

No. 674,854.

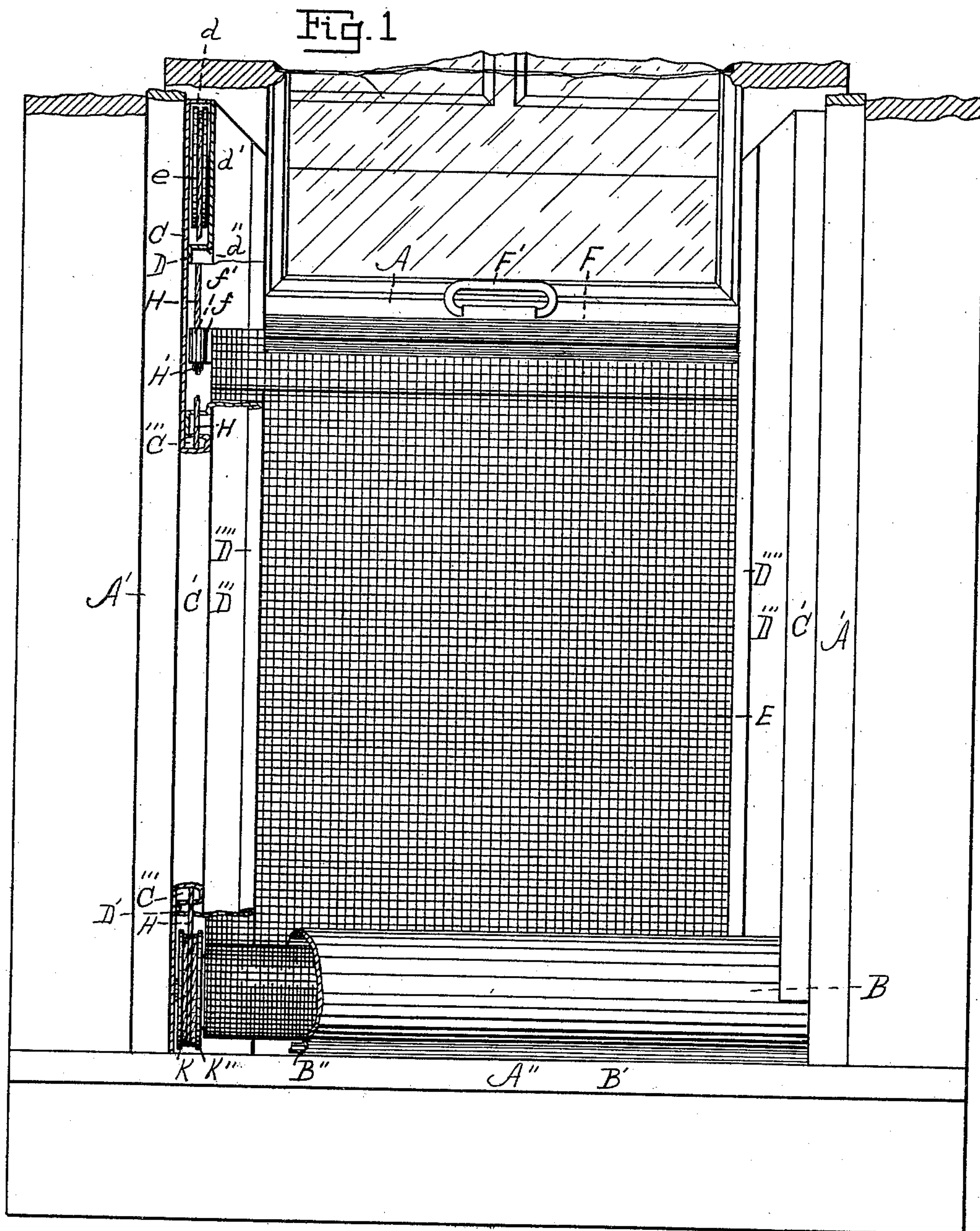
Patented May 28, 1901.

E. B. CROCKER.
WINDOW SCREEN.

(Application filed Dec. 6, 1899. Renewed Sept. 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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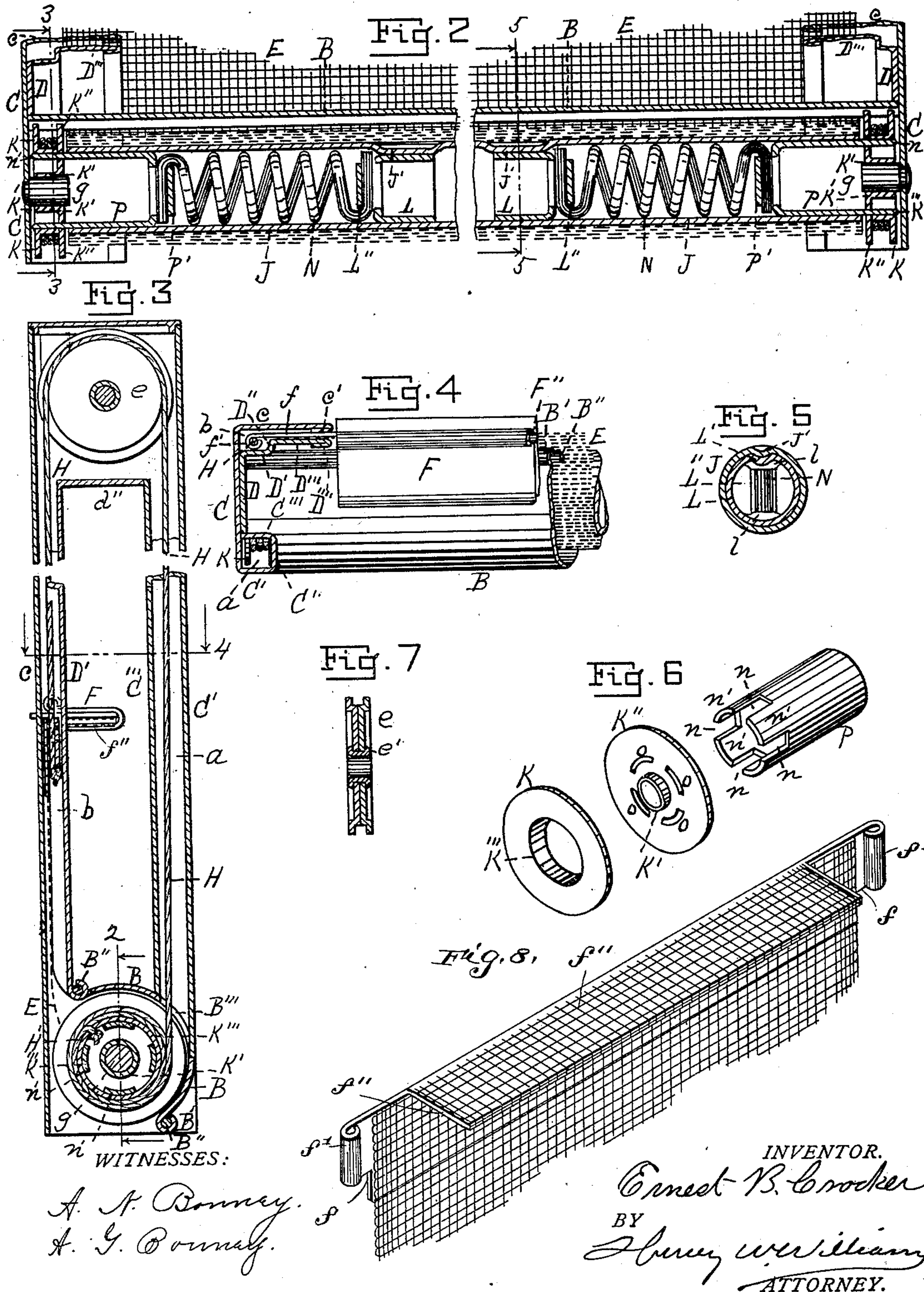
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UNITED STATES PATENT OFFICE.

ERNEST B. CROCKER, OF BOSTON, MASSACHUSETTS.

WINDOW-SCREEN.

SPECIFICATION forming part of Letters Patent No. 674,854, dated May 28, 1901.

Application filed December 6, 1899. Renewed September 17, 1900. Serial No. 30,335. (No model.)

To all whom it may concern:

Be it known that I, ERNEST B. CROCKER, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Window-Screens, of which the following is a specification.

This invention relates to that class of window-screens in which the netting is arranged on a cylinder or shaft and is unwound therefrom when the screen is raised to protect the opening produced by opening the window and rewound thereupon when the screen is lowered; and it relates particularly to that class of rolling screens in which one or more compensating springs are employed for the purpose of enabling the screen to remain at any desired height until moved from that position by the operator.

The nature of the invention is fully described in detail below and illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of my improved window-screen applied to a window, portions of the case and side plates being broken out. Fig. 2 is a longitudinal vertical section taken on line 2, Fig. 3, the springs within the hollow shaft being shown in elevation. Fig. 3 is a transverse vertical section taken on line 3, Fig. 2, and extending to the top of the appliance. Fig. 4 is a horizontal section on line 4, Fig. 3. Fig. 5 is a cross vertical section of the hollow shaft and bushing, taken on line 5, Fig. 2. Fig. 6 is a detail in perspective, showing the end of one of the bushings with its parts at that point separated. Fig. 7 is a cross-section of one of the pulleys. Fig. 8 is a detail in perspective, showing the bar $f'f''$ with the upper edge of the screen secured to it.

Similar letters of reference indicate corresponding parts.

A represents a portion of the lower sash of an ordinary window, and A' and A'' , respectively, the jambs and sill of the window-frame, constructed as usual.

B is a casing covering the upper and outer portion of the roll and provided with beaded edges B' , containing rods B'' , the ends of which are secured in any ordinary manner to the side plates C at opposite ends of the roll. These plates extend vertically up and

against the inner sides of the casing A' and each has its forward edge folded inward at C' , rearward at C'' , and outward at C''' , as shown in Fig. 4, thus providing a vertical passage a , rectangular in cross-section, the portion C' of which faces the apartment into which the window opens. The rear portion of each plate C bends inward at c and folds back upon itself at c' . Rigid with each plate C and next the inner side thereof is a plate D, whose forward end abuts against the part C''' and whose rear portion bends inward at D' , rearward at D'' , inward at D''' , and then folds back upon itself at D'''' . The portions D' and D'' of the plate D and the rear corner of the plate c constitute a vertical passage b .

E represents the netting, whose upper end is provided with a forwardly-extending folded cross-piece F, preferably provided with a handle F' . The edge of this cross-piece folds over a stiffening-rod F'' , and an angle-shaped bar $f'f''$, Fig. 8, extends horizontally, as shown, the horizontal portion f'' lying between the two folds of the cross-piece F, Figs. 3 and 8, and the vertical portion f' extending down behind the netting. The netting is folded around the horizontal portion f'' and is soldered to the portion f' . The opposite ends of this portion f' extend beyond the ends of the portion f'' horizontally between the portion c of the plate C and the portion D''' of the plate D, such portions constituting guides for the portion f'' . (See Fig. 4.) The outer ends of this portion are folded at f' , Figs. 1 and 4, to receive the cords H, whose lower ends are knotted at H' to secure them in place. These cords extend up through the passages b , over pulleys e , sustained within housings, which comprise the upper portions of the plates D, bent as shown at d'' and d' in Fig. 1 and provided with a cap d , Figs. 1 and 3, and down through the passages a and around drums $K K''$, whose hubs K' have their bearings on horizontal studs g , sustained by the plates C, the lower ends of the cords H being secured to the drums, as above mentioned.

The lower end of the netting E is secured to a hollow shaft J, which is formed on opposite sides of its central portion with two longitudinal inward bends or ribs J' , Figs. 2 and 5, which extend into corresponding recesses formed by similar inward bends or ribs L' on

a central bushing L within the hollow shaft. This bushing is formed with curved projecting ends L' and is provided with opposite holes l next said ends to receive the ends of spiral springs N, whose outer ends are similarly secured in bushings P, having curved ends P' exactly similar to the ends L' of the bushings L. These bushings P are not rigid with the hollow shaft, but have a slipping fit therein, and their outer ends are recessed at n, Fig. 6, whereby projections n' are formed which extend into arc-shaped slots O in the disk or flange K'', which constitutes one of the parts of the drum, the other part of which is lettered K. It is from this flange K' of the drum that the hub K' extends, while from the portion K of the drum a larger hub or ring K''' extends around the arc-shaped projections n'. Thus it will be seen that the drums are rigidly connected with the bushings P, that said bushings are connected by the springs N with the bushing L, and the bushing L is connected rigidly with the hollow shaft J.

The pulley e consists of two exactly similar disks having central coincident openings, into which an eyelet e' extends and has its flanges bent around the outer faces of the disks, as shown in Fig. 7. The part d'' of the housing under the pulley e connects the parts D' and C'', being integral with the part D' and abutting against the part C'', the former being secured at its lower end to the rod B'', as shown in Fig. 3, and the latter extending down to the casing B behind the opening B''' for the cord H.

In operation the screen is raised and lowered, as desired, to correspond with the height of the lower edge of the sash, but without being attached to said sash, by means of the handle F', and to whatever height the screen is raised it remains at that point without moving either up or down. This is because of the compensating springs N and their connections. As the screen is raised the diameter of the roll is of course constantly decreased, and at the same time the diameter of the coil of cord H on the drum K K'' is constantly increased. While raising or extending the screen for about the first half of the process the gauze or netting unwinds from the shaft B more rapidly than the drum K K'' can wind the cord, and during this half the springs are relieving their tension and take up the slack in the cord. During the second half the gauze unwinds more slowly than the drum winds the cord, and hence the springs are, so to speak, storing up tension. Thus it will be seen that the springs act on both the netting and the cord and set their own tension. Of course during this process there is relative rotation between the bushings P and the hollow shaft B as the springs expand and contract between the bushings P and the bushing L.

The edges of the netting—that is to say, those portions which are under the end bars f—are overlapped on the inner side by the

portions D''', extending inward from the plates D, and on the outer side by the portions c, extending inward from the plates C. These overlapping guards are of course stationary and are sufficiently broad to thoroughly protect the edges of the screen and prevent them from sagging and from being tampered with or accidentally injured in any manner. Moreover, these plates completely bridge any possible space between the edges of the screen and the casing or between said edges and the side plates, thus preventing the admission of insects.

Of course the construction and mechanism for raising and lowering the screen are the same on both sides of the sash, so that the bar F is kept horizontal at all heights.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a window-screen of the character described, the roll comprising a hollow shaft and the network or screen proper secured at one end thereto; a frame adapted to be arranged vertically next the window-casing; a drum supported by said frame near its lower end; a pulley supported by said frame above the drum; a cord secured at one end to the upper end of the screen or netting, passing over the pulley and connected at the other end with the drum; a bushing within the hollow shaft and rigidly connected with the drum; and a compensating spring within the shaft connected at one end with said bushing and at the other end being rigidly connected with the shaft, substantially as described.

2. In a window-screen of the character described, the roll comprising a hollow shaft and the network or screen proper secured at one end thereto; a frame adapted to be arranged vertically next the window-casing; a drum supported by said frame near its lower end; a pulley supported by said frame above the drum; a cord secured at one end to the upper end of the screen or netting, passing over the pulley and connected at the other end with the drum; a bushing within the hollow shaft and rigidly connected with the drum; a bushing within and rigidly connected with the shaft; and a compensating spring within the shaft connected at its opposite ends with the said bushings, substantially as set forth.

3. In a window-screen of the character described, a hollow shaft carrying the network or screen proper; the drum comprising the disk K and inwardly-projecting annular flange K''' and the disk K'' formed with the slots O and outwardly-projecting annular flange K'; the bushing P within the shaft and provided with the projections n' extending through said slots; a compensating spring within the shaft secured at one end to the bushing and connected at the other end with the shaft; a pulley supported by the frame; and a cord connected at its opposite ends with

the drum and the upper end of the screen and passing over the pulley, substantially as described.

4. In a window-screen of the character described, a hollow shaft carrying the network or screen proper, said shaft being formed with the longitudinally-arranged inward bend or rib J'; the bushing L within the shaft and provided with the longitudinally-arranged inward bend or rib L' coincident with said bend or rib J'; the bushing P within the shaft; the drum K, K'' rigidly connected with said bushing P; the compensating spring N connected at its opposite ends with said bushings L and P; a pulley supported by the frame; and a cord connected at its opposite ends with the drum and the upper end of the screen and passing over the pulley, substantially as set forth.

5. In a window-screen of the character described, a hollow shaft carrying the netting or screen; a pair of separate and independently-operating compensating springs within said shaft and connected separately at their inner ends therewith; and mechanism com-

prising a drum and cord connected with the outer ends of said springs for rolling said screen upon the shaft, substantially as described.

6. In a window-screen of the character described, the plate C provided with the inwardly-extending guard *c* and formed with the inwardly, rearwardly and outwardly bent portions C', C'', C''' whereby the passage *a* is produced; the plate D provided with the inwardly, rearwardly and inwardly bent portions D', D'', D''' whereby the passage *b* is formed; the pulley *e* mounted in the upper portion of the plate C; the roll; a drum connected with said roll; a cord connected at its opposite ends with the drum and the upper end of the screen making a part of the roll; and the end bars *f* extending from the upper end of the screen between the parts *c* and D''' and connecting with said cord, substantially as set forth.

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Witnesses:

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