May 23, 1933. D. PASSONI 1,910,047

FLEXIBLE BLINDS

Filed June 3, 1931

Fig. 5.

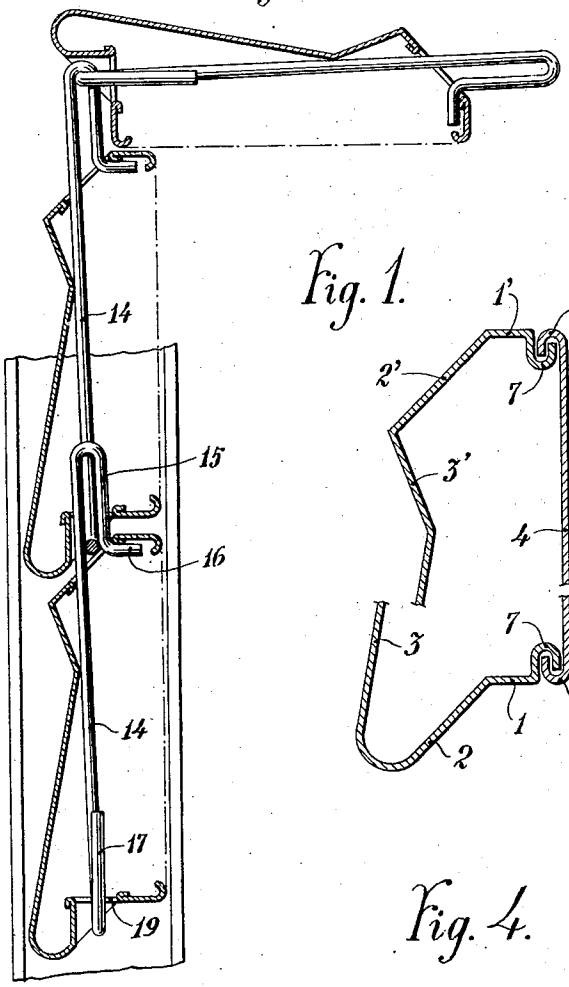


Fig. 3.a.

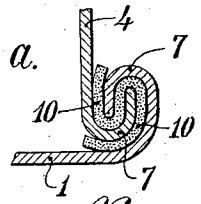


Fig. 1.

Fig. 1a.

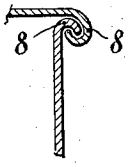
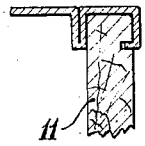


Fig. 3.b.



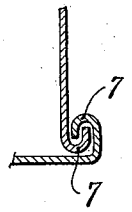


Fig. 1b.

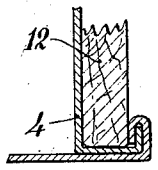


Fig. 3c.

Fig. 4.

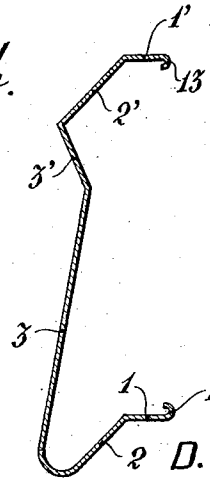


Fig. 2.

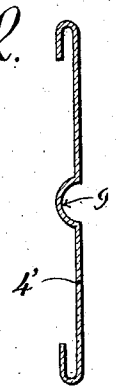
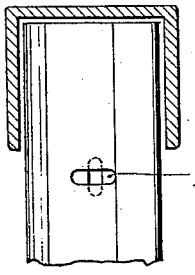


Fig. 6.



D. Passoni

INVENTOR

By: Marks & Clerk

Attys.

Patented May 23, 1933 1,910,047

UNITED STATES PATENT OFFICE

DOMENICO PASSONI, OF MILAN, ITALY, ASSIGNOR TO SOCIETE ANONYME FABBRICHE FORMENTI, OF MILAN, ITALY

FLEXIBLE BLINDS

Application filed June 3, 1931, Serial No. 541,872, and in Italy June 12, 1930.

For some time constructors, with a view to eliminating the disadvantages in the construction, use and price of wooden blinds, have sought to replace wood by sheet metal which can be worked more rapidly and more cheaply, and which is incomparably stronger. These attempts, however, although they have been successful, have been limited to hinged or sliding shutters, probably because these shutters form rigid frames which can very easily be manufactured with sheet metal and any kind of reinforcement or rib applied or moulded on them. In fact, there exist very good sheet metal shutters made for example of a single sheet of metal.

But as regards flexible blinds the problem has not yet been solved, probably because in the case of these shutters it is more difficult to fulfill all the requirements of practice. These comprise in the first place a perfect insulation against heat, imperviousness to water along the seating surfaces of the strips, the provision of a passage for air and light if desired, the greatest mechanical safety, that is to say the inaccessibility of the joints from outside; an operation which is as far as possible silent or light, a certain indispensible degree of artistic appearance, and finally a cost price which is as low as possible.

All the attempts which have been made to obtain a good metal flexible blind have failed because it has not been possible to meet all these requirements or because they have been incompletely or imperfectly met. The chief of these requirements is the heat insulation which could be obtained by simply packing insulating material in the hollow space within each slat, which is shaped as a closed profile with a view to forming an insulating chamber.

The conduction of heat from the front to the back of the slat is much more objectionable than any radiation effect; but, although every effort has been made in order to obtain chambers and packing which prevent all heat radiation, on the other hand no attention has yet been given to this other side of the question, that is to say the creation of an obstacle preventing the conduction of heat.

The object of the present invention is to provide a sheet metal flexible blind which solves all the above mentioned problems in a very simple, very complete and economical manner.

According to the invention the heat insulation is obtained not only by adopting a closed profile so as to form an air cushion preventing the transmission of heat by radiation, but in addition and above all by the creation of an absolute discontinuity between the front wall and the back wall in order to prevent, as completely as possible, any transmission of heat by conduction.

On some cases of less importance (works, shops, cellars etc.) this detail may be left out for economy by giving the slats a complete profile open over the back part. But in general in all other cases, particularly if the blind has to serve for the windows of houses and for like purposes, it will always be present, that is to say that the slats will be closed and discontinuous as described above.

This back part may be covered by an insulating varnish or with a sheet of wood or insulating material or it may even be formed directly by a rectangular strip of wood, paper or other analogous insulating and rigid material.

The other properties required are provided according to the invention by partly inclining the existing surface of the slats outwards from top to bottom so as to provide a slope along which water cannot rise, and which at the same time directs the line of sight of outside observers on to the ceiling of the room, and forms a joint cover which prevents access to the pivotal connections between the slats.

The insulating discontinuity also produces another effect, in that it deadens the metallic timbre of the strip and prevents any possibility of vibration, so that the operation becomes quiet if not silent.

The appearance can be made as artistic as desired because the front profile as well as the back profile are not connected to each other in any way, and may be chosen as desired.

The cost of construction is very low since

the slat is reduced to its most simple form, and may be constructed by a simple rolled section after previously cutting the holes for the passage of the attachment members.

The accompanying drawing illustrates by way of example some embodiments of the invention.

Figure 1 shows the profile of a two-piece closed slat.

Figures 1*a* and 1*b* show modified forms of the joint between the front and back walls of the slat shown in Figure 1.

Figure 2 shows the profile of a ribbed back wall.

Figures 3*a*, 3*b* and 3*c* show the detail of the heat insulation of the back wall.

Figure 4 shows the profile of a slat open at the back.

Figure 5 shows a method of joining the slats in order to form the blind.

Figure 6 shows a plan view of Figure 5.

The profile shown by way of example in Figure 1 does not differ greatly from the ordinary profiles of wooden shutters; but it is expressly understood that this is not the only profile which may and can be adopted. It comprises at the top and at the bottom two horizontal seating edges 1 and 1′, two inclined faces 2 and 2′ for the passage of the light, and an inclined front part composed of an upper surface 3′ and a lower surface 3. It finally comprises a back face 4 which completes the profile. In this example the back part 4 is separate from the front part, and is hooked to this part by means of its longitudinal edges. These hooks are formed by straight beadings 7 or spiral beadings 8 such as those shown, or beadings which correspond with each other in the two assembled parts may be adopted.

This method of assembly provides a sliding assembly which permits access to the interior of the blade, either for fitting the joints between the slats and for dismounting the parts for repair or cleaning, or for any similar purposes. Secondly, this method of assembly presents another very important advantage from the thermal point of view, because, while being very rigid, it establishes a break in continuity between the front and the back part of the slat which prevents the conduction of heat from one of these parts to the other. These facts, together with the feature that the slat forms a closed chamber, provides a heat insulation which if not perfect is at least considerable and quite sufficient in practice.

This back wall may be flat or it may also, with a view to improving its strength or for obtaining a better artistic appearance, be provided with ribs such as that shown in Figure 2, where the wall 4 is provided with a re-entrant rib 9.

The break in continuity which has been mentioned above has also another advantage; it deadens the noise which the metal would produce if it were made in a single piece or were free at its edges. By the provision of this discontinuity, the noise made by the blind is completely deadened, and is very similar and even less than that produced by wood.

An absolutely perfect heat insulation may be obtained by inserting in the beading 7 or 8 (Figure 3*a*) a band 10 of rubber or any other insulating material. For the same purpose this sheet metal back wall may be replaced by a strip 11 of wood (Figures 3*b*) or a strip of wood 12 may be applied against the sheet metal back wall, which in this case will not be dispensed with. One or the other of these details will be employed according to the degree of insulation it is desired to obtain. In the most simple cases of less importance, a layer of insulating varnish may even be sufficient, and this layer will be applied on the back wall 4.

In the case when the thermal insulation is not necessary and where on the other hand economy is a great consideration, the back wall will be dispensed with and only the front part of the slat will be preserved. This case is shown in Figure 4, in which the back wall is missing and the profile is open and is limited to the parts 1—1′, 2—2′, 3—3′ already mentioned. The free edges of the plate will then be simply rounded at 13, 13′ in order to strengthen them and soften the edge.

The construction of the slats from sheet metal sections permits any type of joint to be employed between the strips for forming the blind.

Figure 5 shows a joint obtained by means of a double hook. This is a passing connection. According to this embodiment a small rod 14, which passes right through the slat, is provided at the top with a hook 15 which projects from the slat and has a bent end 16, bent over at right angles, which supports the slat itself. At the lower end the rod comprises a hook 17 turned through 90° with respect to the upper hook 15. Each hook engages in the opposite hook of the contiguous strips, and in this manner a perfect pivotal connection is obtained. Holes 18 are provided for the passage of the hooks through a flat seating surface 19.

The length of the slats may vary. Their width may also vary according to the use to which the blind is to be put.

The blind is guided laterally by channel irons in the same manner as wooden blinds, and its application to windows is also the same. The metallic construction permits decorative impressions (trophies, lines, etc.) to be obtained by pressing on the strips, which could not be done with wooden strips. The blind is wound on a drum in the same manner as wooden blinds, and similar pre-

cautions are also taken to ensure balance and safety.

The blind according to the invention is also very applicable for closing stalls and shops (fanlights, skylights) with this advantage over other fanlights employed, that if desired it permits the entry of light and a good ventilation of the inside space, while the joints described above provide the best safeguard because they prevent any inclination of the slats. The highest degree of security is obtained because the attachments cannot be reached from the outside and the inclined planes 2, 2′ form a cover joint.

What I claim is:

1. As an article of manufacture, a slat for a flexible blind, comprising a front wall formed of a profiled sheet metal strip of C-shaped cross-section, a back wall formed of a profiled sheet metal strip of substantially plane cross-section, secured at its edges to the edges of the C-shaped plate so as to form a closed chamber and means for heat-insulating the front wall from the back wall.

2. As an article of manufacture, a slat for a flexible blind, comprising a front wall formed of a profiled sheet metal strip of C-shaped cross-section, a back wall formed of a profiled sheet metal strip of substantially plane cross-section, secured at its edges to the edges of the C-shaped front wall, and a packing of insulating material in the joint between the front and the back wall.

3. As an article of manufacture a slot for a flexible blind, comprising a front wall formed of a profiled sheet metal strip of C-shaped cross-section, a back wall formed of a profiled sheet metal strip of substantially plane cross-section, secured at its edges to the edges of the C-shaped front wall, the back wall being coated with heat-insulating material, whereby it is heat-insulated from the front wall.

4. As an article of manufacture, a slat for a flexible blind, comprising a front wall formed of a profiled sheet metal strip of C-shaped cross-section, a back wall formed of a profiled sheet metal strip of substantially plane cross-section, secured at its edges to the edges of the C-shaped front wall, the back wall being made of rigid and heat insulating material.

5. As an article of manufacture, a slat for a flexible blind, comprising a front wall formed of a profiled strip of C-shaped cross-section, a back wall formed of a profiled strip of substantially plane cross-section, secured at its edges to the edges of the front wall, and heat insulation between the front and back walls at the joint, the front wall having a flat seating at its upper side, and a flat seating at its under side, and an inclined surface at the front, extending below the lower flat seating and the back wall having a strengthening rib running lengthwise.

6. A slat for a flexible blind as claimed in claim 5 wherein a joint between the front and back walls is obtained by interengaging beaded edges on the front and back walls.

7. A slat for a flexible blind as claimed in claim 5, wherein a joint between the front and back walls is obtained by interengaging beaded edges on the front and back walls, the beaded edges being in the form of interengaging hooks.

8. As an article of manufacture, a flexible blind comprising slats formed of profiled strips of C-shaped cross-section, having an apertured upper flat seating, an apertured lower flat seating, and an inclined front wall extending below the lower flat seating, and rods passing through the aperture in the upper and lower flat seatings of each strip, the ends of the rods passing through adjacent strips being pivotally connected together.

9. As an article of manufacture, a flexible blind comprising slats having a front wall formed of a profiled strip of C-shaped cross-section, having apertures in its upper and lower surfaces, a back wall formed of a profiled strip of substantially plane cross-section, secured at its edges to the edges of the front wall, and rods passing through the apertures in the upper and lower surfaces of each front wall, the ends of the rods passing through adjacent slats being pivotally connected together.

10. A flexible blind as claimed in claim 9, further comprising means for heat insulating the back wall from the front wall of each slat.

11. A flexible blind as claimed in claim 9, further comprising heat insulating means between the front and back walls of each slat.

In testimony whereof I have signed my name to this specification.

DOMENICO PASSONI.