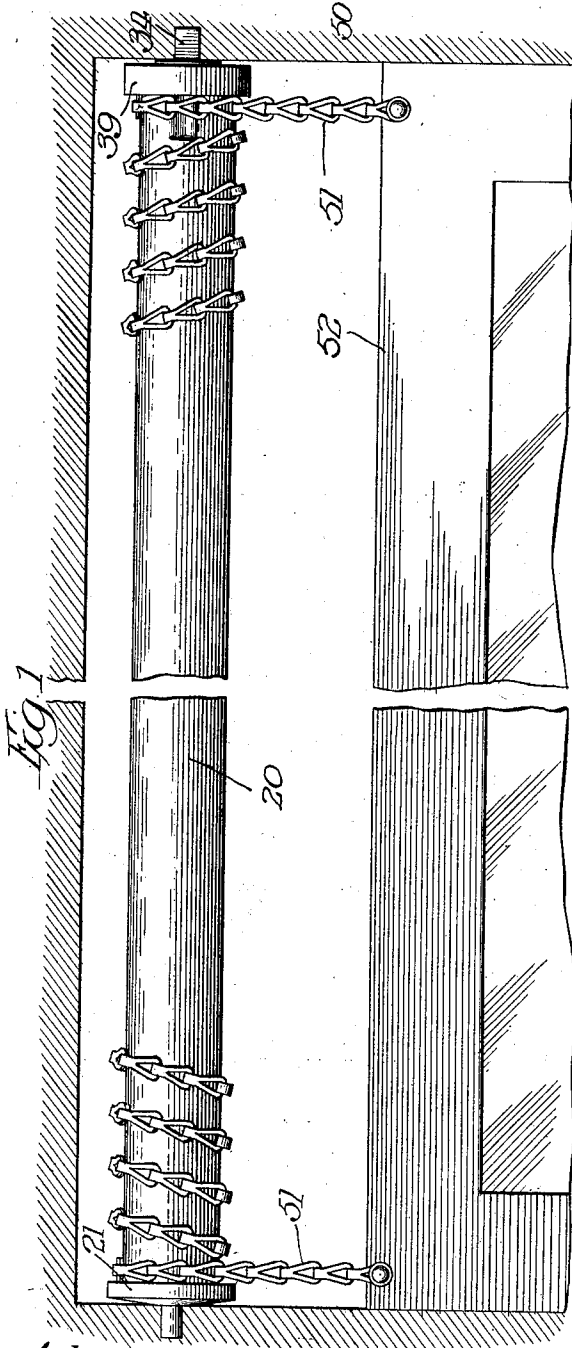


E. E. WHITMORE.
WINDOW SASH BALANCE.
APPLICATION FILED JUNE 12, 1911.

1,058,824.

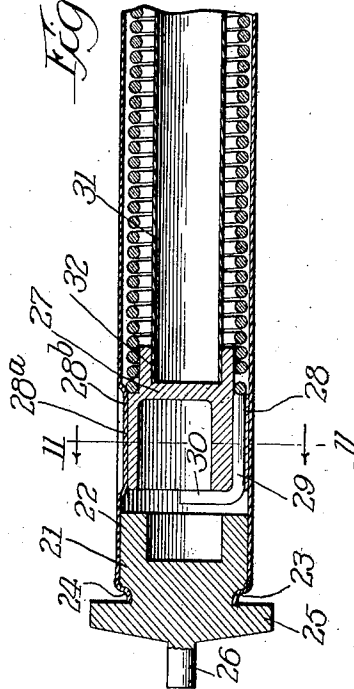
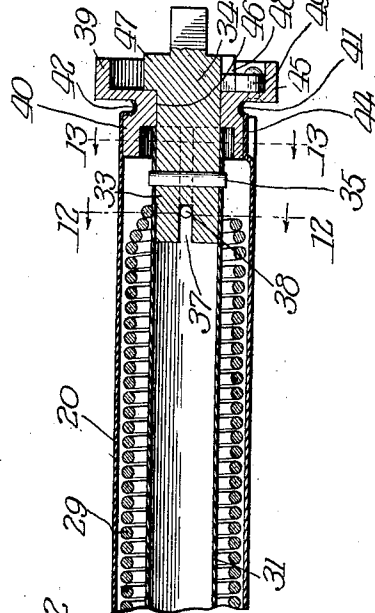
Patented Apr. 15, 1913.

2 SHEETS-SHEET 1.



Witnesses:

Edw. E. Whitmore
Henry M. Shupley.



Inventor:

Edward E. Whitmore

By Smith, Belt & Fuller

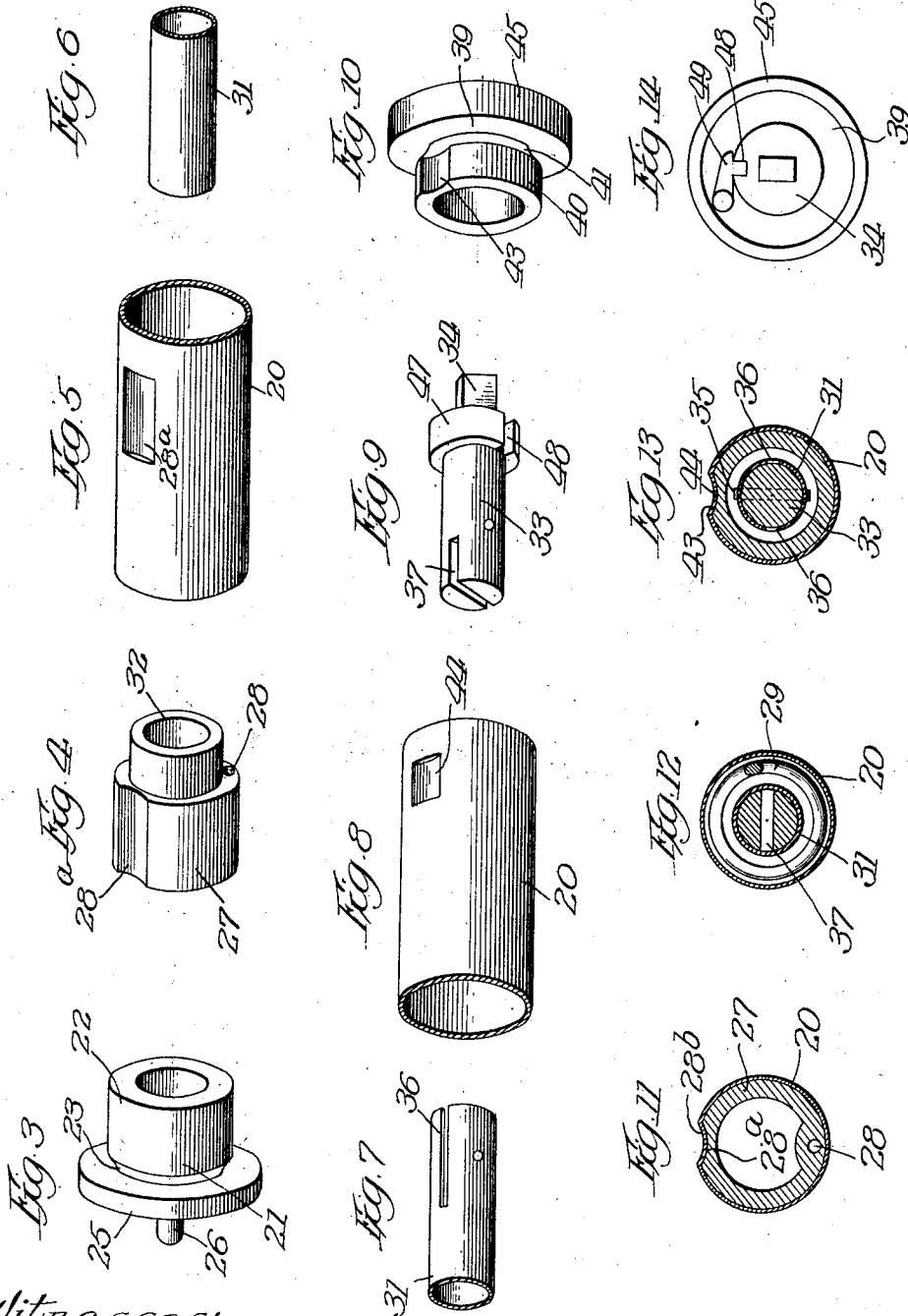
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UNITED STATES PATENT OFFICE.

EDWARD E. WHITMORE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CURTAIN SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

WINDOW-SASH BALANCE.

1,058,824.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed June 12, 1911. Serial No. 632,658.

To all whom it may concern:

Be it known that I, EDWARD E. WHITMORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Window-Sash Balances, of which the following is a specification.

My invention constitutes an improvement over the ordinary forms of window sash balances, inasmuch as it embodies various advantages which I will point out.

In the usual sash balances the window is sometimes attached to the sash balance by means of a chain, one end of which is fastened to a rod which is inserted in a suitable groove in the periphery of the balance itself. The use of such a groove necessitates making the sash balance of a large diameter, so that it also becomes necessary where an upper and lower sash are placed in a single window frame to place one sash balance over the other, since the width of the window frame is not sufficient to allow the balances to be placed side by side.

In having one balance located over the other as just described, the disadvantage arises that in case of repairs to the upper balance it is necessary to remove the lower balance in order to obtain access to the former. A further disadvantage of the ordinary construction resides in the fact that the end of the tube of which the outside of the sash balance is often constructed is of no larger diameter than the rest of the tube, so that when a sash is raised the chain is very apt to slip over the end of the balance and become entangled with the pintle or key end or become wedged between the end of the sash balance and the window frame. A still further disadvantage is that the parts have often been made of a very light construction, so that there has been great liability to bend the same, and in many cases, under the necessary strain of operation, the end members have become displaced from their normal positions.

In my improved form of sash balance I make the outer tube seamless and of substantial thickness so that it may resist the necessary strains. Each end of the tube is provided with an end member which has a barrel projecting into the end of the tube, the edge of which is crimped into a suitable groove in the end member so that the latter

is thereby securely held in position. Immediately adjacent to such groove and abutting against the end of the tube each end member has a laterally projecting flange which is of greater diameter than the diameter of the tube, these flanges serving to prevent the chain from running over the ends of the tube when the chains are coiled on the latter. The chains are attached to the sash balance by being riveted directly to the outer tube of the latter, this construction being made possible by the increased thickness of the tube and its consequent rigidity. In this way it is possible to make the tube of considerably less diameter than was formerly the case, with the result that where two window sashes are used in a single frame the sash balances may be placed side by side in the same horizontal plane. These and other advantages of my invention will be more readily understood by reference to the accompanying drawings, which show a preferred embodiment of my improvements, and in which—

Figure 1 is a front elevation showing the sash balance in position within the window frame and attached by means of suitable chains to one of the window sashes; Fig. 2 is a longitudinal section through the sash balance; Fig. 3 is a perspective of the spindle end member; Fig. 4 is a perspective of the block used within the outer tube; Fig. 5 is a fragmentary perspective of a portion of the outer tube, showing the manner of holding the lock in position; Fig. 6 is a perspective of a portion of the hollow shaft; Fig. 7 is a perspective of the end of the hollow shaft; Fig. 8 is a perspective of the end of the outer tube, showing the manner of holding the shaft-bearing end member in position; Fig. 9 is a perspective of the key end which is attached to the shaft; Fig. 10 is a perspective of the shaft-bearing end member; Fig. 11 is a transverse section, on the line 11—11 of Fig. 2; Fig. 12 is a transverse section, on the line 12—12 of Fig. 2; Fig. 13 is a transverse section, on the line 13—13 of Fig. 2; and, Fig. 14 is an end elevation, showing the shaft-bearing end member, the key end, and the locking pawl.

The outer tube 20 of the sash balance is preferably seamless, and of substantial construction. At one end is located the spindle end member 21, having the barrel 22 fitting within the end of the tube 20. The spindle

end member 21 has a groove 23, into which the end 24 of the tube 20 is crimped, thereby holding the member 21 securely in position. Immediately adjacent the groove 23 is the lateral flange 25, which is of greater diameter than the diameter of the outer tube 20. On the end of the spindle end member 21 is the usual pintle 26. Adjacent to the spindle end member 22 and within the outer tube 20 is the block 27 having the depression or groove 28^a into which a portion 28^b of the periphery of the outer tube 20 is forced, thereby securely holding the block in position. Extending longitudinally through the block is the aperture 28, through which passes the end of the coiled spring 29, which is bent at 30 in order to securely fasten the spring to the block. The end of the hollow shaft 31 extends within the recess 32 of the block 27, and is rotatable therein. The hollow shaft 31 passes through the outer tube 20 for a large portion of the length of the latter, and is inclosed by the coiled spring 29. The opposite end of the hollow shaft 31 is attached to the shank 33 of the key end 34 by means of the pin 35, the shank 33 fitting within the end of the shaft, as clearly shown in Figs. 2, 12 and 13. As shown in Figs. 7 and 13, this end of the shaft 31 is provided with slots 36, which register with the slot 37 in the shank 33 of the key end 34. The end 38 of the coiled spring 29 engages the slot 37, so that when the key end and its attached shaft are rotated with respect to the block 27 attached to the outer tube 20 the spring 29 will be coiled to an increased tension, or uncoiled to a decreased tension, as the case may be.

The shaft-bearing end member 39 is of similar construction to the spindle end member 21. It is provided with a barrel 40 extending within the end of the outer tube 20, and a groove 41, in which the end 42 of the outer tube 20 is crimped. The shaft-bearing end member has a depression 43 in its barrel into which is forced a portion 44 of the periphery of the outer tube 20, thereby preventing the shaft-bearing end member 39 from rotating. The last-mentioned member has a flange 45, of greater diameter than the diameter of the outer tube 20. The key end 34 projects through the aperture 46 in the shaft-bearing end member, and is provided with a collar 47 in which is the groove 48, which may be engaged by the locking pawl 49.

As shown in Fig. 1, the sash balance is placed in position between the sides of the window frame 50. The pintle 26 and the key end engage suitable receiving apertures in the frame. The sash balance chains 51 are suitably attached to the upper portion of the sash 52 and on their opposite ends are riveted, or otherwise suitably attached, to the outer tube 20.

Having thus described the construction of the parts which are used in my invention, its operation may now be readily understood: When it is desired to raise the sash 52, the latter may be pushed upwardly, this action being assisted by the coiled spring 29 which is under tension. The key end 34 and the hollow shaft 31 are held stationary while the outer tube 20 and the block 27 rotate, thus uncoiling and gradually decreasing the tension on the spring 29. As the sash 52 continues to be raised, the chains 51 are coiled about the outer tube 20, but are prevented from passing over the ends of the same by means of the flanges 25 and 45. When the sash 52 is again lowered, the sash chains 51 are, of course, uncoiled, and the spring 29 is again placed under increased tension.

It will be apparent to those skilled in the art that many changes could be made in the detailed construction of the parts which I have described without departing from the spirit or scope of my invention.

What I claim is:

1. In a sash balance, the combination of a metallic tube, and an end member for said tube, said end member having a groove, the said tube having its end portion upset into the groove, whereby said end member is held in position in said tube, substantially as described.
2. In a sash balance, the combination of a metallic tube, a pair of end members for said tube, each of said end members having a laterally projecting flange and a groove, the said tube having its end portion engaging within the groove, and a balance chain attached to the outer surface of said tube and adapted to be coiled about the latter and confined thereon by the flange upon rotation of said tube, substantially as described.
3. In a sash balance, the combination of a metallic tube, a shaft within said tube, a pair of end members for said tube, each of said end members having a laterally projecting flange and a groove engaged by the edge of said tube, a key end attached to said shaft and projecting through one of said end members, a block mounted in said tube and within which said shaft is adapted to rotate, and a spring inclosing said shaft and fastened on one end to said block and on the opposite end to said key end, substantially as described.
4. In a sash balance, the combination of a seamless metallic tube, a pair of end members for said tube, each of said end members having an outwardly projecting flange of greater diameter than the diameter of said tube and a barrel portion extending within the end of the tube, said barrel portion having a groove, said tube having its end portion crimped into the groove, spring means for rotating said tube, and a balance chain

attached to the outer surface of said tube and adapted to be coiled about the latter and confined thereon by the flange when the tube is rotated, substantially as described.

said tube and a depression engaged by a portion of the periphery of said tube, where- 10
by said end member is securely held in position, substantially as described.

5 5. In a sash balance, the combination of a metallic tube, an end member for said tube, said end member having a laterally projecting flange, a groove engaged by the edge of

EDWARD E. WHITMORE.

Witnesses:

HENRY M. HUXLEY,
L. E. HANNEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
