

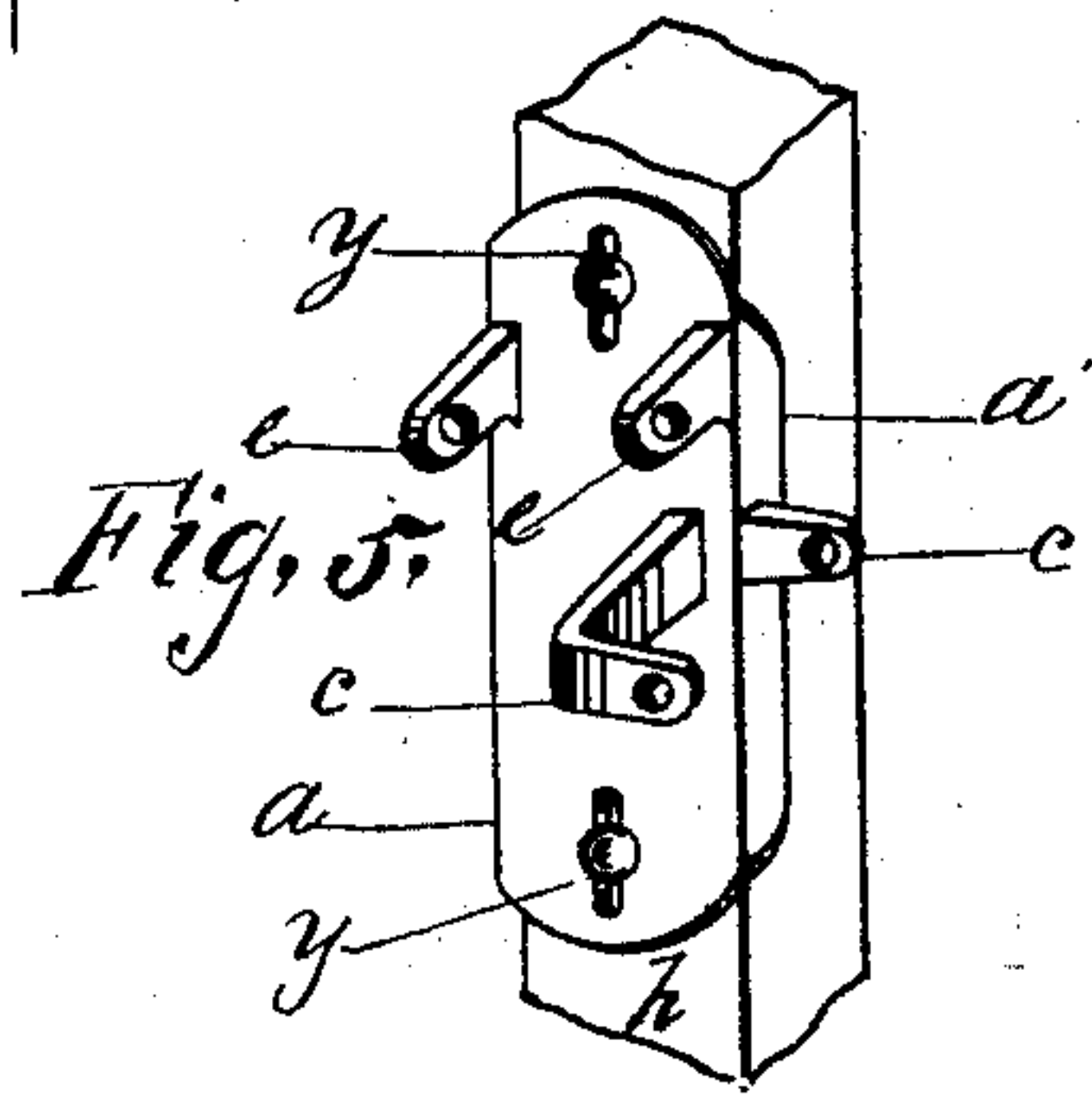
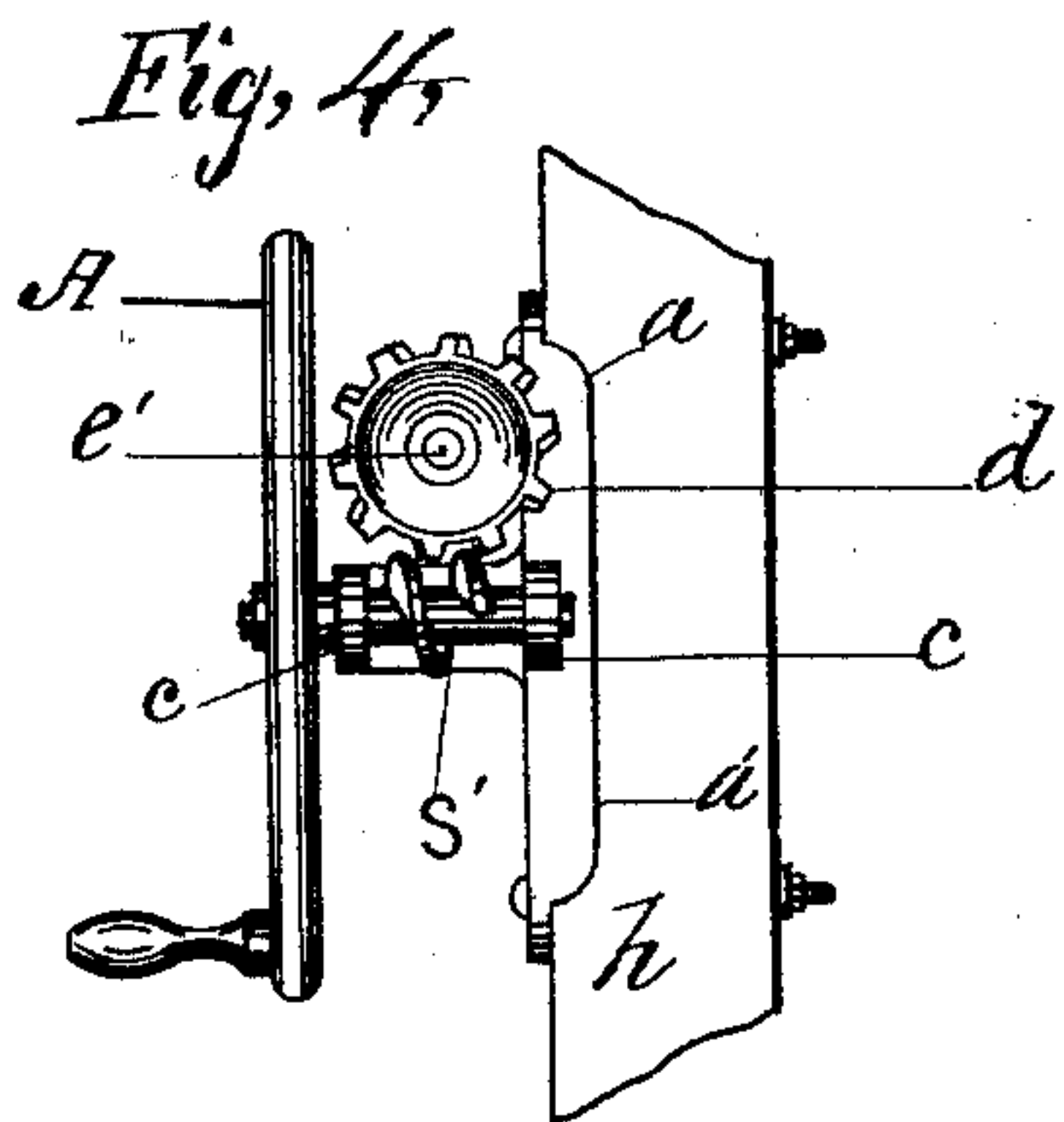
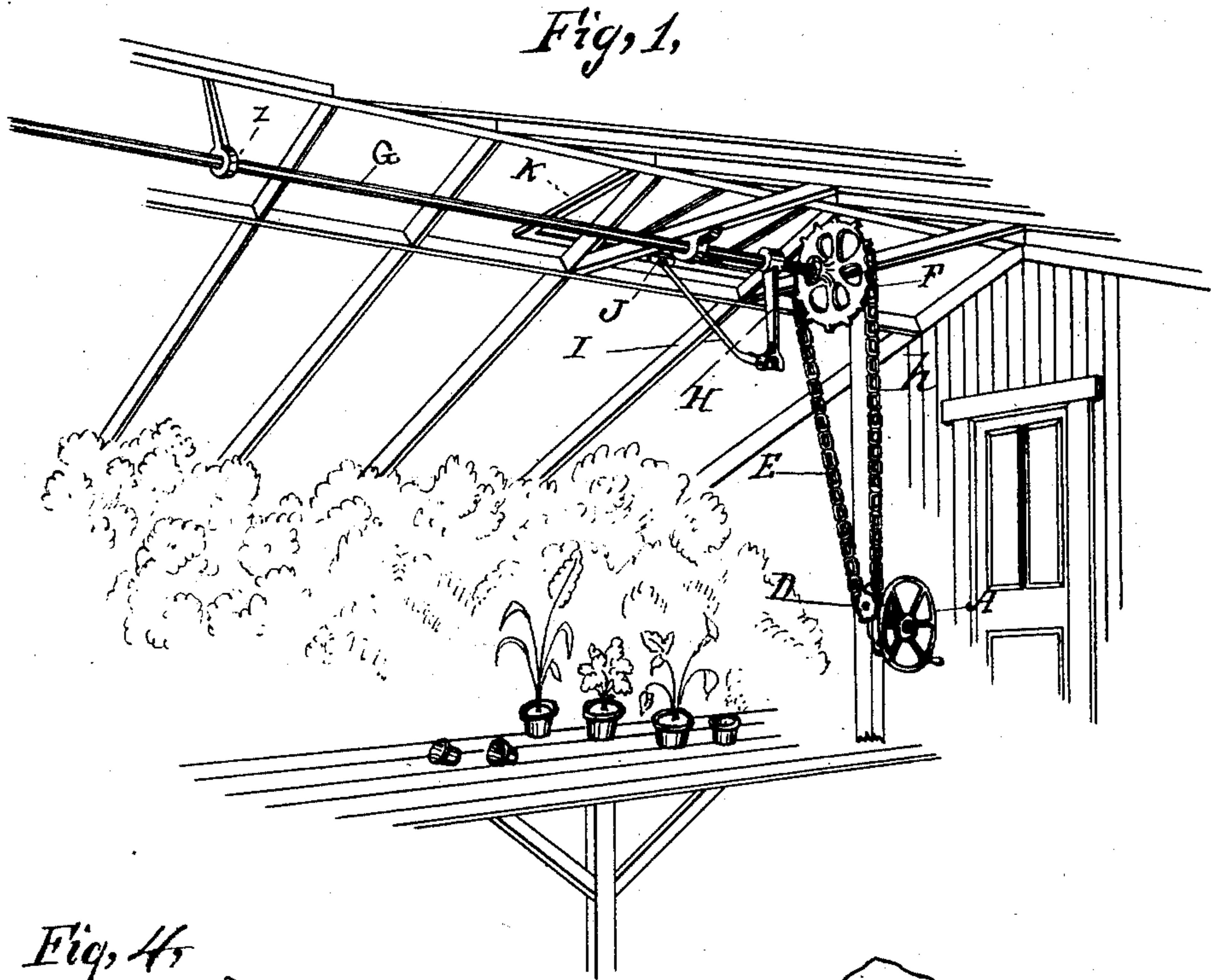
(No Model.)

J. A. EVANS & L. A. TEAGLE.

SASH OPERATOR FOR GREENHOUSES.

No. 371,132.

Patented Oct. 4, 1887.



Witnesses,
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UNITED STATES PATENT OFFICE.

JOHN A. EVANS AND LEANDER A. TEAGLE, OF RICHMOND, INDIANA.

SASH-OPERATOR FOR GREENHOUSES.

SPECIFICATION forming part of Letters Patent No. 371,132, dated October 4, 1887.

Application filed March 26, 1887. Serial No. 232,587. (No model.)

To all whom it may concern:

Be it known that we, JOHN A. EVANS and LEANDER A. TEAGLE, citizens of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Greenhouse-Ventilating Apparatus; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to that class of devices operating to open and close the windows of greenhouses simultaneously to any desired extent.

Our invention consists in the combination of mechanical devices hereinafter described, by which the sash of a greenhouse may be raised, held in position, and lowered at a single operation.

In the drawings, Figure 1 is a perspective view of the interior of a greenhouse showing our improved apparatus in position. Fig. 4 is a side elevation of an alternative combination of gearing for operating the opening and closing devices. Fig. 5 is a perspective detached view of the face-plate and journal-bearings which support the gearing in Fig. 4 and the manner of attachment to the upright post.

In Fig. 1, *h* represents an upright post, which is part of the framing of the greenhouse. The line-shaft *G* has its end bearing in suitable boxing attached to the upper portion of the upright post *h*, in which it is permitted to revolve. The line-shaft is furnished with sleeve-arms *H*, which are secured to it by set-screws in any required position. To the outer end of the sleeve-rod is jointed a brace-rod, *i*, which is hinged at the opposite end to the lower bar of the hinged sash *K*. As the hand-wheel *A* is turned, motion is transmitted to the line-shaft, which in its revolution carries the sleeve-rod *H* in the arc of a circle at its outer end, and this actuates the brace-rod *I* to raise or depress the sash on its hinges.

In Fig. 4 a base-plate, *a*, having projecting flanges *a'*, is bolted to the upright post *h*. The

bolts which secure the plate *a* to the post *h* pass through elongated holes *i i* in said plate, by which the plate is made adjustable vertically. The plate *a* has projecting lugs *c c'* and *e e*, which are provided with openings to receive journals so arranged as that said journals shall be at right angles to each other, the lugs *e e* projecting outwardly from the front face of the plate, and the lugs *c c'* projecting out from the side, the lug *c'* being curved to this effect, all as shown in Fig. 5.

In Fig. 4, *A* is a hand-wheel mounted on a horizontal shaft, *s'*, said shaft having its journal-bearings in the lugs *c c'* of the base-plate *a*. The shaft *s'* is provided with a worm-gear, *s*, which engages a cog-wheel, *d*, mounted on the end of a horizontal shaft, *e'*, which has its journal-bearings in the lugs *e e* of the plate *a*, and being at right angles with the shaft *s'*. On the opposite end of the shaft *e'* and outside of the bearing is fixed a sprocket-wheel, *D*, like that shown in Fig. 1, to operate an open-link chain, *E*, as seen in Fig. 1. This arrangement of the worm-gear *s* on the shaft of the hand-wheel *A* enables the operator to raise a long line of sash with a small amount of power exerted, and at the same time constitutes a perfect lock on the intervening gearing, so that no sudden storm or gust of wind can move the sash with which it is connected, such lock being, by the construction and combination of the parts, automatic and self-existing.

The operation of our improved combination of devices is as follows: When the hand-wheel is put in motion by the operator, the sprocket-wheel *D* is revolved, and by means of the open-link chain the larger sprocket-wheel, *F*, is put in motion, thereby turning the line-shaft *G*, which is rigidly attached to it, moving the outer end of the sleeve-arm *H*, carrying the brace-rod *I* toward the sash, and thus raising the lower bar of the sash *K* on the hinges of the sash as far as desired, when, by means of the combination shown in Fig. 4, it is held in position at any point automatically.

We are aware that a line-shaft carrying arms and connecting-rods to move the sash have been used, and these we do not broadly claim; also, that said line-shaft has been operated by means of gearing mounted on vertical shafts

and operated from the ground, and this we do not broadly claim; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

- 5 In a greenhouse-ventilating apparatus, the combination of the plate *a*, provided with the journal-bearing lugs *e e c c'*, the shaft *s'*, and worm *s*, shaft *e'*, wheels *d* and *D* on said shaft, with chain *E*, wheel *F*, and line-shaft *G*, sub-

stantially in the manner and for the purpose herein set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN A. EVANS.

LEANDER A. TEAGLE.

Witnesses:

W. T. DENNIS,

W. A. PEELLE.