

Sept. 6, 1955

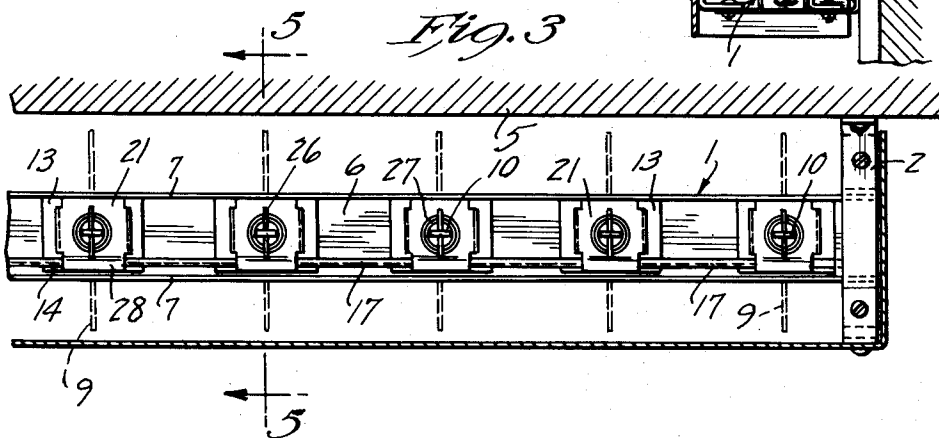
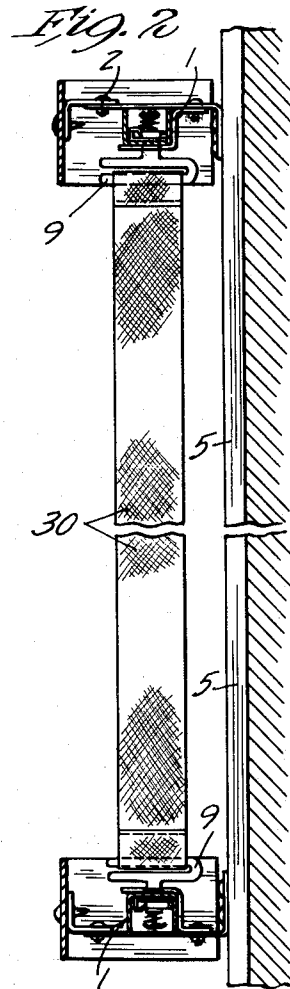
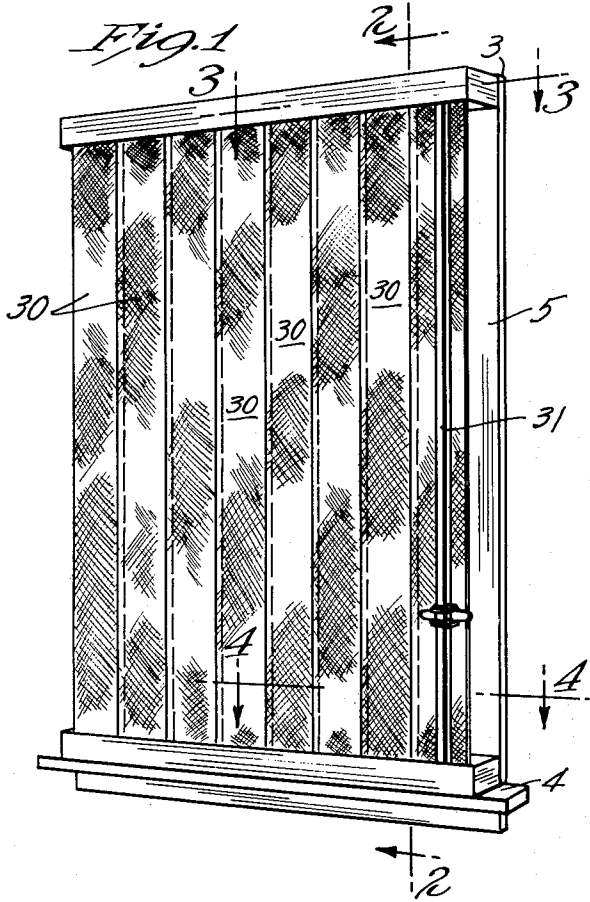
W. F. SHARPE

2,717,034

VERTICAL BLIND CONSTRUCTION

Filed Oct. 20, 1953

2 Sheets-Sheet 1



INVENTOR.

William F. Sharpe

BY

Merchant & Merchant
ATTORNEYS

Sept. 6, 1955

W. F. SHARPE

2,717,034

VERTICAL BLIND CONSTRUCTION

Filed Oct. 20, 1953

2 Sheets-Sheet 2

Fig. 4

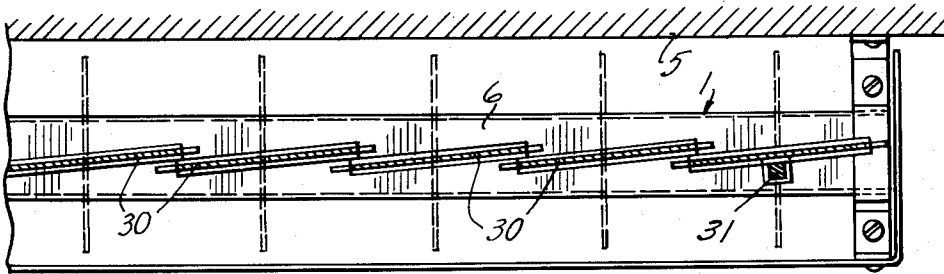


Fig. 5

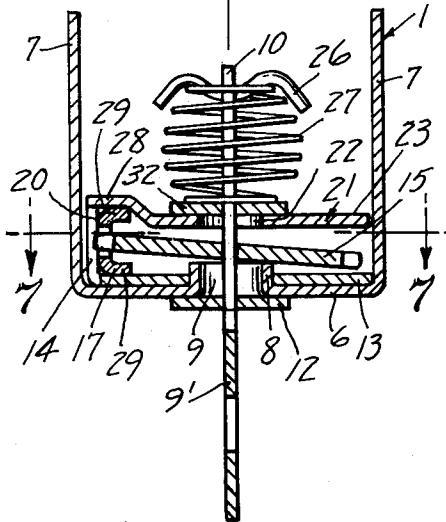
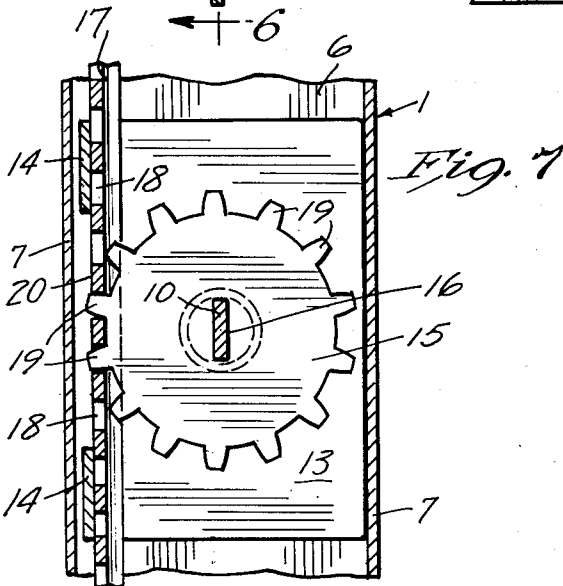
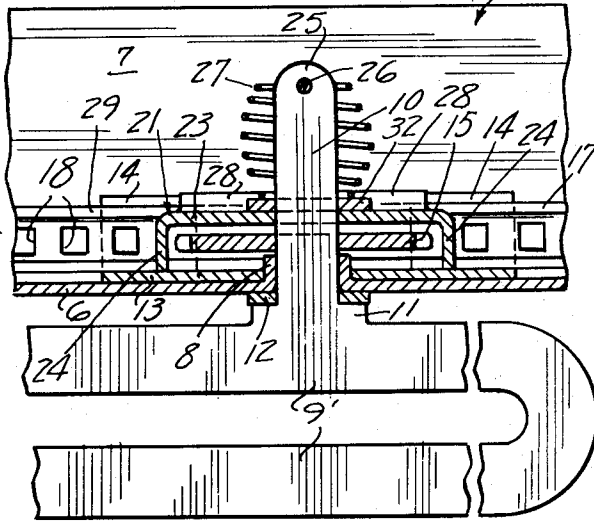


Fig. 6



INVENTOR.
William F. Sharpe
BY
Merchant & Merchant
ATTORNEYS

1

2,717,034

VERTICAL BLIND CONSTRUCTION

William F. Sharpe, Minneapolis, Minn.

Application October 20, 1953, Serial No. 387,138

1 Claim. (Cl. 160—176)

My invention relates generally to window shutters or blinds and more particularly to improvements in vertical blinds including a plurality of parallel slats formed from fabric strips.

Still more particularly, my invention relates to improvements in the support and operating structure for said parallel vertical slats. The primary object of my invention is a provision of the device of the class described which incorporates a plurality of vertical shafts having means at one end for detachably securing same to one end of a slat—the upper ends of said shafts projecting inwardly through the horizontal portion of elongated channel members in longitudinally spaced relationship, geared pinions non-rotatively but axially slidably mounted one each on said shafts within said channels and an elongated rack within said channel having meshing engagement with the teeth of said geared pinions, which structure may be manually operated with a minimum of friction.

A further object of my invention is the provision of means for shielding said geared pinions from dirt and extraneous matter so as to insure easy and quiet operation for a maximum period of time.

A still further object of my invention is a provision of the device of the class immediately above described which is extremely simple and durable in construction, which is relatively inexpensive to produce and which is relatively easy to assemble and disassemble.

The above and still further objects of my invention will become apparent from the following detailed specifications, appended claim and attached drawings. Referring to the drawings wherein like characters indicate like parts throughout several views:

Fig. 1 is a perspective view of a vertical blind, incorporating my novel supporting and operating structure;

Fig. 2 is an enlarged view in vertical section taken substantially on the line 2—2 of Fig. 1, some parts being broken away;

Fig. 3 is an enlarged fragmentary view, partly in horizontal section and partly in plan, as seen from the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view in horizontal section as seen from the line 4—4 of Fig. 1;

Fig. 5 is an enlarged view in vertical section taken substantially on the line 5—5 of Fig. 3;

Fig. 6 is a fragmentary view partly in side elevation and partly in section as seen from line 6—6 of Fig. 5; and

Fig. 7 is a fragmentary view partly in section and partly in plan as seen from the line 7—7 of Fig. 5.

Referring with greater particularity to the drawings the numeral 1 indicates an elongated channel, adapted to be secured in a horizontal position by any suitable means such as mounting brackets 2, to the upper and lower sides 3 and 4 respectively of a window frame 5. As shown, the channels 1 are positioned so that the horizontal bottom portions 6 thereof are in opposed relationship, the lower channel 1 being inverted. The sides of the chan-

2

nel members 1 are identified by the numeral 7. The transversely intermediate portions of the bottom 6 of channels 1 are punched at longitudinally spaced points to provide inwardly extruded or projecting sleeves 8 around the openings 9. Laterally opening hook elements 9 are preferably formed from flat stock and have vertical shafts 10 projecting vertically therefrom through the openings 9 for rotation therein. It will be noted that the axial depth of the sleeves 8 greatly increases the bearing surfaces for the shafts 10 as distinguished from the conventional stamped opening. Preferably and as shown the shoulder portions 11 on shafts 10 engage washers 12, intermediate shoulders 11 and the outer surface of bottom portion 6 of channel 1—to avoid friction due to rotation of the shafts 10 in openings 9.

Plate elements 13 are received over the shafts 10 within the channels 1, and are snugly received over the sleeves 8. One longitudinal edge of the plate elements 13 are in engagement with the adjacent sides 7 of the channels 1 whereas the opposite side edge portions thereof are bent angularly at 90° away from the bottoms 6 and in laterally spaced relation to the adjacent walls 7. These out-turned portions provide relatively narrow spaced bearing flanges and are identified by the numerals 14 (see particularly Figs. 5 and 7). Geared pinions 15 having central rectangular slots 16 therein are the next elements received upon the shafts 10 within the channel 1, the slots 16 being of the general shape of the shafts 10 but only slightly larger to lock the pinions 15 and shafts 10 together for common rotation.

An elongated rack 17, preferably and as shown formed from a strip of sheet metal bent into cross-sectionally U shaped form, has a plurality of longitudinally spaced openings 18 therein which mesh with the teeth 19 of the pinions 15. It will be noted, again see Figs. 5 and 7, that the outer surface 20 of the rack 17 frictionally engages only the relatively narrow spaced bearing flanges 14 instead of the entire inner surface of the adjacent wall 7 of the channel 1—thereby greatly eliminating friction and increasing the ease of operation.

Saddle elements 21 having central openings 22 of a size to permit rotation of the shafts 10 therein are next received over said shafts 10. Saddles 21 include a generally rectangular horizontal portion 23 and angular leg portions 24 which engage the plate elements 13 radially outwardly of the geared pinions 15 whereby to space said rectangular portion 23 from the pinions 15—thus again reducing friction to a minimum.

At their extreme inwardly projected ends 25, the shafts 10 are provided with removable locking pins 26. Coil compression springs 27 are interposed between the locking pins 26 and the saddles 21 and bias said saddles toward engagement of the angular portions 24 thereof with the plate elements 13. It will be noted that the saddle elements 21 have lip portions 28 which overlie the adjacent portions of the rack 17. It will be seen, particularly by references to Figs. 5 and 6, that the longitudinal edge 29 of the rack 17 frictionally engages only the spaced lip portions 28 of the saddles 21, whereas the opposite longitudinal edges 29 of said rack 17 engage only the spaced plate elements 13 instead of the bottom 6 of the channel 1—thereby also greatly eliminating friction in this manner.

As shown in Figs. 1 to 3 inclusive, when the channels 1 with my novel operating structure positioned therein, as above described, are suitably secured in opposed relationship to the upper and lower sides 3 and 4 respectively of a window frame 5, parallel slats 30 are placed upon the opposed hook elements 9, all in a conventional manner, whereby the coil springs 27 stretch said slats 30 taut. Thereafter common movements of the upper and lower racks 17, imparted thereto by the conventional

3

actuator rod 31, will cause common rotation for adjustment purposes of the shafts 10 and the mechanism carried thereby, including the hook elements 9 and the slats 30.

It will be noted that the coil springs 27 are of barrel-shape so as to permit maximum variation in length of the tapes 30 and to compensate for various degrees of longitudinal expansion or contraction of the tapes 30. It will be further noted by reference to Figs. 5 and 6 that the springs 27 bear against washers 32 that are mounted for common rotation with the shafts 10 and bear against the generally horizontal portions 23 of the saddles 21. With this arrangement, there is no tendency of the springs 27 to wind or unwind during rotation of the tape from one adjusted position to another with a consequent tendency of the tapes to rotate away from a newly adjusted position. Thus, there is no necessity for rotating the shafts 10 beyond the desired set position in order to allow for limited reverse rotation and the springs are at all times free from torsional strain.

My mechanism has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects; and, while I have shown a preferred embodiment thereof, same is capable of modification without departure from the scope of the appended claim.

What I claim is:

A support and operating structure for a window blind having vertically disposed parallel slats, said support and operating structure comprising an elongated U-shaped channel adapted to be secured horizontally to a window adjacent its upper or lower frame section, the bottom of said channel being provided with aligned longitudinally

4

spaced inturned sleeve openings, vertical shafts projecting inwardly through each of said openings, laterally spaced hook elements on the outwardly projecting ends of said shafts adapted to receive said slats, plate elements having an aperture therein being positioned within said channel with an inturned sleeve being snugly received in each aperture, said plate elements each terminating in a bearing flange, non-rotative saddle elements mounted on said shafts within the channel, spacing means positively retaining said saddles in spaced relation to said plate elements with said saddle and plate elements defining a housing, geared pinions mounted on each shaft for common rotation therewith and disposed within each said housing intermediate of and positively axially spaced from the respective saddle and plate elements, an elongated rack disposed intermediate the geared pinions and said bearing flanges in meshing engagement with the pinions and sliding frictional engagement with the bearing flanges, said axial spacing of said pinions to the saddle elements and plate elements permitting limited floating movement of the pinions when actuated by said rack and resilient means interposed between the inwardly projecting ends of the shafts and the respective saddles biasing said hook elements toward the bottom of the channel.

References Cited in the file of this patent

UNITED STATES PATENTS

2,524,373	Bopp et al. ----- Oct. 3, 1950
2,604,161	Bopp et al. ----- July 22, 1952
2,660,237	Bopp et al. ----- Nov. 24, 1953