

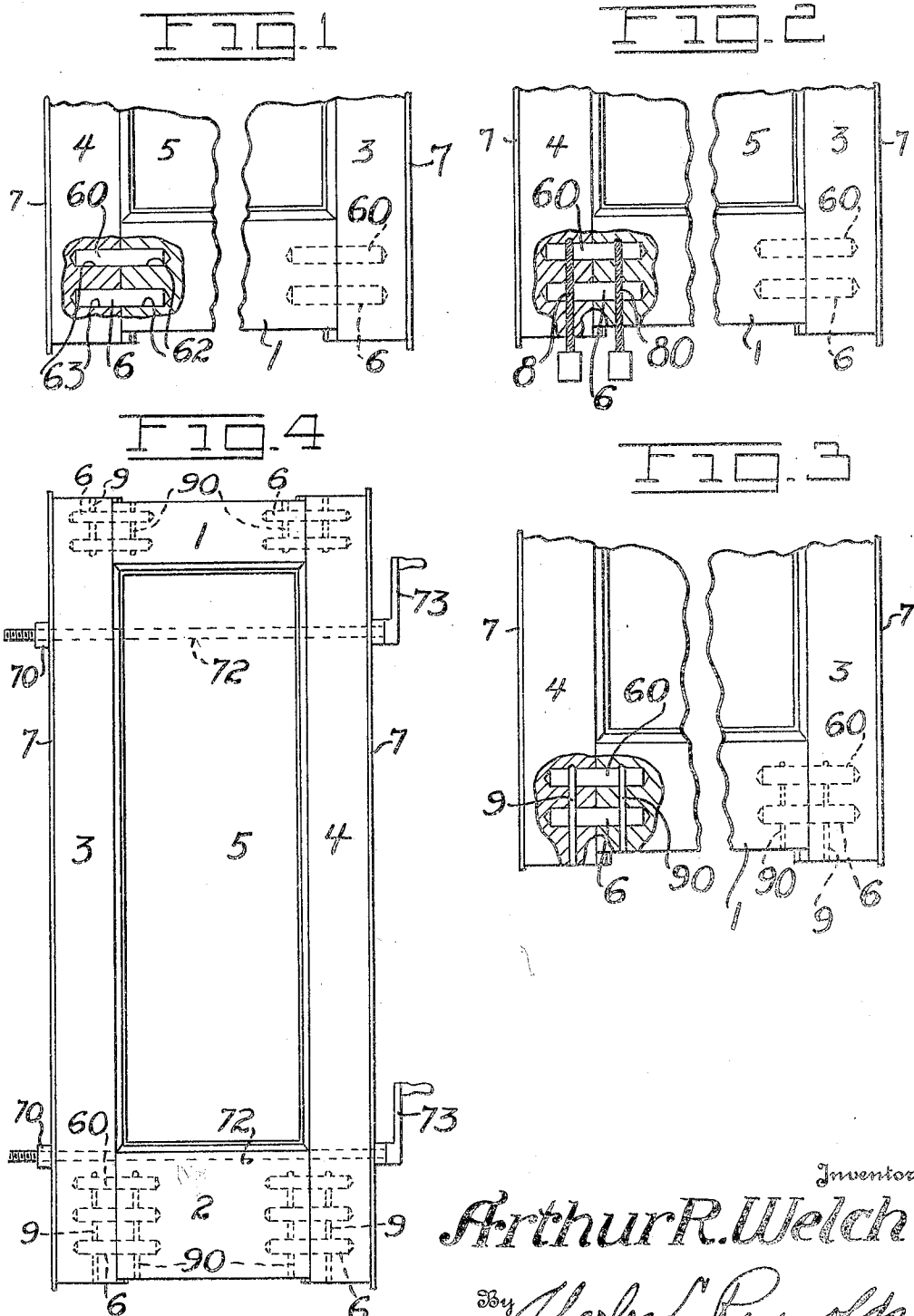
May 16, 1933.

A. R. WELCH

1,909,510

DOOR AND METHOD OF MANUFACTURE

Filed Jan. 5, 1932



Inventor
Arthur R. Welch
By *Charles L. Reynolds*
Attorney

UNITED STATES PATENT OFFICE

ARTHUR R. WELCH, OF HOQUIAM, WASHINGTON

DOOR AND METHOD OF MANUFACTURE

Application filed January 5, 1932. Serial No. 584,781.

My invention relates to the manufacture of commercial doors, which are usually made with a top and bottom rail, and stiles extending from just below the bottom edge of the bottom rail across the ends of both top and bottom rails and just beyond the upper edge of the top rail, these rails and stiles being joined by dowels secured in matching holes drilled in the ends of the rails and in the adjoining inside edges of the stiles. It is immaterial whether intermediate rails are employed or not, so far as the present invention is concerned.

Because of the methods employed in commercial manufacture, especially because the doors cannot be held clamped together for more than a few seconds, and are then laid away for the glue to set, and because of imperfections in the material, such doors will sometimes spring apart or become loose at these joints.

It is a primary object of my present invention, then, to make such a joint which of necessity will be and remain tight. It is likewise an object to form such a permanently tight joint which is adapted to commercial practices and which requires but little in the way of additional operation, time, and expense.

More especially it is an object to provide a method and a door wherein the dowels can be locked in place without reliance wholly upon the glue which is intended to hold the dowels, and by means of which the dowels can be so locked in place that the joint is fixed and held at the time when the door is most tightly set up, and the glue can set and dry while the joint is thus held, without further need of clamps to hold the door while the glue is setting.

It is also an object to provide a joint of this character, a door embodying the same, and a method for manufacturing such doors, whereby the appearance of the door is in no way marred, and such that the jointing and the locking means are not perceptible when the door is in use.

My invention comprises the novel door, as an article of manufacture, and the novel method of forming such a door, as illustrat-

ed in the accompanying drawing, described in this specification, and as will be more particularly pointed out by the claims which terminate the same.

The accompanying drawing illustrates the several steps which distinguish this method and the door during the process of manufacture.

Figure 1 is a fragmentary elevation, with parts broken away, of a door as it is completed by the usual commercial methods.

Figure 2 is an illustration of the first additional step, a part of my process, and Figure 3 is an illustration of a succeeding step therein, the views being similar to Figure 1.

Figure 4 is an elevation of a door completed according to my method, ready to release the clamp.

The door comprises the top rail 1, the bottom rail 2, and the stiles 3 and 4, together with such a panel as may be desired in the frame thus formed, this panel being indicated at 5. The parts of such a door are ordinarily held together by boring matching holes 63 in the stiles and 62 in the rails, and inserting dowels 6, 60 in such holes. The holes 63 are in the inside edge of the stile, and the holes 62 are in the adjoining outer end of the rail. Glue is then inserted in such holes, or the dowel is coated with glue, and the dowel is driven or squeezed home in the adjoining holes by squeezing the door in a clamp which in the drawing is diagrammatically represented by the members 7 carrying nuts 70 and 71, and having swiveled therein a screw 72 rotated by a handle 73. The door is drawn together or squeezed sufficiently by this or any equivalent mechanism to make the joint tight, and to drive the dowels home, but because of the press of commercial conditions it must be immediately released from the clamp, which is an integral part of the door-assembling machine, and set aside to permit the glue to set. If one of the stiles is bent slightly, if the grain is crooked, for instance, it may spring apart, and the joint becomes loose, or it may come loose from climatic conditions or other conditions of use.

According to my invention, when the door is in the clamp and parts are squeezed to-

gether, I employ instruments such as the drills 8 and 80 which enter the stile and adjoining rail respectively, and preferably from the top or bottom edge of the door, these drills passing through the dowel or dowels at this particular joint. If, as is customary, several dowels are employed at a joint, the drill will preferably pass through all the dowels and, of course, through the intervening wood. This step is illustrated in Figure 2.

These drills are now withdrawn, and with the door still clamped in the frame and the glue holding the dowels still wet and unset, pins 9 and 90 are inserted, these being of smaller size than the dowels 6 and 60, and passing through the holes previously drilled in these dowels. Any excess length in these pins is cut off, and the door is now released from the clamping frame and may be set aside to permit the glue to set.

By reason of the fact that the pins are put into place while the door is still held firmly in the clamp, and while the parts may still move because the glue holding the dowels has not set, the pins will retain the dowels in the tightest possible relationship, and thus the joint is held tightly closed and will remain in this position, being held by the glue holding the dowels, after the glue has set. Glue may be used to hold in place the pins 9 and 90, or it may be and preferably is omitted, since they will fit tightly enough in the holes drilled for them, especially since whatever tendency there is for movement of the rails and stiles relative to each other will cause a binding on these pins because of the shearing action caused by any tendency of the dowels to pull out.

It would be possible to drill through the surfaces of the rails and stiles into the several dowels, but this is not preferred. The dowels must be fairly large, and if the door material is thin there is but little wood in which the pins can hold, and there would be the possibility of stresses causing splintering of the wood, and in any event the end grain of the pins would show in the surface of the door when it was in use. However, by inserting the pins from the top and bottom edges of the door, not only do they obtain the greatest thickness of wood to hold them and to retain the dowels in place, but they are out of sight, since the top edge and the bottom edge of a door are not visible when the door is hung.

What I claim as my invention is:

1. The method of forming a door which comprises glueing dowels in place to join the abutting rails and stiles, squeezing the abutting edges together to make tight the joints, drilling holes through the dowels and the surrounding wood of the rail or stile, while the door is held clamped, inserting a pin through each such hole to lock the dowels in place,

then releasing the clamp and permitting the glue holding the dowels to set.

2. The method of forming a door which comprises glueing dowels in place to join the abutting ends and edges of rails and stiles, squeezing the door to make tight the joints, drilling holes from the top and bottom edges of the door, before the glue has set and while the door is held in the clamp, through the dowels and the intervening wood, inserting a pin in each such hole to lock the dowels in place, then releasing the clamp, and letting the glue set.

Signed at Hoquiam, Grays Harbor County, Washington, this 23d day of December, 1931.
ARTHUR R. WELCH.