Aug. 16, 1966 G. BANSE 3,266,831

AUTOMATIC LATCH

Original Filed Nov. 16, 1962 2 Sheets-Sheet 1

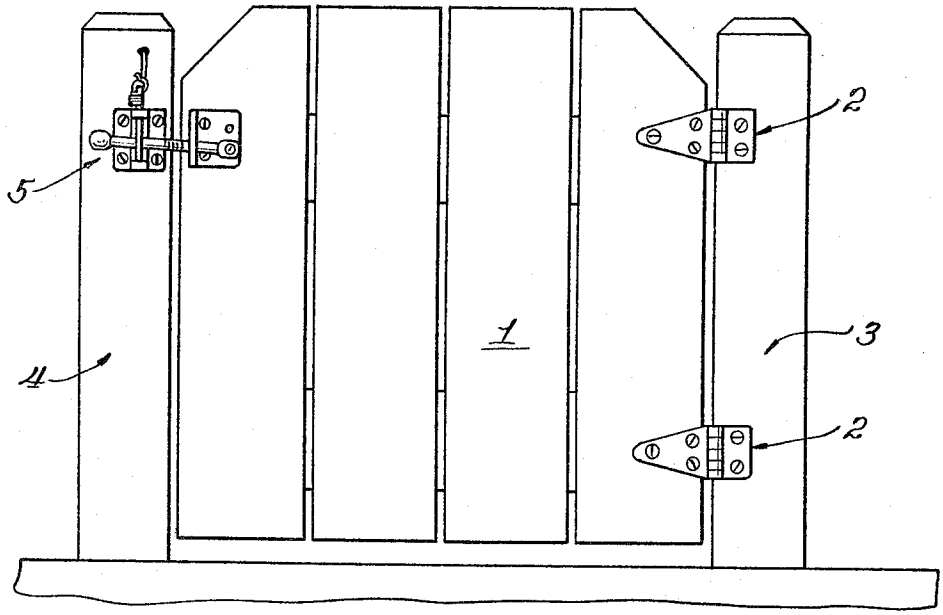


Fig. 1.

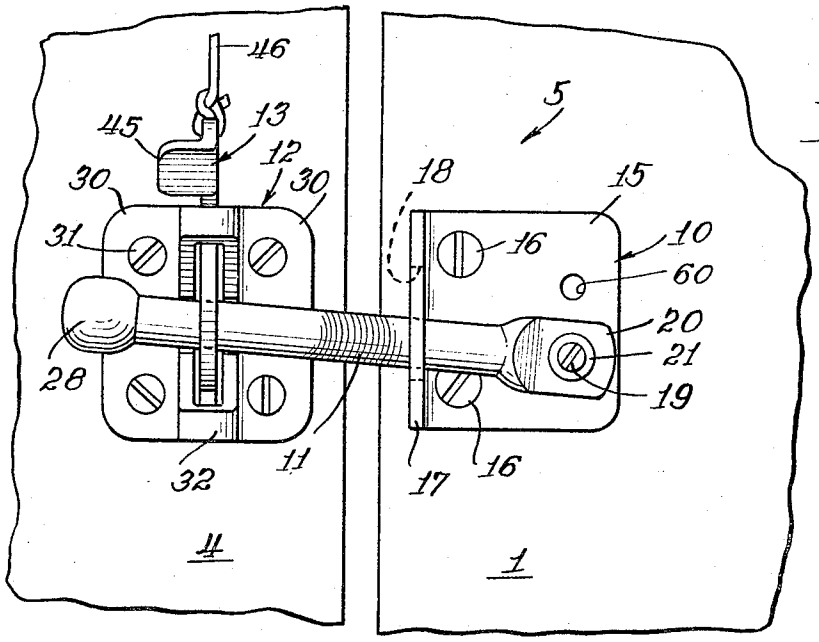


Fig. 2.

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Fig. 3

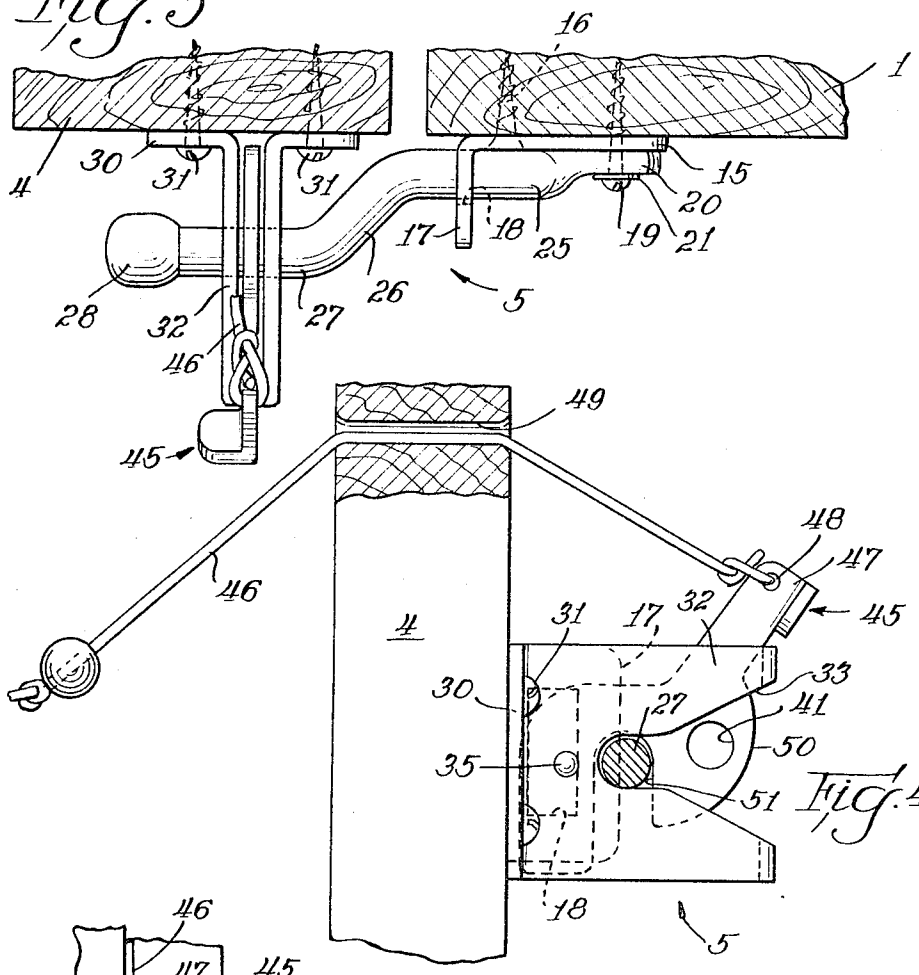


Fig. 4

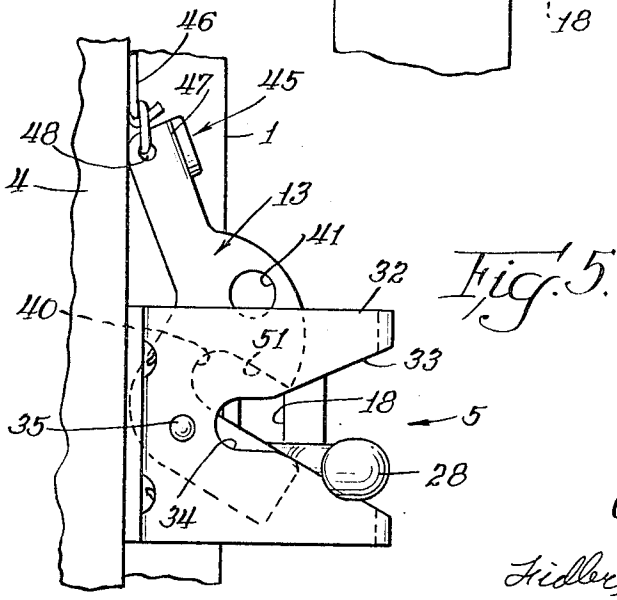


Fig. 5

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AUTOMATIC LATCH

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Continuation of application Ser. No. 238,237, Nov. 16, 1962. This application Feb. 24, 1965, Ser. No. 441,949
5 Claims. (Cl. 292—133)

This invention relates to latches and has to do more particularly with a new and improved latch of the so-called "automatic" type. This is a continuation of application Serial Number 238,237, filed November 16, 1962, now abandoned.

Automatic latches are used for latching a swingable member such as a swinging door or gate to a relatively fixed member such as a frame or post. Heretofore, such latches have included a latching bar which is rigidly fixed to the face of the swingable member and projects beyond the face edge thereof, a strike fixed to the relatively fixed member and having a portion projecting outwardly therefrom and formed with an outwardly divergent opening positioned to receive the latching bar and a latching dog pivotally supported in the projecting portion of the strike in position to engage and retain the latching bar in latching position. When the swingable member is moved into closed position, the latching bar enters the divergent opening in the strike and cams up the latching dog. Upon further movement of the bar into latching position, the dog falls by gravity into latching relation with the bar. The latch can only be unlatched by raising the dog out of latching relation with the bar.

Prior latches of the automatic type are subject to certain disadvantages. In the first place, the movable member, such as a gate or the relatively fixed member such as a post, may sag with the result that the latch may not latch or the latch may be damaged when the gate is moved toward closed position. In the second place, the latch may be damaged or broken when the gate is slammed shut with considerable force. Moreover, it is necessary in the case of prior latches to carefully align the latching bar with the strike in order to insure that the latch will latch when the gate is closed and to prevent breakage due to misalignment.

In accordance with the present invention, the latching bar is pivotally attached to the face of the swingable member so that it can swing in a plane parallel to the plane of the face of the swingable member. Thus, it is not necessary to align the bar and strike accurately. Moreover, even if the post or gate sags somewhat, the gate can be closed without damage to the latch. Also, the gate can be slammed shut without damage to the latch.

An object of the invention is to provide a new and improved automatic latch.

Another object is to provide an automatic latch which will be operative even if the latching bar and strike are somewhat misaligned.

Another object is to provide an automatic latch which will not be rendered inoperative if the swingable member or the relatively fixed member should sag during use.

A further object is to provide an automatic latch which will not be damaged in use even if the latching bar and strike are somewhat misaligned.

A further object is to provide an automatic latch which will not be damaged in use even if the swingable member is slammed shut with considerable force.

Still another object is to provide a new and improved automatic latch which is simple in construction, inexpensive to make, and strong and rugged, and will not become inoperative or damaged even though subjected to relatively severe use.

Other objects and advantages will appear from the following description taken in connection with the appended drawings, wherein:

FIGURE 1 is a front elevational view of a gate employing the latch of my invention;

FIG. 2 is an enlarged front elevational view of the latch in closed position;

FIG. 3 is a top plan view of the latch in closed position;

FIG. 4 is an end elevational view, partially in cross-section, of the latch in closed position; and

FIG. 5 is an end elevational view of the latch in partially closed position.

It will be understood that the latch is employed for latching in closed position, a gate, door or other swingably mounted member. For the purpose of illustration, there is shown a gate **1** which is swingably supported by hinges **2** on a gate post **3** for swinging movement between open and closed position relatively to a second gate post **4**. The latch of the present invention is mounted in part adjacent the free edge of the gate **1** and in part on the adjacent gate post **4**.

The latch **5** includes a guide **10**, a latch bar **11**, a keeper **12** and a latching dog **13**.

The guide **10** which also preferably serves as a mounting bracket for the latch bar **11** has a flat base portion **15** and is secured to the gate by a plurality of screws **16**. The guide has a flange **17** with a slot **18** wherein through which the latch bar **11** extends. While the construction preferably includes a single member serving both as a mounting bracket and a guide for the latch bar, these two functions may be provided by two separate members (not shown) mounted in suitable positions adjacent each other.

The latch bar **11** is pivotally attached at one end to the gate, as by a pivot screw **19** extending through the flattened end **20** of the latch bar **11** and screwed into the gate. Preferably, a washer **21** is provided between the head of the screw **19** and the end **20**.

The latch bar has a first straight portion **25**, an inclined portion **26**, a second straight portion **27** offset from the first straight portion **25** and a head **28**. The first straight portion **25** of the latching bar **11** extends through the slot **18** in the guide **10**. The slot **18** is of sufficient length and is so located as to permit the latching bar to move through a considerable angle from a position approximately horizontal to a position substantially above the horizontal. Thus, as will appear from the following description, the latching bar is positioned to engage with the keeper **12** even though the gate or the post adjacent the free end of the gate may sag to a considerable extent. The latching bar is so located on the gate that the second straight portion **27** is in position to enter and latchingly engage with the keeper **12** now to be described.

The keeper **12** is formed with two flat base portions **30** which are secured to the second post **4** as by screws **31** extending through the portions **30** and into the post **4**. Joining the base portions **30** is a U-shaped portion **32** extending out of the plane of the portions **30** and outwardly of the gate post **4**. The U-shaped portion **32** is formed with an outwardly divergent opening or notch **33** which terminates in a horizontal slot **34** adapted to receive the latching bar **11** when the gate is moved into closed position. In view of the fact that the opening **33** is divergent outwardly the edges thereof provide a camming action which guides the latching bar **11** into the slot **34** as the gate is closed and the latching bar enters the opening **33** thus moving the latching bar into the slot **34** where it is in latching position.

The latching dog **13** is pivotally mounted in the space between the sides of the U-shaped portion **32** as by means of a rivet **35** extending through such side portions. The dog **13** is formed with a notch **40** outwardly of the pivot **35** and positioned to receive the latching bar **11** therein.

The edges of the notch 40 on either side thereof are generally parallel, and the dog 13 is so positioned that when the dog is in open position as shown in FIG. 5, the lower edge of the notch 40 is substantially in alignment with the lower edge of the opening 33. Thus, when the latching bar 11 is moved into the notch 34 it affects a camming action on the locking dog to move the latching dog downwardly into latching position as shown in FIG. 4.

The latching dog 13 is provided with an opening 41 in the portion thereof which is opposite the opening 33 when the latching dog is in latching position whereby a padlock may be passed through the opening to lock the latch in latched position.

The latching dog 13 also is provided with a handle or finger piece 45 at its outer end by which it may be moved to unlatched position to permit the latch to be opened.

The latch may be unlatched from the opposite side of the fence or other closure member in which the gate is installed and to this end an actuating member such as a cord or wire 46 is attached to the free end 47 of the latching dog 13, an opening 48 being provided for this purpose. The actuating member 46 extends through an opening 49 in the gate post 4 and its free end projects on the other side of the gate post from the latch for ready access by the user.

In the use of the device, the guide is mounted on the gate in a position in alignment with the keeper so that under normal circumstances the latching bar will be in alignment with the opening 33 and more particularly with the notch 34. When the latching bar is not engaged with the keeper, the lower edge of the slot 18 in the guide maintains the latching bar in substantially horizontal position and in alignment with the divergent opening 33 in the strike. Thus, when the gate is closed, the latching bar will move into the divergent opening 33 and into latching position. It should be noted at this point also that the verical free edge of flange 17 that defines slot 18 serves to limit transverse movement of the latch bar in a direction normal to the plane in which it pivots. This limitation on the transverse movement of the latch bar serves to prevent strain on the pivot screw 19 when the gate is shut and particularly if the gate should be slammed shut. It will be seen that when the gate is closed, the latching bar will strike against the inner edge of the notch 34 thus creating more or less force on the free end of the latching bar, and, were it not for the flange 17, the latching bar would create a force on the pivot screw which might damage the latter or even pull the latching bar out of position.

The pivoting action of the latching bar permits it to move up and down about its pivot through a substantial angle. Thus, if the gate sags such that the latch bar is no longer horizoztal when it rests on the lower edge of slot 18, but is downwardly inclined, the divergent opening 33 will nevertheless be effective to cause proper latching when the gate is closed. Such latching is achieved because the latching bar will engage the lower inclined edge of opening 33 when the gate is closed and be pivoted clockwise as seen in FIG. 2 about pivot screw 19, the slot 18 providing clearance for this pivotal movement. Such pivotal movement of the latch bar will continue until portion 27 thereof is aligned with slot 34 whereupon terminal movement of the gate to its closed position will occur causing portion 27 to be received in slot 34. Were the latching bar rigidly, rather than pivotally supported on the gate, this misalignment of the latch bar with the keeper would result in literally lifting the gate on its hinges stressing the latch bar, the gate and the hinges. On the other hand, the pivotal connection between the latch bar and the gate prevents such stressing and thus prevents damage to the latch bar, the gate and the hinges.

In normal operation, the latch bar will rest upon the lower end of slot 18 in flange 17 when the gate is open. Closing of the gate will cause the latching bar to enter

divergent opening 33, and if the latching bar is not in alignment with the notch 34, it is cammed into such alignment by the lower edge of the divergent opening 33 and so enters the notch 34. At this time, the latching bar rides along the lower edge of the notch 40 in the latching dog 13 and causes the latching dog 13 to rotate clockwise (as viewed in FIGS. 4 and 5) about its pivot axis and into latching position as shown in FIG. 4. Once the latch is latched, the gate cannot be opened until the latching dog 13 is moved manually out of latching position (as shown in FIG. 4) and into unlatched position (as shown in FIG. 5).

The latch is fully automatic in its closing action in that it is necessary merely to close the gate, during which action the latching bar will move into latching position and the latching dog will move into latching position without further manipulation on the part of the operator. In this connection, it should be noted that the latching dog 13 is formed with a forward edge 50 (see FIG. 4) of cam form whereby, should the gate be closed when the latching dog is in latching position, the latching dog will be cammed upwardly sufficiently to permit the latching bar to pass thereunder and into latching position into notch 34, whereafter the latching dog will be cammed into latching position.

The latching dog, once it has been moved into latching position, will remain in latching position by gravity until moved out of such position manually. Thus, the gate cannot be opened unless and until the latching dog is moved manually out of latching position. In this connection also it will be seen that the outer edge 51 of the notch 40 is so shaped that when the latching dog is in latching position, the outer edge is disposed vertically. Thus, any attempt to move the gate to open position and consequent movement of the latch bar 11 in a horizontal direction will be resisted by the latching dog, inasmuch as the force exerted thereon by the latching bar is in a horizontal direction and in direct line with the pivot 35. Thus, there is no moment of force tending to force the latching dog 13 out of latching position.

In the embodiment shown, the guide 10 is disposed to the right of the strike 12. However, the arrangement is such that the guide 10 can be installed to the left of the strike 12. Where this is done, the guide 10 is inverted and the pivot screw 19 is inserted through the opening 60 in the base portion 15 of the guide 10 instead of as shown in FIG. 2.

It will be seen from the foregoing that the present invention provides a simple latch mechanism of the automatic type wherein the latch will not be damaged or rendered inoperative even though either the gate or the post to which the gate is latched should sag. Moreover, the arrangement is such that even though the strike and guide are not carefully aligned when the latch is installed the latch may still be operative without damage thereto. The pivoted arrangement of the latching bar permits considerable latitude in registration between the latching bar and the divergent opening in the strike. Moreover, the guide serves to maintain the pivoted latching bar in position to enter the divergent opening in the strike. Also, the provision of the guide strengthens and reinforces the mounting of the latching bar so that such mounting is not likely to be damaged even though the gate should be slammed shut with considerable force. In this case, it should be noted that many gates are not provided with stops so that there is a considerable force on the latch when the gate is slammed shut and in many cases damage results when this occurs.

I claim:

1. A latch for holding a hinged gate in closed position where its free edge is adjacent a gate post, said latch comprising:

(a) a latch bar;

(b) connection means adapted to connect said latch bar

to said gate so that said latch bar projects beyond said free edge;

(c) a keeper adapted to be attached to said gate post and engaged by said latch bar when said gate is in closed position;

(d) said keeper having a latching slot therein into which said latch bar is received when said gate is moved to closed position;

(e) said keeper also having at least one upwardly inclined cam portion at said latching slot and effective to engage said latch bar when said bar is positioned below said latching slot as said gate swings about its hinges toward its closed position and to pivot said latch bar in a plane parallel to said gate until said latch bar is received into said latching slot;

(f) said connection means being constructed and arranged so that said latch bar can effect pivotal movement on said gate in response to engagement of said latch bar with said inclined cam portion of said keeper as said gate swings into closed position;

(g) said keeper including a latch dog movable thereon from a first position blocking said latching slot and preventing said latching bar from moving out of said latching slot when it is received therein for holding said gate in closed position, to a second position unblocking said latching slot and permitting entry or egress of said latch bar relative to said slot for permitting said gate to move to or from closed position;

(h) said latch dog, when in its second position, having means engageable by said latch bar when the gate swings to closed position for causing said latch dog to move to its first position.

2. A latch according to claim **1** wherein said connection means includes a guide adapted to be rigidly attached to said gate, said guide having a flange engaged by said latch member for limiting pivotal movement of said latch bar on said gate.

3. A latch according to claim **2** wherein said flange has a slot therein in which said latch bar is movable, the free edge of said flange defining said slot serving to limit movement of said latch bar relative to said guide in a direction transverse to the plane of pivotal movement of said latch bar.

4. A latch according to claim **2** wherein said latch is pivotally mounted on a fastener extending through said guide and into said gate, and said guide is provided with at least two holes for receiving said fastener, the latter extending through one of said holes.

5. A latch according to claim **2** wherein said keeper includes an outwardly divergent opening connected to said latching slot, one edge of said divergent opening constituting said inclined cam portion.

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