

E. VAN NOORDEN.
 DEVICE FOR OPERATING WINDOWS OR SHUTTERS.
 APPLICATION FILED JAN. 15, 1912.

1,049,175.

Patented Dec. 31, 1912.

2 SHEETS-SHEET 1.

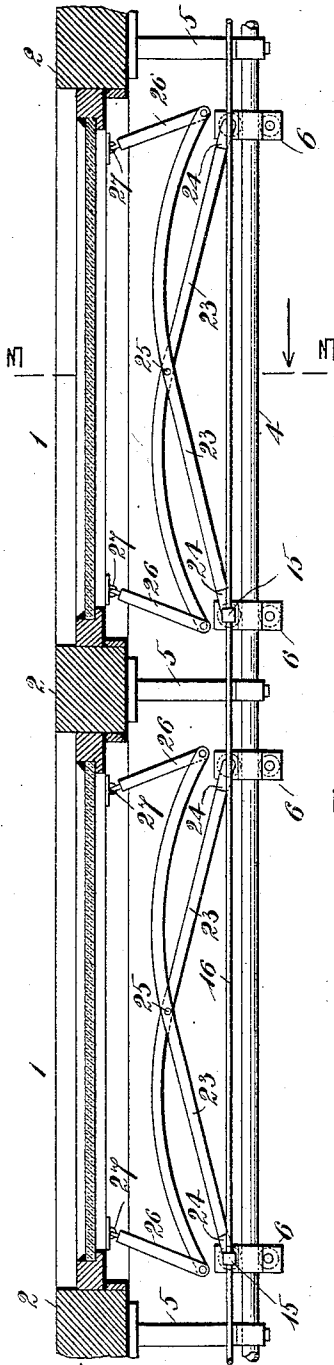


FIG. 1.

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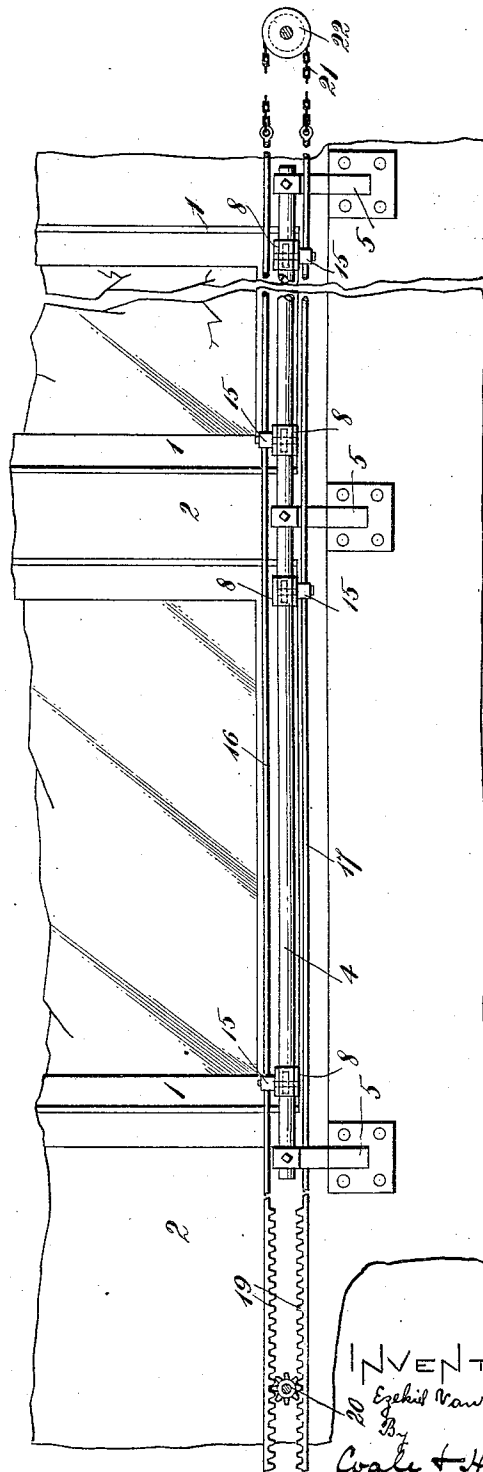


FIG. 2.

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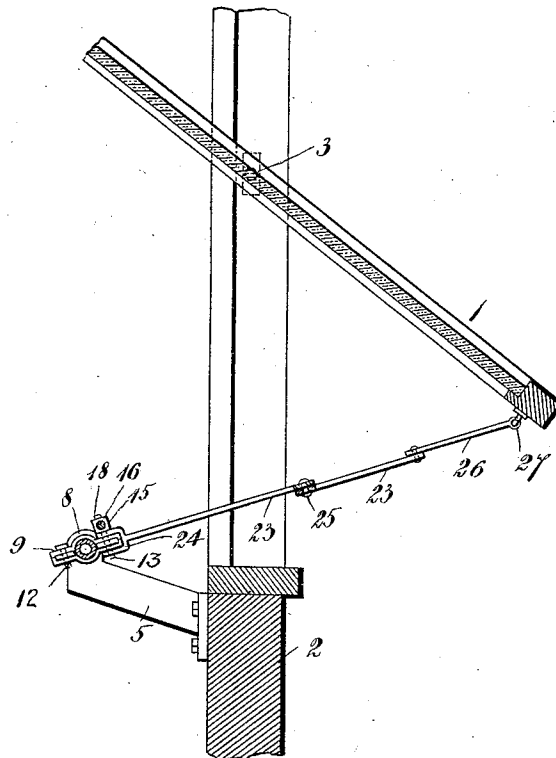


FIG-3-

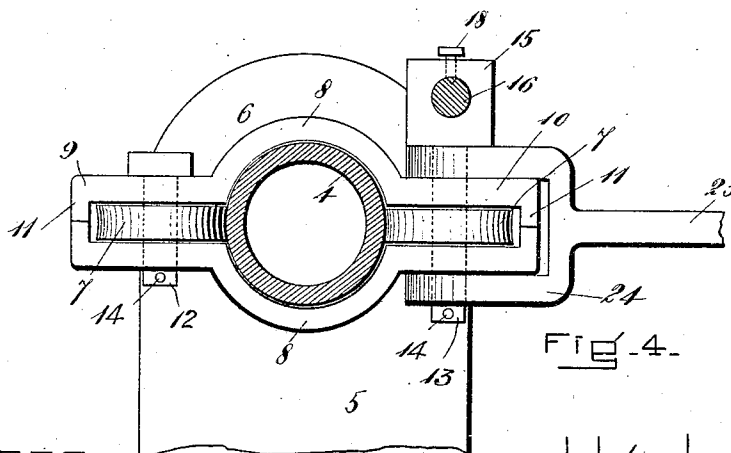


FIG-4-

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UNITED STATES PATENT OFFICE.

EZEKIEL VAN NOORDEN, OF BOSTON, MASSACHUSETTS.

DEVICE FOR OPERATING WINDOWS OR SHUTTERS.

1,049,175.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed January 15, 1912. Serial No. 671,273.

To all whom it may concern:

Be it known that I, EZEKIEL VAN NOORDEN, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Devices for Operating Windows or Shutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to an improved device for effecting the simultaneous control of a series or line of swinging sashes or shutters from a single point.

It comprises for its subject-matter certain elements of construction which are an improvement upon the construction shown and described in my copending application for Letters Patent of the United States, filed August 29, 1911, Serial No. 646,638, and to which reference is hereby made.

The object of my invention is to provide a device of the above character having a simple construction and one especially designed to exert a large amount of force for controlling the sashes without bending or distortion of the operating parts even though the series or line of sashes be of considerable length.

My invention can best be seen and understood by reference to the drawings, in which—

Figure 1 shows the device in plan; Fig. 2 the same in side elevation; Fig. 3 a section on the line 3—3 of Fig. 1, and Fig. 4 is a view partly in section and partly in side elevation of an element of construction to which special reference will hereinafter be made.

Referring to the drawings—1 represents each of a line of sashes of which two sashes only are shown for purposes of illustration.

2 represents the wall or structure in which the sashes are arranged.

The sashes to which my present improvement is especially applicable are those which turn on a horizontal axis. The sashes are accordingly shown pivotally mounted at points 3 (Fig. 3) to turn on horizontal axes and in a manner whereby the lower portion thereof will swing outwardly to an open position, that is, outside the wall or structure 2 in which the sashes are arranged.

Located on the inner side of the wall or structure 2 and extending alongside the

sashes to be controlled, on a line about parallel with the bottoms of the sashes when in a closed position and some little distance removed therefrom is a rod or pipe 4. This pipe is supported in a fixed position by means of a series of brackets 5 which are secured to the wall or structure 2. The brackets are arranged at points between the respective sashes so as to leave a clearance along the pipe in front of each sash between adjacent brackets. Loosely arranged upon the pipe 4 to slide and turn thereon are a series of collars 6, a set of two of these collars being arranged upon the pipe 4 in front of each of the respective sashes.

Each of the collars is provided with friction-bearing wheels 7 which bear against and run on the pipe to facilitate the movement of the collars thereon by reducing friction. In order that the collars may be easily applied to the pipe or disconnected therefrom and for the purpose also of providing for the retention of the friction-bearing wheels, the collars are made in separate parts. Each one of these parts consists of a body portion 8 which fits around the pipe 4 with outwardly-extending flanges 9 and 10 respectively, having in-turned ends 11 which butt against one another when the two parts of the collars are applied to the pipe and separate the respective flanges thereof to form housings in which the friction-bearing wheels 7 are contained. The combined parts of the collars are held together by means of pins 12 and 13 which pass through the flanges 9 and 10 and are secured by means of cotters 14. The pins pass also through the wheels 7 contained in their respective housings and provide axles on which the wheels turn, the arrangement of the parts being such of course that the wheels will bear against and run upon the pipe 4. The pins 13 which hold together the flanges 10 of the collars are provided with enlarged heads 15 reversely arranged for each set of collars, that is, each set movable on the pipe 4 in front of each sash. There are provided accordingly separate lines of the heads 15, one line located above the flanges 10 and the other below said flanges. Through these respective lines of the heads 15 extend rods 16 and 17, respectively, and which are secured to the rods by means of suitable binding screws 18. The rods 16 and 17 are longitudinally movable in reverse directions and

accordingly are adapted when thus moved to move the collars of each set of collars in front of every sash in reverse directions along the pipe 4. The rods 16 and 17 extend to a point beyond the line of the sash or to the place from which the sashes are controlled. There the respective rods are provided each with a rack bar 19 and operated by a pinion 20 to move the respective rods and collars carried by them longitudinally in reverse directions. The pinion 20 is operated in a manner well known to those skilled in the art.

I prefer that the rods 16 and 17 shall be relatively light rods and in order that both rods may be moved in reverse directions by a pull the ends of the respective rods opposite those bearing the rack bars are connected by means of a flexible connection 21 which runs over a pulley 22 having any suitable fixture or support. The effect of this arrangement is that as one of the rods is pulled in one direction the other rod will, through the connection 21, be pulled or drawn in a reverse direction which eliminates any danger of the rod buckling or bending during the operation of the device as might be the case if the rods were operated by the pinion alone and not connected as aforesaid. In such case one rod would be operated by a pull in one direction as the other was pulled in a reverse direction and which might tend to distort this rod if it were as light a rod as I prefer to use.

Pivotally connecting with the respective pins 13 of each set of collars, that is the two collars for every sash, are links 23. The pivotal connection is effected by providing each of the links with a forked end 24 which straddles the combined flanges 10 of the collars and through which forked ends the pins 13 extend providing pivotal bearings on which the links turn. From the points of their pivotal connection the links connecting with each set of collars extend in reverse directions inwardly in the direction of the sash and cross one another in the manner of scissors. At their point or crossing or the point 25 the links are pivotally connected. From this point each set of links 23 is extended to pivotally connect with links 26 which extend inwardly and are pivotally secured to the respective sides of each sash at points 27 preferably near the bottom of the sash. It will be observed that the links 26 are of considerable length on which account the links 23 are made curved in order that they may properly connect with the ends of the links 26 owing to the limited space between the pipe 4 and the sash. The position of the pipe 4 relatively to the bottom of the sashes is also preferably such that the links 23 and 26 will occupy normally a substantially horizontal position when the sashes are closed.

The operation of the device is as follows: Assuming the sashes to be in a closed position, the pinion 20 is turned to operate the rack bars 19 and move the rods 16 and 17 in reverse directions. The movement thus imparted to the rods causes each set of collars or those in front of each sash to move along the pipe 4 in reverse directions toward one another. Thereupon the links 23 which pivotally connect with the respective collars are extended in the direction of the sashes and the force exerted thereby operating through the links 27 pushes the bottoms of the sashes outwardly and accordingly opens the sashes. This operation continues until the respective sets of collars are substantially in contact with one another which defines the full opening of the sashes. The resistance of the sashes to opening is borne by the pipe 4. In this connection it is to be observed that the link connection between the collars and sashes is such as to hold the collars in a position where the friction bearing wheels 7 carried thereby will bear respectively against the inner and outer sides of the pipe. Accordingly as the collars are moved along the pipe toward one another to open the sashes the back thrust of the links upon the pipe causes the collars to bear with some force against the inner side face of the pipe. The friction which might thus be induced to prevent an easy movement of the collars along the pipe is compensated for by those of the friction bearing wheels 7 which bear against the inner side face of the pipe.

As the sashes open and the inclination thereof becomes changed the bottom ends of the sashes will become elevated, the links 23 and 26 then assuming a gradually increasing inclined position from their normal position which is a substantially horizontal one when the sashes are closed as aforesaid. This movement of the links is compensated for and permitted by the collars turning slightly around the pipe as they are moved to approach one another.

The sashes are closed simply by reversing the movement of the rods 16 and 17 when the respective sets of collars are moved reversely away from one another along the pipe 4 which tends to retract the links and draw in the sashes. During this movement the respective sets of collars will draw along the outer edge of the pipe and the friction wheels bearing against the outer side face of the pipe will take up the friction thus induced. A reverse movement of the operating rods and collars is continued until the sashes are drawn to a fully closed position. As the links resume their normal position from their inclined position as aforesaid the collars will turn slightly upon the pipe to compensate for the changed relative position of the links.

It is apparent of course that the sashes may be held in any partially open position depending upon the relative position of the operating rods 16 and 17 and the corresponding relative positions of the collars controlled by these rods.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States:—

1. The combination with a plurality of swinging sashes, of a pipe supported to extend alongside said sashes, members arranged upon said pipe and movable longitudinally thereon, a rod extending alongside said pipe and connecting with said members for effecting a simultaneous movement thereof along said pipe, and means interposed between said members and said sashes whereby the movement of said members along said pipe may be translated to said sashes for moving the same.

2. The combination with a plurality of swinging sashes, of a pipe supported to extend alongside said sashes, members arranged upon said pipe and movable along or around the same, means for simultaneously moving said members along said pipe in reverse directions, and means comprising link forming connections pivotally connecting with said members and with said sashes whereby the movement of said members along said pipe may be translated for moving said sashes.

3. The combination with a plurality of swinging sashes, of a pipe supported to extend alongside said sashes, members arranged thereon and movable along or around the same, said members being arranged upon said pipe in sets for each one of said sashes, rods extending alongside said pipe and connecting respectively with said respective sets of members, means whereby said rods may be moved simultaneously in reverse directions and like movement im-

parted to the respective ones of said sets of members, and means interposed between said respective sets of members and said sashes whereby the movement of said members in reverse directions along said pipe may be translated to said sashes for moving the same.

4. The combination with a plurality of swinging sashes, of a pipe supported to extend alongside said sashes, members arranged thereon and movable along or around the same, said members comprising collars consisting of separate combined parts with friction wheels carried thereby and bearing against the inner and outer faces of said pipe, means for simultaneously moving said members along said pipe in reverse directions, and means comprising link forming connections pivotally connecting with said members and with said sashes whereby the movement of said members along said pipe may be translated for moving said sashes.

5. The combination with a plurality of swinging sashes, of a pipe supported to extend alongside said sashes, members arranged thereon and movable along or around the same, said members being arranged in sets of two for each one of said sashes, rods extending alongside said pipe and connecting respectively with said respective sets of members, means whereby said rods may be moved simultaneously in reverse directions and like movement imparted to the respective ones of said sets of members, crossed pivoted links connecting with said respective sets of members, and other links pivotally connecting with said crossed links and with said sashes.

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