

June 10, 1958

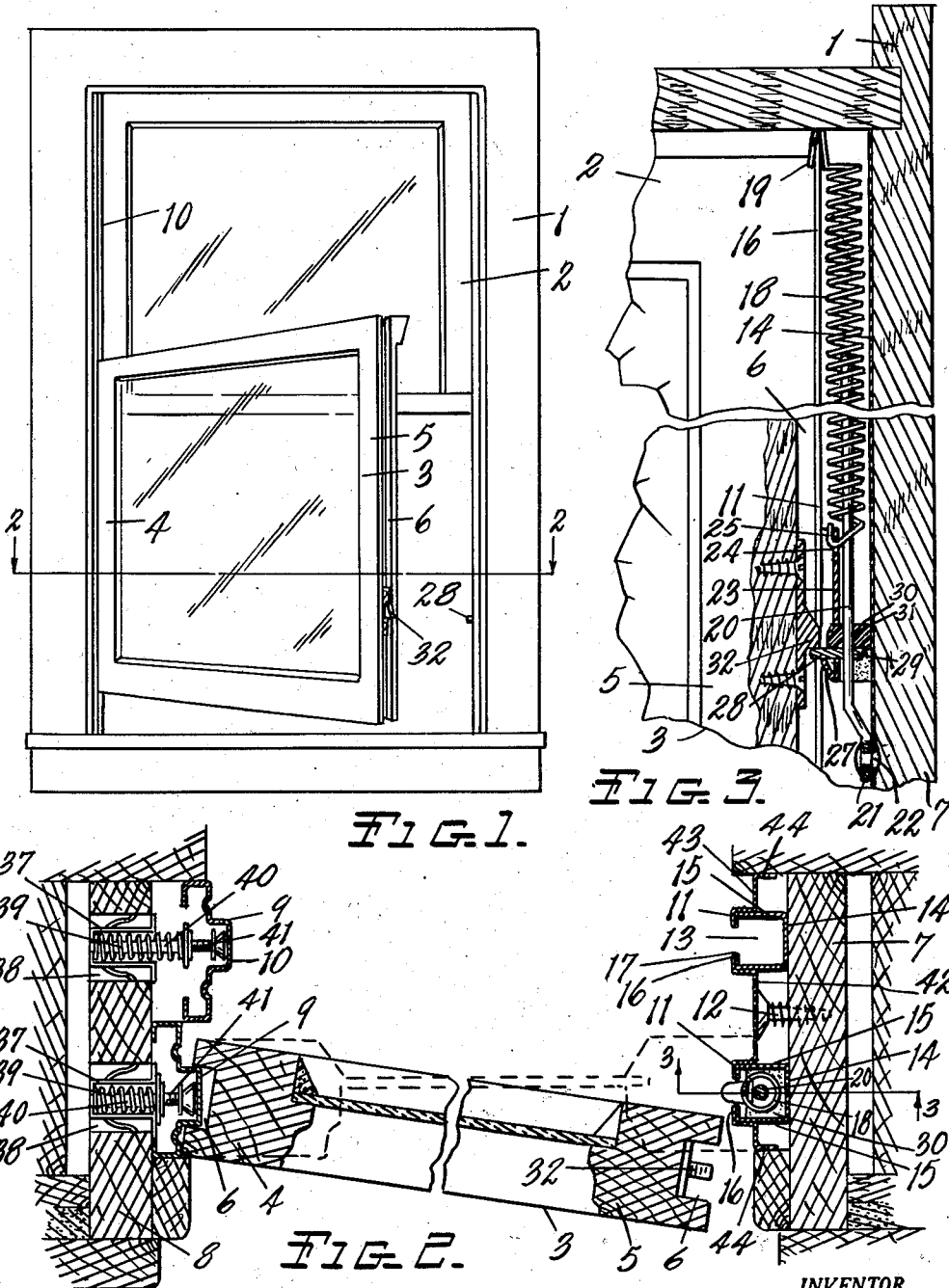
C. J. TEGGELAAR

2,837,781

WINDOW STRUCTURE OR ASSEMBLY

Filed Jan. 18, 1956

2 Sheets-Sheet 1



INVENTOR.
Claude J. Teggelaar
BY
Otis R. Earl
Attorney.

June 10, 1958

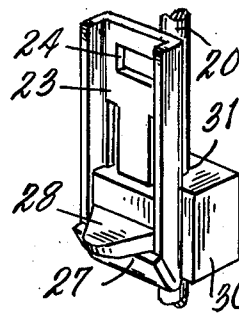
C. J. TEGGELAAR

2,837,781

WINDOW STRUCTURE OR ASSEMBLY

Filed Jan. 18, 1956

2 Sheets-Sheet 2



1

2,837,781

WINDOW STRUCTURE OR ASSEMBLY

Claude J. Teggelaar, Grand Rapids, Mich., assignor to Grand Rapids Hardware Company, Grand Rapids, Mich.

Application January 18, 1956, Serial No. 559,840

13 Claims. (Cl. 20—52.2)

This invention relates to a window structure or assembly of the type in which the sash is readily positioned and removed including a counterbalance.

The main objects of the invention are:

First, to provide a window structure in which the sash is effectively counterbalanced and at the same time may be quickly removed and replaced without the aid of tools and without the necessity for connecting the counterbalance to the sash.

Second, to provide a structure in which the counterbalance is associated with one of the slide rails to constitute a unit which may be assembled as such on the frame or jamb of a window.

Third, to provide a window assembly comprising upper and lower sash in which the slide rails for both are formed as a unit.

Fourth, to provide a structure having these advantages in which the parts may be very quickly assembled with the window frame.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a front elevational view of a window embodying the invention with the lower sash illustrated in one of the positions of inserting into or removal from a frame.

Fig. 2 is an enlarged fragmentary view in horizontal section on a line corresponding to line 2—2 of Fig. 1, the sash being shown in another position and being shown in mounted or operative position by dotted lines.

Fig. 3 is a fragmentary view partially in section on a line corresponding to line 3—3 of Fig. 2.

Fig. 4 is an enlarged front perspective view of the sash hanger and clutch device.

Fig. 5 is a fragmentary view partially in vertical section illustrating the relation of the upper sash to counterbalance parts with the counterbalance spring retracted.

Fig. 6 is a fragmentary view partially in vertical section with the counterbalance spring extended.

Fig. 7 is a fragmentary view partially in vertical section of a modified form or embodiment of the invention employing a spring tensioned drum and cable counterbalance.

Referring to the drawing, the numeral 1 designates generally a window frame, 2 the upper sash and 3 the lower sash. The stiles 4 and 5 of the sash have vertical grooves 6 adapted to engage slide rails to be described mounted upon the jambs or upright stiles 7 and 8. The jambs 7 and 8 are of the same structure except that the jamb 8 is modified to receive springable support members for the slide rails 9. These slide rails 9 are formed of sheet metal conformed to provide longitudinally extending ribs 10 engaging the grooves in the stile 4. The rails 9 are springably supported to permit the engagement and disengagement of the sash with the slide rails on the opposite jamb 7.

2

In the embodiment illustrated the slide rails 11 on the jamb 7 are formed integrally of sheet metal and are mounted as a unit by means of screws 12 disposed between the rails or sash engaging portions of the rails 11.

5 The slide rails are formed to provide channels 13 and generally comprise a rear wall 14, side walls 15 and inverted flanges 16 providing a slot 17 opening at the front of the channels. The channels are desirably of rectangular section as illustrated, the screws 12 clamping the rear walls against the jamb 7.

10 Coil counterbalancing springs 18 are arranged in the channels and have hooked terminal portion 19 engaged over the upper edges of the rails. It will be understood that the structure for both the upper and lower sash rails is the same with the exception of the location of certain parts. Therefore, a description of the parts associated with one sash will apply to both.

A clutch rod 20 is disposed centrally within the channel and has an offset eye 21 at its lower end receiving the rivet 22 which supports the rod while allowing some lateral movement thereof under operating or assembling conditions. The upper end of the rod projects into the coiled spring, the lower end of which is connected to the sash hanger member 23, desirably formed as a sheet metal stamping having an opening 24 at its upper end with which the hook 25 on the lower end of the spring is engaged. The hanger member 23 has an opening 26 therein and an upwardly projecting fulcrum 27 at the bottom of the opening; the clutch member or jaw 28 is disposed through the opening 26 and tiltingly supported on the fulcrum 27. The clutch member has an opening 29 therein of such size as to permit the clutch member to slide freely along the rod when the clutch member is tilted upwardly and held horizontally as by load of the sash thereon against the combined hanger slide and clutch holder 30. This holder member is generally in the form of a block and is formed of nylon or other antifrictional material, and is in sliding engagement with the rear and side walls of the channel.

40 The member 30 has a bore 31 therein receiving the clutch rod 20. When the clutch member or clutch jaw is unloaded or does not have the sash engaged therewith, it automatically drops to rod clutching position. This is partially due to its own weight and to the weight of the member 30 thereon.

45 The stile 5 is provided with a supporting and clutch engaging member 32 which is mounted on the bottom of the groove to project into clutch jaw engaging position as is shown in Fig. 3. As stated, when the weight of the sash is removed from the clutch it automatically engages the rod, thereby retaining it in position to be re-engaged by the sash so that the sash may be removed and replaced, and when replaced is operatively connected to the counterbalance.

50 It is desirable that the member 32 of the upper and lower sash be located in spaced relation to the bottom of the sash as illustrated in Figs. 1 and 5. The relation of parts of the upper and lower sash is illustrated in Figs. 5 and 6. In the modification of Fig. 7 it is desirable that the member 32 of the upper and lower sash be located adjacent its upper end as best illustrated by the partial section of the upper and lower sash stile. In this embodiment the counterbalance is in the form of a tensioned winding drum conventionally illustrated at 34 in Fig. 7, the cable 35 being disposed within the channel and connected to the hanger member 23 of the lower sash. It should be understood that the cable drum type of counterbalance is illustrated in Fig. 7 and associated with the upper and lower sash for the purpose of showing that the invention comprehends the use of either coiled counterbalancing springs or the cable type. I am aware that both types of counterbalance are old in the art, generally con-

sidered. I prefer the embodiment of the invention in which the counterbalance is in the form of a coiled spring, and it will be understood that where coiled springs are employed they are employed for both the upper and lower sash.

As stated, the slide rails 9 are springably supported, the supporting means being the subject matter of my copending application Serial No. 559,226 filed January 16, 1956, and which became Patent No. 2,774,996 on December 25, 1956 and illustrated and described in detail therein. Generally stated, this means comprises base or jamb engaging members 37 mounted in bores 38 provided therefor and supporting coiled springs 39 springably supporting the thrust members 40 which are connected to the rails 9 by means of screws 41. It will be understood, however, that any suitable form of springable support for the rails 9 may be employed.

In the embodiment illustrated the sash slide rails 11 are formed integrally by folding a strip of metal upon itself to provide the laterally spaced channels with a web portion 42 between the channels adapted to receive the attaching screws 12. The outer edges of the side walls of the channels are reversely folded to provide the flanges 16 and the side portions 43 at the outer sides of the channels which terminate in rearwardly turned flanges 44 abutting the stops of the window frame. The counterbalance assemblies for both the upper and lower sash may be installed in this compound rail to constitute an assembled unit, and the assembled unit is installed merely by means of the screws 12.

The combined hanger slide and clutch holder member is preferably of nylon and may be a sliding fit within the channel to support the thrust of the window sash and renders the assembly substantially noiseless in operation. Other anti-friction materials may be used in this connection but the member 31 should perform the double function of holding the clutch member or jaw and also slidably supporting the load carrying parts.

I have illustrated and described my invention in a highly practical embodiment thereof. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A slide rail and counterbalance assembly for a window sash comprising rear and side walls defining a channel, the side walls having inwardly projecting flanges defining a vertical slot opening to the channel, a clutch rod disposed vertically and centrally within said channel, a sash hanger member disposed within the channel at the front of the rod and having an opening therethrough and a forwardly projecting fulcrum adjacent the lower end of the opening, a clutch member sleeved upon said rod and disposed through said opening and tiltably mounted on said fulcrum to project through said slot for supporting engagement with a sash, a combined hanger slide and clutch member holder formed of nylon sleeved upon said rod and disposed through said opening in said hanger member in superimposed relation to said clutch member and being in sliding supported engagement with the rear and side walls of the channel, and a coil sash counterbalance spring arranged in said channel with a portion thereof embracing said rod and with its lower end connected to said hanger member, the upper end of said spring being supportedly engaged with the upper end of the slide rail, the clutch member being mounted and balanced on said fulcrum so that it automatically engages the rod when free from the load of a sash.

2. A slide rail and counterbalance assembly for a window sash comprising a channeled slide rail, the channel having a vertically extending opening at the front thereof, a clutch rod disposed vertically within the channel, a sash hanger member disposed within said channel at the front of said rod and having an opening therethrough and a

forwardly projecting fulcrum at the lower end of the opening, a sash engaging clutch member disposed through said opening in said hanger member and tiltably balanced on said fulcrum so that it engages said rod when the clutch member is without the load of a sash, a combined hanger slide and clutch holder member disposed through said opening in said hanger member in a superimposed relation to said clutch member and in sliding supported engagement with a wall of said channel, and a sash counterbalancing means connected to said hanger member, the clutch member being disengaged from said clutch rod when it is subject to sash load.

3. In combination, a sash having a grooved stile, a sash groove engaging sash slide rail comprising rear and side walls defining an outwardly facing channel, a coiled counterbalance spring disposed within said channel and anchored thereto at its upper end, a clutch rod disposed vertically and centrally within said channel and secured therein at its lower end with its upper end free and projecting into said spring, a sash hanger member disposed within said channel and suspended from said counterbalance spring, a clutch member fulcrumed on said hanger member in coacting relation to said clutch rod to automatically engage said clutch rod when free of load of a sash, and a combined hanger slide and clutch member holder of plastic material mounted on said hanger member in superimposed relation to said clutch member and in supported sliding engagement with the rear and side walls of said channel, the clutch member being disengaged from said rod when subject to the load of the sash.

4. In combination, a sash having a grooved stile, an outwardly facing channeled sash groove engaging sash slide rail, a coiled counterbalance spring disposed within said slide rail and anchored at its upper end, a clutch rod disposed vertically and centrally within said channel with its upper end projecting into said spring, a sash hanger member disposed within said channel and suspended from said counterbalance spring at one side of said rod, and a clutch member mounted on said hanger member in coacting relation to said clutch rod to automatically engage said clutch rod when free of load of a sash, the clutch member being disengaged from said rod when subject to the load of the sash.

5. A slide rail and counterbalance assembly for a window sash comprising a channeled sash slide rail having a vertical opening at the front thereof, a coiled counterbalance spring disposed within said channel and anchored at its upper end to said slide rail, a clutch rod disposed vertically within the channel of the slide rail and secured at its lower end to project upwardly into the counterbalance spring, a hanger member disposed within said channel and suspendingly connected to said counterbalance spring, a clutch member tiltably mounted on said hanger member to clutchingly engage said rod when said clutch member is without load of a sash, and a combined hanger member slide and clutch member holder mounted on said hanger member in sliding supported engagement with opposed walls of the channel whereby the clutch member is supported against lateral movement relative to said opening in said slide rail, said clutch member being disengaged from said rod when it is subject to the load of a sash.

6. A slide rail and counterbalance assembly for a window sash comprising an outwardly facing channeled sash slide rail, a coiled counterbalance spring disposed within said channel and anchored at its upper end, a clutch rod disposed vertically within the channel of the slide rail and to project into the counterbalance spring, a hanger member disposed within said channel and suspendingly connected to said counterbalance spring, and a clutch member tiltably mounted on said hanger member to clutchingly engage said rod when said clutch member is without load of a sash, said clutch member being disengaged from said rod when it is subject to the load of a sash.

7. A sliding window sash carrying means comprising

5

a clutch rod disposed vertically and fixed to the inner side of a vertical side of a window frame, a sash counterbalance means, a sash hanger member suspendingly connected to said counterbalance means and having an opening therethrough and a forwardly projecting fulcrum at the lower end of the opening, a clutch member having an opening therein through which said clutch rod is disposed, said clutch member being tiltable mounted on said fulcrum to clutchingly engage the rod when the clutch member is free from sash load, and a combined hanger slide and clutch member holder disposed through said opening in said hanger member in superimposed relation to said clutch member and acting to limit the upward swinging movement thereof on said fulcrum, said clutch member automatically engaging said clutch rod when free from load and being automatically disengaged therefrom when subject to sash load.

8. A slide window sash carrying means comprising a clutch rod disposed vertically and fixed to the inner side of the vertical side of a window frame, a sash counterbalance means, a hanger member suspendingly connected to said counterbalance means and having an opening therethrough, a clutch member disposed through said opening and tiltingly mounted on said hanger member to clutchingly engage said rod when the clutch member is without load of a sash, and a combined hanger slide and clutch holder disposed in said opening in said hanger member in superimposed relation to said clutch member and acting to limit the upward rod disengaging movement thereof, said combined hanger slide and clutch holder acting to prevent rotative movement of the sash hanger member relative to said rod.

9. A sliding window sash carrying means comprising a clutch rod fixedly connected to the inner side of a vertical side of a window frame, a sash counterbalance means, a hanger member suspendingly connected to said counterbalance means, a clutch member tiltable mounted on said hanger member to automatically clutchingly engage said rod when the clutch member is without load of a sash, and a hanger slide and clutch member holder mounted on said hanger member in superimposed relation to said clutch member to limit its upward tilting movement to rod disengaging position when the clutch member is subject to the load of a sash.

10. A sliding window sash carrying means comprising a counterbalance mounted on a window frame to depend at the inner side of a vertical side of a window frame, a clutch rod fixed to the inner side of the vertical side of the window frame with which said counterbalance is associated and in laterally spaced relation thereto, a sash hanger member suspendingly connected to said counterbalance and slidably associated with said rod, and a clutch member fulcrummed on said hanger member and having an opening therein through which said rod is disposed,

6

said clutch member being mounted on said hanger member to automatically tilt into engagement with said clutch rod when not subject to the load of a sash and being disengaged from said rod when it is subject to the load of a sash.

11. A slide rail and counterbalance assembly for a window sash comprising a channeled sash slide rail, a clutch rod disposed vertically within the channel of said slide rail in rearwardly spaced relation to the front thereof, a coil counterbalancing spring disposed within said slide rail and into which the upper end of said rod projects, and a hanger member disposed within the slide rail and supportedly connected to said spring and provided with a clutch jaw projecting from the slide rail to supportingly engage a sash operatively associated with the slide rail and to clutchingly engage the rod when without the load of a sash, said clutch jaw being disengaged from said rod when subjected to the load of the sash.

12. A slide rail and counterbalance assembly comprising a channeled sash slide rail open at the front thereof, a clutch rod mounted at its lower end to project upwardly within said channel in spaced relation to the walls thereof, a sash counterbalancing means disposed within said channeled slide rail, a sash hanger member disposed within said channel in vertical sliding relation to said clutch rod and in suspended relation to said counterbalance means, a sash engaging clutch member tiltable mounted on said hanger member to clutchingly engage said clutch rod when the clutch member is free from the load of the sash, a combined hanger member slide and clutch member holder mounted on said hanger member in superimposed relation to said clutch member and in sliding supported engagement with a wall of the channel, the clutch member being disengaged from said rod when it is subject to the load of the sash.

13. In combination, a window sash slide rail including a channel, a clutch rod disposed vertically and supportedly within said channel in spaced relation to the walls thereof, a clutch member slidable within said channel in lateral thrust supporting engagement with the walls thereof and in vertical slidable relation to said clutch rod, and a sash counterbalancing means connected to said clutch member to bias it upwardly, said clutch member being provided with a clutch jaw which automatically engages said clutch rod when the clutch jaw is free from the load of a sash and is disengaged from said rod when subject to the load of a sash subject to the lift of said counterbalancing means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,747,219	Haas	May 29, 1956
2,778,069	Starck et al.	Jan. 22, 1957