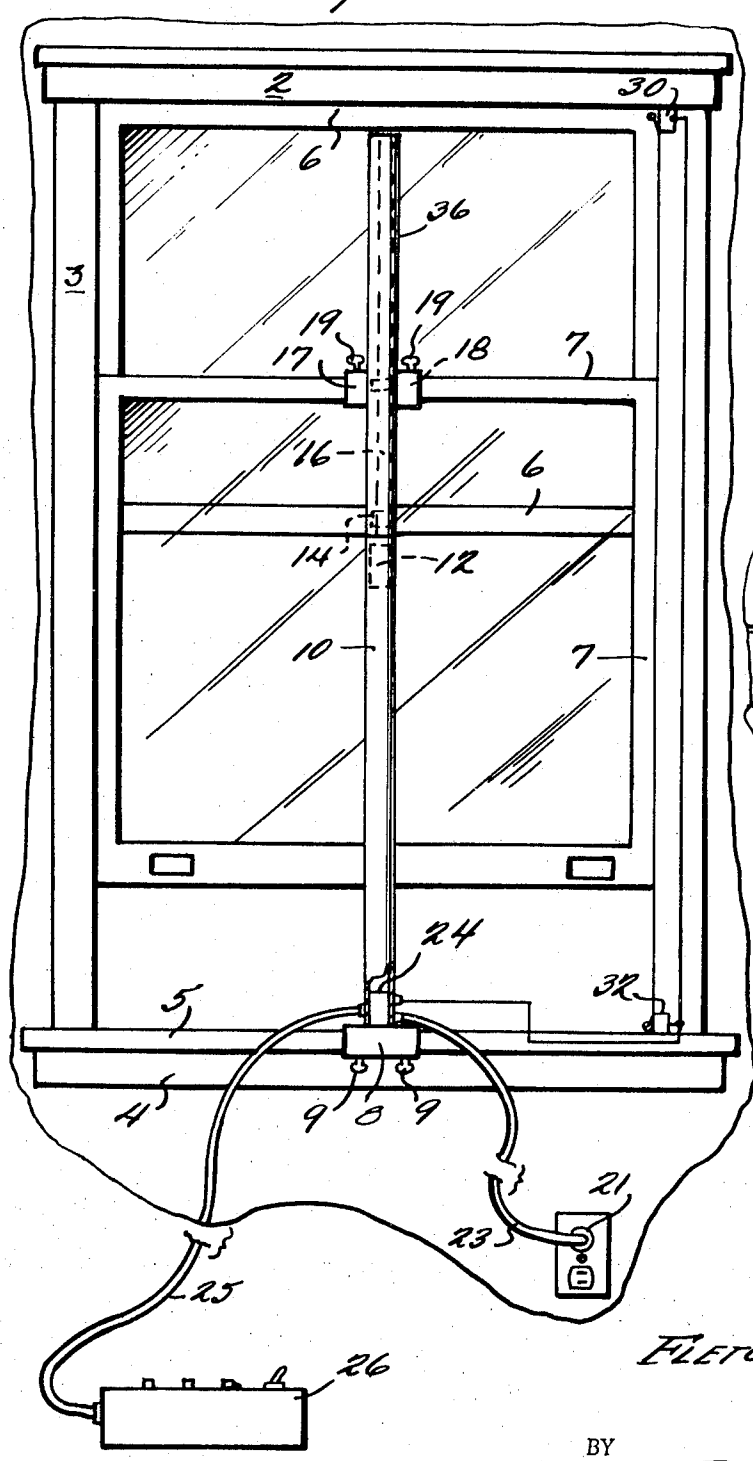
Sept. 30, 1969 F. HANKS 3,469,345

DEVICE FOR OPENING AND CLOSING WINDOWS

Filed June 21, 1968

Fig. 1



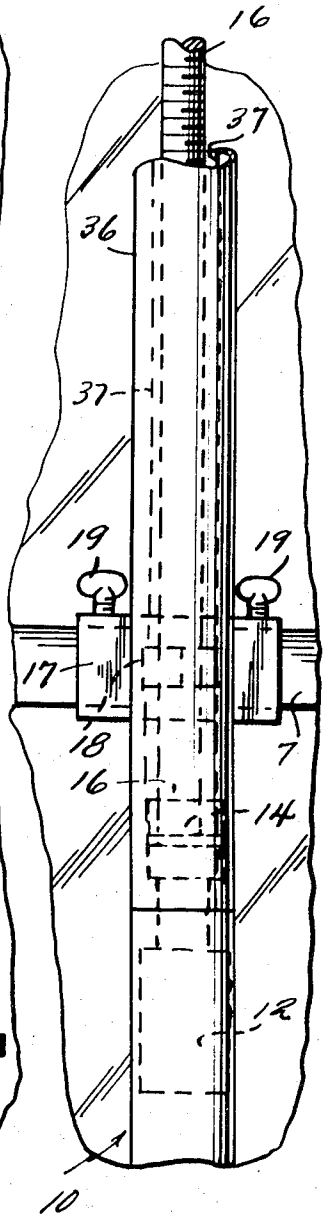


Fig. 2

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DEVICE FOR OPENING AND CLOSING WINDOWS

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ABSTRACT OF THE DISCLOSURE

A clamping bracket on the window ledge of the lower window sill supports the lower end of a vertically disposed reversible electric motor, the shaft of which drives an elongate screw-threaded shaft engaging a nut carried by a clamping bracket attached to the upper transverse member of the window sash; and remotely controlled means are provided for operating the reversible electric motor both thermostatically and manually.

The present invention relates to devices for opening and closing windows either automatically in accordance with temperature changes and/or from a remote location.

In the past there have been numerous proposals for automatically opening and closing windows of both commercial and household types; and to a large extent they appear to be characterized by costliness to manufacture and install as well as comprising combinations of elements which are unsightly.

In a number of these prior art devices, the controls, which are usually thermostatically-operated, are disposed adjacent the window and are adjustable thereat.

It is among the objects of the present invention to provide a device for opening and closing a window from a remote position and on either a temperature-responsive, or manual take-over basis.

Another object of the invention is the provision of a device possessing the foregoing attributes which is highly efficient and durable in service yet inexpensive to manufacture and install.

Still another, and equally important, object is to attain the foregoing objectives with a device which is not unattractive in appearance and which may be quickly and easily installed by a person with but little mechanical skill.

These and further objects and advantages will become more readily understood from the following description to be read in conjunction with the attached drawings wherein like numerals designate like parts and wherein.

FIGURE 1 is an elevational view of a device embodying the teachings of the present invention as attached to an ordinary household window of the vertically slidable type;

FIGURE 2 is a fragmentary elevational view illustrating certain of the parts in more detail, including a cylindrical housing for the upper portion of the device.

Referring more particularly to the drawings, the numeral **2** designates the top member of a conventional window frame which also comprises side members **3** and a bottom or sill member **4**, the latter shown as provided with the usual window ledge **5**.

Within the confines of the window frame are the usual slidably disposed upper and lower window sashes **6** and **7**, respectively, each carrying a single window pane or a plurality thereof, i.e. two-over-two, four-over-four, etc. as the custom dictates.

According to the present invention a bracket is provided for attachment to the bottom or sill member **4** of the window frame, the same being shown in the present instance as a substantially U-shaped clamping bracket **8** which is horizontally disposed to embrace the window

ledge **5**, being held in position by wing-headed clamping screws **9**.

Secured to the upper member of the horizontally disposed U-shaped clamping bracket **8** is the bottom of a superposed elongate tube **10** which houses a vertically disposed reversible electric motor **12**.

The armature shaft of the vertically disposed reversible electric motor **12** extends through and projects from the upper end of the elongate tube **10**, and carries a shaft coupling **14** which is connected to the lower end of a vertically extending screw-threaded shaft **16**.

A U-shaped bracket **17** which is adapted for attachment to the upper transverse member of the lower and inner slidable window sash **7** carries a nut **18** which engages and rides on the vertically extending screw-threaded shaft **16**.

The bracket **17** may either wholly or partially embrace the upper transverse member of the lower window sash, and it is firmly secured thereto by wing-headed clamping screws **19**.

In order that no substantial portion of either of the window sashes **6** and **7** be obscured, it is important that the dimensions of the elements described be kept to an acceptible minimum.

The vertically disposed reversible electric motor **12** is shown as being powered by 110-volt household current through a conventional attaching plug **21** and lead-in cord **23**, although the invention is by no means limited thereto.

The lower end of the vertically disposed reversible electric motor **12** is so positioned as to provide a space between it and the bottom of the elongate tube **10** for the usual motor control elements which are generally indicated at **24**.

Extending from the motor control elements **24** at the bottom of the elongate tube **10** is a relatively long electric cord **25** which is connected at its outer end with a portable motor or control box **26** containing a conventional temperature-responsive switch having manual adjusting means and indicia to determine the setting thereof.

The excessive upward and downward movement of the nut **18** on the vertically extending screw-threaded shaft **16** is prevented by suitably mounted upper and lower limit switches **30** and **32**, respectively, the same being so connected, through wiring **34**, to the motor control elements **24** at the bottom of the elongate tube **10** as to break the circuit to the electric motor upon reaching the upper and lower levels of the slidable window sash **7**.

By reason of the relatively long electric cord **25** the portable motor control box **26** may be remotely disposed with respect to the window; for example on a bedside table.

In any event it will be seen that the device of the invention will, from a remote position, effectively adjust the position of the lower window sash **7** either automatically and in accordance with temperature conditions; or on a manual take-over basis.

If desired, the elongate screw-threaded shaft **16** may be completely enclosed by a cylindrical housing **36** having a longitudinal slot **37** at the rear to permit the nut **18** to move upwardly and downwardly with respect thereto.

On the other hand, the cylindrical housing **36** may be omitted, in which case it may be desirable to employ a nut **18** which is self-lubricating or one which is made of nylon.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A quickly and easily attachable and detachable device for opening and closing a vertically slidable window having a sash including vertically extending members

and upper and lower transversely extending members, together with a window frame having a head member, vertically extending jambs and a lower connecting still member; said device comprising, in combination

a tubular housing,

a bracket secured to said tubular housing and adapted for attachment to the sill of the window and in vertically extending relationship therewith,

a reversible electric motor disposed in said tubular housing with its drive-shaft in coaxial relationship therewith,

motor control elements in said tubular housing,

an elongate screw secured to and extending axially of the drive-shaft of said reversible electric motor,

a bracket adapted for connection to the upper transversely extending member of the window sash,

a nut secured to said last-named bracket and disposed on, and drivingly engaged by, said elongate screw,

a portable motor control box,

a relatively long electric cable connected at one end to said reversible electric motor and at the other end to said portable motor control box,

an electric cable connecting said reversible electric motor with an electrical outlet plug, and

upper and lower electric limit switches connected with said motor control elements for preventing the overtravel in either direction of said nut on said elongate screw.

2. The combination of claim 1, together with temperature responsive means in said motor control box for operating said reversible electric motor.

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