July 9, 1935. S. C. REYNAUD 2,007,434

WINDOW OPERATOR CONSTRUCTION

Filed May 11, 1931 3 Sheets-Sheet 1

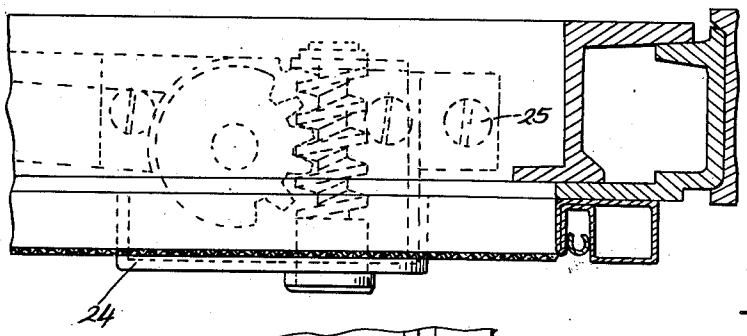


Fig. 5.

Fig. 5.

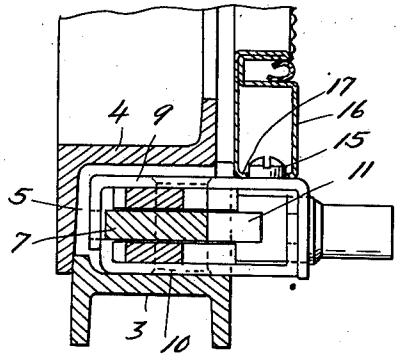
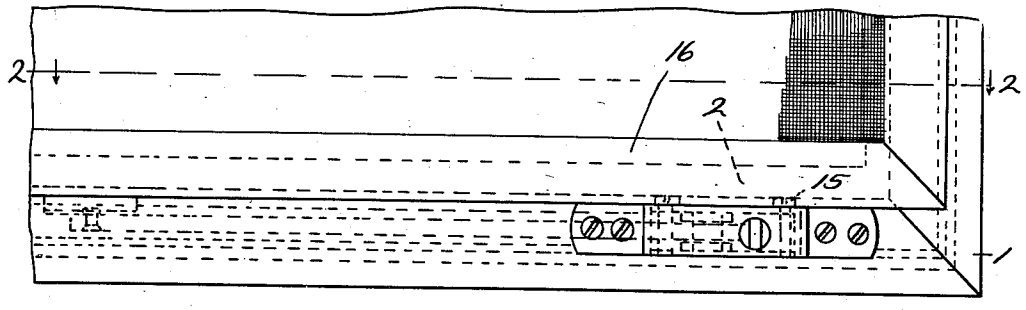


Fig. 1.



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Filed May 11, 1931 3 Sheets-Sheet 2

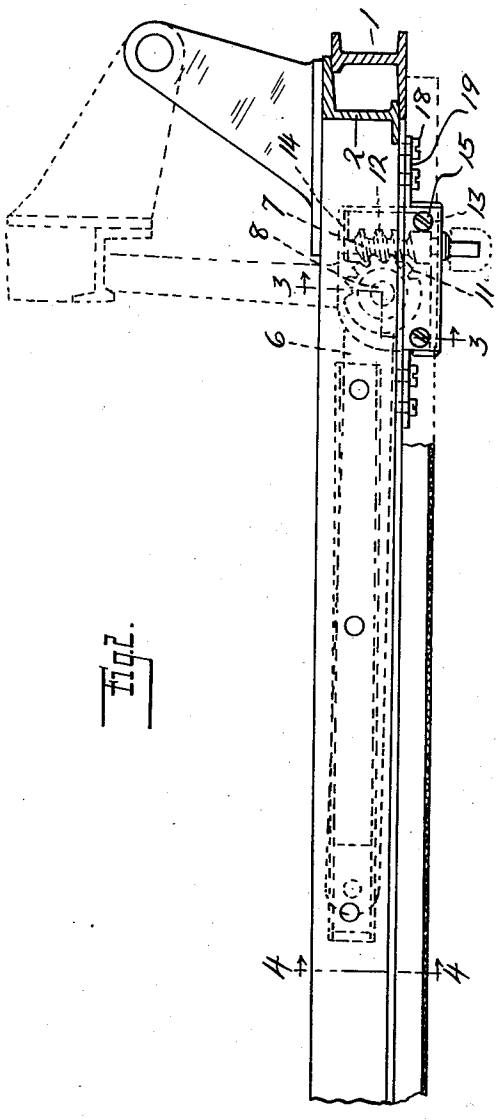


Fig. 2.

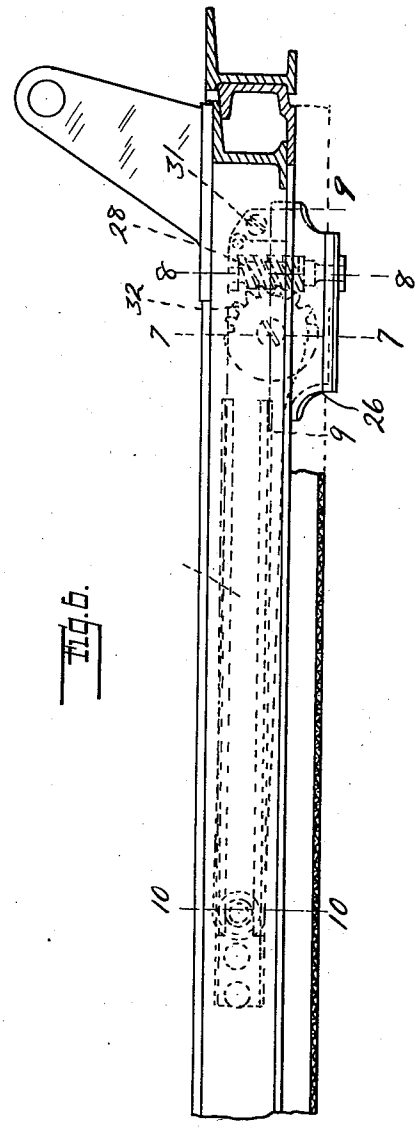


Fig. 6.

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Filed May 11, 1931 3 Sheets-Sheet 3

Fig. 7.

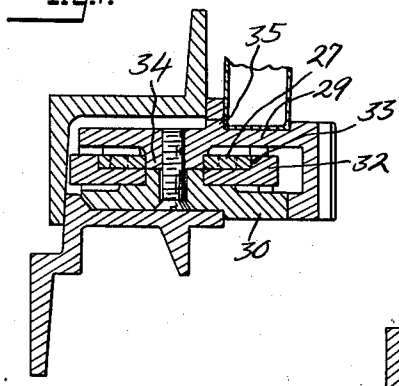
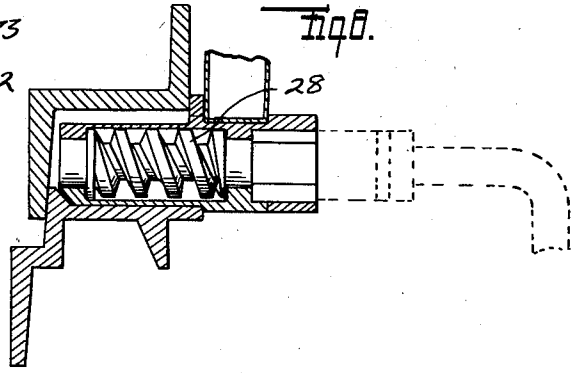


Fig. 8.



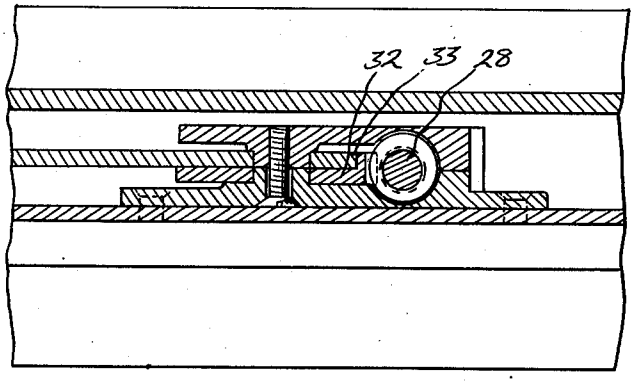
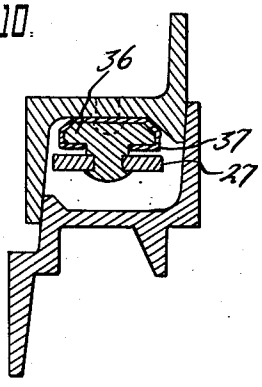


Fig. 9.

Fig. 10.



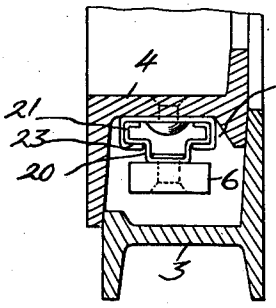


Fig. 4.

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WINDOW OPERATOR CONSTRUCTION

Samuel C. Reynaud, Detroit, Mich., assignor to Detroit Steel Products Company, Detroit, Mich., a corporation of Michigan

Application May 11, 1931, Serial No. 536,584

4 Claims. (Cl. 268—119)

The invention relates to window operator constructions and refers more particularly to operators for windows having skeleton frames and sashes. Some of the objects of the invention are to substantially conceal the operator by the frame and sash; to so construct and locate the operator that it forms no objectionable obstruction within the room; and to so construct the operator that it forms a support for the window screen. Other objects reside in the particular construction of operator and its connection to the sash.

These and further objects of the invention will become apparent from the following description, taken in connection with the accompanying drawings, in which

Figure 1 is a side elevation of a portion of a window showing an operator embodying my invention;

Figure 2 is a cross section on the line 2—2 of Figure 1;

Figures 3 and 4 are cross sections, respectively, on the lines 3—3 and 4—4 of Figure 2;

Figure 5 is a view similar to a portion of Figure 2, showing another embodiment of my invention.

Figure 6 is a view similar to Figure 1 showing another embodiment of my invention;

Figures 7, 8, 9, and 10 are cross sections, respectively, on the lines 7—7, 8—8, 9—9 and 10—10 of Figure 6.

The invention is particularly applicable to metal windows, such as casements, having outwardly opening sashes. As shown in the present instance, 1 is the metal skeleton frame formed of Z bars and having a width which is small as compared to the thickness of the wall having an opening for receiving this skeleton frame. 2 is the metal sash which is also formed of Z bars. The sash is pivotally mounted upon the frame to open or swing outwardly about a vertical axis. The construction is such that the bottom bar 3 of the frame and the bottom bar 4 of the sash have double contact with each other and provide the space 5 therebetween.

For opening and closing the sash, I have provided an operator which is so constructed and arranged that it is located substantially within this space 5. In detail, the operator comprises the arm member 6 which is adapted to extend longitudinally within this space, the driving member 7 which is located substantially within this space and the support 8 which is also located substantially within this space and carries the members 6 and 7. The arm member 6 is pivotally connected to the case by the pin 8 which extends vertically and engages the upper and lower walls 9 and 10 of the case. The pivotal end of this arm is provided with the series of teeth 11 concentric with the axis of the pin and meshing with the worm teeth 12 of the driving member 7. This driving member is journalled in the front and rear walls 13 and 14 of the case. The case, as shown in Figures 1 to 4 inclusive, is formed of co-operating sheet metal sections which may be formed by suitable stamping operations. These sections are so constructed that the lower section telescopes upwardly within the upper section and they are fixedly secured together by suitable means, such as the screws 15.

The upwardly extending room side flange of the bottom bar 3 is cut away, so that the case may extend beyond the room side face of this bottom bar a sufficient distance to support the screen 16, which latter is located at the room side face of the frame 1 and is secured directly thereagainst. The bottom bar 17 of the screen frame is preferably apertured to receive the heads of the screws 15, the arrangement being such that these screws assist in holding the screen in place. The driving member 7 extends beyond the room side face of the case a sufficient distance to detachably receive a handle or crank for rotating this driving member. The support or case for the operator is fixedly secured to the bottom bar 3 at the room side of this bottom bar by suitable means, such as the screws 18, which extend through side flanges 19 formed upon the lower section of the case.

The free end of the pivotal arm member 6 has pivotally secured thereto the T-shaped sheet metal shoe 20 which at its upper edge is formed with the return bent portions 21. To the lower side of the web of the bottom bar 4 of the sash is fixedly secured the sheet metal channel shaped guide member 22 which extends longitudinally of this bottom bar with its web against the web of the bottom bar. This channel member has the lateral terminal flanges 23 which extend toward but are spaced from each other and are also spaced from the web of the channel member. The return bent portions 21 slidably engage the terminal flanges and web of the channel member.

In the modification shown in Figure 5, the parts have the same general arrangement as those shown in Figures 1 to 4 inclusive, but in this construction the support, and more specifically the case 24, is fixedly secured to the bottom bar of the skeleton frame by suitable means, such as the screws 25, which are located within the space between the bottom bars of the frame and sash

when the sash is closed, so that these screws are concealed.

Figure 6 shows another embodiment of my invention in which the case 26 is cast and carries the arm member 27 and the driving member 28 with both members located substantially within the space between the bottom bars of the metal frame and sash. This case, as specifically shown, is formed of the upper and lower sections 29 and 30, respectively, suitably secured together and fixedly secured to the bottom bar of the metal frame by means of the screws 31 extending through foot flanges of the lower section and into the web of the bottom bar behind its room side flange, so that the securing means is concealed. The arm member 27 at its pivotal end is fixedly secured to the gear member 32, which meshes with the driving member 28, which latter is in the nature of a worm. The gear member is preferably recessed at 33 to receive the arm member and both the upper and lower sections of the case are preferably provided with the integral bosses 34 extending toward and abutting each other and upon which the gear member 32 and the arm member 27 are journalled.

The room side flange of the lower bar of the metal frame is cut away to provide for the passage therethrough of the case 26 and this case extends a distance sufficient to pass through the screen which is located at the room side of the metal frame and abuts its room side flange. To assist in holding the screen in place, the case and more particularly its upper section 29 is formed with the upwardly opening recess 35 extending parallel to the room side flange of the frame and of a width to receive the lower bar of the screen frame.

As illustrated particularly in Figure 10, the pivotal arm member 27 has pivotally secured to its free end the T-shaped metal shoe 36 which is solid instead of being formed of sheet metal and which slidably engages within the channel-shaped guide 37 extending longitudinally of and secured to the web of the bottom bar of the metal sash.

What I claim as my invention is:

1. The combination with a skeleton frame and a sash movably mounted on said frame, said frame and sash having adjacent bars providing a space therebetween when said sash is closed, of an operator for said sash having a member connected to said sash and located substantially within said space, a driving member connected to said first mentioned member and extending within said space, and a case supporting said members and located substantially within said space, said case being secured to said frame and extending beyond the room side thereof and forming a support for a screen.

2. The combination with a skeleton frame and a sash movably mounted on said frame, said frame and sash having bottom bars providing a space therebetween when said sash is closed, of an operator for said sash having a toothed member connected to said sash and located substantially within said space, a cooperating toothed member for driving said first mentioned member and extending within said space, a case located substantially within said space and within which said first mentioned member is pivoted and said second mentioned member is journalled, said case extending beyond the room side of the bottom bar of said frame and forming a support for a screen, and means at the room side of said last mentioned bottom bar for securing said case thereto.

3. The combination with a frame and a sash movably mounted on said frame, of an operator for said sash having a case extending between adjacent bars of said frame and sash and beyond the room side face thereof, said case comprising cooperating sections, fastening members for securing said sections together having head portions located above the case, said case being arranged to support a screen at the room side face of said frame and said head portions being adapted to engage in openings in said screen for retaining the latter in place.

4. The combination with a skeleton frame and a sash movably mounted on said frame, said frame and sash having adjacent bars providing a space therebetween when the sash is closed, of operating means for said sash located substantially within said space and including, an arm having a toothed member at one end thereof and having the opposite end slidably connected to the sash, a cooperating toothed member meshing with the toothed member aforesaid for driving the arm, and means for connecting both of the toothed members to the frame extending inwardly of the latter and forming a support for a screen.

SAMUEL C. REYNAUD.