W. M. BRUNST.

FLEXIBLE OR ROLLING METALLIC SHUTTER.

APPLICATION FILED MAR. 26, 1909.

994,440. Patented June 6, 1911.

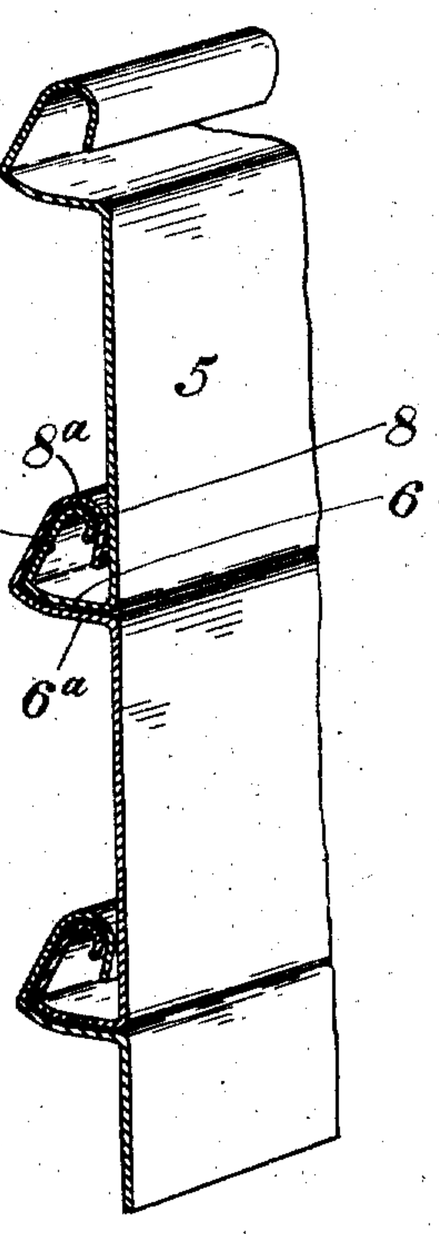

Fig. 1.

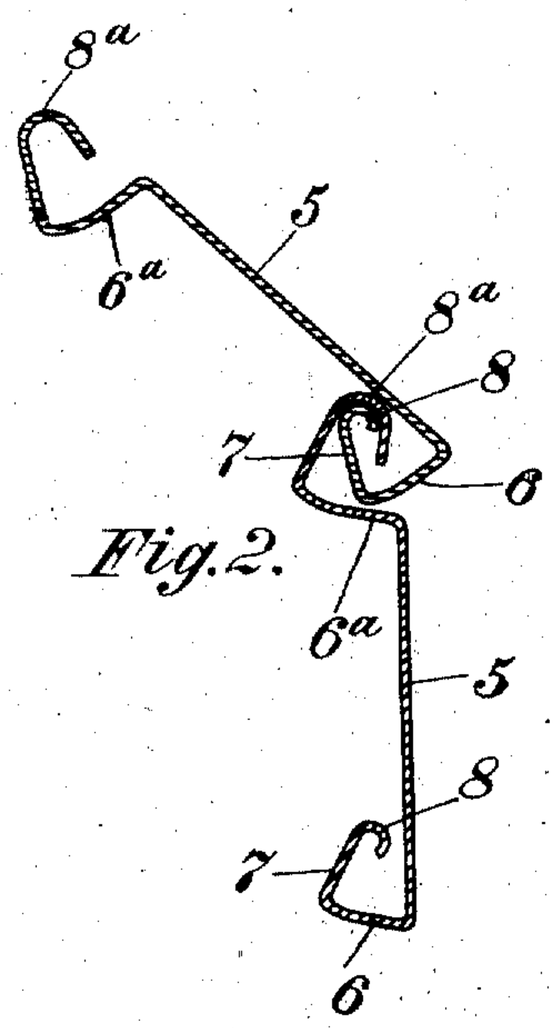

Fig. 2.

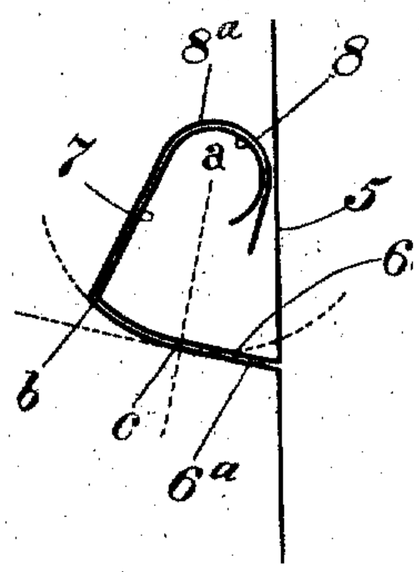

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM M. BRUNST, OF COLUMBUS, OHIO, ASSIGNOR TO THE KINNEAR MANUFACTURING COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF WEST VIRGINIA.

FLEXIBLE OR ROLLING METALLIC SHUTTER.

994,440. Specification of Letters Patent. Patented June 6, 1911.

Application filed March 26, 1909. Serial No. 485,937.

To all whom it may concern:

Be it known that I, WILLIAM M. BRUNST, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Flexible or Rolling Metallic Shutters, of which the following is a specification.

The object of this invention is to provide an improved slat for the construction of metallic rolling shutters or curtains.

The invention is embodied in the construction herein shown and described and particularly pointed out in the appended claims.

In the accompanying drawing—Figure 1 is a vertical section and perspective of fractions of three slats according to my invention joined as when in an unrolled shutter or curtain. Fig. 2 is a section showing two slats flexed at the joint. Fig. 3 is a diagrammatic section of the joint as shown in Figs. 1 and 2 to better illustrate the principle of the preferred construction of joint. Fig. 4 is a section of a modification.

Referring more particularly to Fig. 3 the slat body 5 is bent away at its lower margin or portion to form a wall or shoulder 6 that, generally speaking, stands at an acute angle to the plane or the body of the slat, and from the outer edge of said wall 6 said edge or margin is bent upward and inclinedly in a straight plane toward the side of the slat to form a wall 7 and this latter wall is finally bent at its extreme edge to form a terminal hinging roll 8. But assuming that the point *a* is the axis of motion of the parts described I prefer that wall 6 be curved from its outer edge or angle at *b* to a point *c* on an arc concentric with said axis, said point *c* being about midway the wall and from that point be tangent to said arc. The joint member at the upper edge of the slat is formed in substantially the same way except that the wall 6^a is made at an obtuse angle to the body of the slat and the roll 8^a terminates in a rather deep straight edge instead of a curved one in cross section. When the curtain is normally hanging the bearing between adjoining slats is practically wholly at these hinging members the weight of the upper hinging member of the lower slat pulling or resting on the upper edge of the lower hinging member of slat next above but the arc of this bearing between the hinging members is in my construction comparatively small. Because the inclined wall 7 and its parallel companion wall are substantially tangential to this arc the wall 7 moves away from its said companion wall upon the flexion of contiguous slats as depicted in Fig. 2. As the jointing member at the lower edge of one slat is to be slid into the complementary jointing member at the upper edge of another slat the latter is, of course, made of slightly larger dimensions to permit this; but these dimensions are preferably such that the jointing members lie parallel to and in sliding contact with each other so that when the shutter or curtain is hanging or suspended from its upper edge it is fairly rigid. When the joint members of connected slats are thus in contact with each other satisfactory bearings are provided for transmitting upward thrust from one slat or section to the others above it as in raising the shutter and this without the disagreeable noise incident to the operation of loosely jointed slats or sections. When the curved walls heretofore referred to are employed contact of the parts of the joint can be maintained, even when the sections are flexed in the rolling up operation. The said curved walls also permit of the making the walls 6, 6^a more nearly horizontal. With this construction it will be noted that the axis of flexion of the joint members and the point or line of suspension between each pair of slats is thrown near the plane of the bodies or face of the shutter; hence the latter will hang more nearly in a true vertical plane and therefore travel with less friction in the vertical channels usually provided for metallic shutters or curtains than where the said axis or line is greatly offset from the plane of the slat bodies.

In Fig. 4, I have illustrated a modification of the construction in which the idea of putting the axis of flexion and line of suspension near the plane of the slat bodies is employed, but in which the contact between the parts of the joint members is not maintained upon flexion. In this construction (Fig. 4) the parts of the joint will usually be in contact so long as the curtain is in upright position in a proper channel or guide.

Viewed in a general way the cross section of the joint is in the form of a triangle with

the axis of movement of one of its members near one of the angles.

What I claim is:

1. In a flexible or rolling shutter or curtain, slats or sections forming the same having their edges bent to form complementary joint members, the walls of which extend first off from the body of the slat and then toward the plane of the body of the slat, and hinging members at the terminals of said last named walls, said last named walls being tangential to the arc of the bearing between said hinging members when the curtain is normally hanging.

2. In a flexible or rolling shutter or curtain, slats or sections forming the same having their edges bent to form complementary joint members, the walls of which extend first off from the body of the slat and then toward the plane of the body of the slat, and hinging members at the terminals of said last named walls, said walls being parallel to each other to nearly their terminal edges and tangential to the arc of the bearing between said hinging members when the curtain is normally hanging.

3. In a flexible or rolling shutter or curtain, slats or sections forming the same having their edges bent to form complementary joint members, the walls of which extend first off from the body of the slat and then toward the plane of the body of the slat, and hinging members at the terminals of said last named walls, said first named walls being parallel to each other and at their outer portions formed on arcs concentric with the axis of the hinging members but on greater radii than those on which the said hinging members are formed.

4. In a flexible or rolling shutter or curtain, slats or sections forming the same having their edges bent to form complementary joint members, the walls of which extend first off from the body of the slat and then toward the plane of the body of the slat, and hinging members at the terminals of said last named walls, said first named walls being parallel to each other and at their outer portions formed on arcs concentric with the axis of the hinging members and at their inner portions formed tangent to said arc and the second named walls being tangent to the bearing of the hinging members when the curtain is in normal hanging position.

5. In a flexible or rolling shutter or curtain, slats or sections forming the same having their edge portions bent to form complementary joint members that are, in cross section and generally, of the form of a triangle with hinging members at the terminals of the joint forming portions.

6. In a flexible or rolling shutter, slats or sections having their edges bent to form walls that extend first from and then toward the body of the slat, said bent edges terminating in hooks constituting connecting and suspending members, the walls that extend toward the body of the slat being tangential to the bearing arcs of the hooks.

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