(No Model.) 2 Sheets—Sheet 1.

H. L. MORRELL.

VENTILATOR.

No. 435,544. Patented Sept. 2, 1890.

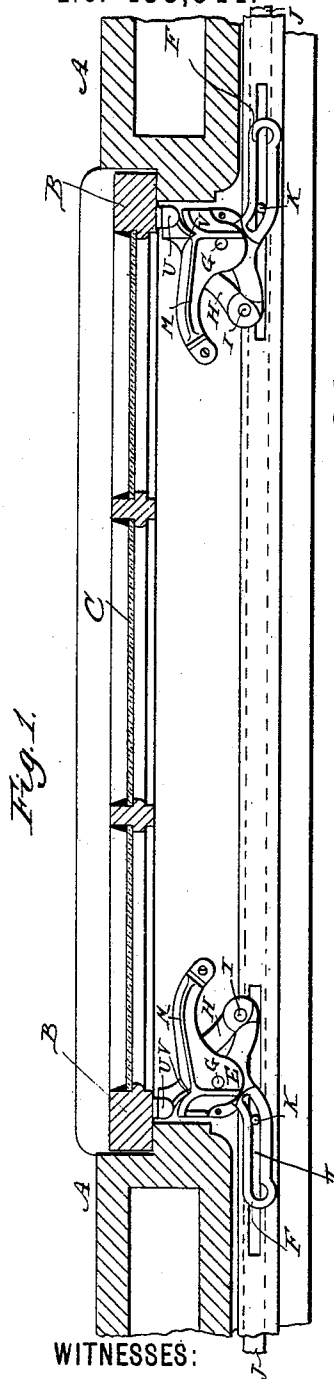


Fig. 1.

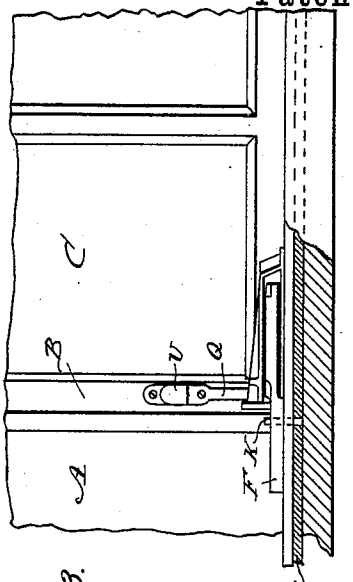


Fig. 3.

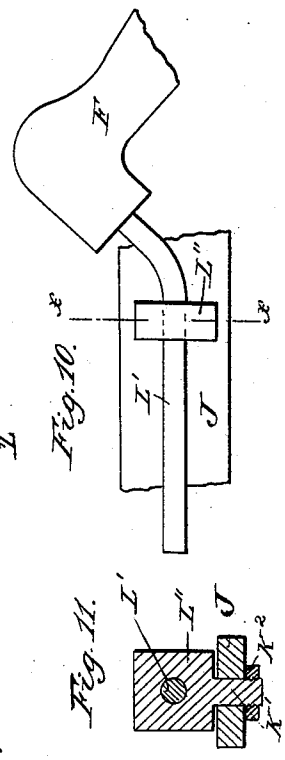


Fig. 10.

Fig. 11.

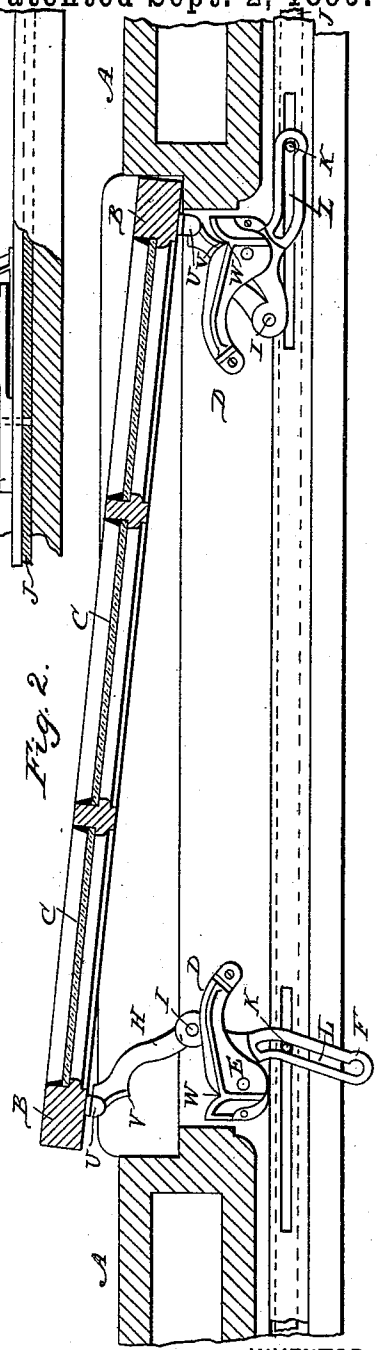


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

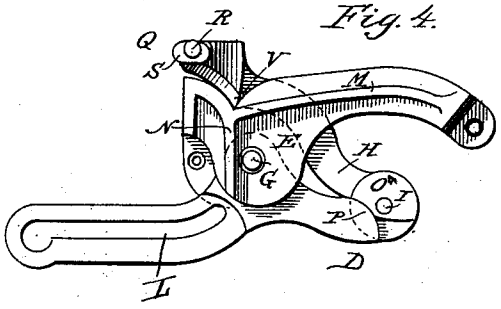


Fig. 6.

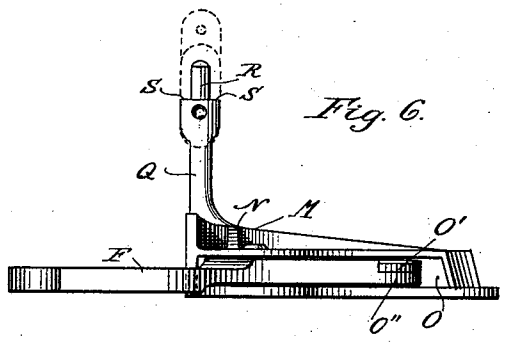


Fig. 5.

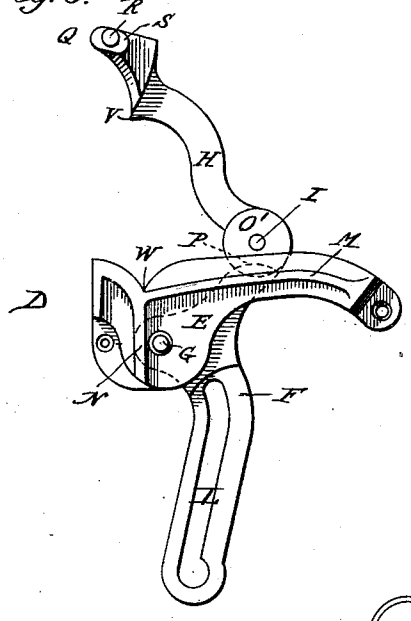


Fig. 7.

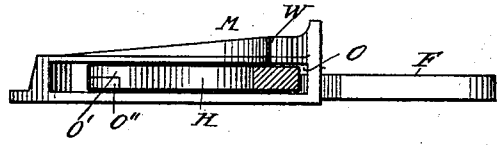


Fig. 9.

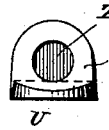
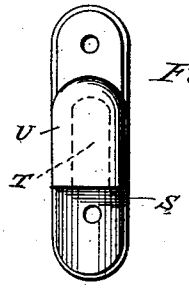


Fig. 8.



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UNITED STATES PATENT OFFICE.

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

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 435,544, dated September 2, 1890.

Application filed April 22, 1890. Serial No. 349,039. (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 Ventilator Apparatus, of which the following is a specification.

My invention relates to ventilating apparatus especially adapted to use in connection with railway passenger-cars, but capable of use also in a great variety of other structures and places; and it consists in an improvement upon the ventilating apparatus for which I obtained Letters Patent of the United States on the 27th day of May, 1890, numbered 428,624.

In the drawings hereof the same reference-letters refer to the same parts in all the figures.

Figure 1 illustrates a horizontal section of a window-sash in the clear-story of the car, taken through about the medial vertical line of the glass, showing the position of the parts when the sash is closed. Fig. 2 illustrates a like view of the parts as shown in Fig. 1, the sash being open at the left. Fig. 3 illustrates an elevation of the left-hand end of a sash closed. Fig. 4 illustrates a plan of the sash-operating device which forms the subject of this application detached, the parts being in their closed position. Fig. 5 illustrates a view similar to that shown in Fig. 4, the parts being in their open or projected position. Fig. 6 illustrates an elevation of the parts shown in Figs. 4 and 5 as viewed from the front. Fig. 7 illustrates an elevation, partly in section, of the parts shown in Fig. 6 as viewed from the rear. Fig. 8 illustrates an elevation of the swivel-socket, which is fastened to the sash. Fig. 9 illustrates an end view from below of the swivel-socket. Fig. 10 illustrates a plan of an alternative construction of the sash-actuating bell-crank partly broken away. Fig. 11 is a sectional view on the line X X of Fig. 10.

In my said former invention it was desirable to employ certain hinges at each end of the sash to aid in holding the ends thereof in their correct position whether they were projected or retracted. By this present invention I avoid the necessity or desirability of any such parts, and thus simplify the structure and reduce its cost by saving from seven to ten pieces.

I wish it to be understood that although I illustrate and shall describe my invention as applied to a railway-car I do so for convenience only and without limitations to such use of it only, because, as above stated, it is applicable to many other structures in which a swinging sash can be used.

A is the frame of the car. B is one of the sashes. C is the glass therein.

D is the sash-actuating combination of levers, &c., one being placed at each end of each sash. It comprises especially a base-plate E, which is fastened to the sill of the sash-opening, a slotted bell-crank lever F, which is pivoted at G to the base-plate E, and a lever-arm H, which is pivoted to the short end of the bell-crank lever F at I. These parts are in their general construction and features substantially the same as the like parts described in my said former application, and it is in certain novel features thereof that this present invention consists.

A longitudinally-running rod J, which may be incased within a molding running along in front of the sash-sills, as shown, although it may be exposed, if preferred, has rigidly attached to it upwardly-extending pins K, which pass through slots L made in the long arm of the bell-cranks, so that when the usual lever, (not shown,) to which one end of the rod J is attached, is operated by the train-hand, the rod will move lengthwise in one direction or the other, and all the bell-cranks being operated upon by the pins K will move the sash either inwardly or outwardly in a manner fully explained in my said former application.

The base-plate E, instead of being a simple flat plate, as shown in said former case, has raised ribs M N upon it, through which a slot O is cut, in which moves the bell-crank lever, and it is prevented by the sides of the slot from moving in any way excepting in a horizontal plane. Thus sagging of the sash is avoided; also, the joint between the bell-crank lever F and the lever-arm H is made as a "rule-joint"—*i. e.*, there is a circular or disk-

shaped part O′ on the arm H, which rests upon a similar disk-like part O″ on the bell-crank, and there is also a lip P made on the bell-crank F, which overlaps the edge of the disk O′ on the arm H. The pivot I passes through these two disks. If preferred, the lip P may extend outwardly, being practically a duplication of the disk O″. I prefer the form shown, however, because it saves metal and reduces the weight of the parts. The lever-arm H has at its free end an upwardly-extending right-angular piece Q, which has a spindle R at its upper end and a shoulder S at the base of the spindle. This spindle is received within a hole T made in a socket U, which is screwed or otherwise fastened to the sash.

Near the end of the lever-arm H there is a laterally-projecting chisel-edge part V, which, when the sash is drawn inwardly, is received within a correspondingly-formed recess W, made in the outer vertical wall of the base-plate, and these parts interlocking with each other prevent endwise movement of the sash consequent on the projection of its other end. The shoulder S at the base of the spindle R, engaging with the shoulder S′ on the under side of the socket, affords a substantial support for the sash.

The operation has already been practically set forth in the above description in connection with my said prior patent. When the rod is moved in one direction, the pins K all move through their respective slots made in the several bell-cranks and the right or left hand end of each of the sashes is projected, while the other end is held in firmly to the sash-casing, and all endwise movement of the sash which would prevent the snug fit of the sash at its confined or closed end is prevented by the engagement of the sides of the part V of the lever-arm H with the sides of the recess W on the base-plate; also, the vertically-standing part Q enables the sockets U to be placed at about the center, vertically, of the sash at each end, whereby it receives the best support and is moved inwardly and outwardly by evenly-disposed force and holds both edges of the sash with equal firmness; also, the socket and the spindle afford all the pivoting or rocking movement requisite to enable the sash to attain the necessary angling position relative to the side of the car; and the engagement of the sides of the slot O in the base-plate with the upper and lower sides of the bell-crank and the interlocked construction of the rule-joint between the bell-crank and the lever-arm and the engagement of the shoulder on the socket with the shoulder at the base of the spindle R give to the sash firm support against vertical movement.

In Figs. 10 and 11 I show an alternative construction of the bell-crank. Instead of having a slot made in it in which the pin K moves, the long end of the bell-crank is made in the form of a round rod L′, which passes through a swiveling-eye L″, attached to the rod (which in this construction is preferably made flat, as shown) by means of a spindle K′, which passes through the rod and is movably fastened on its under side by a washer or nut K^2. The operation of this alternative construction is obvious. When the rod J is moved, the eyes L″ slide along the rod L′, acting upon it in the same way that the pins K act upon the sides of the slots in the bell-cranks, and when the eyes reach the curved part of the rods L′ they swivel slightly in going around the curve.

I do not limit myself to the details of construction shown and described, as many alterations may be made therein and still the essentials of my invention be present—as, for example, many different forms of interlocking or engaging parts may be substituted for the parts V and W; also, other methods of sustaining the bell-crank by its engagement with upper and lower surfaces on the base-plate may be devised aside from the slot made in the rib on the base-plate, and so, also, in other details of construction.

I claim—

1. In a sash-opening apparatus, the combination of a base-plate fastened to the sash-frame, a bell-crank supported on its upper and lower sides by the base-plate and pivoted thereon, and a lever-arm connected to one end of the bell-crank and connected with the sash, the other end of the bell-crank engaging with means for operating the device, substantially as set forth.

2. In a sash-opening apparatus, the combination of a bell-crank pivoted to a base-plate which is attached to the frame of the sash and a lever-arm attached to the bell-crank by a rule-joint, and having a vertically-arranged spindle on its free end which engages with a socket on the sash, substantially as set forth.

3. In a sash-opening apparatus, the combination of a bell-crank pivoted to a base-plate and supported on its upper and lower sides by the same, said base-plate being attached to the frame of the sash, and a lever-arm pivoted to one end of the bell-crank, and which has a vertically-arranged spindle on its free end which engages with a socket on the sash, substantially as set forth.

4. In a sash-opening apparatus, the combination of a bell-crank pivoted to a base-plate, which is attached to the frame of the sash, and a lever-arm pivoted to the bell-crank at one end and connected with the sash at the other end, and engaging surfaces on the lever-arm and on the base-plate, which prevent longitudinal movement of the sash when the device is closed, substantially as set forth.

5. In a sash-opening apparatus, the combination of a bell-crank pivoted to a base-plate and supported on its upper and under surfaces by it, and a lever-arm pivoted to the bell-crank and engaging surfaces on the lever-arm and on the base-plate, which prevent longitudinal movement of the sash when the device is closed, substantially as set forth.

6. In a sash-opening apparatus, the combi-

nation of a bell-crank pivoted to a base-plate, and a lever-arm pivoted to the bell-crank and having a vertically-disposed spindle on its free end, and engaging surfaces on the lever-arm and on the base-plate, which prevent longitudinal movement of the sash when the device is closed, substantially as set forth.

7. In a sash-opening apparatus, the combination of a bell-crank pivoted to a base-plate, and a lever-arm pivoted to the bell-crank and extended upwardly at its free end to engage with a bearing at about the medial vertical line of the sash, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 19th day of April, A. D. 1890.

HENRY L. MORRELL.

Witnesses:
HENRY K. GILMAN,
FREDERICK SMITH.