No. 664,451. Patented Dec. 25. 1900.

W. ALFORD.

OUTSIDE WINDOW BLIND.

(Application filed May 16, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 2.

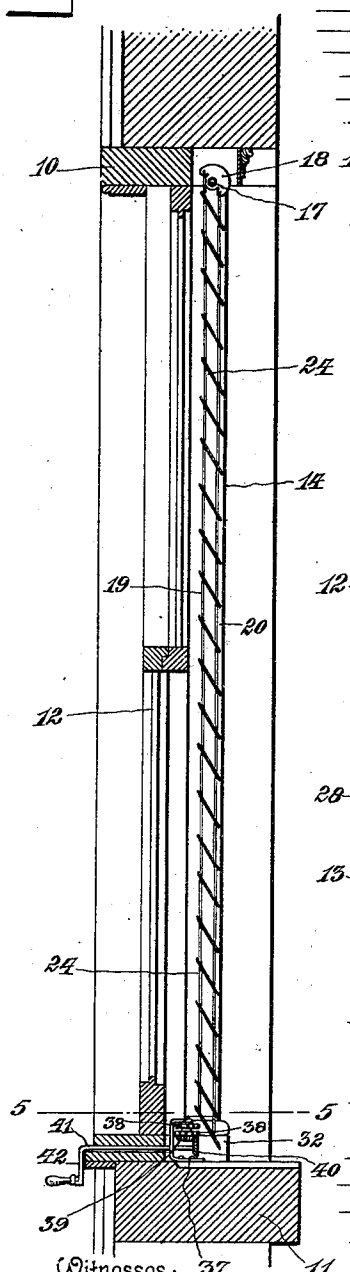
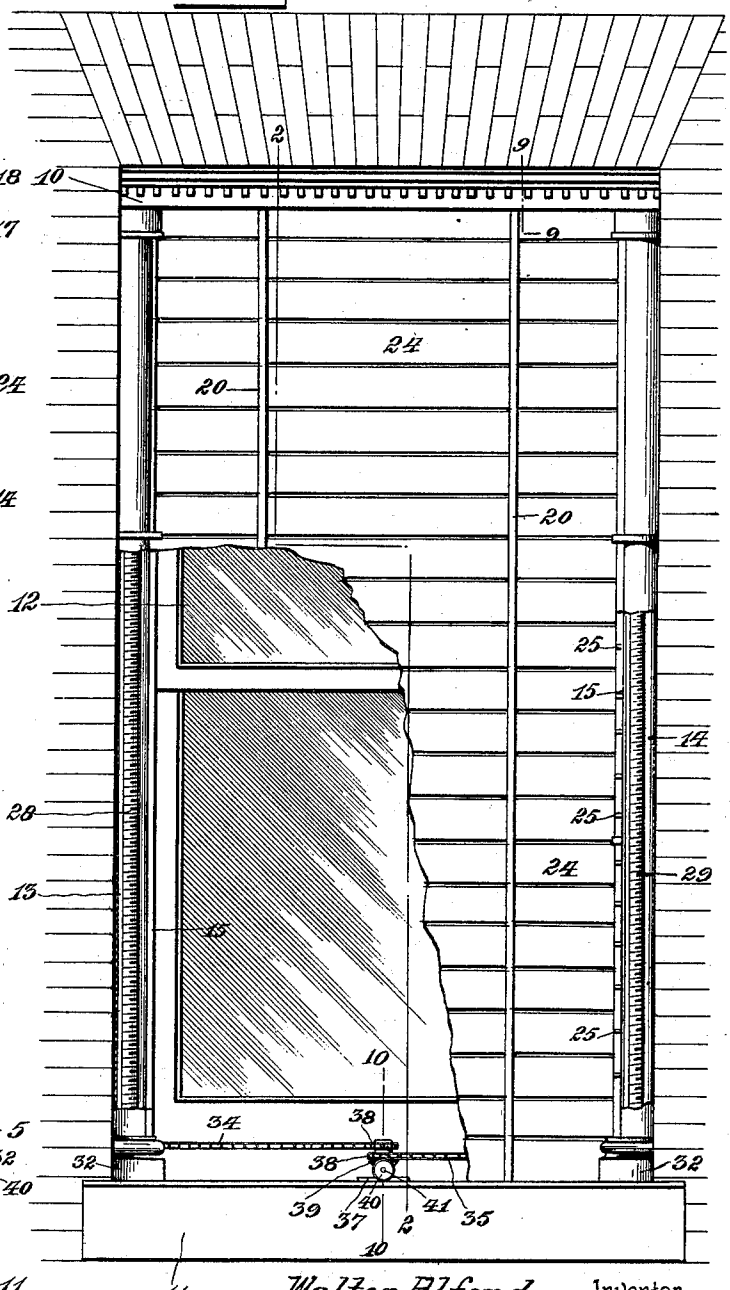


FIG. 1.



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FIG. 3.

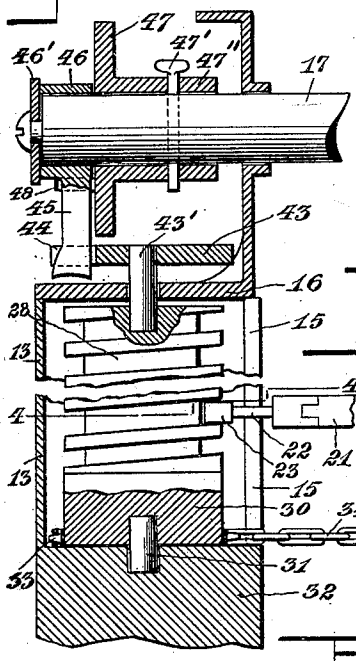


FIG. 5.

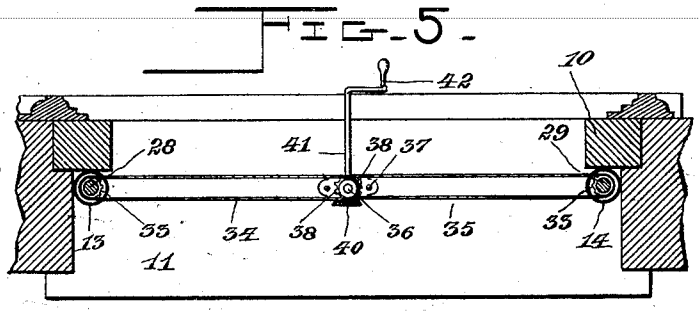


FIG. 4.

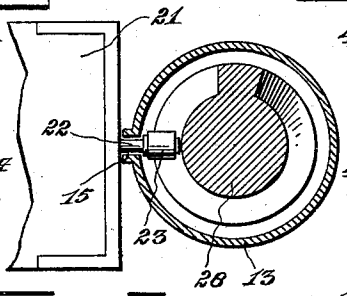


FIG. 6.

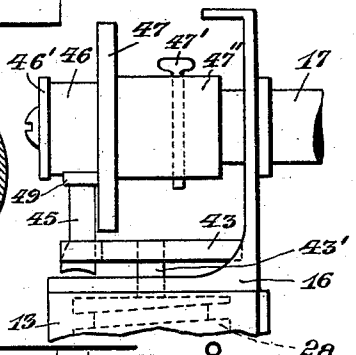


FIG. 7.

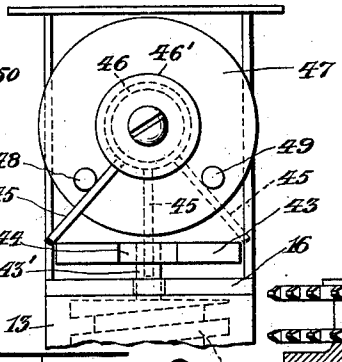


FIG. 12.

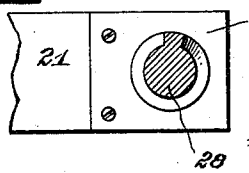


FIG. 8.

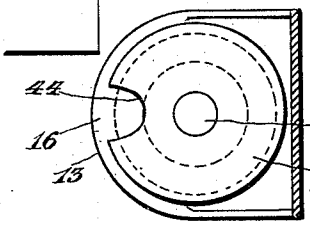


FIG. 11.

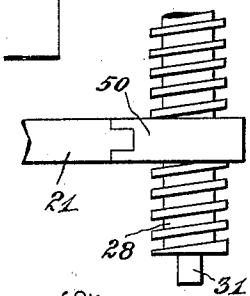


FIG. 9.

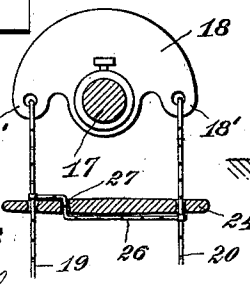
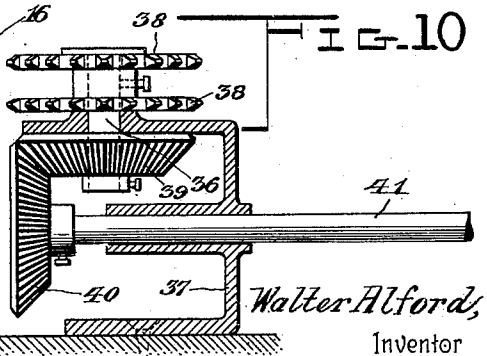


FIG. 10.



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UNITED STATES PATENT OFFICE.

WALTER ALFORD, OF BELLEVILLE, CANADA.

OUTSIDE WINDOW-BLIND.

SPECIFICATION forming part of Letters Patent No. 664,451, dated December 25, 1900.

Application filed May 16, 1900. Serial No. 16,836. (No model.)

To all whom it may concern:

Be it known that I, WALTER ALFORD, a subject of Her Majesty the Queen of Great Britain, residing at Belleville, county of Hastings, Province of Ontario, Canada, have invented certain new and useful Improvements in Outside Window-Blinds; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to outside window-blinds of that class which employ a number of slats capable of being raised and lowered and also of a tilting adjustment to open or close the spaces in the blind.

One object of this invention is to provide a simple operating mechanism that serves to raise and lower the slats and which may also be operated in a peculiar manner for the purpose of tilting said slats so as to open and close the spaces between the same.

A further object is to simplify the construction, so as to make it efficient in operation, readily applicable to ordinary windows, and comparatively cheap of manufacture.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty in the combination of devices and in the construction and arrangement of parts will be defined by the claims.

In the drawings, Figure 1 is an elevation of an ordinary window having my improved blind applied thereto. Fig. 2 is a vertical sectional elevation in the plane of the dotted line 2 2 on Fig. 1. Fig. 3 is a vertical sectional elevation of the vertical screw-spindle and the parts associated therewith. Fig. 4 is an enlarged cross-section on the plane of the dotted line 4 4 on Fig. 3. Fig. 5 is a sectional plan view through the window in the plane of the dotted line 5 5 on Fig. 2. Fig. 6 is an enlarged side view of the upper part of the spindle, the casing therefor, and parts connected therewith. Fig. 7 is an elevation at right angles to Fig. 6. Fig. 8 is a detail plan view of the notched head at the upper part of the screw-spindle. Fig. 9 is an enlarged cross-section in the plane of the dotted line 9 9 on Fig. 1. Fig. 10 is an enlarged sectional elevation through the operating mechanism in the plane of the dotted line 10 10 on Fig. 1. Figs. 11 and 12 are detail views of a modified construction.

The same numerals of reference are used to indicate like parts in each of the several figures of the drawings.

10 designates an ordinary window-frame, 11 the sill thereof, and 12 the sashes. On opposite sides of this frame are erected the tubular casings 13 14, each of which extends from the sill to the head of the frame. Each casing is preferably constructed of metal, although any other suitable material may be employed, and in the opposing sides of these casings are provided the vertical slots 15. Each tubular casing is furthermore provided at its upper extremity with a bearing-plate 16, which may be in the form of an extension of said casing. A horizontal cross-shaft 17 extends between the casings at the head or upper end of the window-frame, and the end portions of this shaft are journaled in suitable bearings provided on or by the plates 16, whereby the cross-shaft is adapted to rock or turn on its axis. Said cross-shaft is provided at suitable points intermediate of its length with the quadrantal plates 18, one of which is shown by Fig. 9, and said plates have the lugs 18′, to which are attached the upper ends of the chains or flexible tapes 19 20. Each plate 18 is provided with two of these chains or tapes, and as there are two plates employed it will be seen that the window-blind is equipped with four chains or tapes, two of which lie at the front side or the front edges of the slats and two at the rear edges of the slats.

The bottom slat of the blind is indicated by the numeral 21, said slat having at its ends the lugs 22, which pass through the slots in the tubular casings 13 14, each lug 22 of said bottom slat serving to carry a friction-roller 23, which rides upon the spiral thread of one screw-spindle, as will hereinafter appear. The intermediate slats of the blind are spaced at proper intervals on the chains or tapes, said intermediate slats being indicated by the numeral 24. Each intermediate slat is provided at its ends with the guide-lugs 25, which are loosely fitted in the slots 15 of the tubular casings, but do not engage with the spiral threads on the screw-spindles, whereby

the casings restrain the slats from swaying and serve as guides to properly direct the vertical travel of the slats, the lugs of the bottom and intermediate slats being free to tilt or turn in the slots 15 of the tubular casings for the purpose of permitting the tilting adjustment of the slats to open and close the spaces in the blind. The intermediate slats are connected to the pairs of chains or tapes through the medium of the cross-chains 26, which serve to hold each intermediate slat in proper spaced position with relation to the adjacent slats. Each cross-chain passes through a slot 27, provided at a proper point in each intermediate slat, and the end portions of each cross-chain are attached to the chains or tapes 19 20, whereby each slat is connected by two cross chains or tapes to the two pairs of chains or tapes suspended from the plates 18 on the cross-shaft.

28 29 designate the vertical screw-spindles which are housed or contained in the tubular casings 13 14, each screw-spindle having a spiral thread with which is adapted to engage the friction-roller 23 on a lug 22 of one end of the bottom slat 21, whereby the two friction-rollers at the opposite ends of the bottom slat are engaged properly with the screw-spindles for the purpose of raising or lowering said bottom slat on the rotation of the spindles and of maintaining the bottom slat in a horizontal position at all times. Each screw-spindle is provided at its lower end with a foot-piece 30, having a depending pintle 31, which is stepped in a foot-bearing 32, made fast in the lower end of one tubular casing.

I have provided a simple operating mechanism by which the two screw-spindles are simultaneously operated from a single shaft, said operating mechanism being arranged on or adjacent to a window-sill, so as to have a hand element thereof disposed within the room or apartment for convenient access at all times, whereby the occupant of the room is able to raise or lower the blind or to tilt the slats thereof without opening the window. The lower portions of the screw-spindles have the sprocket-wheels 33 made fast therewith, and with said sprocket-wheels on the screw-spindles 28 29 engage the sprocket-chains 34 35, respectively. A short vertical shaft 36 is mounted in a suitable bearing or bracket 37, attached to the window-sill, at or near the middle thereof or in any other convenient position. Said short shaft has the sprocket-gears 38, with which engage the sprocket-chains 34 35, which transmit the motion of said shaft directly to the screw-spindles for operating the latter in proper directions to raise or lower the bottom slat 21, the latter being sustained in its proper horizontal position at all times. Said short shaft 36 is also provided with a bevel-gear 39, which meshes with a bevel driving-gear 40, the latter being secured to the outer end of a horizontal operating-shaft 41. Said shaft extends into the room or apartment and is suitably supported on the window-sill, the inner end of the shaft 41 being provided with a crank or hand-wheel 42, whereby the shaft may be rotated for the operation of the short vertical shaft and the sprocket-gearing to effect the simultaneous rotation of the screw-spindles.

The screw-spindles 28 29 are provided at their upper ends with heads 43, which are in the form of disks secured fast to said spindles, and these spindles have the pintles 43′ fitted loosely in sockets of the bearing-plates 16, whereby each screw-spindle is rotatably supported by the pintles 31 43′ in the foot-bearing 32 and the bearing-plate 16, respectively, so as to be free to rotate within the tubular casing. One or both of the heads 43 is furnished with a notch 44, (see Fig. 8,) said notch lying in a radial position and being quite deep and wide for the reception of an arm or pendulum 45. Said pendulum is fitted loosely on an end portion of the cross-shaft 17, so as to be free to swing or move thereon, and it is disposed in such position that its free end may readily enter the notch 44 of the spindle-head. If desired, this pendulum may be made integral with a sleeve or collar 46, which is fitted loosely on an end portion of the cross-shaft and is held in place thereon between an enlargement or washer 46′ and the disk or plate 47. This disk or plate is made fast with the cross-shaft by a suitable binding screw or pin 47′ passing through the hub 47″ of the disk-plate and the shaft, and said disk or plate 47 is provided on its face next to the pendulum with the laterally-extending stop pins or lugs 48 49, the latter being disposed in spaced relation to each other and on opposite sides of the pendulum 45 on the cross-shaft.

The operating-shaft 41 may be turned in one direction and set in motion the sprocket-gearing to propel the vertical screw-spindles in a direction to lift the bottom slat 21, which acts to successively lift the intermediate slats, beginning at the bottom of the blind, and this rotation of the screw-spindles causes the head 43 to turn therewith, so that on the first turn of said head the notch 44 thereof will engage with the loose pendulum 45 and carry the latter over to the inclined position indicated by full lines in Fig. 7 and into engagement with the stop-pin 48, in which position the pendulum-arm will remain during the subsequent rotations of the head 43 and the screw-spindle, because the free end of said pendulum-arm will ride or track upon the top face of the head 43. The rotation of the screw-spindles in the opposite direction, due to reversal of the operating-shaft 41, propels the head 43 in a corresponding opposite direction, so that the notch 44 will shift the position of the pendulum from the stud or pin 48 past the vertical center of the shaft and to the opposite inclined position (shown by dotted lines in Fig. 7) and into engagement with the stud or pin 49 on the shaft-

disk 47, said pendulum remaining in said dotted position during the continued rotation of the notched head 43, because said pendulum tracks on said notched head of the screw-spindle. The rotation of the screw-spindles serves to raise or lower the slats, as will be readily understood, and the shifting of the pendulum or arm in one direction or the other by the notched head, according to the direction of rotation of the latter, operates through the pendulum or arm one or the other of the stop-pins 48 49 and the disk 47 to rock or turn the cross-shaft 17 in one direction or the other, whereby the chains 19 are raised and the chains 20 are lowered, or vice versa, and the slats 24 are canted to the inclined positions or moved to the horizontal positions, so as to close or open the spaces between the slats, as may be desired.

In lieu of providing the bottom slat with the lugs and the friction-rollers I may adopt the construction shown by Figs. 11 and 12. The bottom slat is provided with the feed-nuts 50, one of which is shown by said figures of the drawings. Each feed-nut is secured to one end of the bottom slat, and it is provided with a female-threaded aperture whereby the nut may fit on one screw-spindle and the threads of the spindle and the nut may engage for the bottom slat to be raised or lowered, according to the direction in which the screw-spindles are rotated.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts, while their essential features are retained and the spirit of the invention is embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described my invention, what I claim as new is—

1. In a window-blind, the combination of a rock-shaft, a series of slats suspended therefrom, spindles having operative engagement with the lower slat to raise and lower the series by successive engagement or disengagement of the slats one with the other, and means between the rock-shaft and a spindle to rock the shaft by reversal of the spindle, whereby the slats may be opened and closed through the operation of the rock-shaft and the spindle, substantially as described.

2. In a window-blind, the combination with a series of suspended slats, of revoluble screw-spindles, means for connecting the lowermost slat with the screw-spindles, a single operating mechanism connected with said screw-spindles, a rock-shaft from which the slats are suspended, and connections between the rock-shaft and one spindle for operating the shaft to change the position of the slats, substantially as described.

3. In a window-blind, the combination of the slotted side casings, vertical screw-spindles mounted within said casings, a common operating mechanism connected with said spindles, a rock-shaft, a series of slats suspended from said shaft and each having lugs slidably fitted in the slots of the casings, the lugs of the lowermost slats engaging with said screw-spindles, and connections between the rock-shaft and one screw-spindle for operating the shaft to change the position of the slats, substantially as described.

4. In a window-blind, the combination with a series of suspended slats, of vertical spindles situated on opposite sides of a window, and both connected operatively with the lowermost slat of the series, a single angular bracket fixed between said spindles, a short vertical shaft journaled in the upper horizontal part of said bracket, an operating-shaft journaled in the vertical portion of said angular bracket and geared to said short shaft, and individual sets of sprocket-gearing connecting the respective side spindles with the short vertical shaft, substantially as described.

5. In a window-blind, the combination of a horizontal rock-shaft, a series of slats suspended therefrom, vertical spindles for raising or lowering said slats, means for operating said spindles, and devices substantially as described between the rock-shaft and one of said spindles to turn the shaft and tilt the slats suspended therefrom.

6. In a window-blind, the combination of a horizontal rock-shaft, slats suspended therefrom, vertical spindles having operating means, a notched head revoluble with said spindle, a disk provided with studs and made fast with the rock-shaft, and a pendulum loose on the rock-shaft and arranged for engagement with the notched head, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WALTER ALFORD.

Witnesses:
F. DAVEY DIAMOND,
W. JEFFERS DIAMOND.