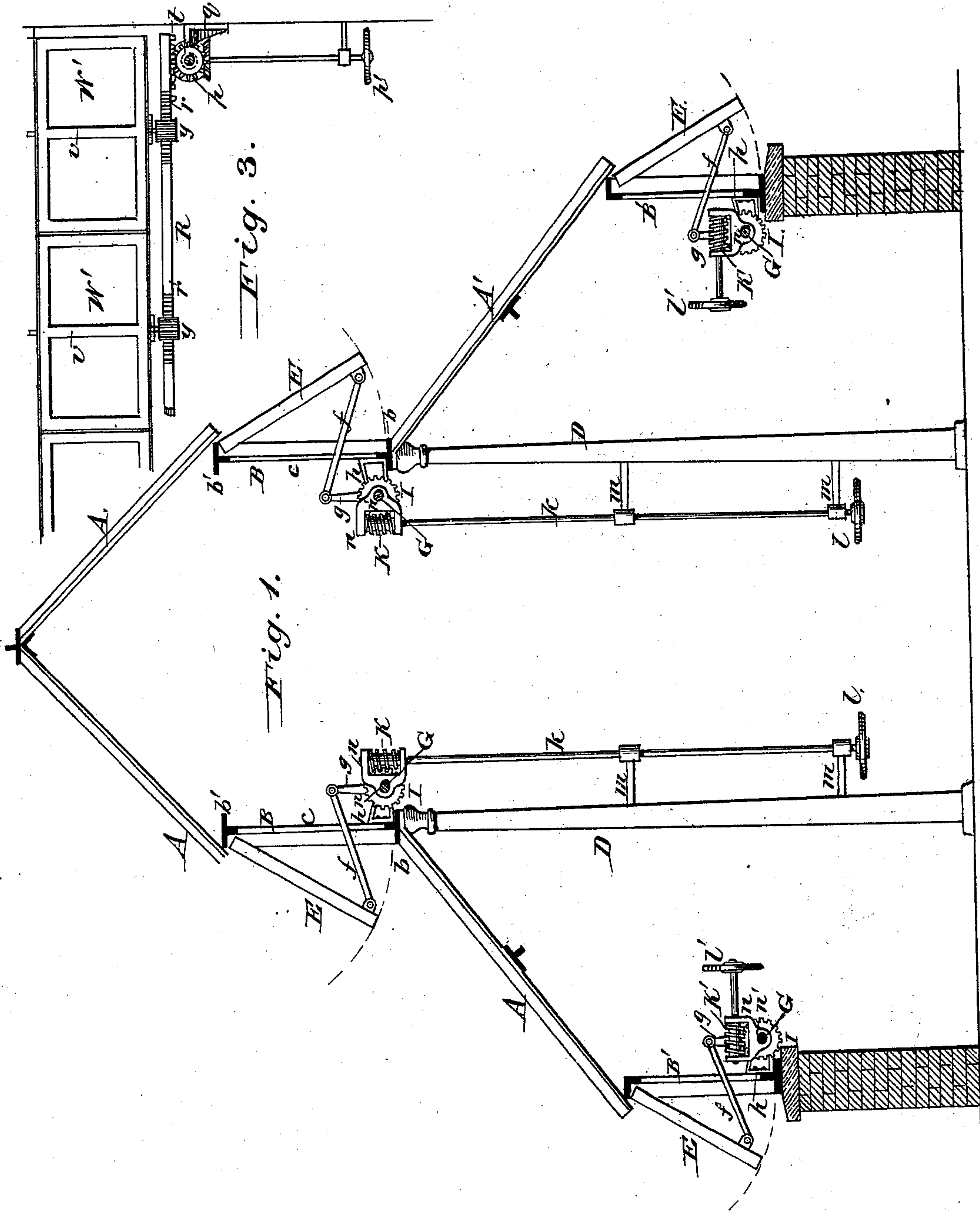


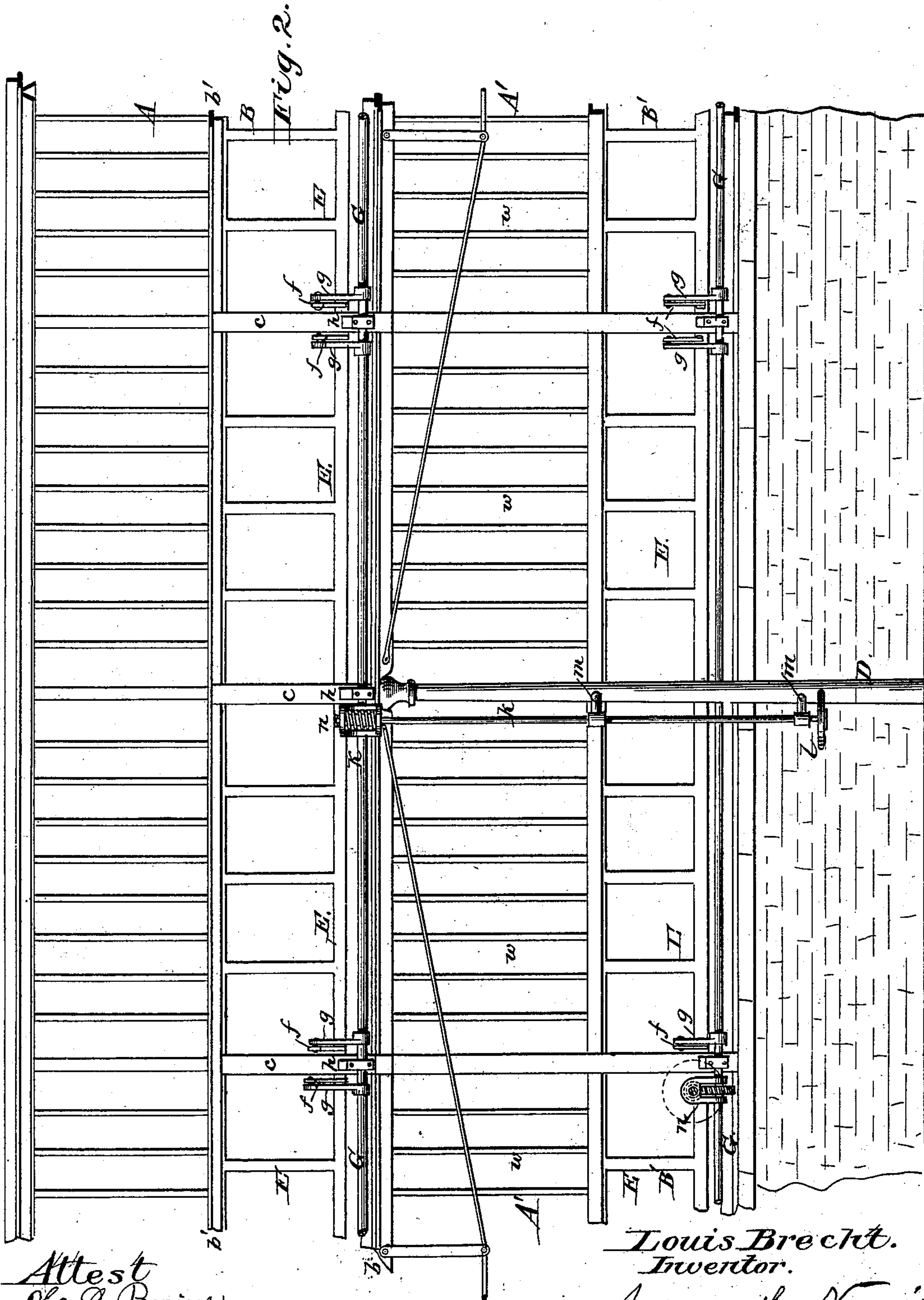
L. BRECHT.
Ventilating Green-House.
No. 209,854. Patented Nov. 12, 1878.



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Louis Brecht.
Inventor.
By James L. Norris.
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UNITED STATES PATENT OFFICE.

LOUIS BRECHT, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN VENTILATING GREENHOUSES.

Specification forming part of Letters Patent No. 209,854, dated November 12, 1878; application filed September 25, 1878.

To all whom it may concern:

Be it known that I, LOUIS BRECHT, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Ventilating Greenhouses, of which the following is a specification:

This invention relates to an improved combination of devices for opening or closing a series of greenhouse-windows simultaneously and to any desired extent.

Its object is to save labor by placing any desired number of windows under the control of a single person, who may operate them from a single point, thus obviating the necessity of moving from one window to another and manipulating each and its fastening or adjusting devices separately.

It consists, first, in the combination, with a series of hinged or pivoted windows of a green-house, of a common moving part or prime mover provided with gear-teeth, and connected with each window by intermediate connections, and a rotary operating rod or handle mounted in fixed bearings, provided with a suitable gear engaging with the gear-teeth of the said prime mover, whereby the said common moving part or prime mover may be operated from a single point and communicate motion to each of the windows, for opening or closing the same.

It consists, secondly, in providing each of a series of swinging greenhouse-windows with a loosely-attached rod, each rod being also connected with a separate arm projecting from a single rock-shaft, which is operated through gear-connections by a suitable hand-wheel.

In the accompanying drawings, Figure 1 represents a transverse section of one side of a greenhouse having my invention applied thereto. Fig. 2 is an inside view of one side of the greenhouse. Fig. 3 is a view of a modification of my invention.

The letters A and A' indicate the water-sheds or upper and lower roofs of the greenhouse. The entire house is composed of iron and glass. The upper vertical wall, B, is a skeleton iron frame, composed of the iron beams or girders *b b'*, separated by vertical posts *c*. The lower girder or beam, *b*, is supported by iron pillars D, at suitable distances

apart. The lower water-shed or roof, A', is formed of slanting T-iron rafters, the upper ends of which are bent at an angle to fit flat against the under side of the girder *b*, and are bolted thereto, and between these rafters are laid the glass panes *w*. The lower ends of these rafters rest upon the upper beam or girder of the lower vertical wall, B'. The lower vertical wall is constructed in the same manner as the upper vertical wall, B. To the upper girder or beam of each of the vertical walls are hung the swinging windows E. At the lower edge of each window is loosely attached one end of a rod, *f*, the opposite end of which is pivoted to an arm, *g*, projecting from a horizontal rock-shaft, G, mounted in bearings in brackets *h*, which are bolted to the lower beam or girder of each vertical wall. This rock-shaft extends along the series of swinging windows, and is provided at any suitable point with a gear-wheel, I, with which engages a worm on a suitable operating-rod. The worm K, which engages with the gear-wheel of the upper rock-shaft, is shown as arranged upon a rod, *k*, which extends downward within reach from the floor of the house, terminating in a hand-wheel, *l*, and passing through steadying-bearings in arms *m*, projecting from a pillar, D. The worm K', which engages with the gear-wheel of the lower rock-shaft, is shown as upon a rod extending horizontally, in convenient position for being turned by its wheel *l'* by a person standing on the floor of the house. The ends of the rods carrying the worms K K' have bearings in suitable brackets *n*, formed with eyes *n'*, which embrace the rock-shafts on each side of the respective gear-wheels.

From the foregoing description it will readily be seen that when the hand-wheels *l l'* are turned in one direction the rock-shafts will be caused to turn and move the arms *g* outward, thus causing an outward thrust of the rods *f*, which opens the windows, while movement of the hand-wheels in the opposite direction causes the closing of the windows.

In the modification shown in Fig. 3 the windows W' are pivoted centrally, and the shafts *v*, to which the sash are secured, are provided with pinions *y*. A reciprocating bar, R, arranged in suitable guides or bearings, is

provided with rack-teeth r , which engage with said gear-wheels, and as the bar is moved in either direction a corresponding movement is communicated to the windows, opening or closing the same, as desired. At one end the bar R is also provided with a short series of rack-teeth, t , with which engages a pinion, p , mounted in a bracket, q , and gearing with a bevel-wheel having a downward-projecting shaft, provided with a hand-wheel, p' . By means of this handle or lever, pinion, and rack-teeth the reciprocating bar is readily operated, as will be understood.

What I claim is—

1. The combination, with a series of hinged or pivoted greenhouse-windows, of a movable shaft, bar, or part, connected with said windows, respectively, by intermediate connections, and provided with a series of gear-teeth

and a rotary operating rod or handle mounted in fixed bearings, and provided with a suitable gear engaging with the gear-teeth of said shaft, bar, or part, substantially as and for the purpose set forth.

2. The combination of the swinging greenhouse-windows, their connected rods f , the horizontal shaft provided with the arms h and gear-wheel I , and the worm K , engaging with said gear and provided with a suitable operating rod or handle.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

LOUIS BRECHT.

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.