Jan. 13, 1953 A. NIHON 2,625,218

WINDOW

Filed Jan. 21, 1949 2 SHEETS—SHEET 1

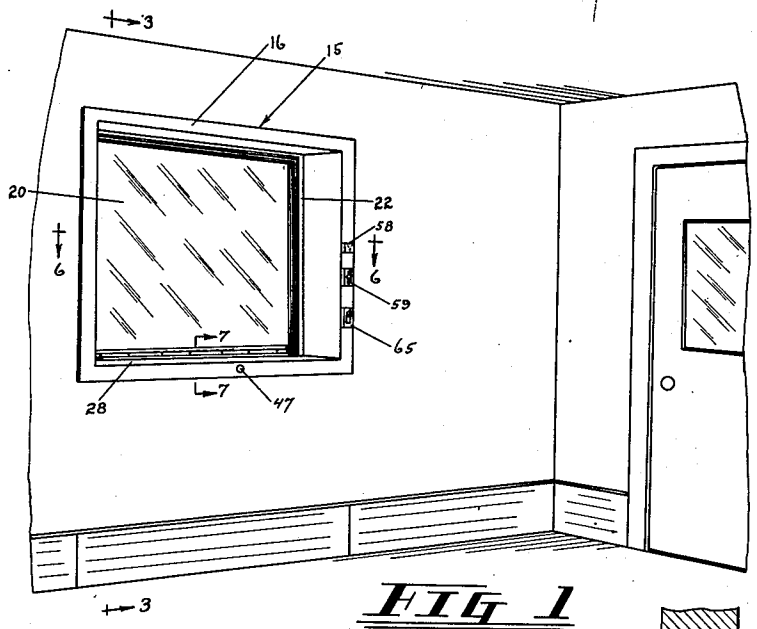


FIG 1

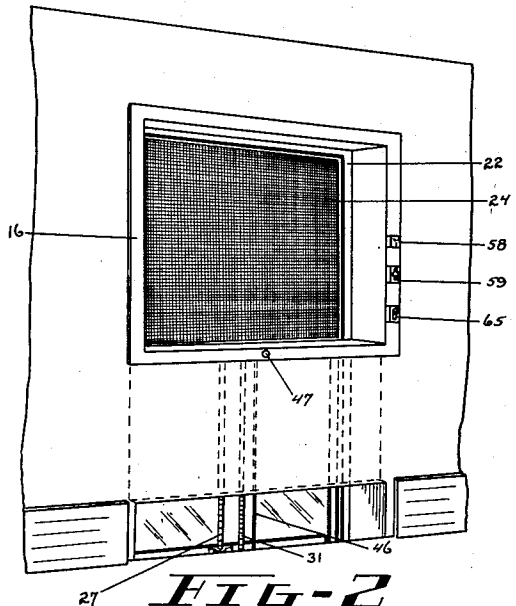


FIG-2

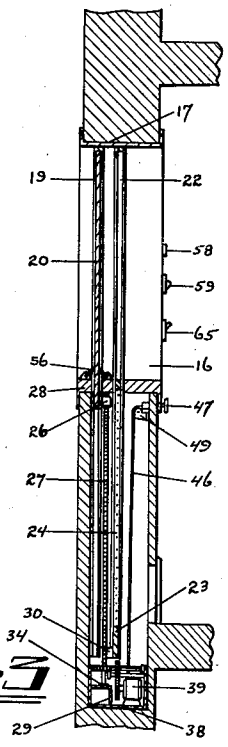


FIG-3

INVENTOR

Alexis Nihon

by Edward N. Fetherstonhaugh

ATTORNEY

Jan. 13, 1953 A. NIHON 2,625,218

WINDOW

Filed Jan. 21, 1949 2 SHEETS—SHEET 2

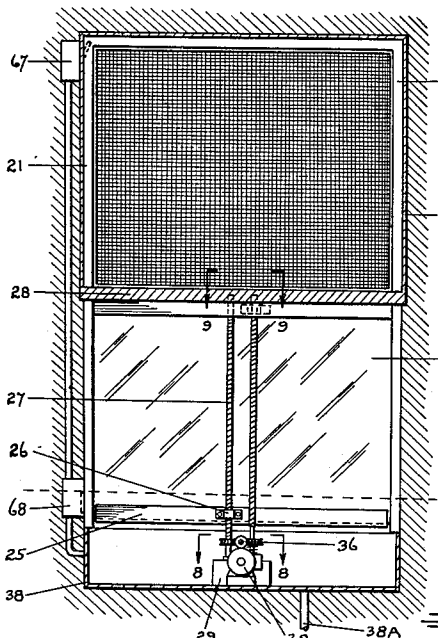


FIG-4

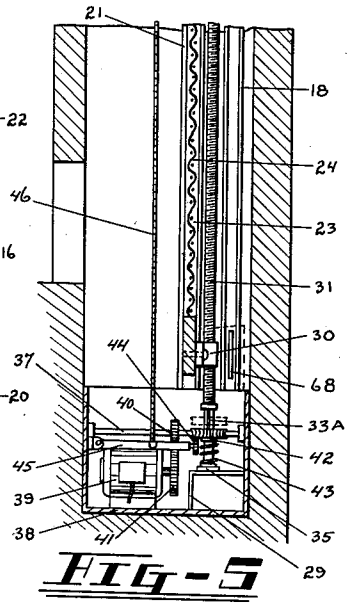


FIG-5

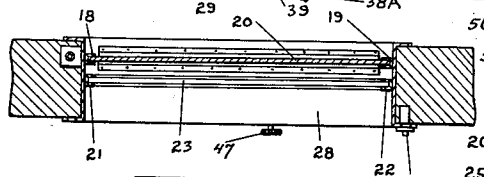


FIG-6

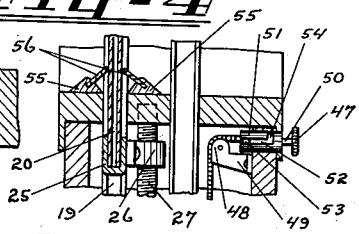


FIG-7

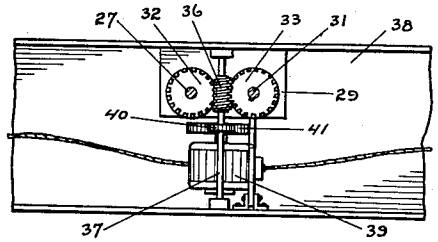


FIG-8

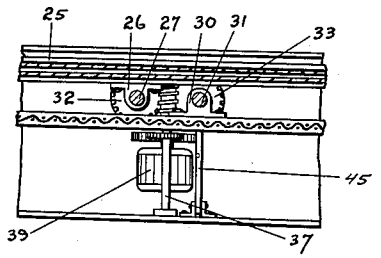


FIG-9

INVENTOR

Alexis Nihon

by Edward N. Fetherstonhaugh

ATTORNEY

Patented Jan. 13, 1953

2,625,218

UNITED STATES PATENT OFFICE

2,625,218

WINDOW

Alexis Nihon, Montreal, Quebec, Canada

Application January 21, 1949, Serial No. 74,595

4 Claims. (Cl. 160—103)

1

The invention relates to improvements in windows, as described in the present specification and illustrated in the accompanying drawings that form a part of the same.

The invention consists essentially of the novel features in construction as pointed out broadly and specifically in the claims for novelty following a description containing an explanation in detail of acceptable forms of the invention.

The objects of the invention are to devise a window which may be automatically opened or closed; to contrive a window and operating mechanism therefor which will permit the same to be opened or closed by mechanical or automatic means; to eliminate the necessity of manually opening or closing a window by providing mechanical means electrically controlled; to furnish a window in which a screen replaces the pane of the window when the latter is moved to an open position; and generally to provide a window which may be easily opened or closed without manual effort and which will be dependable and efficient for its purpose.

In the drawings:

Figure 1 is a fragmentary perspective view showing the interior of a room having the window installed in the wall thereof, and in which the same is shown in a closed position.

Figure 2 is a fragmentary perspective view showing the interior side of the window frame and in which the window is in an open position, with a screen replacing the glass.

Figure 3 is a vertical sectional view through the window as taken on the line 3—3 in Figure 1.

Figure 4 is a view of the window as taken from inside a room and in which the inner wall portion has been removed therefrom so as to show the window pane in open position and the screen filling the window opening.

Figure 5 is an enlarged fragmentary vertical section taken through the lower portion of the window and showing the operating mechanism therefor.

Figure 6 is a plan sectional view through the window frame, as taken on the line 6—6 in Figure 1.

Figure 7 is an enlarged fragmentary side sectional view showing a portion of the window at the sill.

Figure 8 is an enlarged fragmentary plan sectional view as taken on the line 8—8 in Figure 4.

Figure 9 is an enlarged fragmentary sectional view as taken on the line 9—9 in Figure 4 and in which the window sill has been removed therefrom.

2

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawings, the invention, as illustrated in Figures 1 to 9 inclusive, consists of a mechanical device adapted to be electrically operated for opening and closing a window and/or filling the opening in the window with a screen when the pane is in an open position.

The window, as indicated by the numeral 15, consists of a window frame 16 suitably mounted within an opening in the wall 17. A pair of outer channels 18 and 19 are fixedly secured to the sides of the frame 16 and adapted to movably support the window pane 20. A pair of inner channels 21 and 22 are fixedly secured to the sides of the frame 16 and are spaced inward a suitable distance from the outer channels 18 and 19. These inner channels 21 and 22 are adapted to movably support a screen frame 23.

The window pane 20 is preferably of the thermo-sash type, which is a twin seal glass which consists of an inner and outer layer having an air space sealed in therebetween. The window pane 20, as hereinbefore described, is of sufficient thickness and strength to eliminate the necessity of providing a conventional type sash.

The screen frame 23 has a suitable wire mesh 24 secured thereto, and the same is adapted to be raised or lowered in the opposite direction to that in which the window pane 20 is moved.

A horizontal channel 25 is fitted over the lower edge of the window pane and provides a means of mounting an adjusting bracket 26 which is fixedly secured thereto. This adjusting bracket 26 has an internally threaded portion extending vertically therethrough, and is adapted to be engaged by a threaded shaft 27. The upper end of the threaded shaft 27 is rotatably supported in the sill 28 of the window and extends downward therefrom towards the bottom of the frame 16 where it is rotatably supported in a bracket 29. An adjusting bracket 30 is fixedly secured to the lower portion of the screen frame 23 and is internally threaded in a similar manner to that of the adjusting bracket 26. The threaded shaft 31 is rotatably supported at the upper end thereof by the sill 28 and engages the threaded portion of the adjusting bracket 30. The lower end of the threaded shaft 31 is rotatably supported by the bracket 29. Each of the threaded shafts 27 and 31 rotates on thrust bearings 34 and 35 which are mounted on the bracket 29. In this respect it will be seen that the threaded shafts 27 and 31 extend through the adjusting brackets 26 and 30, and as the shafts are rotated within the

adjusting brackets the latter are adapted to be threaded upwardly or downwardly. The adjusting bracket 26 is secured on the inner side of the horizontal channel 25 on the bottom of the window pane 20, and the adjusting bracket 30 is secured to the outer side of the screen frame 23, thereby placing the threaded shafts 27 and 31 in alignment with one another.

The threaded shaft 27, which operates the window pane 20, has a small worm wheel 32 fixedly secured on the lower portion thereof. The threaded shaft 31, which operates the screen frame 23, has a small worm wheel 33 slidably keyed on the lower portion thereof. This worm wheel 33 is adapted to slide upward or downward on the lower portion of the threaded shaft 31, and at the same time, fixed with respect thereto by means of a spline 33A, thus turning the threaded shaft as the small worm wheel 33 rotates. A worm 36 is rotatably supported on a horizontal shaft 37 which is rotatably mounted to the inner walls of the pan 38. This worm 36 is driven by an electric motor 39 which is connected thereto by means of the gears 40 and 41. A drain 38A provides a moisture outlet for the aforesaid pan 38.

The rotation of the worm 36, which is located between the small worm wheels 32 and 33 and engages both of the same simultaneously, rotates one in an opposite direction to that of the other. As these worm wheels rotate, their corresponding threaded shafts turn in opposite directions, thus either lowering the window pane 20 and raising the screen frame 23, or raising the window pane 20 and lowering the screen frame.

The worm wheel 33, which is slidably fitted on the shaft 31, is supported in a suitable horizontal position in alignment with the worm 36 by means of a shoulder 42 on the shaft. A tension spring 43 is suitably secured to the worm wheel 33 to extend a downward pull thereon, thus tending to seat the worm wheel 33 on the shoulder 42 of the shaft. A disengaging roller 44 is rotatably mounted on the arm 45, and upon upward movement of the latter the roller 45 raises the worm wheel 33 to clear the worm 36. This arm 45 is pivotally secured to one wall of the pan 38 and has a chain 46 secured thereto and extending upward, where the free end thereof is secured to a manual operating pull 47. A small pulley 48 is rotatably supported by the bracket 49 and the upper portion of the chain 46 rides over this pulley in changing from a vertical to a horizontal position. A plunger 50 forms a connection between the upper end of the chain 46 and the manual operating pull 47. This plunger is accommodated in a cylindrical member 51 having a slot 52 cut in the wall thereof. A locking pin 53 is fixedly secured in the plunger 50 and projects through the slot 52 in the cylindrical member. A cut-out portion 54 leading from the slot 52 provides a means of locking the plunger 50 in position when the same is pulled outward and turned sufficiently so that the locking pin 53, extending through the slot 52, enters the cut-out portion 54. In this manner it will be seen that the worm wheel 33 may be easily disengaged from the worm 36 by simply raising the arm 45 and chain 46 as the plunger 50 is manually pulled out by the operating pull 47, thereby permitting the mechanical device to operate the window pane 20 only, and leaving the screen frame 23 in a downward position. When the plunger 50 is released and the chain lowered, the arm and disengaging roller are lowered thus permitting

the tension spring 43 to return the worm wheel 33 to its original position for engagement with the worm 36.

The sill 28 has brackets 55 secured on the upper surface thereof on each side of the window pane 20. These brackets 55 each support a resilient strip 56 which extends inward and upward to rest against the outer and inner surface of the window pane 20. These resilient strips 56 may be of rubber or any other suitable material which will efficiently seal the opening in the sill through which the pane extends, thus protecting the operating mechanism from rain, snow or the like. In the construction of the window, as hereinbefore described, the window pane 20 closes the opening in the wall by being sealed at the sill by means of the resilient strips 56, abutting the top of the window frame 16 and by fitting snugly within the outer channels 18 and 19 which are secured to the sides of the window frame. When the window is in an open position, the screen fills the opening in the wall as the screen frame 23 extends through a suitable sized elongated slot in the sill 28 and the top of the screen frame abuts the top of the window frame 16, while the sides of this frame are suitably fitted within the inner channels 21 and 22. In this way the window pane 20 substantially closes the opening in the wall when in a closed position and when the same is open, the screen effectively fills the opening to prevent insects and the like from entering the room.

What I claim is:

1. In a window, a frame, a sill dividing said frame into an upper and lower portion, the portion above said sill forming a light opening and the portion below said sill being enclosed by the wall of the building, a transparent panel slidably supported in said frame, and a screen slidably supported in said frame to the rear of said transparent panel, a mechanical device supported within the lower portion of said frame and comprising a pair of vertical threaded shafts, means on said transparent panel and said screen for being engaged by each of said vertical threaded shafts, a worm wheel fixedly mounted on each of said vertical threaded shafts, a worm located between said worm wheels, electrical means for rotating and controlling said worm, thus controlling the opening or closing of said transparent panel and said screen.

2. In a window, a frame forming a light opening in the wall of a building and extending into the wall portion thereof, a sill enclosing the portion of said frame below the light opening in the wall, outer channels secured to the inner sides of said frame, a transparent panel slidably supported in said outer channels, inner channels secured to the inner sides of said frame behind said outer channels, and a screen slidably supported in said inner channels, threaded brackets fixedly secured to the lower portion of said transparent panel and said screen, threaded shafts rotatably supported below said sill and engaging each of said threaded brackets, worm wheels suitably mounted on each of said threaded shafts for rotating the same, said threaded shafts being suitably spaced apart and parallel to one another, a worm located between said worm wheels for engaging the same and turning said threaded shafts in an opposite direction with respect to one another, thus providing a means of raising said screen as said transparent panel is lowered, and simultaneously, permitting said screen to be lowered as said transparent panel is raised, an

electric motor, gears connecting said electric motor and said worms, and electrical means for rotating said motor in either direction or for stopping the same.

3. In a window, a frame, a sill extending across the central portion of said frame, a transparent panel slidably supported within said frame, said transparent panel comprising a pair of transparent sheets having an air space sealed therebetween, a screen slidably mounted within said frame to the rear of said transparent panel, a pair of threaded shafts located below said sill, a worm wheel located at the lower end of each of said threaded shafts and adapted to rotate the same, a worm located between said worm wheels and engaging both of the same, a motor connected to said worm for driving said worm wheels in opposite directions, threaded brackets on the lower portion of said transparent panel and said screen, said threaded shafts engaging said threaded brackets for opening or closing said transparent panel and simultaneously moving said screen in the opposite direction to that of said transparent panel, and means for disengaging the worm wheel operating the threaded shaft which controls the movement of said screen.

4. In a window, a frame, a sill extending across the central portion of said frame, a transparent panel slidably supported within said frame, a screen slidably supported within said frame to the rear of said transparent panel, a pair of threaded shafts located below said sill, a worm wheel located at the lower end of each of said threaded shafts and adapted to rotate the same, a worm located between said worm wheels and engaging both of the same, a motor connected to said worm for driving said worm wheels in opposite directions, threaded brackets on the lower portion of said transparent panel and said screen, said threaded shafts engaging said threaded brackets for opening or closing said transparent panel and simultaneously moving said screen in

the opposite direction to that of said transparent panel, and means for disengaging the worm wheel operating the threaded shaft which controls the movement of said screen, the aforementioned worm wheel connected to the operating mechanism of said screen being slidably keyed on the threaded shaft for same, a shoulder formed on the aforesaid threaded shaft, a tension spring suitably connected to the aforesaid worm wheel and tending to seat the latter on said shoulder, an arm pivotally mounted and having a roller on the free end thereof adapted to engage the underside of the last mentioned of said worm wheels, a chain connected to said arm and extending upward therefrom, a pulley supporting the upper portion of said chain, a plunger connected to the free end of said chain at the upper end thereof, said plunger being adapted to be manually pulled outward thus raising said roller on said arm by means of said chain and accordingly disengaging the last mentioned of said worm wheels with respect to said worm, and as said plunger is released said tension spring providing a means of lowering said worm wheel connected thereto for engaging the same with said worm.

ALEXIS NIHON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS.

Number	Name	Date
744,404	Reno	Nov. 17, 1903
991,527	Miller	May 9, 1911
1,270,915	Zimmer	July 2, 1918
1,551,512	Goff	Aug. 25, 1925
2,022,848	Fuller	Dec. 3, 1935
2,150,829	Grishkevich	Mar. 14, 1939
2,198,488	Smith	Apr. 23, 1940
2,311,972	Simpson	Feb. 23, 1943