L. LEFÉBURE.
Shutter.

No. 215,374. **Patented May 13, 1879.**

Fig. 1

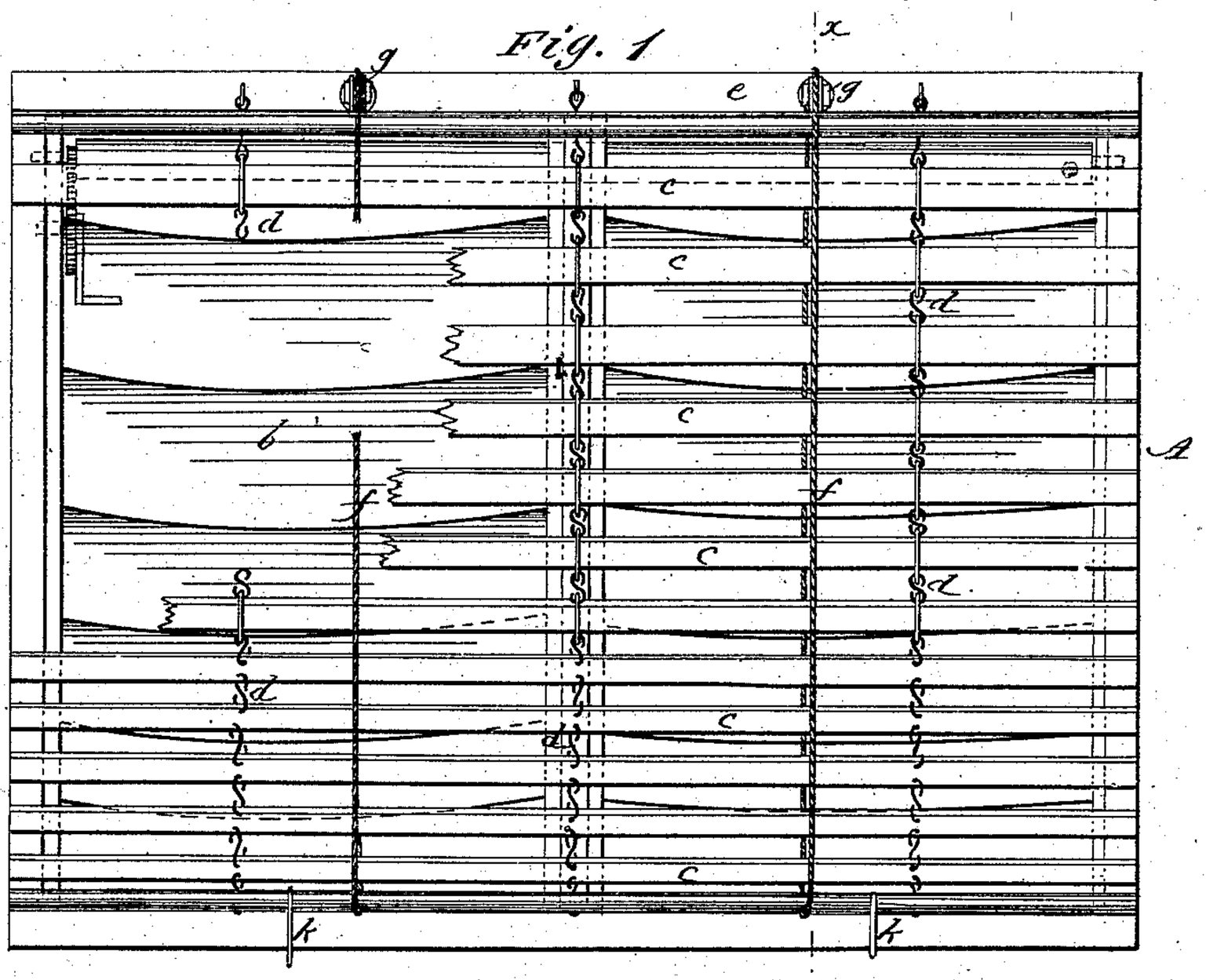
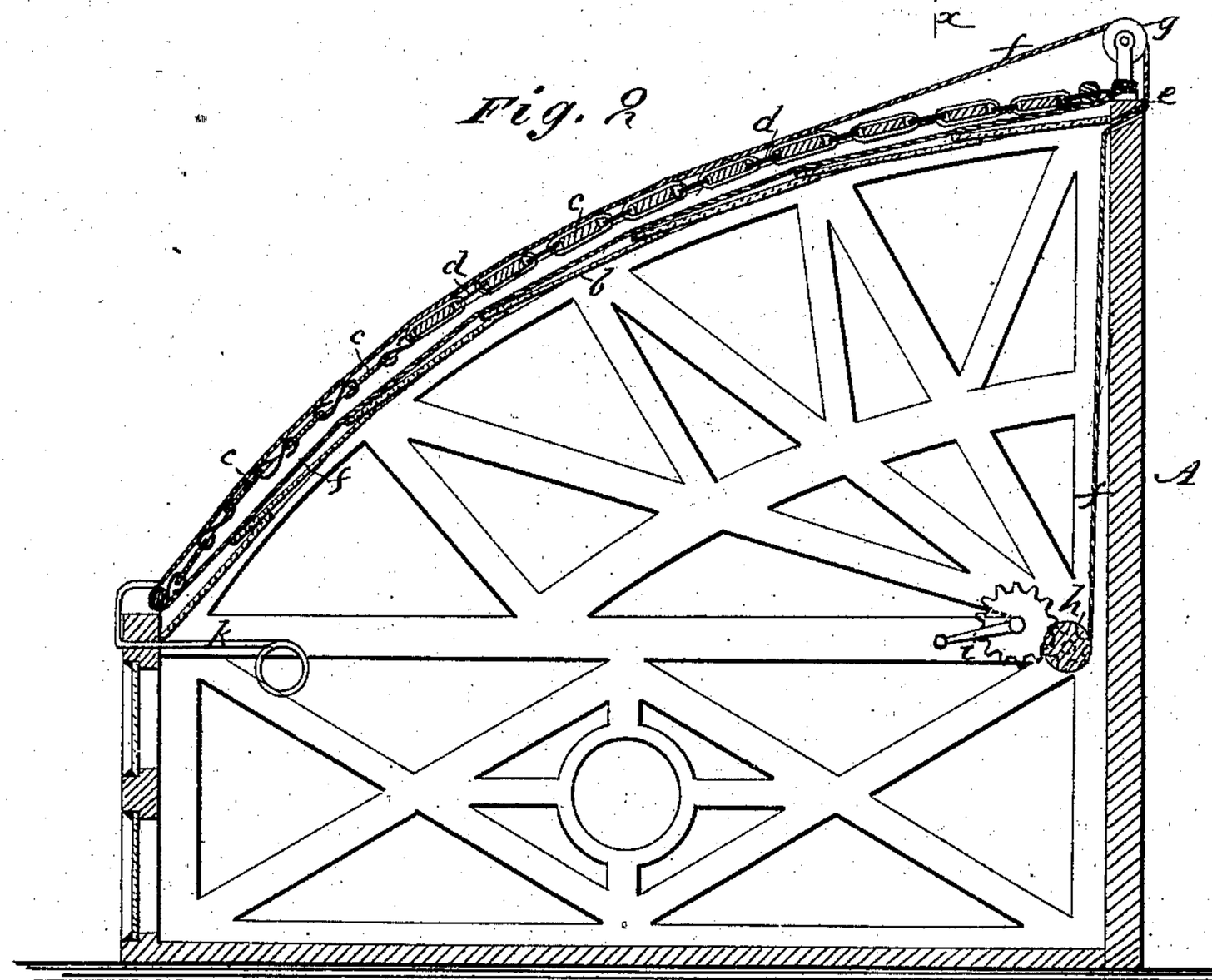


Fig. 2



WITNESSES:

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LÉON LEFÉBURE, OF NEW YORK, N. Y.

IMPROVEMENT IN SHUTTERS.

Specification forming part of Letters Patent No. **215,374**, dated May 13, 1879; application filed November 5, 1878.

To all whom it may concern:

Be it known that I, LÉON LEFÉBURE, of the city, county, and State of New York, have invented a new and Improved Shutter for Greenhouses, of which the following is a specification.

The object of my invention is to furnish means for shutting off the direct rays of the sun from greenhouses to a greater or less extent, as may be desired. It has been heretofore usual to cover the glass with a wash of some material to deaden the light; but the plants need direct sunlight at times, and to obtain it the removal of the wash is necessary.

My invention relates to a rolling shade or shutter composed of slats hinged together and applied upon the outside of a greenhouse roof, so that it may be rolled up or let down over the glass by mechanism inside the house. The slats are a short distance apart, thereby shading alternate spaces, and the plants will thereby be subjected alternately to direct rays and shaded light. The shutter also serves to protect the house from frost and the glass from hailstones.

In the accompanying drawings, Figure 1 is a plan view of a greenhouse with my improved shutter applied thereto. Fig. 2 is a sectional elevation on line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The house A may be of any usual shape or character, with its glass roof *b* more or less sloping. The shutter is composed of slats *c*, preferably thin wooden strips, connected together at two or more points of their length by wire loops *d*, which form hinges permitting the slats to lie flat upon the roof when unrolled, as shown.

The slats *c* lie and move upon the rafters of the roof, the upper slat being connected fast to the ridge-pole *e*. *f f* are cords connected to *e*, passing beneath and over the shutter and over friction-rollers *g g* at the top of the house, and from thence through the side to a windlass, *h*, that is fitted inside the house.

i is a crank-handle upon a gear-wheel that meshes with a small gear-pinion on *h*, and is used for winding ropes *f* on the windlass, which action draws up the shutter from the bottom, rolling the slats up as the shutter is raised.

k k are catches for holding the shutter when it is down, to prevent its becoming misplaced by wind. These catches *k* pass over the lower slat *c*, and can be operated from inside the house.

I prefer that the slats *c* be hung so that the space between them is somewhat less than the slats are wide. By that means the shutter is made more effectual for protection against frost and hail, and if more direct sunlight is needed than can pass the spaces the shutter may be raised; but as the slats do not lie upon the glass the spaces will generally be sufficient when narrower than the slats.

The effect of the shutter described is that the plants in the house are subjected to alternate shade and direct sunlight, as the sun changes in position, producing a better and more healthy growth than can be obtained by the dead light from a covered glass. When a full light is needed the shade can be readily rolled up.

The slats *c* may all be made of metal, or some of the lower ones only, to obtain sufficient weight to unroll the shutter.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with a rolling shutter on a greenhouse, and fastened to the ridge-pole thereof, of the cords *f f*, passing under as well as over the shutter, then over top pulleys and to a windlass in the green-house, substantially as and for the purpose set forth.

LÉON LEFÉBURE.

Witnesses:
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