March 4, 1958 E. B. SIMMONS 2,825,099

PANEL DOOR JOINT AND METHOD OF CONSTRUCTION

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Fig. 1

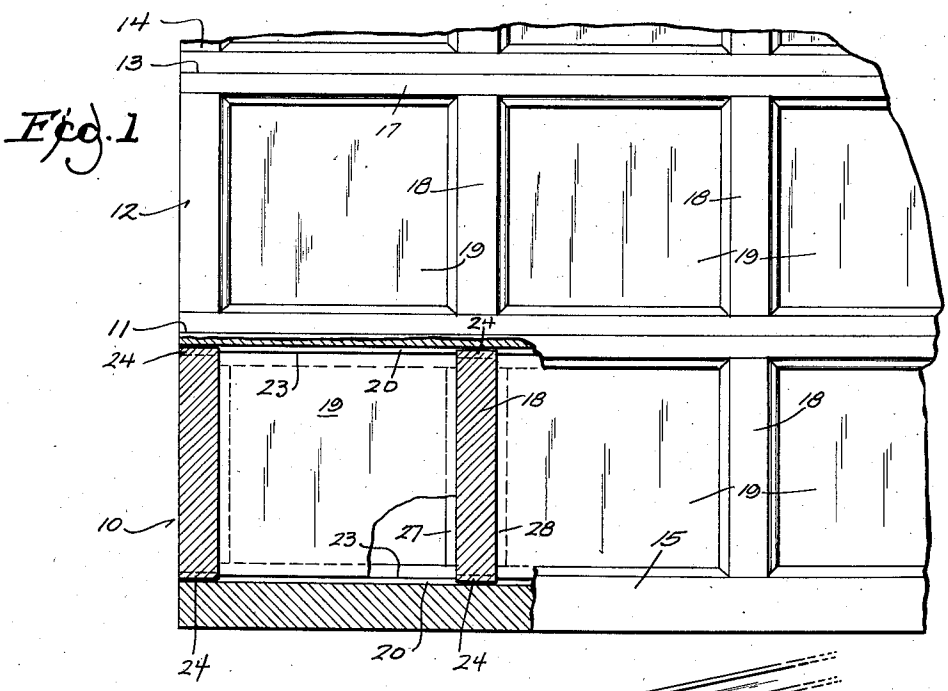


Fig. 2

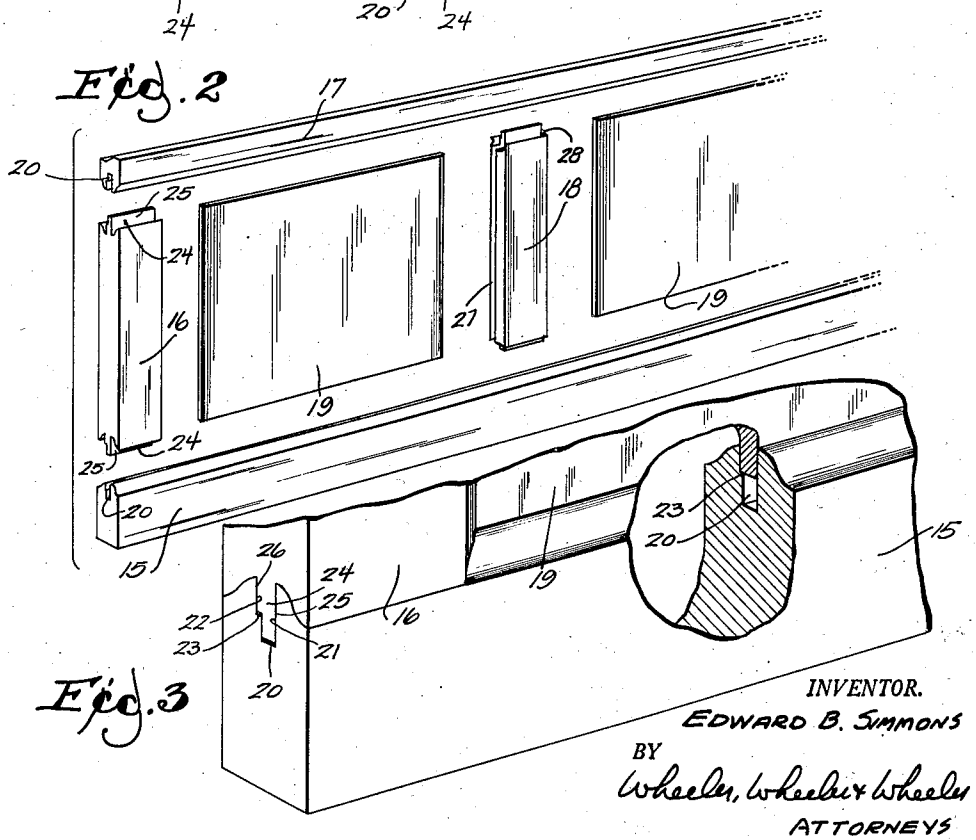


Fig. 3

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PANEL DOOR JOINT AND METHOD OF CONSTRUCTION

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3 Claims. (Cl. 20—15)

This invention relates to improvements in panelled joiner work. In panelled joiner work, particularly the manufacture of panelled doors, rails, stiles and muntins have been provided with joints shaped so that the sides or ends of the members are provided with dowels or with tongue and groove connections. The particular joint which is suited to this invention is a tongue and groove joint which permits manufacture of the various components of the door in standardized sizes which may be kept in inventory in readiness to fill orders either standard or special; at the same time providing for economy as to the required area of panel material.

The object of the invention is to facilitate the manufacture of panelled doors and other joiner work, to provide a strong and improved tongue and groove joint, to force the assembler of the component parts to use the materials in the most advantageous manner for accuracy and appearance, and to reduce the number of component parts required for a complete panelled product.

In the drawings:

Fig. 1 is an elevation of a multi-panelled door such as a garage door; portions of the front face of the rails and muntins being broken away to exhibit the joiner construction.

Fig. 2 is an exploded assembly view in perspective showing the parts of a section of a sectionalized panel door.

Fig. 3 is a perspective of a lower left hand corner of a panel door made in accord with this invention, a portion of the lower rail and a portion of adjacent panel being broken away to show the assembled relationship of panel and rail.

The drawings show the incorporation of the invention in a sectionalized door for garage door purposes. The lowermost section **10** terminates along an upper margin **11** and extends as a unit across the bottom of the door. Immediately above the section **10** is a similar section **12**, the upper margin of which is shown at **13**. Additional sections **14** may be joined successively to fabricate a door of the required size and along the lines of separation at **11—13** hinges may be provided for in a manner well known in this art, but which need not been shown here, since the invention may be incorporated in sectionalized doors or in "one piece" doors.

Fundamentally, the construction of the joiner work in accord with this invention calls for a lower rail **15**, stiles as exemplified at **16** and top rail **17**. There are as many mullions **18** as are needed to demark the required number of panel areas to be occupied by panels **19**.

An important feature of the invention is the tongue and groove construction which, as to the rails **15** and **17**, includes a continuous routed channel **20** having one straight wall **21** at one side thereof and an opposite wall **22** stepped at **23**. There is thus provided a groove for the substantially complementary tenon **24** of the stiles and mullions which has one straight wall **25** and one stepped wall **26**. When the tongue or tenon **24** is properly glued in position as shown in Figure 3, a decidedly strong tongue and

groove connection between rail and stile or between rail and mullion is achieved.

A far greater depth of groove at **20** is required for a satisfactory joint between rail and stile or between rail and mullion than is required for the reception of the margins of a panel **19**. Therefore, if the groove **20** had straight side walls **22** instead of the stepped side wall as shown, the panel **19** would necessarily be received to the bottom or to the full depth of channel **20**, but because of the stepped configuration of wall **22** and **23**, this invention makes possible a long tongue joint with deep channel **20**, but with a shoulder or step at **23** against which panel **19** may abut to limit the extent to which the panel is received in the channel. The result is a considerable economy in panel material requirements and at the same time a stepped tongue and groove joint which is superior to a tongue and groove joint which has unstepped walls.

Mullions **18** need only be grooved with a straight wall shallow groove at **27** and **28**, since it is not necessary to provide the deep narrow extension of the groove as at **20**, because tongue **24** is to be received in such a groove **27** or **28**.

As shown in Figure 3, panel **19** is only received into groove **20** as far as the step **23**.

It will be apparent to those skilled in this art that because of the step at **23** there is a front and a back side to a stile or rail or mullion and it is possible for the skilled workman selecting the materials for the milling operations to mill the step for the tongue **24** or to mill the step **23** for the groove **20** so as to present the best quality of material on the "front" face and thus force the assembler of a door or door section **10—12** to so assemble the parts as to exhibit the "best" face at the front of the product. The joint can be assembled in only one way since the stepped tongue must face the stepped, grooved wall.

It will also be observed that rails **15** or **17** may be manufactured in quantity in the approximately finished lengths which, because of general standardization, are suited to particular sizes of doors. There is no need to mill accurately for a given dimension of a door since no dowels are needed and the tongue **24** is receivable anywhere along groove **20**. Likewise, the panel is received anywhere along its wider portion of the groove, and the assembly operation may be rapid and accurate in accord with the precut sizes of panels.

Another feature of the invention is the provision of an unfilled channel lying beyond the margin of each of the plywood panels **19**. This unfilled portion of the channel **20** in the rails and the mullions provides what is known as aeration in the completed door sections. This is of importance where the door divides spaces having different temperatures. In this industry such variation in temperature is known to cause condensation with resulting warpage. It has been found that joiner work made up in accord with this invention is sufficiently aerated because of the unfilled channel portions at **20**, that warpage is substantially reduced.

I claim:

1. A panelled joiner construction including rails and styles adapted to be joined in a plane frame by an inter-engaging movement parallel with said plane and having tongue and groove connection between the rails and styles, the axis of the tongues being disposed in said plane and the tongues and grooves having walls only one wall of a tongue and one complementary wall of a groove being stepped, the extremities of the tongues being substantially bottomed in said grooves.

2. A panelled joiner construction including rails and styles adapted to be joined in a plane frame by an inter-engaging movement parallel with said plane and having tongue and groove connection between the rails and styles, the axis of the tongues being disposed in said plane and

the walls of the tongues and the walls of the grooves being complementarily stepped, the extremity of the tongue being substantially bottomed in said groove, the rails and styles are provided with intervening panels receivable in the grooves, and the panel is of a thickness receivable in the groove only to the depth of the step.

3. A joiner work constructon having rails continuously grooved with a deep narrow groove having one straight wall and one stepped wall whereby to provide a shallow portion of the groove presenting greater width shaped to receive successive stiles, panels, mullions and additional panels in contiguity, the stiles and mullions being provided with stepped tongues extending axially thereof and

having walls complementarily receivable against the walls of the stepped grooves and the panels being receivable in the wider portions of said grooves whereby to be in abutment against said steps.

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