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2,386,622

SUSPENDED BUILDING CONSTRUCTION

Filed Dec. 16, 1942

2 Sheets-Sheet 1

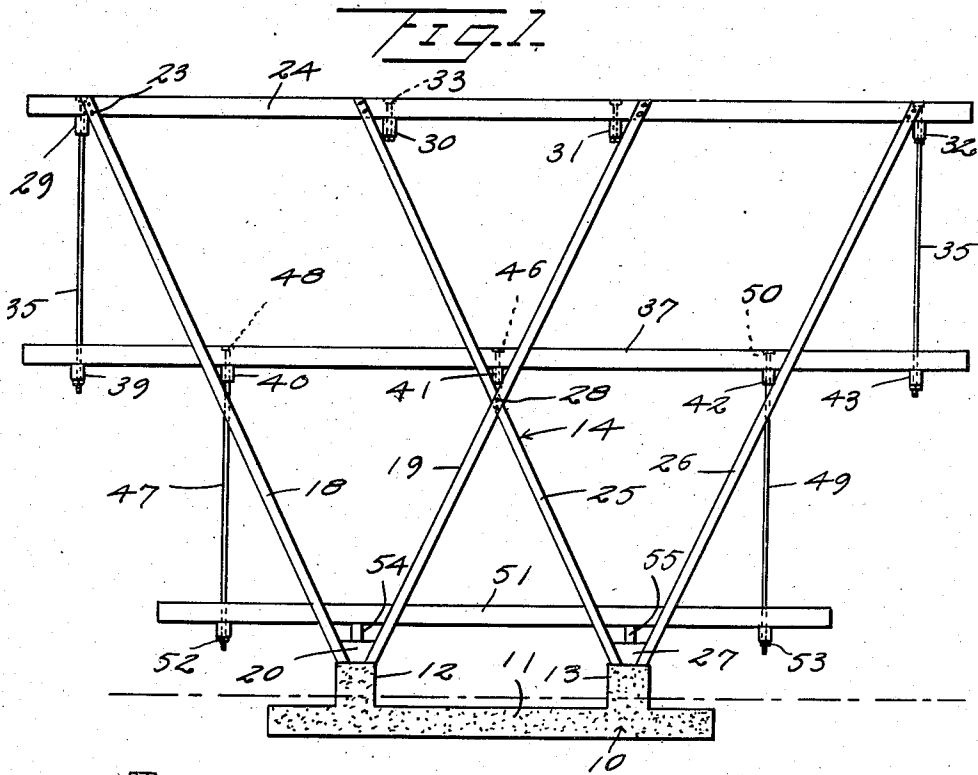
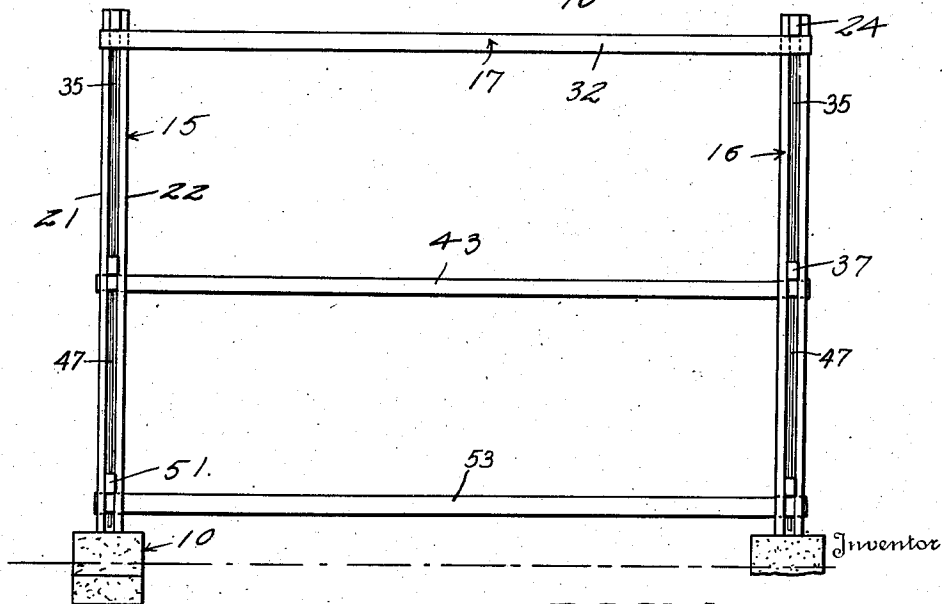


FIG. 2.

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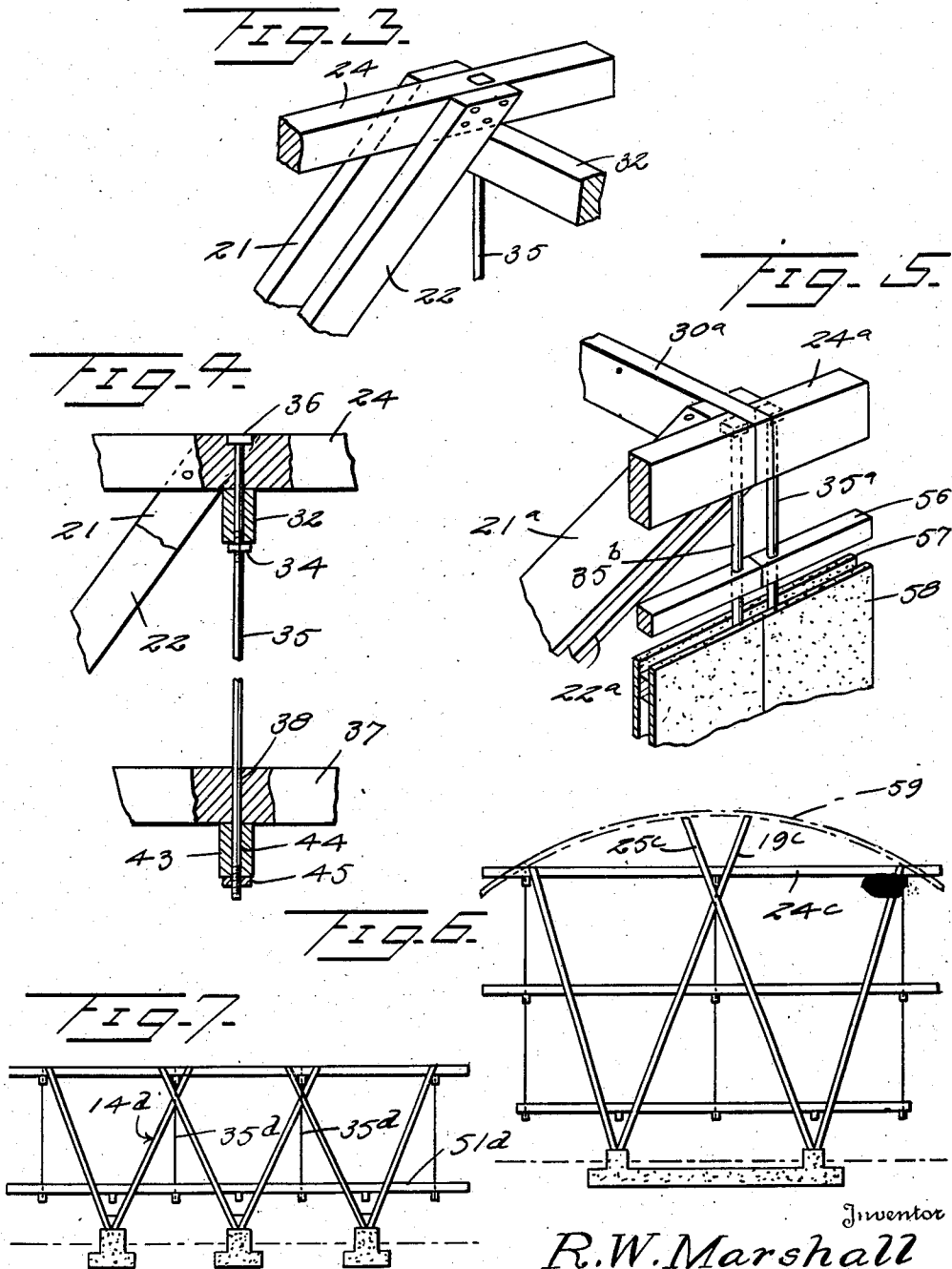
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2 Sheets-Sheet 2



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SUSPENDED BUILDING CONSTRUCTION

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7 Claims. (Cl. 20-1)

This invention relates to building constructions.

An object of this invention is to provide an improved building construction in which the floors and walls are in suspension, being suspended from truss-like supports, thus facilitating the prefabrication of the parts making up the building.

Another object of this invention is to provide a suspended building construction in which either the outer side walls, or certain of the inner dividing walls form the support for the building, permitting wide variations in the construction of the foundation so that in certain instances the foundation may be substantially smaller than the first floor, and the first floor may be smaller in size than the second floor.

A further object of this invention is to provide a suspended building construction formed of pairs of upwardly divergent supports secured at their upper ends to an upper horizontal connecting beam, the upper floor being suspended from hangers carried by the upper connecting beam, and the lower or first floor being suspended from hangers carried by the second floor.

The invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings wherein are shown embodiments of the invention, but it is to be understood that modifications, variations and changes may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a detail side elevation of a skeleton frame for a building constructed according to an embodiment of this invention.

Figure 2 is a detail end elevation of the frame.

Figure 3 is a fragmentary perspective view of one of the upper corners of the frame.

Figure 4 is a fragmentary side elevation partly in section of a portion of the frame.

Figure 5 is a fragmentary perspective view of a modified form of this invention.

Figure 6 is a detail side elevation on a reduced scale of a skeleton frame showing a slight variation in the arrangement of the suspended floors, and

Figure 7 is a detail side elevation on a reduced scale of another variation in the use of this invention.

Referring to the drawings and first to Figures 1 to 4 inclusive, the numeral 10 designates generally a base or foundation structure which includes an elongated footing 11 which has rising therefrom at spaced points between the opposite ends thereof upright members 12 and 13. The

base 10 may be constructed out of concrete, bricks or other suitable material and the footing 11 may if desired be disposed slightly below the level or surface of the ground with the upright members 12 and 13 rising above the level of the ground.

A building frame structure generally designated as 14 is mounted on the upright footing members 12 and 13 and comprise a pair of side frame members 15 and 16 which are secured together at their upper ends by a plurality of cross tie members 17. The side members 15 and 16 are of like construction and each includes a pair of upwardly divergent supporting members 18 and 19 which are connected together at their lower ends by an inverted truncated V-shaped tie member 20. The supporting members 18 and 19 are of like construction and each includes a pair of spaced apart parallel beams 21 and 22. The beams 21 and 22 at their upper ends are secured by fastening members 23 to a horizontally disposed beam 24.

A second pair of upwardly divergent supporting members 25 and 26 extend upwardly from the footing member 13 being connected at their lower convergent ends to an inverted truncated V-shaped tie member 27. The supporting member 25 is an inner supporting member and the supporting member 19 is also an inner supporting member, the two inner supporting members 19 and 25 intersecting each other as at 28 and at the points of intersection of the beams comprising the supporting members 19 and 25, the beams may be rabbetted out so as to reduce the space occupied by the beams at their points of intersection. The upper beam or header 24 of each side member has secured thereto a plurality of horizontally disposed transversely extending tie beams 29, 30, 31 and 32. The beams 30 and 31 are inner beams and are secured by fastening means 33 in depending relation to the horizontal longitudinal beam 24. The transverse ties or beams 29 and 32 are outer end beams and are adapted to be secured beneath the horizontal longitudinal beam 24 by means of a collar or clamping member 34 which is secured about a depending or suspending rod 35. The rod or bar 35 constitutes a hanger and is provided at its upper end with a head 36 which is countersunk in the upper side of the horizontal upper member 24.

An intermediate horizontal longitudinal beam 37 is dependently carried by the lower ends of the hanger rods 35, being provided with openings 38 through which the rods 35 are adapted to loosely engage. A plurality of transversely extending horizontal floor supporting beams 39,

40, 41, 42 and 43 are secured beneath the horizontal longitudinal beam 37, the beams 39 and 43 being outer end beams and provided with openings 44 through which the lower portions of the hanger rods 35 are adapted to loosely engage. A holding nut 45 is threaded onto the lower end of each rod 35 and bears against the under side of the outer end beams 39 and 43 as shown in Figure 4 so as to hold the longitudinal beams 37 and the transverse floor supporting beams 43 against downward movement.

The transverse beams 40, 41 and 42 are intermediate or inner transverse beams, and in the present instance, the beam 41 is the middle beam and is secured in suspended relation to the longitudinal beam 37 by means of a fastening member 46. A depending hanger rod 47 has an upper end 48 which is countersunk in the upper side of the longitudinal beam 37 and extends downwardly through the transverse floor supporting beam 40. A second depending hanger rod 49 has an upper head 50 which is also countersunk in the upper side of the horizontal beam 37. The rod 49 extends through the transverse floor supporting beam 42 and clamping collars or other suitable fastening means may be secured to the hanger rods 47 and 49 below the beams 40 and 42 to hold these beams against downward movement.

A lower first floor supporting beam 51 is dependently carried by the lower ends of the hanger rods 47 and 49 being disposed in the desired upwardly spaced relation to the ground surface by holding nuts 52 and 53 which are threaded on the lower ends of the rods 47 and 49. The beam 51 extends between the pairs of upwardly extending members 21 and 22 forming the upwardly divergent supporting structure.

The lower longitudinal beam 51 has secured to the lower side thereof a pair of transversely disposed floor supporting beams 54 and 55 and these beams may rest on their lower edges on the upper sides of the V-shaped connecting members 22 and 27. There may be as many of these transverse floor supporting beams or tie members 54 and 55 as may be desired and there also may be as many of the upper transverse floor supporting members as may be desired, the number varying in proportion to the lengths of the beams 37 and 51.

It will be noted from Figure 1 that the lower longitudinal beam 51 is substantially shorter in length than the upper longitudinal beams 24 and 37. However, the length of the lower horizontal beam 51 may be varied depending upon the character of the building which is to be formed around this skeleton framework.

The frame structure shown in Figures 1 to 4 inclusive is constructed with the outer side walls forming the suspension means whereas in Figure 5 the suspension means may be a pair of inner dividing or partition walls. In this form of the invention the upper ends of the upwardly divergent supporting members 21a and 22a are secured on opposite sides of the transverse floor supporting beams 30a and the supporting members 21a and 22a extend transversely of the building. The upper horizontal supporting member 24a may be secured in any suitable manner to the transverse floor supporting member 30a. A pair of depending hanger rods 35a and 35b are dependently carried by the upper horizontal longitudinal beam 24a and the lower ends of the rods 35a and 35b may have secured thereto the same

horizontal longitudinal beam structure shown in Figure 1 at 37.

The rods 35a and 35b have mounted thereon longitudinal splines or stringers 56 which constitute horizontal studs and inner and outer walls 57 and 58 may be secured to the stringers or studs 56. The construction shown in Figure 5 is identical in every respect to the structure shown in Figure 1 with the exception that the supporting members 21a and 22a extend transversely across the building, are secured at their upper ends to the transverse members 30a, and these transverse members may be spaced apart the desired distance in order to provide for the proper support for the longitudinal horizontal members 24, 37 and 51.

In Figure 6 there is disclosed a slight variation in the use of this suspension means, the variation being principally in the extension of the inner supporting members 19c and 25c which extend upwardly above the upper horizontal longitudinal beam 24c and provide opposite side supports for a suitable roof 59.

In Figure 7 there is also disclosed a further variation in the use of this suspension frame structure wherein the suspension means is used for a single floor building. In this latter form the upwardly divergent supporting members 14d are shorter in length than shown in Figure 1 and additional inner supporting hangers 35d may be used to suspend the first floor longitudinal beam 51d.

A skeleton frame structure constructed according to this invention may be pre-fabricated, the side wall supporting frames being initially constructed in a horizontal position and then raised to an upright position on the supporting base 10. The upright side walls may then be tied together at their upper ends by the tie members 30 and 31 and the tie members 29 and 32. The second floor supporting beams 39, 40, 41, 42 and 43 may be secured to the lower ends of the hangers 35 with the longitudinal beam 37 resting on the upper edges of the transverse beams 39 to 43 inclusive. The lower horizontal longitudinal beam 51 may then be suspended by securing the hanger rods 47 and 49 to the intermediate longitudinal beam 37 and the transverse floor supporting members 54 and 55 may then be secured to the lower edges of the side frame members 51. The skeleton frame structure may be enclosed by means of panels formed as shown in Figure 5 of inner and outer panel members which are secured together in spaced apart relation so as to provide the desired air insulating space between the inner and outer walls.

The improved suspension means hereinbefore described will provide for the elimination of a considerable amount of material, such as lumber or the like now used in the construction of a building, particularly the buildings of the fabricated type.

What I claim is:

1. A building construction comprising foundation means, pairs of upwardly divergent supporting members, a pair of upper horizontally disposed members secured to the divergent ends of supporting members, a second pair of horizontal members below said first pair of horizontal members, cross ties between said upper and second pair of horizontal members, and means dependently supporting said second pair of horizontal members from said upper horizontal members.

2. A skeleton building frame construction com-

prising spaced apart wall supports and floor supporting ties connecting said supports together, each support comprising at least two pairs of V-shaped members, an upper horizontal beam secured to the upper divergent ends of said members, a lower horizontal beam, and depending hangers carried by said upper beam supporting said lower beam therefrom.

3. A skeleton building frame construction comprising opposed pairs of spaced apart wall supports, each support including a pair of confronting V-shaped members, a pair of horizontal upper beams disposed between said confronting members and secured to the divergent ends of at least two of said supports, hanger rods depending from said beams, a pair of lower beams carried by said hanger rods, and floor supporting members carried by said lower beams.

4. A skeleton building frame construction comprising opposed pairs of spaced apart wall supports, each support comprising a V-shaped member, the adjacent inner sides of each member being disposed in crossed relation, means securing the inner sides of said members together at their crossing points, a horizontal upper longitudinal beam for and secured to the divergent ends of each pair of supports, horizontal upper transverse tie members secured to and extending between said upper beams, a plurality of hanger rods depending from said upper longitudinal beams, and means fixed to said rods for dependently supporting a floor therefrom.

5. A skeleton building frame construction comprising opposed pairs of spaced apart wall supports, each support comprising a V-shaped member, the adjacent inner sides of each member being disposed in crossed relation, means securing the inner sides of said members together at their crossing points, a horizontal upper longitudinal beam for and secured to the divergent ends of each pair of supports, horizontal upper transverse tie members secured to and extending between said upper beams, a plurality of hanger rods depending from said upper longitudinal beams, intermediate longitudinal beams fixed to said rods, intermediate transverse tie members fixed to said intermediate beams, lower hanger rods depending from said intermediate beams, lower longitudinal beams carried by said lower hanger rods, and lower transverse tie members fixed to said lower beams.

6. A skeleton building frame construction comprising opposed pairs of spaced apart wall supports, each support comprising a V-shaped member, the adjacent inner sides of each member being disposed in crossed relation, means securing the inner sides of said members together at their crossing points, a horizontal upper longitudinal beam for and secured to the divergent ends of each pair of supports, horizontal upper transverse tie members secured to and extending between said upper beams, a plurality of hanger rods depending from said upper longitudinal beams, intermediate longitudinal beams fixed to said rods, intermediate transverse tie members fixed to said intermediate beams, lower hanger rods depending from said intermediate beams, lower longitudinal beams carried by said lower hanger rods, and lower transverse tie members fixed to said lower beams, said lower longitudinal beams being substantially shorter in length than said upper and intermediate longitudinal beams.

7. A foundation structure including an elongated footing, uprights rising therefrom at certain points between the opposite ends thereof, a building frame mounted on the upright footing members comprising a pair of side frame members secured together at their upper ends by a plurality of cross tie members, said side members being of like formation and each including a pair of upwardly divergent supporting members connected together at their lower ends by a truncated V-shaped tie member, said supporting members being of like construction and including a pair of spaced apart parallel beams, fastening members, and a horizontally disposed upper beam to which said parallel beams are secured, a second pair of upwardly divergent supporting members extending upwardly from the footing member and being connected at their lower convergent ends to a V-shaped tie member, the two supporting members intersecting each other, and means whereby the space occupied by said beams may be reduced, and a plurality of horizontally disposed transverse extending tie beams secured to the upper beam, an intermediate longitudinal beam, hanger rods dependently carried by said upper beam dependently supporting said intermediate beam, said intermediate beam having openings in said beam through which said rods are adapted to loosely engage.

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