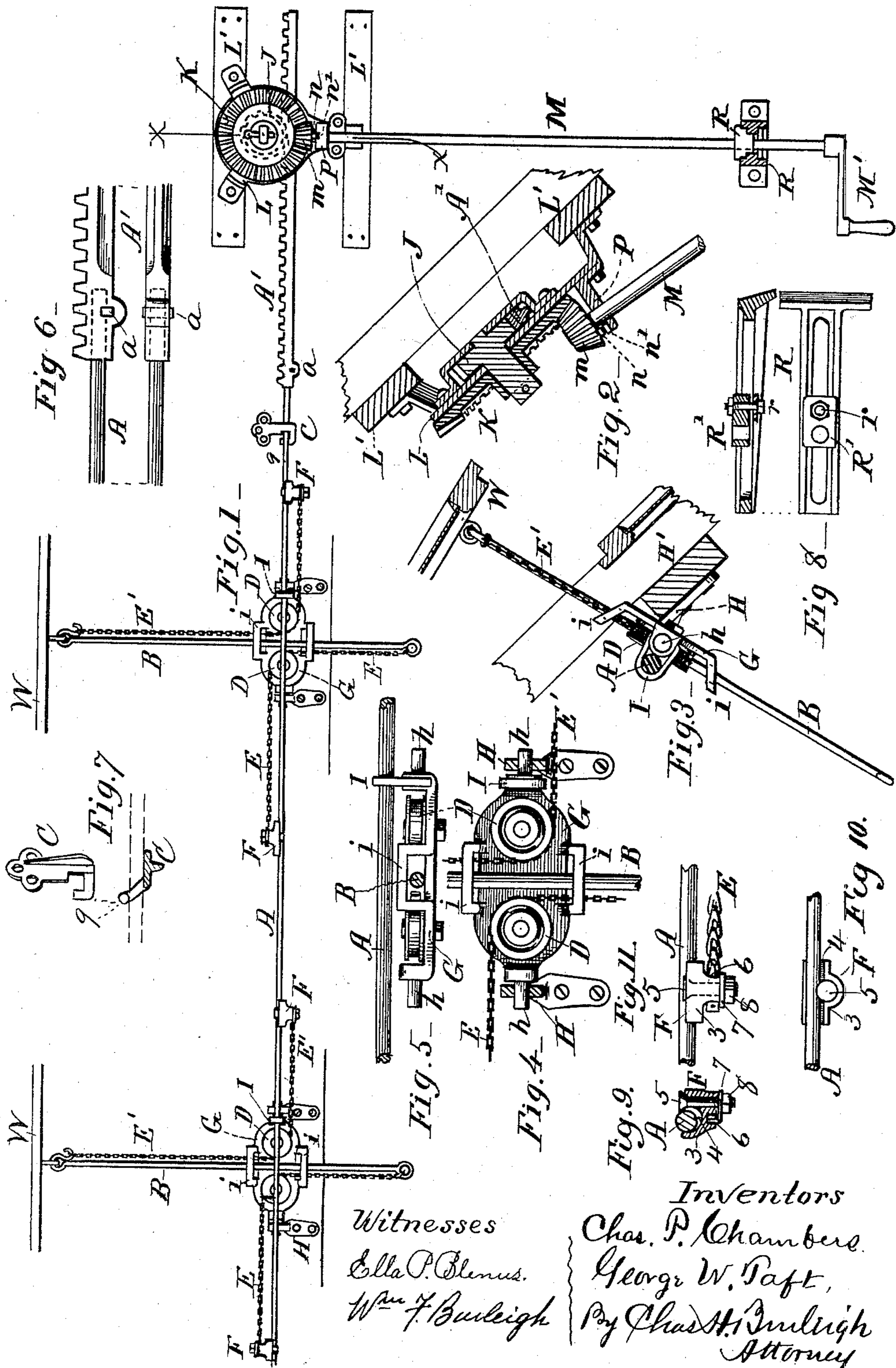


(No Model.)

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TRANSOM LIFTER.

No. 488,426.

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TRANSOM-LIFTER.

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To all whom it may concern:

Be it known that we, CHARLES P. CHAMBERS and GEORGE WARNER TAFT, both citizens of the United States, residing the former at New Garden township, the latter at Kennett Square, in the county of Chester and State of Pennsylvania, have invented a new and useful Mechanism for Simultaneously Raising or Lowering Series of Hinged or Pivoted Windows or Ventilators, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of our present invention is to provide a light, simple and efficient mechanism for opening and closing pivoted or hinged windows or ventilators, the same being adapted for simultaneously operating a series of any desired number of windows, as for instance, the series of windows or ventilators along the roof of a green-house, or the clear story windows of a factory and for similar purposes. Also to provide such apparatus with means for retaining the windows at any intermediate position, or opened or closed.

Another object is to afford facilities, in mechanism of the class described, for an oscillative action of the lifters to accommodate the relative variations of position due to the swinging of the window or ventilator as it opens or closes. These objects we obtain by the mechanisms shown in the drawings, wherein

Figure 1 is a front view of our apparatus for raising and lowering windows or ventilators. Fig. 2 is a vertical section through the operating gearing at line *x x*. Fig. 3 is a side view of one of the lifting connections and its pivotally supported sheave plate. Figs. 4 and 5 show the details of the sheave plate. Fig. 6 shows a plan and bottom view of the rack and rod connection. Fig. 7 shows a side view and horizontal section of the hook used for supporting the main rod. Fig. 8 is a section and plan view of the bracket and adjustable bearing for supporting the lower end of the crank-shaft. Figs. 9, 10 and 11 show a section, plan and side view of the chain-attaching device.

The drawings, Fig. 1, shows the mechanism

in a somewhat contracted form and with only two window connections; the size of the sheet being too small to give it its full proportion dimensions in the lengths of the rods and shafts; but it will be understood that the length or extension of the rods and shaft can be made more or less according to the requirements and dimensions of the buildings or structure wherein the apparatus is to be used in any particular instance.

Referring to parts, A denotes a main rod that extends the length of the building, past all of the windows W to be operated.

B indicates the lifting-rods, one end of which is attached by screw-eyes to the movable part of the window sash, which sash may be hung to swing on pivots or hinges in well known manner. The number of lifting rods can correspond with the number of windows to be operated in the series.

D indicates sheaves or pulleys supported adjacent to each other, at or near the line of the main rod; and E E' indicate cords, steel bands or chains respectively attached at one end to the ends of the lifter-rods, passed around the sheaves D, then extending to the right and left with their other ends attached by clips or fastening devices F to the main rod A in the manner illustrated. The two sheaves D are preferably supported on a plate G having at its ends pivots or trunnions *h*, and mounted in bearings H that are secured by screws to the frame of the building, or some stationary piece connected therewith. The plate is best provided with side loops or guides *i* through which the rod B and chains pass, in the manner illustrated; so that the swinging of the rod, or its variation by the swinging of the window, will cause the plate to oscillate on its pivots and thus keep the sheaves in proper alignment with the direction of the draft of the chain, the apparatus accommodating itself to the swing of the ventilator or window as it opens or closes.

The chain-attaching device F is preferably made as shown in Figs. 9, 10 and 11, with a body 3 having the longitudinal groove 4 for the rod A, and a transverse opening through which is arranged a bevel-headed bolt 5. A notch 6 is formed in the back part on the body to receive the end of the cord or chain E

which is retained therein by a washer 7 under the nut 8. The device is clamped to the rod A and the cord or chain confined thereto by screwing down the nut 8 which draws the bevel-head of the bolt 5 against the side of the rod binding it in its groove 4, and at the same time forcing the washer 7 down upon the cord or chain to prevent its escape from the notch 6. This device can be attached on the rod at any place, and adjusted for taking up the slack of the cord or chains E E' at any time as desired.

On one end of the sheave plate there is fixed a loop I that forms a bearing or support for the main rod. Said loop can be a spring steel staple attached by driving its fork onto the properly shaped hub at the end of the plate.

Brackets C having an offset hook 9, as in Fig. 7, are used for supporting the main rod where required. Said brackets can be attached to the rafters or framework of the building at any convenient position by screws.

To the end of the main rod a rack A' is attached, preferably as indicated in Fig. 6, by a notched end of the rod inserted into a longitudinal opening in the end of the rack, and fastened by a key α passed through the same. The rack meshes with a pinion J supported in connection with the beveled gear K by means of a plate or frame L having suitable feet for attaching it to the side of the building, or to cross-pieces L' that are nailed to the rafters.

M indicates an operating shaft that carries a beveled pinion m which meshes with the beveled gear K for imparting motion thereto. Said shaft extends downward to a convenient position and is provided with a hand crank M'. The back of the pinion m is provided with a lug n that engages with a recess n' in the bearing P for locking the parts at any position; the locking and unlocking being effected by a slight endwise movement of the shaft M.

For supporting the lower end of the shaft N we preferably employ a bracket R such as shown in Fig. 8. Said bracket is slotted and carries an adjustable bearing R' through which the shaft M passes. This bearing is provided with a bolt r by which it can be clamped at any position, thus facilitating the setting out of the shaft from the side of the roof or wall to a distance sufficient to permit the rotation of the crank when operating the apparatus. Any number of lifting rods and sheave-plates can be arranged in connection with the single main rod according to the number of windows to be opened or closed, and all the series of windows simultaneously lifted or depressed by endwise movement of said main rod A effected by the rack and gearing; the action being controlled in both directions by means of the operating shaft M, while the self-locking at any position of adjustment is effected by the inter-engaging lug n and recess n' . Hence by means of this ap-

paratus a series of ventilators or windows can be simultaneously raised or lowered; retained secure and rigidly held at any position open or closed, or at intermediate points, and at all times prevented from escaping or becoming displaced by high winds; while the entire series are all controlled by the single reciprocating rod. The apparatus is especially appropriate for use in green houses it being very light so that it does not weight down the frames; and as the main rod is not subjected to torsional strain the action is positive and not liable to fail by reason of the twisting of the rod. The mechanism is convenient, economical for manufacture, and has no parts that interfere with high or climbing plants. The connecting joints at α and for the chains and rod are of such structure that the apparatus can be fitted up in any ordinary greenhouse or building without having the parts made expressly for such house, which is a feature of importance.

In the operation of this mechanism, the attendant by taking hold of the crank M' slightly lifts the shaft M and pinion m to free the lug n ; then by turning the crank rotates the gear K and pinion so as to move the rack A' and rod A endwise toward the left, causing the cord, band or chains E to draw up the rods B and thus open the windows W. When the windows are raised to the desired degree the lug n is allowed to fall into the notch n' locking the parts in place as above stated. For closing the windows the operation is substantially the same but reversed; the movement of the gears, rack and rods being in opposite direction, as will be readily understood.

We claim as our invention herein to be secured by Letters Patent,

1. The combination, substantially as hereinbefore described, of the endwise movable main rod having the rack connected therewith, the spur pinion meshing with said rack, the operator gear connected to the pinion axis, the crank shaft provided with a pinion that meshes with said operator gear, the series of lifting-rods, the oppositely disposed cords or chains connecting said main rod and lifting rods, the chain-guiding sheaves, and the pivoted sheave-supporting plate, for the purposes set forth.

2. The sheave-supporting plate G provided with trunnions h at its ends, guiding loops i at its sides, and having the sheaves D pivoted thereon in the manner shown, in combination with the cords, bands or chains E E', and the lifting rods B disposed through said guiding loops, and the plate-supporting brackets H embracing the trunnions, as set forth.

3. The attaching clasp F having the groove 4, the chain-receiving notch 6, and the clamp bolt 5 and washer 7, in combination with the main rod A, transversely disposed lifting rod B, guiding-sheaves D and lifting-rod chain, as and for the purpose described.

4. The slotted support-bracket R having the bearing-block R' adjustably mounted thereon,

as shown, in combination with the operating crank-shaft M carrying pinion *m*, the beveled gear K, pinion J, rack A', rod A and window-operating devices, substantially as described.

5 5. The pinion *m* and its bearing P provided with an inter-engaging lug and recess, in combination with the operating shaft M, the end-wise movable rod A, its rack and pinion, the right and left connecting chains, the sheaves
10 D and the window-operating rods controlled thereby, for the purpose set forth.

6. The rack A' having the longitudinally hollowed end and transverse key-seat, the rod

A having the transverse notch matching into the same, and the key *a*, in combination with 15 the window-lifting rods and chains, and the rack-operating gearing, as and for the purpose set forth.

Witness our hands this 23d day of July, A. D. 1892.

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Witnesses:

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