July 12, 1932. M. K. ARMSTRONG 1,867,299

WALL STRUCTURE AND BUILDING UNIT THEREFOR

Filed April 7, 1930

Fig. 1

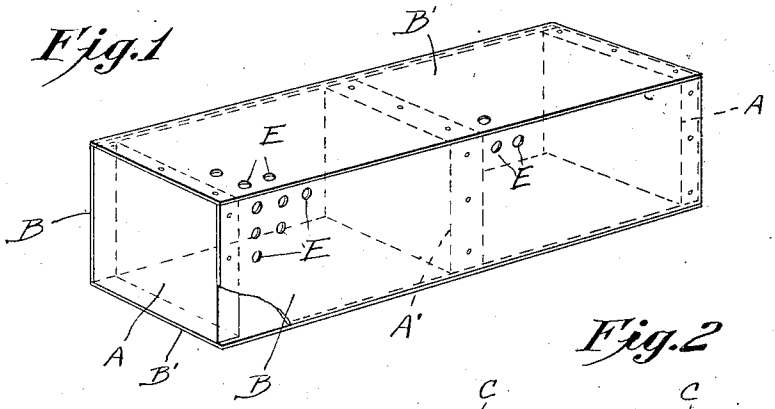


Fig. 2

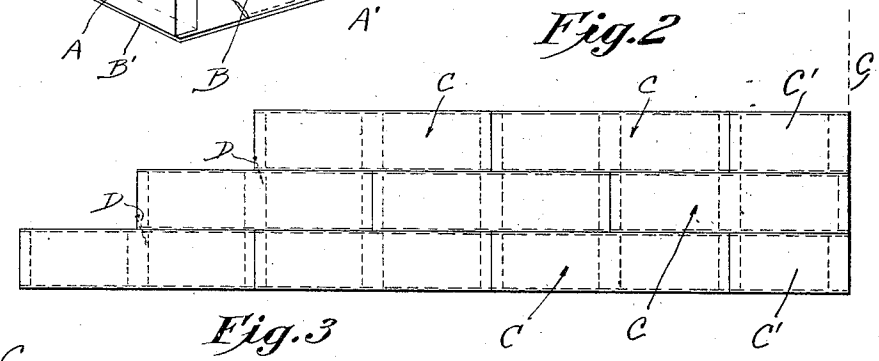


Fig. 3

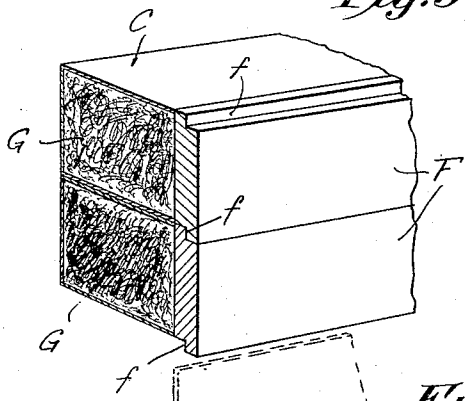


Fig. 4

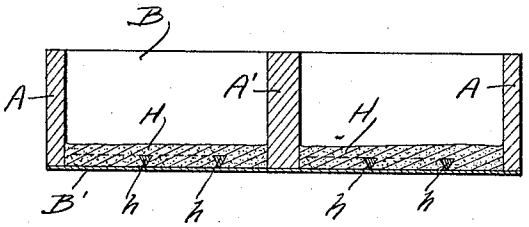


Fig. 5

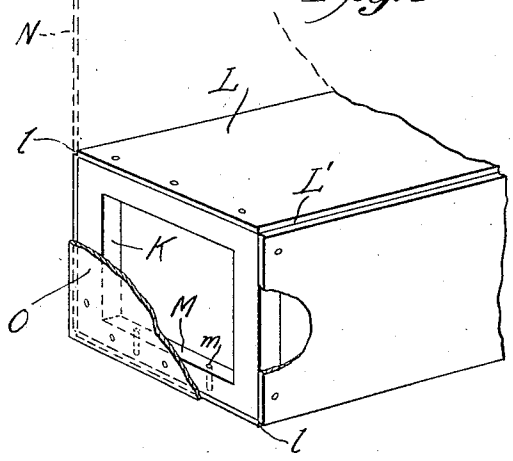
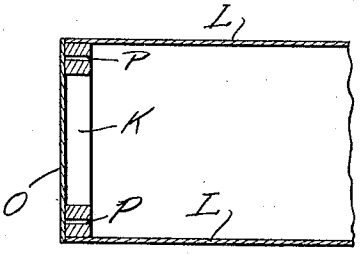


Fig. 6



INVENTOR

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UNITED STATES PATENT OFFICE

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WALL STRUCTURE AND BUILDING UNIT THEREFOR

Application filed April 7, 1930. Serial No. 442,296.

This invention relates to the art of building wall structures for houses, barns, garages and the like and to units comprising said walls, and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

In the use of lumber in the building art, there is great waste of lumber left over at the mills after cutting the usual forms and lengths adapted for commercial use because there is no call or demand or present method of use of the so-called short length lumber, millions of feet of which are wasted in the United States. The object of the present invention is to devise a cheap and economical building unit and a wall structure in which the same may be economically and readily used by means of which the so-called short lengths of lumber may be advantageously used in the manufacture of said building units. Another object of the invention is to provide a building unit which, though light in weight, is strong and durable and when incorporated in the improved wall structure will present all the vertical support required in such wall to adequately support the load of floors, roofing and the like. Another object of the invention is to provide a unit of the kind where the material composing the same may be shipped to the point of erection knocked down or in shooks to be set up into the form of units "on the job", thus taking advantage of greatly reduced freight rates as compared to the cost of units of the kind if shipped set up and ready for use. Another object of the invention is to provide a unit of the kind in which any suitable and cheap insulating material, such as slag, gypsum plaster, sand or any suitable material found at or located near the job may be incorporated into the unit as desired or necessary for the purpose of the structure in which the wall structure is to be used.

These and many other objects and advantages of the invention will appear more fully as I proceed with my specification.

In the drawing:—

Figure 1 is a view showing in perspective one form of the improved building unit.

Figure 2 is a view representing in side elevation a partial wall structure with the building units in erected relation.

Figure 3 is a view showing a partial vertical section at perspective of a wall structure with the building units provided with a different form of covering for the sides presented as the outside finish of the wall structure.

Figure 4 is a longitudinal section through the unit showing one means of insulating it.

Figure 5 is a perspective view of an end part of a modified form of the building unit.

Figure 6 is a side sectional elevation of one end of the unit shown in Figure 5.

The foundation of my invention is embraced in a building unit of a length equal to a multiple of the usual stud spacings—16″—as for example, 32″ or 48″ lengths. It will be understood that these lengths are not necessary and may be varied as desired; but are adopted in ready following of present practice in building structures and as conforming to the general practice in the making of door openings, window openings and the like. The building unit may be square or rectangular as desired, such as 8″ x 8″ or 8″ x 10″. In its simplest form the unit consists of end members A, A, and an intermediate member A^1, each 8″ x 8″, 8″ x 10″ or any other dimensions required. The three members A, A^1 and A, are spaced 16 inches, as in the ordinary method of spacing studding in buildings. The sides B, B, and the top and bottom B^1, B^1, of the block, are formed of thin veneer or any other suitable light weight material, such for example as plasterboard, fibre-board, or the like. Said walls, as shown in Figure 1, are nailed to the end members A, A, and to the intermediate member A^1.

Obviously the resulting unit is a light, hollow structure which may be assembled and completed "on the job" with the most ordinary and cheapest labor and in a very short time, so that many of them may be erected and finished ready to be incorporated into the wall structure in a minimum of time.

In Figure 2 is shown a method of assembling the building unit in a wall. C, indicates the building units which are laid one

upon the other in horizontal courses, as when laying brick, with the joints broken and with the end members of one unit placed vertically above and vertically below the intermediate members of the units in the courses below and above the course in which it is contained. The units may be nailed together as indicated at D or may be held in their proper spaced relation in any other convenient manner, such as gypsum plaster.

Obviously the support of the wall is presented by the end and intermediate members of the unit which extend in vertical rows from top to bottom of the wall so that rigid supporting structures presenting the same vertical support as vertical studding spaced on 16″ centers, will be incorporated in the wall structure.

For convenient finishing inside and out, the side walls B, B of the units may be apertured or perforated, as indicated at E. Said apertures or perforations present holds for stucco applied to the outside of the wall and for plaster applied to the inside of the wall; thus lath is eliminated and the cost of a building in which the improved wall structure is incorporated is greatly reduced, a wallboard of gypsum or rough fibre requires no holes.

If desired, one side wall of the unit, namely the one that is to present the outside face of the building, may be made of 7/8″ or 1″ board, as shown in Figure 3, at F. Said board may be notched or matched top and bottom, and ends as indicated at *f* and when the units are erected to form a wall structure in this case, a lapped board effect will be presented which will be of architectural value in the building containing the wall structure. If an insulating material is desired, each unit may be filled, as indicated at G in Figure 3, with the desired insulating material at hand. Mixtures of gypsum and saw-dust, kieselguhr or any other suitable material may be used for the purpose. I find that pop-corn slag and a gypsum binder is very cheap and effective insulating material for the purpose. When such material is used it is poured into the unit and allowed to set and dry before the unit is in place, thereby saving both time and labor.

Again, instead of entirely filling the unit with the insulation material, it may be applied simply to one side, as for example, the outside, as shown in Figure 4. In this case before the final closing side wall is applied to the unit, the insulation material is applied to the said side wall to the depth desired, as indicated at H. Diagonally running cleats *h* nailed to the side will aid in holding this insulation in place.

In Figures 5 and 6 I have shown a form of the unit in which plasterboard is used for the sides and ends of the unit. In this case the end and intermediate members of the unit were preferably made in the form of square or rectangular (depending upon the form of the unit) frames K. The use of such frames not only presents a rigid and desirable end member for the unit, but also still further reduces the weight of the same without materially reducing its strength or the supporting strength of the wall structure in which it is incorporated. In applying the plasterboard to the sides, top and bottom of this unit, it may obviously be applied in separate pieces, as in the case of the veneer or wooden walls hereinbefore described, but in this case the plasterboard L is made of such dimensions as to provide the four sides of the unit in a single piece. The plasterboard is then scored on its outer face as indicated at *l* so that it may be wrapped around the frame, the scoring permitting breaking of the plasterboard at the corners of the block, but leaving the inner paper sheet of the plasterboard unbroken and continuous. As a result there is only one open joint, as indicated at L′ where the two edges of the plasterboard wrapper meet at the one corner. This may be filled and closed as desired in any familiar manner. The plasterboard is nailed to the frames K just as in the case of the veneer sheets.

The frames K may be made in any convenient manner just so that they are rigid and secure in holding their form. For convenience in nailing the units in the wall structure, the frame piece M corresponding to the bottom side of the unit may be provided with holes *m* for the passage of nails. Then when building the wall structure the top side of the unit may be left open as, when using a plasterboard wrapper, by leaving the top side of said wrapper in the position indicated in dotted lines at N, until the unit has been nailed to the unit next below by nails taking through said holes.

If the open end form is used the ends of the unit may be covered by a thin sheet as of plasterboard, fibre board or thin wood, indicated at "O". For convenience in securing the units in a course together end to end by nails or otherwise, the end frames may be provided with transverse nail holes P.

It will be obvious that the building units may be cut to any length by sawing the same and inserting an extra end frame so that the section becomes a complete unit. Thus the vertical line of a doorway, window, or other opening, may be easily conformed to as indicated in Figure 2 where "C^2" indicates the door line and "C^1", "C^1" indicate two and a half units which have been sawed or cut to terminate at one end in the vertical plane of the end of the full length intermediate building unit "C".

After the building wall is erected any usual or desirable interior or exterior finish may be applied to the faces of the walls. They may be waterproofed, painted, plastered,

stuccoed, or in anywise finished and without the necessity of any lath, as hereinbefore pointed out.

I claim as my invention:—

1. A building unit consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit, and a sheet of plasterboard formed and scored to be wrapped about said end and intermediate members secured thereto and forming the sides, top and bottom of said unit.

2. A building unit consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit, and a sheet of plasterboard material formed and scored to be wrapped about said end and intermediate members and secured thereto to form the sides, top and bottom of said unit, the scores on said plasterboard sheet being in the outer face thereof and the inner paper of said plasterboard being continuous and unbroken.

3. A building unit consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit, said members each consisting of an open frame, a sheet of plasterboard material formed and scored to be wrapped about said end and intermediate members and secured thereto to form the sides, top and bottom of said unit, the scores on said plasterboard sheet being in the outer face thereof and the inner paper of said plasterboard being continuous and unbroken, and sheets of thin material attached to and covering said open frames at the ends of the unit.

4. A building unit consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit, a sheet of plasterboard formed and scored to be wrapped about said end, and intermediate members secured thereto and forming the sides, top and bottom of said unit, and an insulated gypsum filler for said unit.

5. A building unit consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit and sheets of material secured to said end and intermediate members and forming the sides, top and bottom of said unit, one of said sheets being thicker than the others and being oppositely notched at its top and bottom edges and ends to provide an overlap when a plurality of said units are placed in assembled relation one upon the other.

6. A wall structure for houses and buildings comprising a plurality of units each consisting of an elongated member rectangular in cross section and comprising end and intermediate mmbers spaced at equal intervals of the length of said unit, and sheets of material secured to said end and intermediate members and forming the sides, top and bottom of said unit, the said units being laid in courses the one upon the other with the units in the several courses arranged to break joints with the end members of one unit in vertical alignment with the intermediate members of the units in the courses above and below.

7. A wall structure for houses and buildings comprising a plurality of units each consisting of an elongated member rectangular in cross section and comprising end and intermediate members spaced at equal intervals of the length of said unit, sheets of material secured to said end and intermediate members and forming the sides, top and bottom of said unit, the said units being laid in courses the one upon the other with the units in the several courses arranged to break joints with the end members of one unit in vertical alignment with the intermediate members of the units in the courses above and below, and means securing the units of the several courses in fixed relation as thus arranged.

In testimony whereof I claim the foregoing as my invention, I affix my signature this 27th day of March, A. D. 1930.

MORGAN K. ARMSTRONG.