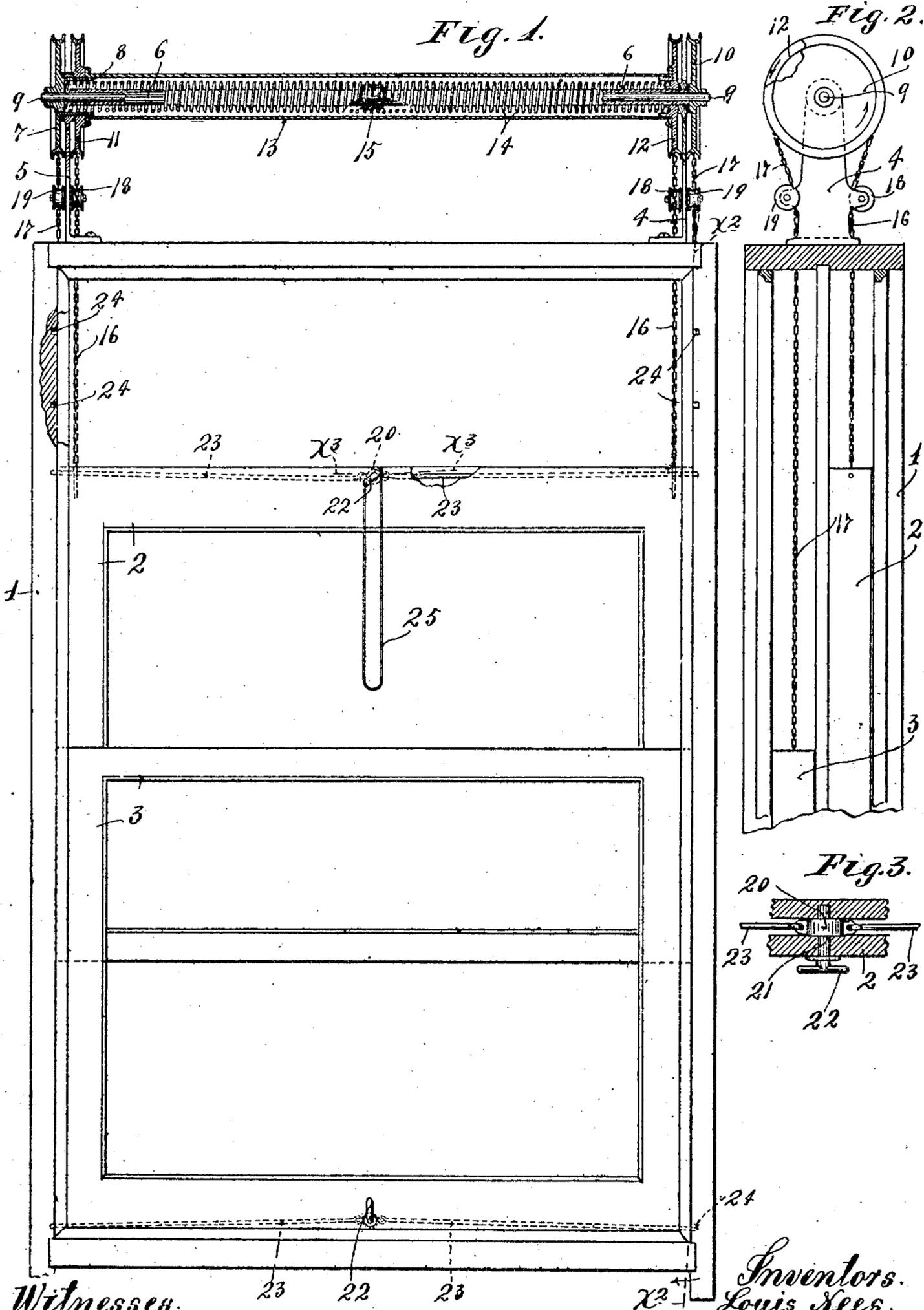


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L. NEES & W. VENSKE.  
AUTOMATIC SASH OPERATOR.  
APPLICATION FILED MAR. 12, 1906.



Witnesses.  
A. H. Opsahl.  
E. W. Jeppesen.

Inventors.  
Louis Nees.  
William Venske.  
By their Attorneys  
Williamson Muedant.

# UNITED STATES PATENT OFFICE.

LOUIS NEES AND WILLIAM VENSKE, OF MINNEAPOLIS, MINNESOTA.

## AUTOMATIC SASH-OPERATOR.

No. 849,490.

Specification of Letters Patent.

Patented April 9, 1907.

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*To all whom it may concern:*

Be it known that we, LOUIS NEES and WILLIAM VENSKE, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Automatic Sash-Operators; and we do hereby 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.

Our invention relates to devices for automatically moving window-sash, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claim.

In the accompanying drawings, which illustrate the invention, like reference characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view, principally in elevation, looking at the inner side of the window frame and sash and showing our improved sash-operating device applied thereto, said device being shown principally in section. Fig. 2 is a view, partly in edge elevation and partly in section, on the line  $x^2 x^2$  of Fig. 1; and Fig. 3 is a detail in horizontal section taken approximately on the line  $x^3 x^3$  of Fig. 1.

The numeral 1 indicates a window-frame of the usual or any suitable construction, the same having the usual upper and lower sash 2 and 3, respectively. Secured on top of the window-frame 1 is a pair of bearing-brackets 4 and 5, to the former of which is rigidly secured one end of a long sleeve 6.

The numeral 7 indicates a sheave that is provided with a sleeve-like hub 8, that is loosely journaled in the upper end of the bearing-bracket 5.

The numeral 9 indicates a shaft which at one end is rigidly secured to the hub of the sheave 7 and at its other end is rigidly secured to another sheave 10. This shaft 9 extends axially through and is loosely journaled in the sleeve 6. The sheave 11 is loosely journaled on the sleeve-like hub 8 of the sheave 7, and a similar sheave 12 is loosely journaled on the sleeve 6 adjacent to the sheave 10. The hubs of the sheaves 11 and 12 are rigidly connected to the ends of a tubular casing 13, which surrounds the sleeve 6.

The numeral 14 indicates a long coiled spring that is contained within the casing 13 and surrounds the non-rotary sleeve 6. At its central portion the spring 14 is rigidly secured to the central portion of the non-rotary sleeve 6 by solder or otherwise, as shown at 15 in Fig. 1. The left-hand end of this spring 14 is attached to the sheave 7, and the right-hand end thereof is attached to the sheave 12. This spring 14 acts as a torsional spring and is wound in such direction that it tends to rotate the two sheaves 7 and 10, which are connected by the shaft 9 in the direction of the arrow marked thereon in Fig. 2, and tends to rotate the two sheaves 11 and 12, which are connected by the casing 13, in the direction of the arrow marked on the sheave 10 in Fig. 2. The two inner sheaves 11 and 12 are connected by chains 16 to the upper sash 2, and the two outer sheaves 7 and 10 are connected to the lower sash 3 by chains 17. The chains 16 and 17 run over guide-sheaves 18 and 19, respectively, mounted on the lower portions of the brackets 4 and 5. It will thus be seen that the spring power device—to wit, as shown, the spring 14—acts in a direction to raise both of the sash whenever said sash are released. From this statement of course it follows that the spring 14 must have a tension considerably greater than that required to counterbalance the respective sash.

In connection with the spring device for automatically raising the sash there is provided sash-locking devices, preferably constructed as shown in the drawings. These sash-locking devices in themselves are of novel construction and described briefly are as follows: Loosely mounted in the upper portion of the upper sash 2 and in the lower portion of the lower sash 3 is a crank-head 20, the stem 21 of which projects from the inner surface of the sash and is provided with a handpiece 22, by means of which it may be readily turned. Loosely connected to perforated lugs carried by the head 20 is a pair of lock-rods 23, the outer ends of which are adapted to be engaged with any one of a vertical series of perforations or seats 24, formed in the window-frame 1, in position to be engaged by the outer ends of the said rods 23. The crank-heads 20 and the rods 23 are set into recesses formed in the respective sash. The handpiece 22 of the locking device for the lower sash stands in position to be readily reached by a person standing on

the floor in the vicinity of the window. The handpiece 22 of the lock device for the upper sash occupies a much higher position, and hence in order to enable the same to be easily operated by a person standing on the floor a chain or other flexible connection 25 is attached at its ends to the opposite ends of said handpiece 22.

The operation of the device is probably obvious from the foregoing statement, but may be briefly summarized as follows: When it is desired to raise the lower sash, for instance, all that is necessary is to turn the lower handpiece 22 so as to draw the rods 23 inward, and thereby unlock the said lower sash, whereupon the spring 14 will become active to automatically raise the said lower sash, and its upward movement may be intercepted at any desired point by throwing the lock-rods 23 outwardly, so that they will engage with the proper lock-seats 24. When the upper sash is lowered and it is desired to raise the same, it is of course necessary to draw inward the upper lock-rods 23, and thereby allow the said spring 14 to raise the said sash. Both sash must of course be lowered by hand and against the tension of the spring 14.

It will of course be understood that the device above described is capable of modification and that the spring 24, for instance, may take different forms. It would even be within the scope of this invention as broadly claimed, although by no means the full equiv-

alent thereof, to substitute a weight for the said spring.

What we claim is—

The combination with a window frame and sash, of bearing-brackets mounted on the upper portion of said frame, and projecting upward therefrom, a non-rotary bearing-sleeve 6 secured to one of said bearing-brackets, a shaft 9 journaled in said bearing-sleeve 6 and projecting from the ends thereof, a pair of sheaves 7 10 secured onto each end of said shaft 9, said sheave 7 being journaled in one of said bearing-brackets, flexible connections between said pair of sheaves 7 10 and one of said sash, a second pair of sheaves 11 12, the latter of which is journaled on said non-rotary sleeve 6 and the former of which is journaled on the hub of said sheave 7, a tubular casing connecting said pair of sheaves 11 12 for common rotation, flexible connections between said pair of sheaves 11 12 and the other sash, and a coil-spring anchored to said non-rotary sleeve 6 and attached at one end to one of the inner pair of sheaves, and attached at its other end to one of the outer pair of sheaves, substantially as described.

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

LOUIS NEES.

WILLIAM VENSKE.

Witnesses:

MALIE HOEL,

F. D. MERCHANT.