(No Model.) 4 Sheets—Sheet 1.

H. L. MORRELL.

CAR VENTILATING DEVICE.

No. 428,624. Patented May 27, 1890.

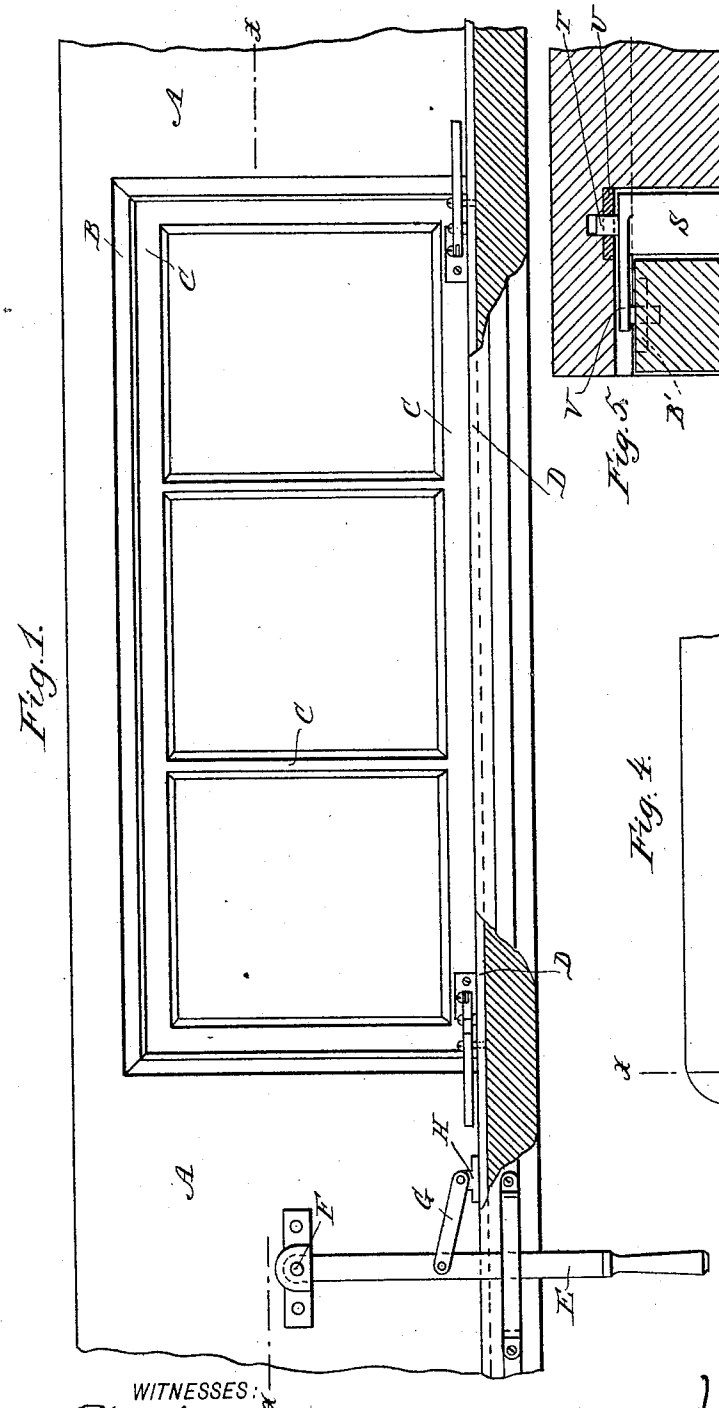


Fig. 1.

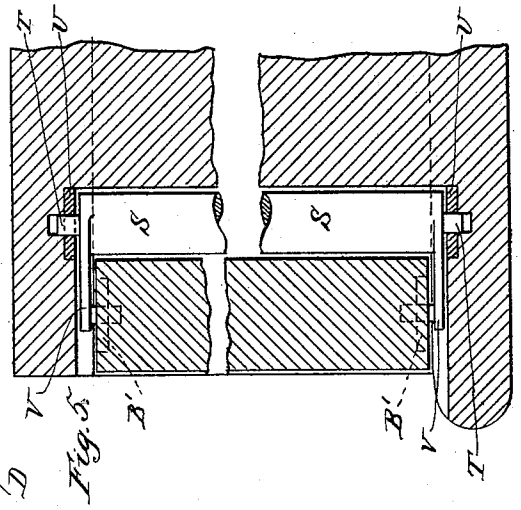


Fig. 3.

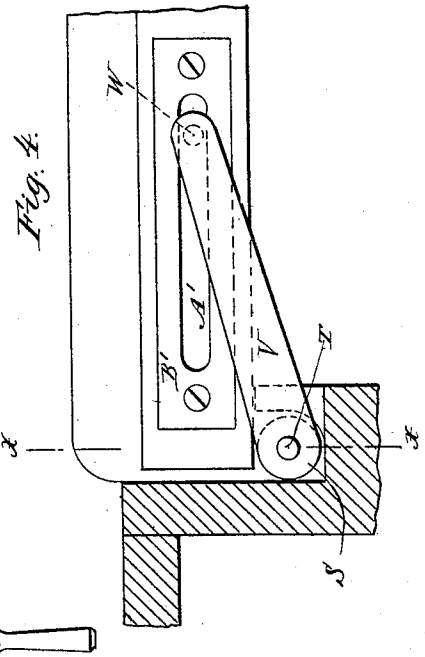


Fig. 4.

WITNESSES:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 2.

H. L. MORRELL.

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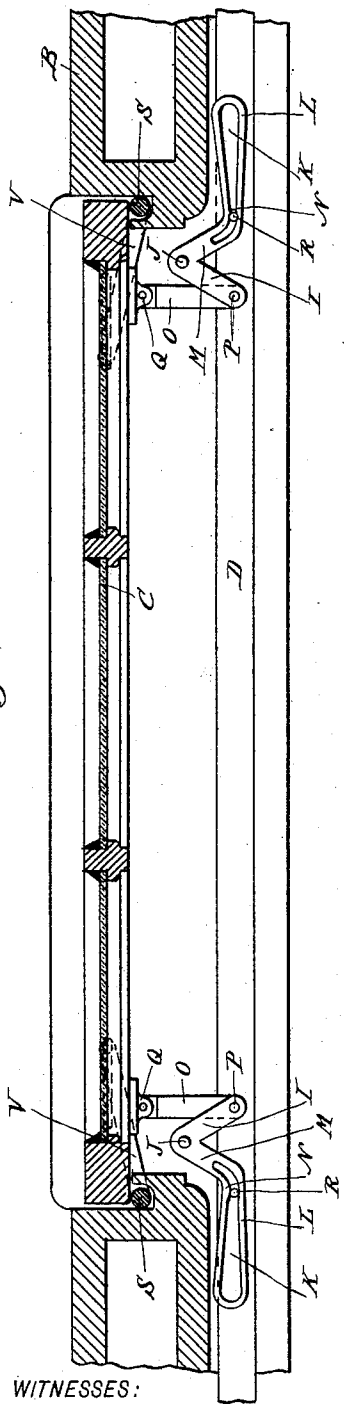


Fig. 2.

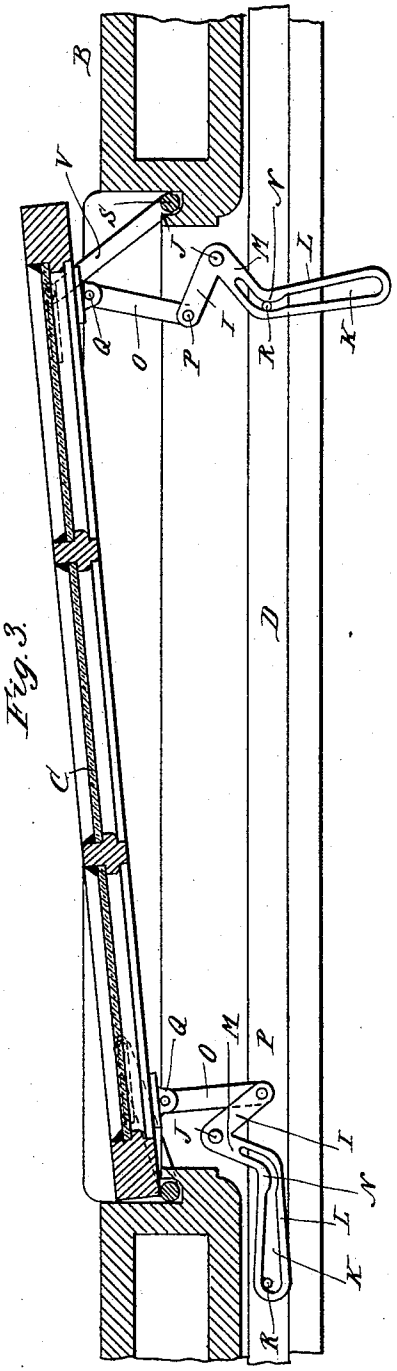


Fig. 3.

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(No Model.)

4 Sheets—Sheet 3.

H. L. MORRELL.

CAR VENTILATING DEVICE.

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Fig. 6.

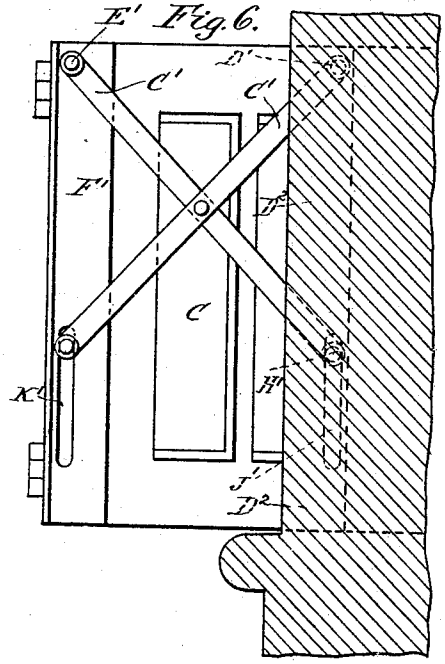


Fig. 7.

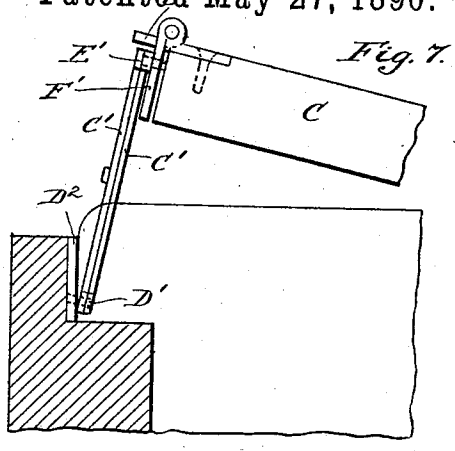


Fig. 9.

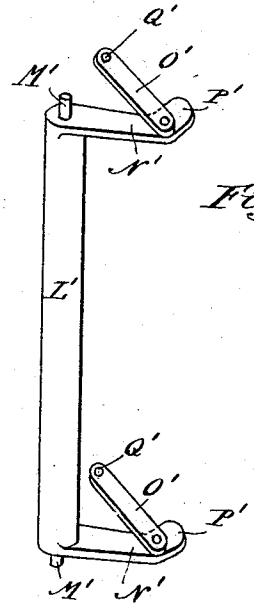


Fig. 10.

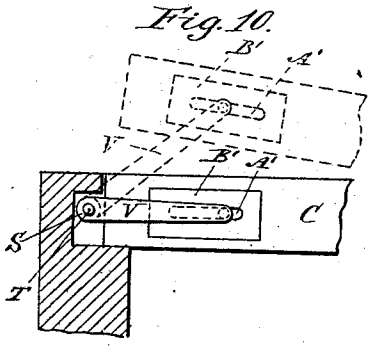
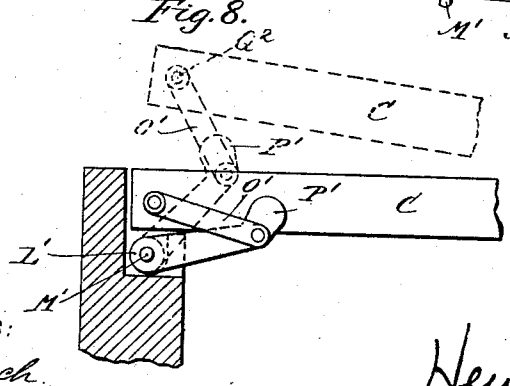


Fig. 8.



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(No Model.)

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H. L. MORRELL.

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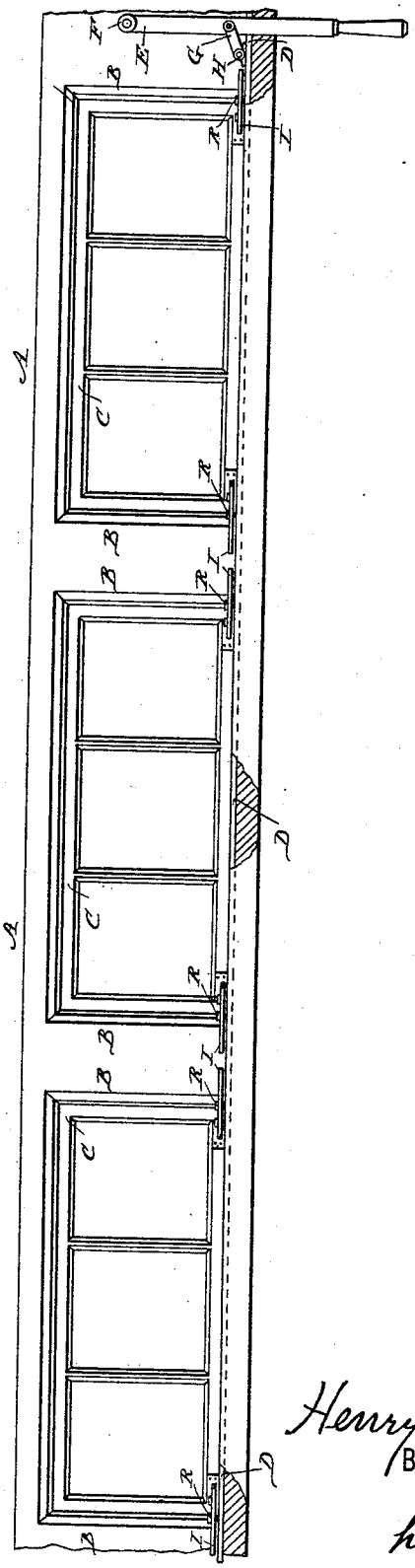


Fig. 11.

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UNITED STATES PATENT OFFICE.

HENRY L. MORRELL, OF BROOKLYN, ASSIGNOR TO THE INTERNATIONAL MANUFACTURING ASSOCIATION, OF NEW YORK, N. Y.

CAR-VENTILATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 428,624, dated May 27, 1890.

Application filed February 6, 1890. Serial No. 339,426. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. MORRELL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Car-Ventilating Devices, of which the following is a specification.

My invention relates to an improvement in car-ventilating devices; and it consists, generally speaking, in so constructing the apparatus that either end of the clear-story windows or sashes may be swung outwardly from the car, the other end in the meantime being held in against the sash-casing, thus irrespective of the direction in which the car may be moving I am enabled to open all of the sashes at their rear ends. I thus secure twice the amount of ventilation which has been attainable by any other form of car-ventilating apparatus heretofore practiced, so far as I am aware, because in prior systems the windows have been arranged in alternating series, one half of the windows opening rearwardly to the right and the other half to the left.

I am aware that there have been attempts heretofore made to accomplish the results which I accomplish; but I believe all such prior mechanisms have been found impracticable, or at least undesirable, in use.

The construction, arrangement, and conjoint action of the parts constituting my improved apparatus I will now describe, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, partly broken away, of a part of the clear story of a car, showing one sash and its co-operating parts, the sash being closed at both ends. Fig. 2 illustrates a horizontal section of the apparatus shown in Fig. 1 on the line *x x*. Fig. 3 shows a horizontal section of the same, the sash being, however, open at one end. Fig. 4 shows a detail view of the sash-supporting mechanism, the upper part of the sash-casing having been broken away. Fig. 5 is a vertical section of the parts shown in Fig. 4 on the line *x x* of that figure. Fig. 6 is an elevation of an alternative form of sash-supporting mechanism. Fig. 7 is a top view of the parts shown in Fig. 6. Fig. 8 is a top view of still another form of sash-supporting mechanism, showing the parts in two positions. Fig. 9 is a perspective of the sash-supporting rod and levers as shown in Fig. 8. Fig. 10 illustrates a modified construction of the sash-supporting devices illustrated in Figs. 4 and 5. Fig. 11 illustrates an elevation of a series of sashes embodying my invention.

A is the clear story of the car.

B is the sash-casing, both of which may be made as usual.

C is the sash.

D is a rod, which extends along the lower edge of the sashes, and is preferably inclosed within a molding, as shown.

E is a lever pivoted at F to the wall of the clear story, and is connected by a link G to a bracket H, fastened to the rod D.

I I are bell-crank levers pivoted at J J to the lower part of the sash-casing, or to such other part of the frame of the clear story as may be desired. One end of the bell-crank levers has slots K K. These slots are partly in an extended part L L of the bell-crank levers and partly in an angling part M of the lever, it being curved, following the outline of the lever, as shown. Near the bend of the slot there is an enlargement or inwardly-projecting part N.

O O are links pivoted to the free ends of the bell-crank levers at P P and to the lugs Q Q on the sash near each end.

R R are pins rigidly fastened in the rod D, which play through slots in the molding, if the rod be inclosed in the molding, and which project upwardly through the slot K in the bell-crank levers.

S S (see particularly Figs. 4 and 5) are upright posts pivoted at T T, by means of pins projecting from their ends into plates U U, fastened in the sash-casing.

V V are arms projecting horizontally from the posts S S, above and below, having pins W W on their ends, which enter and move through slots A′ A′, made in plates B′ B′, fastened on or in the upper and under edges

of the sash. The function of this post, having the arms V, &c., is to additionally support the sash when in a projected position.

I will now describe the operation of the apparatus as thus far set forth. It will of course be understood that the rod D extends down the entire side of the car, and that at each one of the sashes in the clear story of the car there are the several parts above described, each coacting with the other parts in the manner hereinafter described. Thus when the rod D is actuated by the lever E through the link G there are the same movements secured at each of the sashes, they all occurring simultaneously. Of course on the opposite side of each car there are duplicate devices.

In Figs. 1 and 2 the parts are shown in position which they severally occupy when the sashes are closed at both ends. It will be noted that the pins R R rest in the slots K K of the bell-cranks opposite the swell N in the side of the slots K K. The inward projections N N are provided in order that there may be a little crowding upon the bell-crank when the sash is drawn in at both ends, so that it (the sash) may be held firmly against its casing, and thus exclude dust and prevent rattling. When it is desired to open the windows, the lever E is moved to the right or to the left, as the case may be.

In Fig. 3 I show the effect of moving the lever to the left. It will be noticed that the pin R in the right-hand bell-crank is at substantially the same point in the slot that it occupied when the sash was drawn in, but that the pin at the left is at the end of the slot K. This is accomplished as follows: The pin R in the right-hand bell-crank moves through the short curved end of the slot K, impinging against the outside of the curve, thus forcing the lever over toward its position, as shown in Fig. 3. The pin reaches nearly or quite to the end of the slot and then returns along the same line until it reaches the position shown in Fig. 3, by which time the bell-crank has been carried into the position shown in that figure, thus forcing the right-hand end of the sash outwardly, as shown. In the meantime the pin R in the bell-crank has moved along the straight path of the slot until it reaches nearly or quite to the end thereof, as shown at the left-hand bell-crank in Fig. 3. Thus this bell-crank has not been oscillated at all on its pivot J—at all events but slightly so. It will be noticed that there is a slight outward movement of the lug Q at the left-hand end of the sash, as shown in Fig. 3, because of the change of angle of the sash. To accomplish this I cut the slot in the straight part L of the bell-crank a little spreading, as shown, so that it is wider at its rear end than near the bend, or, that which would be substantially the same thing, the slot may be cut in the part L of the bell-crank on an angle to allow for this slight outward movement at the closed end. I prefer to make the adjustment of the parts such that the pin will take a bearing upon the side of the straight part of the slot, so that that end of the sash which is confined against the casing shall be held there snugly to avoid rattling. During the outward movement of the sash the arms V V of the posts S S are swung outwardly by reason of the engagement of the pins W W in the slots A′ A′ of the plates B′ B′, which are attached to the sashes, and these arms V V firmly support the extended end of the sash supplemental to the support given by the bell-cranks and the links O O. These supplemental supporting devices will not always be necessary, depending upon the stiffness of the other parts, the weight of the sash, and the firmness of the hold by the bell-crank at the confined end of the sash. When it is desired to reverse the position of the sashes consequent upon the car moving in the other direction, the levers E E are first moved back again to a vertical position, which of course brings all the sashes back again into contact with their casing at both ends, and then by further pressure upon the lever E carrying it over to the right. All the movements just described are repeated, with the exception that they occur at reverse ends of the sashes.

In Figs. 6 and 7 are shown an alternative form of the supplemental sash-supporting devices. C′ C′ are two bars pivoted, respectively, at D′ to a plate D^2, fastened to the sash-casing, and E′ to a plate F′, hinged to a plate G′, which is in turn attached to the sash C. The lower ends of these bars respectively are provided with pins H′ and I′, which move in slots J′ and K′ made, respectively, in the plate D^2 and in the plate F′. The operation of this form of sash-supporter is obvious. As the sash moves outwardly, the pins H′ I′ slide upward through the slots J′ and K′, as the bars swing across each other until the end of the sash reaches its most projected position, in which position they support the sash, and when the end of the sash is brought back again they fold over upon one another, after the manner of the blades of shears, the pins H′ and I′ moving downwardly through the slots J′ and K′ until, when the end of the sash is brought entirely home within the casing, they are folded upon one another practically side by side.

In Figs. 8 and 9 I show still another modification of the sash-supporting devices. L′ is a post having the pivot-pins M′ M′, substantially the same as the post S, with its pins T. (Shown in Figs. 4 and 5.) The arms N′ N′, however, of this form of post, which correspond to the arms V V of said post of Figs. 4 and 5, have links O′ O′ pivoted thereto somewhat in the rear of ears or plates P′ P′, formed on the ends of the arms N′. The other ends of these links O′ O′ are pivoted at Q′ Q′ to the sash C. The operation of this form of sash-supporter will be readily understood by inspection of Fig. 8, in which the sash is

shown both in its projected and retracted position. The advantage of this form of sash-supporter is that it is capable of considerable extension, owing to the fact that the link O′ is pivoted to the arm N′, thus admitting of folding of the parts together, saving space; also, the links O′ O′ being pivoted at the rear of the ears P′ P′, the ears support the links, greatly stiffening the supporting devices.

In Fig. 10 I show a construction the same as shown in Figs. 4 and 5, to which I give the same lettering, except that the posts S S are set opposite the end of the sash when closed, thus making the construction of the parts a little more snug and allowing somewhat greater projection of the sash for the same length of arm or lever V.

It will be obvious to those familiar with this art that many modifications may be made in the details of construction of my apparatus and still the gist of my invention be employed. I therefore do not limit myself to the details shown and described.

I claim—

1. In ventilating apparatus, the combination of a sash having at each end a sash-actuating device adapted both to project and to hold inwardly the ends of the sash to which they are respectively attached, and a movable rod engaged with each of said devices, which being moved in one direction opens one end and closes the other of the sash, and vice versa, substantially as set forth.

2. In ventilating apparatus, the combination of a sash having at each end a sash-actuating device adapted both to project and hold inwardly the ends of the sash to which they are respectively attached, a movable rod engaged with each of said devices, which being moved in one direction opens one end and closes the other of the sash, and vice versa, and supplemental sash-supporting mechanism adapted to move outwardly with the projected end of the sash and to support the same, substantially as set forth.

3. In ventilating apparatus, the combination of a sash having at each end a sash-actuating device adapted both to project and to hold inwardly the ends of the sash to which they are respectively attached, and a movable rod engaged with each of said devices, the construction and operation of the parts being such that when the rod is at or near its medial position both ends of the sash will be held inwardly by the sash-actuating devices, and when at or near its extreme movement in one direction one end of the sash will be projected and the other end confined, and vice versa, substantially as set forth.

4. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of each sash and connected therewith, respectively, at one end by a movable connection, and a movable rod engaged with the other end of each bell-crank, so that when the rod is moved in one direction one bell-crank will be actuated for the projection of that end of the sash and the other remain stationary, and vice versa, substantially as set forth.

5. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of the sash and connected therewith, respectively, by a movable connection, and a movable rod engaged with the other end of each bell-crank, so that when the rod is moved in one direction one bell-crank will be actuated for the projection of that end of the sash and the other remain stationary, and vice versa, and supplemental sash-supporting devices, substantially as set forth.

6. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of each sash and connected therewith, respectively, by a movable connection, and a movable rod so engaged with the other end of each bell-crank that when the rod is in its medial position the sash is held firmly closed at both ends, and when moved to either extreme the sash is held closed at one end and open at the other, substantially as set forth,

7. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of each sash and connected therewith, respectively, by a movable connection, and a movable rod so engaged with the other end of each bell-crank that when the rod is in its medial position the sash is held firmly closed at both ends, and when moved to either extreme the sash is held closed at one end and open at the other, and supplemental sash-supporting devices, substantially as set forth.

8. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of each sash and connected therewith, respectively, by movable connections, one end of each bell-crank being slotted, and a longitudinally-moving rod provided with pins which move in the slots of the bell-cranks, the whole being constructed and arranged substantially as set forth.

9. In ventilating apparatus, the combination of two bell-cranks pivoted, respectively, near the ends of the sash, one end of each bell-crank having a curved slot, a longitudinally-moving rod inclosed in the sash casing or frame and having upwardly-projecting pins which engage with the slots in the bell-cranks, and supplemental sash-supporting devices attached to the ends of the sash and to the sash frame or casing, substantially as set forth.

10. In ventilating apparatus, the combination of a series of sashes, each having at each end a sash-actuating device adapted both to project and to hold inwardly the ends of the sash to which they are respectively attached, and a movable rod adjacent to the entire series of sashes and engaged with each of said sash-actuating devices, which being moved in one direction opens one end and closes the

other of each sash, and vice versa, substantially as set forth.

11. In ventilating apparatus, the combination of a series of sashes, each having at each end a sash-actuating device adapted both to project and to hold inwardly the ends of the sash to which they are respectively attached, and a movable rod adjacent to the entire series of sashes and engaged with each of said sash-actuating devices, which being moved in one direction opens one end and closes the other of each sash, and vice versa, and supplemental sash-supporting devices attached to the ends of each sash in the series, substantially as set forth.

12. In ventilating apparatus, the combination of a series of sashes, each having at each end a sash-actuating device adapted both to project and hold inwardly the ends of the sash to which they are respectively attached, and a movable rod engaged with each of said sash-actuating devices, the construction and arrangement of the apparatus being such that when the rod is in its medial position the sashes will be held within the sash-frame at both ends, and when the rod is at or near the extremities of its movement one end of the sash will be projected and the other held inwardly, and vice versa, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 5th day of February, A. D. 1890.

HENRY L. MORRELL.

Witnesses:
PHILLIPS ABBOTT,
FREDERICK SMITH.