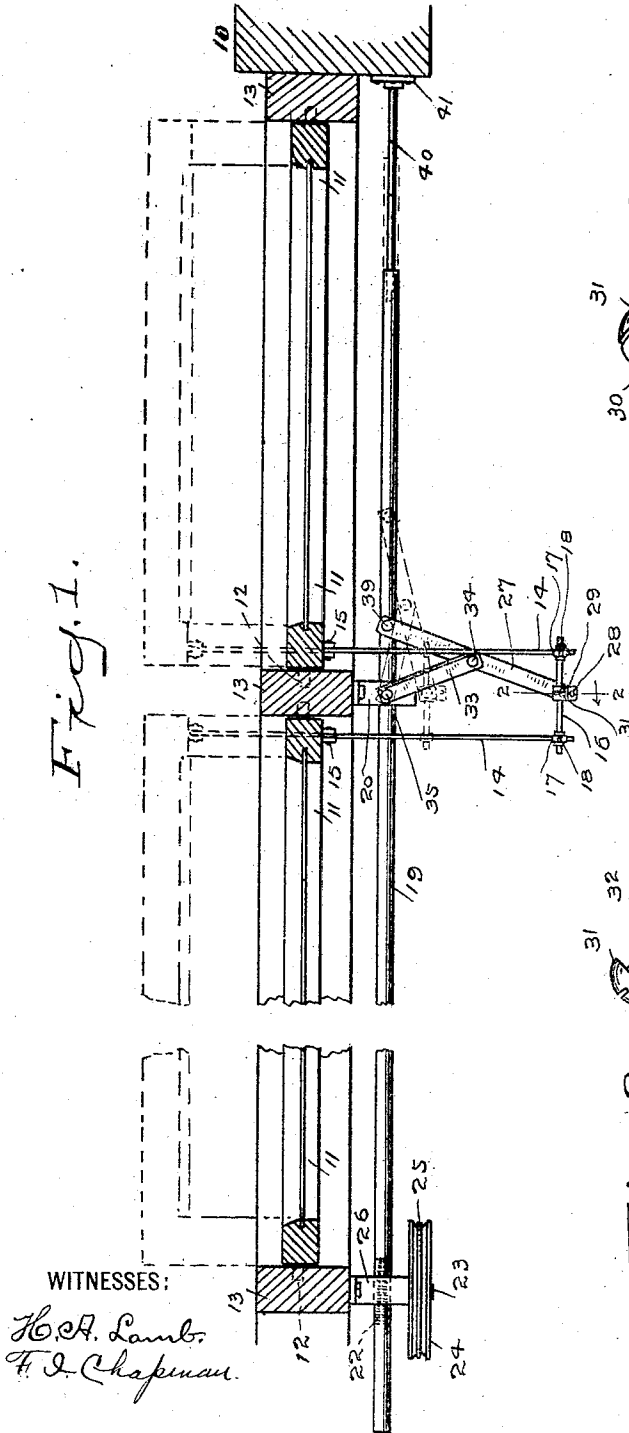


S. E. CIBULAS.
SASH OPERATING MECHANISM.
APPLICATION FILED OCT. 14, 1909.

941,343.

Patented Nov. 23, 1909.
2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:
H. A. Lamb.
F. J. Chapman.

Fig. 3.

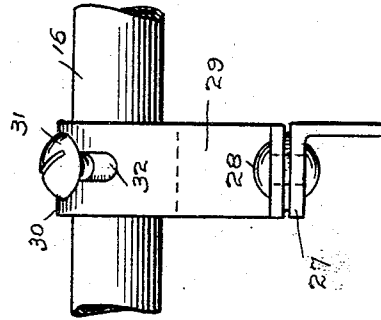
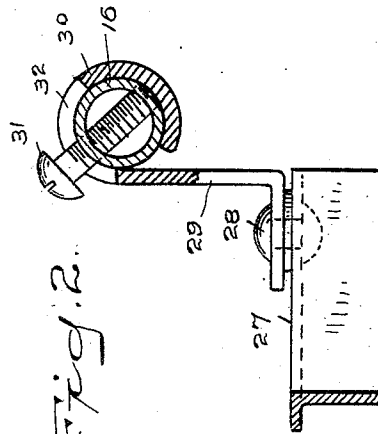


Fig. 2.

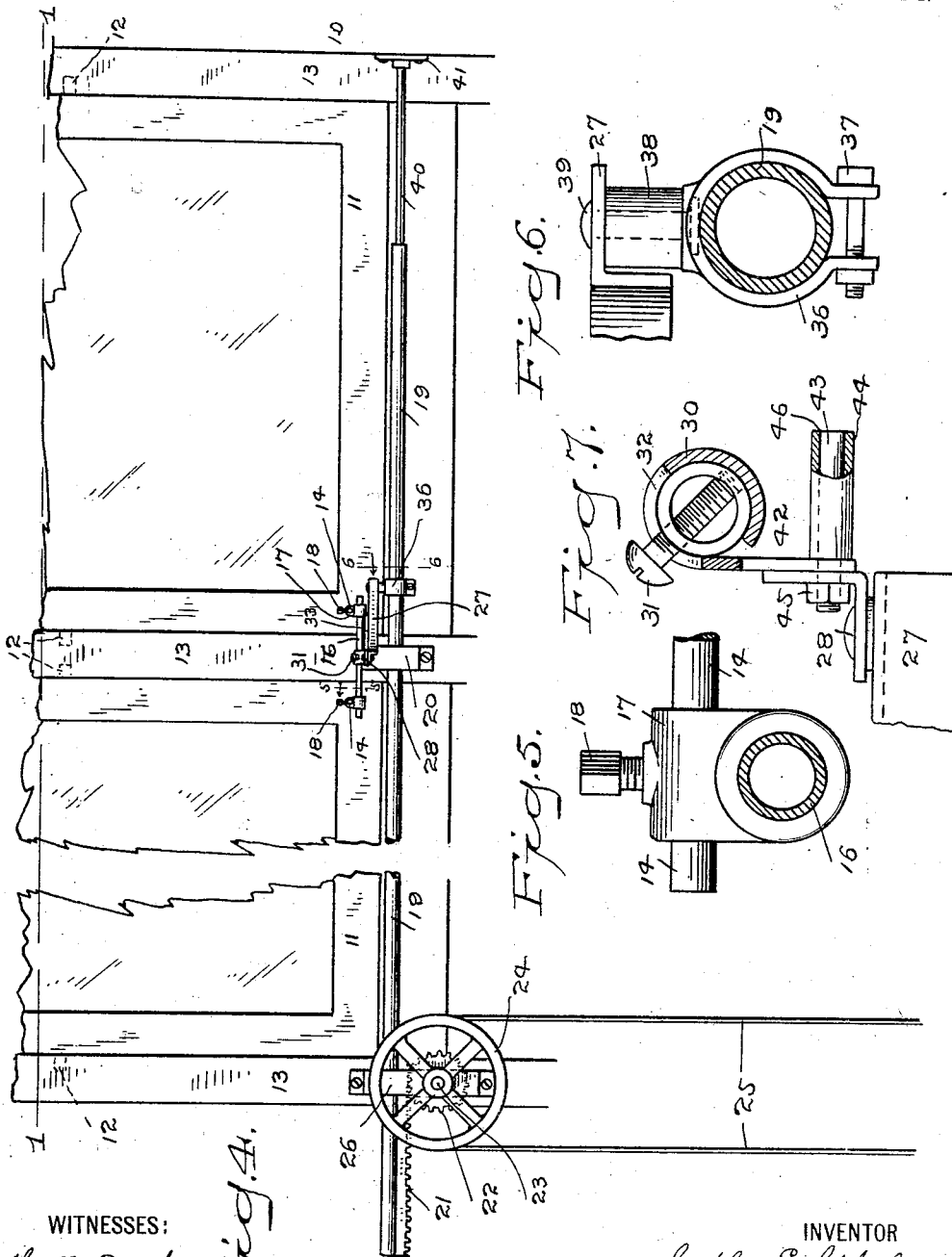


INVENTOR
Stephen E. Cibulas
BY
Attorney

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Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

INVENTOR
Stephen E. Cibulas
BY
A. M. Wooster
ATTORNEY

UNITED STATES PATENT OFFICE.

STEPHEN E. CIBULAS, OF BRIDGEPORT, CONNECTICUT.

SASH-OPERATING MECHANISM.

941,343.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed October 14, 1909. Serial No. 522,585.

To all whom it may concern:

Be it known that I, STEPHEN E. CIBULAS, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Sash-Operating Mechanism, of which the following is a specification.

This invention has for its object to provide simple, inexpensive and easily operated mechanism for simultaneously opening and closing a plurality of swinging windows, as for example the cupola windows of a factory, and that shall provide an operating rod for each side of each window except the end ones, thereby insuring smooth and easy operation of the windows as binding is prevented.

My invention furthermore has for its object to provide low fusing connections between the operating rods and the operating shaft that will yield should the temperature be abnormally raised, as in case of fire, thereby disconnecting the windows from the operating shaft and permitting them to swing to the closed position by gravity without operation of the shaft.

With these and other objects in view my invention consists in certain constructions and in certain parts improvements and combinations which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings forming a part of this specification, Figure 1 is a horizontal section of a series of windows in the closed position, on the line 1—1 in Fig. 4, showing the operating mechanism in plan, an open position of the windows being indicated by dotted lines; Fig. 2 an enlarged detail view partly in section on the line 2—2 in Fig. 1 looking in the direction of the arrow; Fig. 3 a view as seen from the left in Fig. 2; Fig. 4 an elevation showing the construction of my novel operating mechanism and its application to a series of windows; Fig. 5 an enlarged detail view, the cross bar being in section on the line 5—5 in Fig. 4 looking in the direction of the arrow; Fig. 6 an enlarged detail view, the operating shaft being in section on the line 6—6 in Fig. 4 looking in the direction of the arrow; and Fig. 7 is a view corresponding with Fig. 2 illustrating a variant form in which provision is made for the releasing of the windows, permitting them to automatically close by gravity in the event of a fire.

10 denotes the wall of a building and 11 windows pivoted as at 12 to swing in casings 13.

14 denotes operating rods the inner ends of which are pivoted to the side rails of the windows, as at 15. The outer ends of these rods are adjustably connected to a cross bar 16. The connection of the operating rods to the cross bars may be made in any ordinary or preferred manner. In the drawings I have shown guides 17 which are rigidly secured to the cross bars through which the operating rods pass and to which said rods are locked by set screws 18 thereby permitting adjustment, (see Fig. 5 in connection with Fig. 4).

19 denotes a longitudinally movable operating shaft, in the present instance shown as a tube, which slides in suitable guides 20 secured to the casing. The guides are preferably provided with anti-friction bearings (not shown) for the shaft. The shaft is provided with a rack 21 which is engaged by a pinion 22 carried by a short shaft 23 which also carries a pulley 24 over which an operating rope 25 passes. Shaft 23 is mounted to rotate in a bracket 26 which may also serve as a guide for the operating shaft. The cross bars are connected to the operating shaft at their mid-length by means of operating links 27.

29 denotes brackets which are pivoted to the outer ends of links 27, as at 28, and are provided with eyes 30 through which the cross bars pass and in which they are free to oscillate. The brackets are connected to the cross bars by means of screws 31 which pass through slots 32 in the eyes and engage the cross bars (see Figs. 2 and 3 in connection with Fig. 1).

33 denotes links the ends of which are pivoted to the mid-length of links 27, as at 34, and to fixed supports, in the present instance to guides 20, in alinement with the pivotal points of links 27 to the cross bars, as at 35. The inner ends of links 27 are connected to the operating shaft by means of yokes 36, the arms of which straddle the shaft and are locked thereto by means of bolts 37. The yokes are shown as provided with bosses 38 to which links 27 are pivoted as at 39, (see Fig. 6 in connection with Fig. 4). Links 27 and 33 are shown as angle links for the purpose of securing ample strength with the least weight and material although the special shape of the

links is wholly immaterial so far as the principle of the invention is concerned. The ends of the operating shaft may be supported in any ordinary or preferred manner. I have shown one end of the operating shaft, in the present instance a tube, as sliding over a guide rod 40 which extends from a base plate 41 which is secured to the wall.

It will be noted as an important feature of the invention that each cross bar is operated by means of a single link extending from its mid-length to the operating shaft and that two operating rods are connected to each cross bar, said operating rods being connected to the contiguous side rails of different windows so that each window except the two end windows is controlled by two operating rods. I thus insure perfectly easy and smooth operation of the windows as there can be no lateral pressure that would cause them to bind in the casings.

The operation will be perfectly obvious from the drawing. To open or close the entire series of windows the operator simply pulls upon one side or the other of the operating rope rotating short shaft 23 and moving the operating shaft longitudinally by means of the rack and pinion. When the operating shaft is moved toward the right as seen in the drawing, operating links 27 will be drawn inward, which will draw the cross bars and operating rods inward and will swing the windows to the open position, as indicated by dotted lines in Fig. 1, the operation of links 33 being to prevent lateral movement and to insure direct inward movement of the cross bars and operating rods so that the windows will swing perfectly freely. When the operating shaft is moved toward the left the operating links and links 33 will be moved from the dotted toward the full line position shown in Fig. 1 and the windows may be moved to the closed position as shown in full lines in said figure.

In the form illustrated in Fig. 7, I provide a low fusing connection between the cross bars and the operating links, which will be melted in the event of an abnormal rise in temperature and release the cross bars and operating rods from the operating links and will permit the windows to close automatically by gravity without operation of the operating shaft. In this form the cross bars are secured to a two-part bracket 42 in the same manner as before. The two parts of the bracket are secured together by means of a rod 43 and sleeve 44. One end of the rod passes through the two parts of the bracket, is threaded and is engaged by a nut 45. The other end of the rod extends outward from the bracket and receives the sleeve which is secured thereto by low fusing solder indicated by 46. In the event of a sufficient rise in temperature to melt the

solder, the weight of the windows when in the open position will force the sleeve off from the rod, separating the two parts of the bracket and permitting the windows to drop to the closed position by gravity, the parts of the brackets carried by the cross bars moving outward to the closed position, as in full lines in Fig. 1, leaving the other parts attached to the operating links which remain in the open position, as in dotted lines in Fig. 1. It will of course be understood that under ordinary conditions the two-part bracket is as rigid as the other form, the sleeve being securely attached to the rod by the solder and the two parts of the bracket being rigidly secured together by tighteneing up the nut.

Having thus described my invention I claim:

1. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars connecting operating rods pivoted to contiguous sashes, a longitudinally movable operating shaft and operating links pivoted to the cross bars and to the operating shaft.

2. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars connecting operating rods pivoted to contiguous sashes, a longitudinally movable operating shaft, operating links pivoted to the cross bars and to the operating shaft and links pivoted to the mid-length of the operating links and to fixed supports in alinement with the pivotal points of the operating links to the cross bars.

3. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars connecting operating rods pivoted to contiguous sashes, a longitudinally movable operating shaft, guides for said shaft, operating links pivoted to the cross bars and to the operating shaft, and links pivoted to the mid-length of the operating links and to the guides.

4. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars connecting operating rods pivoted to contiguous sashes, a longitudinally movable operating shaft, operating links pivoted to the operating shaft, brackets mounted to oscillate on the cross bars to which the other ends of the operating links are pivoted, and links pivoted to the mid-length of the operating links and to fixed supports in alinement with the pivotal points of the operating links to the brackets.

5. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars carrying guides through which the operating rods pass and to which they are adjustably connected, a longitudinally movable operating shaft, operating links pivoted to the operating rod and to the cross bars at their mid-length and links pivoted to the mid-length of the operating links and to

fixed supports in alinement with the pivotal points of the operating links to the cross bars.

5 6. Sash operating mechanism comprising operating rods pivoted to the sashes, cross bars connecting operating rods pivoted to contiguous sashes, a longitudinally movable operating shaft, yokes secured to said shaft and provided with bosses, operating links
10 pivoted to the bosses and to the cross bars and links pivoted to the mid-length of the operating links and to fixed supports.

7. Sash operating mechanism comprising operating rods pivoted to the side rails of
15 contiguous sashes, cross bars connecting said rods, a longitudinally movable operating shaft, operating links pivoted to the operating shaft, two-part brackets mounted to oscillate on the cross bars to which the other
20 ends of the operating links are pivoted, low fusing means for connecting the parts of the brackets and links pivoted to the operating links and to fixed supports.

8. Sash operating mechanism comprising operating rods pivoted to the side rails of 25 contiguous sashes, cross bars connecting said rods, a longitudinally movable operating shaft, operating links pivoted to the operating shaft, two-part brackets mounted to oscillate on the cross bars to which the 30 other ends of the operating links are pivoted, threaded rods passing through the parts of the brackets, nuts engaging the rods upon one side of the brackets, sleeves on said rods engaging the other sides of the brackets, 25 low-fusing solder connecting the sleeve to the rods, for the purpose set forth, and links pivoted to the operating links and to fixed supports.

In testimony whereof I affix my signature 40 in presence of two witnesses.

STEPHEN E. CIBULAS.

Witnesses:

A. M. WOOSTER,
S. W. ATHERTON.