C. C. TOMKINSON.

SHUTTER SLAT.

APPLICATION FILED JULY 12, 1920.

1,406,303. Patented Feb. 14, 1922.

Fig. 1.

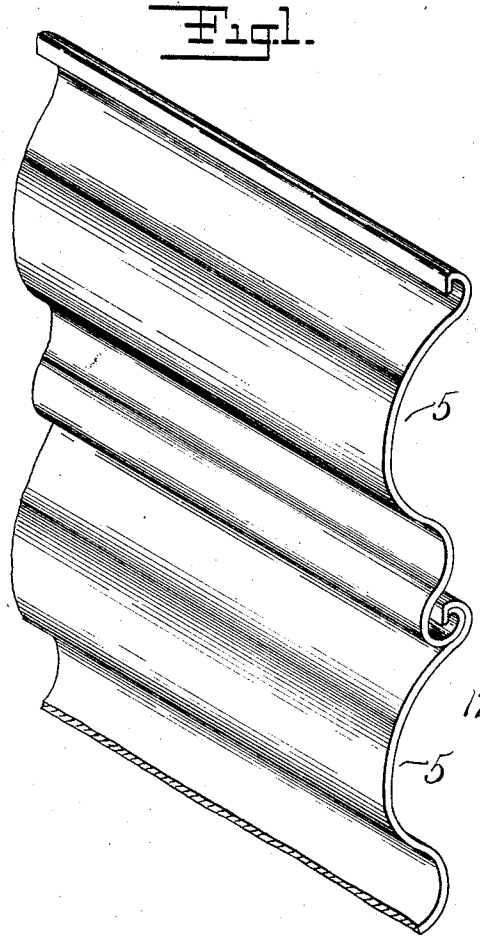


Fig. 2.

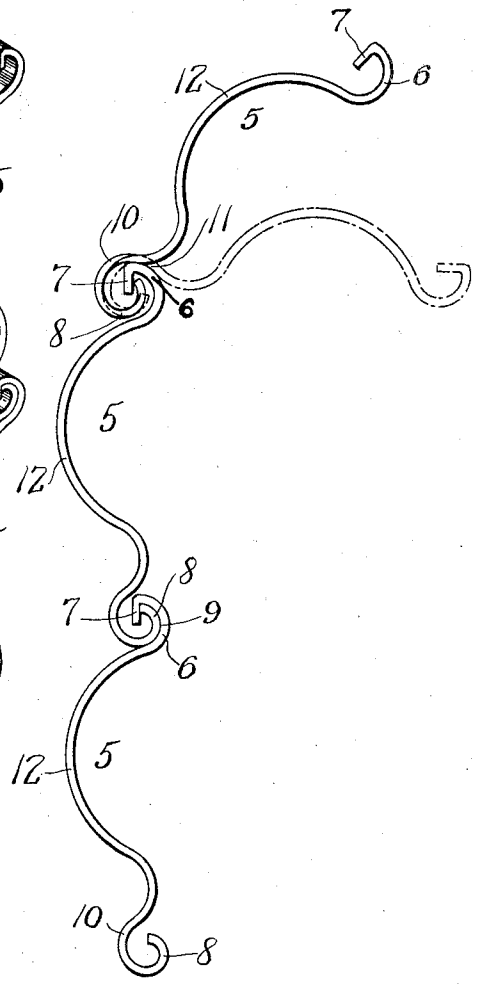
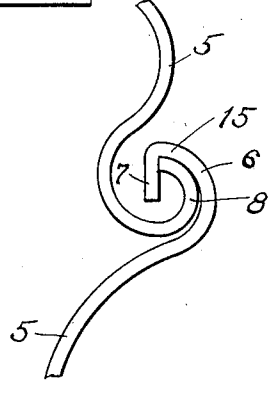


Fig. 3.



Inventor

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By his Attorney

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UNITED STATES PATENT OFFICE.

CHARLES C. TOMKINSON, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO JOHN EDWARD OGDEN, OF MOUNTAINVILLE, NEW YORK.

SHUTTER SLAT.

1,406,303. Specification of Letters Patent. **Patented Feb. 14, 1922.**

Application filed July 12, 1920. Serial No. 395,583.

To all whom it may concern:

Be it known that I, CHARLES C. TOMKINSON, a citizen of the United States, and a resident of Plainfield, Union County, and State of New Jersey, have invented certain new and useful Improvements in Shutter Slats, of which the following is a specification.

This invention relates to rolling steel shutters such as are commonly used for doors in warehouses and the like.

The objects of the invention are to provide an easy rolling shutter structure which will be practically wind and moisture proof.

The invention involves certain novel features of construction and combinations of parts, as will be disclosed in the following detailed specification, reference being had to the accompanying drawing forming a part thereof and in which I have illustrated the invention embodied in one of its practical commercial forms.

In the drawing referred to:

Figure 1 is a perspective view of the shutter in use as a door.

Figure 2 is an edge view of the same, illustrating the rolling action thereof and showing how the slats may be turned to disconnect the same.

Figure 3 is an enlarged broken detail view of a modified form of joint between the slats.

The slats 5 which make up the shutter are connected by rolling joints provided by interfitting reversely curled portions at the opposite edges of the slats.

Thus, each slat is formed at its upper edge with an outwardly curved bearing portion 6 terminating in an angularly abrupt inturned flange 7 and at its lower edge with an inwardly curled hooked bearing 8.

The slats are assembled with the inwardly curved bearing portion 8 at the lower edge of one slat fitting with a rolling sliding engagement within the outwardly curved bearing at the upper edge of the next adjoining slat. The curvatures of the end portions of the lower bearings are drawn on an arc to fit the substantially semi-cylindrical seats provided at 9 in the upper bearing portions 6 and these lower bearings, above or inward from the ends thereof are of increased radius as indicated at 10 so as to slide over the outer surface of the upper bearing members as indicated at 11, when the shutter is being rolled up.

When, therefore, the shutter is extended or stands in a vertical plane, the portions of smaller radius at the lower edges of the slats fit into the sockets in the upper edges of the slats and when the slats are rolled over or inward, as shown in Figure 2, as when the shutter is being rolled on a supporting drum, the portions of greater radius have a sliding bearing over the outer surfaces of the upper bearing members. In each instance, a practically weather-proof joint is provided between the slats.

The angularly inturned flanges 7 at the upper edges of the slats, by engagement with the hooked ends of the lower bearings 8 (Figure 2) to stiffen the structure against wind pressure prevent disengagement of the joints as the shutter is being rolled up and also form additional seals at the joints. Similarly, these flanges, by cooperating with the inwardly curled edges of the slats, form supplemental sealing means when the shutter is fully extended, as will also be clear from Figure 2.

The slats may be disengaged, when desired, by rocking them to an abnormal extent, as indicated in dotted lines in Figure 2, in which position it will be seen the interlocking hook elements at the meeting edges are free of each other, so as to permit disengagement of the slats. This construction provides for the easy assemblage of the shutter and permits of the opening of the joints at any point, for instance, when it is desired to replace injured or worn out slats.

The slats illustrated are shown as bowed outwardly intermediate their edges as at 12, which causes the shutter to coil in relatively compact form.

The slats can be produced relatively inexpensively, and when assembled and used in the manner described, provide a close-fitting and practically weather-proof door or other desired structure. It will also be noted that in the rolling action, the engagement of the hooked ends of the lower bearings with the inner faces of the locking flanges 7 (Figure 2) provide substantially "knife edge" bearings, facilitating the rolling action of the shutter.

The rolling action of the joints may be

further "eased" by forming the curled lower edges 8 with a lesser radius than the curled upper edges 6 or by making these parts eccentric so that said parts will engage practically only at their extreme edges, as indicated at 15 in Fig. 3. This reduces the friction and allows the suspended slats to swing more freely.

In Figure 2 I have indicated how the upper slat may be readily removed or unhooked from the adjoining slat. When, however, this upper slat is supporting the weight of the shutter, the point of the hook 8 will nest closely behind the guard flange 7 substantially as shown at the joint between the second and third slats in this view. When the shutter is being rolled, however, the points of the supporting hooks 8 will rock or roll over the inner face of the guard flange 7, in the corner provided between this flange and the upper ends of the bearings 6.

What I claim is:

1. A rolling shutter, comprising slats having rolling joints provided by interfitting reversely curled portions at opposite edges of the slats and one of said curled portions on each slat having an inturned flange at the edge thereof and forming a stop limiting the rolling movement of the slat in one direction with respect to the companion slat.

2. A rolling shutter structure comprising slats having rolling joints formed by interfitting bearings, each slat having an outwardly curled portion at one edge thereof forming a substantially semi-cylindrical seat and terminating in a locking flange and an inwardly curled portion at the opposite edge thereof having an end part of a radius to fit inside the substantially semi-cylindrical seat of an adjoining slat and a part adjacent said end of greater radius to have a rolling fit over the outer surface of the same bearing in which said seat is formed.

3. A rolling shutter structure comprising slats each having reversely curled edges, one of which is curved to form a substantially semi-cylindrical seat and the other of which has a portion curved on one radius to fit inside the substantially semi-cylindrical seat of the next slat and a portion of greater radius to slide over the outside of said bearing in the adjoining slat.

4. A rolling shutter structure comprising slats each having reversely curled edges and one of which curled edges terminates in an inturned flange, said slats being assembled with the oppositely curled edges thereof interlocked in rolling engagement and with the angular flanges aforesaid forming bearings for the cooperating curled edges engaged behind the same and over which said edges may roll as "knife edge" bearings in the rolling operation of the shutter.

5. A rolling shutter comprising slats having rolling joints formed by interfitting reversely curled portions at opposite edges of the slats, one of the curled portions in each slat having an inturned flange and the other curled portion on each slat having its curvature adapted to fit the curvature on the first named portion and having its end adapted to engage the flange on said portion to brace the slats against lateral stress.

6. A rolling shutter comprising slats having rolling joints formed by interfitting reversely curled portions at opposite edges of the slats, one of the curled portions in each slat having an inturned flange and the other curled portion on each slat having its curvature adapted to fit the curvature on the first named portion and having its end adapted to engage the flange on said portion to brace the slats against lateral stress, said flange and end being disposed in a vertical plane when the shutter is suspended.

7. A rolling shutter comprising slats having rolling joints formed by interfitting reversely curled portions at opposite edges of the slat having like curvature, the ends of said edges being constructed to interlock to prevent relative movement of the slats about the joints in one direction.

In witness whereof, I hereunto set my hand this 1st day of June, 1920.

CHARLES C. TOMKINSON.

Re-executed this 9th day of July, 1920.

CHARLES C. TOMKINSON.