April 7, 1931. H. J. MACKIN 1,799,522

BLIND

Filed Feb. 12, 1930 3 Sheets-Sheet 1

Fig. 1

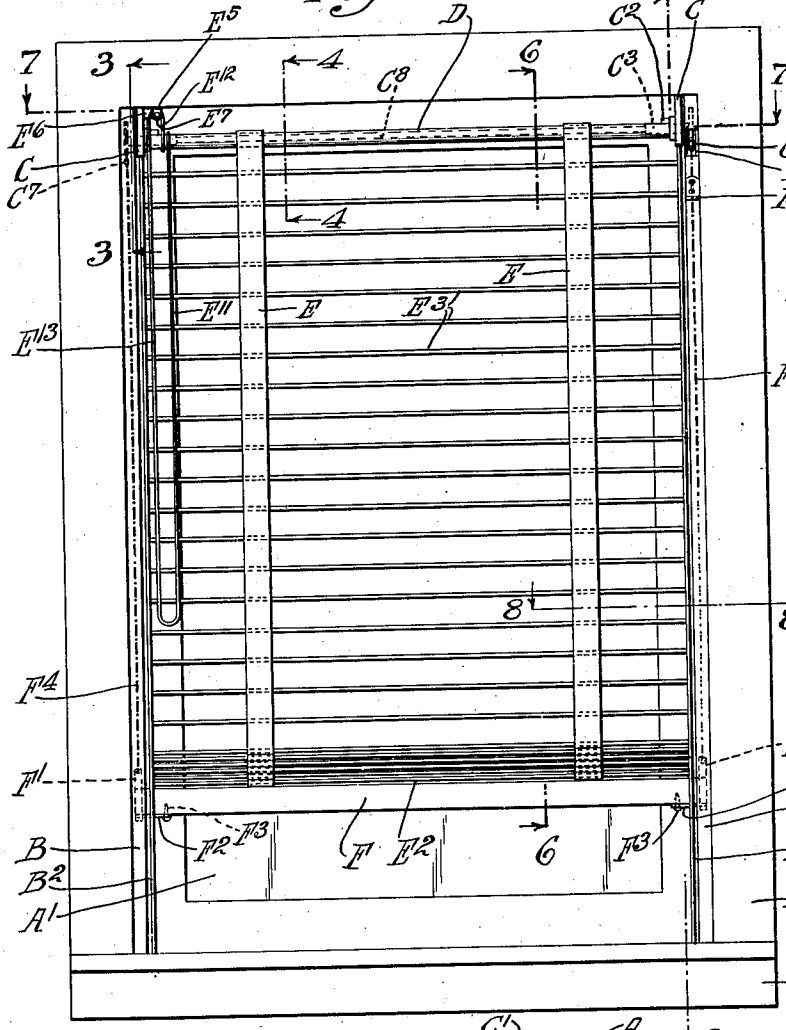


Fig. 2

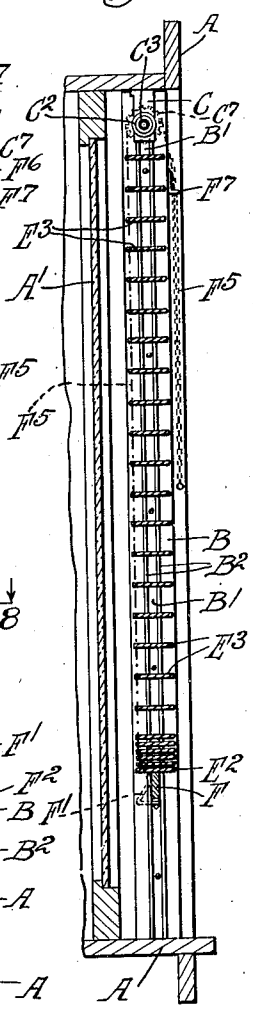


Fig. 3

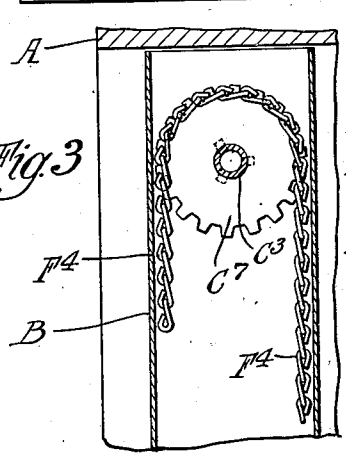
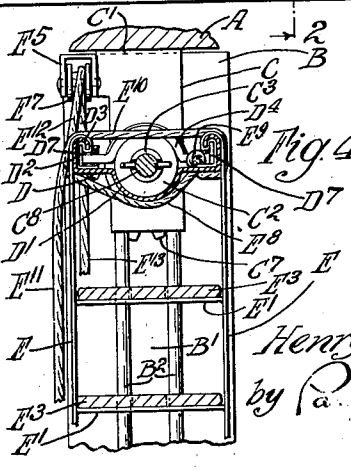


Fig. 4

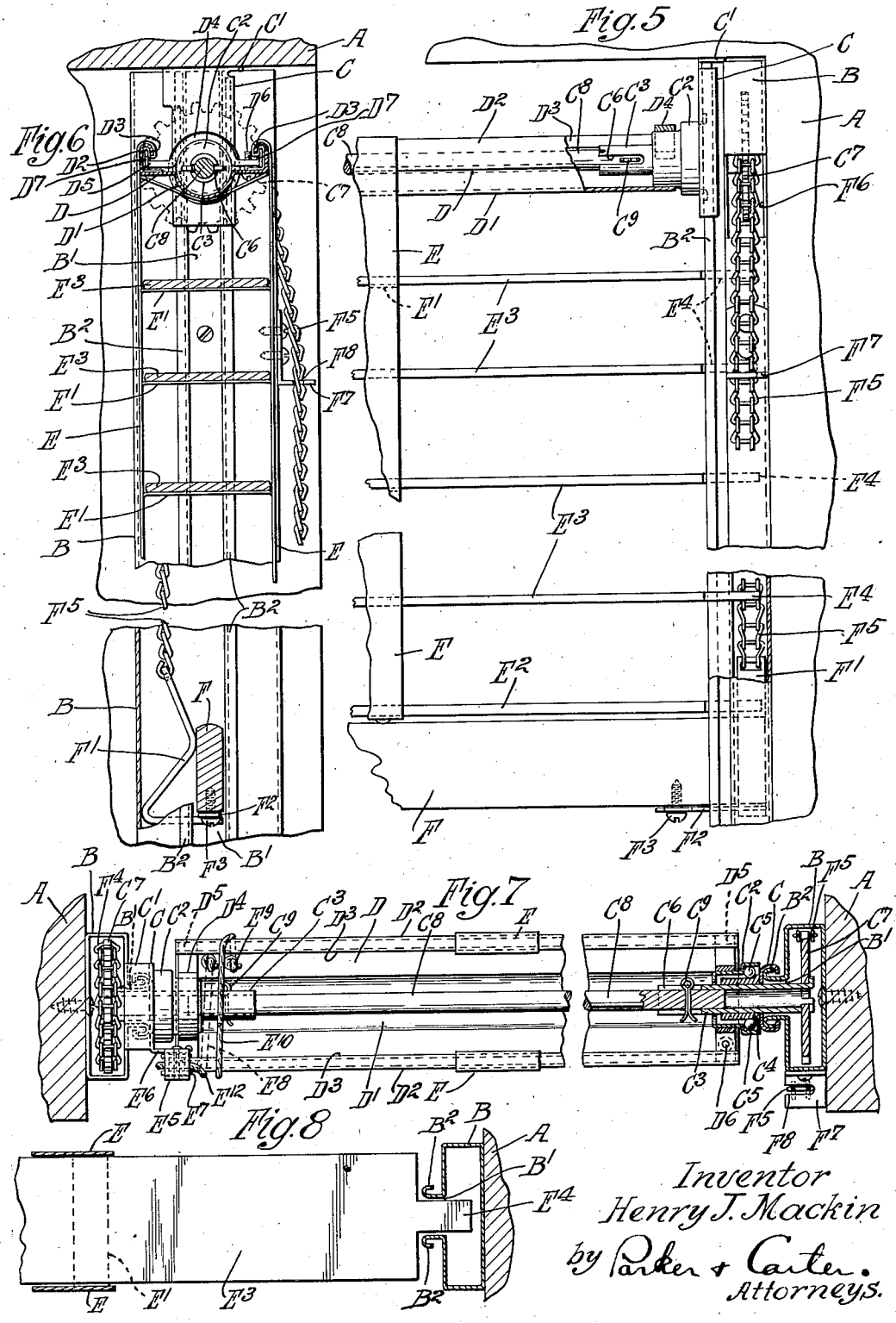


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BLIND

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Fig. 9

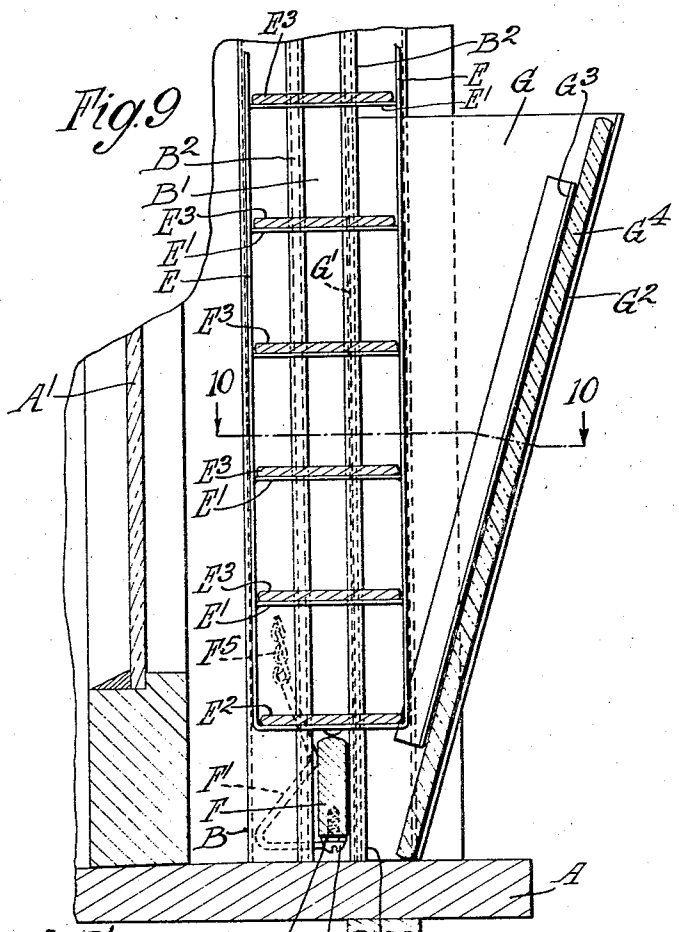
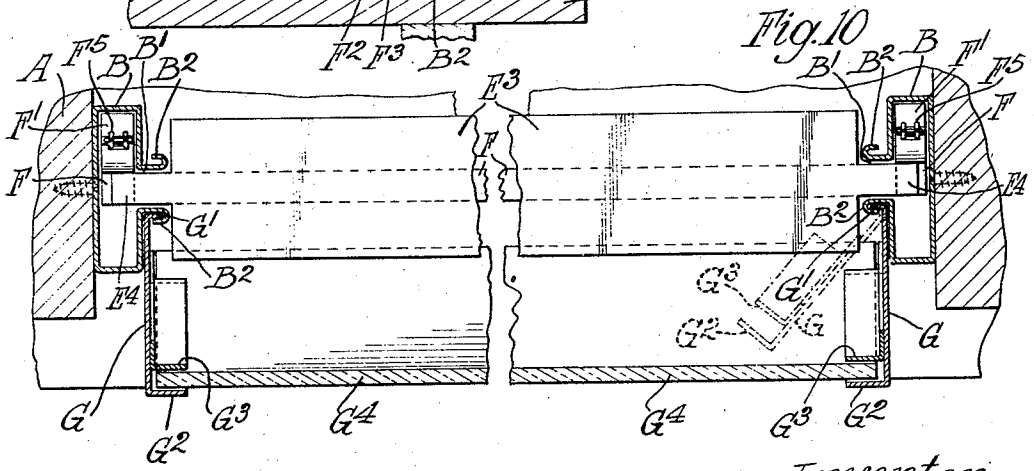


Fig. 10



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UNITED STATES PATENT OFFICE

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BLIND

Application filed February 12, 1930. Serial No. 427,705.

This invention relates to window blinds, particularly to blinds of the type which is generally referred to as Venetian blinds. In its main outline, the structure of the invention includes a series of slats extending laterally across a window, together with mechanism for supporting them, for raising them and for tilting them.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is an elevation of a blind positioned in a window;

Figure 2 is a transverse vertical cross section taken on line 2—2 of Figure 1;

Figure 3 is a sectional detail taken on an enlarged scale at line 3—3 of Figure 1;

Figure 4 is a sectional detail on an enlarged scale taken at line 4—4 of Figure 1;

Figure 5 is an enlarged detail view showing the blind lowered, with parts in section and parts broken away;

Figure 6 is a transverse vertical cross section on an enlarged scale taken at line 6—6 of Figure 1;

Figure 7 is a longitudinal cross section taken at line 7—7 of Figure 1;

Figure 8 is a horizontal sectional detail taken at line 8—8 of Figure 1;

Figure 9 is a vertical section through the blind, showing the channel in elevation and showing in addition a ventilator supported on the channel with parts of the ventilator in section;

Figure 10 is a horizontal section taken on line 10—10 of Figure 9;

Like parts are designated by like characters throughout the specification and drawings.

A is a window frame within which a window A^1 is positioned. The blind and its associated parts are positioned within the window frame.

B is a channel member formed on one side with a slot B^1. The slot B^1 is preferably bounded by inwardly extending flanges or ribs B^2. One such channel is fastened on the inside of the window frame as shown in the figures. Adjacent the top of the window frame and engaging the flanges B^2 at each side is positioned a channel member C. This member has at its top a flange C^1 which may overlie a portion of the top of the channel member B. Positioned upon the member C is a bearing housing or inclosure C^2. This housing may constitute the outer ball race of a ball bearing, as shown in detail in Figure 7. Positioned within the housing C^2 is a short and preferably hollow shaft C^3. There may be fixed on the outside of this shaft a ball race C^4. C^5, C^5 are balls mounted to rotate between the outer race formed by the member C^2 and the inner race C^4. The shaft C^3 is preferably provided in one end with a pair of slots C^6. At its opposite end the shaft C^3 has mounted upon it a sprocket wheel C^7. As shown there are two such housings C^2 and consequently two shafts C^3 normally associated with each complete blind assembly. C^8 is a shaft adapted to fit at each end within one of the hollow shafts C^3 and to be held in position against rotation with relation to these shafts by cotter pins C^9.

D is the uppermost slat. It is normally provided with a downwardly curved central portion D^1 and upwardly extending edges or flanges D^2 which terminate in inwardly and downwardly bent corners D^3. Mounted at either end of the slat D is a retaining member D^4. This is curved as shown in Figure 6 to conform to the shape of the bearing housing member C^2 over which it is positioned and which it embraces. One end of the member D^4 is hooked under one of the flanges D^3, as shown at D^5. The other end is adjustably held in position by means of a screw D^6. By means of this construction the slat D and its associated parts may be positioned on the members C^2 and the parts may be so adjusted that the slat can rotate freely on this member. The member C^2 thus furnishes a bearing for the slat and its associated parts which are supported from it.

Downwardly depending from the slat D is a pair of tapes E. These tapes are fastened at their upper ends to the slat D by wedges D^7 and are joined intermediate their ends at frequent and preferably regular intervals by cross tape members E^1. At their bottoms they are fastened to a bottom slat member E^2.

E^8 are slat members. Each is preferably provided at either end with a tongue E^4 and these tongues on the slats project within the slot B^1 of the channel B as indicated particularly in Figures 5 and 8. E^5 is a roller bracket which may be positioned on an extension E^6 from one of the members C. Within this bracket is rotatably mounted a roller E^7. E^8 is a looped tilting cord. At one end it is fastened to the slat D at E^9. It extends across this slat as at E^{10} and downwardly as at E^{11}. Its other end is also fastened to the slat D, but crosses below it as indicated at E^8, thence passes upwardly as at E^{12} about the roller and downwardly as at E^{13}. When the slats are in the position indicated in Figure 4 and it is desired to tilt them, a downward pull on the portion E^{11} of the tilting cord will cause the left hand edge of the slats as shown in Figure 4, to be depressed. If this position is to be reversed, a downward pull on the portion E^{13} is necessary and this would reverse the slats and tilt them if continued to the full tilting limit in the opposite direction.

F is a raising bar. Normally it will extend within the slot B^1, B^1 of the channels B, B at each end, as indicated particularly in Figures 1, 5 and 6. At each end of the raising bar F is a supporting member F^1 which lies in large part within the channel B and is provided with an outwardly extending portion F^2 which extends beyond it. This portion is fastened to the bar F by means of screws F^3 or other suitable means. Fastened to the member F^1 at the left hand side as shown particularly in Figures 1 and 7, is a chain F^4. This chain normally lies wholly within the channel B and meshes with one of the sprocket wheels C^7, as shown in detail in Figure 3. The clearance between the teeth of the wheel C^7 and the sides of the channel member B is such that the chain F^4 cannot slip out of engagement with the teeth. At the opposite side of the window is a similar chain F^5 which is fastened to the corresponding supporting member F^1. This chain F^5 meshes with the right hand sprocket wheel C^7 and it also is held in engagement with that wheel by the fact that the clearance between the wheel and the side walls of the channel which incloses it is not sufficient to permit displacement of the chain. The right hand channel member B is preferably provided with a cut away portion F^6 through which the chain F^5 extends outwardly. F^7 is a catch member preferably fastened on the side of the right hand channel member B and provided with a slot F^8. Within this slot the chain F^5 may be moved and when so moved the chain is held against upward or downward movement, as the slot is only narrow enough to permit one of the relatively thin portions of the chain link to penetrate. This construction is shown in detail in Figures 5, 6 and 7.

In Figures 9 and 10, I show a modification in which the channel B is made to support a pair of ventilator sections. These sections, as shown, are more or less triangular in plane and comprise the members G, each of which has one straight edge from which a flange G^1 is bent. This flange is adapted to be engaged in or behind the inwardly extending flange B^2 of the channel B, as indicated in Figure 10. The member G is provided also with a flange or bent portion G^2 on its opposite or inclined edge and it has formed parallel with this flange a member G^3. Between the flange G^2 and the member G^3 a sheet of glass or other preferably transparent or translucent material G^4 is removably positioned.

By means of the construction shown in these figures, the channel B and its associated flanges serve also as the supporting and positioning member for the ventilator holding part and thus a ventilator may be positioned in the window in which the blind has been located and this may be done without the necessity of fastening any other parts into the window frame or casing since the ventilator itself is carried on the channel B which is an essential part of the blind and, therefore, must be used whether or not the ventilator is to be added.

It will be obvious that while I have shown and described an operative device, many changes may be made in the size, shape, proportion and relation of parts without departing materially from the spirit of my invention, and I wish therefore that my description and showing be considered as in a large measure diagrammatic.

The use and operation of this invention are as follows:

When the parts are in the position shown, for example, in Figure 1, the slats are so tilted as to admit a maximum of light and the blind is down throughout substantially the whole length of the window. The raising chain F^5 is locked in the catch F^7 and movement of the blind cannot accidentally take place. If now, it is desired to tilt the blind downwardly a downward pull on the portion E^{11} of the tilting cord will cause the inner edges of the slats as viewed in Figure 1, to tilt downwardly. The tilting of the slats is effected, of course by the tilting of the upper slat D which moves the tapes E so as to tilt the slats which are held by them, and this movement is entirely independent of the position of the blind as a whole or the bar F. No matter what the position of the blind or what portion of it is up or down, so long as the blind is not wholly raised, that portion which is down can be tilted.

To raise or lower the blind the chain F^5 is moved out of contact with the catch F^7 and if the blind is to be raised, the chain is pulled downwardly. This rotates the right hand sprocket C^7 and through the right

hand shaft C^8, the shaft C^8, the left hand sprocket C^7 and the left hand shaft C^3 this raises the chain F^4 and thus raises the two sides of the bar F together. When the blind has been moved to the proper position the chain F^5 is again engaged with the catch F^7 and further movement is prevented. To lower the blind it is sufficient to move the chain F^5 out of engagement with the catch F^7 and permit the weight of the blind to pull it downwardly the desired distance.

The tapes E are fastened to the top slat D by means of wedges or keys D^7. These are fitted into the channel made by the inwardly and downwardly bent edges or corners D^3 of the flanges D^2 of the slat D. The use of this type of fastening makes it possible to attach and detach the tapes E from the slat readily. When it is necessary to remove the parts for cleaning or repair, it is necessary only to dislodge the wedges D^7 from their position, as indicated in Figures 4 and 6. The tape E which is bent around the curved portions D^3 of the flanges D^2 is then free to be removed.

I claim:

1. In combination in a window blind, a plurality of inclosed guides, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft.

2. In combination in a window blind, a plurality of inclosed guides, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains extending out from the guide within which it lies and adapted to be moved to rotate the shaft.

3. In combination in a window blind, a plurality of inclosed guides, a shaft positioned on said guides and extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft.

4. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying in each of said guides sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft.

5. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft positioned on said guides and extending at each end into one of said guides, said shaft carrying in each of said guides sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft.

6. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft positioned on said guides and extending at each end into one of said guides, said shaft carrying in each of said guides sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains extending out from the guide within which it lies and adapted to be moved to rotate the shaft.

7. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a built up shaft positioned on said guides and extending at each end into one of said guides, said shaft carrying in each of said guides sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guides being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains extending out from the guide within which it lies and adapted to be moved to rotate the shaft.

8. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth.

9. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a discontinuous piece of chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth.

10. In combination in a window blind, a plurality of inclosed guides, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the

ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft, and a raising bar guided by said guides connected to said chains to be supported and moved thereby.

11. In combination in a window blind, a plurality of inclosed guides, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains extending out from the guide within which it lies and adapted to be moved to rotate the shaft, and a raising bar guided by said guides connected to said chains to be supported and moved thereby.

12. In combination in a window blind, a plurality of inclosed guides, a shaft positioned on said guides and extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft, and a raising bar guided by said guides connected to said chains to be supported and moved thereby.

13. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying in each of said guides sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft, and a raising bar guided by said guides connected to said chains to be supported and moved thereby.

14. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, and a raising bar guided by said guides, connected to said chains to be supported and moved thereby.

15. In combination in a window blind, a plurality of inclosed guides, said guides having slots formed therein, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a discontinuous piece of chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, and a raising bar guided by said guides, connected to said chains to be supported and moved thereby.

16. In combination in a window blind, a plurality of inclosed guides, a shaft extending at each end into one of said guides, said shaft carrying sprockets, a chain over each of said sprockets, the clearance between the ends of the sprocket teeth and said guide being such as to prevent said chain from slipping off of the sprocket teeth, a portion of one of said chains adapted to be moved to rotate the shaft, and a raising bar guided by said guides connected to said chains to be supported and moved thereby, and a series of slats projecting partially into said guides, flexible supporting and spacing members for them and a tiltable controlling slat supporting said flexible members and adapted to be tilted and to tilt all the slats in unison.

17. In combination, a blind including a plurality of members adapted to be raised and lowered, a guide for said members, a portion of said guide shaped to receive a supporting member for a ventilator.

18. In combination, a guiding element for window blinds, provided with a projecting flange having an inwardly bent edge, said edge and the body of said member serving as attaching and spacing elements to receive a ventilator part.

19. As a means for supporting in proper spaced relation, a Venetian blind and a ventilator, a single supporting and guiding element adapted to be fastened with relation to a window, and comprising a member provided with a slot adapted to receive portions of said blind and to guide them in their movement, a part bounding said slot provided with a seating part to support a ventilator carrying element, said ventilator being spaced from said element so that the ventilator, when in position, leaves the blind free for normal movement without interference.

20. In combination in a window blind assembly, means for guiding and positioning the blind and for positioning and supporting a ventilator, said means including a part formed on said guiding member adapted to receive a ventilator supporting part.

Signed at Chicago, county of Cook, and State of Illinois, this 3rd day of February, 1930.

HENRY J. MACKIN.