March 18, 1969 R. E. FOLTZ 3,433,518

LATCH ASSEMBLY

Filed March 16, 1967

Fig. 1.

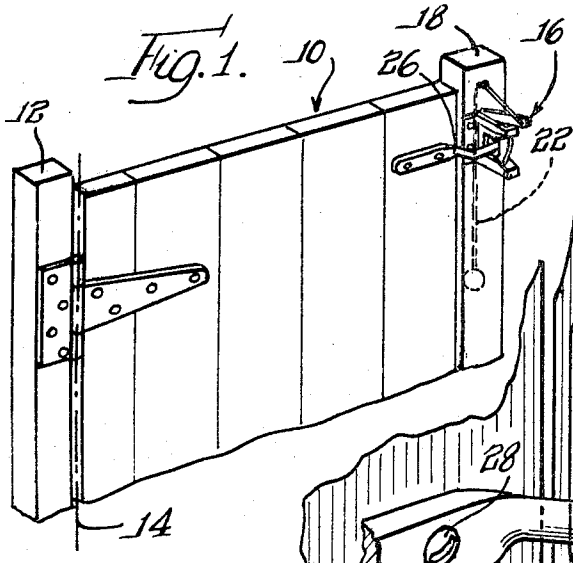


Fig. 2.

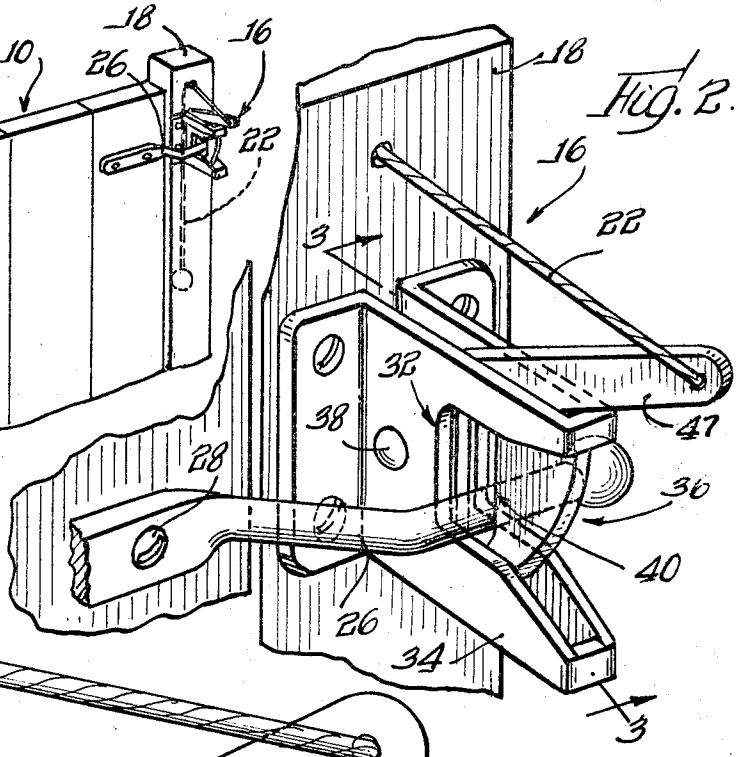


Fig. 3.

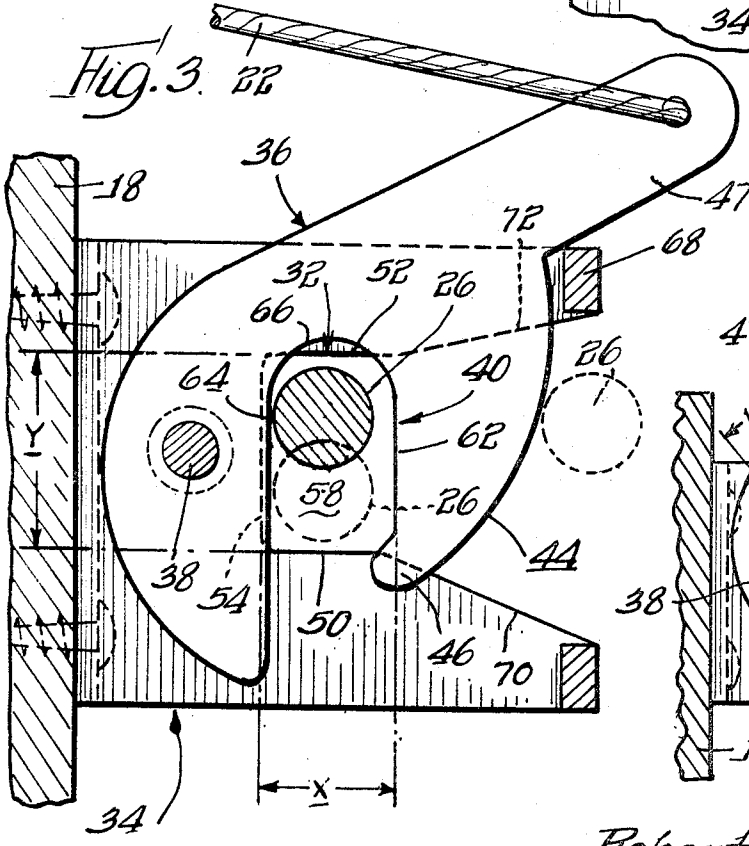
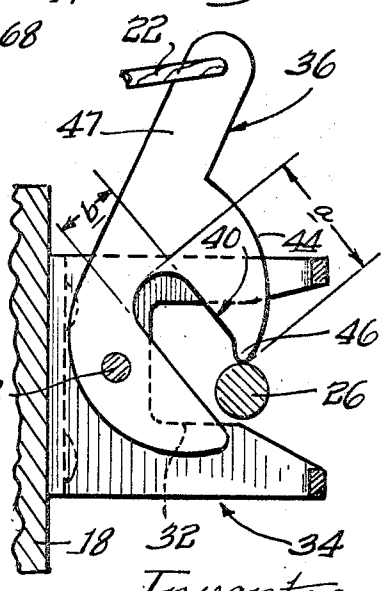


Fig. 4.



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LATCH ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

This invention relates to a gate latch assembly. More particularly this invention relates to a gate latch assembly including a latch bar which is received into a slot in a latch frame, the slot in the latch frame having a width which is substantially larger than a transverse dimension of said latch bar to enable the latch bar to readily engage the slot in the event of sagging of the gate.

Gate latch assemblies commonly include a strike or latch bar which is fixedly mounted on a gate. The gate is latched or held closed by positioning the latch bar in a slot in a frame and engaging the latch bar with a pawl or trip which is mounted on the frame. The latch bar and gate are then retained by the pawl against movement relative to the frame and a gate post. When the gate is to be opened, the latch pawl is pivoted upwardly to release the latch bar for movement relative to the gate post.

The widespread usage of these prior art gate latch assemblies is eloquent testimony as to their generally satisfactory service. However, difficulties are encountered in using the prior art gate latch assemblies where the gate tends to sag or droop relative to the gate post. After the gate has begun to sag, the latch bar is out of alignment with its normal position relative to the frame. The prior art latch assemblies are commonly provided with guide or cam surfaces for forcing the latch bar of a sagging gate upwardly into a normal relationship with the frame as the gate is closed. Since the gate is lifted upwardly contemporaneously with the upward movement of the latch bar, the closing of a sagging gate is relatively difficult with prior art latch assemblies. In fact, in cases of severe sagging of a gate, it is sometimes almost impossible to close and latch the gate with prior art latch assemblies.

Therefore, it is an object of this invention to provide a gate latch assembly which overcomes the aforementioned problems and shortcomings of prior art assemblies. Briefly, the invention provides a gate latch assembly which has a latch pawl mounted on a frame including a latch bar receiving slot which is substantially larger than a transverse dimension of an associated latch bar to enable the latch bar of the gate to be readily received in the slot in the event of sagging of the gate.

Another object of this invention is to provide an inexpensive durable latch assembly having relatively few components.

Another object of this invention is to provide a gate latch assembly which enables a latch bar to move vertically relative to a latch pawl and gate post without impeding operation of the latch assembly.

These and other objects and features of the invention will become more apparent upon a consideration of the following detailed description, taken in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a gate which is retained in a closed position by a gate latch assembly forming a preferred embodiment of the invention;

FIG. 2 is an enlarged perspective view of the gate latch assembly of FIG. 1;

FIG. 3 is an enlarged sectional view, taken along the line 3—3 of FIG. 2, illustrating a latch frame or bracket and latch pawl or trigger in a position wherein the latch bar and gate are retained against movement by the frame and latch pawl; and

FIG. 4 is a sectional view, similar to FIG. 3 but on a reduced scale, illustrating the latch bar and latch pawl of a sagging gate in an intermediate relationship between a latched and unlatched position.

Referring now to the drawings in greater detail, a gate **10** is pivotally or hingedly mounted on a base or pivot post **12** for movement about an axis of rotation **14** from the closed position illustrated to an open position. A latch assembly **16**, forming a preferred embodiment of the invention, is provided for holding or retaining the gate **10** against movement relative to a latch or support post **18**. A draw or latch string **22** is connected to the latch assembly **16** and extends through an aperture in the gate post **18** to enable the latch assembly to be operated or released from a far side of the gate **10**.

As is perhaps best seen in FIG. 2, the latch assembly **16** includes a latch or strike bar or member **26** which is fixedly mounted on the gate **10** by a suitable connection means such as screws **28**. The latch bar extends into a shallow or broad U-shaped slot or recess **32** in a frame or bracket **34** which is fixedly mounted on the gate post **18**. A latch or detent pawl or trigger **36** is pivotally connected to the frame **34** by a rivet **38** or other suitable connection means. The latch pawl **36** has a deep or narrow generally U-shaped retaining recess or throat **40** which cooperates with the slot **32** to retain the latch bar against movement outwardly from the latched position shown in FIG. 2.

The latch bar **26** is moved from a released or open position outwardly of the slot **32** and recess **40** to the latched or closed position of FIG. 2 when the gate **10** is pivoted about the vertical axis **14** from an open position to the closed position in which the gate blocks a passageway between the gate post **18** and pivot post **12**. As the gate is moved from the open position to the closed position the latch bar **26** is moved into engagement with an arcuate outer cam or drive surface **44** of the pawl **36**. Further movement of the gate toward the closed position causes the latch bar **26** to exert an inwardly directed force against the cam surface **44** to pivot the pawl **36** upwardly from the position shown in FIG. 3 to the position shown in FIG. 4. Additional closing movement of the gate **10** causes the latch bar to move past a protuberance or nose **46** of the pawl **36** and into engagement with the slot **32** in the frame **34** and the recess **40** in the pawl **36**. As the latch bar **26** is moved past the nose **46**, the pawl **36** pivots downwardly from the position shown in FIG. 4 to the position shown in FIG. 3 to hold or retain the latch bar **26** against movement relative to the frame **34**.

As can be seen from an inspection of FIG. 3, when the latch bar **26** is in the closed or latched position it is circumscribed by the slot **32** and the recess **40** to hold the latch bar against outward movement relative to the frame **34**. If the gate **10** is forced toward the open position with the latch bar positioned as shown in FIG. 3, the latch bar engages the latch pawl and is retained against outward movement. The latch bar **26** is released for outward movement to enable the gate **10** to be opened by pulling the draw string **22** or manually pivoting the pawl **36** by grasping a handle or actuator section or lever **47** of the pawl and pivoting the pawl about the connector pin **38** to the position shown in FIG. 4. Of course, the latch string **22** can be omitted when the gate is to be opened only from the latch side to gain an additional amount of security for a yard or enclosure.

The slot **32** is defined by a pair of parallel horizontally extending side surfaces **50** and **52** which are interconnected by a vertical inner or end surface **54**. The slot **32** has a depth, indicated at X in FIG. 3, which is slightly larger than the transverse dimension or diameter of the latch bar **26**. The slot **32** has a width, indicated at Y in FIG. 3, which is approximately two and a half times as large as the transverse dimension of the latch bar **26**. The relatively large width of the slot **32** enables the latch bar **26** to remain in alignment with the slot even though the gate **10** sags or droops relative to the gate post **18**. A sagging of the gate **10** results in a downward displacement of the latch bar **26** from the normal position shown in solid lines in FIG. 3 to the position shown in solid lines in FIG. 4 and indicated at **58** in dashed lines in FIG. 3. It is apparent from an inspection of FIG. 4 that the latch bar **26** of a sagging gate can still actuate the pawl **36** and readily move into the slot **32**.

While a slot **32** having a width which is approximately two and a half times as great as the transverse dimension of the latch bar **26** is used in the embodiment of the invention illustrated, it is apparent that the width Y of the slot **32** is determined by the amount of space which is to be allowed for sagging of the gate **10**. Thus, it is necessary that the slot **32** have a minimum width Y which is substantially greater than the transverse dimension of the portion of the latch bar **26** which is received in the slot, that is a width Y which is larger than the transverse diameter or dimension of the latch bar **26** by a material or considerable amount corresponding to the expected maximum sagging of the gate. From a practical standpoint, it has been found that slots **32** having a width Y varying from a minimum of from one and one-half (1.5) times the transverse dimension of the latch bar **26** to about five times the transverse dimension of the latch bar **26** are possible without resulting in a latch assembly **16** which is too large and cumbersome for use.

The recess **40** is defined by a pair of spaced apart parallel side surfaces **62** and **64** which are interconnected by an arcuate end surface **66**. The protuberance or nose **46** extends inwardly from the side surface **62** to securely hold the latch bar **26** of a sagging gate in the slot **32**. The recess **40** has a depth A (see FIG. 4) which is at least as large as the width Y of the slot **32** to enable the position of the latch bar **26** to vary vertically relative to the pawl **36** from the normal position, indicated in solid lines in FIG. 3, to the position indicated in dashed lines at **58** in FIG. 3 when the gate **10** sags. Therefore, the depth of the recess **40** varies by a substantial amount from the transverse dimension or diameter of the portion of the latch bar **26** which is received in the slot **32**. In accordance with the aforementioned relative dimension for the slot **32**, it has been found that a recess **40** having a depth *a* from slightly over one and one-half (1.5) times as great as the transverse dimension of the latch bar **40** to approximately four times as great as the transverse dimension of the latch bar **40** is advantageous for use with most gates. The recess **40** has a width *b* (see FIG. 4) which is slightly larger than an entry way or mouth of the recess or the distance between the protuberance **46** and side surface **64**. Of course, the mouth or entry way is in turn slightly larger than the transverse dimension of the latch bar **26**, to enable the latch bar to enter the recess **40**.

The frame **34** is provided with a pair of opposite spaced apart inwardly converging guide surfaces or jaws **70** and **72** which engage the latch bar **26** to move the latch bar into the slot **32** in much the same manner as is presently done in prior art latch assemblies. However, due to the relatively large width Y of the slot **32** and the relatively large depth *a* of the recess **40**, the latch bar **26** does not engage the guide surface **70** unless an extremely large amount of sag or droop is present in the gate. Since the guide surfaces **70** and **72** seldom, if ever, engage the latch bar **26**, it is contemplated that these surfaces may be eliminated in embodiments of the invention other than the preferred embodiment illustrated.

The operation of the latch assembly **16** constructed as illustrated in FIGS. 1 to 4 will be largely apparent from the foregoing description. However, for purposes of affording a more complete understanding of the invention, it is advantageous now to provide a functional description of the mode in which the component parts cooperate. The gate **10** will be retained in a closed position, as shown in FIGS. 1 and 2, by the latch assembly **16** when the latch bar **26** extends into the slot **32** in the bracket **34** and the recess **40** in the pawl **36**. A force tending to swing the gate open will result in the latch bar **26** engaging the outer side surface **62** of the recess **40** in the pawl **36**. The latch bar **26** will then exert an outward force on the pivot pin **38** and a moment or turning action on the pawl **36** which tends to rotate the pawl about the pivot pin or rivet **38**. The outward force will be resisted by the pivot pin **38**. The turning action will be resisted by either a stop portion **68** of the frame **34** or by the nose **46** of the pawl, depending upon whether the center of the latch bar **26** is above or below the center of the pivot pin **38**. When the draw string **22** is pulled by a person standing on the far side of the gate, as viewed in FIG. 1, or when the release lever section **47** of the pawl is manually grasped to pivot the pawl counterclockwise about the connector pin **38**, the latch bar **26** and gate **10** will be released for movement from the closed position of FIG. 1 to an open position. The latch bar will then move out of engagement with the slot **32** and the recess **40**, as shown in FIG. 4.

When the gate is swung back to the closed position of FIG. 1, the latch bar **26** will engage the cam surface **44** to pivot the pawl **36** upwardly from the position shown in FIG. 3 to the position shown in FIG. 4, to enable the latch bar to clear the nose portion **46** of the pawl. The pawl **36** will then pivot downwardly, to the position of FIG. 3, to retain the latch bar and gate in the closed position of FIG. 1. The slot **32** and recess **40** will then circumscribe the engaged portion of the latch bar to retain the latch bar against outward movement from the position shown in FIG. 3.

If during use the gate **10** should sag or move relative to the gate post **18**, the latch bar **26** will still be in alignment with the slot **32**, since the slot **32** has a width Y which is substantially larger than the transverse dimension of the latch bar **26**. Thus, a sagging of the latch bar with the gate from an initial position of installation with the latch bar traversing the upper portion of the slot **32** when the gate is closed, will merely result in a displacement downwardly of the latch bar in the slot **32** and the recess **40**. The gate **10** will still be readily closed even though it is sagging, as shown in FIG. 4, since the latch bar does not have to be forced or cammed upwardly to a normal position, as is the case with prior art structures. To obtain this advantageous interrelationship between the latch bar **26** and the frame **34** and pawl **36** it is necessary to make the slot **32** and recess **40** substantially larger than the transverse dimension of the latch bar **26**, that is the slot **32** should have a width and the recess **40** a depth which are greater than the transverse dimension of the latch bar **26** by a material amount which corresponds to the expected maximum amount of sag of the gate **10**. The cam surface **44** and longitudinal axis of the recess **40** must be related to each other in such a manner as to cause the pawl **36** to pivot upwardly and back again about the pivot pin **38** as the latch bar **26** engages the pawl **36** and moves into the slot **32**.

In the illustrated embodiment of the invention, particular constructions of the frame **34** and pawl **36** have been illustrated for use in association with a particular latch bar **26**. It is contemplated that the particular structures shown will be changed by those skilled in the art while still using the highly advantageous relationship between the slot **32** in the frame **34** and the latch bar **26**, whereby the latch bar will remain in alignment with the slot **32**

even though the gate **10** sags. Therefore, while particular embodiments of the invention have been shown, it should be understood, of course, that the invention is not limited thereto since many modifications may be made, and it is contemplated to cover by the appended claims any such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A sag-accommodating gate latch assembly for releasably holding a gate in closed position relative to a gate post; and comprising frame means to be fixedly mounted on the gate post and including an outwardly opening slot, a latch bar to be fixedly mounted on the gate with a portion thereof traversing the slot in said frame means when the gate is closed, the slot in said frame means being of a width substantially vertically longer than the transverse dimension of the latch bar portion to be received therein by a distance to effectively accommodate substantial gate sagging from an initial position of installation of the latch bar and frame means on the gate and gate post, respectively, with the latch bar portion initially traversing the upper portion of the slot when the gate is closed, and a pawl pivotally connected to the frame means and including an outwardly facing cam surface to be engaged by the latch bar portion for pivoting the pawl upwardly when the gate is moved to closed position, said pawl including a recess opening at the bottom thereof to receive the latch bar portion as the pawl is pivoted upwardly upon movement of the latch bar portion into the slot in said frame means, the recess in the pawl being defined along one side by a wall surface thereof traversing the slot in the frame means when the gate is closed to trap the latch bar portion in the slot and in the initial position thereof traversing the upper portion of the slot as well as in lower positions thereof traversing lower portions of the slot resulting from sagging of the gate relative to the gate post.

2. An assembly as set forth in claim **1** wherein: the width of said slot in said frame means and the depth of the recess in said pawl are at least one and one-half times as large as the transverse dimension of the portion of said latch bar which is received into said slot, whereby the portion of the latch bar which is received into said slot is engaged by said pawl and said frame means to retain said latch bar against movement relative to said frame means while enabling the gate to sag relative to both said frame means and said pawl.

3. An assembly as set forth in claim **1** wherein the slot in said frame means has a width between 1.5 to 5 times the transverse dimension of said latch bar and said recess in said pawl has a depth between 1.5 to 4 times the transverse dimension of said latch bar.

References Cited

UNITED STATES PATENTS

844,907	2/1907	Aikin	292—136
974,566	11/1910	Giles	292—136
3,266,831	8/1966	Banse	292—133
627,750	6/1899	Happy	292—99

FOREIGN PATENTS

122,131	9/1946	Australia.

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U.S. Cl. X.R.

292—235