Jan. 27, 1942. B. E. BALDUF 2,271,472

BUILDING CONSTRUCTION

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Fig.1

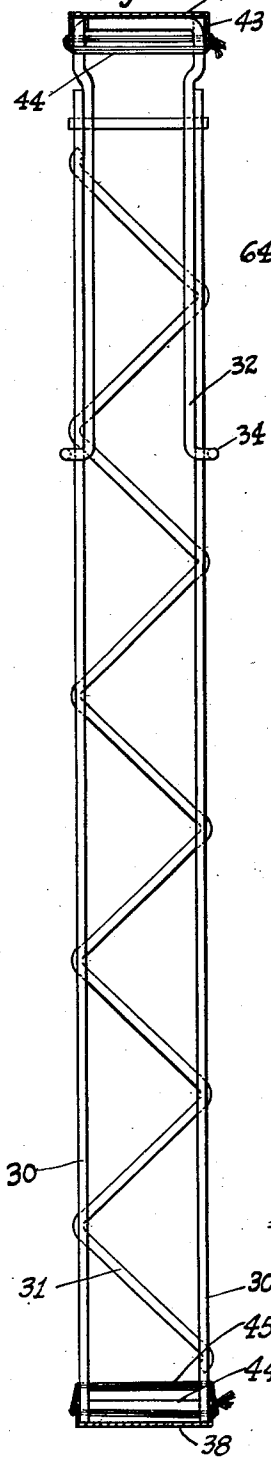


Fig.2

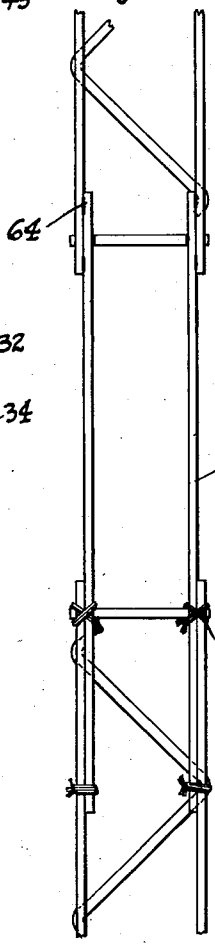


Fig.3

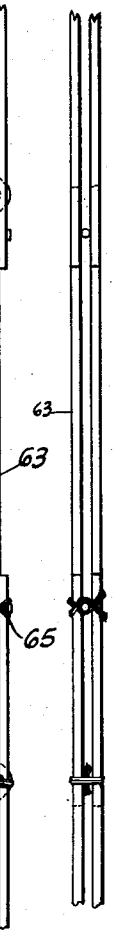


Fig.4

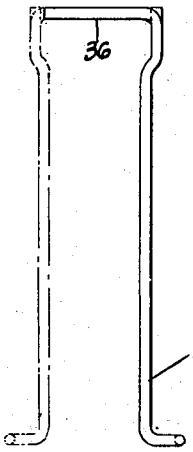


Fig.5

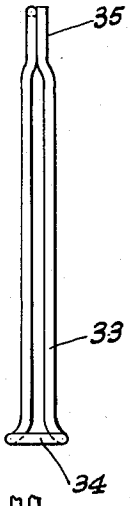


Fig.6

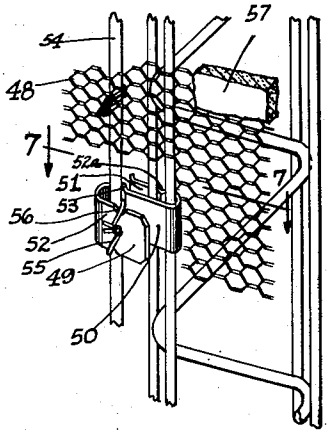


Fig.7

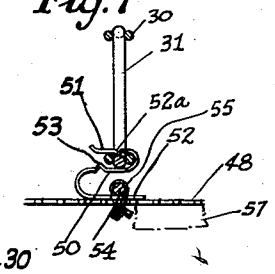
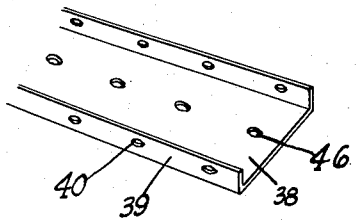


Fig.8



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Fig.9

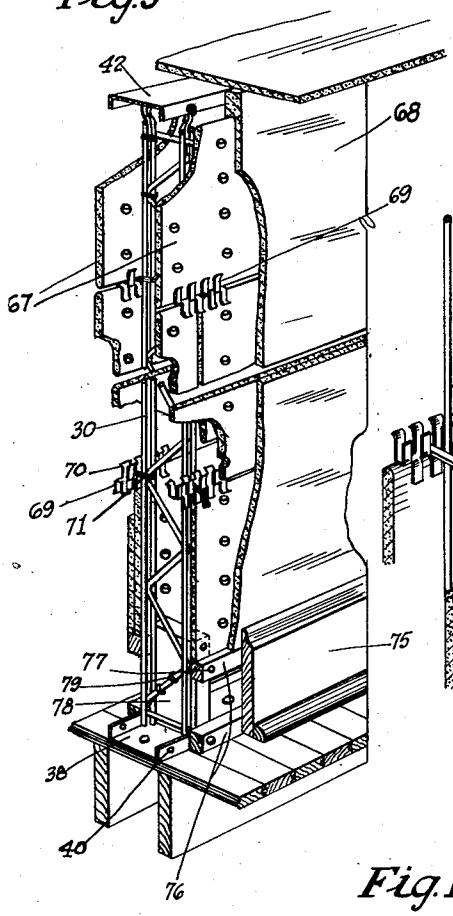


Fig.11

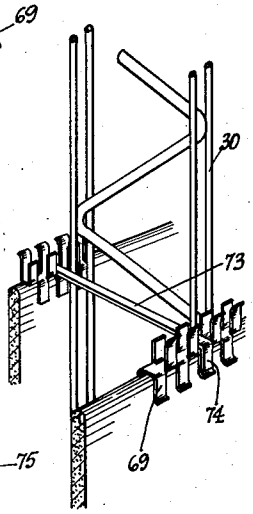


Fig.10

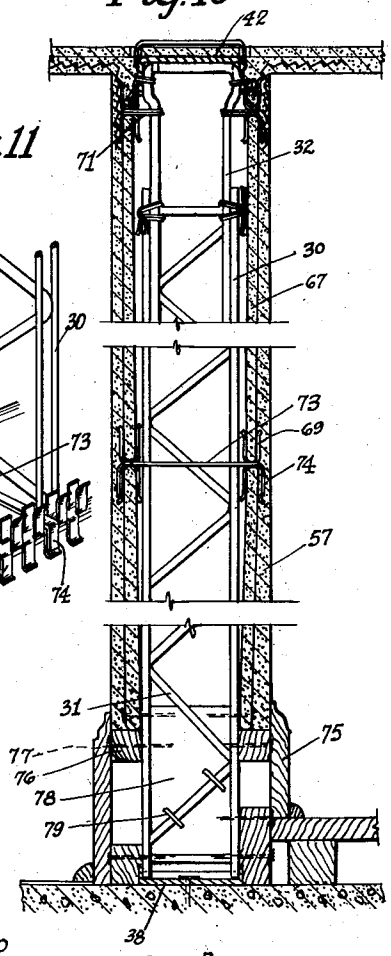


Fig.13

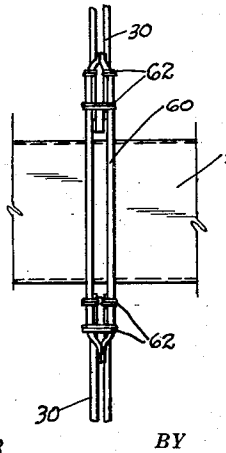


Fig.12

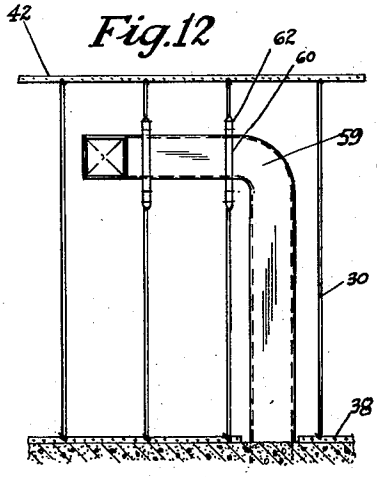
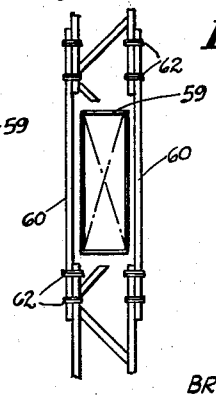


Fig.14



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Fig. 15

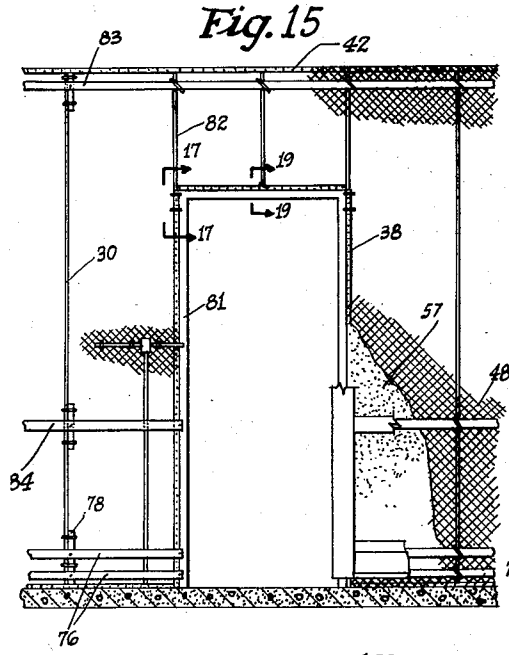


Fig. 16

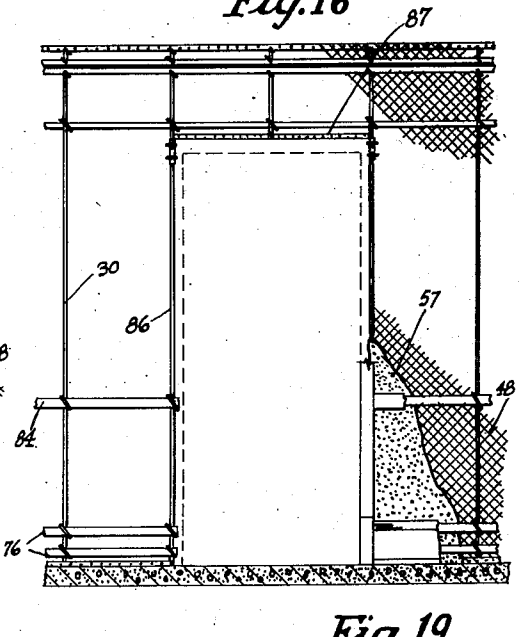


Fig. 17

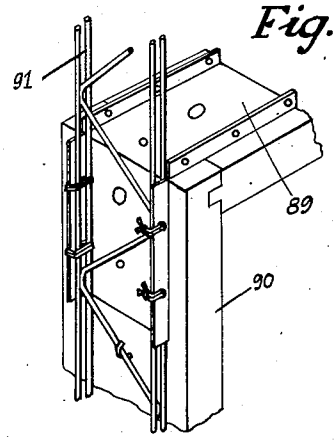


Fig. 18

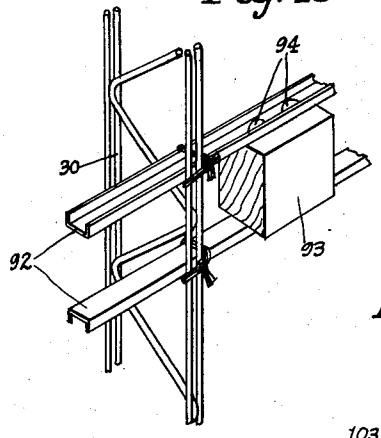


Fig. 19

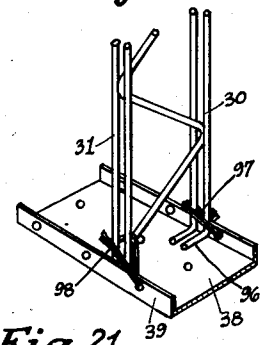


Fig. 20

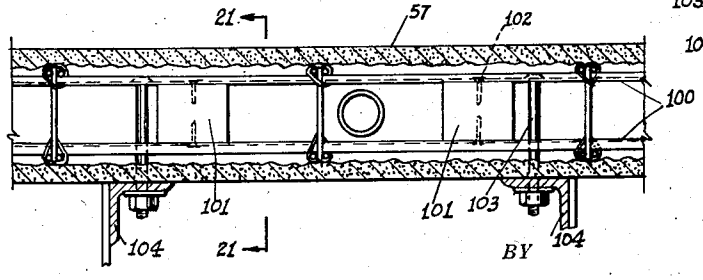
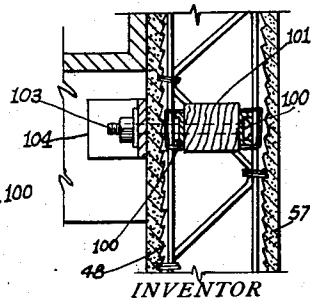


Fig. 21



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Fig. 22

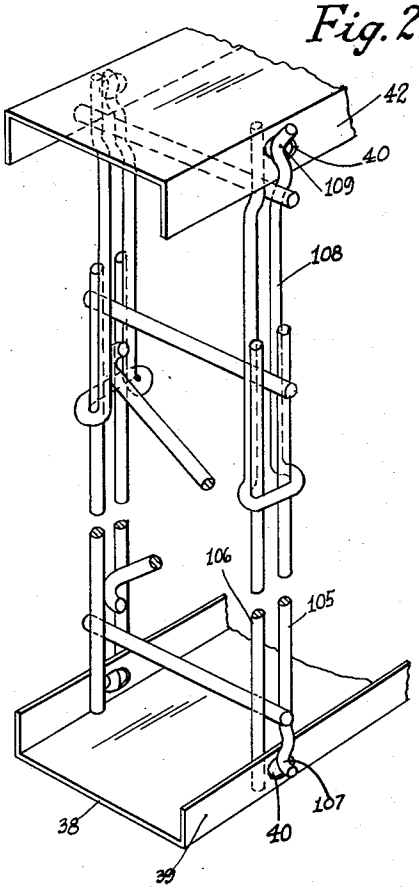
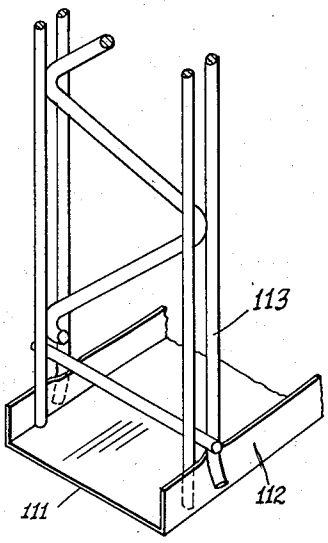


Fig. 23



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Patented Jan. 27, 1942 2,271,472

UNITED STATES PATENT OFFICE

2,271,472

BUILDING CONSTRUCTION

Bruno E. Balduf, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill., a corporation of Illinois

Application January 23, 1939, Serial No. 252,306

11 Claims. (Cl. 72—115)

This invention relates to building constructions, and has reference more particularly to a building construction utilizing specially constructed wire studs together with suitable accessories.

In the construction of walls, ceilings and partitions of a building, it has been customary to utilize steel studs of various constructions, such as that shown in patent to Balduf No. 2,087,867. I have found that a stud built up of wires suitably welded together, has somewhat greater strength and resistance to bending and twisting. Such a stud also lends itself well to assembly in a wall if proper accessories are provided.

An object of this invention therefore, is to provide a building construction utilizing a welded wire stud having adequate strength and resistance to bending and twisting.

Another object of the invention is to provide suitable accessories for use with said stud, in order to facilitate the construction of a building; also to improve building constructions in other respects hereinafter specified and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which

Fig. 1 is a side elevation of one of my improved studs,

Fig. 2 is a side elevation of two of the studs spliced together,

Fig. 3 is an edge elevation of a stud splice,

Figs. 4 and 5 are side and edge elevations of a form of extension member,

Fig. 6 is a perspective view of a portion of a stud with metal lath attached,

Fig. 7 is a sectional plan view through a stud taken on line 7—7 of Fig. 6,

Fig. 8 is a perspective view of a metal runner for supporting the studs,

Fig. 9 is a perspective sectional view of a wall structure,

Fig. 10 is a sectional elevation through a partition construction,

Fig. 11 is a sectional perspective view of a modified form of board attaching means,

Figs. 12, 13 and 14 are elevations showing ducts and stud splices,

Fig. 15 is a sectional elevation through a wooden door structure,

Fig. 16 is a sectional elevation metal door buck and trim,

Fig. 17 is a perspective view of the stud framing around a wooden door buck,

Fig. 18 is a perspective view showing a manner of attaching wood grounds to a stud,

Fig. 19 is a perspective view of a bottom of the stud showing the manner of attachment to a runner,

Fig. 20 is a sectional plan view through a partition showing the manner of attaching heavy fixtures to the studs,

Fig. 21 is a sectional elevation through the partition taken on line 21—21 of Fig. 20,

Fig. 22 is a perspective view of a modified form of stud, and

Fig. 23 is a perspective view of a further modified form of stud.

Referring to the drawings by numerals, the stud comprises two pairs of spaced chord wires 30 between which zig-zag web wires 31 extend, the assembly being spot welded together at the junctions of the various wires. These studs are made in different lengths to approximately fit different ceiling heights and for a final adjustment as to length, I provide a special extension member 32 which is slidably mounted on one end of the stud. This extension 32 is preferably composed of two pairs of spaced wires 33 which are connected at the bottom by a semi-circular integral wire loop 34 and at the top, wires 33 are bent laterally to form sections 35 which are spot welded together. One of the wires 33 of each pair extends beyond the section 35 and is bent at right angles to form a wire section 36, said sections 36 being spot welded together. The composite extension structure is thus substantially U-shaped and is arranged to slide over the end of the stud with web wires 31 extending between wires 33, loops 34 encircling the chord wires 30, and wires 33 extending inside of chord wires 30. The extension is so proportioned that sufficient friction exists between the extension and the stud, that it is unnecessary to wire the extension in place on the stud. A U-shaped channel runner 38 receives the bottoms of a series of studs between upstanding flanges 39 having spaced perforations 40. A similar channel strip 42 is secured to the ceiling of a room and has downwardly extending flanges 43 to receive the upper ends of extension members 32. Wires 44 attach the extension members 32 to channel flanges 43. A transverse wire 44_a is welded between chord wires 30 at a short distance from the bottom of the stud and a wire 45 passes about wire 44 to attach the lower end of the stud to flanges 39. Perforations 46 are provided in the webs of channels 38 and 42 for receiving nails to attach said channels to the floor and ceiling.

In order to attach plaster bases, such as expanded metal lath 48 to the studs, I provide a

clip 49 which is approximately S-shaped, having a central section 50 and legs 51 and 52. The chord wires snap in place between section 50 and leg 51, being held in place by V-shaped beads 52a and 53 formed in the leg 51 and section 50, respectively. A metallic pencil rod 54 is attached to the leg 52 by a wire 55, being held in place by notches 56 formed in the edge of said leg 52. A coating of plaster 57 may then be applied to the lath 48 to form a finished wall. The clip leg 52 has a certain degree of resiliency so as to impart substantial sound insulating qualities to the finished wall.

It is often desirable to pass ducts 59 through the wall, Figs. 12, 13 and 14, for the purpose of ventilating and heating. In such a case, I provide splicing members 60 which consist of pairs of spaced wires welded together at their ends. The chord wires 30 are severed at the desired point, the cut ends of the stud are separated the required distance, and wires 62 are then used to attach the splicers 60 to the chord wires 30. If desired, splicer members 63 (Figs. 2 and 3) may be provided in which one end of the splicer members 63 may be secured by welds 64 to the chord wires 30 at one end, and the other end of said splicer member 63 are attached by wires 65 to a second section of the stud wires 30 at the desired distance. In this form of structure, the section of the stud secured by welds 64 together with the splicers 63, become in effect, an extension member and may be sold as such in varying lengths to suit job conditions.

In the form of partition shown in Fig. 9, plaster boards 67 are used as a plaster base for supporting a layer of plaster 68. The boards 67 are held in position by clips 69 having opposed channel forming fingers 70 for receiving the adjacent edges of said boards 67. The clips 69 are attached by wires 71 to the chord wires 30. If desired, I may use the modified clip attaching means as shown in Figs. 10 and 11 in which a U-shaped strap 73 spans the width of the stud, and has downwardly extending legs 74 which engage over opposite clips 69 and the edges of boards 67 to maintain said clips and boards in position against the chord wires 30. The straps 73 are simply dropped in position over the clips 69 at the time of erection and are held firmly in position by the next succeeding boards.

In erecting a finished partition as shown in Figs. 9, 10 and 11, I attach base boards 75 to nailing strips 76, said strips being secured by nails 77 to a nailing block 78. The block 78 extends across the web wire 31 and is secured thereto by staples 79.

In Fig. 15 is shown the manner of assembling a wooden door buck 81 in a partition in combination with my improved studs. The runner track 38 is fastened around the periphery of the door buck with flanges clipped at the corners. Sections 82 of studs are wired at the bottom to the runner track 38 and at the top to runner track 42. Picture mould 83 is then wired to the studs 82 and various ground strips 76 and 84 may be attached to the studs in the manner heretofore described. In the use of a metal door buck as shown in Fig. 16, studs 86 preferably run full height from floor to ceiling and runner sections 87 are wired across the top of the door to said studs 86. In framing around locker alcoves, (Fig. 17) a runner section 89 is formed around a frame 90 by clipping the flanges at the corners and wiring the flanges to studs 91. In the construction of stairways and the like, channels 92 may be wired to the chord wires 30. Wooden blocks 93 may then be secured between the channels 92 by nails 94 and the handrail brackets may be secured to the blocks 93 by screws or the like.

When it becomes necessary to cut a stud over doors or openings, (Fig. 19) chord wires 30 may be bent inwardly at the bottom to form sections 96, and wires 97 engage over said sections 96 to attach the studs to runner flanges 39. Wires 98 extend diagonally over one of the chord wires 31 and engage a runner flange 39 to urge the stud downwardly against the runner 38. When it becomes necessary to attach heavy fixtures, such as lavatories, etc. to the studs, (Figs. 20 and 21) spaced channels 100 are wired to the inside of chord wires 30 and blocks 101 are secured between said channels 100 by nails 102. Bolts 103 are then passed through the channels 100 and through angles 104 which support the heavy fixture.

In the modified form of construction shown in Fig. 22 a stud is shown which automatically attaches to runner tracks 38 and 42 at top and bottom, without the use of tie wires, thus effecting a marked saving in erection costs. Chord wires 105 and 106 are arranged at their lower ends to straddle one of the runner flanges 39. Chord wire 105 is formed into an arcuate snap or latch 107 which engages in one of the flange perforations 40 to lock the stud to said flange. An extension member 108 is used at the top of the stud, this member 108 being similar to that shown in Figs. 4 and 5 except that an arcuate snap 109 is provided on chord wire 105 to engage in one of the flange perforations 40 and lock said extension to said flange. If desired a form of wireless attachment as shown in Fig. 23 may be used. Here a runner track 111 is used which has flanges 112 without perforations. Stud chord wires 113 straddle the flange 112 and deform said flange slightly so as to prevent movement of said stud 113 longitudinally of said runner 111.

I would state in conclusion that, while the illustrated examples constitute practical embodiments of my invention, I do not wish to limit myself precisely to these details, since manifestly the same may be considerably varied without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a building construction, a stud comprising a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, a plurality of metal strips secured to the inside of one pair of chord wires, and a nailing block secured between said strips.

2. In a building stud, a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, and an extension member slidably mounted adjacent one end of said stud, said extension member having portions frictionally engaging each side of said web wire between said pairs of chord wires for longitudinal adjustment.

3. In a building construction, a stud comprising a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, metal strips secured to the inside of each pair of chord wires, a nailing spacer block secured between said metal strips, and fixture attaching bolts passing through said metal strips.

4. A sectional stud for a building construction, each section comprising spaced pairs of chord wires connected together by a sinuous web wire to form a skeleton I-beam, said sections being

in spaced longitudinal alignment, and spacer strips secured to and connecting the respective pairs of chord wires of said sections so that a vacant space is provided bounded by said spacer strips and the ends of said sections to enable a duct to extend therethrough.

5. A stud for a building structure comprising a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, a nailing piece positioned between said chord wires and secured to said web wire, said nailing piece being of sufficient size and lateral extent to enable nailing strips or wall facing elements to be secured thereto.

6. A stud for a building construction comprising a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, the ends of at least some of said chord wires being bent inwardly at substantially a right angle to provide an abutment for a channel runner embracing the end of said stud.

7. In a building stud, a main section in the general form of an I-beam having flanges and web, and an elongated adjustable extension member for said main section, said extension member having one end forming a pair of oppositely disposed loops, each telescopically engaged around a respective pair of flanges of said main section, an intermediate portion constructed to frictionally engage opposite sides of said web, and the opposite end adapted to engage a runner.

8. In a building stud, a main section comprising a plurality of chord wires in spaced pairs connected by a sinuous web wire, and an adjustable extension member for said main section, said member comprising an elongated wire loop, said loop having one end formed to slidably embrace a pair of said chord wires and the opposite end adapted to engage a channel runner, the intermediate portion of said loop being constructed to frictionally engage an intermediate portion of said main section when mounted thereon.

9. In a building stud, a main section in the general form of a skeleton I-beam, and an adjustable extension member for said main section, said extension member comprising an elongated U-shaped wire element having its closed end formed for engagement between, and securing to, the flanges of a channel runner, the legs of said extension each forming an elongated narrow loop with the free end formed laterally to closely embrace the adjacent flanges of said I-beam section, with the intermediate portion of each leg frictionally engaging substantially in the inside corners formed by the junction of the web and flanges of said skeleton I-beam.

10. An extension member for frictionally telescoping a stud in the general form of an I-beam, comprising a pair of elongated narrow loops of wire, the side spans of each loop adapted to frictionally engage on opposite sides of the web of said stud, the lower end of each loop being formed laterally to telescope over adjacent flanges of said stud, and the other ends of said loops having laterally extending portions welded together to form a runner engaging portion.

11. A stud for a building construction comprising a plurality of chord wires arranged in spaced pairs connected by a sinuous web wire, the free ends of each pair of chord wires being offset laterally one from the other sufficiently so that each flange of a floor runner channel will be directed between a respective pair of offset chord wires and frictionally retained therebetween when said studding is positioned on said runner in the usual manner of erecting studding.

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