W. BAYLEY.

WINDOW SASH ADJUSTER.

APPLICATION FILED AUG. 4, 1913.

1,093,099.

Patented Apr. 14, 1914.

2 SHEETS-SHEET 1.

Fig. 1.

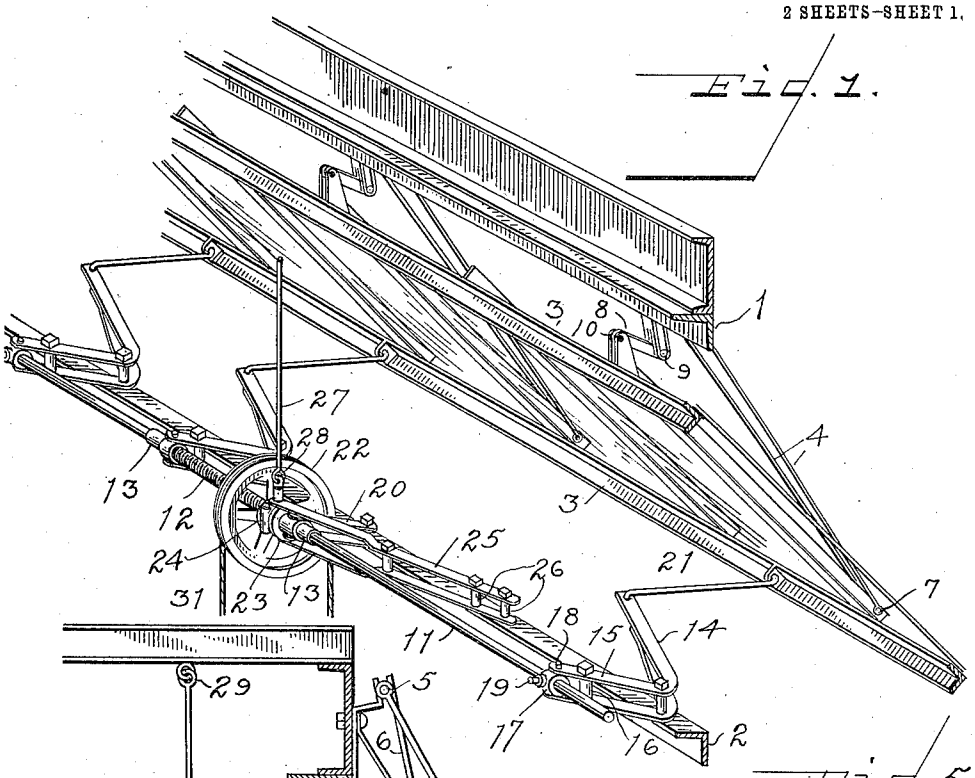


Fig. 5.

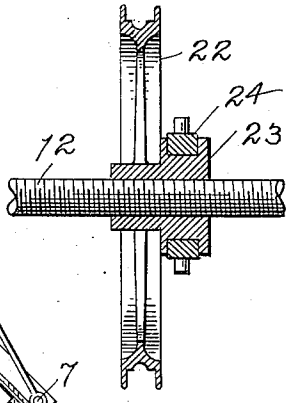
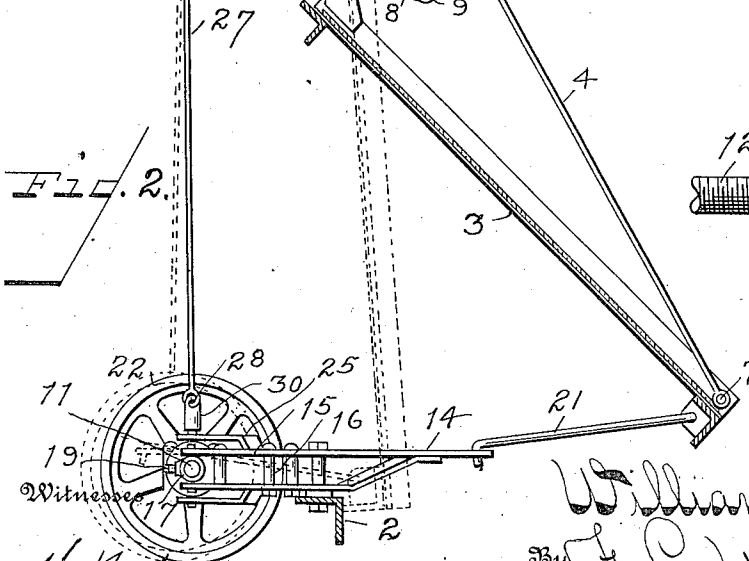


Fig. 2.



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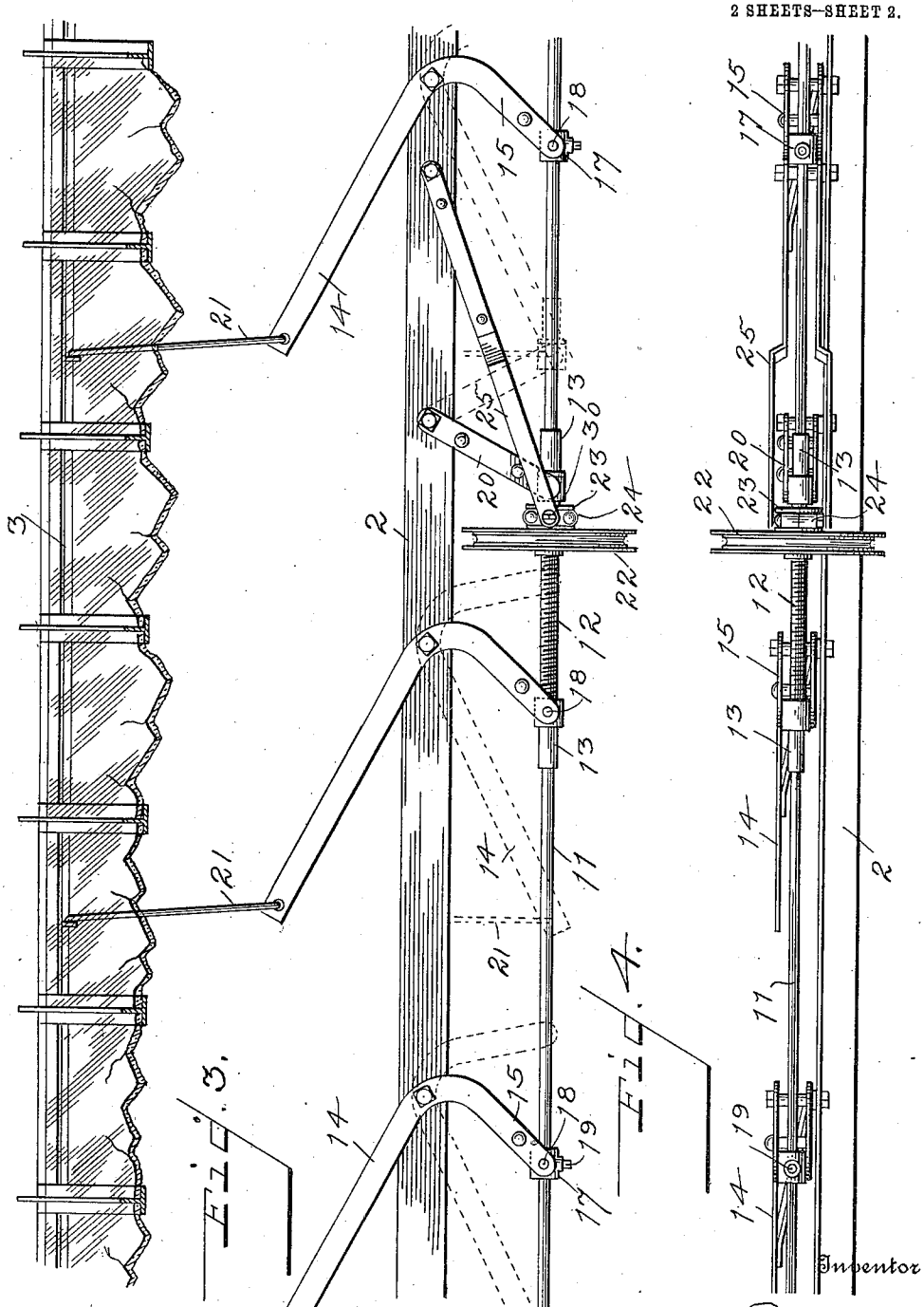


Fig. 3.

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM BAYLEY, OF SPRINGFIELD, OHIO.

WINDOW-SASH ADJUSTER.

1,093,099. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed August 4, 1913. Serial No. 782,858.

To all whom it may concern:

Be it known that I, WILLIAM BAYLEY, citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Window-Sash Adjusters, of which the following is a specification.

My invention relates to adjustable window constructions embodying movable sashes and particularly to an adjuster adapted to shift the movable sash uniformly throughout its entire length during its opening and closing movement.

While the invention has been herein shown and described in connection with a particular type of balanced window sash it is to be understood that it is equally applicable to sashes hinged to oscillate about either a vertical or horizontal axis located either at the edge of the sash or upon a medial line, or it might be adapted to operate a sliding sash.

The object of the invention is to simplify the structure as well as the means and mode of operation of such devices, whereby they will not only be cheapened in construction but will be more efficient in use, uniform in operation, easily and quickly manipulated to adjust the sash to the desired position, compact in form requiring a minimum operating space and unlikely to get out of repair.

A further object of the invention is to provide a device which will afford a multiplication of power, whereby a window sash of large extent and great weight may be adjusted with minimum expenditure of energy.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof and the mode of operation or their equivalents as hereinafter described and set forth in the claims.

Referring to the drawings, Figure 1 is a perspective view of the assembled apparatus and a portion of window sash with which the apparatus is connected, the sash being shown in its open position. Fig. 2 is a sectional end elevation of the window sash and adjuster. Fig. 3 is a plan view of the adjuster and sash, Fig. 4 is a detail side elevation, Fig. 5 is a detail view of the adjusting wheel.

Like parts are indicated by similar characters of reference throughout the several views.

The apparatus forming the subject matter hereof is particularly designed for use in factory buildings, auditoriums or warehouse constructions, wherein are employed movable window sash of large area and of great weight. The apparatus may likewise be employed in conjunction with sashes of small size, such as are used in offices, stores and residences, or for operating the ventilators of railway cars. The adjuster is especially adapted for use in conjunction with movable sash comprising single units of extreme length. It is capable of operating a sash having a length of several hundred feet uniformly throughout its entire extent.

In the drawings 1 and 2 are longitudinal frame members of the building structure, comprising the cap and sill respectively of the window opening. The movable sash 3 is suspended upon the swinging links 4 pivoted at 5 to the bracket 6 secured to the building structure and at their lower ends, pivotally engaged at 7 with the sash 3 adjacent to the lower edge thereof. Other links 8 pivoted at 9 to the brackets 6 are pivotally connected at 10 adjacent to the upper edge of the sash. The relation of the links 4 and 8 and their pivotal connections are such that the sash 3 will travel through a simultaneous oscillatory and shifting movement in which the center of gravity will travel in a horizontal plane, while the sash oscillates about a floating axis coincident with the center of gravity. This particular window construction and method of supporting and guiding the sash 3 is fully described in my co-pending application, Serial No. 777,634, and forms no part of the present invention.

The adjuster apparatus forming the subject matter hereof, comprises a floating shaft or rod 11, having therein a screw threaded section 12. The screw threaded section 12 may form an intermediate portion of the shaft or rod 11, or may be located at either end thereof. While the section 12 may be formed integral with the shaft or rod 11, it is preferably a separate member connected with the shaft 11 by suitable unions or couplings 13. The floating shaft or rod 11 is arranged parallel with a stationary supporting member, which in the present instance is the structural bar 2 forming the

sill of the window opening. The shaft or rod 11 is supported throughout a shifting parallel movement by means of a plurality of parallel swinging operating levers 14. These operating levers 14 are preferably though not necessarily of a bifurcated formation, whereby the inner arms 15 of the lever will be double, the parallel portions of which are separated by intermediate space blocks 16. These operating levers are pivotally supported upon the longitudinal stationary supporting bar which as before stated, is the window sill 2.

The extremities of the inner arms 15 of the operating levers 14, are pivotally connected with the bearing sleeves 17 on the shaft 11, carrying trunnions 18 with which the parallel portions of the arms 15 are engaged. The bearing sleeves 17 are preferably though not necessarily, longitudinally adjustable upon the shaft 11, and are secured in adjusted positions by set screws 19. The adjustment of the bearing blocks 17 facilitates the assembling of the apparatus and its initial adjustment.

If found desirable, swinging arms 20, corresponding to the arms 15 of the operating levers 14, may be located intermediate the said levers 14 and pivotally connected with the sill 2 and the shaft 11 in the manner before described. It is obvious that a longitudinal shifting movement of the shaft or rod 11, will cause a simultaneous oscillation of the operating levers 14 and the swinging arms 20 in unison one with the other. It is obvious that in addition to the longitudinal movement of the shaft or rod 11, there will be a limited lateral movement thereof due to the arcuate path of the pivotal connections 18 of the arms 15 and 20 with the shaft 1 about their pivotal connection with the stationary support 2. Links 21 pivotally connected with the extremities of the operating levers 14 and with the movable sash 3, cause the operating levers 14 to move the sash simultaneously with the longitudinal movement of the shaft 11.

It is to be noted that while the shaft 11 is capable of a longitudinal movement and a limited lateral movement in unison with the oscillation of the operating levers 14 and swinging arms 20, it is securely held against rotation by the engagement of the bearing blocks or sleeves 17 therewith.

Screw threaded upon the threaded section 12 of the shaft 11 is a revoluble adjusting nut in the form of a wheel or pulley 22. While the wheel or pulley 22 is capable of revoluble movement, it is held securely against lateral movement upon the screw threaded section 12, whereby a rotation of the wheel or pulley 22 will cause the screw threaded section 12 of the shaft which is held against rotation, to travel through the wheel, thereby moving the shaft or rod 11 longitudinally to cause a simultaneous oscillation of the several operating levers 14. To secure the wheel or pulley 22 against lateral movement while permitting the revoluble movement thereof, there is provided upon the wheel a laterally projecting hub 23, having therein a peripheral groove. Located in the peripheral groove of the hub 23, is a collar or boxing 24, with which is pivotally engaged the extremity of a swinging arm 25 pivoted to the stationary support 2. The swinging arm 25 is preferably though not necessarily formed double and comprises two parallel bars spaced apart by intermediate space blocks 26. The parallel portions of the arm 25 are pivotally connected with the collar or boxing 24 at diametrically opposite points. The construction is such that the swinging arm may oscillate to and fro to compensate for the lateral shifting movement of the shaft 11, due to the arcuate paths of the supporting arms 15 and 20, while at the same time it will limit the lateral movement of the wheel or pulley 22 in line with the shaft. The wheel 22 freely rotates within the collar or boxing 24. To further support the floating shaft 11 and pulley 22, and to relieve the arms 15 and 20 whereby said arms may oscillate freely, the shaft is further supported by auxiliary suspension links 27 flexibly connected with the shaft or swinging arms and with the building structure, as shown at 28 and 29 respectively, in Fig. 2. In Fig. 2 the uppermost trunnion of the collar or box is shown provided with a thimble 30, with which the link 27 is engaged. It is obvious that other forms of connector may be used in lieu thereof. While the path of the connection 28 will be slightly arcuate, concentric with the connection 29, such variation will be so slight as to be immaterial and will be fully compensated for by the play of looseness of bearings which would naturally result in a structure of this character.

The adjuster thus described may be located at any height in accordance with the window sash to be operated and may be controlled from a lower level by means of a cable 31 passing over the wheel or pulley 22, whereby said pulley may be rotated to cause the longitudinal adjustment of the shaft 11 to oscillate the levers 14.

It is obvious that without otherwise changing the structure from that disclosed in the drawings, the shaft might be made revoluble within the bearing sleeves 17 and the arm 25 connected direct to the adjusting member or nut, thereby holding the adjusting member against rotation, and the adjustment accomplished by rotating the shaft. In such case the bearing blocks 17 would be located between adjustable collars secured to the shaft. Such modification is so obvious as not to require illustration, since the

appearance would not be different from that now shown.

From the above description it will be apparent that there is thus provided a device of the character described, possessing the particular features of advantage before enumerated as desirable but which obviously is susceptible of modification in its form, proportion, detail construction or arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to certain structural features, it is to be understood that the invention is not limited to any specific details, but that the means and construction herein described comprise but one mode of putting the invention into effect, and the invention is therefore claimed broadly in any of its possible forms or modifications within the scope of the appended claims.

Having thus described my invention, I claim:

1. In an adjuster for movable window sashes, a plurality of pivoted operating levers connected one with the other for simultaneous oscillation, an adjusting member adapted by its adjustment to oscillate the levers, and a swinging carrier for the adjusting member having a different radial length than that of the operating levers.

2. In an adjuster for movable window sashes, a plurality of pivoted operating levers connected with the sash to be operated, a reciprocatory bar connecting the levers one with the other, a screw threaded portion in said reciprocatory bar, an adjusting nut engaging the screw threaded portion of the bar and a swinging carrier for the adjusting nut, the swinging carrier and levers describing arcs of different radii, the construction and arrangement being such that the relative rotation of the nut and screw will cause a reciprocatory movement of the bar to simultaneously oscillate the operating levers.

3. In an adjuster for movable window sashes, an operating lever connected with the sash to be operated, a bar connected with the lever, an adjusting member adapted by its operation to reciprocate the bar to oscillate the lever, and a swinging carrier for the adjusting member.

4. In an adjuster for movable window sashes, a reciprocatory bar, a plurality of swinging arms carried by the support and engaging the bar and adapted to guide the bar through a reciprocatory parallel movement, a screw threaded section in said bar, an adjusting member engaging the screw threaded section, a swinging arm pivoted to the support and engaging the adjusting member to limit the reciprocatory movement of the adjusting member in unison with the bar, but permitting an oscillatory movement thereof.

5. In an adjuster for movable window sashes, a pivoted lever connected with the sash to be operated, a floating screw connected with the lever, an adjusting member engaged with the screw and adapted by the relative rotation of the adjusting member and screw to cause a reciprocatory movement of the latter and a swinging arm engaging the adjusting member to prevent its lateral movement in line with the screw, but permitting transverse oscillation of the screw and adjusting member.

6. In an adjuster for movable window sashes, a reciprocatory bar, connections between the bar and sash whereby its reciprocatory movement will cause a simultaneous movement of the sash, and two series of swinging supports for said bar operating in planes angular one with the other.

7. In an adjuster for movable window sashes, a reciprocatory bar, connections between the bar and sash whereby its reciprocatory movement will cause a simultaneous movement of the sash, a series of swinging arms supporting the bar and oscillating in a horizontal plane, and suspension members for the bar capable of oscillation in a vertical plane.

8. In an adjuster for movable window sashes, an operating lever adapted by its oscillatory movement to vary the position of the sash, an adjusting member, a swinging arm upon which the adjusting member is carried, and a connection between the adjusting member and operating lever, the adjusting member carrying arm and the operating lever being of different radii.

9. In an adjuster for movable window sashes, an actuating screw capable of simultaneous reciprocatory and lateral movement, an adjusting nut engaged by the screw, and a swinging arm engaging the adjusting nut to limit the movement thereof in line with the screw.

10. In an adjuster for movable window sashes, a reciprocatory actuating bar, connections between the bar and sash whereby a reciprocatory movement of the former will cause a simultaneous movement of the latter, a screw threaded portion in said bar, an adjusting nut engaging the screw threaded portion having a peripheral groove therein, a collar engaged in the peripheral groove, and a guiding member engaging the collar whereby the adjusting nut will be permitted a lateral movement, but movement in line with the bar will be prevented.

11. In an adjuster for movable window sashes, a reciprocatory actuating bar, connections between the bar and sash whereby a reciprocatory movement of the former will cause a simultaneous movement of the

latter, a screw threaded portion of said bar, an adjusting nut engaging the screw threaded portion, and means for guiding the adjusting nut through a lateral movement while preventing movement thereof in line with the screw threaded portion.

12. In an adjuster for movable window sashes, a reciprocatory actuating bar, connections between bar and sash whereby a reciprocatory movement of the former will cause a simultaneous movement of the latter, a screw threaded portion in said bar, an adjusting nut engaging the screw threaded portion, and a swinging arm engaging the adjusting nut and adapted to guide the nut through an arcuate path simultaneous with the relative movement of the adjusting nut and screw threaded portion.

In testimony whereof, I have hereunto set my hand this 1st day of August, 1913.

WILLIAM BAYLEY.

Witnesses:
HARRY F. NOLAN,
F. L. WALKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."