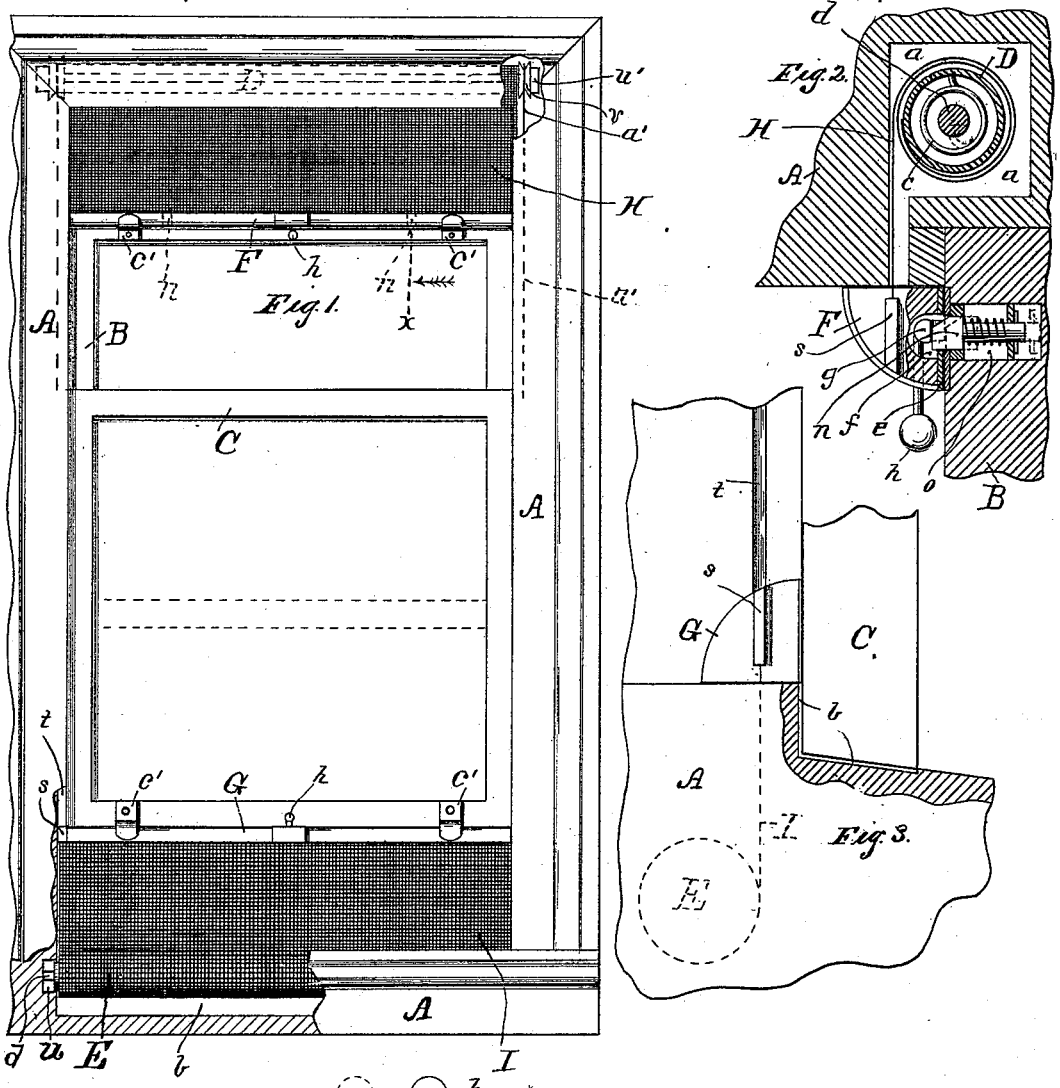
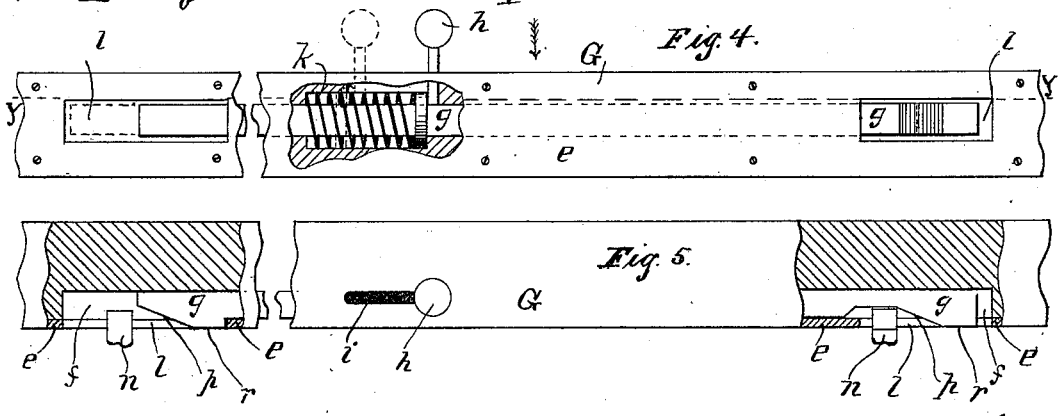
(No Model.) 2 Sheets—Sheet 1.

G. A. JACOBS.

WINDOW SCREEN.

No. 421,719. Patented Feb. 18, 1890.





Attest:
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(No Model.) 2 Sheets—Sheet 2.

G. A. JACOBS.

WINDOW SCREEN.

No. 421,719. Patented Feb. 18, 1890.

Fig. 9.

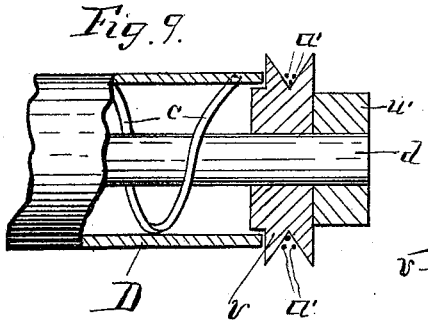

Fig. 6.

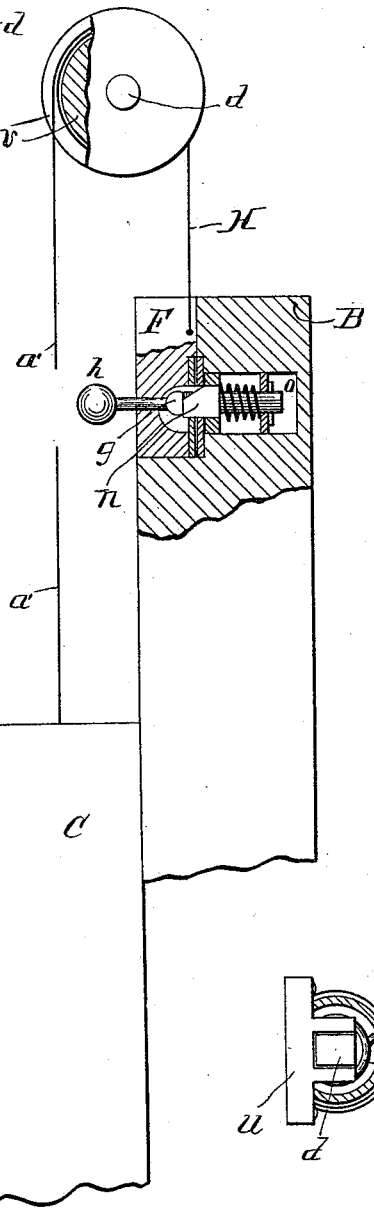

Fig. 8.

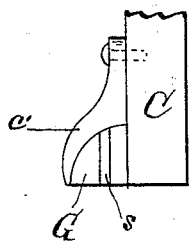

Fig. 7.

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UNITED STATES PATENT OFFICE.

GABRIEL A. JACOBS, OF RED CREEK, NEW YORK.

WINDOW-SCREEN.

SPECIFICATION forming part of Letters Patent No. 421,719, dated February 18, 1890.

Application filed November 9, 1888. Serial No. 290,763. (No model.)

To all whom it may concern:

Be it known that I, GABRIEL A. JACOBS, of Red Creek, in the county of Wayne and State of New York, have invented a new and useful Improvement in Window-Screens, which improvement is fully set forth in the following specification and shown in the accompaing drawings.

The object of my invention is to produce a new window-screen and sash-balance, the device being such that when a sash is raised from the bottom or lowered from the top, as the case may be, a screen may be presented to cover the opening thus made, or not, as the operator may wish, to which device I add a balance for the sashes, the invention being hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a view of the inside of a window having my improved screen attached in place, parts being broken away; Fig. 2, a vertical cross-section of the parts through the cavity holding one of the holders for the screen-bar, taken on the dotted line *x* in Fig. 1, and viewed as indicated by the arrow. Fig. 3 shows some of the parts at the bottom of the lower sash, more particularly the weather-strip and channel for the screen-bar and screen; Fig. 4, a view of the inner face of a screen-bar, showing the catch-openings for the holders, a part being broken out to expose the spring; Fig. 5, a view of the screen-bar, (seen as indicated by arrow in Fig. 4,) parts of the bar being broken away and longitudinally sectioned, as on the dotted line *y;* Fig. 6, a view similar to that shown in Fig. 2, drawn to show more fully the sash-balance feature of the invention; Fig. 7, a view at the end of the lower roller, showing the manner of holding the core shaft or spindle; Fig. 8, an enlarged view of a clip for holding the screen-bars, showing the edge of the clip; and Fig. 9, a central longitudinal section of parts of the upper roller, showing the relation of the grooved pulley with the spindle and other parts. Fig. 1 is drawn to a scale smaller than the other figures.

Referring to the parts of the device, A is the frame of the window, B the upper sash, and C the lower sash.

D is the upper screen-roller, set in an internal box or cavity *a* in the frame over the upper sash, and E the lower screen-roller, likewise placed in a box or cavity *b* in the frame below the lower sash.

F and G are screen-bars for the upper and lower sashes, respectively, the upper one being fastened to the upper screen H and the lower one fastened to the lower screen I. These screen-bars are arranged to be attached to their respective sashes to draw the screens with the sashes as the latter are moved upward or downward, or to be detached from the respective sashes, so that the latter may move without the screens, as may be desired. The screen-rollers are hollow and each provided with an internal spring *c*, Fig. 2, coiled around a central shaft *d*, the tendency of the springs being to turn each roller in a manner to wind the screen upon the roller, and also to pull it away from the sash.

The screen-bars F G reach from side to side of the sash, and these may be of any form of cross-section desired—as, for instance, quadrantal, as shown in most of the figures, or rectangular, as shown in Fig. 6—the form being a matter of convenience or of position. Each bar is faced with a metallic strip *e* and formed with a longitudinal cavity *f*, in which to receive a detaching-rod *g*. The detaching-rod is held to move longitudinally in the screen-bar and is operated by a knob or handle *h*, reaching out through a slot *i* in said bar. A spring *k* tends to hold the detaching-rod at one extreme of its longitudinal movements.

l l are openings through the metal face *e* into the cavity *f* at the respective ends of the rod *g*. The sash is provided with two spring catches or holders *n n*, held in cavities *o o* in position to reach into the respective openings *l l* to engage the spring-bar, so that when the sash is moved it will carry the spring-bar, and consequently the screen, with it.

As shown in Figs. 4 and 5, the detaching-rod is formed with two inclined parts or surfaces *p p*, leading to other parts *r r*, which project into the respective openings *l l*, so that the outer surfaces of the parts *r r* come about even with the outer face of the metal facing *e* of the bar. Now, by moving the de-

taching-rod endwise by means of the handle *h*, so that the high parts *r r* are presented to the respective holders *n n*, the latter are pushed back against their springs into the cavities in the sash and caused to release the screen-bar, in which case the sash may be moved without the bar and screen. Left to themselves the rod will be thrown by the spring *k* back out of the way of the holders and the latter will enter the openings *l l* when the sash is brought back to the bar, these being the normal positions of the various parts.

When a screen-bar is detached from a sash as above described, the stress of the spring in the roller holds the screen-bar snugly in place against the window-frame at the top or at the bottom, as the case may be, without regard to the movements of the sash. The screen-bars are formed with tenons *s* at their respective ends, which project into vertical races *t* in the sides of the window-frame, the edges of the respective screens also projecting within said races. These tenons prevent the respective bars from turning or moving back from the sashes, thus preventing them from becoming detached from the bolts *n;* and to further hold the bars snugly against the respective sashes clips *c'* are secured to the sashes at points opposite the ends of the bolts, which overlap the bars and prevent them separating from the sashes.

In case of the lower screen-roller E the shaft *d* is held motionless at its ends in rests *u*, rigid with the window-frame, and the spring is fastened to the shaft at one end and to the roller at the other, this construction being common in curtain rolls and fixtures; but the construction of the upper roller D is different, in this roller the shaft being held to rotate in its bearings *u'*. The shaft *d* is provided at its ends with grooved pulleys *v*, upon which are wound cords or cables *a'*, which extend downward and are attached to the lower sash. As shown in Fig. 6, the cable leads from one side of the axis of the roller, while the screen H leads from the other side, which construction causes one sash to balance the other, the roller turning freely upon the shaft, except as to the action of the intervening spring. The lower sash is suspended from parts (pulleys *v*) rigid with the shaft *d* on one side, and the upper sash is suspended from the roller on the other side of the common axis, and the shaft and roller being connected by a yielding spring admits of independent motion within limits of the shaft and roller. From this it will be understood that the two sashes may move independently of each other, while constantly tending to balance each other. Each sash must always move more or less sluggishly on account of the friction between the numerous moving parts, which friction aids in permitting the two sashes to move independently, though constantly tending to balance each other. This balance action can of course occur only when the upper sash and its screen are connected. To further explain, if both sashes are in place and the upper one, for instance, be drawn downward, the lower one will not immediately move, nor will it move at all until the lowering of the upper sash causes a stress upon the spring *c* sufficiently intense to overcome the friction and inertia of all the parts in addition to the weight of the lower sash, and if the upper sash be lowered to a distance the lower one may remain down, or it may be raised to any given point and remain balanced without the upper sash moving from its position.

The balance feature is used only where the window has an upper and a lower sash, as shown. In case of a window with a single sash—as, for instance, a window in a railway-car—the balance device is not needed. When it is used, the screen-bar F is, as a matter of adaptation, formed rectangular in cross-section and inserted in the top rail of the upper sash in a rabbet or groove, as shown.

An angular weather-strip *b'*, Fig. 3, of sheet metal, is, by preference, inserted in the frame to aid in keeping water from entering the roller-cavity when the lower sash is raised.

What I claim as my invention is—

1. In combination with the upper and lower sash of a window, a frame for the window, formed with a cavity over the sash, a hollow roller in said cavity, a screen upon said roller connected with the upper sash, a rotary shaft within said roller, a spring connecting said roller and shaft, pulleys rigid with said shaft, and cables connecting said pulleys and the lower sash, said screen pending from one side of the axis of the roller, and the cables pending from the other side of said axis, substantially as described.

2. In a window-screen, in combination with a sash and a grooved window-frame, a spring-roller below the sash, a screen upon the roller, a screen-bar secured to the screen, bolts on the sash to catch the screen-bar, and clips on the sash to hold the screen-bar, the latter having tenons adapted to fit in the grooves of the frame, substantially as shown.

GABRIEL A. JACOBS.

Witnesses:
PATRICK MALONEY,
GEO. ROBERTSON.