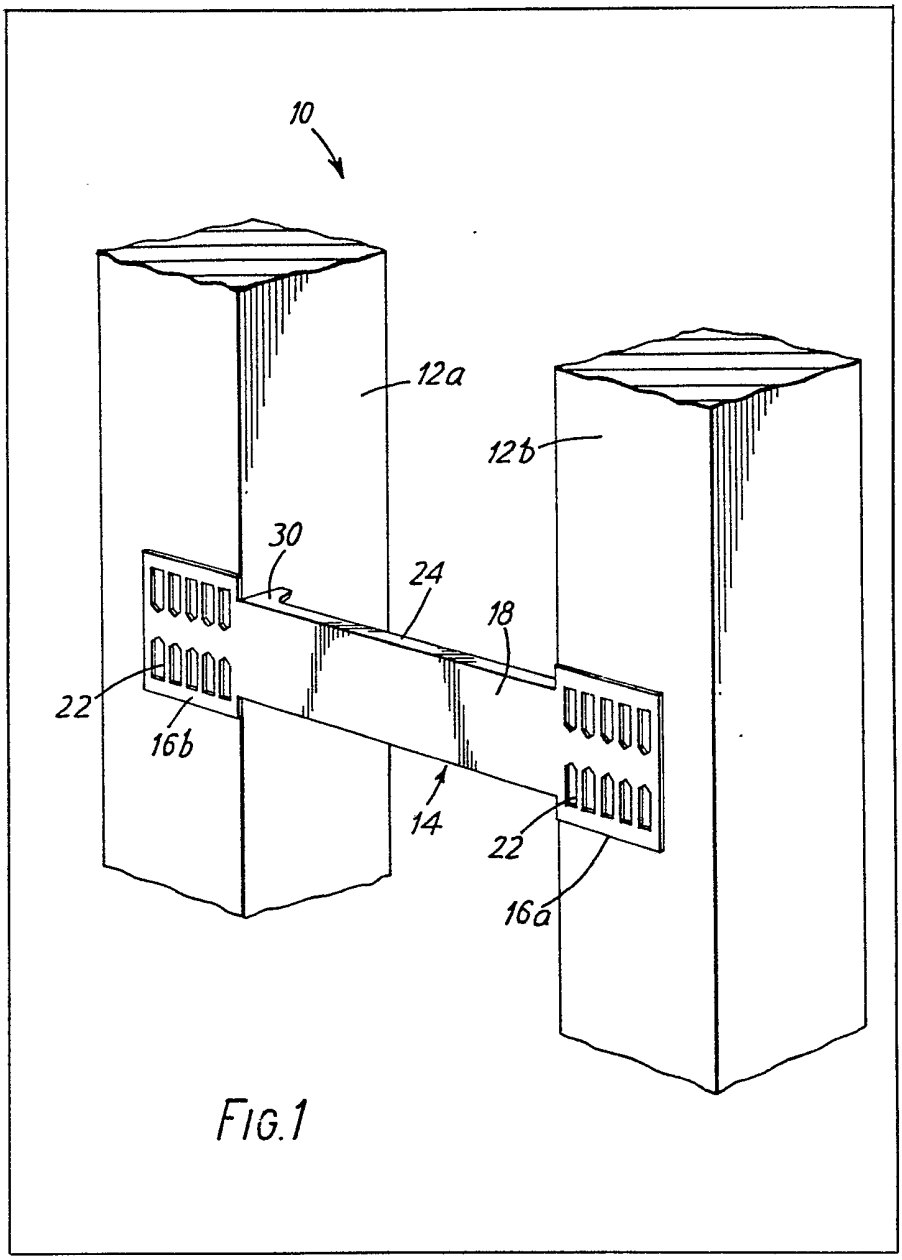

FIG.1

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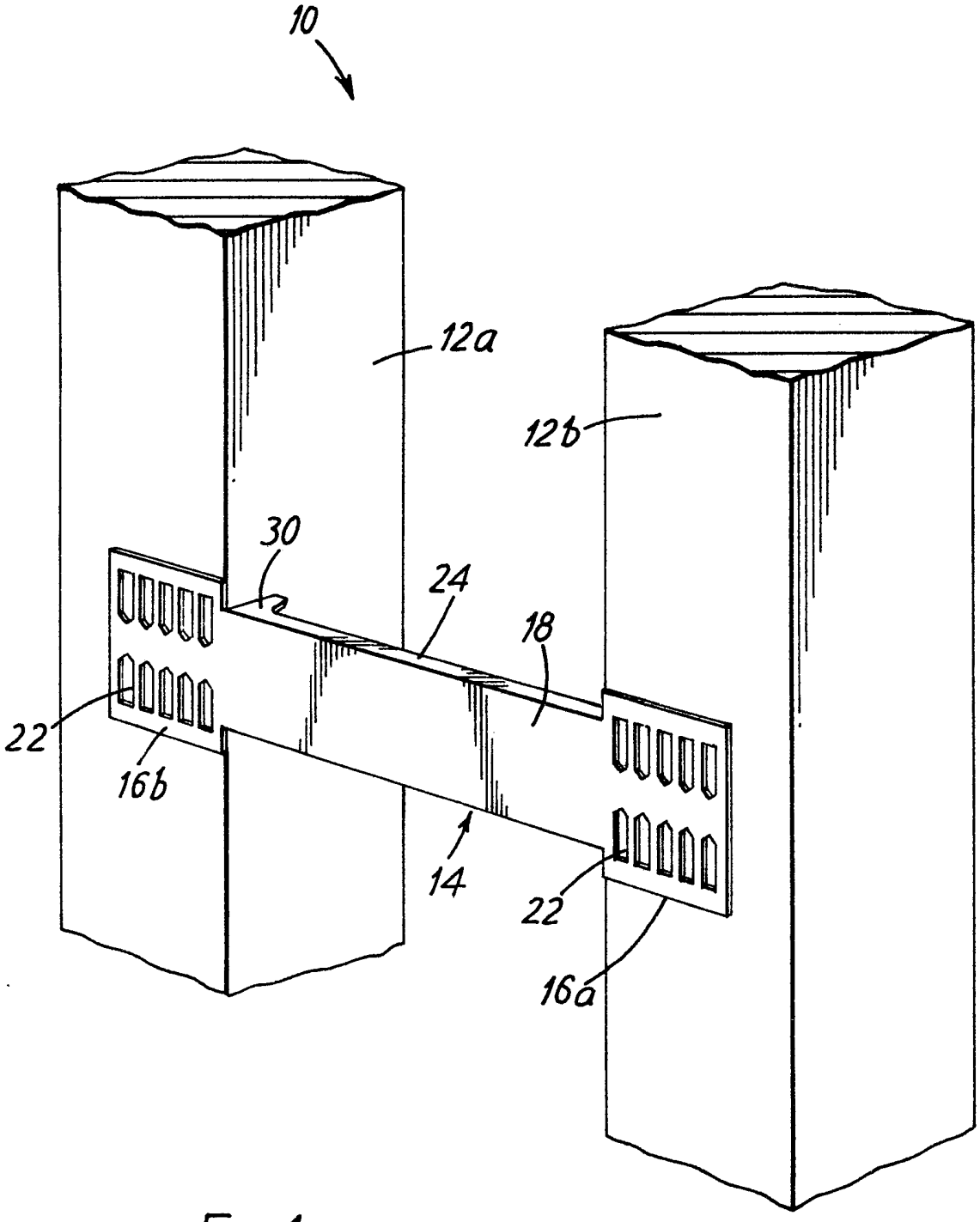


FIG.1

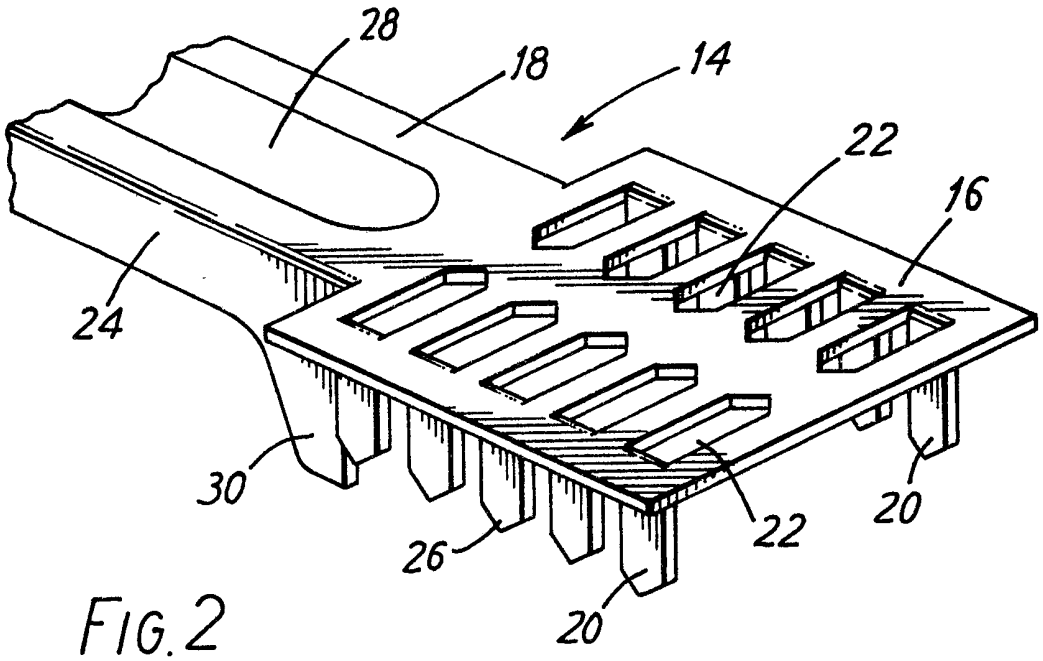


FIG. 2

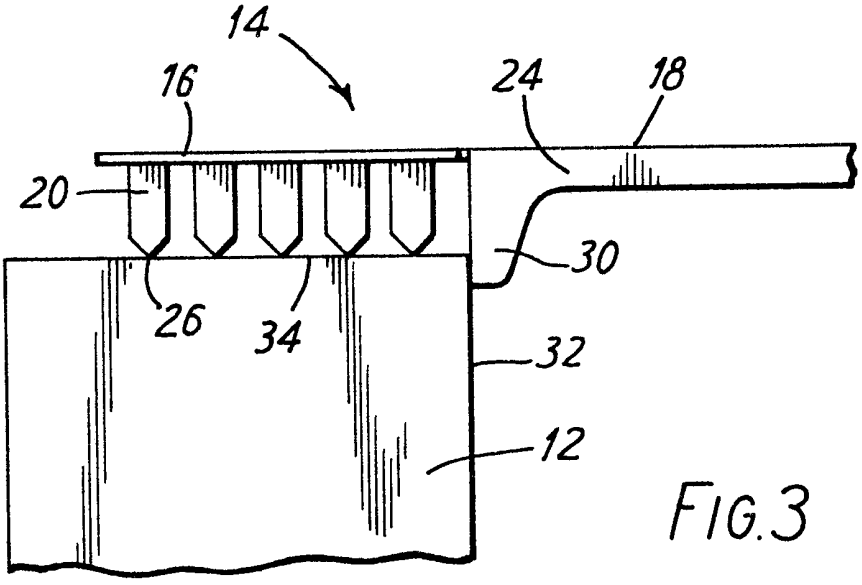
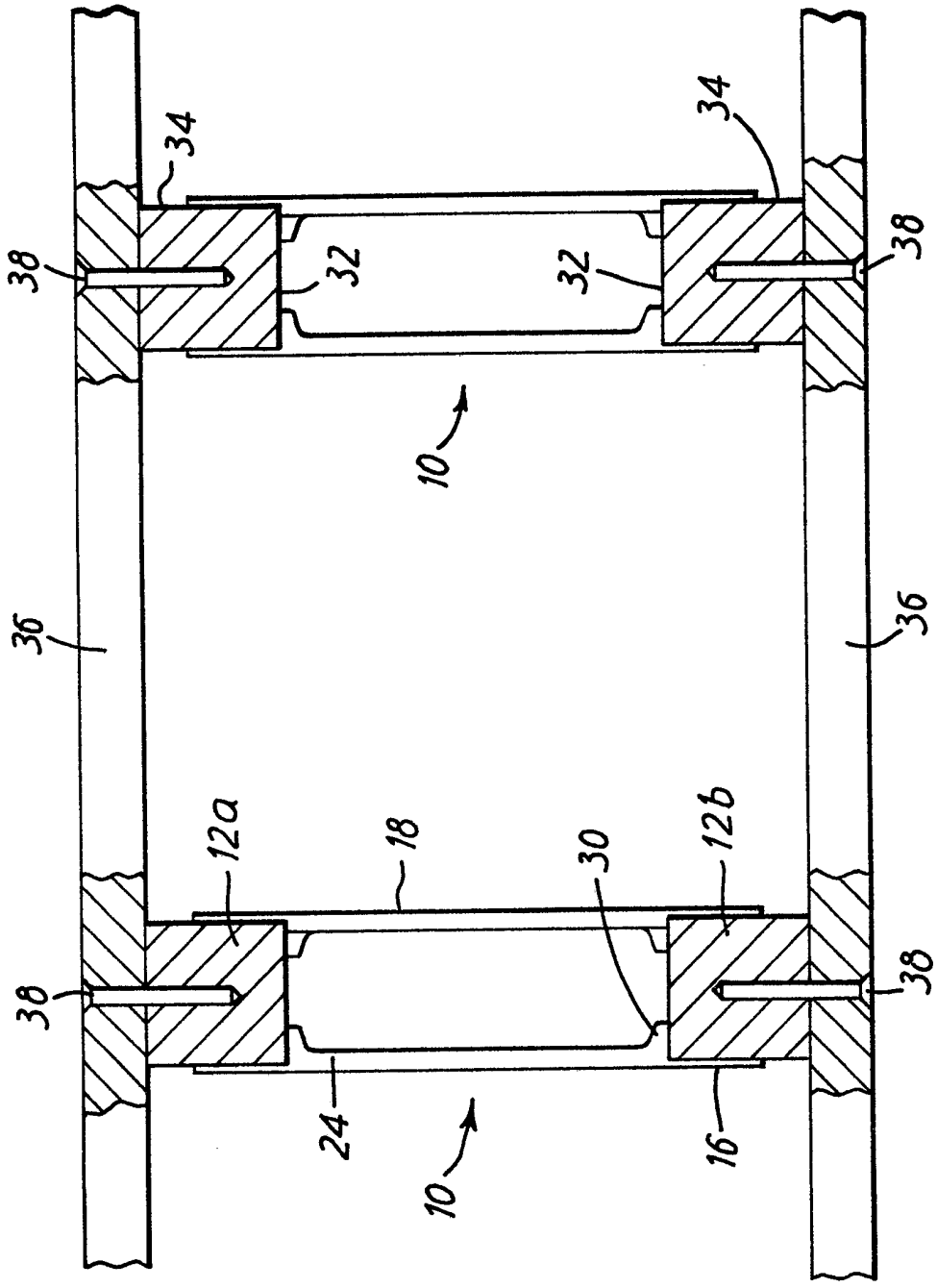


FIG. 3

FIG. 4



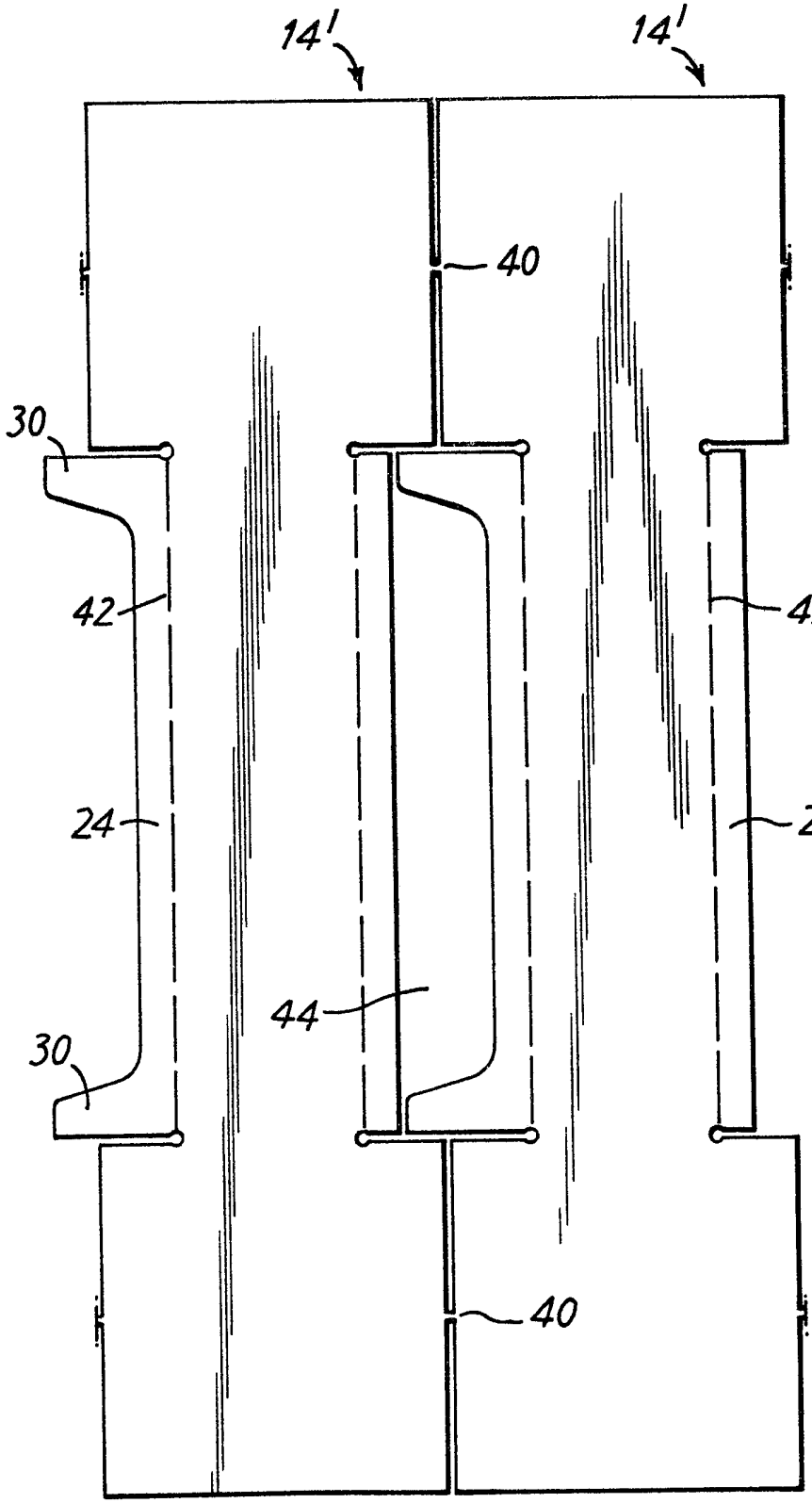


FIG.5

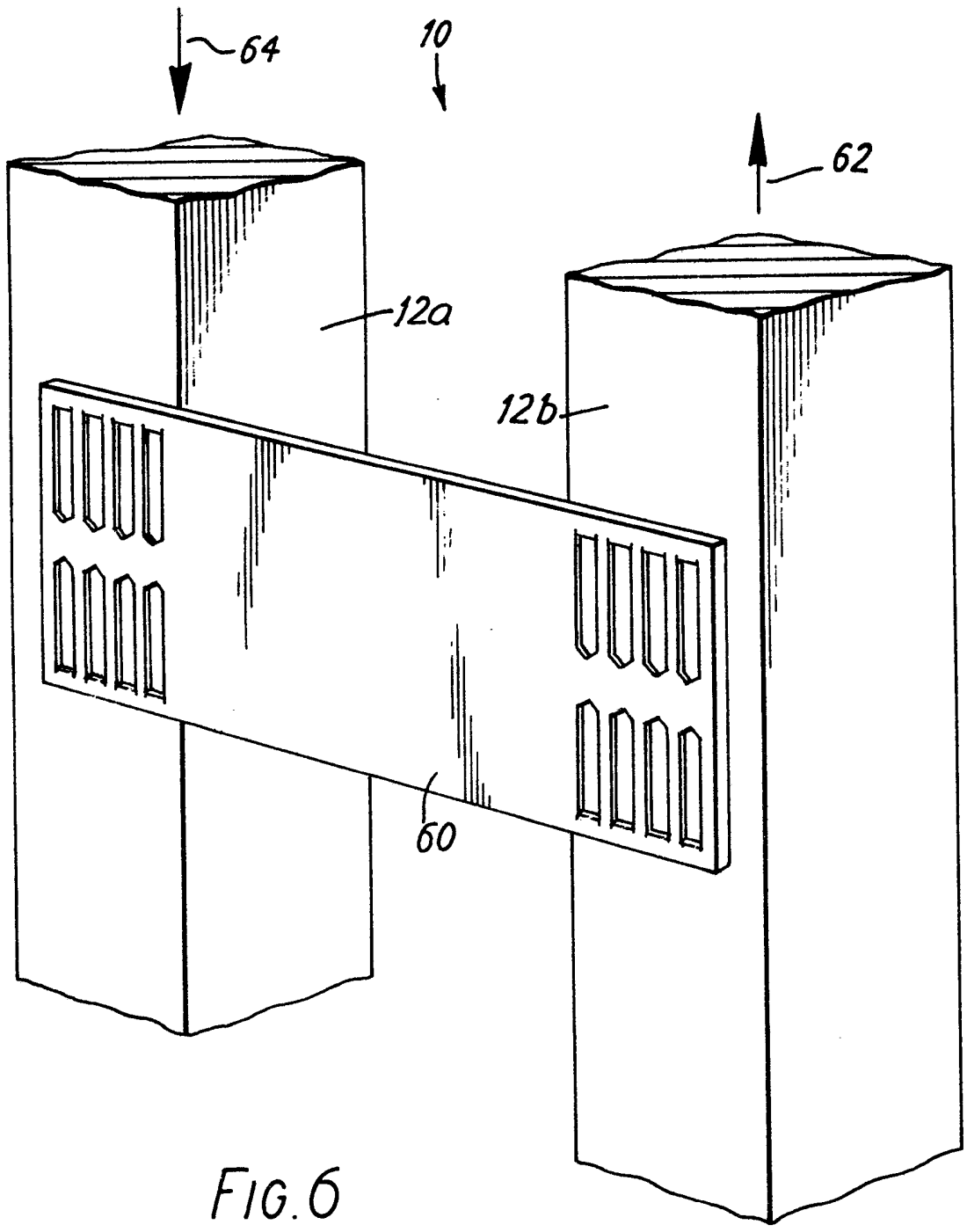


FIG. 6

SPECIFICATION

Wall studs and connectors therefor

The present invention relates to studs for use in the construction of walls and connectors for use in fabricating the studs.

It is well known to construct walls by cladding both sides of a row of vertical, horizontally spaced timber studs with building boards. If the wall is required to have a large cavity, for instance, if it is to be used as the outer wall of a building in a cold climate, the studs may have a cross-section as large as 195 mm × 45 mm. A considerable amount of timber is required to build a wall of this sort and consequently the cost of such a wall is high.

A need therefore exists for means by which the amount of timber used in such a wall may be reduced without any effective reduction in the strength of the wall, a need which is met by the present invention. According to the present invention there is provided a stud as defined in claim 1 below. The invention also provides a connector for use in such a stud, as defined in claim 6.

The preferred embodiment of the stud and the stud connector and a wall comprising such studs, will now be described with reference to the drawings in which:

Fig. 1 is a perspective view of a length of a stud according to the present invention,

Fig. 2 is a perspective view of one end of a stud connector according to the invention,

Fig. 3 is a partial plan view of the stud during construction,

Fig. 4 is a partial cross-section on a horizontal plane of a wall according to the invention, comprising of plurality of the studs,

Fig. 5 shows a pair of stud connectors during their manufacture, and

Fig. 6 is a perspective view of a length of a stud according to the invention and shows a connector plate, which may be used in addition to stud connectors.

Referring to Fig. 1, a stud 10 comprises a pair of parallel, spaced timber lengths 12a, 12b, which have a generally square or rectangular cross-section. The timber lengths 12a, 12b are held in position relative to each other by a plurality of stud connectors 14, only one of which is shown in Fig. 1. The timbers may be 45 mm square.

Each connector comprises two coplanar head portions 16a, 16b connected by a shank 18. Each head portion comprises integrally formed nails 20, see Fig. 2, which are stamped out from the material of the head portions 16a, 16b, leaving slots 22. The nails extend generally perpendicular to the head portions 16a, 16b and are sharpened at their extremities 26.

The material adjacent each edge of the shank is bent through a right angle to form flanges 24 which extend along the length of the shank. The flanges increase the rigidity of the shank under compression. Strengthening may be provided in addition, or alternatively, by swaging a region of the shank to form a rib 28 along all or part of the shank. At each end of the shank, either or both flanges has an integral lug 30, coplanar with the flange 24, to facilitate alignment and spacing of the timber lengths 12a, 12b during construction of the stud 10, in a manner indicated in Fig. 3. The timber lengths 12a, 12b can be pushed into each other until the opposing faces 32 of the lengths 12 abut the edges of the lugs 30, thus ensuring that the lengths 12 are correctly spaced.

Pressure is now applied to the head portions 16 to push the nails 20 into the timber lengths 12 until the head portions 16 are flat against the coplanar timber faces 34, and the nails 20 are embedded in the timber. It will be apparent that connectors may be used on either or both sides of the stud, spaced according to the strength which the resultant stud is required to have. Furthermore, the final separation of the timber is predetermined, during manufacture of the connector, by the length of the shank 18. Shank lengths may be 80, 105, 130 or 155 mm to give stud depths of 170, 195, 220 and 245 mm respectively. The stud may further comprise one or more connector plates 60, see Fig. 6, each comprising nails formed integrally in the same manner as are the nails 20, the nails at each end of the plate being embedded in the timber lengths 12, so that the plate abuts faces of both timber lengths 12. The racking resistance of the stud, that is the resistance of the stud to shearing forces acting on the timber lengths 12, in the direction of, for instance, the arrows 62, 64, is thereby increased. Rectangular plates can also be used to provide a stud with increased resistance to point loads from above, for instance if a stud is to be positioned beneath a wall in the storey above. In this case, further timber lengths are interposed between the timber lengths 12. The timber is held together by a plurality of connector plates having integral nails across the whole of one face, which are embedded in the various timber lengths. No stud connectors of the type shown in Figs. 1 to 5 are used in a stud of this type, which need only be used when unusually high point loads are likely to be encountered.

Studs of the type described can be used to construct a wall as indicated in Fig. 4. A plurality of parallel, spaced studs are clad with boarding 36 in two parallel planes, the boarding 36 being attached to the studs 10, usually by nails 38, so that the connectors are perpendicular to the boarding. The cavity between the boarding, including the space within the stud, may be filled with insulating material. The narrow flanges 24 allow the insulating material to be introduced even between the connectors when they are used in opposed pairs, so avoiding even small cold spots in the wall.

As shown in Fig. 3, the nails 20 preferably come near to the edge of the face 34 in order to avoid a zone prone to buckling under compressive loads.

A large number of connectors can be manufactured simultaneously in a manner

indicated by Fig. 5. A chain of connector blanks 14' are stamped from a strip of metal and are connected by necks 40. A pressing action bends the flanges 24 along the lines 42 and punches the nails 20 in the head portions, to produce a chain of finished connectors, joined by the necks 40. The necks 40 are sufficiently pliable to allow the chain of connectors to be coiled up for storage or transport prior to use. Such a coil is a convenient source of connectors for a machine assembling studs, which can break connectors off the coiled chain, one by one, whilst forming the stud in the manner described above.

It will also be apparent that very little waste is produced during the manufacturing process. Only a small region 44 of material between each pair of adjacent blanks is not used in the final connectors.

CLAIMS

1. A stud comprising two parallel lengths of timber held apart by a plurality of sheet metal connectors, each comprising two coplanar head portions which are connected by a shank and which abut faces of the timber and comprise integrally formed nails embedded in the timber.

2. A stud according to claim 1 in which the shank has flanges extending along its length, formed by bending material adjacent the shank edges.

3. A stud according to claim 2, in which, at each end of the shank, either flange has an integrally formed lug, coplanar with the flange, to enable the correct spacing of the timber lengths to be determined, during construction of the stud, by abutment of the lug edges and the opposing faces of the timber.

4. A stud according to any of the above claims in which a region of the shank is swaged to produce a reinforcing rib.

5. A stud according to any of the above claims, further comprising a metal connector plate which abuts a face of each timber length, and which comprises integrally formed nails embedded in the timber, the connector plate being such as to provide an increased racking resistance.

6. A stud connector made from sheet metal comprising two coplanar head portions which are connected by a shank and which comprise integrally formed nails.

7. A stud connector according to claim 6 in which the shank has flanges extending along its length, formed by bending material adjacent the shank edges.

8. A stud connector according to claim 7 in which, at each end of the shank, either or both flanges have an integrally formed lug, coplanar with the flange.

9. A stud connector according to any of claims 6 to 8, in which a region of the shank is swaged to produce a reinforcing rib.

10. A wall comprising a plurality of spaced parallel studs according to any of claims 1 to 5, clad with boarding in two parallel planes so that the connector shanks are perpendicular to the boarding.

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