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ABSTRACT

The present invention relates to frames for building assembly particularly having provision for timber swelling and/or shrinkage of nogs wherein the building frame includes

- a first elongate member,
- a second elongate member spaced from said first elongate member,
- a plurality of spanning members each to extend between said first and second elongate members, and
- a plurality of nogs, each nog extending between an adjacent pair of said spanning members,

wherein at least one adjacent pair of said spanning members ("A/B pair") has both

(A) (i) no nog at all or (ii) no nog or the equivalent in alignment with any other nogs, and
(B) means (whether of wood, metal or other material) dependent from at least one of the spanning members of the A/B pair is capable of being fixed directly or indirectly to the other spanning member of the A/B pair to act as a said nog.
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Invention Title: “Wall, Floor, Roof or other Panel Framing”
The present invention relates to frames and wall, floor, roof and other panel framing, and to related methods, sub-assemblies and assemblies and uses.

There is frequently a desire to provide frames and/or panels formed using frames where the frame or panel has been made to measure off site, (e.g. has been prefabricated in a factory for delivery on to the building site) or is fabricated with wet timbers. Frequently such prefabricated frames and panels once fitted onto a foundation or floor by themselves must align with mating panels or frames or align to accommodate jambs. Usually some squeezing or racking adjustment is necessary to ensure fit of the overall mixture of frames and panels if unnecessary distortions are not to ensue and be visible in the resulting structure once clad.

Frequently prefabricated frames use kiln dried timber which is a non homogenous and non isotropic material. Such timber is dimensionally affected by variations in moisture content due to “wetting”. This dimensional “swelling” causes problems for builders on site primarily due to the studs on the ends of walls “bowing out”. This is particularly so on nog or dwang (hereafter “nog”) lines of a framed wall owing to individual width swelling of studs or length “swelling” of nogs.

A traditional solution to such a problem (whether dealing with prefabricated frames or those fabricated on site) has included leaving an end nog out of the frame so that it can be installed at a later stage, or cutting all nogs up to 2mm shorter than required to allowing for any possible swelling. These two methods both have inherent problems. For instance leaving a nog out results in complaints from the builders over the extra work to be done. The use of shorter nogs results in complaints over “loose” frames and bad workmanship. Also sometimes even 2mm per nog clearance by shortening is not enough to compensate for on site swelling.

The present invention therefore is directed to frames of a kind (whether prefabricated off site or fabricated on site) which has provision for timber swelling and/or shrinkage of nogs or their floor, roof or panel frame equivalent with minimal additional input from a builder when the rigidity of the frame is to be finalised.

In a first aspect the present invention consists in a building frame of a kind having a first elongate member,
a second elongate member spaced from said first elongate member,
a plurality of spanning members each to extend between said first and second elongate members, and
a plurality of nogs (or their floor, roof or panel frame equivalent) (hereafter regardless
referred to as a “nog” or “nogs”), each nog extending between an adjacent pair of said
spanning members,

  wherein at least one adjacent pair of said spanning members (the or each such pair
hereafter referred to as an “A/B pair”) has both

(A)  (i) no nog at all or (ii) no nog or the equivalent in alignment with any other
nogs, and
(B) means (whether of wood, metal or other material) dependent from at least one
of the spanning members of the A/B pair is capable of being fixed directly or indirectly
to the other spanning member of the A/B pair to act as a said nog.

As used herein “spanning” covers members extending between the elongate members
(e.g. from endwise butt joints or the like) as well as members extending to or beyond the
outside faces of said elongate members.

Preferably each of said adjacent spanning members of a nogless pair has a member
dependent therefrom in a sliding interrelationship with the other, such members (preferably
wooden) being capable of being fixed one to the other (preferably by nailing or some other
physical interaction, whether involving additional members or not, e.g. nails, screws, etc.).

Other means capable of providing the adjustment between studs besides sliding timber
blocks capable by nailing of them in a fixed condition of fixing the relativity of an A/B stub
pairing include are

- a threaded bolt
- a cam like arrangement made from a variety of materials, steel, plastic,
  aluminium, etc.
- a piece of steel angle or flat brace nailed off.

Preferably the pair of adjacent spanning members are at towards one extremity of the
frame.

Preferably said first and second elongate members are of timber.
Preferably said spanning members are of timber.
Preferably said nogs are wooden.
Preferably said frame is that of a wall.
Preferably said spanning members are studs.
Preferably said frame is at least largely unclad (i.e. at the time of initial installation and preferably when the A/B pair is fixed). Obviously after such fixing the frame can be clad fully.

In another aspect of the present invention consists in, in a building frame or a building envelope, the use of a frame of a kind previously defined.

Preferably said frame has been fabricated off site.

In still a further aspect the present invention consists in a method of providing (for or in a building) a brace frame, said method comprising locating and fitting as required for the building a frame as previously defined, and later fixing the said at least one adjacent pair of said spanning members relative to each other (e.g. in a manner equivalent to a nog or the equivalent) by interengaging said spanning members by using said means dependent from at least one of them.

Preferably said fixing is by nailing or the use of nail plates.

Preferably said fixing is in alignment with a nog line between most, if not all, of the other pairings of said spanning members.

In another aspect the present invention consists in a method of properly aligning one end most spanning member of a frame as previously defined, which method comprises or includes fitting the frame in place and thereafter aligning said end most spanning member whilst fixing said means dependent from at least one of the A/B pair of which the end most spanning member is one spanning member.

In a further aspect the present invention consists in a panel (preferably a wall, floor, roof or bracing panel) formed by a method as previously stated or which uses a frame of the kind previously defined.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

Preferred forms of the present invention will now be described with reference to a rectangular frame useful for use in a wall with specific reference to the drawings in which;

Figure 1 is a side elevation of a wall frame such as might be fabricated off site, and Figure 2 is a sectional view AA with respect to Figure 1.
In Figure 1 a top timber plate 1 and a bottom timber plate 2 provides said first and second elongate members respectively. Timber studs 3 provide the plurality of spanning members with studs 3' being those of an adjacent pair to be left nogless. Nogs or dwangs 4 are provided between adjacent pairs of studs 3 and 3, and 3 and 3' save in respect of at least one pair of adjacent studs or spanning members. These are the spanning members that are the pair 3' and 3'.

The adjacent pair of studs 3' are preferably those which might hitherto have been provided with shorter cuts nogs. This choice of the shorter spaced pairing of studs (or other spanning members) tends to minimise extra timber to be used for the blocking which provides the complementary interengagement capable of being nailed to rigidity (from their hitherto relative sliding condition) when appropriate. As shown in Figures 1 and 2 blocks 5 and 6 are positioned in alignment preferably with nog lines provided by the nogs 4.

It is to be seen that there is an interface at 7 between the blocks 5 and 6 which allows (without bowing of the end wise studs 3) movement in the manner of an expansion joint within the frame by virtue of shrinkage, swelling, racking or other force deformation of the studs 3' as allowed by this sliding interface at 7.

Other means capable of providing the adjustment between studs besides sliding timber blocks capable by nailing of them in a fixed condition of fixing the relativity of an A/B stub pairing include are

- a threaded bolt
- a cam like arrangement made from a variety of materials, steel, plastic, aluminium, etc.
- a piece of steel angle or flat brace nailed off.

In use once frames of the kind depicted in Figures 1 and 2 are in position (and irrespective of whether or not there is one or more pairs 3' and 3' per frame), the building procedure would continue. For example the roof would be placed as appropriate or higher floors will be placed as appropriate. The thing a builder would do before applying wall claddings or linings would be to nail off the expansion and/or contraction blocks by, for example, nailing along the line “BB” of Figure 2.

Persons skilled in the art will appreciate how the same procedure could be used for floors, roofs, bracing panels, etc. The procedure allows even the end studs of for example, a wet timber wall frame to be better aligned once the frame is positioned in the structure. The
procedure of course is most beneficial on any walls with extra vertical members (under-studs, trimming studs, beam studs, junction blocks, etc.).
WHAT WE CLAIM IS:

1. A prefabricated building frame of a kind having
   a first elongate member,
   a second elongate member spaced from said first elongate member,
   a plurality of spanning members each to extend between said first and second elongate members, and
   a plurality of nogs (or their floor, roof or panel frame equivalent - hereafter regardless referred to as a “nog” or “nogs”), each nog extending between an adjacent pair of said spanning members,

   wherein at least one adjacent pair of said spanning members (the or each such pair hereafter “A/B pair”) has either (i) no nog at all, or (ii) no nog (or nog equivalent), in alignment with any other nogs, and has means dependent from at least one of the spanning members of the A/B pair capable of being fixed directly or indirectly to the other spanning member of the A/B pair to act as a said nog, and

   wherein in situ, prior to fixation, said means dependent from at least one of the spanning members is capable of movement in any direction of at least one plane of movement in respect of said other spanning member.

2. A frame of claim 1 wherein said at least one adjacent pair of spanning members has no nog at all, and has means dependent from at least one of the spanning members of the A/B pair capable of being fixed directly or indirectly to the other spanning member of the A/B pair to act as a said nog.

3. A frame of claim 1 or 2 wherein a spanning member of an A/B pair is directly fixable to the other spanning member of the A/B pair.

4. A frame of claim 2 wherein the or each A/B pair has a member dependent from one of its spanning members in a sliding interrelationship with a member of the other, such members being capable of being fixed one to the other.

5. A frame of claim 3 or 4 wherein said fixing is by penetrative means (e.g. nails, screws, etc.).

6. A frame of any one of claims 1 to 5 wherein the A/B pair is or each A/B pair is towards one extremity of the frame.

7. A frame of any one of the preceding claims wherein said first and second elongate members are of timber.

8. A frame of any one of the preceding claims wherein said spanning members are of
timber.
9. A frame of any one of the preceding claims wherein each of said plurality of nogs is wooden.
10. A frame of claim 3 or 4 or any claim dependent thereon wherein the or each member to be fixed is wooden.
11. A frame of any one of claims 1 to 10 wherein said frame is that of a wall.
12. A frame of claim 11 wherein said spanning members are studs.
13. A frame of any one of claims 1 to 12 wherein said frame is at least largely unclad.
14. A frame substantially as hereinbefore described with reference to one or more of the accompanying drawings.
15. In a building frame or a building envelope, the use of a frame of any one of the preceding claims.
16. The use of claim 15 wherein said frame has been fabricated off site.
17. A method of providing (for or in a building) a frame, said method comprising locating and fitting as required for the building a frame of any one of claims 1 to 14 and later fixing the spanning member of the or each A/B pair relative to its paired spanning member in a manner of a nog or the equivalent by interengaging said spanning members by using said means dependent from at least one of them.
18. A method of claim 17 wherein said fixing is by nailing or the use of nail plates.
19. A method of claim 17 or 18 wherein said fixing is in alignment with a nog line between most, if not all, of the other pairings of said spanning members.
20. A method of any one of claims 17 to 19 substantially as hereinbefore described with reference to one or more of the accompanying drawings.
21. A method of properly aligning one end most spanning member of a frame of any one of claims 1 to 14, which method comprises or includes fitting the frame in place and thereafter aligning said end most spanning member whilst fixing said means dependent from at least one of the A/B pair of which the endmost spanning member is one spanning member.
22. A panel formed in part by a method of any one of claims 17 to 21 or which uses a frame of any one of claims 1 to 14.