

No. 619,571.

Patented Feb. 14, 1899.

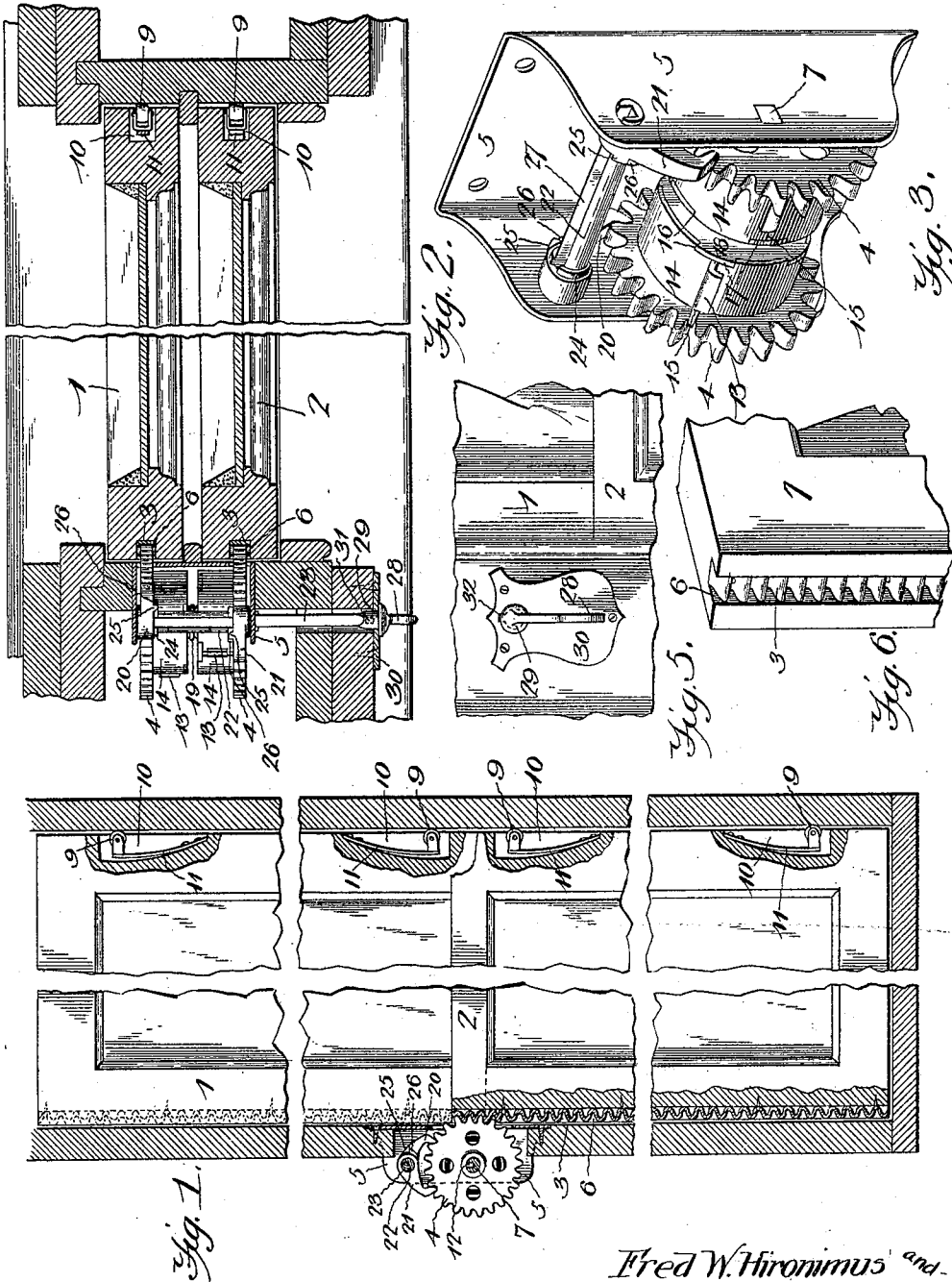
F. W. HIRONIMUS & R. A. HARNESS.

SASH BALANCE AND LOCK.

(Application filed Jan. 27, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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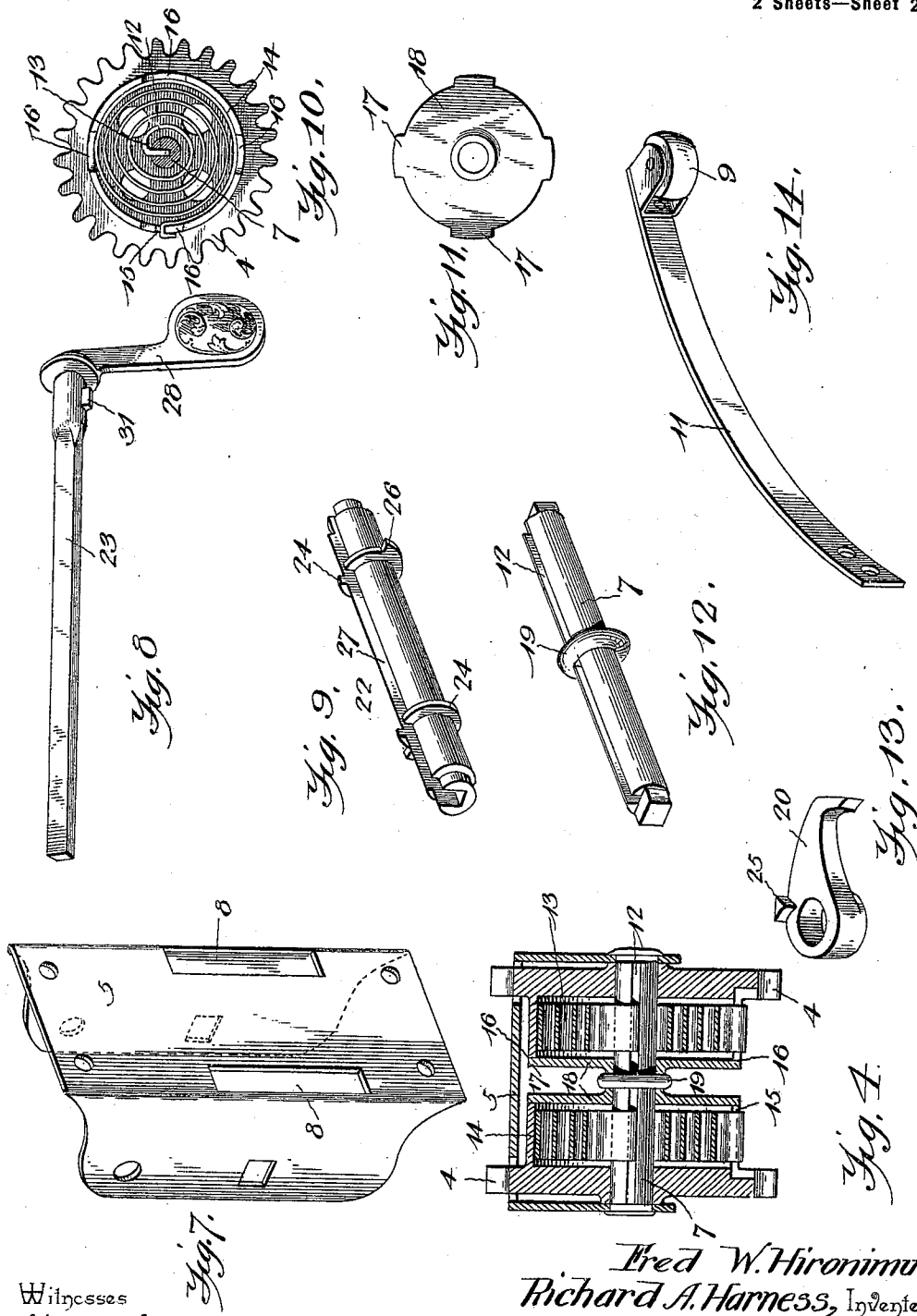
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UNITED STATES PATENT OFFICE.

FRED W. HIRONIMUS AND RICHARD A. HARNESS, OF CORYDON, KENTUCKY.

SASH BALANCE AND LOCK.

SPECIFICATION forming part of Letters Patent No. 619,571, dated February 14, 1899.

Application filed January 27, 1898. Serial No. 668,212. (No model.)

To all whom it may concern:

Be it known that we, FRED W. HIRONIMUS and RICHARD A. HARNESS, citizens of the United States, residing at Corydon, in the county of Henderson and State of Kentucky, have invented a new and useful Sash Balance and Lock, of which the following is specification.

The invention relates to improvements in sash balances and locks.

The object of the present invention is to improve the construction of sash-balances and to provide a simple, inexpensive, and efficient device adapted to enable the sashes of a window to slide freely and capable of locking them at any desired adjustment.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a vertical sectional view of a portion of a window provided with a sash-balance constructed in accordance with this invention. Fig. 2 is a horizontal sectional view. Fig. 3 is a detail perspective view of the casing and the cog-wheels, showing the pawls in engagement with the latter. Fig. 4 is a transverse sectional view illustrating the manner of mounting the cog-wheels on the fixed shaft. Fig. 5 is a detail view of a portion of the window, showing the escutcheon-plate and the handle of the operating-shaft. Fig. 6 is a detail view of a portion of one of the sashes, illustrating the manner of mounting the rack-bar thereon. Fig. 7 is a detail view of the casing. Fig. 8 is a detail view of the key. Fig. 9 is a similar view of the slotted tubular shaft. Fig. 10 is a detail view of one of the cog-wheels, its plate being removed to show the spring. Fig. 11 is a detail view of the plate. Fig. 12 is a detail view of the fixed shaft. Fig. 13 is a detail view of one of the pawls. Fig. 14 is a detail view of one of the rollers and its spring.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 and 2 designate upper and lower sashes of a window, each provided at one side of the latter with a rack-bar 3, which meshes with

a cog-wheel 4 of a casing 5. The rack-bar 3, which may be constructed in any suitable manner, preferably consists of a strip of metal bent as shown and arranged in a groove 6 of the sash, so that the teeth do not project beyond the same.

The casing 5, which is preferably constructed of steel, is provided with tapered ends and is secured to the window-frame by suitable fastening devices, as indicated in Fig. 1 of the accompanying drawings. A pair of cog-wheels is shown, but one or more may be employed, and the cog-wheels 4, which are mounted upon a fixed shaft 7, project through slots 8 of the casing 5 and mesh with the rack-bars of the upper and lower sashes.

Cog-wheels and rack-bars may be arranged at each side of the window; but they are preferably arranged, as illustrated in the accompanying drawings, at only one side of the window, the sashes being provided at the other side with yieldingly-mounted rollers 9, located at the top and bottom of the sashes and arranged in suitable recesses 10. Each roller which bears against the window-frame is mounted upon one end of a spring 11, which has its other end secured to the sash in the recess 10. The rollers enable the sashes to slide freely and retain the rack-bars and gear-wheels in mesh and prevent any rattling of the sashes.

The fixed shaft 7 has its ends reduced and arranged in openings of the sides of the casing 5, and it is provided with a longitudinal groove 12, adapted to receive the inner end of a barrel-spring 13, which is mounted on each of the gear-wheels. Each gear-wheel is provided with an annular flange 14, forming a cylindrical casing, receiving the barrel-spring and provided with a slot or opening 15, which is engaged by the outer end of the barrel-spring, whereby the same is connected with the gear-wheel. The annular flange 14 which receives the spring is provided at its outer edge or periphery with a series of recesses 16, which receive lugs 17 of a cap-plate 18. The cap-plate 18 forms one side of the cylindrical casing for the spring, and it is readily removable to afford access to the same. The inner end of the spring is bent at an angle to fit the groove of the fixed shaft, and it is adapted to

engage the latter at any point thereon. When two gear-wheels are employed, the shaft is provided with a central flange or stop 19, formed integral with it and adapted to space 5 the gear-wheels from each other.

The barrel - springs counterbalance the sashes in the usual manner, and in order to lock the upper sash against downward movement and the lower sash against upward 10 movement the cog-wheels are engaged by oppositely-disposed pawls 20 and 21, mounted upon a slotted tubular shaft 22, which is operated by a key 23. The shaft 22, which is journaled in suitable bearing-openings of the 15 sides of the casing 5, has its ends reduced and is provided a short distance from the sides of the casing 5 with annular flanges or collars 24, which retain the pawls in position adjacent to the cog-teeth. Each pawl is provided with a projection or lug 25, extending 20 inward toward the center of the casing and adapted to be engaged by a shoulder 26 of the collar or flange 24, whereby when the shaft is partially rotated the pawl will be lifted out of engagement with its cog-wheel, 25 so that the latter will rotate freely and permit the corresponding sash to be freely moved. The pawls extend in opposite directions as clearly shown in Figs. 1 and 3 of the accompanying drawings, and the shoulders 26 are reversely arranged, so that the shaft is adapted to operate the pawls alternately. By rotating the shaft 22 in one direction one of the pawls is lifted out of engagement with 30 the adjacent cog-wheel and by turning the shaft in the opposite direction the other pawl is operated.

The key 23, which is polygonal in cross-section, conforms to the configuration of the 40 longitudinal groove or opening 27 of the slotted tubular shaft, and it is adapted to slide inward and outward and is capable of rotating the slotted tubular shaft to operate the pawls.

The adjustment of the operating-shaft and the key is provided for the purpose of adapting the sash-balance to various sizes of window-sashes, and the casing 5 may be arranged at any desired distance from the outer face 50 of the window-frame to bring it opposite the sashes. The key 23 is provided at its outer end with a handle 28 and has its adjacent portion rounded to fit in a bearing-opening 29 of an escutcheon-plate 30, and it is provided at its lower side with a projecting lug 55 31, which engages the inner face of the escutcheon-plate, whereby the said key 23 of the shaft is held against outward movement. The escutcheon-plate, which may be of any 60 configuration, is provided at the top of the bearing-opening with a notch 32, forming a passage or entrance for the lug 31, to permit the parts to be assembled, and as the lug 31 does not in the operation of the shaft register 65 with the recess or notch the key 23 is retained in place. By partially rotating the operating-shaft in one direction one of the pawls is

lifted out of engagement with the cog-wheel and a corresponding movement in the opposite direction disengages the other pawl. 70

The invention has the following advantages: The sash-balance is simple and comparatively inexpensive in construction, and the sashes of a window are always locked. 75 One or more cog-wheels may be employed, and each cog-wheel is provided with a casing for housing its spring. The operating-shaft and the key for controlling the pawls are capable of adjustment to suit the thickness of a window-frame and to arrange the cog-wheels opposite the sashes. The sashes slide freely 80 and the yieldingly-mounted rollers retain the cog-wheels and the rack-bars in close mesh and prevent the sashes from rattling.

Changes in the form, proportion, and minor 85 details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What we claim is—

1. In a device of the class described, the 90 combination of a casing, a fixed shaft mounted in the casing and provided with a central annular flange 19 and having longitudinal grooves at opposite sides of the flange, a pair of cog-wheels arranged on the shaft, and provided 95 at their inner faces with annular flanges forming casings, the plates 18 located at opposite sides of the central annular flange of the shaft, and springs housed within the casings of the cog-wheels and interlocked with 100 the grooves, substantially as described.

2. In a device of the class described, the combination of a cog-wheel, a rack-bar meshing with the cog-wheel, a shaft provided with a shoulder, a pawl mounted on the shaft, engaging the cog-wheel and provided with a projection or lug arranged to be engaged by the 105 said shoulder, and means for operating the shaft, substantially as described.

3. In a device of the class described, the 110 combination of a cog-wheel, a spring connected with the cog-wheel and adapted to balance a sash, a rack-bar meshing with the cog-wheel, a shaft provided with a flange or collar having a shoulder, a pawl mounted on the shaft, 115 engaging the cog-wheel and having a projection or lug arranged to be engaged by the said shoulder, and means for operating the shaft, substantially as and for the purpose described. 120

4. In a device of the class described, the combination of a pair of cog-wheels, rack-bars, springs connected with the cog-wheels and adapted to balance sashes, oppositely-disposed pawls engaging the cog-wheels and 125 provided with lugs or projections, and a shaft carrying the pawls and provided with reversely-arranged shoulders adapted to engage the pawls alternately, whereby the shaft is adapted to operate one of the pawls when rotated in one direction, and is capable of engaging the other pawl when rotated in the opposite direction, substantially as and for the purpose described. 130

5. In a device of the class described, the combination of a casing, a cog-wheel, a spring connected with the cog-wheel and adapted to balance a sash, a slotted tubular shaft, a pawl
5 mounted on the shaft and adapted to engage the cog-wheel, a longitudinally-adjustable key fitting in the groove or opening of the slotted tubular shaft and provided at its outer end with a handle, and having a lug, and an
10 escutcheon-plate having a bearing-opening and interposed between the lug and the han-

dle, and provided with a notch to permit the passage of the lug, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures 15
in the presence of two witnesses.

FRED W. HIRONIMUS.
RICHARD A. HARNESS.

Witnesses:

GEORGE LAURENCE,
WILLIAM T. McMURRAY.