Dec. 26, 1961 D. D. VAN ZANTE 3,014,250

DOOR STRUCTURE

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Fig. 1

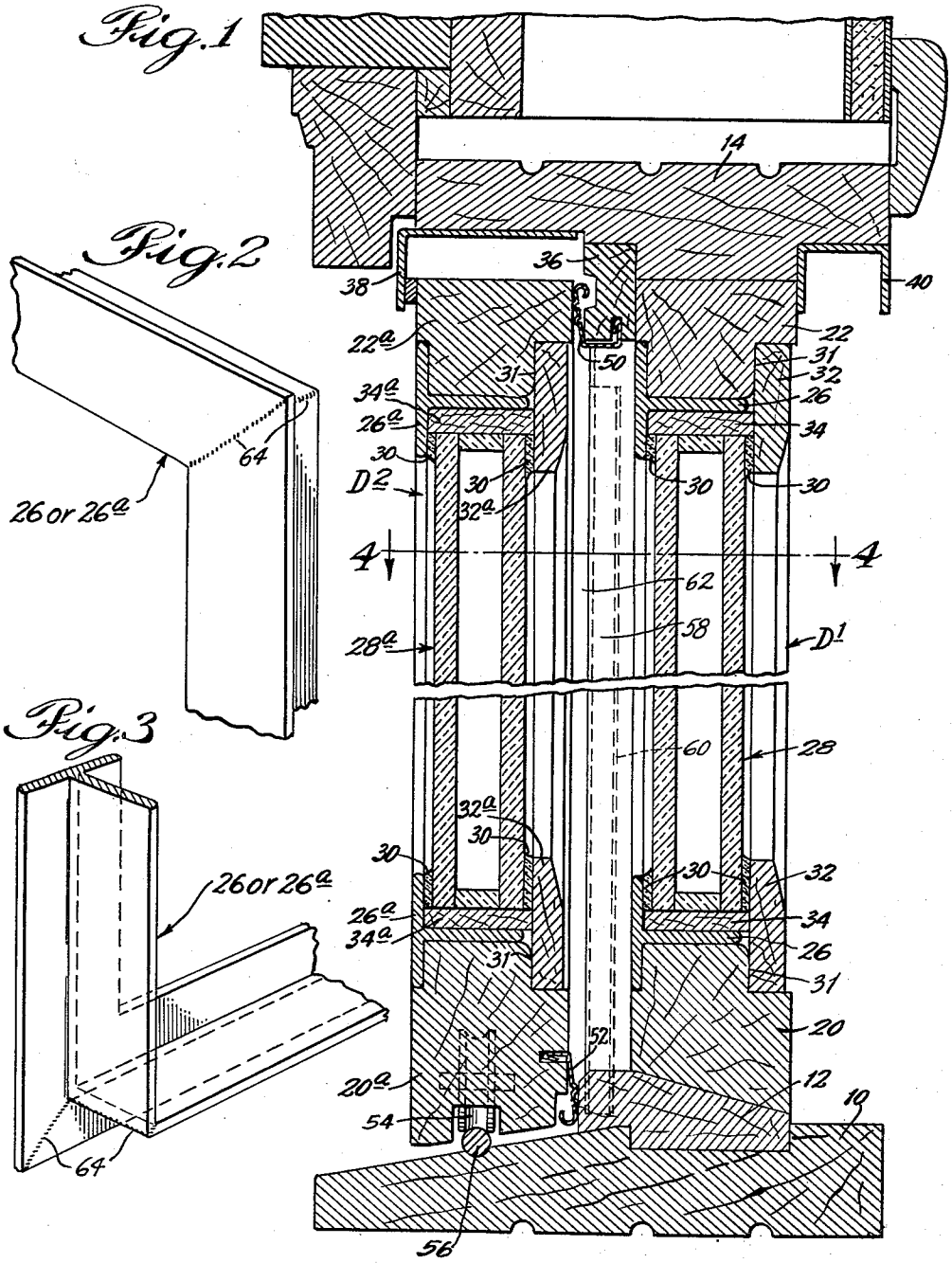


Fig. 2

Fig. 3

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Fig. 4

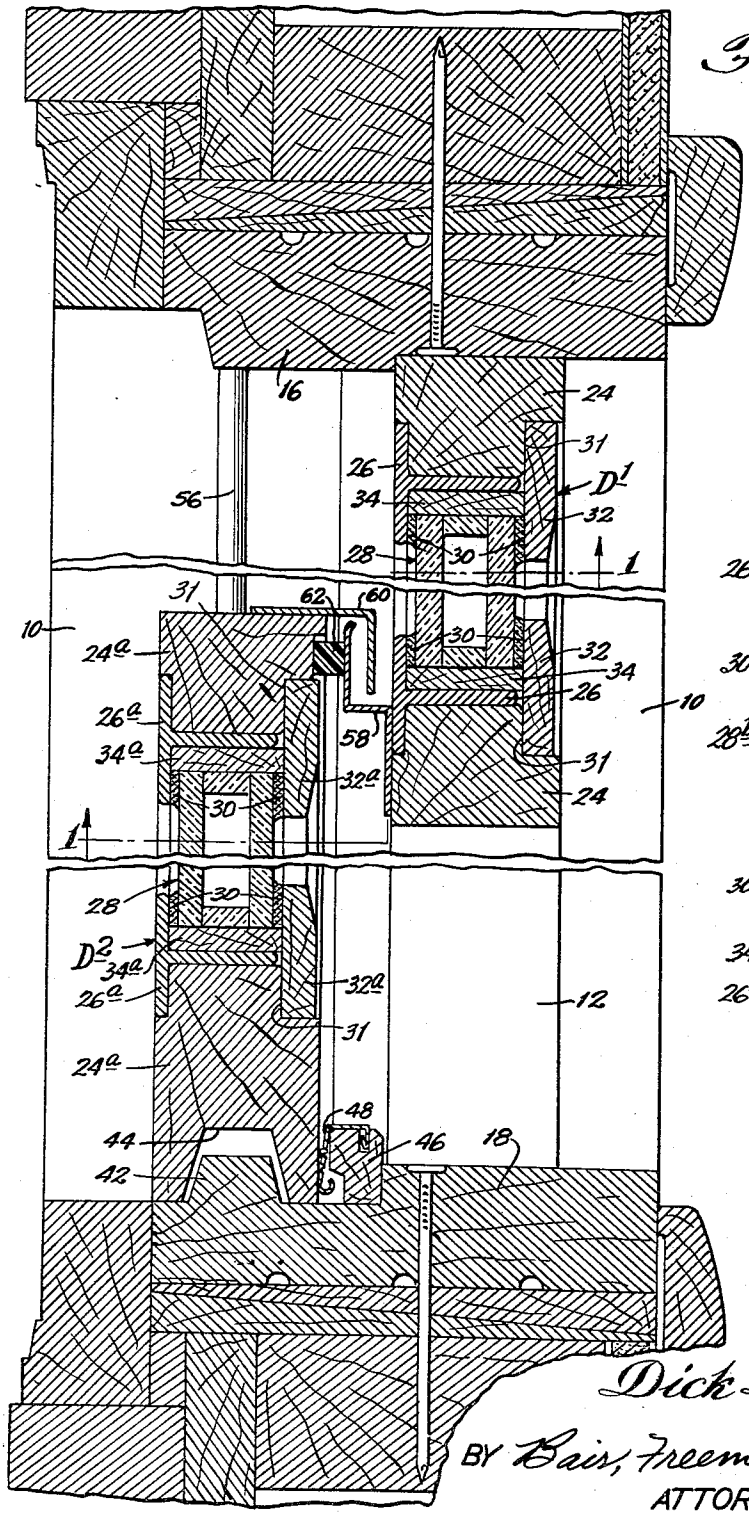
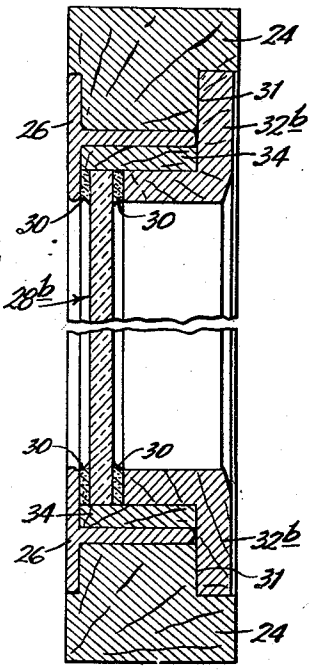


Fig. 5



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DOOR STRUCTURE

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This invention relates to a door structure and particularly one having a relatively narrow frame that does not appreciably interfere with vision.

One object of the invention is to provide the framework for the door partially of metal, such as steel for strength yet small cross section, and partially of wood so that the metal does not extend from exterior to interior of the door, thus eliminating the disadvantage of heat transmission through all-metal frames which do extend from exterior to interior, and which therefore are not too satisfactory in cold climates.

Another object is to provide a metal reinforcing framework for a door which is covered on the inside with wood for insulating value and to break the heat transmission path, thus avoiding "sweating" under certain temperature and humidity conditions, the steel reinforcement providing strength, rigidity and stability in a combination steel and wood construction which is almost as narrow as that customary on all-metal door framework.

Still another object is to provide a combined wood and steel section for both strength and to satisfy some customer preference for wood that is more harmonious with conventional residential interiors.

A further object is to provide a combined wood and steel construction that provides an exterior glazing stop only ⅛" thick, thus permitting the use of 1" thick insulating glass such as "Thermopane" or "Twindow" in a sash just 1¾" thick. This makes possible an over-all door frame width of 5¼" which fits nicely into the usual residential walls.

Still a further object is to provide a metal frame with a wood surround, the metal being exteriorly exposed but the interior being covered with wood so as to break the heat transmission path, the door being adaptable for mounting with one of a pair thereof stationary and the other slidable in the door frame.

An additional object is to provide a construction of the character contemplated which is readily adaptable for sealing against weather infiltration by means of weatherstrips that permit sliding of the movable section of the door.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my door structure, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawings, wherein:

FIG. 1 is a vertical sectional view through a door structure embodying my invention;

FIGS. 2 and 3 are perspective views of upper and lower corners of the steel framework of the door sections;

FIG. 4 is a horizontal sectional view taken on the line 4—4 of FIG. 1, FIG. 1 being taken on the line 1—1 of FIG. 4; and

FIG. 5 is a horizontal sectional view similar to FIG. 4 showing a modified construction.

On the accompanying drawings I have used the reference character D^1 to indicate in general a door which is stationarily mounted and D^2 a door which is movably mounted. A sill is shown at **10** in FIG. 1 and a threshold at **12**, the head jamb of the door frame being shown at **14** and the side jambs thereof (see FIG. 4) at **16** and **18**.

The door D^1 comprises a bottom rail **20**, a top rail **22**, a pair of stiles **24**, and a metal frame **26**. The framework of the door consisting of the elements **20**, **22**, **24** and **26** is glazed with a double-pane unit **28** such as a "Thermopane" or "Twindow" unit, the glazing compound, such as putty or plastic seal strips, being shown at **30**. The door D^1 also has wood stops **32** all around its four sides and thus isolating the steel frame **26** from the interior of the room. The stops **32** are located in rabbets **31** of the rails **20**, **20***a*, **22** and **22***a*, and of the stiles **24** and **24***a*.

The door D^2 is similar to the door D^1 and has the same elements **20***a*, **22***a*, **24***a*, **26***a*, **28***a* and **32***a* corresponding to the door D^1 as already described. At **34** and **34***a* filler strips are shown around the periphery of the units **28** and **28***a* which may be of wood, rubber, or other resilient material, and need not be continuous but may be short lengths adequate to support the glass.

The door D^1 is adapted to be mounted stationarily in the door frame **10—12—14—16—18**, the bottom rail **20** resting on the sill **12** and the top rail **22** confined between a parting stop **36** and an inside stop **40** of metal. The door D^2 is adapted for sliding horizontally by means of rollers **54** in the bottom rail **20** traveling on a rod-like track **56** of the sill **10**, and the top rail **22***a* sliding between the parting stop **36** and an outside stop **38** of metal.

When the door D^2 is closed as in FIG. 4, a groove **44** of one of the stiles **24***a* coacts with a bead **42** of the side jamb **18**. Adjacent the bead **42** is a weatherstrip supporting strip **46** having a metal weatherstrip **48** mounted thereon. Similarly, weatherstrips **50** and **52** (see FIG. 1) are provided for the top and bottom rails **22***a* and **20***a* respectively of the door D^2.

Referring again to FIG. 4, a metal check rail **58** is provided on the stationary door D^1 and a cooperating metal check rail **60** on the slidable door D^2. A resilient sealing strip of neoprene or the like **62** cooperates with the check rail **58** in the closed position of the door.

The metal frames **26** and **26***a* of the doors D^1 and D^2 are preferably formed of T-section steel such as illustrated in FIGS. 1 and 4 having their corners mitered and welded together as illustrated at **64** in FIGS. 2 and 3. This provides an adequately stable, reinforcing means for the door framework, and an exterior glazing stop that is only about ⅛" thick thus permitting the use of 1" thick insulating glass in each door section that is only 1¾" thick so that the two doors occupy no more room than is necessary for an over-all door frame width of 5¼".

In FIG. 5 I illustrate how my special door framework construction may be single-glazed instead of double-glazed if desired. A single pane of glass **28***b* is illustrated and since its thickness is much less than the double glazing **28** or **28***a*, a special shaped wood stop **32***b* is used in place of the stop **28** or **28***a* shown in the previous figures. The stop **32***b* is of different dimensions than the stops **28** and **28***a* to compensate for the difference in thickness of the pane **28***b* compared with the double-glazed pane **28** or **28***a*.

It will be noted that the metal frames **26** and **26***a* do not extend from exterior to interior but the interior is covered by the wood stops **32**, **32***a* and **32***b* which break the heat transmission path and avoid the undesirable "sweating" encountered with all-metal frames that extend from exterior to interior, especially when the temperature goes down to near, or drops below, the freezing point. Thus the undesirable sweating is eliminated and the usual preference for wood as interior finish is had, yet the advantages of a reinforcing steel framework is had for each door section panel.

Some changes may be made in the construction and arrangement of the parts of my door structure without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. In a door structure of the character disclosed, a door panel comprising a rectangular framework of T cross section metal welded together at the corners to form an integral structure with the legs of the T's projecting toward the inner face of the door panel, a wood surround for said framework having one portion surrounding said legs and another portion surrounding the outwardly projecting arms of said T's, the inner face of said surround being rabbeted adjacent the inner edges of said T legs, wood stops in said rabbets and overlapping said inner edges of said T legs whereby said stops are effective to prevent exposure of said framework interiorly, said stops extending beyond said inner edges of said T legs, said door being glazed between the inner faces of the inwardly projecting arms of said T's and the portions of said stops extending beyond said edges of said T legs, and means for mounting said door panel in a wood door frame devoid of metal that extends from exterior to interior with respect to a wall in which said door frame is mounted

2. In a door structure of the character disclosed, a door panel comprising a rectangular framework of T cross section metal welded together at the corners to form an integral structure with the legs of the T's projecting toward

the inner face of the door panel, a wood surround for said framework having one portion surrounding said legs and another portion surrounding the outwardly projecting arms of said T's, the inner face of said surround being rabbeted adjacent the inner edges of said T legs, wood stops in said rabbets and overlapping said inner edges of said T legs whereby said stops are effective to prevent exposure of said framework interiorly, said stops extending beyond said inner edges of said T legs, said door being glazed between the inner faces of the inwardly projecting arms of said T's and the portions of said stops extending beyond said edges of said T legs, and means for mounting a pair of said door panels in a wood door frame devoid of metal that extends from exterior to interior with respect to a wall in which said door frame is mounted with one of said door panels stationary and the other slidably movable horizontally relative to said door frame.

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