

J. & W. F. BEHEL.
WINDOW-BLINDS.

No. 179,642.

Patented July 11, 1876.

Fig 1.

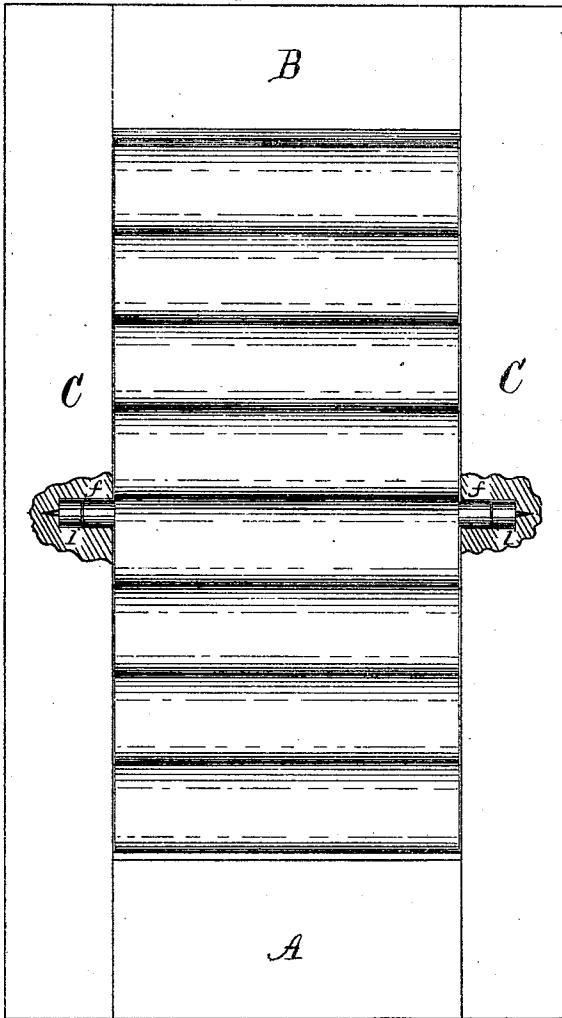


Fig 2.

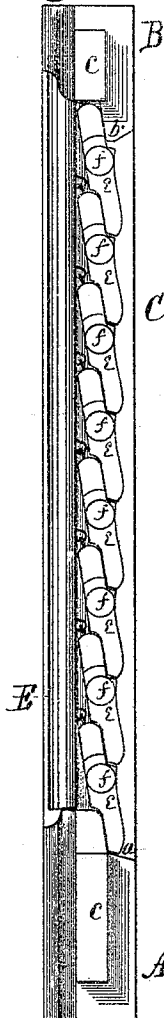
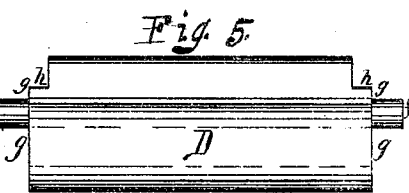
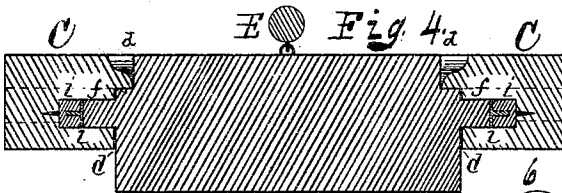
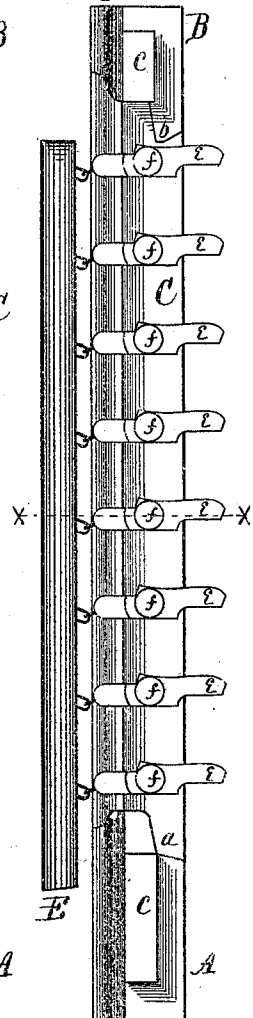
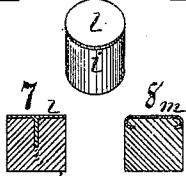


Fig 3.



Attest.
C. F. Behel
A. O. Behel



Inventors.
Jacob Behel
Milburn F. Behel
Per Jacob Behel
Atty.

UNITED STATES PATENT OFFICE.

JACOB BEHEL, OF ROCKFORD, AND WILBUR F. BEHEL, OF CHICAGO, ILL.

IMPROVEMENT IN WINDOW-BLINDS.

Specification forming part of Letters Patent No. **179,642**, dated July 11, 1876; application filed May 27, 1876.

To all whom it may concern :

Be it known that we, JACOB BEHEL, of the city of Rockford, in the county of Winnebago, and WILBUR F. BEHEL, of the city of Chicago, in the county of Cook, all of the State of Illinois, have invented certain new and useful Improvements in Window-Blinds, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

The object of our invention is to produce a window-blind of simple construction, at a small cost, that will be more nearly impervious to rain, wind, dust, and light than the ordinary blind now in use; and also to produce a blind with adjustable slats, that will remain in any adjusted position, to admit more or less light, as may be required by the user, and that may be closed so as to exclude all direct rays of light, and that can be locked in the closed position, so that they cannot be opened from the outside.

To this end we have devised and constructed the blind represented in the accompanying drawings, in which—

Figure 1 is an outside face view of a window-blind embodying our invention. Fig. 2 is an edge view with one stile removed, and showing the slats closed and locked in position. Fig. 3 is a similar edge view, showing the slats fully open. Fig. 4 is a transverse section on dotted line *x* in Fig. 3. Fig. 5 is an outside face view of a slat.

In the drawings, A represents the lower cross-rail of a window-blind rabbeted on its upper outer corner, as at *a*, to receive the lower portion of the lower slat when closed. B represents the upper cross-rail rabbeted on its inner lower corner, as at *b*, to receive the upper portion of the upper slat when closed. In large blinds it will be necessary to employ one or more intermediate cross-bars, in which instance all the intermediate cross-bars will be rabbeted on the upper outer corner, as at *a*, in the lower rail A, and rabbeted on their inner lower corner, as at *b*, in the upper rail B. The ends of these cross-rails are fitted in the usual manner, with tenons, represented at *c*, to enter mortises in the stiles C, prepared for their reception. C represents the stiles, which are also rabbeted on the outside inner corner, as

at *d*, and are mortised to receive the tenons on the ends of the cross-rails. These parts, rabbeted as described and shown, and framed and put together in the usual manner, constitute the frame of our improved window-blind. The stiles C, on their inner rabbeted edges some distance from the raised portion of the rabbet, and at proper intervals, are bored to receive the round tenons formed on the ends of the blind-slats. D is an outside face view of our improved blind-slat, an end view of which is clearly shown at *e*. These slats are rabbeted on their lower edge and inner face, and on their upper edge and outer face, to about one-third of the width of the slat from each edge, and are reduced in the rabbeted portions about one-third of the thickness of the whole slat, and are formed in such a manner that the upper rabbeted portions of the slats fit into the lower rabbeted portion of the slat next above it, forming a double rabbeted joint at all the overlappings of all the slats and the cross-rails, as seen in Fig. 2. These slats are fitted at each end with a round tenon, *f*, having a shoulder, *g*, in the same plane on both the upper and lower sides of the tenon, which extends above the tenon, as at *h*, a distance about equal to the distance that the holes in the rabbeted edges of the stiles are from the inner raised portion of the rabbet, at which point the upper portion of the slat is reduced in length at both ends, about equal to the depth of the rabbet on the inner edges of the stiles, forming double-shouldered slats of proper length, to freely play between the inner rabbeted edges of the stiles pivoted therein on the tenons *f*, as shown in Fig. 1, in which portions of the stiles are broken away to show the parts, and is shown in section at Fig. 4. The slats in place in the blind-frame are connected at their inner upper edge to the blind-rod E by staples in the usual manner, the rod E being employed to open and close the slats by its up-and-down movement, in substantially the same manner as now in common use. The blind-rod E is of such length that, when the slats are closed, the lower end of the rod may be forced outward onto the upper edge of the lower cross-rail, securely locking the slats in the closed position, so that they cannot be opened from the outside. We

have employed a metallic-capped india-rubber spring, placed in the holes in the stiles fitted to receive the tenons of the slats, with the metallic cap *l* against the end of the tenon, as seen in place at *i*, Fig. 1, and in section at *i*, Fig. 4, which, by means of their spring-action against the ends of the tenon, serve to hold the slats in any adjusted position, to admit more or less light. For this purpose it will ordinarily be found sufficient to employ these springs to operate on but one or two slats in each section of the blind; but, if required, more may be employed; and when it is required to prevent the slats from rattling, they may be employed to act upon all the slats.

Fig. 6, in the drawings, is an isometrical view of the spring enlarged, in which *i* is the india-rubber portion, and is of cylindrical form, one end of which is provided with a metallic cap, *l*, fitted with a central line, which is received in the axis of the rubber-cylinder, more clearly shown in the sectional view at Fig. 7. In Fig. 8 is shown in section another form of the metallic capping of the spring, in which *m* is the metallic cap, made from plate material, with the edges or portions thereof turned inward, which receives the end of the rubber-cylinder.

These metallic-capped rubber springs, as an article of manufacture, may be produced in different ways, among which we would mention that the metallic portion may be produced as rivets are now manufactured, or as tacks having flat heads of circular form are produced, or they may be produced as metallic caps for buttons or other similar articles are produced, with the outer edge or portion thereof turned over and inward to receive the rubber portion of the spring, or, instead of the metallic capping, hard rubber may be employed and formed in any proper manner to receive the spring-rubber cylinder. The rubber portion of the spring may also be produced in different ways, among which we would mention that the cylinder may be cut from plate rubber, or the rubber may be prepared in tubular or cylindrical form and cut in proper lengths, and the metallic capping applied to the ends of the cylinders may be fixed in position by mechanical appliance or cemented thereto, or the cylinder may be molded on the metallic or hard-rubber capping and vulcanized thereon.

We are aware that window-blinds, in some instances, have been made with some portions of the blind-frame rabbeted on its inner edges,

and that blind-slats have been made in some instances, having corrugated or rabbeted sides, with eccentric tenons, which were difficult to balance. Blind-slats have also been produced, having the portion of the slat above the tenon shorter than the portion below the tenon. This construction, when of wood, proved in practice a weakening of the slat, liable to split at the tenon on the lower side, and when constructed to exclude the direct rays of light required the slats, on both the in and out sides, to overlap onto the tenon. These, therefore, we do not claim; but

We claim as our invention—

1. A blind-frame, consisting of stiles and cross-rails rabbeted on its inner edges, framed, and stiles bored, as hereinbefore described and shown, constituting a frame for the reception of vibrating slats, as and for the purpose hereinbefore set forth.

2. A blind-slat, as herein described and shown, provided with tenons *f* on both ends, and shoulders *g* on both sides of the tenon in the same plane, the slat above the point *h* reduced in length at both ends about equal to the depth of the rabbet on the inner edge of the stiles, forming a double-shouldered slat, as shown and described, and for the purpose set forth.

3. The combination of the rabbeted blind-frame and the double-shouldered blind-slats pivoted therein, substantially as and for the purpose hereinbefore set forth.

4. In combination with the rabbeted blind-frame and double-shouldered blind-slats pivoted therein, the blind-rod *E* hinged to the blind slats, operating as described, for the purpose of adjusting the slats and locking them in a closed position by forcing the end of the rod outward on the upper edge of the lower and intermediate cross-rails.

5. The metallic-capped rubber spring, in combination with a pivoted blind-slat, for the purpose of holding the slats in adjusted position to control the admission of light, substantially as hereinbefore set forth.

6. The metallic-capped rubber spring herein described, as an article of manufacture.

JACOB BEHEL.

WILBUR F. BEHEL.

Witnesses for J. BEHEL:

A. O. BEHEL,

E. J. BEHEL.

Witnesses for W. F. BEHEL:

S. R. FRAZIN, Jr.,

W. S. DENBARSPECK.