Oct. 25, 1960 P. J. HOWARD 2,957,211

WINDOW CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 1

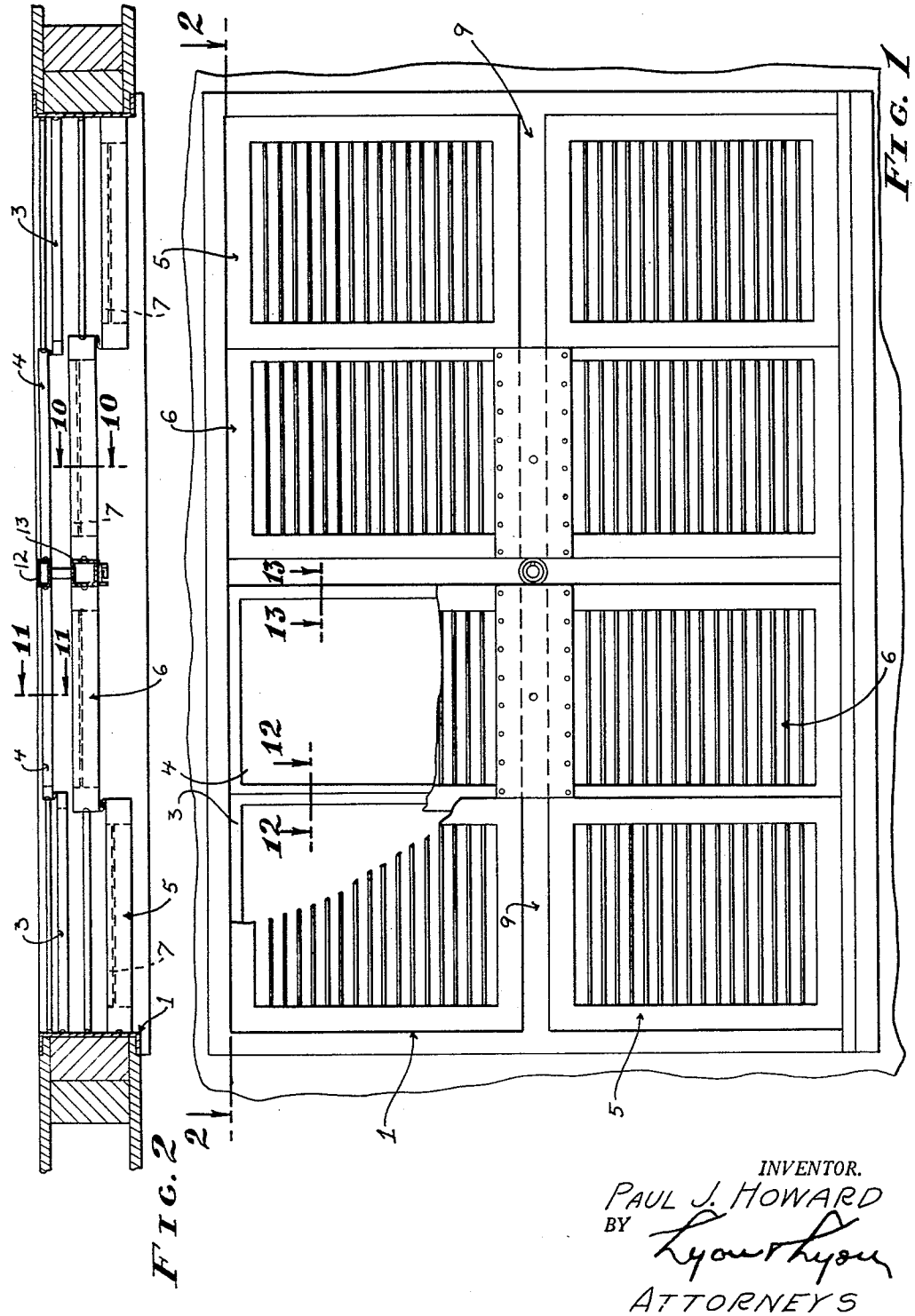


FIG. 1

FIG. 2

INVENTOR.
PAUL J. HOWARD
BY Lyon & Lyon
ATTORNEYS

Oct. 25, 1960 P. J. HOWARD 2,957,211

WINDOW CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 2

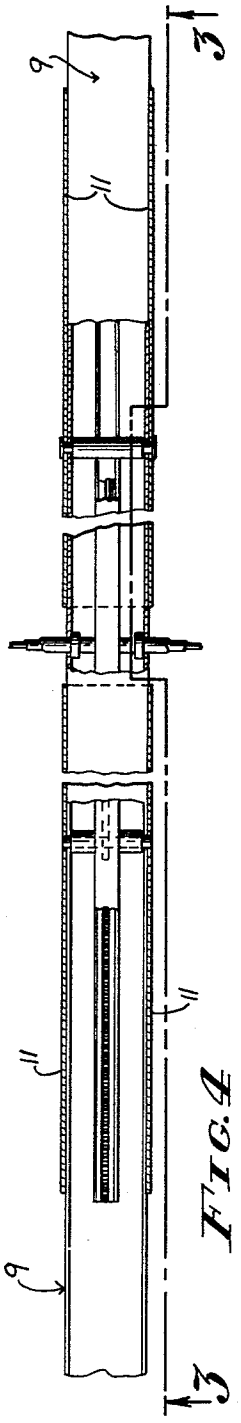


FIG. 4

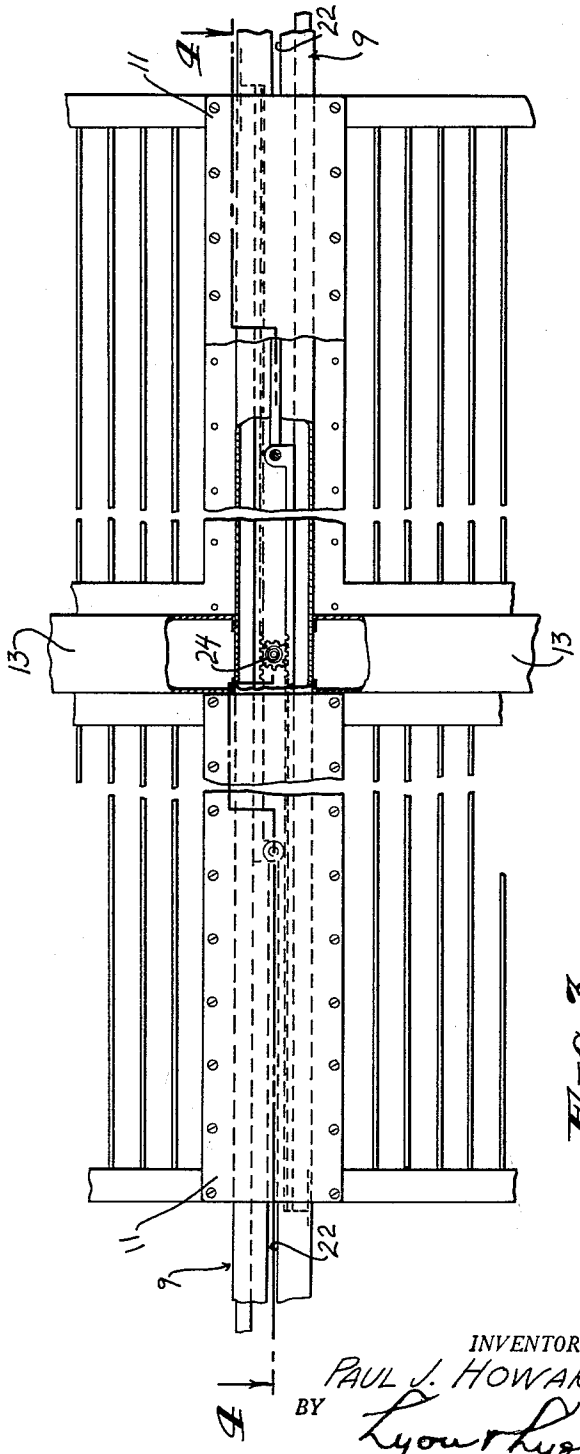


FIG. 3

INVENTOR.
PAUL J. HOWARD
BY Lyon & Lyon
ATTORNEYS

Oct. 25, 1960 P. J. HOWARD 2,957,211

WINDOW CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 3

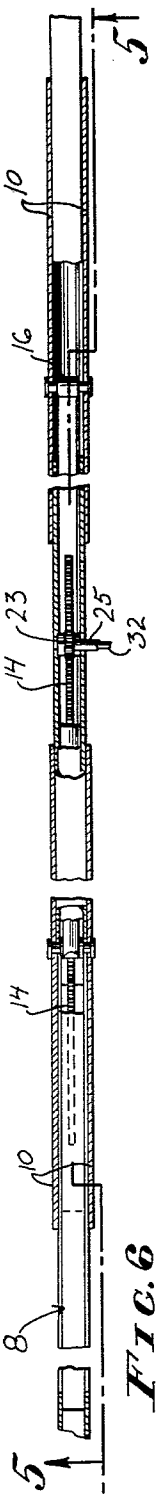


FIG. 6

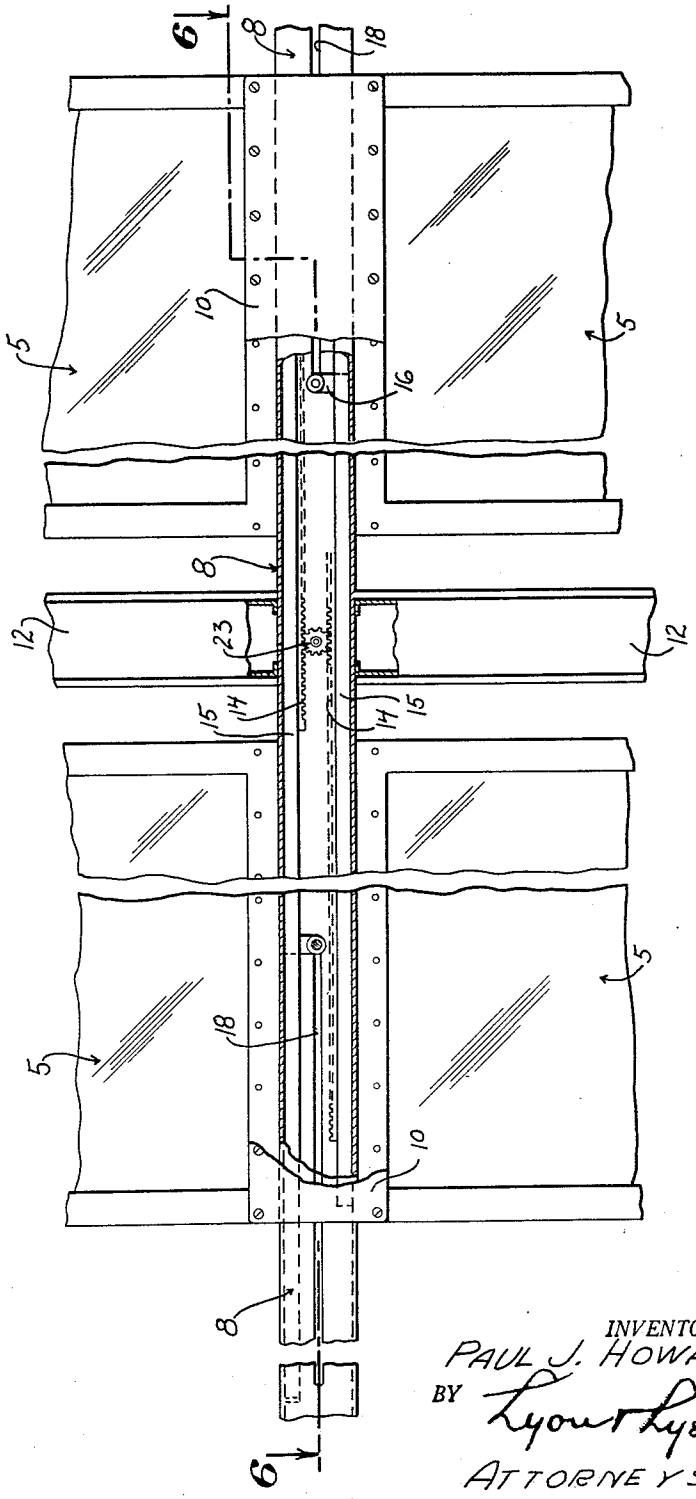


FIG. 5

INVENTOR.
PAUL J. HOWARD
BY Lyon & Lyon
ATTORNEYS

Oct. 25, 1960 P. J. HOWARD 2,957,211

WINDOW CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 4

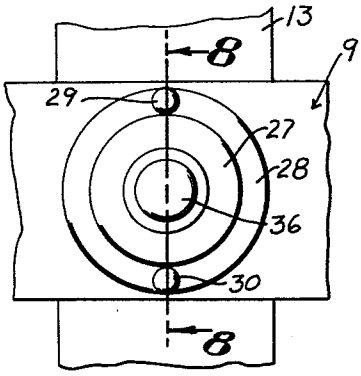


FIG. 7

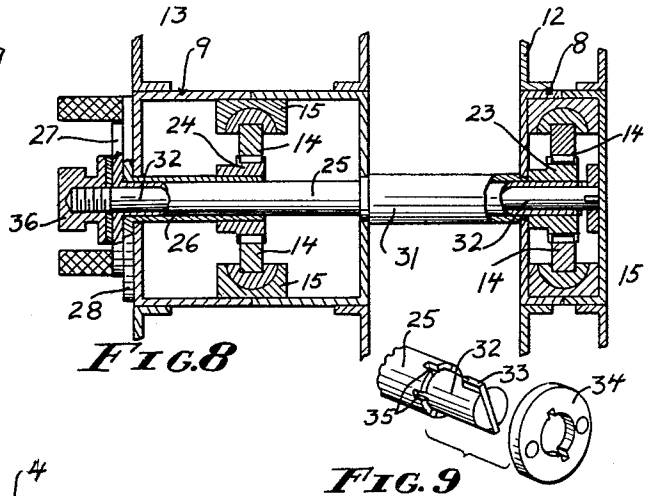


FIG. 8

FIG. 9

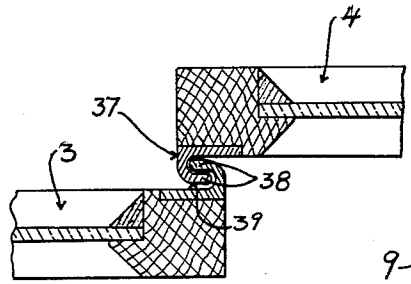


FIG. 12

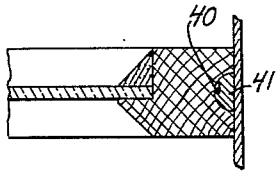


FIG. 13

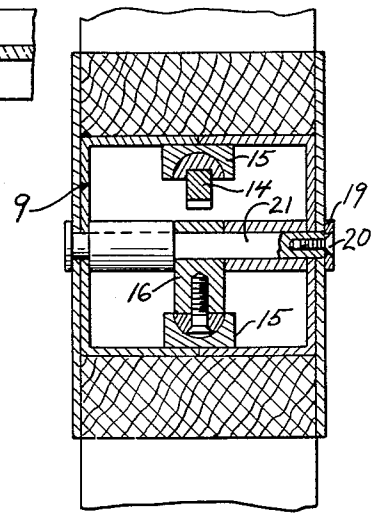


FIG. 10

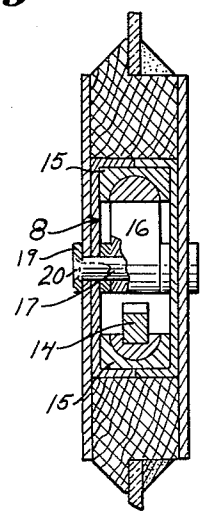


FIG. 11

INVENTOR.
PAUL J. HOWARD
BY Lyon & Lyon
ATTORNEYS

United States Patent Office

2,957,211

Patented Oct. 25, 1960

2,957,211

WINDOW CONSTRUCTION

Paul J. Howard, 458 N. Barrington Ave., Los Angeles 49, Calif.

Filed Sept. 22, 1958, Ser. No. 762,595

4 Claims. (Cl. 20—52)

This invention relates to window constructions, and included in the objects of this invention are:

First, to provide a window construction which incorporates a novel control means, whereby window units and Venetian blind frames may be readily moved laterally or horizontally between open and closed positions and locked therein, as well as in intermediate positions.

Second, to provide a window construction which is divided into upper and lower sections or units by a horizontal control housing, and wherein the upper and lower sections are connected for movement in unison.

Third, to provide a window construction which incorporates a novel seal means.

With the above and other objects in view, as may appear hereinafter, reference is directed to the accompanying drawings in which:

Figure 1 is a reduced front elevational view of a window incorporating the invention;

Figure 2 is a sectional view through 2—2 of Figure 1 showing the various window elements in plan;

Figure 3 is an enlarged, fragmentary, partial front elevational view and partial sectional view of the movable Venetian blind units and their control mechanism, taken through 3—3 of Figure 4;

Figure 4 is a fragmentary, sectional view taken substantially along the line 4—4 of Figure 3;

Figure 5 is an enlarged, fragmentary, partial front elevational view and partial sectional view of the movable window units and their control mechanism, taken through 5—5 of Figure 6;

Figure 6 is a fragmentary sectional view thereof taken through 6—6 of Figure 5;

Figure 7 is an enlarged, fragmentary, elevational view showing the control handles for the control mechanism;

Figure 8 is an enlarged sectional view through 8—8 of Figure 7 showing particularly the control mechanism;

Figure 9 is a perspective view showing a portion of the locking means of the control mechanism;

Figure 10 is an enlarged, fragmentary sectional view through 10—10 of Figure 2;

Figure 11 is a fragmentary sectional view through 11—11 of Figure 2;

Figure 12 is a fragmentary sectional view through 12—12 of Figure 1;

Figure 13 is an enlarged, fragmentary sectional view through 13—13 of Figure 1.

The window construction is mounted in a window frame 1 which may be in the form of channel members set into a wall 2. The window construction is adapted to various arrangements. However, for purposes of illustration the window construction is shown as including a pair of upper and a pair of lower stationary window panels 3, and a pair of upper and a pair of lower movable window panels 4. In front of the window panels there is mounted an upper and a lower pair of stationary Venetian blind panels 5, and a pair of upper

and a pair of lower movable Venetian blind panels 6. The Venetian blind panels may include screen units 7.

The upper and lower window panels 5 are separated by a housing 8 in the form of a horizontally extending rectangular tube. Similarly, the upper and lower Venetian blind panels 6 are separated by a horizontally extending tubular housing 9. The upper and lower window panels are joined together by connecting plates 10, whereas the upper and lower Venetian blind panels are joined by connecting plates 11 which overlie the sides of the housings 8 and 9, respectively. The pairs of window panels are divided vertically by vertical dividers 12, whereas the pairs of Venetian blind panels are similarly separated by vertical dividers 13, extending above and below the housings 8 and 9, respectively.

Mounted in each housing 8 and 9 is a pair of rack bars 14 which ride in tracks 15 secured to the upper and lower sides of the respective housing 8 and 9. Each rack bar 14 is provided at one end with a connecting post 16, which either projects upwardly or projects downwardly, depending upon whether the rack bar is disposed at the lower or upper side of its respective housing.

The connecting posts 16 within the control housing 8 receive cross bars 17 which project through slots 18 provided in the side walls thereof and through the overlying connecting plates 10. The cross bars 17 are provided with washers 19 and screws 20 for attachment to the connecting plates 10. Similarly, the connecting posts 16 within the control housing 9 are joined to cross bars 21, which project through slots 22 provided in the side walls of the housing 9 and through the overlying connecting plates 11. The cross bars 21 are also provided with washers 19 and screws 20 which join the cross bars 21 to the connecting plates 11.

The teeth of each pair of rack bars 14 within each housing 8 or 9 are disposed in confronting relation and traverse the central portion of their respective housings in the region of the vertical dividers 12 and 13. Interposed between the rack bars 14 within the housing 8 is a drive gear 23, and interposed between the rack bars within the housing 9 is a drive gear 24.

The drive gear 23 is mounted on a tubular shaft 25 which extends laterally from the housing 8 through the housing 9. The drive gear 24 is mounted on a second tubular shaft 26 which journals on the shaft 25 and extends therewith laterally through the housing 9. The exposed ends of the shafts 25 and 26 are provided with crank disks 27 and 28 having handles 29 and 30, respectively. A bearing sleeve 31 for the shaft 25 bridges between the housings 8 and 9.

Fitted within the tubular shaft 25 is a lock rod 32 which projects beyond the shaft 25 within the housing 8 and is provided with a key bar 33 which engages a key collar 34 secured in the housing 8 thereby to fix the lock rod against rotation. The lock rod 32 is, however, capable of limited axial movement to engage end slots 35 in the confronting end of the tubular shaft 25. The opposite end of the lock rod projects through the disks 27 and 28 and receives a knob 36 which is screw-threaded thereon. If the lock rod 32 is pulled outwardly, the window panels are locked in position by engagement of the key bar 33 with the end slots 35. If the knob 36 is tightened, the crank disks 27 and 28 are clamped against the housing 9 so as to secure both the window panels and Venetian blind panels against movement.

In order to seal the stationary and movable panels, when the movable panels are in their closed position, seal strips 37 are provided, as shown in Figure 12. Each seal strip is secured along a vertical margin of a panel, and is provided with hook lips 38 spaced outwardly from

the strip to form a groove 39. Each lip 38 fits into the groove 39 of the opposite strip.

The vertical sides of the panels which engage the window frame 1 or the vertical dividers 12 and 13, as well as the horizontal sides of the panels which confront the upper and lower sides of the frame 1, are provided with grooves 40 which ride or move into engagement with mating ribs 41 provided on the window frame 1 or vertical dividers 12 or 13, as shown in Figure 13.

The Venetian blind panels may contain conventional Venetian blind units, or preferably contain the special Venetian blind unit more fully disclosed in the copending application Serial No. 752,713, filed August 4, 1958, entitled "Venetian Blind."

Operation of the window construction is as follows:

The Venetian blind panels 6 may be moved between closed positions, as shown in Figures 1 and 2, and open positions, not shown, behind the stationary Venetian blind panels 5. This may be done with the Venetian blind slats in their open or closed position, as desired. Movement of the Venetian blind panels is accomplished by rotation of the crank disk 28 which turns the drive gear 24 to move the rack bars 14 within the housing 9 in opposite directions. The slots 22 within the housing 9 are of sufficient length to permit the necessary travel of the Venetian blind panels. Similarly, when it is desired to open or close the movable window panels 4, the crank disk 27 is turned to rotate the gear 23 which moves the rack bars 14 within the housing 8 in opposite directions.

If it is desired to lock the windows, only the lock rod 32 is pulled outward. If it is desired to lock both the window panels and the Venetian blind panels, the knob 36 is tightened.

While a particular embodiment of this invention has been shown and described, it is not intended to limit the same to the exact details of the construction set forth, and it embraces such changes, modifications, and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

What is claimed is:

1. A window construction, comprising: a horizontally elongated hollow housing; a sliding closure frame above and below said housing; a connecting plate extending over a side of said housing and secured to each of said frames; a drive means within said housing movable lengthwise thereof; connecting means between said drive means and said connecting plate, there being an accommodation slot in said side of said housing for said connecting means; and an operating means connected to said drive means for moving the same within said housing.

2. A window construction, comprising: a horizontally elongated hollow housing; a sliding closure frame above and below said housing; a connecting plate extending over a side of said housing and secured to each of said frames; a rack drive means within said housing and slidable lengthwise thereof; connecting means between said drive means and said connecting plate, there being an accommodation slot in said side of said housing for said connecting means; and a manually operated gear in said housing and meshing with said rack drive means for moving the same.

3. A window construction, comprising: a horizontally elongated tubular housing; rack guides disposed within said housing at its upper and lower sides; racks slidable in said guides; a drive bar connected to each rack and extending through the side walls of said housing, there being accommodation slots for said drive bar; two pairs of slidable closure frames, one member of each pair of frames being mounted above and the other below said housing for sliding therealong; plates overlying the sides of said housing and being secured to the frames of each pair of frames, the plates associated with each pair of frames being connected to the ends of a drive bar protruding from said housing to effect movement of said pair of frames in unison; and a pinion drive means in said housing and meshing with said racks for operating said racks in unison but in opposite directions, to move said pairs of frames to and from each other.

4. A window construction, comprising: a pair of vertically spaced substantially coplanar horizontally slidable closure frames; a horizontally elongated housing extending between said frames; connecting plates joining said frames and bridging said housing; rack bar drive means within said housing and movable lengthwise therein; connecting means between said drive means and connecting plates to move said pair of frames in unison; a gear member in said housing meshing with said rack bar drive means for moving the same; and a sleeve carrying said gear member terminating in a manually accessible crank handle for operating said gear member, a lock bar extending through said sleeve, being manually slidable therein, and having means thereon selectively engageable with said sleeve and housing to lock said sleeve against rotation.

References Cited in the file of this patent

UNITED STATES PATENTS

270,047	Foss	Jan. 2, 1883
623,365	Golden	Apr. 18, 1899
1,021,492	Strauss	Mar. 26, 1912
1,927,423	Stevens et al.	Sept. 19, 1933
2,282,885	Raymond	May 12, 1942
2,638,377	George	May 12, 1953
2,730,775	Edwards	Jan. 17, 1956

FOREIGN PATENTS

150,871	Great Britain	Sept. 16, 1920