No. 682,322. Patented Sept. 10, 1901.

F. J. CRONIN.

DOOR.

(Application filed Sept. 26, 1900.)

(No Model.)

Fig. 1.

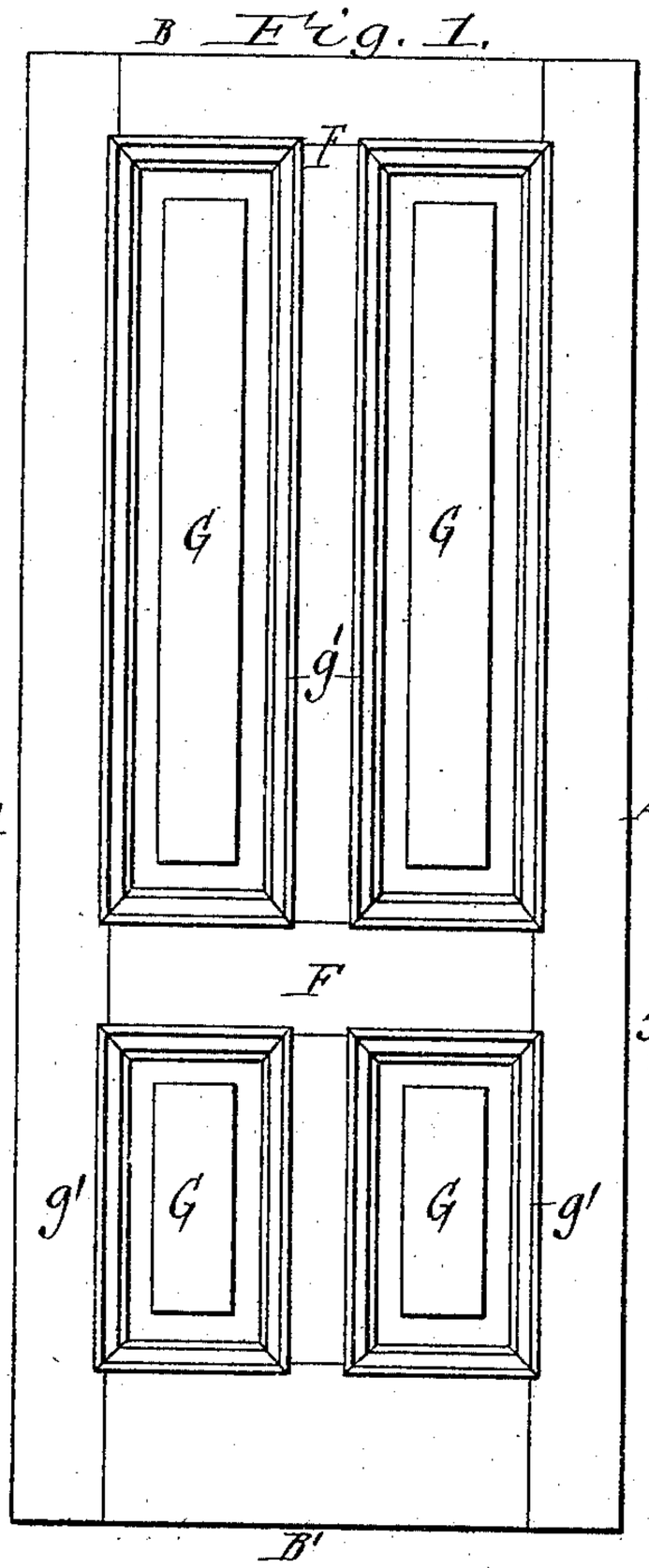


Fig. 2.

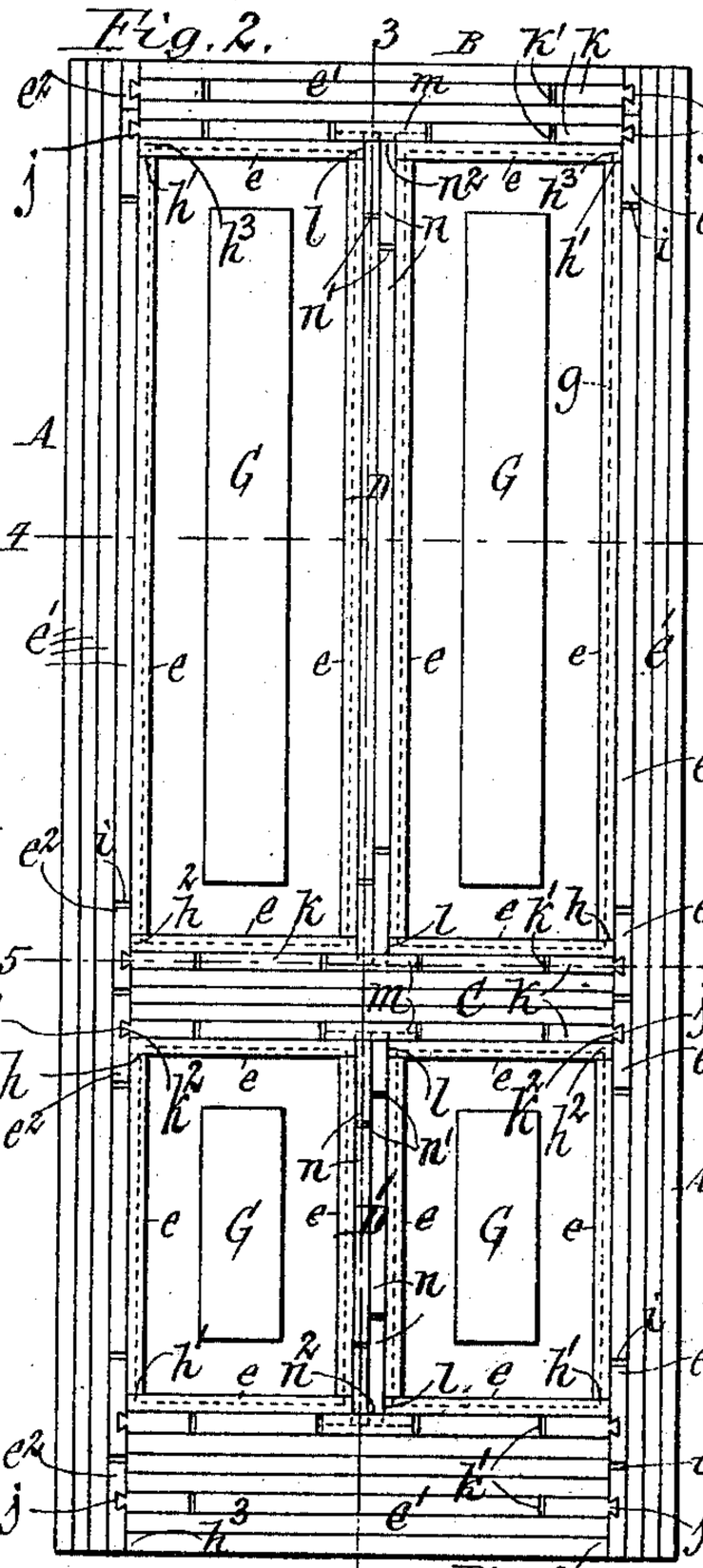


Fig. 3.

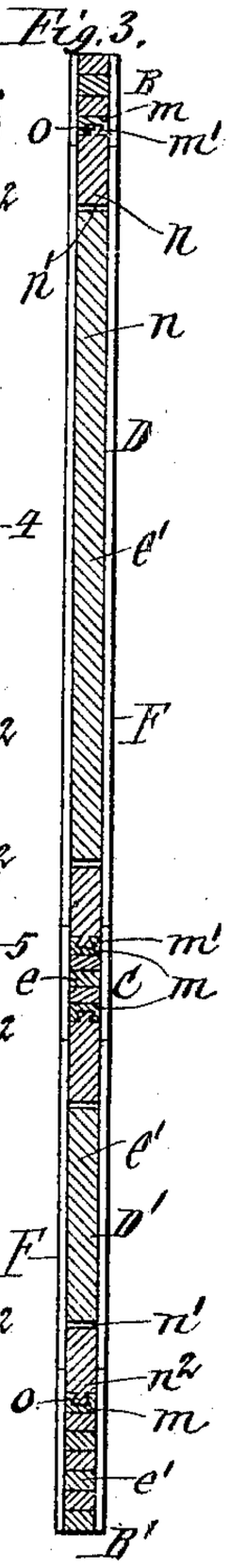


Fig. 4.

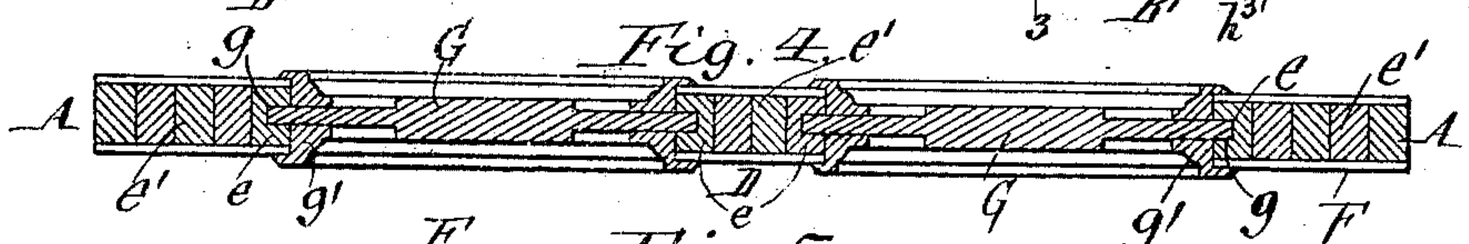


Fig. 5.

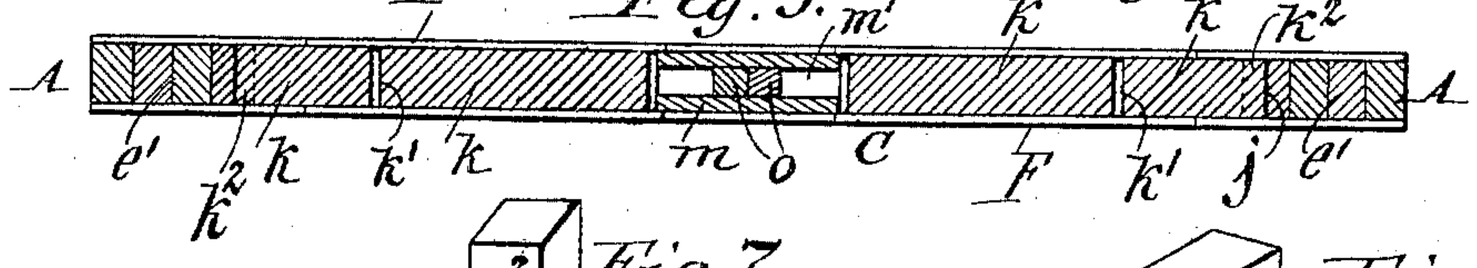


Fig. 7.

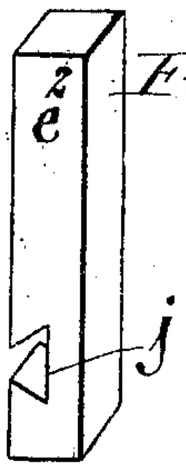


Fig. 6.

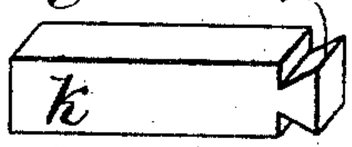


Fig. 8.

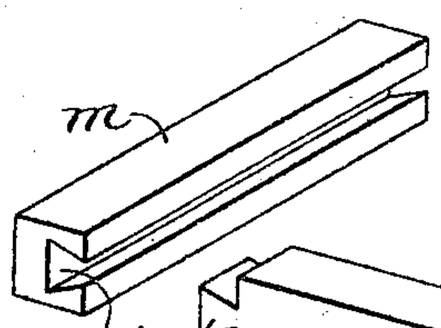
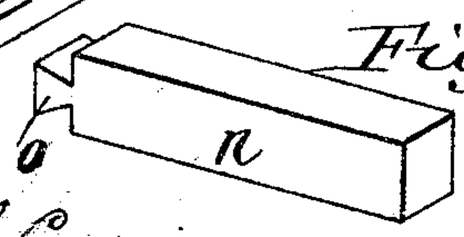


Fig. 9.



Henry L. Deck.
F. F. Schrzinger } Witnesses.

F. J. Cronin Inventor
By Wilhelm & Bonner Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK J. CRONIN, OF UTICA, NEW YORK.

DOOR.

SPECIFICATION forming part of Letters Patent No. 682,322, dated September 10, 1901.

Application filed September 26, 1900. Serial No. 31,168. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. CRONIN, a citizen of the United States, and a resident of Utica, in the county of Oneida and State of New York, have invented a new and useful Improvement in Doors, of which the following is a specification.

This invention relates that class of doors in which the body, frame, or core is composed of strips or pieces of inferior or cheap wood and veneered with superior or more expensive wood.

The object of this invention is to produce a door of the character in which the members are connected by dovetail joints of cheap and simple construction and which securely hold the members of the door-frame together independent of the veneering which is applied to the same.

In the accompanying drawings, Figure 1 is a face view of a door constructed according to my invention. Fig. 2 is a face view of the same before the veneer is applied thereto. Fig. 3 is a vertical section in line 3 3, Fig. 2. Figs. 4 and 5 are transverse sections, on an enlarged scale, in lines 4 4 and 5 5, Fig. 2, respectively. Figs. 6 and 7 are detached perspective views of the two parts of one form of coupling whereby the members of the door may be connected according to my invention. Figs. 8 and 9 are detached perspective views of the two parts of another form of coupling whereby the members of the door may be connected according to my invention.

Like letters of reference refer to like parts in the several figures.

A represents the stiles of the door; B B′, the top and bottom rails; C, the intermediate or lock rail, and D D′ the upper and lower muntins. Each of these door-frame members is built up of a number of wooden strips *e e′* of uniform thickness arranged side by side and secured together by glue. The outermost strips of the stiles may be of the same kind of wood as the veneer with which the door members are covered and the remaining strips may be of inferior or soft wood.

F represents the veneer, which is secured to the strips of the door members by glue.

G represents the panels, which are secured in the panel-openings in any suitable manner. As shown in Figs. 2 and 4 of the drawings, the panels are seated with their edges in longitudinal grooves *g* in the inner side of the innermost or panel strips *e*, which face the panel-openings of the door members, and the joint between the same is covered by moldings *g′*.

The preferred form of my improved joint for connecting the stiles with the top and bottom rail and the intermediate or lock rails is shown in Figs. 2, 5, 6, and 7 and is constructed as follows: The panel-strip *e* of each stile is divided between its ends and also stops short of the ends of the stile, so as to form a straight-sided mortise *h* near the middle of the stile and straight-sided mortises *h′* at opposite ends of the stile. The ends of the lock-rail form straight-sided tenons h^2, which fit into the mortises between the divided panel-strips of the stiles and abut against the inner side of the adjacent intermediate stile-strips. The ends of the top and bottom rails form straight-sided tenons h^3, which fit into the straight-sided mortises at the outer ends of the panel-strips *e* and abut against the inner sides of the adjacent intermediate stile-strips. The intermediate strip of each stile, which is arranged at the bottom of the mortises *h h′* therein, is divided into a number of sections e^2, which are separated slightly at their ends by intervening spaces *i*. Each of the sections e^2 of the divided intermediate strip which lies at the bottom of a straight-sided mortise in the stile is provided with a transverse dovetail mortise *j*. Each of the top and bottom rails and the lock-rail has one or more of its intermediate strips divided into sections *k*, which are separated at their opposing ends by intervening spaces *k′*. The outermost section *k* of each of the divided intermediate rail-strips is provided at its outer end with a dovetail tenon k^2, which engages with the dovetail mortise *j*, formed in the intermediate-strip section e^2 of the adjacent stile. Each of the stile strip sections e^2 and its coöperating rail-strip section *k* form the two locking members of a coupling whereby two adjacent door members are connected. As shown in Fig. 2, each stile is connected with each of the rails by two pairs of coupling members, but, if desired, only one pair of coupling members may be employed to connect each stile with each rail.

The preferred form of my improved joint for connecting the muntins with the top and bottom rails and with the lock-rail is shown in Figs. 2, 3, 5, 8, and 9, and is constructed as follows: The panel-strip *e* of each rail is divided at its middle into two sections, so as to form a straight-sided mortise *l* between the sections of each of the panel-strips. The panel-strips *e* of the muntins engage with the panel-strips of the rails on opposite sides of the straight-sided mortises *l* in the same. As shown in Fig. 2, the divided strips of the rails which are arranged next to the panel-strips have their central sections *m* arranged at the bottom of the straight-sided mortises *l* in the rails. The sections *m* of the divided rail-strips which lie at the bottom of the mortises *l* in the rails are provided on their outer sides with longitudinal dovetail grooves or mortises *m'*. Each of the intermediate strips of the muntins is divided into sections *n*, which are separated at their opposing ends by intervening spaces *n'*. The sections *n* of the intermediate muntin-strips, which are arranged at the ends of the muntins, form straight-sided tenons n^2 on the ends of the muntins, which engage with the straight-sided mortises *l*, formed between the panel-strips of the rails. Each of the end or tenon sections *n* of the intermediate muntin-strips is provided at its outer end with a dovetail tenon *o*, which engages with the dovetail mortise *m'* in the intermediate-strip section *m*, which is at the bottom of the straight-sided mortise *l* in the respective rail. The rail-strip sections *m* and the muntin-strip sections *n'*, which are connected by the dovetail joint, form the members of the couplings, whereby the rails and the muntins are connected. As shown in Fig. 2, the coupling members *n* at each end of each muntin are arranged side by side, and the dovetail tenons *o* of these two coupling members *n* engage with the dovetail groove of the same coupling member *m* on the adjacent rail; but, if desired, the coupling members *n* at the same end of a muntin may be separated by an intervening strip, and each member *n* may engage its dovetail tenon with the dovetail groove in a separate coupling member on the adjacent rail.

The strips forming the several door members are assembled upon the veneer for one side of the door members, and then the veneer of the other side is applied thereto. Previous to assembling the parts of the door the panels are fitted into the grooves of the panel-strips and glue is applied to the strips and veneer for securing them together. After the parts have been thus assembled pressure is applied against the outer sides of the stiles, against the top and bottom rails, and against the veneer on opposite sides of the door members. As the stiles are pressed toward each other the several strips of each stile are firmly united and the middle and end portions of the stiles are firmly united with the ends of the top, bottom, and lock rails. At the same time that the stiles are pressed against opposite ends of the rails the dovetail coupling members *k* are shifted lengthwise between the adjacent strips until the same have adjusted themselves to a neutral position, this being permitted by the slack space between the sections of the divided rail-strips. This pressure of the stiles against opposite ends of the rails causes the panel-strips of the rails to be pressed against opposite sides of the tenons *l* of the muntins. As the two tenon-sections *n* at each end of each muntin move toward each other under pressure, the dovetail tenons *o* at the ends thereof slide in the dovetail grooves or mortises *m'*, which are formed lengthwise in the rail-strip sections *m*, thereby permitting each of these dovetail connections to adjust itself according to the pressure applied thereto and preventing the dovetail tenons from being sheared off. As the top and bottom rails are pressed toward each other and against the adjacent ends of the stiles and muntins, the panel-strips of the rails are pressed against the ends of the panel-strips of the stiles and muntins, and the sections of the divided stile and muntin strips move lengthwise on the adjacent strips until they reach a neutral position, this movement of these strip-sections being permitted by the slack space between the same. By permitting the sections of the divided stile-strips to slide lengthwise the same are free to adjust themselves to the pressure applied to the side of the rails, thereby preventing the dovetail tenons *j* from being sheared off. It will thus be seen that the interlocking dovetail joints between the several members of the door are free to adjust themselves under the pressure which is applied to the same until all the parts assume a neutral or balanced position, thereby avoiding straining of the door or producing a tension upon the joints which constantly tends to distort the door.

My improved door can be built up largely out of material which usually goes to waste, and when connected in the manner described produces a cored door, the members of which are securely locked together and do not depend for their strength upon the veneer which is glued to the same.

Although I have shown my invention illustrated as applied to a door-frame, it is obviously applicable to other woodwork of a similar character.

I claim as my invention—

1. A frame for doors and similar articles, the members of which are composed of strips arranged side by side, one of said members having a straight-sided mortise on its side and a dovetail mortise at the bottom of the straight-sided mortise, and the other member having a straight-sided tenon which engages with said straight-sided mortise and also having a dovetail tenon at the end of the straight-sided mortise which engages with said dovetail mortise, substantially as set forth.

2. A door having adjacent frame members which are composed of strips arranged side by side, one of said members having a straight-sided mortise formed in its inner or panel strip and a dovetail mortise formed in a strip at the bottom of the straight-sided mortise, and the other member having a straight-sided tenon at its end which engages with said straight-sided mortise and having a dovetail tenon on one of its strips which engages with said dovetail mortise, substantially as set forth.

3. A door having adjacent frame members which are composed of strips arranged side by side, one of said members having an inner or panel strip provided with a straight-sided mortise and an intermediate strip composed of sections one of which forms the bottom of said straight-sided mortise and has a dovetail mortise, and the other member having a straight-sided tenon at its end which engages with said straight-sided mortise and having one of its intermediate strips composed of sections one of which has a dovetail tenon at its end which engages with said dovetail mortise, substantially as set forth.

4. A frame for doors or similar articles having its frame members composed of strips arranged side by side, one of said members having an elongated dovetail mortise formed lengthwise therein and the other member having a dovetail tenon engaging with said mortise, whereby the last-mentioned frame member is permitted to move lengthwise on the first-mentioned member without liability of shearing off the tenon, substantially as set forth.

5. A door having adjacent frame members composed of strips arranged side by side, one of said members having an inner or panel strip provided with a straight-sided mortise and an intermediate strip which is arranged at the bottom of said straight-sided mortise and which is provided with a longitudinal dovetail mortise, and the other member having a straight-sided tenon which engages with said straight-sided mortise and a dovetail tenon arranged at the end of the straight-sided tenon and engaging with said dovetail mortise, substantially as set forth.

6. A door having adjacent frame members composed of strips arranged side by side, one of said members having an inner or panel strip provided with a straight-sided mortise, and an intermediate strip which is arranged at the bottom of said straight-sided mortise and which is provided with a longitudinal dovetail mortise, and the other member having two or more intermediate strips forming a straight-sided tenon which engages with said straight-sided mortise and dovetail tenons arranged at the ends of the strips forming the straight-sided tenon and both of said dovetail tenons engaging with the same longitudinal dovetail mortise, substantially as set forth.

Witness my hand this 18th day of September, 1900.

FREDERICK J. CRONIN.

Witnesses:
A. B. McCABE,
HENRY HIPPLE,
HARRY I. MORGAN.