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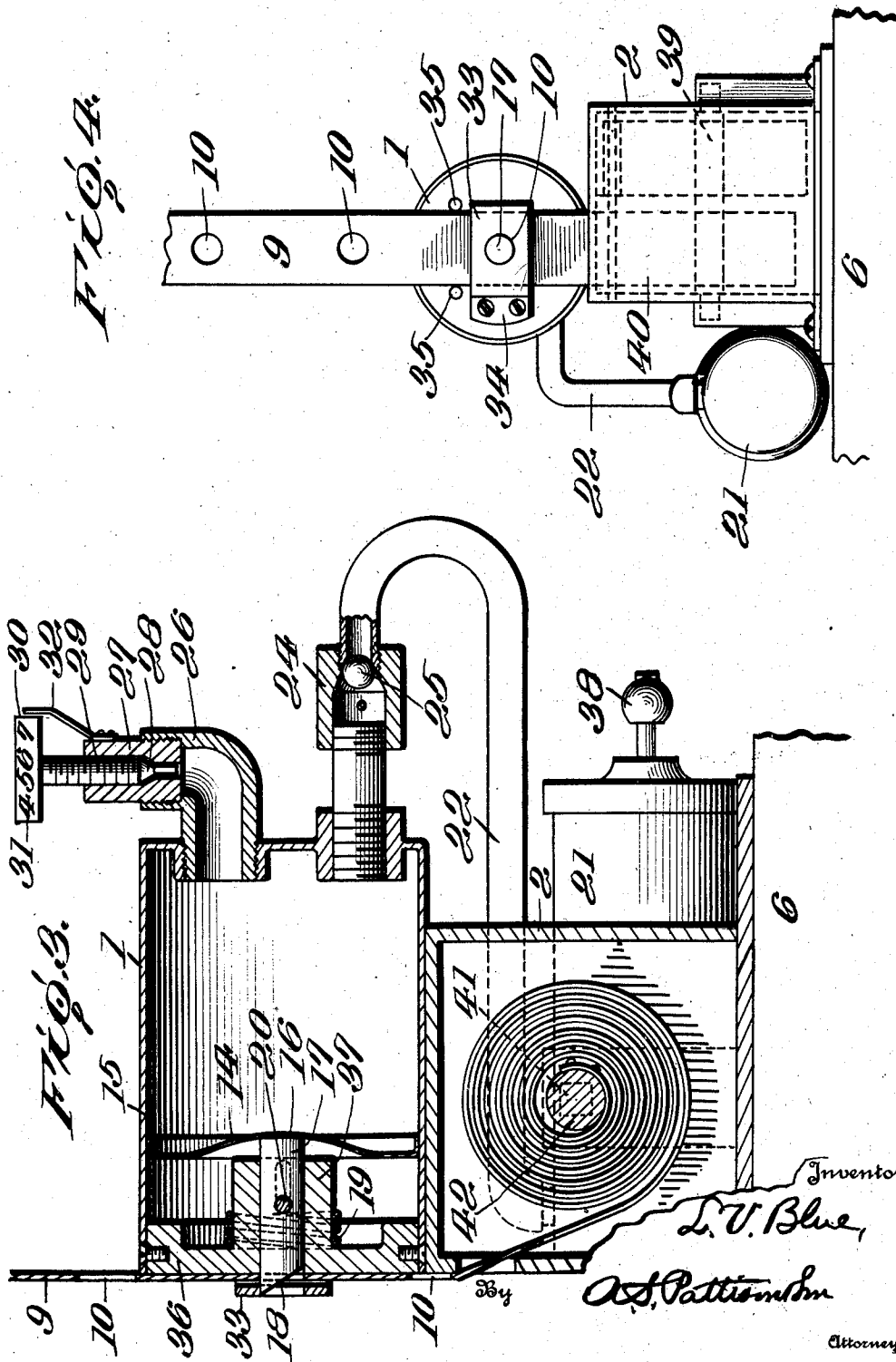
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AUTOMATIC CLOSER FOR WINDOWS AND THE LIKE

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2 Sheets-Sheet 2



## UNITED STATES PATENT OFFICE.

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## AUTOMATIC CLOSER FOR WINDOWS AND THE LIKE.

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This invention relates to improvements in automatic closers for windows and the like, and the primary object of the invention is to provide means for holding the window open a limited time and then automatically causing it to close, whereby an open window can be automatically closed at any given time in the morning and the room heated by the usual heating apparatus before the occupant of the bed is required to arise.

My invention is adapted to be used for automatically operating other devices at stated times as will appear hereinafter.

It is common to open windows in rooms before retiring at night, and different types of devices have been constructed for automatically closing the windows, but so far as I am aware, these devices have not come into general use.

One object of my present invention is to construct a device for the above described purpose that is comparatively cheap and simple in construction and easily applied to any window.

Another object of the invention is to provide the device with a manually operated means for charging it, and holding the window open and for releasing the charge and releasing the holding means for the window, the window then being automatically closed.

Further objects of the invention will appear from the following description:

Figure 1 is a side elevation of my improved automatic window closing device, the same being shown attached to a window sill and in conjunction with a window.

Figure 2 is a front elevation of the same.

Figure 3 is an enlarged vertical central sectional view of my improved window operating device.

Figure 4 is a front view of the modified form.

I here show a mechanical expression of my present improvement, which may be varied in certain respects without departing from the spirit of the invention so long as it is within the scope of the appended claims.

In the form of the invention here shown, I have a suitable cylinder 1 which is here shown mounted on a suitable casing 2 that

contains within it a suitable spring 3. The cylinder 1 will be attached to the casing 2 by spot welding, bolts or otherwise, and the casing provided with a flange portion 4 through which screws 5 pass into the window sill 6. 7 indicates the sash of a window and 8 its glass.

The spring 3 may be elongated to form a tape 9 which is provided with a plurality of openings 10 located at suitable points throughout its length. Instead of having the spring itself extended as just described, it will be readily understood that any suitable material may form the tape 9 and have its end attached to the end of the spring. The upper end of this member 9 is preferably provided with a loop 11 that is passed over a hook 12 carried as here shown on an upwardly extending member 13 that has its lower end 14 suitably attached by screws or otherwise to the window sash 7.

I here show a diaphragm 14 having its periphery 15 welded or otherwise air tight attached to the inner side of the cylinder. This diaphragm will be made of thin metal whereby it can be pressed outward, and the diaphragm preferably has its central portion 16 bulged outward whereby it can be forced or pushed in the opposite direction. A bolt 17 is slidably mounted in the inner end of the cylinder 1 and its outer end 18 beveled as shown whereby the tape can freely pass upward by the end of the bolt, and when the bolt passes in one of the openings 10 of the said member 9, its upper surface end will engage with the upper wall of the opening 10, thereby preventing the said member 9 and the window to which it is attached from being pulled down and the window closed.

I here show any suitable form of coil spring 19 that will serve to engage a suitable pin or projection 20 extending from the bolt 17, whereby the bolt is normally spring held in its inward position.

Attention is directed to the fact that the inner end of the bolt engages the center of the diaphragm, and should it be desired the bolt can be attached to the diaphragm in any suitable air tight manner.

It will be understood, of course, that the diaphragm is normally of the shape shown,

whereby after being pushed outward sufficiently to actuate the bolt, it will normally spring inward.

For the purpose of charging the cylinder 1 preferably with air pressure, I provide a suitable hand pump 21 that is connected by a pipe 22 with the cylinder at 23. At 24 I show a suitable nipple and a valve 25 that normally closes the pipe 22 against outward passage of air from the said cylinder. Also attached to the cylinder is a suitable pipe or other connection 26 carrying at its outer end a nipple 27, the said nipple provided with a screw threaded needle valve 28. At the outer end of the stem 29 of this valve is a disk handle 30 that has on its periphery any desired number of numerals 31 that can be made to register with a pointer 32. The object of this handle 30 thus marked will be presently described.

For the purpose of holding the member 9 in proper relation with the extended end of the bolt 17, I provide a member 33 that has its end 34 suitably attached to the inner end of the cylinder 1. Guiding pins 35 also project from the outer end of the cylinder and are located at each side of the tape or other device 9 for suitably guiding it in its movements.

In the form here shown I preferably close the inner ends of the cylinder by a member 36, which carries a central opening that receives the bolt 17, the said member 36 provided also with an inwardly projecting portion 37 through which the bolt passes, thus making a bearing therefor.

The pump 21 is an ordinary air pump provided with a handle 38 for forcing the air through the pipe 22 to the cylinder 1 thereby furnishing the cylinder with air pressure. This pump 21 is provided with the usual air valve or valves (not shown) as they are well understood.

Instead of having the end of the spring act as the member 9, the said casing 2 may be extended laterally as shown in Figure 4. This lateral extension will have the spring 3 attached to a suitable shaft 39 while its end is attached to the casing by a pin or other device 5. In this instance a spool or other like device 40 may be carried by the shaft and the inner end of the member 9 attached to the spool. It will be understood of course that when the member is drawn outward, the spring will be wound up, and that the spring always is under tension pulling down on the member 9.

It is unnecessary to specifically describe the manner of holding the spring shaft against rotation, but it will be stated that its end or ends 41 are squared and fit in square openings either in the walls of the box or other member, and that the inner end of the spring 42 is attached to the shaft. Suitable provision is made whereby the shaft

can be rotated for putting the spring under the desired tension for pulling the window down.

The operation of the device is as follows: The pump handle 38 is operated until the cylinder 1 is filled with air under considerable pressure. This air pressure will force the center 16 of the diaphragm 14 and cause it to push the bolt 17 into the position shown in Figures 1 and 3. The cylinder can be provided with any desired air pressure and the valve 28 closed during that operation. When the window 7 is raised the desired height, the end 18 of the bolt will engage an opening 10, thus holding the window in the adjusted position. In order to cause the window to automatically close say at 7 o'clock a. m., the handle 30 will be turned until "7" is at the pointer 32. This will permit enough air gradually to escape so that the window will be closed at that time, likewise as to the other figures on the handle 30.

Therefore on retiring it is only necessary to charge the cylinder 1, turning the handle 30 to the number indicating the hour that it is desired the window should close in order to operate automatically, whereby the room will be warm when the occupant arises.

Instead of having the numbers on the handle 30 indicate the hour that it is desired the window should close, it may indicate the number of hours that it will require the air to escape and release the bolt 18. When a person retires at a given time, then the numbers may be used to indicate the hour that the window will close. When, however, the occupant is irregular in retiring, then the numbers will indicate the amount of hours required for the pressure to properly be lowered to withdraw the bolt 18. By that is meant that a person retiring at 11 p. m. who is desirous of having the window closed at 7 a. m. should set the device at "8" which would mean that 8 hours are required for the pressure to release the bolt 18 and the window to close.

It will of course be understood that the threads on the stem 29 of the valve 28 will be very fine since the adjustment of the air valve must be delicate in order to prevent the too rapid escape of air and at the same time enable the valve stem to be turned to have the numbers on the wheel at the pointer 32. It will also be understood that instead of the handle 30 a lever may project inwardly from this wheel and the lever swing past a numbered dial, the operation then being substantially as that described for the wheel. I desire it also to be understood that this device may be used in connection with dampers, radiator valves, etc., to cause them to be opened or closed at specified times, for the purpose of regulating the heat.

Different forms of diaphragms may be used in the cylinder, that is to say it may

be corrugated to permit its longitudinal movement, and this may be made in the locking device operated by the diaphragm and other details may be changed, all without departing from the spirit and scope of the said invention as expressed in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

10 1. A device for automatically closing windows comprising a pressure receiving cylinder, a spring actuated member in the cylinder and adapted to be forced in the opposite direction by pressure in said cylinder; means movable past the said member which is connected with the window, said spring actuated member adapted to lock and release the said movable means by the action of the spring and the air pressure within the tank.

20 2. A device for automatically closing windows comprising a pressure receiving cylinder, a spring actuated member movable in the cylinder which is moved in the opposite direction by the pressure in the said cylinder, means movable past the said member, said means having openings engaged by the projecting end of the member for holding the window open, and pressure means for releasing the said member, whereby the window is held open and is released.

30 3. A device for automatically holding windows open and for closing them, comprising a pressure receiving cylinder, a locking and releasing member actuated by the pressure in the cylinder, a spring actuated tape having one end connected with the window, the tape having a plurality of openings to receive the said locking and releasing member, whereby the said window is held open and is automatically closed by the spring tape.

40 4. A device of the character described comprising a pressure receiving cylinder, a pressure actuated device projecting from the cylinder and having its end inclined upwardly, a tape having one end connected with a window or the like and the tape having openings adapted to be engaged by the locking member for holding the said window open, means for providing pressure in the said cylinder, and means for gradually releasing the said pressure in the cylinder.

50 5. A device of the kind described comprising a cylinder having a pressure actuated diaphragm therein, a locking and releasing member operated by the diaphragm, means for supplying pressure to the cylinder and means for gradually releasing the pressure from the cylinder.

60 6. A device of the character described comprising a pressure receiving cylinder having a diaphragm therein adapted to be actuated by pressure, means for supplying pressure to the cylinder, a locking and releasing member actuated by the diaphragm,

a spring engaging the locking and releasing device, means for supplying pressure to the cylinder and means for releasing gradually the said pressure from the cylinder.

70 7. A device of the character described comprising a cylinder having a diaphragm, a reciprocating bolt located outside of the diaphragm and operated thereby, a hand operated pump having connection with the cylinder, means connected with the cylinder for gradually releasing the pressure therein and a spring actuated tape movable by the end of the bolt for the purpose described.

80 8. A device of the character described comprising a cylinder having a diaphragm secured therein, a bolt projecting beyond one end of the cylinder and actuated by the diaphragm, a spring, an elongated perforated member operated by the said spring and movable past the extending end of the bolt, means for supplying pressure within the cylinder, and means for slowly permitting the escape of pressure from the cylinder.

90 9. An automatic device for holding and releasing a window and the like comprising a cylinder having a diaphragm, a locking and releasing member projecting from the cylinder and actuated by the diaphragm, a spring, an elongated member having its outer end connected with the window and its opposite end operated by the said spring, means for supplying pressure within the tank and means for slowly releasing the said pressure from the tank.

100 10. A window locking and releasing device comprising a cylinder having a diaphragm, a locking member projecting from the cylinder and operated by the diaphragm, the outer end of the locking member tapered downwardly, a spring, an elongated perforated member operated by the spring having its outer end connected with the window, means for supplying pressure to the cylinder and means for gradually releasing said pressure.

110 11. A device for the purpose described comprising a cylinder having a diaphragm, a locking member projecting from the cylinder and operated by the diaphragm, means for supplying pressure within the cylinder, a pressure escape for the tank adapted to be set to release the pressure within a given time from the cylinder, thereby operating the locking member.

120 12. A device of the type described comprising a cylinder, means for supplying pressure to the cylinder, a locking member operated by the said pressure, a release for the said pressure carrying a dial member whereby it is adapted to be set to release the pressure within adjustable periods.

130 13. A device of the character described comprising a cylinder adapted to contain pressure, a locking and releasing member

operated by the said pressure and means connected with the tank for relieving the said pressure, said means adjustable for varying the period of time required to release the said pressure for the purpose set forth. 5 the said pressure. 10

14. A device of the type described comprising a pressure cylinder, a locking means operated by the pressure of the said tank, a

hand pump connected with the said tank for supplying pressure thereto and pressure releasing means connected with the tank adjustable to vary the time required to release the said pressure.

In testimony whereof I hereunto affix my signature.

LOUIS V. BLUE.