

July 19, 1927.

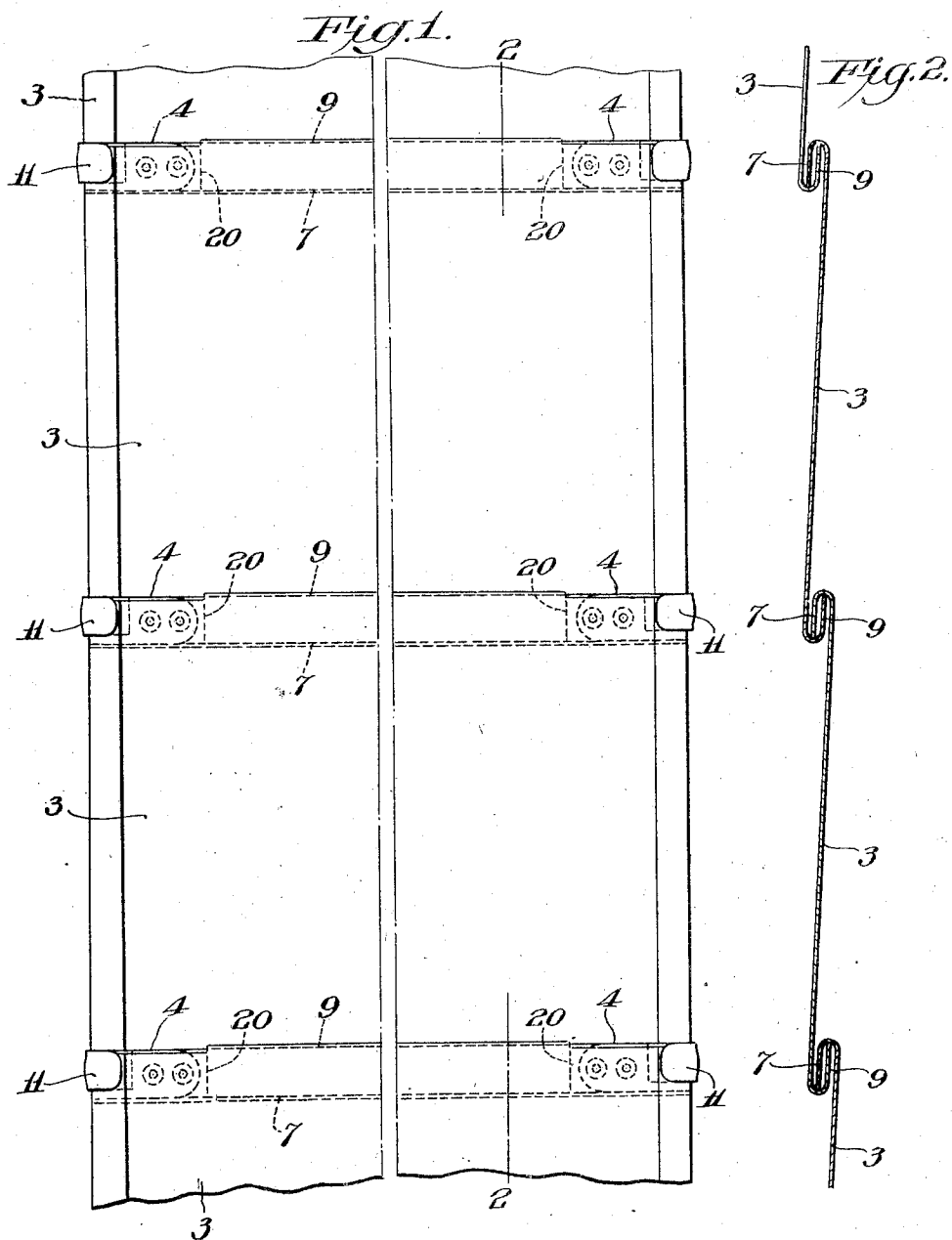
H. M. VETTERLEIN

SHUTTER OR DOOR

Filed Aug. 30, 1926

4 Sheets--Sheet 1

1,636,200



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Fig. 3.

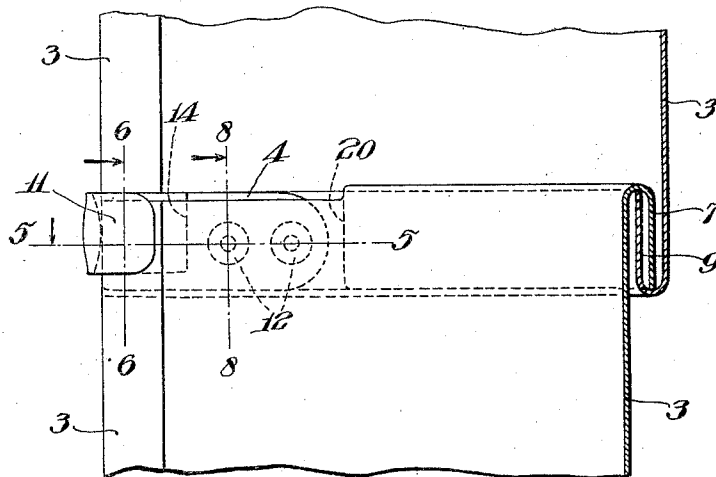
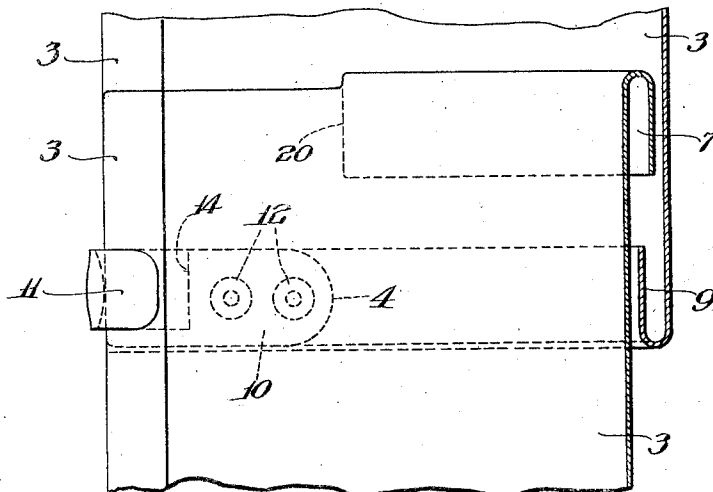


Fig. 4.



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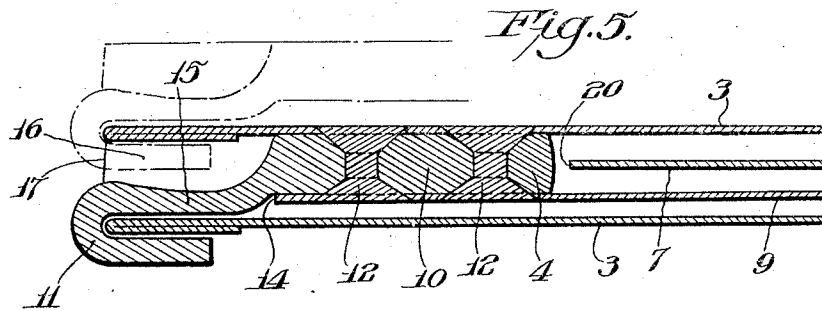
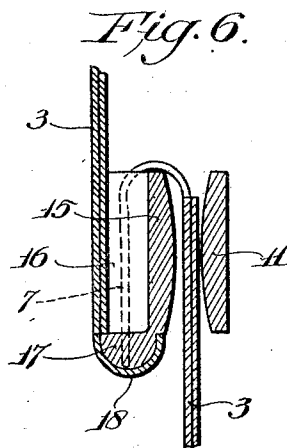
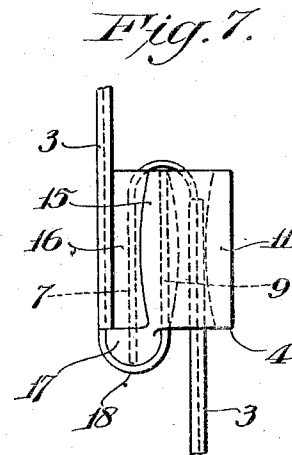
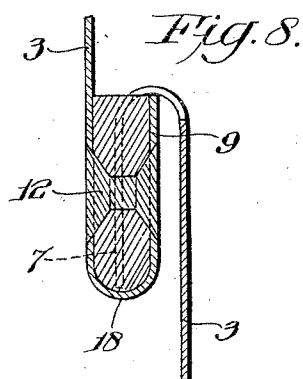
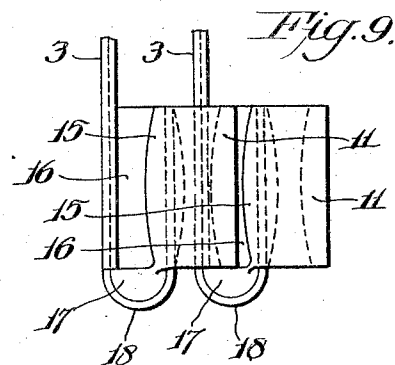
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Fig. 10.

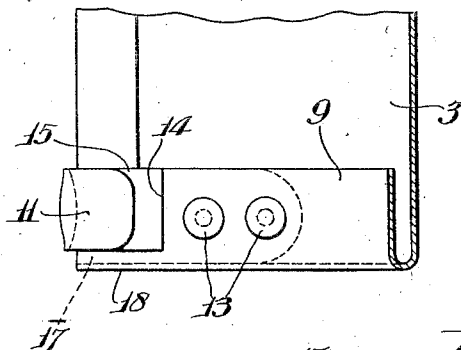


Fig. 11.

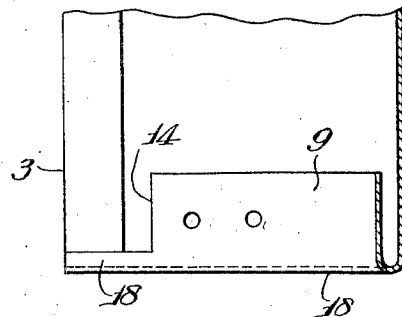


Fig. 12.

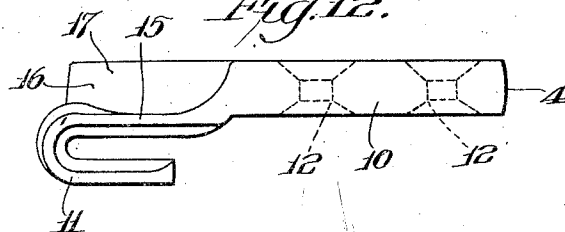


Fig. 13.

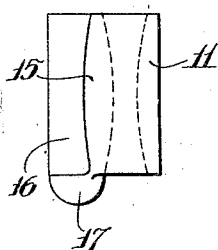


Fig. 14.

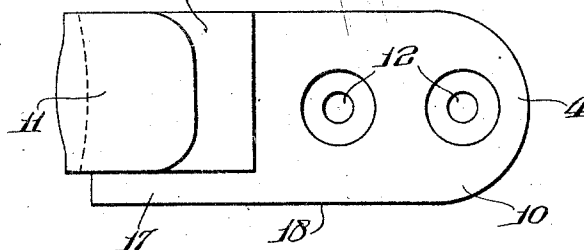
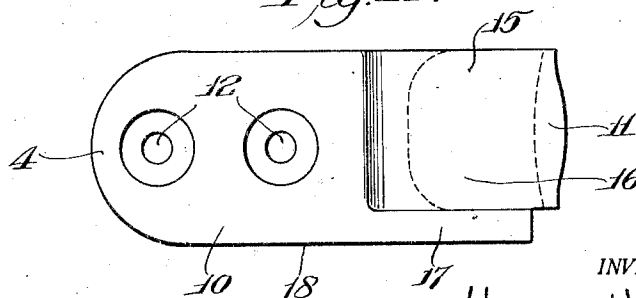


Fig. 15.



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UNITED STATES PATENT OFFICE.

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SHUTTER OR DOOR.

Application filed August 30, 1926. Serial No. 132,429.

This invention relates to improvements in shutters or doors of the general character shown and described in Letters Patent of the United States No. 1,492,420, dated April 29, 1924.

In curtains of this general character the major portion of the shutter or door is comprised of a series of metal plates each having horizontally disposed hooks at the lateral edge portions thereof embracing an adjacent plate and each having a downturned flange on its upper end and an upturned flange on its lower end providing each plate with top and bottom hooks adapted to enter and leave bottom and top hooks, respectively, when the plates of the shutter or door are lowered and raised relatively to one another in closing and opening the same.

The object of the present invention is to improve and strengthen the plates in the regions of their connections with one another and thereby render them more durable and efficient when in service.

The invention consists of the elements and the combinations of them hereinafter described and claimed.

In the accompanying drawings illustrating the invention,

Figure 1 is a front view of a portion of a shutter or door embodying my invention.

Figure 2 is a vertical section through the same, on line 2—2 of Fig. 1.

Figure 3 is a front view, partly in section, of the left hand side of the meeting top and bottom portions of two plates when the shutter is in the closing position.

Figure 4 is view similar to Fig. 3, showing one plate slightly raised with relation to the other.

Figure 5 is a horizontal section through a portion of the shutter, on line 5—5 of Fig. 3, showing by dot-and-dash lines, the position of an additional rearward plate in the position it occupies when the shutter is in the closed position.

Figure 6 is a vertical section through a portion of the shutter, on line 6—6 of Fig. 3.

Figure 7 is a side view of the parts shown in Fig. 3, as seen from the right hand side thereof.

Figure 8 is a vertical section through a portion of the shutter, on line 8—8 of Fig. 3.

Figure 9 is a side view of the bottom por-

tion of two plates of the shutter when they are in the raised or open position.

Figure 10 is a front view, partly in section, of the bottom portion of the left hand side of one of the shutter plates.

Figure 11 is a view similar to Fig. 10, with the block removed from the plate.

Figures 12, 13, 14 and 15 are top, front, rear and end views, respectively, of the block shown in Figs. 3, 4 and 10 of the drawings.

Referring to the drawings, the shutter or door comprises a series of plates 3 each having blocks 4 secured to the lower corners thereof and each having a down turned flange 7 on its upper end, providing a downwardly opening hook, and an upturned flange 9 on its lower end, providing an upwardly opening hook.

The blocks 4 on the respective sides of each plate 3 are alike excepting that they are made right and left, and, therefore, a description of one will suffice for both.

Each block 4 comprises a body 10 having a horizontally disposed hook 11 formed thereon, all parts of the block being shaped as clearly shown in the several figures of the drawings. The inner portion of the block body 10 is provided with rivet holes 12 and it is fitted snugly between and in engagement with the main body of the plate 2 and the end portion of the lower flange 9 thereon; and the block 4 is firmly secured to the body of the plate 2 and its flange 9 by rivets 13 which extend through the holes 12 in the block and engage the plate 2 and its flange 9.

The end portion of the flange 9 to which the block 4 is secured terminates, at 14, inwardly of a vertical plane extending from the adjacent vertical edge of the body of the plate 2 at right angles thereto; and that portion of the block 4 which extends between such plane and the end 14 of the flange 9 is offset, providing a wall 15 which forms a cavity 16 between it and the body of the plate 2. This wall 15 also forms the inner wall or part of the hook 11 and it extends in alinement with the plate flange 9 and forms, in effect, a continuation thereof.

The block 4 is provided with an extension 17 which forms the bottom wall of the cavity 16 and which also forms a continuation

of the block body 10 and a continuation of the bottom of the wall 15; and the bottom of the block body 10 and its extension 17 is made rounded and snugly fitted within the rounded bottom portion 18 of the plate 2 which connects the flange 9 with the main body of the plate and which extends beneath the block extension 17 from the end 14 of the flange 9 to the adjacent lateral edge of the plate 2 and forms a backing or support for the block 4 and its extension 17.

When the shutter is in the lowered or closing position, the hooks formed by the flanges 7 on the upper ends of the plates rest within the hooks formed by the flanges 9 on the lower ends of the plates so that each plate is suspended from and supported by the next adjacent plate above it; and, when the shutter is in the raised or opening position the successive plates 2 occupy positions back of one another.

The hooks 11 of the blocks 4 of each plate 2 embrace and are slidably engaged with the lateral edge portions of the next adjacent plate in front thereof so that each plate 2 may slide vertically through the hooks 11 of the next adjacent rearward plate when the entire shutter is raised to the open position or lowered to the closed position by raising and lowering the lowermost plate 2 of the shutter.

During the lowering of the shutter to the closing position, the downward movement of the successive plates 2 is stopped by the flanges 7 on the upper ends thereof into the hooks formed by the flanges 9 on the lower ends thereof successively, leaving the plates suspended from one another, as shown in Figs. 1 and 2. During the raising of the shutter to the opening position, the plates 2 are raised successively one by the other from the bottom upwards; and, as they are thus raised, the blocks of each plate are brought into engagement with the forward arms of the hooks 11 of the next adjacent rearward plate, after such hooks enter the cavities 16 formed by the blocks 4 which engage the same, thereby causing each plate to pick up the next adjacent rearward plate, as the bottom of each plate reaches the level of the next adjacent rearward plate.

The upper flanges 7 of the plates 2 have end portions which terminate, at 20, inwardly of parallel vertical planes which extend at right angles from the lateral edges of the bodies of the plates, and the length of the flange 7 of each plate 2 is less than the space between the blocks 4 of the next adjacent rearward plate to permit the flange 7 to enter such space when the hook formed by the flange 7 of each plate enters the hook formed by the flange 9 of the next adjacent rearward plate.

The lateral edge portions of the plates 2 which slide through the hooks 11 are folded

back against the bodies of the plates, as clearly shown in the drawings, providing a reinforcing or double thickness for such edge portions to withstand wear and to stiffen the plates.

The hooks 11 are so proportioned and related to the lateral edge portions of the plates 2 that the sliding engagement of the hooks 11 with the edge portions will guide the hooks formed by the flanges 7 on the tops of the plates 2 into the hooks formed by the flanges 9 on the bottoms of the plates, when the plates are lowered, and will also guide the forward arms of the hooks 11 into the cavities 16 when the plates 2 are raised.

The plates 2 may be advantageously formed of suitable blanks of sheet iron or sheet steel and the blocks 4 may be advantageously formed of forged steel.

I claim as my invention:

1. In a shutter or door, a plate having a down turned flange on its upper end providing a hook, a second plate having an upturned flange on its lower end providing a hook adapted to be raised into and lowered from the hook of the first named plate, and connecting blocks secured to the respective sides of the second named plate and having horizontally disposed hooks embracing the lateral edge portions of the first named plate, said blocks having parts extending in spaced relation to the body of the second named plate and providing cavities between them and the second named plate, and a third plate having parts providing horizontally disposed hooks embracing the lateral edge portions of the second named plate and being constructed to enter said cavities when the second named plate is raised.

2. In a shutter or door, a plate having a down turned flange on its upper end providing a hook, a second plate having an upturned flange on its lower end providing a hook adapted to be raised into and lowered from the hook of the first named plate, connecting blocks secured to the respective sides of the second named plate and having horizontally disposed hooks embracing the lateral edge portions of the first named plate, the flange of the first named plate terminating inwardly of the lateral edge portions of the plate and being constructed to pass between said blocks when the hook of the second named plate is raised into the hook of the first named plate, said blocks having parts extending in spaced relation to the body of the second named plate and providing cavities between them and the second named plate, and a third plate having parts providing horizontally disposed hooks embracing the lateral edge portion of the second named plate and being constructed to enter said cavities when the second named plate is raised.

3. A shutter or door plate having an up-

turned flange on its lower end providing a hook to receive the reverse hook of a second plate, a connecting block interposed between and engaging the flange and the opposing part of the body of the plate and having a horizontally disposed hook adapted to embrace the lateral edge portion of said second plate, and means to secure the block to said flange and to the body of the plate.

4. A shutter or door plate having an upturned flange on its lower end providing a hook to receive the reverse hook of a second plate, said flange being provided with an end portion terminating inwardly of and spaced from a vertical plane extending at right angles from the adjacent lateral edge of the body of the plate, a connecting block having a horizontally disposed hook adapted to embrace the lateral edge portion of said second plate and having a part extending between said plane and said end portion in spaced relation to the body of the plate and providing a cavity between it and the body of the plate to receive a horizontally disposed hook of a third plate, and means for securing the plate and the block together.

5. A shutter or door plate having an upturned flange on its lower end providing a hook to receive the reverse hook of a second plate, said flange being provided with an end portion terminating inwardly of and spaced from a vertical plane extending at right angles from the adjacent lateral edge of the body of the plate, a connecting block having a horizontally disposed hook adapted to embrace the lateral edge portion of said second plate and having a part extending between said plane and said end portion in spaced relation to the body of the plate and providing a cavity between it and the body of the plate to receive a horizontally disposed hook of a third plate, said block being provided with an extension forming a bottom wall for said cavity, and means for securing the plate and the block together.

6. A shutter or door plate having an upturned flange on its lower end providing a hook to receive the reverse hook of a second plate, said flange being provided with an end portion terminating inwardly of and spaced from a vertical plane extending at right angles from the adjacent lateral edge of the body of the plate, a connecting block having a horizontally disposed hook adapted to

embrace the lateral edge portion of said second plate and having a part extending between said plane and said end portion in spaced relation to the body of the plate and providing a cavity between it and the body of the plate to receive a horizontally disposed hook of a third plate, said block being provided with an extension forming a bottom wall for said cavity, and the plate having a part extending beneath said extension, and means for securing the plate and the block together.

7. A shutter or door plate having an upturned flange on its lower end providing a hook to receive the reverse hook of a second plate, said flange being provided with an end portion terminating inwardly of and spaced from a vertical plane extending at right angles from the adjacent lateral edge of the body of the plate, a connecting block interposed between and engaging the flange and the opposing part of the body of the plate and having a horizontally disposed hook adapted to embrace the lateral edge portion of said second plate and said block having a part extending between said plane and said end portion in spaced relation to the body of the plate and providing a cavity between it and the body of the plate to receive a horizontally disposed hook of a third plate, and means for securing the plate and the block together.

8. A shutter or door plate having a connecting block secured thereto and provided with a horizontally disposed hook adapted to embrace the lateral edge portion of a second plate, said block having a part extending in spaced relation to said plate and providing a cavity between the plate and the block to receive a horizontally disposed hook of a third plate.

9. A shutter or door plate having a connecting block secured thereto and provided with a horizontally disposed hook adapted to embrace the lateral edge portion of a second plate, said block having a part extending in spaced relation to said plate and providing a cavity between the plate and the block to receive a horizontally disposed hook of a third plate, and the plate having a supporting part extending beneath the block.

In testimony whereof I affix my signature.

HENRY M. VETTERLEIN.