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WINDOW OPERATOR

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4 Claims. (Cl. 268—119)

This invention relates to improvements in window operators.

It is well known that most people living in dwellings, apartments and hotels keep the windows to their bedrooms open, or partly open, at night even during the winter. Hotel and apartment owners usually turn off the heat at night to conserve coal and turn it on in the morning in time to raise the temperature of the rooms to a comfortable degree by the time the tenants and guests usually arise. Where the windows are open, the cold air thus admitted consumes the heat and makes it practically impossible to raise the temperature and as a result much coal or other fuel is wasted.

It is obvious that if all of the windows were closed at or before the heat is turned on in the morning a large amount of fuel would be saved.

It is the object of this invention to provide means for operating the windows, so that they may be manually adjusted by the tenant or guest and hold securely in adjusted position and which, at the same time, permits all of the open windows to be simultaneously closed by the building engineer, or by a clock controlled switch.

Tenants and owners of small residences also find this control device useful as by this means the bedroom and other windows will automatically close at any predetermined time which assures that the room will be warm when it is time to arise.

The above and any other objects that may become apparent as the description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail, and for this purpose reference will be had to the accompanying drawing in which the preferred embodiment of the invention has been illustrated, and in which:

Figure 1 is a digrammatic representation showing the invention applied to a casement window;

Figure 2 is a top plan view of the control mechanism, parts being broken away and shown in section to better disclose the construction;

Figure 3 is a front elevation thereof;

Figure 4 is a section taken on line 4—4, Figure 2;

Figure 5 is a view partly in section and partly in top plan taken on line 5—5, Figure 3;

Figure 6 is a fragmentary view showing a spring applied to a casement window to exert a closing force thereon;

Figure 7 is an end view looking in the direction of arrow 7, Figure 2;

Figure 8 is a fragmentary sectional view similar to that shown in Figure 2 and shows the position of the parts when the worm gear is in inoperative position;

Figure 9 is a diagrammatic view showing the invention applied to an ordinary vertical, slidable window; and

Figure 10 is a fragmentary top plan view of a modified form of armature.

In the drawing reference numeral 11 designates the lower surface of a window opening and reference 12 the lower rail of a casement window frame. The casement windows 13 is connected with the vertical casement frame member 14 by means of a hinge 15. A spring 16 is provided with its ends contacting the sash 13 and the casement frame member 14. The spring is so tensioned that it exerts a biasing force on the sash tending to move it to closed position.

Secured to the casement rail 12 is a sash operating device comprising a housing 17 having a chamber 18. This housing is preferably cast and is provided with ends 19 and an outer wall 20. Feet 21 extend beyond the end walls 19 and are provided with openings for the reception of screws by means of which the housing is secured to the rail 12. One side wall is provided with a bearing 22 in which is journaled the inner end 23 of a worm 24. The worm is provided with another trunnion 25 that is journaled in a removable part 26 which is secured to the housing by means of screws 27. A handle 28 is attached to the outer end of trunnion 25 and serves as a means for turning the screw. An arm 29 is provided at one end with an opening 30 for the reception of an eccentric pivot 31. This pivot is provided with cylindrical extensions 32 and 33 that are positioned eccentrically with respect to the pivot 31 and the extension 33 is journaled in a bearing 34 in the lower wall of the housing while the extension 32 is journaled in a bushing 35. The bushing 35 must be at least as large in diameter as the eccentric and is removable to permit the latter to be inserted and removed during the manufacture and assembly of the device. A spur gear 36 is nonrotatably connected with the upper end of the shaft or projection 32. The arm 29 has its pivot end provided with a gear segment 37 which cooperates with the worm so as to form a worm gear by means of which the arm 29 can be rotated about the eccentric pivot whenever the crank 28 is operated to rotate the worm. The free end of arm 29 is slidably connected with the window sash at 28 and therefore whenever the worm is rotated, the window sash is moved about its pivot. The worm gear serves

out of bed for this sole purpose some time before they ordinarily would do so, thereby allowing them an uninterrupted night's rest.

Having described the invention what is claimed as new is:

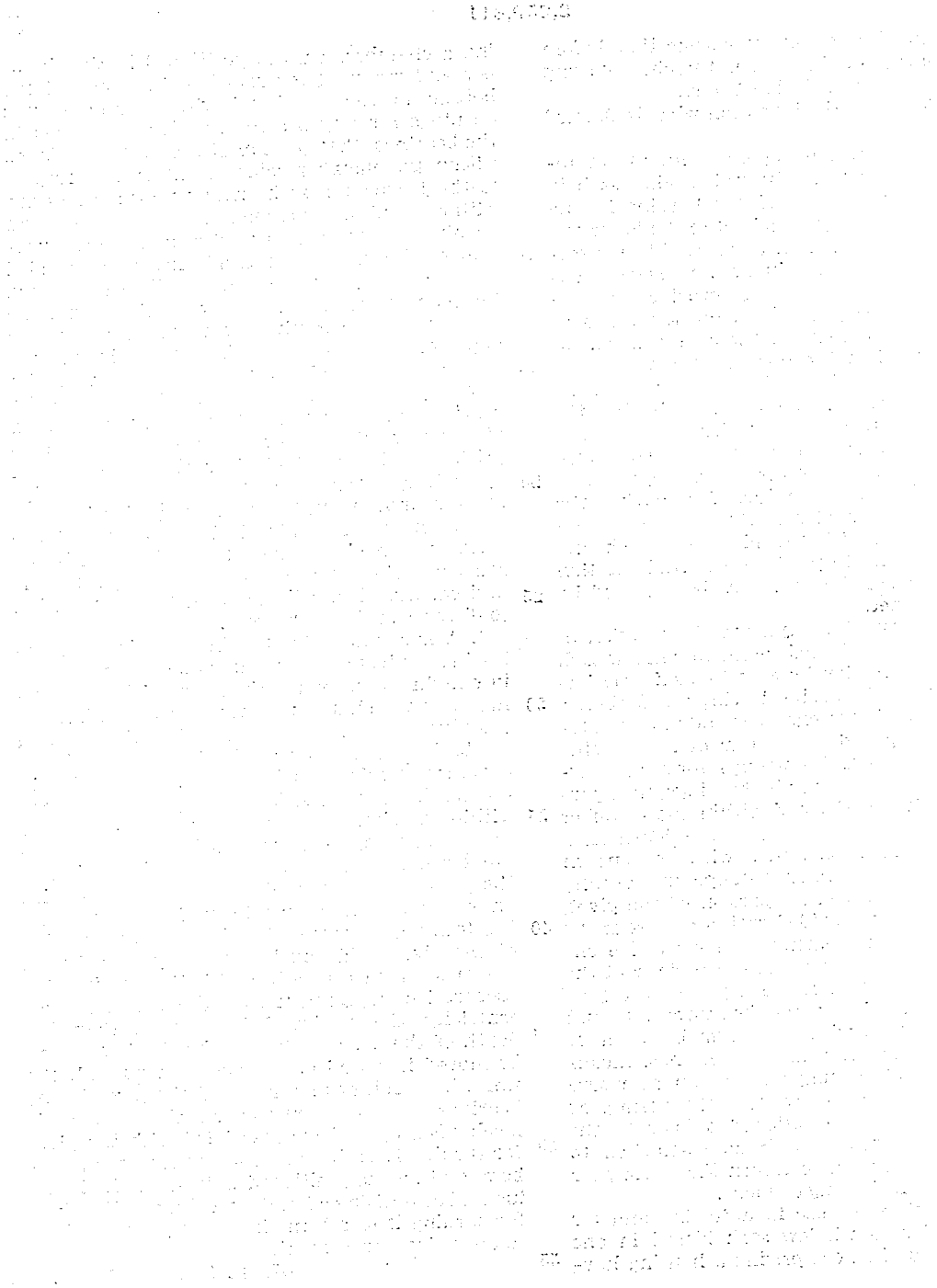
1. A casement window operator for use in adjusting the position of a hinged window sash in a window opening, comprising a housing having means whereby it may be joined to the lower rail of the casement frame, an eccentric pivot rotatably mounted in the housing, a window sash engaging arm having one end provided with a bearing for the reception of the pivot, a gear segment on the pivoted end of the arm, a worm rotatably mounted in the housing, the worm and gear segment being in mesh when the eccentric pivot is in one position and out of mesh when the pivot is rotated to another position, and means comprising an armature operatively connected with the pivot, and an electromagnet operatively associated with the armature for moving the same, a rack connected with the armature and a pinion connected with the pivot, the rack and pinion cooperating to produce a partial rotation of the pivot when the armature is attracted by the electromagnet.

2. A mechanism for adjusting the position of and for releasing a pivoted casement window sash biased in one direction by a spring, said mechanism comprising, a housing having a chamber, a worm positioned in the chamber and mounted for rotation, the top and the bottom of the housing having axially aligned openings forming bearings, a pivot journaled in the bearings, that portion of the pivot positioned within the chamber being eccentric with respect to the journals, a sash engaging arm positioned with one end in the chamber, said end having an opening forming a bearing for the eccentric portion of the pivot, said end being also provided with a gear segment concentric with the bearing for cooperative engagement with the worm, the eccentricity of the pivot being greater than the depth of the gear teeth whereby the latter may be moved into and out of engagement with the worm by a rotary movement of the pivot in the bearings, means comprising an electromagnet and an armature for turning the pivot to disengage the worm gear members, and means positioned outside of the housing and comprising a handle attached to the pivot for turning it to return the worm gear members to operative engagement.

3. A mechanism for use in adjusting and for releasing a pivoted window sash biased in one direction by a spring, comprising a housing having a chamber, a worm positioned in the chamber and mounted for rotation, the top and the bottom of the housing having axially aligned openings forming bearings, a pivot journaled in the bearings, that portion of the pivot positioned within the chamber being eccentric with respect to the journals, a sash engaging arm positioned with one end in the chamber, said end having an opening forming a bearing for the eccentric portion of the pivot, said end being also provided with a gear segment concentric with the bearing, for cooperative engagement with the worm, the eccentricity of the pivot being greater than the depth of the gear teeth whereby the latter may be moved into and out of engagement with the worm by a rotary movement of the pivot in the bearings, and means for turning the pivot in a direction to release the arm from the worm, comprising a pinion attached to the pivot, a rack operatively mounted on the housing for reciprocatory movement, the rack and pinion being in mesh, an armature attached to one end of the rack, and an electromagnet associated with the armature whereby when the electromagnet is energized, the pivot will be turned in a direction to disconnect the worm gear.

4. A mechanism for use in adjusting and releasing a pivoted casement window sash biased in one direction by a spring, comprising a housing having a chamber, a worm positioned in the chamber and mounted for rotation, the top and the bottom of the housing having axially aligned openings forming bearings, a pivot journaled in the bearings, that portion of the pivot positioned within the chamber being eccentric with respect to the journals, the bearing in the top being of a greater diameter than the eccentric portion of the pivot, a sash engaging arm positioned with one end in the chamber, said end having an opening forming a bearing for the eccentric portion of the pivot, said end being also provided with a gear segment concentric with the bearing, for cooperative engagement with the worm, the eccentricity of the pivot being greater than the depth of the gear teeth whereby the latter may be moved into and out of engagement with the worm by a rotary movement of the pivot in the bearings, means comprising an electromagnetic mechanism operatively associated with the pivot for turning it to disengage the worm gear members, and means positioned outside of the housing and comprising a handle attached to the pivot for turning it to return the worm gear members to operative engagement.

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Oct. 21, 1941. P. E. FUCHS 2,259,812

MATCH COVER

Filed Feb. 9, 1940

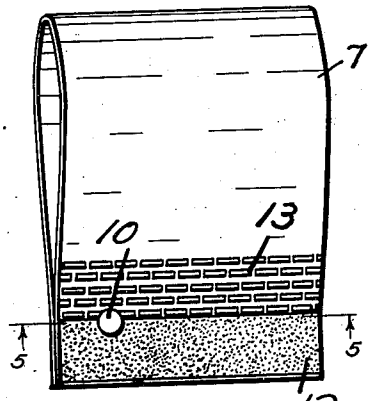


FIG. 1

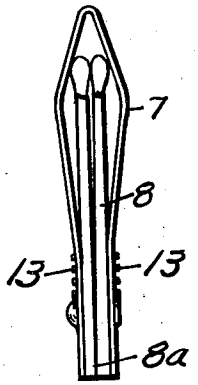


FIG. 2

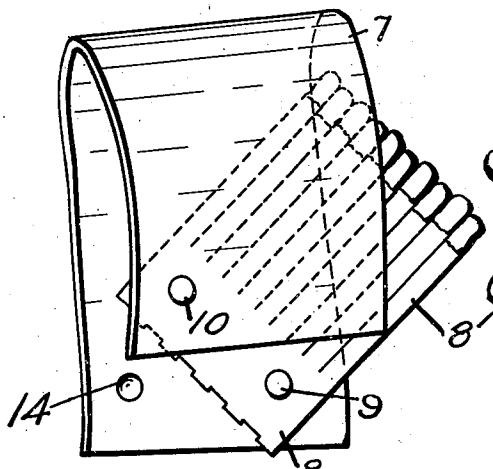


FIG. 3

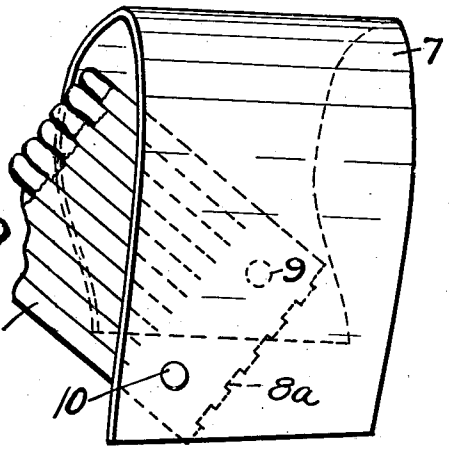


FIG. 4

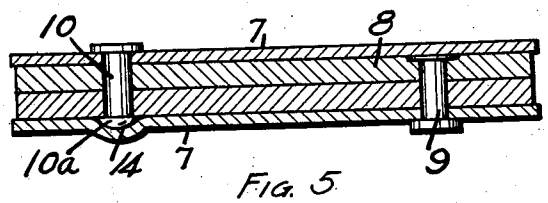


FIG. 5

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