

Aug. 24, 1926.

1,596,935

E. W. MARSHALL

DOOR LATCH

Filed Sept. 15, 1924

2 Sheets-Sheet 1

Fig. 1

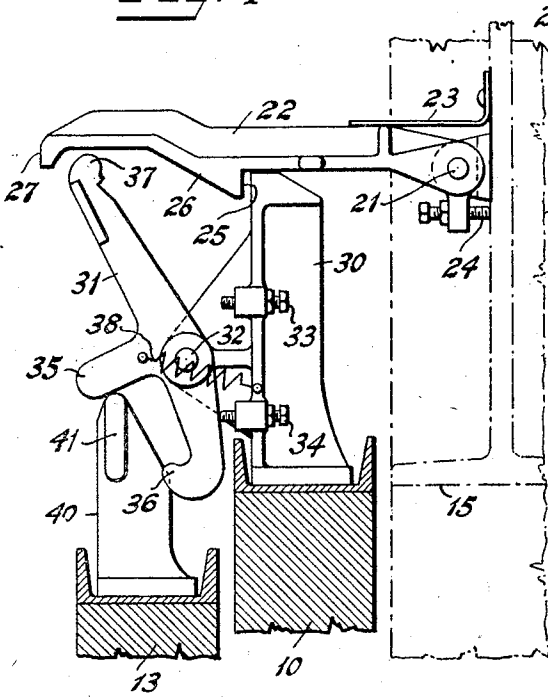


Fig. 2

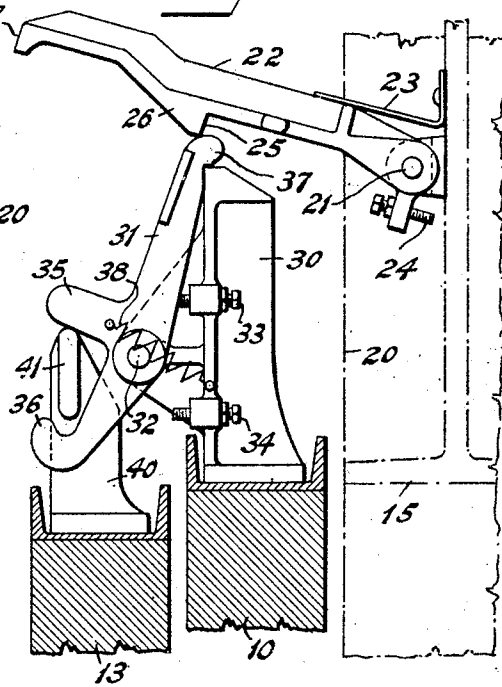
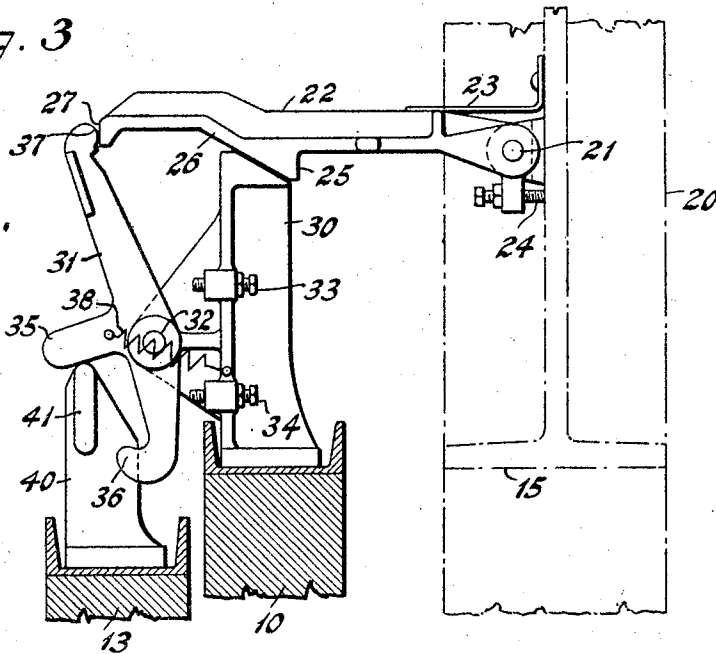


Fig. 3



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Fig. 5

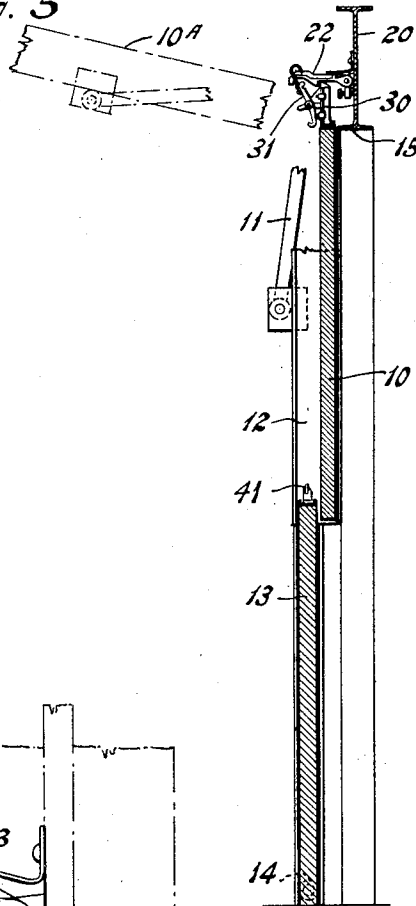
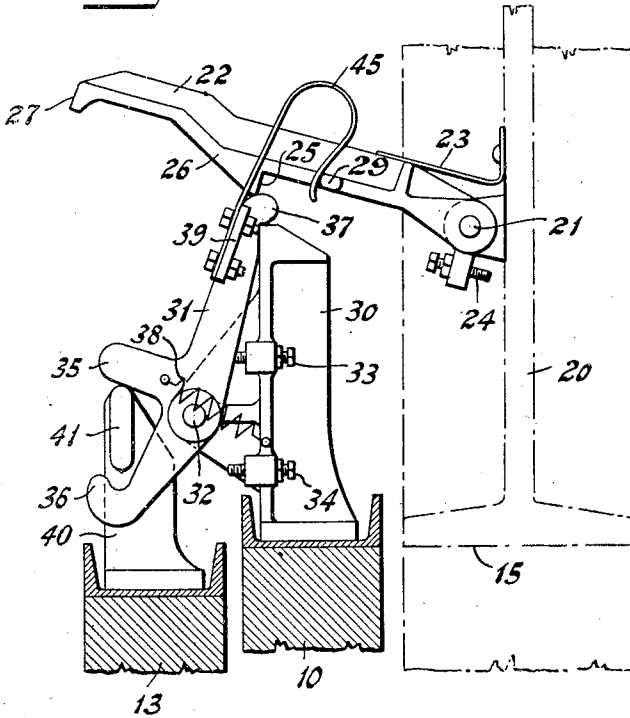


Fig. 4



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UNITED STATES PATENT OFFICE.

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DOOR LATCH.

Application filed September 15, 1924. Serial No. 737,684.

This invention relates to door latches for multi-section doors such as are largely used on pier-sheds and warehouses, and to mechanism for actuating such latches. Its object is to provide a simple mechanism for latching the upper section of such a door against the door header, which may be released by the movement of another door section. Another object is to provide mechanism for locking two door sections together during the time when they move together and for unlocking them at the end of their closing movement in unison. A further object is to provide means for unlocking the door sections from each other to permit the lower door section to be lowered after it has been raised a sufficient amount to have actuated the door section interlock, without the necessity of first moving the two sections together.

These and other objects of the invention will appear in the following specification in which the invention will be described and its novel features defined in the claims.

Referring to the drawings Fig. 1 is a side elevation of an embodiment of this invention showing the upper ends of two door sections in section and showing the door header and a latch supporting member thereon in broken lines.

Figs. 2 and 3 are similar views showing the parts in different relative positions.

Fig. 4 is a view similar to Fig. 2 of the same parts with a resilient member added for a purpose which will be described herein.

Fig. 5 is a sectional side elevation of a two section link supported turn-over door of a common type, with the novel latch mechanism applied thereto. In this figure the door sections are shown in full lines in closed position and their open position is indicated in broken lines.

Like characters of reference designate similar parts in all of the figures of the drawings.

Referring first to Fig. 5, 10 designates an upper door section, swingingly supported by links 11 which are pivotally connected near the middle thereof as shown, and their upper ends are connected to stationary pivots omitted from the drawings for the sake of clearness. On the edges of this upper door section are guides 12 in which the lower door section slides.

The lower door section, designated by 13, has trunnions and rollers 14 near its lower corners, and these rollers run in vertical guides on the door-way frame which extend up to the top of the door opening. The lower door section is raised by hoisting chains attached to the trunnions. It can be raised vertically in the guides 12 until it is superimposed over the upper door section when the lower half of the door-way is open. From this position it can be lowered if desired. But to effect a full opening of the door-way the vertical movement of the rollers in their guides is continued. The trunnions then engage the lower ends of the guides 12 and pick up the upper section. Thereafter on opening, the two sections move in unison vertically and laterally, swung inwardly by the links 11 away from the door header 15 until they reach the position indicated at 10^A. A more complete description of a door of this particular type is to be found in Patent No. 973,691 issued to J. Edward Ogden October 25, 1910.

Doors of this kind are subjected to heavy wind pressures and it is desirable to latch the upper edge of the upper door section against the door header when closed, and it is also desirable to lock the two sections together to prevent relative movement between them while they are swung out of and back to a vertical position. Various devices have been provided to accomplish these ends but it is the object of this invention to provide a better mechanism for these purposes.

On the door header 15 is a supporting member 20 on which is pivotally supported at 21, a latch 22. This is biased to swing downwardly and if desired, a spring 23 may be added to push it down. Its downward movement is adjustably limited by a set screw 24. This latch has a shoulder which engages the upper end of a bracket 30 on the upper door section when the door is closed. It extends beyond this shoulder to form an inclined cam 26 and a nose 27.

31 is a swinging lever or tripper, pivoted at 32 to the bracket 30 with its movement adjustably limited by set screws 33, 34. 35 is an arm and 36 a hook, both integral parts of lever 31. The upper end of lever 31 is rounded as shown at 37. A tension spring 38 attached to bracket 30 and to lever 31 completes the movement of the lever after

it has been started by other means, and holds it against these set screws.

On the upper end of the lower door section 13 is a bracket 40 which carries a lug 41 projecting laterally therefrom into the paths of movement of the arm 35 and the hook 36.

Before describing the modification illustrated in Fig. 4, I will describe the operation of this device. In Fig. 1 the upper door section is shown closed and latched and the lower door section approaching the upper limit of its vertical movement. Its lug 41 has reached such a position that its upper end is in contact with the lower edge of arm 35. As the upward vertical movement of the lower door section is continued, the lug 41 will swing lever 31 and the spring 38 will complete its movement to the position in which it is shown in Fig. 2, slightly ahead of the completion of the upward movement of the lower door section to its position shown in Fig. 2. That is, the lever 31 has a snap action after the axis of spring 38 is moved above the axis of pivot 32.

The rounded upper end 37 of lever 31, engaging cam 26 will raise latch 22 and release its shoulder 25 from the upper end of bracket 30 so that the upper parts of the two door sections are free to move laterally.

At this same time the hook 36 will be moved under the lower end of lug 41 to lock the two door sections together.

As soon as the door sections have been moved away from the door header, the latch 22 will assume its original position. Now when the upper parts of the two door sections are returned to the door header, the nose 27 at the end of latch 22 will be in the path of movement of the rounded upper end 37 of the swinging lever 31 and will engage the latter as shown in Fig. 3, so that further movement of the door sections will force lever 31 over to release the hook 36. Then the upper end of bracket 30 which may be beveled as shown, engages the cam surface 26 to raise the latch and to permit it to ride over and into engagement with the bracket 30. When the lever 31 is moved by the engagement of its rounded end 37 with the latch nose 27, its arm 35 engaging the upper end of lug 41 will force the lower door section downwardly to put the lug 41 in position to again actuate the lever or tripper 31 upon a subsequent upward movement of the lower door section.

As the lower door section cannot be lowered from its position shown in Fig. 2 (as is sometimes desirable) without first swinging the upper parts of the door sections away from and back to the door header, the arrangement shown in Fig. 4 may be provided to make such operation possible. On swinging lever 31 is a lug 39 to which a bow-spring 45 is affixed. The free end of

this spring is arranged to engage and be flexed by a lug 29 on the latch 20.

With this spring 45 added, the lower door section may be moved vertically downward from the Fig. 4 position because the arm 35 will be kept in contact with the upper end of lug 41 until spring 38 snaps lever 31 over to its Fig. 1 position with hook 36 away from the path of movement of lug 41.

Spring 45 does not interfere with the lateral closing movement of the door sections, because as soon as the door sections are moved away from the door header the latch drops to its initial position in which the lug 29 is below the path of movement of the free end of spring 45.

The drawings and description are of one embodiment of this invention, which can be embodied in parts of different design and construction, and therefore no limitations are intended other than those in the following claims.

What I claim is:

1. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and means on said upper section actuated by the upward movement of another section for releasing said latch, said latch being arranged to return the latch releasing means to non-releasing position during the lateral closing movement of the upper door section.

2. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch pivoted on a stationary member for holding the upper of the door sections against lateral movement and a member pivoted on said upper section arranged to be moved by the upward movement of another section to release said latch.

3. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and a member pivoted on said upper section arranged to be moved in one direction by the upward movement of another section to release said latch, said latch being arranged to move said member back during the lateral closing movement of the upper door section.

4. A door comprising an upper door section and a lower door section slidable on the upper door section said door sections being arranged to move vertically and laterally in unison, a pivoted latch having a shoulder engageable with the upper door section to hold said upper door section against lateral movement, and a nose; a pivoted lever on the upper door section, a

stationary member on the lower door section arranged to move said lever into engagement with the latch to raise and release said latch, said latch being arranged to move back to its initial position when the lateral opening movement of the door sections moves the lever away from the latch, the nose of the latch being thus positioned to engage the lever during the closing lateral movement of the door sections to move the lever out of latch releasing position.

5. A door comprising an upper door section, a lower door section slidable on the upper door section, said door sections being arranged to move vertically and laterally in unison, a pivoted latch having a shoulder engageable with the upper door section to hold said upper door section against lateral movement, a nose and a cam surface; a pivoted lever on the upper door section, a stationary member on the lower door section arranged to move said lever into engagement with the latch cam to raise and release the latch, said latch being arranged to move back to its initial position when the lateral opening movement of the door sections moves the lever away from the latch, the nose of the latch being then positioned to engage the lever during the closing lateral movement of the door sections to move the lever out of latch releasing position, said cam surface being arranged to then raise the latch shoulder over and into latching engagement with a part of the upper door section.

6. A door comprising an upper door section vertically disposed when closed, a latch arranged to hold said upper door section in its closed position, and a latch releasing member on said upper door section, a lower section slidable on the upper door section arranged to move said member to release the latch and to lock said sections together.

7. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and means on said upper section actuated by the upward movement of another section for releasing said latch and locking the door sections together.

8. A door comprising an upper door section vertically disposed when closed, a latch arranged to hold said upper door section in its closed position, and a latch releasing member on said upper door section, a lower section slidable on the upper door section arranged to move said member to release the latch and to lock said sections together, said latch being arranged to return said latch releasing means to non-releasing position and to unlock the door sections from one another during the lateral closing movement of the upper door section.

9. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and a member pivoted on said upper section arranged to be moved by the upward movement of another section to release said latch and to lock the door sections together.

10. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and a member pivoted on said upper section arranged to be moved in one direction by the upward movement of another section to release said latch to lock the door sections together, said latch being arranged to move said member back during the lateral closing movement of the upper door section.

11. A door comprising an upper door section and a lower door section slidable on the upper door section, said door sections being arranged to move vertically and laterally in unison; a pivoted latch having a shoulder engageable with the upper door section to hold said upper door section against lateral movement, and a nose; a pivoted lever on the upper door section having a hook, a stationary member on the lower door section arranged to move said lever into engagement with the latch to raise and release said latch and to move said hook into position to engage the stationary member on the lower door section, said latch being arranged to move back to its initial position when the lateral opening movement of the door sections moves the lever away from the latch, the nose of the latch being thus positioned to engage the lever during the closing lateral movement of the door sections to move the lever out of latch releasing position and to move the hook out of its engaging position.

12. A door comprising an upper door section, a lower door section slidable on the upper door section, said door sections being arranged to move vertically and laterally in unison, a pivoted latch having a shoulder engageable with the upper door section to hold said upper door section against lateral movement, a nose and a cam surface; a pivoted lever on the upper door section having a hook, a stationary member on the lower door section arranged to move said lever into engagement with the latch cam to raise and release the latch and to move said hook into position to engage the stationary member on the lower door section, said latch being arranged to move back to its initial position when the lateral opening movement of the door sections moves the lever away from the latch, the nose of the latch being then posi-

tioned to engage the lever during the closing lateral movement of the door sections to move the lever out of latch releasing position and to move the hook out of its engaging position, said cam surface being arranged to then raise the latch shoulder over and into latching engagement with a part of the upper door section.

13. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement, a tripper arranged to be moved by another door section to release said latch and means for resetting the tripper by the lateral closing movement of the door sections.

14. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement, a tripper arranged to be moved by the upward movement of another door section to release said latch and means for moving the tripper back to force the other section downwardly to a position from which its subsequent upward movement will again release the latch.

15. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper section against lateral movement, a tripper arranged to be moved by the upward movement of another section to release said latch and means for resetting the tripper free of said latch to permit the latch to move into holding position, said means at the same time resetting the other section to a position from which its subsequent upward movement will release the latch.

16. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement, a tripper arranged to be moved by another door section to release said latch and to lock said sections together and means for resetting the tripper by the lateral closing movement of the door sections.

17. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement, a tripper arranged to be moved by the upward movement of another door section to release said latch and to lock said sections together and means for moving the tripper back to unlock the sections and to force the other section downwardly to a position from which its subsequent upward movement will again release the latch.

18. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper section against lateral movement, a tripper arranged to be moved by the upward movement of another section to release said latch and to lock said sections together and means for resetting the tripper free of said latch to permit the latch to move into holding position, said means at the same time unlocking the sections and resetting the other section to a position from which its subsequent upward movement will release the latch.

19. A door comprising an upper and a lower section arranged to move vertically and laterally, a releasable locking device for holding the upper section in closed position, releasing means for said locking device and means for actuating said releasing means to unlock said locking device, said last named means being movable to operative position by the lateral closing movement of the door.

20. A door comprising an upper and a lower section arranged to move vertically and laterally, a releasable locking device for holding the upper section in closed position, releasing means for said locking device and means carried by the lower section for actuating said releasing means to unlock said locking device, said last named means being movable to operative position by the lateral closing movement of the door.

21. A door comprising an upper and a lower section arranged to move vertically and laterally, a releasable locking device for holding the upper section in closed position, pivoted releasing means for said locking device and means carried by the lower section for actuating said releasing means to unlock said locking device, said last named means being movable to operative position by the lateral closing movement of the door.

22. A door comprising an upper and a lower section arranged to move vertically and laterally, a releasable locking device for holding the upper section in closed position, releasing means for said locking device carried by the upper section, and means for actuating said releasing means to unlock said locking device, said last named means being movable to operative position by the lateral closing movement of the door.

23. A door comprising a plurality of sections arranged for relative vertical movement and for movement vertically and laterally in unison, a latch for holding the upper of the door sections against lateral movement and a member pivoted on said upper section arranged to be moved by the upward movement of another section to release said latch.

24. A door comprising a plurality of sections arranged for movement vertically and

laterally in unison, releasable means for holding one of the door sections against lateral movement in closed position and releasing means movable to releasing position by the lateral closing movement of the door.

25. A door movable laterally to closed position, a releasable locking device for holding the door in closed position and releasing means for said locking device movable to releasing position by the lateral closing movement of the door.

26. A door movable laterally to closed position, a releasable locking device for holding the door in closed position and pivoted releasing means for said locking device movable

to releasing position by the lateral closing movement of the door.

27. A door comprising an upper and a lower section arranged to move vertically and laterally, a locking device comprising a releasable latch for holding the upper section in closed position and means actuated by the lateral movement of the door for moving the lower section into a position from which subsequent upward movement of said lower section will cause said latch to be released.

In witness whereof, I have hereunto set my hand this 12th day of September, 1924.

ERNEST W. MARSHALL.