Nov. 17, 1931. E. A. SWEELEY ET AL 1,832,592

REFRIGERATOR CAR DOOR

Filed July 18, 1930 4 Sheets-Sheet 1

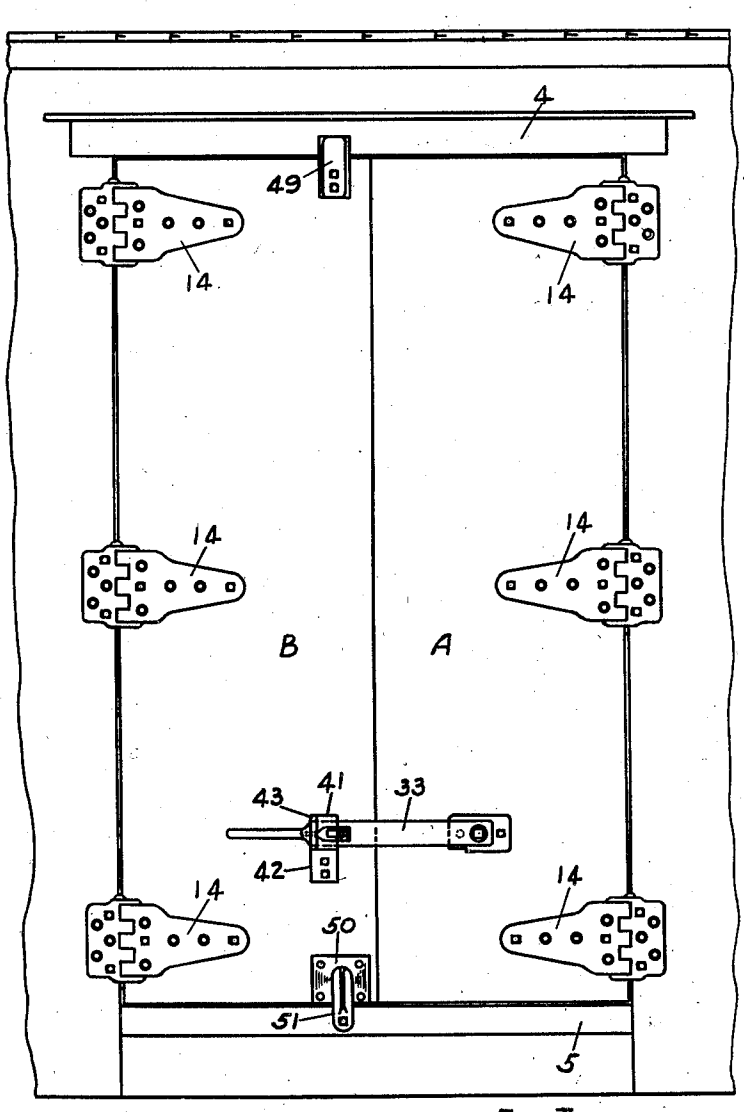


FIG. I

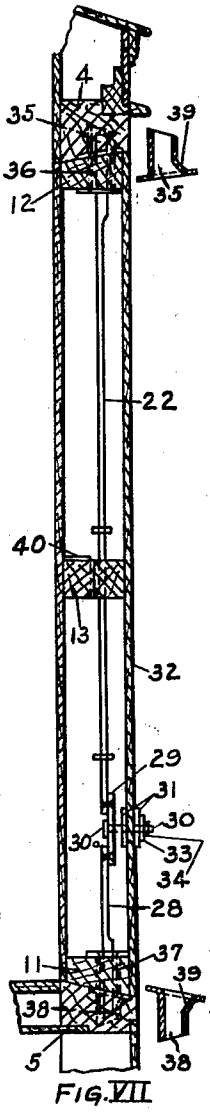


FIG. VII

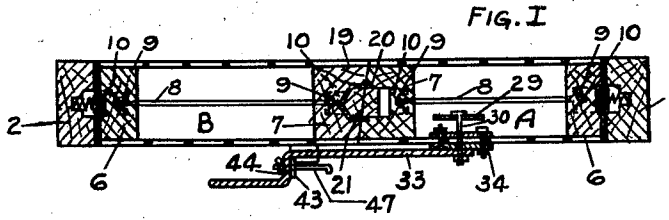


FIG. II

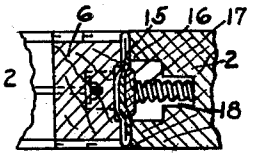


FIG. XI

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Nov. 17, 1931. E. A. SWEELEY ET AL 1,832,592

REFRIGERATOR CAR DOOR

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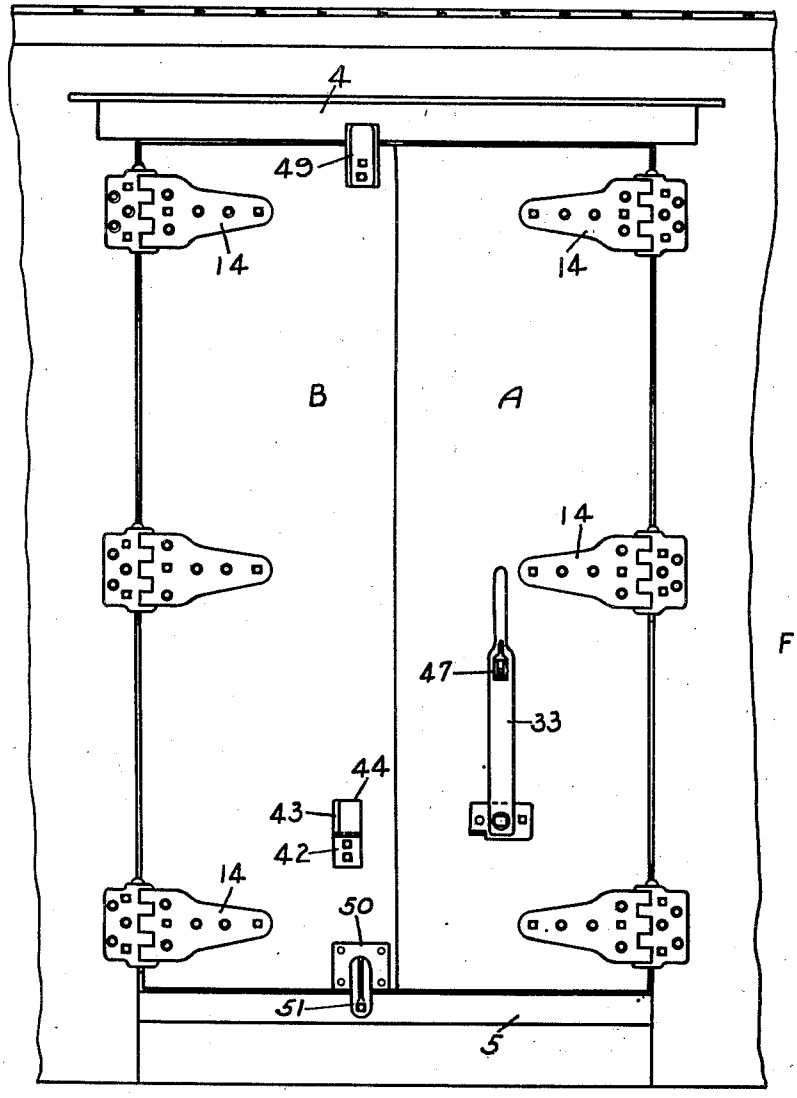


FIG. III

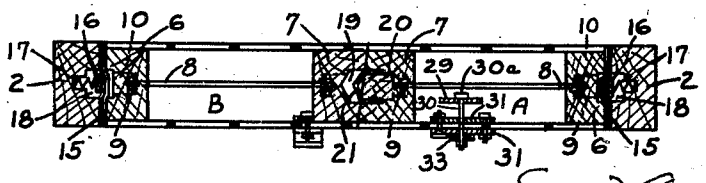


FIG. IV

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REFRIGERATOR CAR DOOR

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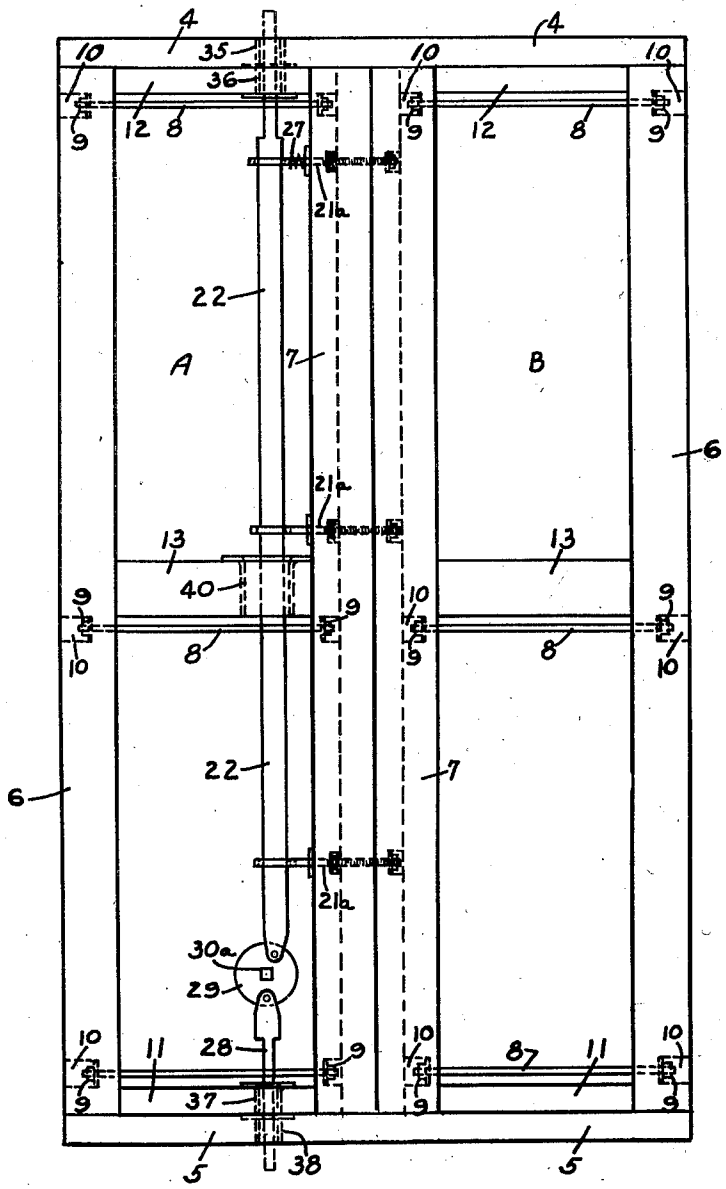


FIG. V

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Nov. 17, 1931. E. A. SWEELEY ET AL 1,832,592

REFRIGERATOR CAR DOOR

Filed July 18, 1930 4 Sheets-Sheet 4

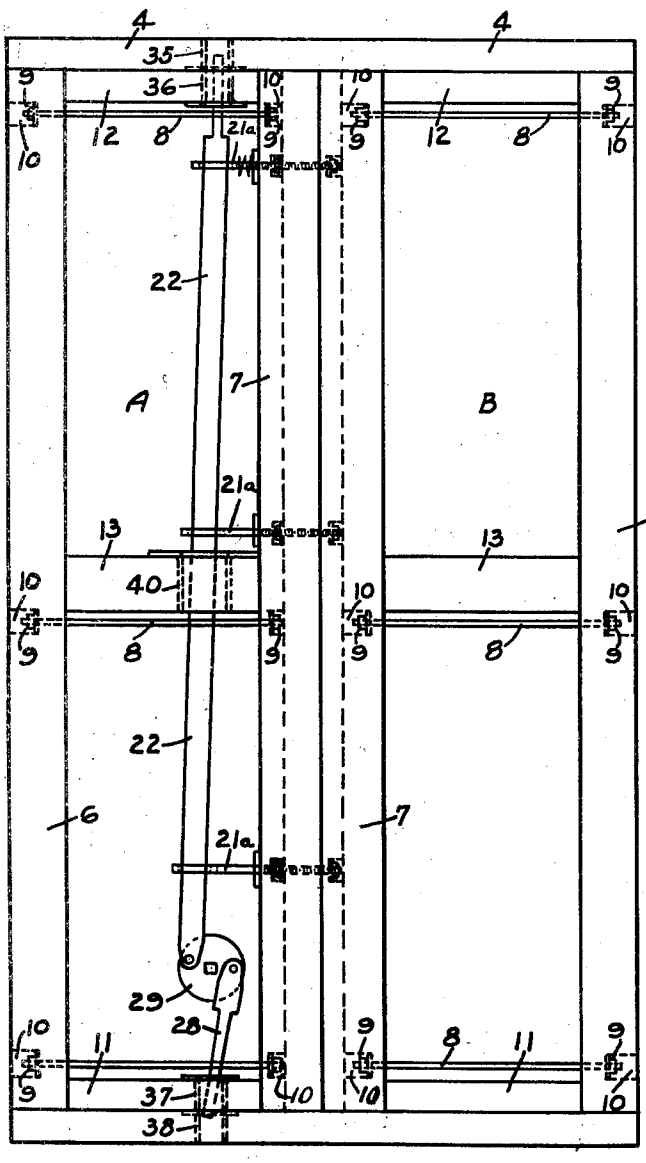


FIG. VI

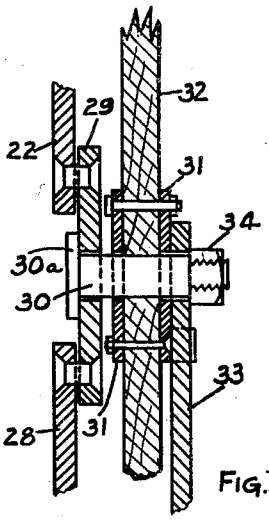


FIG. VIII

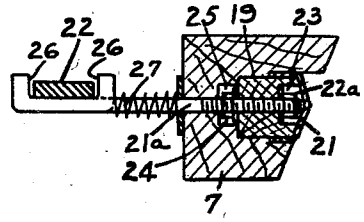


FIG. IX

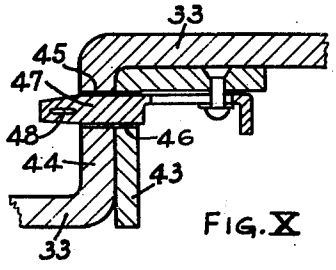


FIG. X

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Patented Nov. 17, 1931 1,832,592

UNITED STATES PATENT OFFICE

EDWARD A. SWEELEY, OF ALEXANDRIA, VIRGINIA, AND NORMAN T. ANDERSON, OF WASHINGTON, DISTRICT OF COLUMBIA

REFRIGERATOR CAR DOOR

Application filed July 18, 1930. Serial No. 468,892.

Our invention relates to refrigerator cars, and more particularly to refrigerator car doors, although susceptible for use in connection with other doors. It has among its objects to provide effective practically air tight sealing joints to the doors, and also improved means for operating and securely holding the doors in closed position. Refrigerator car door locking mechanisms at present in use provide a quite satisfactory seal when the doors and parts are first applied but not infrequently considerable force must be exerted in order to properly lock the doors; and it often happens that the top closing unit is imperfectly engaged for effective sealing when the doors are closed. The objectionable conditions mentioned are to a large extent, if not entirely, overcome by the present invention. To the accomplishment of the foregoing and such other objects as may hereinafter appear, the invention consists in the features hereinafter particularly described and then sought to be clearly defined by the claims, reference being had to the accompanying drawings forming a part hereof, and in which

Figure I is a front elevation of the refrigerator door in locked position, the handle showing on the outside of the door;

Figure II a cross-section taken along the center line of the handle, showing position of the male door slidable center stile when the door is closed and locked;

Figure III is an elevation of the door, in closed and unlocked position, looking at the outside, of the door;

Figure IV a horizontal section, through the center line of the door handle center, showing the position of the male door slidable center stile, with the door closed but not locked;

Figure V a side elevation looking at the inside face of the door, showing position of the locking mechanism when the doors are closed and locked;

Figure VI a side elevation looking at the inside face of the door, showing position of the locking mechanism when the doors are closed and not locked;

Figure VII a vertical section through the center line of the door locking bolts, in projected or locking position; and showing detail views of keepers for locking bolts;

Figure VIII an enlarged detail vertical section through the slidable locking bolts and actuating rotatable disc of the bolts;

Figure IX an enlarged cross section through one of the door stiles and slidable center door stile, the bolt connecting it to one of the slidable and swinging locking bolts being shown in full lines;

Figure X an enlarged sectional detail of the bolt operating arm and seal pin, catch-keeper of the arm, and the seal pin for holding the parts in locked position;

Figure XI a cross section, enlarged scale, through a door-post and door-stile, showing interposed packing.

In the drawings the letter A indicates one door, which will be designated as the male door, and B the companion door which will be designated the female door. The numeral 2 indicates the posts for the two doors; 4 the header for the doors, and 5 the threshold for the doors. Each door has an outer stile 6 and inner stile 7. Each door has its outer and inner stiles connected together by any desired number of tie-rods 8 having nuts 9 applied to their threaded ends and fitted in sockets 10 formed in the stiles for clamping the parts together. Each door also has a lower rail 11, an upper rail 12, and middle rail 13. The meeting faces of headers 4 and upper rails 12 are inclined downwardly and inwardly from the outer fronts of the doors, and meeting faces of the threshold and lower rails 11 are inclined upwardly and inwardly as illustrated in Fig. VII. The doors are hinged to their respective posts 2 by suitable hinges 14. A flexible packing material, 15, for illustration, of canvas, is placed between the meeting faces of the posts 2 and end stiles 6 of the doors which may be by plates 16 under the influence of springs 17 fitting in sockets 18 formed in the posts 2 so that when the doors are closed the juncture between them and the door posts will be substantially air tight.

The inner style 7 of the female door member B is formed throughout its length with

a rabbet 19, preferably of V-shape formation, as illustrated in Figures II and IV, which is designed to receive a tongue or laterally slidable stile 20 having a V-shaped face corresponding to the V-shaped rabbet 19, and having a flexible facing 21 suitably attached thereto and adapted to make a close, substantially air tight juncture with the stile of the female door member when the doors are closed and the slidable stile is projected into the rabbet of the female door. The movable stile 20 is connected by a desired number of slidable operating bars or rods 21*a* to a vibratable bar 22, which also serves as a locking bar as hereinafter described. The operating bars or rods 21*a* pass transversely through the male door stile 7 and through the movable or slidable tongue or stile 19 and is provided at one end with a nut 22*a* fitting in a recess 23 formed in the movable stile and also with a nut 24 threaded to the rod in a recess 25 in the stile 7 at the rear of movable stile 19 so that stile 19 may be moved back and forth through the medium of the slidable rods or bars 21*a*. The rods 21*a* are formed with a recess 26 in which the vibratable bar 22 lies so that the throw of the rods 21*a* is controlled by the lateral movement of bar 22. The rods 21*a* are preferably provided with coil springs 27 which are placed under compression in the projection of movable stile 19 into the rabbet of the female door, and the recoil of which serves to retract the operating rods and movable stile when the doors are brought into unlocked position.

The male door A carries the vibratable, longitudinally slidable bar 22 and also the vibratable, longitudinally slidable bar 28, both of which at their adjacent ends are eccentrically, pivotally connected to a rotatable disc or member 29 connected so as to rotate with a shaft 30 provided with a head 30*a* and journaled in plates 31 bolted to a panel or portion 32 of the door and provided with an operating lever or handle 33 connected thereto so as to rotate the shaft and which may be held in position by a nut 34 screwed into the threaded end of the shaft, as clearly shown in Figure VIII of the drawings.

The header 4 has a thimble 35 seated in it and the upper rail 12 of the male door has a thimble 36 seated in it, the two thimbles forming a keeper for the end of the slidable bar or bolt 22 when the doors are closed and the bolt projected. The threshold 5 and lower cross rail 11 of the door also have a thimble 37 and a thimble 38 seated therein, respectively, which, when brought into register, will constitute a keeper for the lower locking bar or bolt 28 when the doors are closed and the bolt projected. The two thimbles 35 and 37 may have the inner wall at the entrance flared or beveled, as indicated at 39, so as to direct and guide the bars or locking bolts therein when projected. The middle cross rail 13 may also have a thimble 40 inserted therein for the passage of locking bar or bolt 22. The female door B carries a keeper 41 to receive the operating lever 33 of the other door when closed. The keeper, may be of any type suitable for the purpose but preferably comprises a plate 42 bolted to the door with its upper portion spaced from the door to permit the lever 33 to pass between it and the door and is formed with an outwardly extending lip or flange 43 against which the angular portion 44 of the lever will lie when in locking position as shown in Fig. X, the angular portion of the lever being formed with an opening 45 registering with an opening 46 in the flange 43 so that a seal-pin 47 slidably connected to the latch may be passed through the two openings, and receive a sealing member (not shown) passed through a slot 48 in the end of the pin to seal the fastening in the locked position of the doors. The female door B has a metal lip 49 bolted to it near its upper end so as to lap over onto the head 4 when the door is closed and is provided at its lower end with a plate 50 to form a bearing for a finger or button 51 pivotally bolted to the threshold 5 so as to be swung upward against the plate 50, when the door is closed, the lip 49 and button 51 functioning in positioning the door in closing and holding it when closed. The face of plate 50 may be inclined or beveled so that when finger or button 51 is turned into contact therewith a wedging action will be exerted against it so as to more tightly press the door against its threshold.

When the doors are closed, the operating lever 33 is given one quarter of a revolution to move it from the position shown in Fig. III to the position shown in Fig. I. This rotates the disk or member 29 which acting as a cam or eccentric projects the locking bars or rods 22 and 28 longitudinally and at the same time draws or moves them into substantial alinement, or to the position shown in Fig. V. This also moves the rods 21*a* laterally through the instrumentality of bar or rod 22, thus placing springs 27 under compression and shifting the tongue or movable stile 20 so that it enters the rabbet 19 of the adjacent inner stile 7 of the female door, thus practically closing the joint between the inner stiles of the two doors and by the flexible facing to the movable stile providing a substantially air tight sealing between the two doors. It will be observed that in swinging the operating lever 33 from its upright to its horizontal position the stile 20 is projected into the rabbet 19 of the female door and at the same time the locking bars or rods 22 and 28 are projected into their respective keepers to lock the doors in closed position, and that the parts are held in their position by engagement of the lever 33 with its latch. As

the lever 33 is swung from its locking to its unlocking position, the cam or eccentric member 29 is rotated with the effect of retracting the locking bars or rods 22 and 28 from their keepers and at the same time through the instrumentality of the rods 21*a* and recoil of the springs 27 the laterally movable or shiftable tongue or stile 20 is retracted from the rabbet 19 in the female stile door, and the doors can then be opened. The features which make possible the operation described are important characteristics of the present invention. Other desirable features of the invention have been described with clearness and their advantages stated in connection with the description of the structural features illustrated in the preferred embodiment of the invention illustrated in the drawings. It is to be understood, however, that changes may be made in the details of the various parts without departing from the essential features of the invention as sought to be defined in the appended claims.

Having described our invention and set forth its merits what we claim is:—

1. A door structure, comprising a pair of hinged doors, one door formed with a rabbet in its inner stile, the other door provided with a transversely movable stile positioned along its inner stile to register with the rabbet in the other door, longitudinally slidable and laterally swinging bolts connected to one of the doors, a rotatable member to which the adjacent ends of the bolts are eccentrically connected, means connecting the movable stile of one door with at least one of the slidable and laterally swinging bolts, a swinging lever connected with the rotatable member to turn the same to project the locking bolts and move the transversely shiftable stile to project it into the rabbet of the companion door in throwing the lever in one direction and retract the locking bolts and movable stile in throwing the lever in the opposite direction, and means for fastening and holding the swinging lever in position for holding the locking bolts and movable stile projected.

2. A door structure comprising a pair of hinged doors, one formed with a longitudinally extending rabbet in its inner stile, the other door provided with a transversely movable stile fitted in a recess of the inner stile of said door, longitudinally slidable and laterally swinging bolts carried by one door, a rotatable member with which the slidable and swinging bolts are connected, slidable spring influenced rods connecting the transversely slidable stile with at least one of the slidable and swinging bolts, and a swinging lever connected with the rotatable member to project the locking bolts and shift the transversely movable stile into the rabbet of the companion door, and means for fastening the swinging lever to secure the locking bolts, and movable stile in projected positions.

3. A door structure comprising a pair of hinged doors, one door formed with a V-shaped rabbet in one of its stiles, the other door provided with a transversely movable stile fitted in a recess of a stile of said door in position for projection into the rabbet of the companion door, said movable stile being formed with a V-shaped face provided with a flexible covering, and means for projecting the transversely movable stile into the rabbet of the companion door and at other times retracting it therefrom.

4. A door structure comprising a pair of hinged doors, one door being formed with a rabbet in one of its stiles and the other door provided with a transversely movable stile fitted in a recess in said door in position to register with the rabbet of the other door, longitudinally slidable and swinging locking bolts carried by one of the doors, a rotatable member to which the adjacent ends of said bolts are pivotally connected, means connecting said bolts with the transversely movable stile of one door, a swinging lever operatively connected with said rotatable member for projecting the bolts into locking position and projecting the movable stile into the rabbet of the companion door, a lip attached to and projecting beyond the top edge of the door formed with the rabbet, and a rotatable button secured to a part of the door structure in position to overlap the lower portion of the door formed with the rabbet when said door is closed, said lip and button cooperating to position said door in projection of the movable stile into the rabbet formed in said door.

In testimony whereof we affix our signatures.

EDWARD A. SWEELEY.
NORMAN T. ANDERSON.