

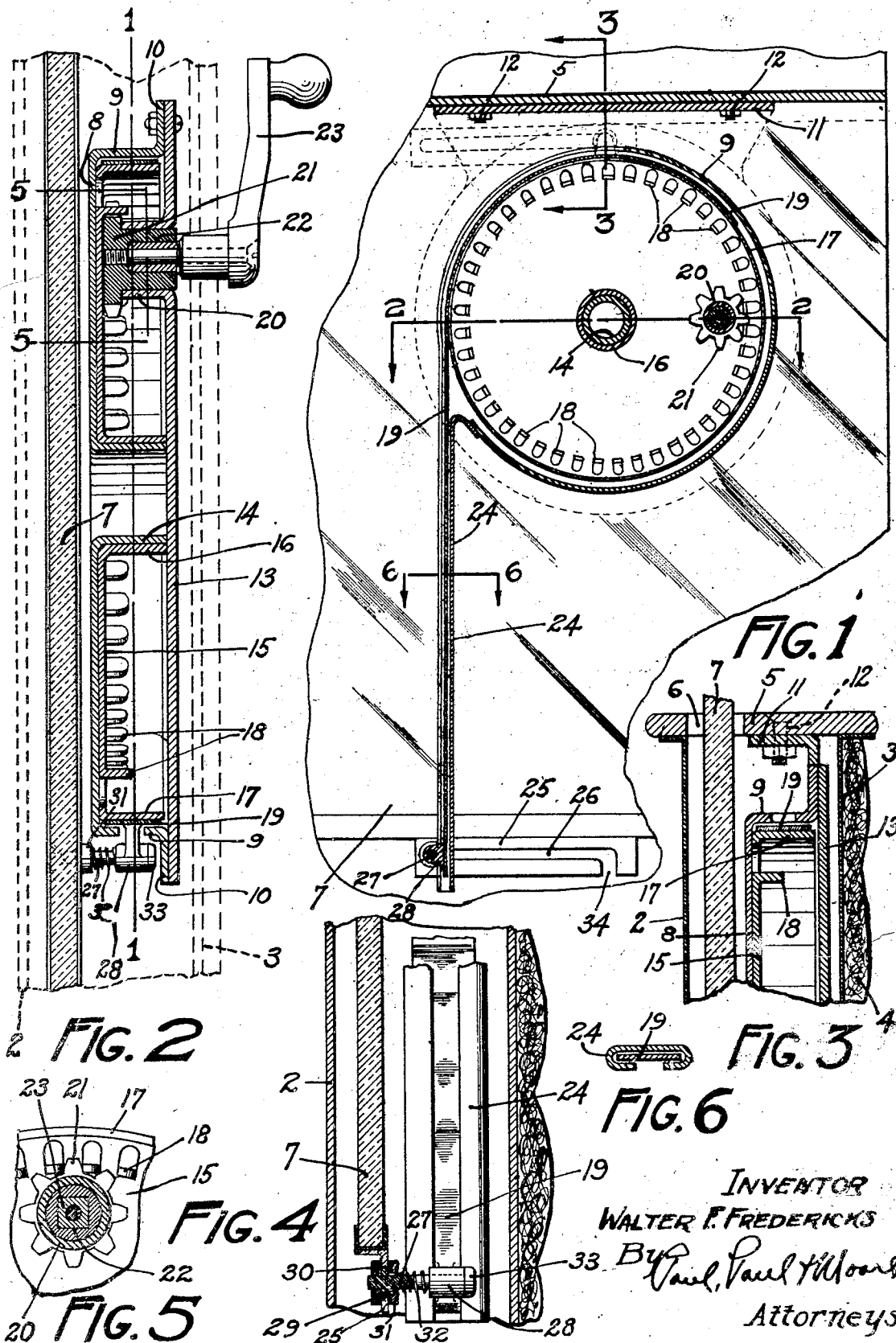
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WINDOW RAISING DEVICE

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WINDOW-RAISING DEVICE.

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My invention relates generally to devices for raising and lowering a window sash and holding it in any of its adjusted positions either partially or entirely closed, and while capable of general application is designed particularly for use with the sash of a closed automobile, street-car or railway coach.

The primary object of my invention is to mount the operating device in such a manner that it can be easily and quickly removed without the necessity of disturbing the wall of the car or door in which the operating device may be mounted.

A further object is to provide a connection between the operating mechanism and the sash which can be easily and quickly disconnected to allow the removal of the sash from the door or wall without disturbing any of the finish or upholstering of the coach or vehicle.

A further object is to dispense with the expensive sprocket chain and gear mechanism connected therewith and substitute therefor an inexpensive steel band and hub gear stamped from sheet metal, thus materially reducing the cost of the device.

The invention consists generally in various constructions and combinations all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a vertical sectional view on the line 1—1 of Figure 2;

Figure 2 is a horizontal sectional view on the line 2—2 of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 1;

Figure 4 is a detail sectional view showing the means connecting the window operating mechanism with the sash;

Figure 5 is a sectional view on the line 5—5 of Figure 2;

Figure 6 is a sectional view on the line 6—6 of Figure 1.

In the drawing, I have illustrated my invention as applied to the door of a vehicle, such as an automobile, but I do not confine myself to such use as the invention can be readily adapted for operating the window of street-cars, railway coaches and the like.

In the drawing, Figure 3, 2 represents the outer paneling of the vehicle door and 3 the inner paneling therefor, usually covered with suitable upholstery, as shown at 4. 5 represents the sill of the window open-

ing in the door fitting the upper flanged edges of the pannels 2 and 3 and secured in a suitable manner and provided with a longitudinal slot 6 in which the sash 7 is adapted to slide vertically to open or close the opening in the door. 8 represents a disc formed preferably from sheet metal and provided with a peripheral flange 9 having a web 10 circular in form, terminating in a lip 11 that is seated against the under side of the sill 5 and is secured thereto by suitable means such as bolts 12. These bolts and the web 10 support the window-operating mechanism suspended between the inner and outer panels of the door. A plate 13 has its peripheral edge secured to the web 10 and forms with the flanged disc 8, a housing or chamber for the moving parts of the mechanism. The disc 8 has a centrally arranged hub 14 against which the plate 13 is seated and a disc 15 has a centrally arranged annular flange or hub 16 thereon that is journaled on the hub 14 and is free to revolve thereon. The disc 15 also has a peripheral flange 17, and between said peripheral flange and the hub 16 a series of teeth 18 are preferably pressed out of the metal. These teeth are concentric with the axis of the disc 15. An annular space is provided between the flanges 17 and 9 and a metallic ribbon or band 19 is inserted into this space and attached at one end to the flange 17; the surface of the flange forming a seat or drum upon which the band is wound as the disc is revolved. The plate 13 has a bearing 20 therein and a pinion 21 has its hub journaled in said bearing and is provided with a socket 22 for a winding crank 23. The teeth of the pinion 21 engage the teeth 18 of the revolving disc or drum 15 and when the crank is revolved a rotary movement will be imparted to the drum to wind or unwind the metal band and raise or lower the sash. The metal band depends within a flanged guide 24 provided at one side of the housing and forms a vertical continuation of the passage between the inner flange 17 of the revolving disc or drum 15 and the outer flange 9 of the stationary disc or housing 8, the walls of the guide serving to direct the band and prevent it from bending or buckling in the operation of moving the window. I thus confine the normally flexible member within a guide or holder which keeps the member or a portion thereof in a fixed plane when longitudinal

compression is applied thereto at one end for the purpose of exerting pressure in the same direction at the opposite end. In other words, the flexible metallic tape or band which I prefer to use is so confined throughout its entire length and movement that sufficient pressure and pull required to lower or raise the sash can be readily exerted through or by the rotating member to which the band is fastened. I thus am able to positively move the sash in both directions by the simple attachment of a single flexible member thereto and dispense with the sprocket chain and pinions usually employed for this purpose in mechanisms of this kind. My invention is therefore less expensive to manufacture and install and will require less space for installation and operation.

A pin 27 is mounted in a bracket 28 secured to the lower terminal end of the metal band 19, as shown in Figure 4. An anti-friction roller 29 is preferably mounted on the pin 27 adjacent its outer end, adapted to roll in the slot 26 when the sash is opened and closed. A washer 30 is secured to the end of the pin and a similar washer 31 is loosely mounted on the pin and yieldingly held against the bracket 25 by a compression spring 32 coiled about the pin between the washer 31 and the bracket 28 on the end of the band. A head 33 is preferably provided on the pin as shown. The above construction provides a simple and inexpensive means for connecting the sash to the operating mechanism, and also provides a connection which will not rattle as a result of vibration, etc.

In closing the window, the band is wound on the toothed disc or drum 15, thereby raising the sash and the connection therewith to a point between the outer panel of the door and the operating mechanism, and to prevent backward movement of the sash and eliminate the necessity of some locking device designed for the purpose, I prefer to arrange the parts so that in closing the window the connection between the band and the sash can be moved to a point midway substantially above the drum, as indicated by the dotted lines in Figure 1, the roller 29 traveling in the slot 26 to accommodate itself to the position of the band with respect to the window. To detach the window from the band it is only necessary to move the roller 29 to a point where it will register with the open end 34 of the bayonet slot when separation can be easily and quickly effected by simply lifting the sash out of engagement with the slot. I am thus able to easily and quickly detach the sash from the door and the operating mechanism without disturbing the paneling or the upholstery, and by raising the sill through which the sash is adapted to slide, I can remove the entire operating mechanism

without in any way disturbing or marring the interior or exterior walls or finish of the door. I am thus able to mend broken or worn parts of the mechanism or repair the sash of any of the connections without dismantling the wall of the door or car or in any way damaging the finish or upholstery thereof.

The use of the flexible band eliminates the expensive sprocket chain and wheels, the gear having the peripheral flange whereto the band is attached being pressed or stamped in an inexpensive way from sheet metal. The first cost of the device is thereby very materially reduced. The ribbon or band will be of sufficient gage to allow the sash to be pulled and pushed by the action of the gear and the operating pinion will be so proportioned to the large gear that the sash may be adjusted at any point in its movement and be held in such position without the use of any additional locking means. When the device is used on a car the sash will be held by the band and its connections without danger of falling open by gravity or by the jar of travel.

It will be understood that the invention can be applied to vehicles such as automobiles and for operating the sash of street-cars and various types of railway coaches.

I claim as my invention:

1. A wall having a sash well therein, a sill fitting over said well and having a slot therein, a sash vertically slidable in said slot, a drum secured to the under side of said sill and depending therefrom, a crank-operated mechanism supported by and nested within said drum and a ribbon slidably supported against a buckling and operatively connected to said crank-operated mechanism and to said sash.

2. A structure forming a sash well, a sash-raising unit therein removable vertically therefrom and comprising a sill board as a support and cover bridging said well, a sash slidable through said sill, and a sash-raising and lowering mechanism including a drum-like enclosing casing dependently attached only to said sill and having a metallic ribbon operatively detachably connected to said sash within the well, said drum having a tangentially related guide for the ribbon, to prevent buckling of the same.

3. A structure forming a sash well, a sash-raising unit therein removable vertically therefrom and comprising a sill board as a support and cover bridging said well, a sash slidable through said sill, and a sash-raising and lowering mechanism including a drum like enclosing casing dependently attached only to said sill and having a metallic ribbon, supported against buckling and operatively connected to said sash within the well, and an operating crank detachably engaged with the raising and lowering mechanism.

anism and accessible laterally of and from the outside of the structure whereby after removal of the crank the unit including the sash can be bodily removed from the well in a vertical direction.

4. In a device of the class described, a first drum having a peripheral slot, a second drum nested within and journaled concentrically to the first drum with the peripheries spaced to form a narrow guide channel, a narrow slotted housing and guide vertically disposed tangentially to and connected with the first drum, and forming a continuation of its peripheral slot and of the channel formed between the drums, a sash, a flexible steel ribbon slidable within and supported against buckling by said channels, and attached at its upper end to the peripheries of the second drum and slidably connected at its lower end to said sash, and means for imparting rotary motion to the second drum.

5. A structure providing a sash well, a sill board as a lid closing the well, a sash traversing the sill, a first cylindrical drum dependently attached to the sill within the well, said drum having a peripheral slot, a second cylindrical drum nested and journaled within said first drum concentrically therewith with its periphery spaced therefrom to form a narrow guide channel, said second drum having gear teeth concentric to and extending parallel with its axis of rotation, a driving gear meshing with said teeth and supported by said first drum and operable from a point exteriorly of the well structure, a tangentially disposed guide element as a continuation of the drum guide connected to said first drum and having a

slot as a continuation of said drum slot, a flexible steel ribbon attached to said drum and slidably supported against buckling in said guide and having its opposite end slidably connected with the sash whereby the ribbon can sustain compression and tensile loads without buckling respectively for lowering and raising the sash.

6. A device of the class described including a structure providing a well, a first cylindrical drum as a sheet metal stamping having a peripheral slot therein, a second drum as a sheet metal stamping nested within and journaled concentrically to and upon the first drum concentrically therewith and spaced therefrom to form a narrow guide channel between the peripheries of the drums, said second drum having struck-out axially disposed gear teeth, a driving gear meshing with said teeth and supported by said first drum and operable from a point exteriorly of the well structure, a vertically disposed guide element tangent to the first drum and forming a slot at its outer side in register with the drum slot, a sash slotted lengthwise at its lower side, the slot being of a length substantially equal to the horizontal distance from a point over the guide element to a point over a vertical diameter passing through the axis of the drums, a flexible steel tape attached at one end to the second drum and slidably disposed and supported against buckling in the guides and slidably connected at its opposite end with the sash slot.

In witness whereof, I have hereunto set my hand this 19th day of January 1924.

WALTER F. FREDERICKS.