No. 646,042. Patented Mar. 27, 1900.

D. R. SHEEN & J. A. PHILBRICK.

COMBINED SASH BALANCE, LOCK, AND ANTIRATTLER.

(Application filed Sept. 23, 1899.)

(No Model.)

Fig. 1.

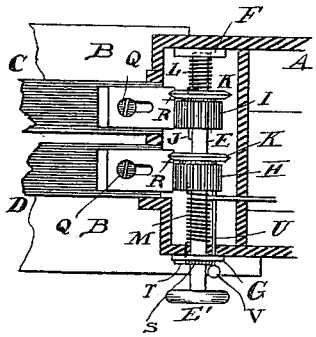


Fig. 2.

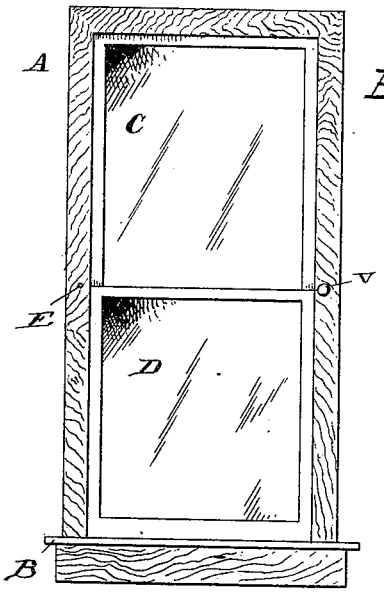


Fig. 3.

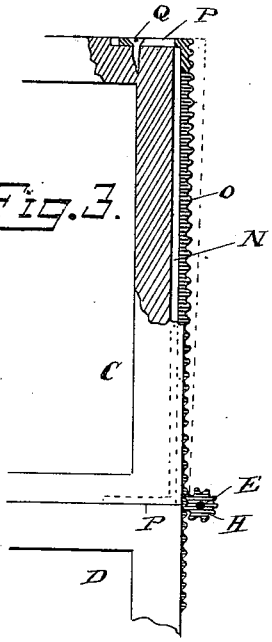


Fig. 4.

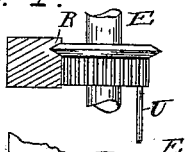


Fig. 5.

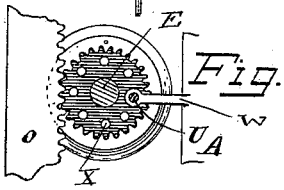


Fig. 7.

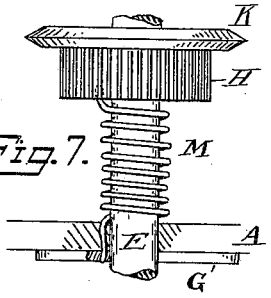


Fig. 8.

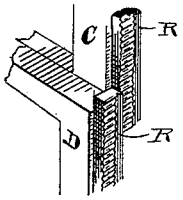


Fig. 6.

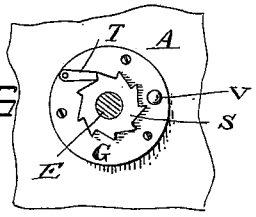


Fig. 9.

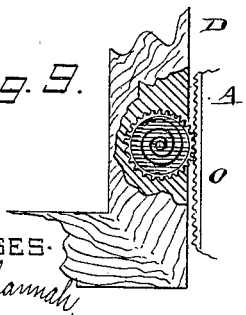
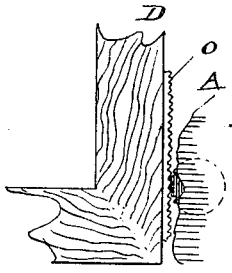


Fig. 10.



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By L. M. Thurlow
ATTY.

UNITED STATES PATENT OFFICE.

DANIEL R. SHEEN AND JAMES A. PHILBRICK, OF PEORIA, ILLINOIS.

COMBINED SASH-BALANCE, LOCK, AND ANTIRATTLER.

SPECIFICATION forming part of Letters Patent No. 646,042, dated March 27, 1900.

Application filed September 23, 1899. Serial No. 731,434. (No model.)

To all whom it may concern:

Be it known that we, DANIEL R. SHEEN and JAMES A. PHILBRICK, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in a Combined Sash-Balance, Lock, and Antirattler for Windows; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to a combined balance, lock, and antirattler for windows.

One object thereof is to furnish windows with a simple arrangement for balancing the sashes thereof.

The further object is to provide this arrangement as a substitute for the cords and weights usually employed.

Furthermore, the object is to furnish means for preventing the rattling of the sashes of windows without causing them to bind or sacrifice the free vertical movement thereof.

Lastly, the object is to combine with a device of this character means for locking the sashes of windows, and thus do away with the usual well-known class of window-locks which cause so much annoyance.

In the appended drawings, Figure 1 is a cross-section of a window-casing, showing the two sashes and the invention in position for work. Fig. 2 is an elevation of a window-frame and its sashes, showing the knob for operating the device. Fig. 3 shows a portion of the sashes of a window, one of which is partly broken away to show a rack-bar therein. Fig. 4 is an enlarged view of part of Fig. 1, showing a rack-bar in cross-section, together with a gear-wheel adapted to mesh therewith. Fig. 5 is an elevation of the same. Fig. 6 shows a ratchet and pawl for use on the inside of the window-casing. Fig. 7 is plan view of Fig. 1, enlarged, showing an operating-spring around the shaft. Fig. 8 is a perspective view of the sashes at their junctures, showing the protruding ends of the vertical bars thereof. Fig. 9 shows part of the sash of a window having a modified form of balancing mechanism therein. Fig. 10 is still another form of the same arrangement.

In the several figures, A is the window-casing, B the sill, and C D the upper and lower sash, respectively. A horizontal shaft E in the casing at the juncture of the sashes and at right angles thereto is journaled at one end in a plate F, secured to the casing, and the inner end of said shaft is carried in a similar plate G on the casing within the room. While we prefer to support the shaft in this way, other means may be used, as is obvious. The said shaft carries two gears H and I, the former being loose thereon and the other fixed, as by a key J, Fig. 1. To the shaft also two revoluble wheels K K, are secured having beveled edges, as in Figs. 1, 4, 5, and 7. These may be fastened to the shaft or to the gear-wheel mentioned, as desired. A spring L surrounds the shaft and has one end secured to the plate F in suitable manner and the other to the wheel I. A similar spring M surrounds the other extremity of the shaft and is likewise fixed to the wheel H at one end and the plate G at the other. The springs are wound in contrary directions, as shown, the purpose of which will be presently shown. The edges of the sashes are grooved or plowed out at N, Fig. 3, and a rack-bar O is placed therein and made adjustable by means of the slotted extremities P and suitable binding-screws Q. The rack-bars extend beyond the ends of the sashes where the latter come together at the middle, as in Fig. 8, and since the shaft E is located also at that point, Fig. 3, both of the bars are engaged at once by the gears. Such bars are grooved longitudinally at R beyond the cogs and engage the said plates, as shown. This combined mechanism we use to prevent the rattling of the sashes, to which all windows are subject. The gears and the said plates are constantly in engagement with the bars N. When the upper sash is in its usual closed position, the spring L sustains it. When lowering the sash, the spring is tightened, and the lower it is carried the more tension is applied to such spring. However, the spring is of such length that the increased tension does not necessarily raise the sash from any position in which it may have been placed, but merely sustains it in that position. In moving this sash the shaft is turned with the gear-wheel, as is evident when we remember that the said gear and shaft are fixed together, and

since the gear H is loose on the shaft neither it nor the lower sash will be affected. When the lower sash is closed or in its down position, the spring M is under as much strain as would be sufficient to sustain the weight of the sash when raised or opened to any position, but need not be enough to raise the sash from its closed position. Both springs are of sufficient length to store sufficient power for the purposes named without opening the window in the manner stated and are wound in opposite directions, because the sashes operate in opposite directions. The means employed for locking the sashes consists of a ratchet S, secured to the shaft outside the plate G, with which a pawl T is adapted to engage, the latter being pivoted to the said plate. The upper sash may by this arrangement be locked at any elevation desired, as is evident. The lower sash may also be locked at any height by means of a pin U, parallel with E, and operated inside the room by a knob V. The opposite end of the pin is supported by means of an eyebolt or equivalent means W, driven into the casing, and is adapted to enter one of a series of apertures x in the face of the gear H. Thus it will be seen that either sash may be operated separately or independent of each other, and by the pawl and ratchet and the pin U the upper and lower sashes, respectively, can be locked independently or at the same time. We provide a handpiece E′ for the shaft E for use in raising or lowering the upper sash or to revolve the shaft, if desired, in either direction in order to better lock the ratchet by means of the pawl. We have provided for the sagging of the sashes by making the rack-bars adjustable, whereby the latter may be at all times in a perfectly-upright position. Fig. 3 shows the adjustable idea and will be easily understood. We employ one of the combined balances described at each side of the window, as indicated in Fig. 2, so that the sashes will work evenly and smoothly. The device on the left side of the window, Fig. 2, does not necessarily have the knob V or the handpiece E′, though we may use them. Neither are the pawl and the ratchet necessary, but simply the shaft E and its loose and fixed gear, together with the springs, which latter must be set in a reverse position to the corresponding ones at the right side of the window, for the reason that the gears operate in a reverse direction, as is evident.

In Fig. 9 is shown a modified form of the device, and consists in providing a hollow gear-wheel, in which is seated a spiral spring, one end being secured to the inner periphery of the gear and the other to the stationary stud on which the gear revolves. The rack-bar is secured to the casing, and as the window is raised and lowered the spring is put under strain to accomplish the desired end. Fig. 10 has the same general arrangement, except that the parts are reversed as to location—*i. e.*, the rack-bar is fastened to the sash and the spring-drum to the casing; but the same results are obtained as with the other form. Suitable locking mechanism may also be provided for these forms. We may use the antirattler, lock, and balance either in its combined form or use the several ideas separately.

We are aware of an arrangement somewhat the same as ours, but its parts are complicated and costly, and such a device cannot accomplish the results that ours do. By placing a device as we construct it at each side of the window in line with the juncture of the upper and lower sashes and extending the rack-bars R, as in Fig. 8, to meet them we preclude the necessity of using more than two of such arrangements for the window, whereas in the arrangement referred to four are necessary.

Having thus described our invention, we claim—

1. In a combined sash-balance, lock and antirattler for the same, the casing A, shaft E therein, a fixed and a loose gear-wheel on the latter, substantially as set forth, the upper sash adapted to engage with the fixed gear, the lower sash adapted to engage with the loose gear, a rack-bar on each sash to engage such gears as set forth, a groove on each rack-bar, revoluble wheels for engaging the grooves, springs on the shaft for engaging the gears at one end and the casing, or other stationary part at the other end and means for locking each sash separately or conjointly substantially as set forth.

2. In a sash-balance a shaft located within the window-casing, a fixed gear-wheel thereon for engaging the upper sash, a loose gear thereon for the lower sash, a rack-bar on each sash for engaging said gears, springs surrounding the shaft and secured at one end to the gears and at the other to the stationary casing substantially as and for the purposes described.

3. In a lock for window-sashes, a shaft E, a loose and a fixed gear thereon, sashes C and D, adjustable rack-bars thereon for engaging the gears, a ratchet-wheel G on the shaft, a pawl for engaging it, a pin U for locking the gear H all substantially as and for the purposes specified.

4. In a sash-balance, lock and antirattler, the upper sash having a downwardly-projecting rack-bar, the lower sash having an upwardly-projecting rack-bar both adapted to pass each other at the juncture of said sashes, a horizontal shaft within the window-casing, a gear-wheel on the shaft for engaging the bar of the upper sash and a gear-wheel on the shaft for engaging the bar of the lower sash as set forth.

5. In a sash-balance and lock, an upper sash having a rack-bar thereon projecting below the bottom thereof, a lower sash, a rack-bar thereon projecting above its top, a horizontal shaft at each side of the window-frame and projecting therethrough, the same being in line with the junctures of the sashes, gear-

wheels on each shaft for engaging the rack-bars, beveled wheels on each shaft, a groove in each rack-bar for receiving the bevels of said wheels, springs surrounding the shaft, stationarily held at one end and connected at the other with the revoluble wheels and adapted to be tightened or relaxed by the movement of said sash substantially as set forth.

6. For window-lock, rack-bars on the upper and lower sashes, a shaft within the casing at the juncture of the sashes, gear-wheels on the shaft for engaging the rack-bars, springs on the shaft adapted to be tightened and relaxed by a movement of the sashes, a series of apertures in one end of the gear-wheels and an adjustable pin adapted to enter said apertures, such pins being parallel with the shaft and adapted to be moved by the hand for locking the window substantially as set forth, a ratchet-wheel on the shaft outside of the casing and a pawl adapted to engage such ratchet substantially as described.

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

DANIEL R. SHEEN.
JAMES A. PHILBRICK.

Witnesses:
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J. H. BLUSCH.