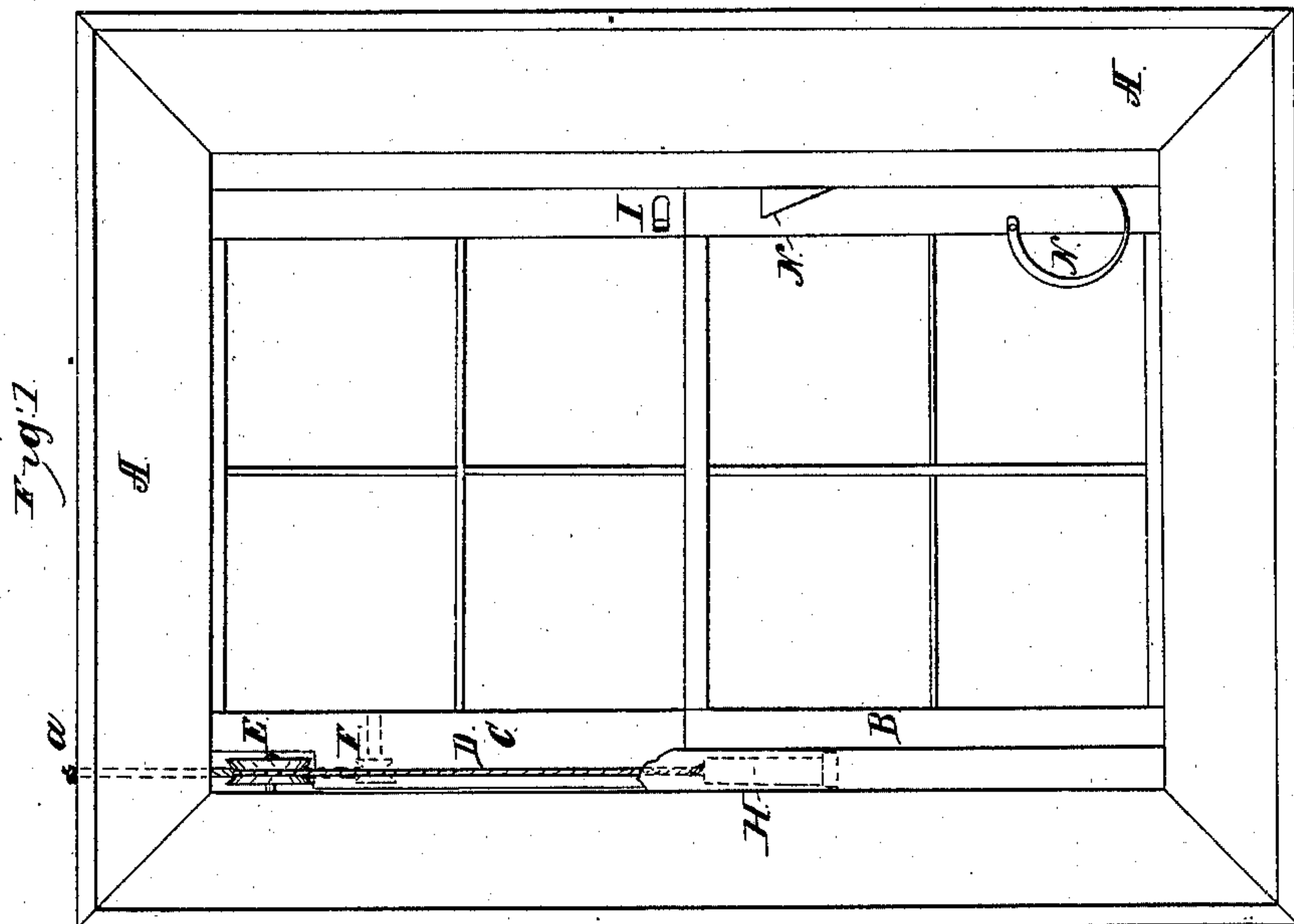
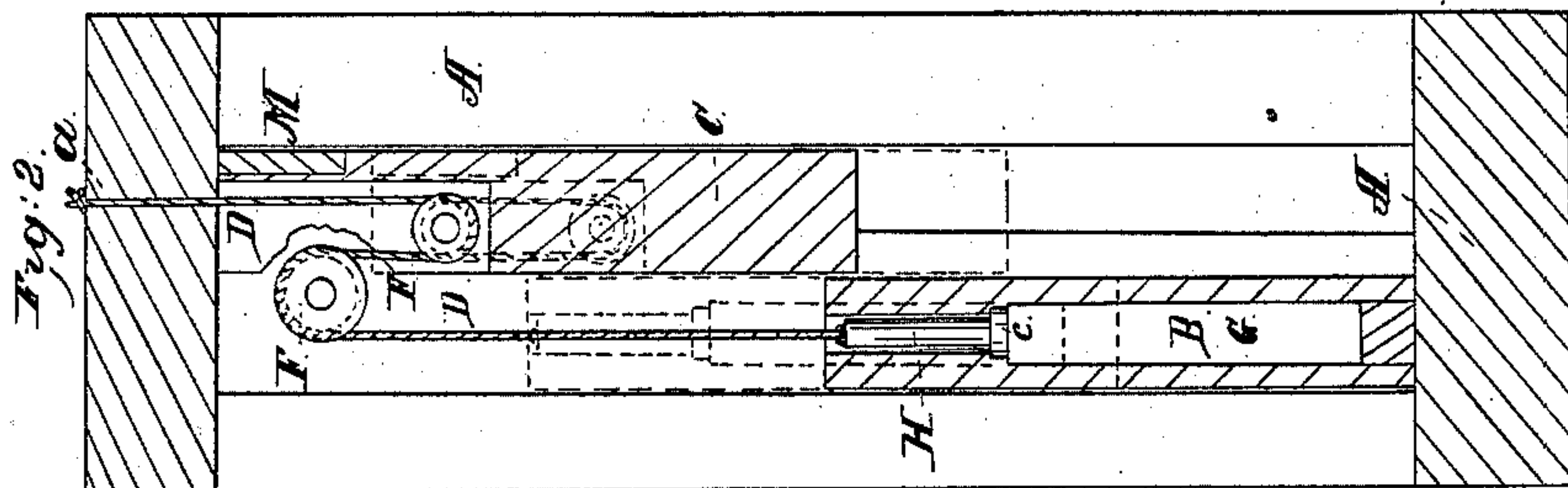


*A. T. Clark,*  
*Sash Balance.*

*N<sup>o</sup> 10,957.*

*Patented May 23, 1854.*





# UNITED STATES PATENT OFFICE.

ALFRED T. CLARK, OF LANCASTER, PENNSYLVANIA.

## MODE OF BALANCING WINDOW-SASHES.

Specification of Letters Patent No. 10,957, dated May 23, 1854.

*To all whom it may concern:*

Be it known that I, ALFRED T. CLARK, of the city and county of Lancaster and State of Pennsylvania, have invented a new and useful Differential Window-Balance; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a front elevation of a window frame, a portion being broken away to show the cords and pulleys. Fig. 2, is a vertical transverse section of the same, plainly showing the balancing arrangement.

Similar letters of reference in each of the two figures, indicate corresponding parts.

My invention has reference to a well known arrangement of window sashes wherein the one sash is made to balance the other so that upon lifting the lower sash the upper sash descends. By the ordinary mode or cord and pulley arrangement of gearing together these sashes, the two sashes move with equal velocities in opposite directions and of course through equal lengths of spaces. This arrangement is objectionable as it does not admit of the window being as fully open at the bottom as is frequently desirable in warm weather to a person sitting at the window and under other circumstances, by reason of the top sash descending below the bottom of the lower sash when the latter is raised above a medium height; thereby causing the upper sash to contract or partly close the air or open space formed by the highly raised lower sash.

To remove this defect is the object of my improvement which consists in so gearing the upper and lower sash together that, while they continue to balance each other, the sashes are made to move at different velocities or through different lengths of spaces in opposite directions so that the lower sash may be lifted high, or through a great length of space, while the upper one, descending through a less length of space, will not lap over or below the bottom edge of the lower sash, whereby the air or open space formed by the raised lower sash will not be contracted or partly closed by the upper sash, and thus the window may be opened wide to the air at the bottom. The means by which I accomplish this improvement consist of a fixed pulley placed on

each side of the window frame at or near the top portion of the said frame and a traveling pulley or movable sheave placed on each side of the upper sash near the top portion of the said sash, and two weighted cords attached by their weighted ends to the lower sash, then passing upward over the fixed pulleys, thence downward under the aforesaid movable sheaves, and again upward, and fastened to the top of the window frame, the aforesaid pulleys all revolving on their respective axes. By this arrangement of cords, movable sheaves and fixed pulleys, the lower sash is caused to move twice as fast as the upper sash, so that in elevating the lower sash two feet the upper sash will descend but one foot.

As the difference between the amount of open space, above the sashes, and that below them, is equal to, and results from, the difference between the motion of the upper sash, and that of the lower sash, I have denominated my invention, the "differential window balance."

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, A, represent the window frame; B, the lower sash, and C, the upper sash.

D, D, are the cords connected with the lower sash B, and passing upward over the fixed pulleys, E, E, at the top of the frame—thence downward and around the movable sheaves, F, F, placed on the upper sash—thence upward and fastened to the top of the frame, at *a*, as seen in the drawing, Fig. 2.

In order to elevate the lower sash, without moving the upper sash, I attach small weights, H, H, to the lower ends of the cords, D, D, to keep them stretched, when the cords are relieved of the weight of the sashes. A bolt or catch, I, will sustain the upper sash, when the cords are relieved of the weight of the lower sash. A groove, G, in each side of the lower sash, allows each of the small weights, H, H, to remain stationary, when only the lower sash is raised or lowered.

Instead of using the small weights, H, H, I can keep the cords stretched, by causing the sheaves, F, F, to move in guides in the sides of the upper sash.

Each of the small weights H, H, is formed of a screw tube, *b*, having a nut, *c*, working upon it. The said weights serve each, or



all, of the following purposes, to wit: for stops for sustaining the lower sash, when it is balanced by the upper sash; second, for keeping the cords, D, D, stretched, when  
5 they are relieved of the weight of the lower sash, and, third, for adjusting the length of the cords, D, D.

A catch, N, will sustain the lower sash, when it is raised without being balanced  
10 by the upper sash.

To produce equilibrium between the two sashes, I place, when needful, a supplemental weight, M, on the sash which carries the movable sheaves, F, F. A plate or bar of  
15 metal, will suit for the said weight. A spring will answer the same purpose as the said supplemental weight.

By examining Fig. 2, of the drawing, the arrangement of the pulleys and sheaves will  
20 be seen; also, the manner in which the sashes are raised, lowered and balanced. In this view, the red lines show the lower sash raised, and the upper sash lowered—the lower sash being shown raised twice the  
25 distance the upper sash is lowered; thus plainly illustrating my differential window balance.

What I claim as new and useful in window

sashes wherein the one sash is made to balance the other, and desire to secure by Letters Patent is— 30

Gearing the two sashes together in such a manner that, while the balance of the sashes, the one by the other, is preserved, a differential movement is obtained for the  
35 two sashes, by means of the fixed and traveling pulleys (E and F) with their cords, chains or ropes (D) arranged and operating, together with the sashes, substantially as specified, so that, on raising the lower or  
40 one sash through a given length of space, the other or upper sash is caused to descend through a less length of space, whereby a wider opening or air space may be procured for the window at its bottom than is  
45 obtainable by the ordinary arrangement herein referred to and described in which the sashes balancing each other are made to move with equal velocities and the top sash thereby caused to contract or partly  
50 close the open air space at the bottom formed by the highly raised lower sash.

ALFRED T. CLARK.

Witnesses:

JOHN K. SMOKERS,

I. BUYERS FREELANDY.