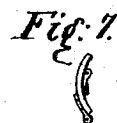
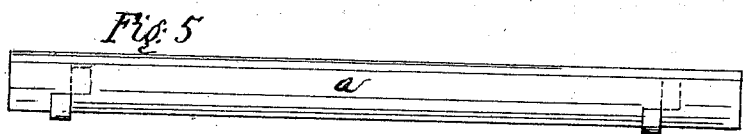
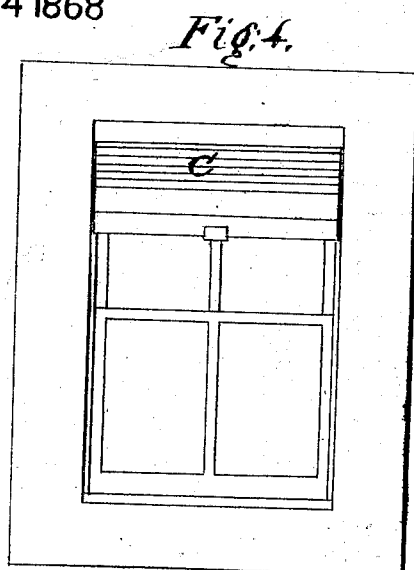
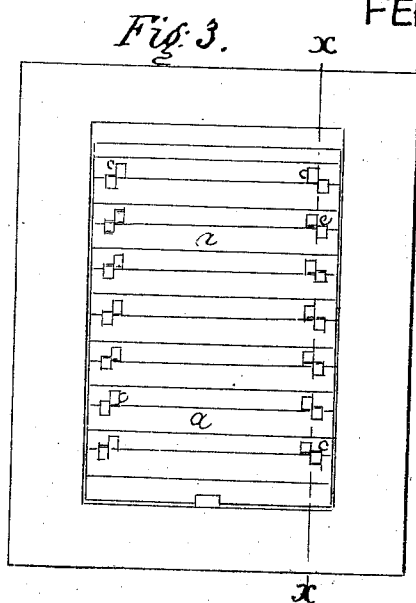
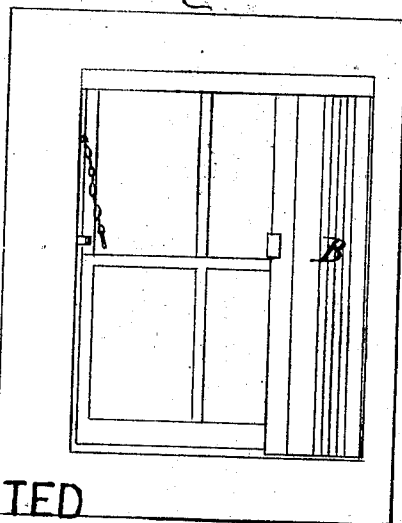
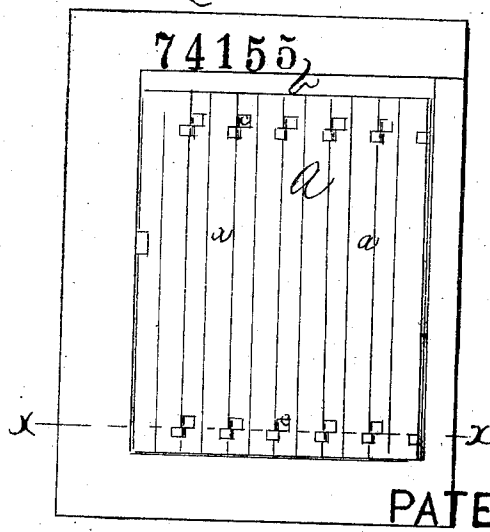


Samuel J. Seely Folding Iron Shutters
 Assignor to J. M. Brown



Witnesses
 Batten D. Long
 J. W. Webster

Inventor
 Samuel J. Seely
 by his atty.
 B. A. M. Brown

United States Patent Office.

SAMUEL J. SEELY, OF NEW YORK, ASSIGNOR TO J. M. BROWN, OF
BROOKLYN, NEW YORK.

Letters Patent No. 74,155, dated February 4, 1868.

IMPROVED FOLDING METAL SHUTTERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, SAMUEL J. SEELY, of the city, county, and State of New York, have invented a new and useful Improvement in Folding Metal Shutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a vertically-hung folding metal shutter of my invention, opened and fastened over a window.

Figure 2 represents the same shutter partially folded into a recess on one side of the window.

Figure 3 represents my shutter open and suspended from the top over the window.

Figure 4 represents the same shutter partially raised.

Figure 5 represents a plan view of a single leaf of the shutter.

Figure 6, a cross-section, on the lines *x x* of figs. 1 and 3; and

Figure 7, a cross-section of the single leaf.

Plane-leaved metal shutters, if made light, are deficient in strength, and if made strong, they are necessarily inconveniently heavy, and quite expensive; and moreover, whether made light or heavy, they are liable to warp or bend in the leaves from heat or hard usage; and it is, besides, quite difficult to repair them when a leaf is worn or injured. It is, therefore, the object of my invention to so form the separate leaves of folding shutters as to render the shutter light, strong, durable, and easily adaptable to all positions where shutters are required; to which end my invention consists in forming folding metal shutters of leaves, which are curved transversely in lines that will permit them to be closely folded together, whether united by a hinge over the whole length of the blade, or by strap-hinges placed at intervals upon the blades, and that admit the shutters to be hung vertically to one or both sides, suspended from above, or dropped below the opening to be covered, and shall, when opened, present a waved ornamental surface.

In the example shown in this specification, I form the shutter A of any suitable sheet-metal leaves *a*, curved transversely in the arc of a circle, as shown in figs. 6 and 7, by a proper die, or upon a former; one edge of the leaf being flattened for a short distance, and bent slightly in, to fit closely upon the adjoining leaf to which it is hinged. I do not limit myself, however, to any particular form of curve, so long as it is such as that one leaf will fold closely upon the leaf next to it, and will admit of the leaves, when united in a shutter, to be folded closely together, as in figs. 2 and 4, and when opened to permit the most prominent points on the convex side of the leaves to be in a straight line, as in fig. 6. Such curved leaves may be united one to the other by strap-hinges *c*, or the edges may be so turned, cut, and brought together upon a rod as to form a continuous hinge for each leaf. Leaf is added to leaf in numbers sufficient to form a shutter of the desired capacity for covering any proposed opening; and the leaves may be of any desired width, and of proper length, to form single or double doors or shutters for covering openings in buildings, entrances to cellars, or hatches of ships. When strap-hinges are used they should be placed in straight lines across the shutter, for symmetry, and when the continuous hinge is used, if properly formed, it will make an extremely neat finish. This shutter may be hung vertically, as shown in fig. 1, when a guide-strip, *b*, can be placed above the shutter, distant from the inside edge of the cap far enough to permit the shutter to fold within the space between the guide-strip and cap; and if the window is so wide as to strain the hinges when opened, one or more of the forward leaves may rest on friction-rollers, which will prevent there being any strain upon the hinges, and the shutters cannot sag. When the shutter is hung vertically, it can be folded into any properly-formed recess, as shown at B in fig. 2. When hung at the top it can be drawn up in folds, as at C, in fig. 4, or it will admit of being depressed beneath the window, and in either position will occupy little more space than the thickness of the leaves.

It is obvious that the leaves of my shutter may be painted, enamelled, gilded, or ornamented in any style desired, and that the shutter is capable of being used with advantage, as either an inside or outside shutter. From the form of the leaves my shutter derives strength, though made of light materials, and the leaves can

hardly be warped by heat out of their proper form ; besides which, they can be readily and economically applied to any openings where a recess can be placed on its top, bottom, or sides.

What I claim as my invention, and desire to secure by Letters Patent, is—

Forming sheet-metal shutters of leaves, bent in a curved form, transversely, and united substantially as and for the purpose set forth.

In testimony whereof, I have hereunto subscribed my name.

SAML. J. SEELY.

Witnesses:

LYDIA A. SEELY,

CHS. E. BROWN.