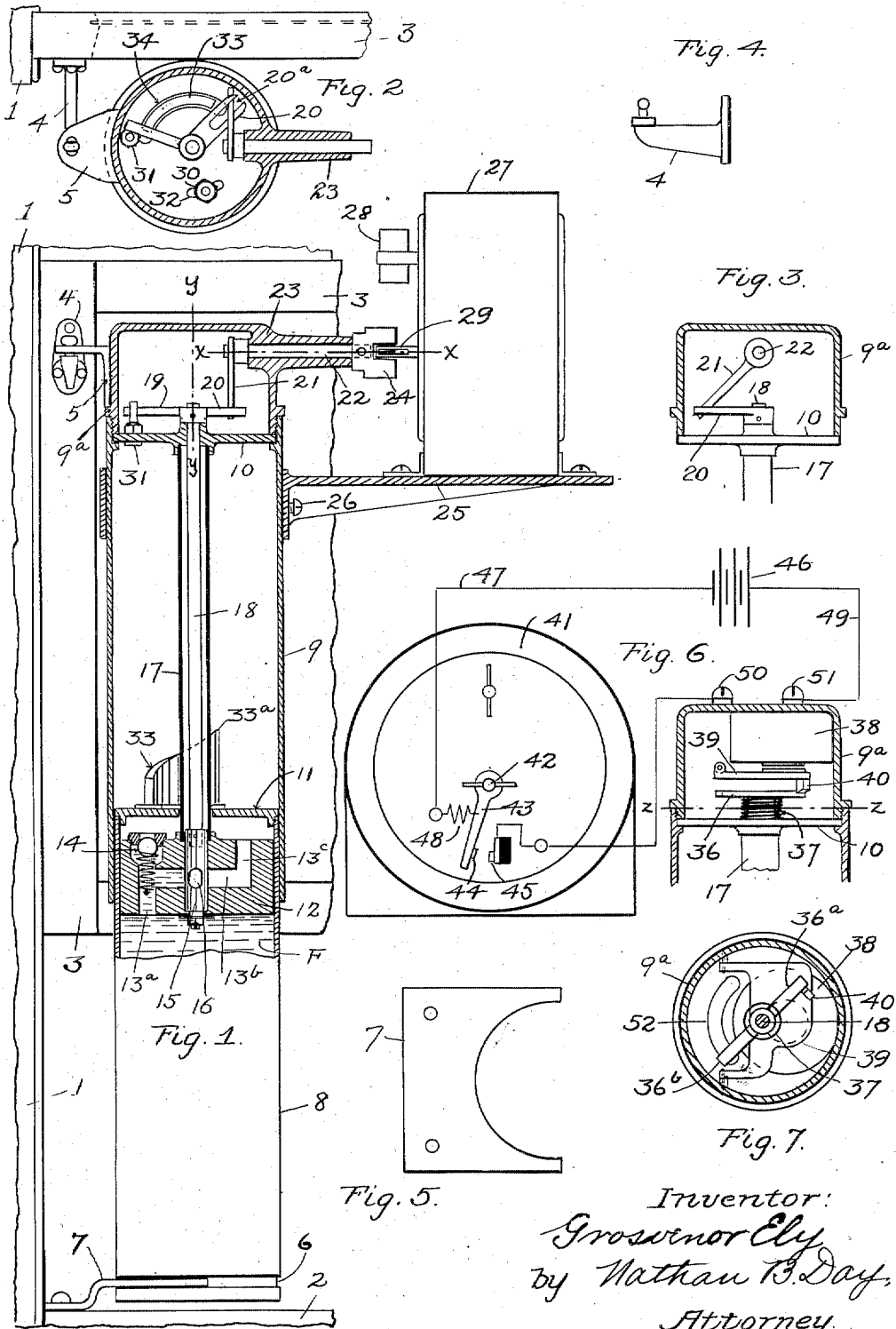


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WINDOW LOWERING DEVICE.
APPLICATION FILED MAY 9, 1916.

1,237,764.

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UNITED STATES PATENT OFFICE.

GROSVENOR ELY, OF NORWICH, CONNECTICUT.

WINDOW-LOWERING DEVICE.

1,237,764.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GROSVENOR ELY, a citizen of the United States, residing at Norwich, in the county of New London, State of Connecticut, have invented a certain new and useful Improvement in Window-Lowering Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has to do with apparatus which is designed to lower a window at a predetermined time, and has for its purpose the adaptation to a window frame and sash, of mechanisms arranged to permit the lowering of the window sash, on the operation of suitable time controlled devices which are substantially as hereinafter set forth and claimed.

Referring to the figures,—

Figure 1 is a view, partly in central section, showing my window closing device as applied to a single window.

Fig. 2 is a view of the same, partly in section on the plane $x-x$, in Fig. 1.

Fig. 3 is a view, partly in section, on the plane $y-y$ in Fig. 1, showing a portion of the upper part of my window lowering device.

Figs. 4 and 5 are views respectively, showing the upper and lower fastenings by which my window lowering device is preferably secured in position.

Fig. 6 is a view, partly in section, and partly in diagram showing the application of my invention in a slightly modified form, and one in which the window lowering mechanism by the timing device is rendered operative by the timing device through the agency of an electrical apparatus.

Fig. 7 is a view, partly in section on the plane $z-z$, in Fig. 6, showing the electrical apparatus by which the valve controlling the window lowering device is actuated.

Referring to the drawings, and first to Fig. 1,—the side of the window frame is shown at 1, at 2 is the window sill and 3 is one of the sashes of a window. The window lowering mechanism is located preferably at one side of the window sash; its upper end being attached to the sash through the bracket 4 and the ear 5 secured to the upper part of the window lowering device and easily detachably removable from said

bracket. The lower end of the said device is provided with a groove 6 adapted to detachably engage a supporting strip 7.

In the said Fig. 1 the window lowering device is shown of a size relative to the window sash which is entirely out of the proportions adopted in practice; this being done in order that the construction of the said device may be more clearly shown. In practice my lowering device is designed of such dimensions as to be compact in regard to the amount of space occupied and, in general, unobtrusive to the sight.

As appears in Fig. 1, the window lowering device consists of two freely telescoping tubular portions 8 and 9, the lower portion 8 being supported at its base in the manner hereinbefore set forth. To the upper telescoping portion 9 is attached the head portion 9^a being preferably threaded thereto, and also operating to secure in position the top disk 10. A bottom disk 11 is secured, preferably by threading, to the top of the lower telescoping portion 8.

Sliding within the lower telescoping portion 8 is the piston 12. Said piston has a vertical passage 13^a provided at its upper end with the ball check 14, or other type of check valve, which valve is arranged to permit fluid to pass therethrough from top to bottom only. Connecting with the said passage is a cross passage 13^b the communication through which is controlled, by the plug valve 15 provided with an opening 16 which, in the position shown in Fig. 1, is adapted to close the said cross passage 13^b, and in the position substantially at 90° to that shown in Fig. 1, is arranged to allow a free communication between the upper and lower sides of said piston through the passage 13^a, the cross passage 13^b, and the passage 13^c, opening to the upper side of the piston. The lower telescoping portion 8 is filled with fluid, F, such as glycerin or fluid of the like nature, and upon this fluid the piston 12 rests and is supported, when the plug valve 15 is in its closed position.

A tube or tubular support 17 is secured at one end in the top of the piston 12 and leads freely, though preferably with a close fitting joint, through the bottom disk 11 and up to the top disk 10; to the bottom of which it is secured. This tube 17 acts to

support the upper telescoping portion 9 of the lowering device upon the piston. Within the tube 17 is a shaft or rod 18 secured at its lower end to the plug valve 15 and extending through and freely rotatable with respect to the top disk 10. To the upper portion of the said rod 18 is secured a lever arm preferably with double arms as shown, and having one of the levers 20 forked and provided with the slot 20^a. The other lever 19, hereinafter termed the resetting arm, is preferably formed as an integral part of the forked lever.

In cooperating engagement within the slot 20^a of the said forked lever 20 is an arm 21 which is secured to a horizontal shaft 22 rotatably mounted in a bearing 23 provided therefor on the head portion of the lowering device; said rod 22 carrying at its outer end a slotted boss 24. The proportions of said forked lever 20 and the arm 21 and the cooperative engagement of the same are such that the said arm 21 is permitted to swing through an angle calculated to produce a corresponding rotation of the forked lever 20 and the valve 15 to which it is connected to an angle of about 90°.

Toward the upper end of the telescoping portion is supported thereon a shelf 25 which, through the set screw 26, may be secured thereto at the desired position of elevation. Upon said shelf is carried the timing mechanism which is designed to actuate the lowering device at the predetermined time. Said mechanism is preferably embodied in the form of an alarm clock 27 of ordinary type, 28 being the winding key thereof, and 29 the key for the alarm wind. The height of the shelf 25 and the position of the clock on the shelf, are so adjusted that said alarm wind key 29 is substantially concentric with the shaft 22, and the wings of said key 29 are entered within the slot formed in the boss 24.

Studs 30 and 31 are mounted upon the upper disk portion 10 which by contact with the lever arms mounted upon the shaft 18 serve to limit the range of angular movement of the said shaft 18. Said studs 30 and 31 are preferably mounted on said disk 10 in slots of which one is shown at 32, which slots are concentric with the shaft 18 and enable the adjustment of the studs in the desired position.

Upon the upper face of bottom disk 11 is carried a circular cam 33 concentric with the shaft 18 and having a cam surface on its upper edge. A slot 34 is also provided in the top disk 10 which is slightly larger than the cam 33 and is in concentric registration therewith, permitting said cam 33 to project upwardly through the slot 34 as the telescoping portions of the window lowering device close together.

The operation of the mechanism which I have hereinbefore described is as follows:—

Assuming the window sash to be raised and the apparatus to be in the position in which it is shown in Fig. 1, and the alarm to be wound and set for a stated hour, it will be noted that the weight of the sash is carried through the upper securing device and the upper telescoping portion, which in turn is supported upon the piston 12 through the tube 17. Inasmuch as the passage through the plug valve 15 and the check valve 14 are in their closed position, the piston is prevented from moving downwardly, and thus operates to hold the sash indefinitely in its raised position.

When the predetermined hour arrives and the alarm releasing mechanism, not shown in the drawing, operates, the action of the alarm mechanism will, in well-known manner, cause the rotation of the alarm wind key 29. Such rotation will produce a corresponding rotation on the part of the boss 24, engaged by the said alarm wind key 29, and will cause an angular motion of the arm 21. Said arm 21 through its engagement within the slot 20^a of the slotted lever 20 will produce a corresponding motion of said lever 20, said motion causing a rotation of the plug-valve 15 with respect to the piston 12 until the intercommunicating passage between the top and lower surfaces of the piston 12 is opened. When such communication is established, the weight of the sash, together with that of the upper portion of the lowering mechanism, will permit a slow lowering of the piston and the sash supported thereby, due to the weight of the sash and the upper parts of the lowering device as the fluid below the piston is allowed to pass through said communicating passages.

In practice the window weights of the window may require adjustment to insure the free sliding of the sash and positive operation of the device. Furthermore, it may be necessary to provide rollers or other frictionless bearings which may serve to prevent the binding of the window sash which is liable to occur by reason of the support for the same being applied at one corner of the sash, such rollers, however, not being shown in the drawings.

The stop 30 is set at such a point that it will limit the angular movement of the slotted lever 20 to a point about 90° from that in which it is shown in Fig. 2, the resetting arm 19, which moves simultaneously with said slotted lever 20, being moved through a similar angle. In such new location the arm 19 is in a position adapted to be engaged by the surface of the circular cam 33 which surface at a point 33^a adjacent its highest point as the upper and lower portions of the

lowering device reach the limit of their telescoping movement, projects upwardly through the upper disk 10. As the telescoping motion continues, the engagement of the said cam surface with said resetting arm 23 will cause the said arm to move angularly in a direction opposite to that in which it was caused to move by the swinging of the arm 21, in respect to the action of the timing device and this reverse motion will be continued until as the limit of the telescoping motion of the portion of the lowering device is reached, the said arm is returned to its initial position. At the same time the slotted lever 20 and the vertical arm 21 are caused to be returned to their initial positions, said operation further effecting a re-setting or rewinding of the timing device through the shaft 22 and the boss 24, engaging the alarm wind key. The effect of the return of the parts just mentioned to their original position, will, it will be further noticed, be to revolve the plug valve returning it to its closed position.

When desired to re-open the window this may be readily done without dismounting the device from the window frame and sash, the lower telescoping portion of the same being prevented from being moved upward by the lower securing device, while the check-valve 14 affords a passage through which the liquid lying above the piston in its lowered position may flow through the same as the sash, and the piston connected therewith through the upper telescoping portion, as hereinbefore described, is raised.

The device which I have heretofore described is one in which the timing device and the lowering device are combined in a single integral mechanism. My invention may, however, be applied in a modified form which permits one time-piece to control a plurality of lowering devices. I effect this result by employing electrical devices to effect the rotation of the plug valve 14 at the proper time.

In such modified mechanism shown in Figs. 6 and 7, the construction, with the exception of the head 9^a are substantially identical to that already hereinbefore shown and described. The rod 18, however, carries instead of the slotted lever 20, a double-arm lever 36 as shown in Fig. 7 with the two arms 36^a and 36^b. Lying around the hub of said lever 36 is a coiled wire spring 37 which is arranged to normally impel the said lever 36 and the rod 18 into the position corresponding to that in which the plug valve 15 opens the intercommunicating passage between the upper and lower surfaces of the piston 12.

Located within the said head 9^a is an electromagnet 38 which, when energized by an electric current, is adapted to attract the

armature piece 39 on which is carried a latch 49. Said latch normally, by its weight or otherwise, tends to occupy a lowered position, and in such position it is arranged to engage against the side of the lever arm 36^a when said lever is turned into such position that the plug valve 15 closes the intercommunicating passage in the piston 12 and hold said arm 36^a in opposition to the pressure of the spring 37.

The time piece may be an alarm clock of ordinary type. On the alarm wind is mounted a lever 43 carrying a contact 44 which is arranged to engage a cooperating contact 45 insulated with respect to the contact 44.

From a battery 46 one wire 47 leads, through a yielding connection 48, to the lever 43 and the contact 44. Another wire 49 from said battery leads to the binding post 51 on the head of the lowering device, and thence, by wiring, not shown in the drawing, through the magnet 38 and another binding post 50 to the insulated contact point 45.

The operation of this modified device is as follows:—

On the release of the alarm mechanism the rotation of the alarm wind will cause the lever arm 42 to rotate until the contact point 44 comes into engagement with the contact point 45, thereby closing the electric circuit, and causing the battery 46 to energize the electromagnet 38. Such energization will effect the raising of the armature 39 thereby releasing the latch 40 and allowing the lever arm 36^a to turn in under the pressure of the spring 37 until the rotation of the same with the rod 18 has caused the plug valve 15 to open the intercommunicating passage between the upper and lower surfaces of the piston. Thereafter the device will operate to permit the window, to which it is applied, to lower in a manner substantially identical with that of the device hereinbefore described, the exception, however, being noted that the automatic re-setting of arm 36 does not operate to re-wind the clock alarm in this particular form of my invention.

For the sake of clearness, I have in Fig. 7, shown the slot 52 provided to permit the passage of the circular cam 33 and the lever arm 36^b in somewhat different positions than that in which they appear in Fig. 2. This change, however, is not material. Further, if desired, the said cam may be arranged to engage directly upon the lever arm 36^a dispensing with the lever arm 36^b.

It is obvious that one timing mechanism can be applied to control a plurality of lowering devices of the type last described; it being necessary merely to provide individual circuits leading from the battery and all of which are controlled by the same timing

mechanism to the different lowering mechanisms which it is desired to have the same control. The modifications necessary to accomplish this result can be readily effected
5 by any competent electrician and I have not for that reason further illustrated or described the same in this application.

While my invention is more particularly designed for the use hereinbefore described,
10 the means by which the escape of the fluid of which the confinement between the cooperating sliding members of my device fixes the relative position of said members, is caused to take place at the desired time, are
15 capable of employment in many other connections to advantage.

I claim as my invention:—

The combination of a dash-pot adapted to support a window-sash, comprising a piston with a valve therein adapted to be opened at
20 a time piece at a predetermined time, and an outer casing with a hollow head, inclosing members 19, 20 and 31, and means for supporting a stub-shaft, substantially as described.
25

In testimony whereof I affix my signature in presence of two witnesses.

GROSVENOR ELY.

Witnesses:

NATHAN B. DAY,
CHAS. F. RANDALL.

It is hereby certified that in Letters Patent No. 1,237,764, granted August 21, 1917, upon the application of Grosvenor Ely, of Norwich, Connecticut, for an improvement in "Window-Lowering Devices," an error appears in the printed specification requiring correction as follows: Page 4, line 23, claim, for the reference numeral "31" read 21; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of September, A. D., 1917.

[SEAL.]

R. F. WHITEHEAD,

Acting Commissioner of Patents.

Cl. 161—1.