G. GROFF.

DISAPPEARING WINDOW SCREEN.

APPLICATION FILED APR. 29, 1918.

1,294,094.

Patented Feb. 11, 1919.

2 SHEETS—SHEET 1.

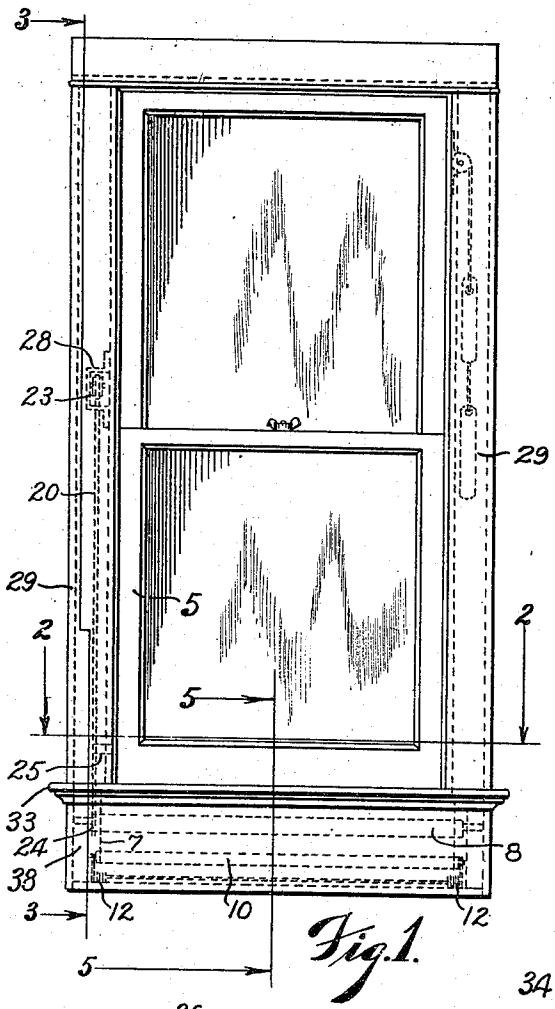


Fig. 1.

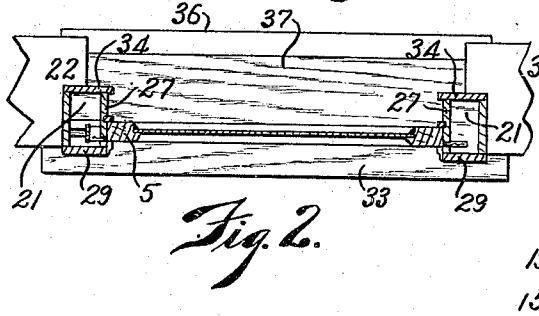


Fig. 2.

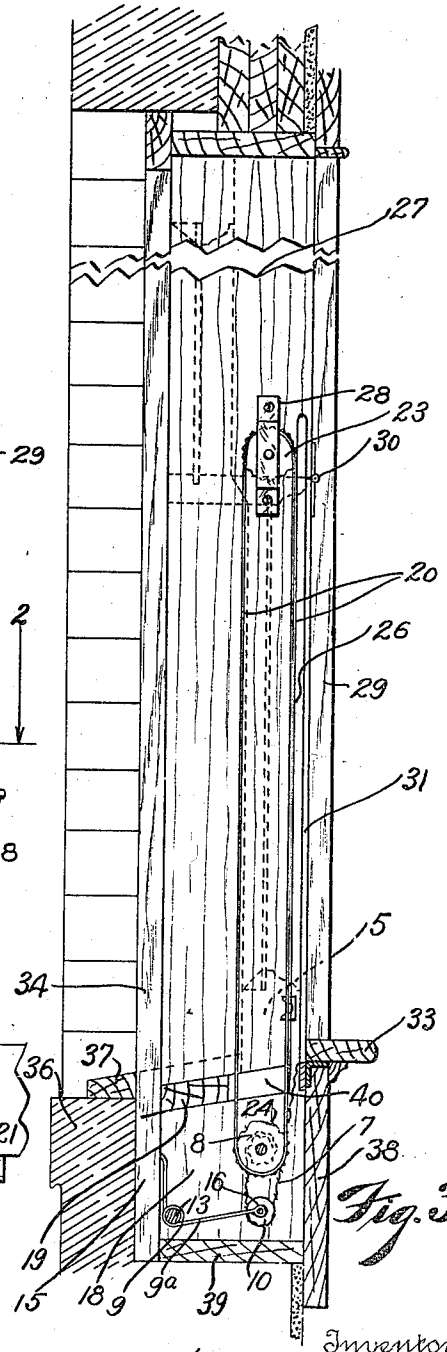


Fig. 3.

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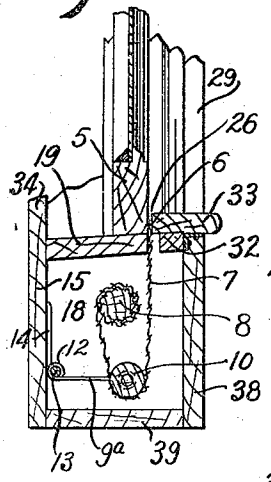
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2 SHEETS—SHEET 2.

Fig. 5.



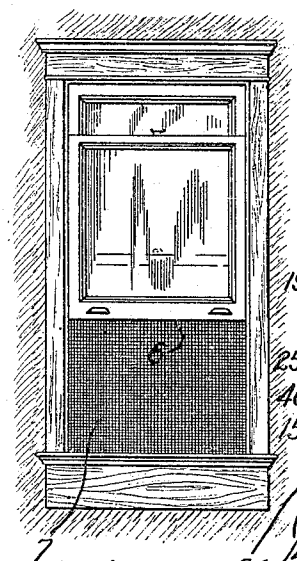


Fig. 6.

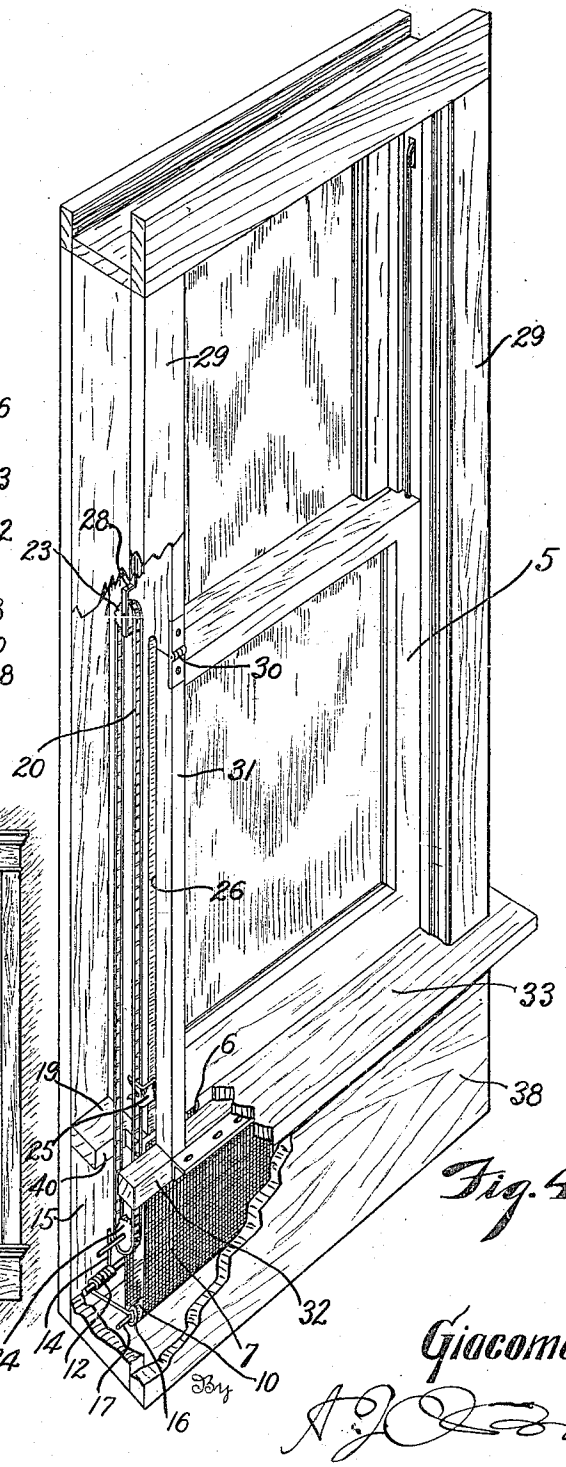


Fig. 4.

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UNITED STATES PATENT OFFICE.

GIACOMO GROFF, OF DENVER, COLORADO.

DISAPPEARING WINDOW-SCREEN.

1,294,094. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed April 29, 1918. Serial No. 231,364.

To all whom it may concern:

Be it known that I, GIACOMO GROFF, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Disappearing Window-Screens; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in means whereby a window screen is caused to disappear when the sash is closed and is caused to cover the opening when the sash is opened. This invention necessarily involves a structure of the window frame that will accommodate the disappearing screen and permit its manipulation to cause it to occupy the one position or the other, as may be required.

Below the window frame proper or the sill of the frame, a pocket is arranged containing a roller upon which the screen is wound when not in use, one end of the screen being connected with the roller while its opposite end is connected with the bottom or adjacent extremity of the sash, so that as the sash is raised for instance, the screen member will be unrolled and stretched taut to cover the opening made by the lifted sash. It is evident that the pocket could also be formed above the top of the window frame so that the screen could be pocketed above and moved downwardly as the upper sash is lowered, if desired.

Having briefly outlined my improvement, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing:

Figure 1 is a front view of a window and its frame shown in connection with my improvement which is indicated by dotted lines.

Fig. 2 is a cross section taken on the line 2—2, Fig. 1 looking downwardly.

Fig. 3 is a vertical section taken on the line 3—3, Fig. 1, the structure being partly broken away, and shown on a larger scale.

Fig. 4 is a perspective view of the window and its frame equipped with my improvement, the frame structure being partly broken away on one side for better illustration.

Fig. 5 is a section taken on the line 5—5, Fig. 1 shown on a larger scale.

Fig. 6 is a front view of a window and frame structure equipped with my improvement, the lower sash being raised to expose the screen in its position to cover the opening. In this view the structure is shown on a smaller scale than in any of the other views.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the lower sash of a window which as illustrated in the drawing is connected at its lower extremity, as shown at 6, with one extremity of a wire screen member 7, the latter being connected with a roller 8 in any suitable manner. Arranged below the roller 8 and supported by springs 9 is a second roller 10 which is under tension to hold and maintain the screen member taut as it is wound or unwound from the roller 8. Each spring 9 is torsionally acting, having a part 12 wound around a pin 13, one extremity 14 of the spring bearing against a stationary part 15, while the opposite extremity is formed into an eye 16 in which the adjacent extremity of the roller 10 is journaled being equipped with a spindle 17 for the purpose. It will be understood that each roller is arranged in a pocket 18 beneath the window sill 19 and that the opposite extremities of the roller 8 are suitably journaled in the frame structure, while each of the opposite extremities of the roller 10 is engaged and supported by an arm 9^a of the spring 9, the part 12 of the spring being so coiled that the spring arm 9^a will exert a downward stress upon the roller 10 in order to maintain the screen which it is assumed is of metal mesh structure, in a taut condition at all times, both as it is wound upon and unwound from the carrying roller 8.

As illustrated in the drawing, the roller 8 is positively actuated in both directions by an endless chain 20 which is arranged in the cavity 21 in one side of the box window frame 22, its upper extremity engaging a sprocket wheel or pulley 23, while its lower extremity engages a similar sprocket 24 fast on one end of the roller 8. The lower sash 5 as illustrated in the drawing, is provided

with an angular projection 25 which passes through a slot 26 formed in one part 27 of the box window frame structure. As shown in the drawing, but one chain and one part 25 which engages the chain, are employed, but there is a slot 26 in each part 27 of the frame, since when the sash is raised the screen is drawn upwardly through these slots. The upper sprocket 23 is supported in a bracket 28 carried by the adjacent part 27 of the box frame, this sprocket being located somewhat above the top of the upper sash.

In order to make it practicable to put the lower sash 5 in place, the lower part 31 of the frame structure which is normally covered by the outside members 29, is hinged as shown at 30, so that before the parts 29 of the frame are put in position, this part may be swung outwardly from the axis of the hinges 30 (there being one on each side). This makes it practicable to put the lower sash in place with its part 25 extending beyond the slot 26 and into engagement with the chain 20. The hinged part 31 includes a bottom part 32, to which for convenience is connected and made fast the window stool 33.

From the foregoing description the use and operation of my improved disappearing screen will be readily understood.

Assuming that the sash 5 is in the lowered or closed position, when it is raised or opened, the screen member 7 is raised and maintains the opening left by the sash, closed to the full extent of the area of the opening. This lifting of the screen is facilitated and positively affected through the medium of the chain 20 with whose inner run the bracket or part 25 is connected, the roller 10 arranged below the screen-carrying roller 8 being relied on to maintain the metal mesh screen member taut and perfectly flat and straight at all times. Again, when the sash is lowered, the roller 8 is positively actuated by the movement of the sash itself through the medium of the part 25 and the chain 20, to wind the metal screen member upon its roller 8, the tension roller 10 serving to cause the convolutions to flatly or closely engage each other.

As the innermost members 34 of the box frame structure on both sides extend downwardly, as shown at 35, in order to properly inclose the pocket 18 and the regular sill 19 of the frame engages this part on the inside, in order to cover a joint between the main sill 19 and the stone sill 36, I prefer to employ an auxiliary sill 37 arranged above the sill 19 and extending outwardly over a part of the stone sill. This prevents water, snow, etc., from working into the joint which would otherwise be left.

It must be understood that the invention is not limited to the details of the structure herein set forth, except as made necessary by the prior state of the art. The pocket 18 is further inclosed by an apron member 38 in front and a part 39 below. The regular sill 19 above this pocket is open, as shown at 40, to make room for the operating chain 20.

Having thus described my invention, what I claim is:—

1. A disappearing window screen structure comprising in combination with a movable sash, a flexible screen member connected therewith, a roller, with which the screen member is also connected, and a frame having a pocket in which the roller is arranged and slots in its opposite sides in which the screen may travel.

2. In combination, a movable window sash, a frame having a pocket adjacent one extremity thereof, a roller journaled in the frame and located in the said pocket, a flexible screen member connected with the roller at one end and with the sash at the opposite end, and means connected with the roller and operated by the movement of the sash for positively actuating the roller both to wind and to unwind the screen.

3. In combination, a movable window sash, a frame having a pocket adjacent one extremity thereof, a roller journaled in the frame and located in the said pocket, a flexible screen member connected with the roller at one end and with the sash at the opposite end, and means connected with the roller and operated by the movement of the sash for actuating the roller to wind and unwind the screen, said means including an endless flexible member suitably mounted and connected in operative relation with the roller and sash.

4. In combination, a box window frame, a sash mounted to slide therein, the frame having a pocket adjacent the sash, a roller journaled in the frame and arranged in the pocket, a screen member connected with the roller and with the sash, and a roller under tension engaging the screen member between the sash and the first named roller and cooperating with the first named roller to maintain the screen taut.

5. In combination, a box window frame, a sash mounted to slide therein, a frame having a pocket adjacent the sash, a roller journaled in the frame and arranged in the pocket, a screen member connected with the roller and with the sash, and a tension roller engaging the screen member and coöperating with the first named roller, the frame being slotted on opposite sides to allow the screen member to travel during the manipulation of the sash.

6. In combination, a box window frame, a sash movable therein, an end pocket adjacent the sash, a roller in said pocket, a flexible screen member connected at one extremity with the roller and at the opposite extremity with the sash, and a roller under tension arranged in said pocket and engag-

ing the screen adjacent the first named roller to maintain the screen taut.

7. In combination, a box window frame, a sash movable therein, an end pocket adjacent the sash, a roller in said pocket, a flexible screen member connected at one extremity with the roller and at the opposite extremity with the sash, a tension roller arranged in said pocket and engaging the screen adjacent the first named roller, a flexible device mounted in a side pocket of the frame and engaging a wheel with which the first named roller is equipped, and an operative connection between the said first named roller and the flexible device and between the latter and the sash to actuate the screen member as the sash is manipulated.

8. In combination, a movable window sash and a frame therefor, a roller journaled in one end of the frame, a screen member connected with the roller at one end and with the sash at the other end, a flexible member operatively connected with the roller, and a connection between the sash and the flexible member whereby the roller is positively operated both to wind and to unwind the screen upon closing and opening the sash respectively.

In testimony whereof I affix my signature.

GIACOMO GROFF.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."