United States Patent [19]

Peterson

[11] **3,901,541**

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[54] **BALER DOOR LATCH**

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[73] Assignee: **Harmony Enterprises, Inc.**, Harmony, Minn.

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[52] **U.S. Cl.** **292/100**; 292/259; 292/DIG. 32

[51] **Int. Cl.**[2] **E05C 3/04**

[58] **Field of Search** ..... 292/98, 100, 197, 200, 292/218, 259, DIG. 32

[56] **References Cited**

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[57] **ABSTRACT**

A latch for the bale door of a baler including an elongated latch bar member pivoted to the door and an elongated strike carried by the baler, and latching mechanism including a roller pivoted to the bar member, an abutment carried by the door, and a control lever for causing revolution of said roller about its pivots into contact with said abutment.

3 Claims, 6 Drawing Figures

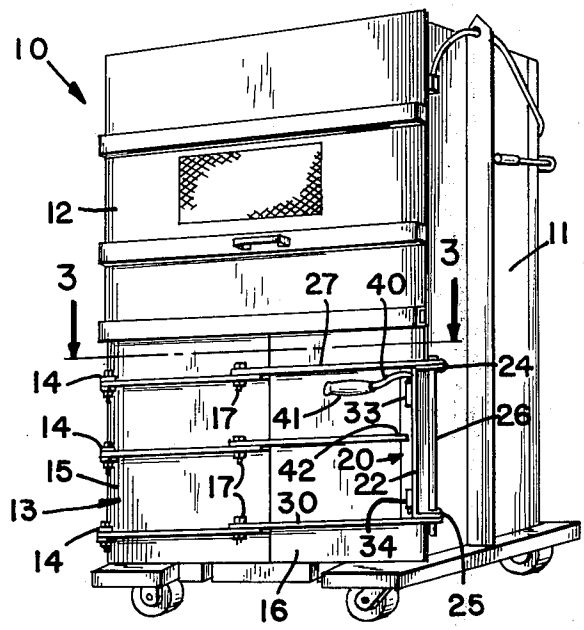


FIG. 1

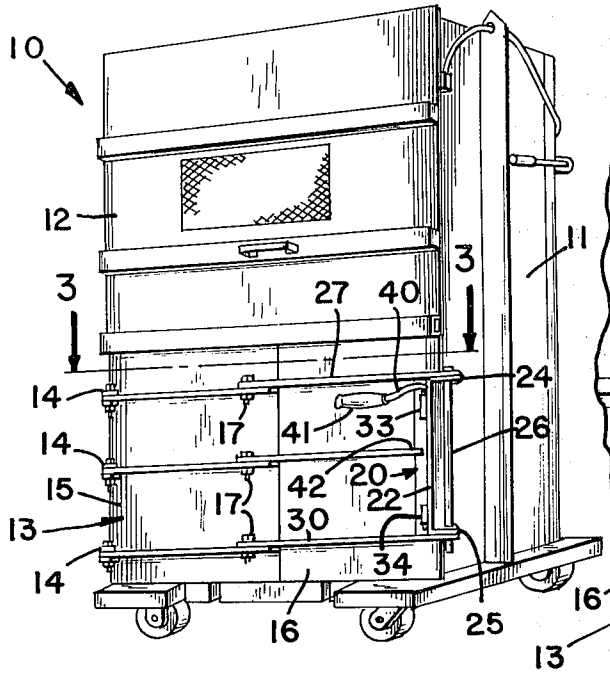


FIG. 2

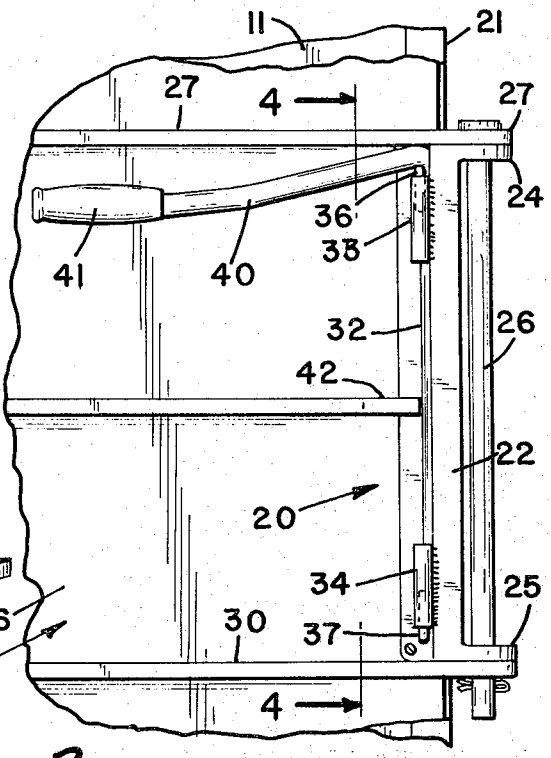


FIG. 3

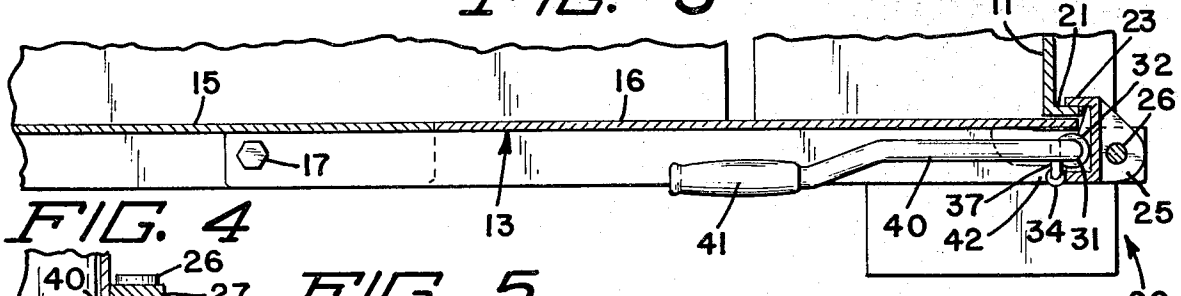


FIG. 4

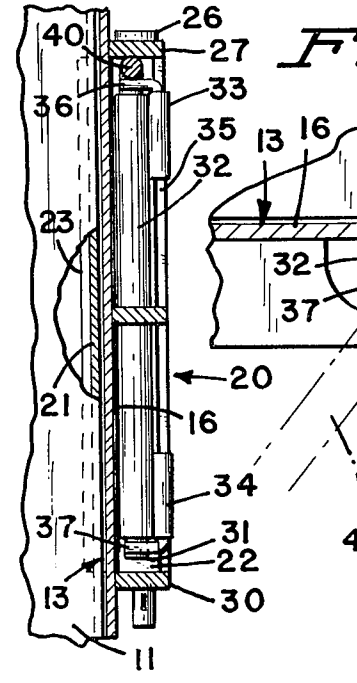


FIG. 5

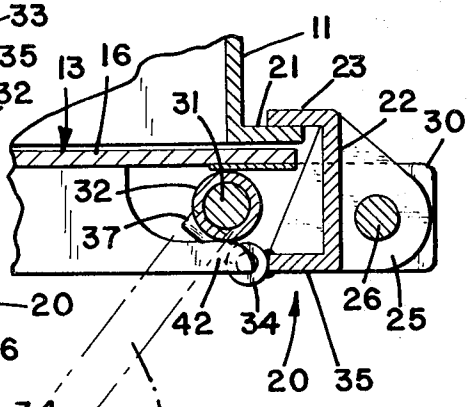
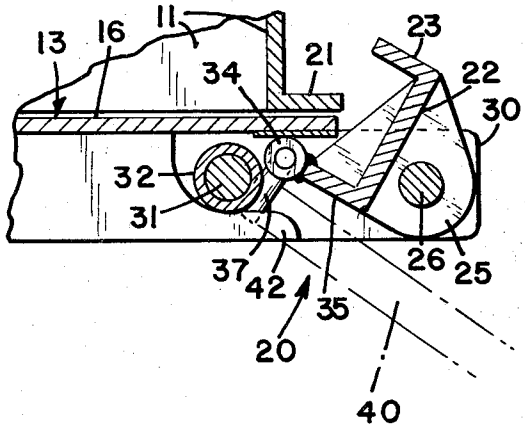


FIG. 6



BALER DOOR LATCH

BACKGROUND OF THE INVENTION

In the art of baling equipment for compaction and convenient disposal of compressible waste it is necessary to provide an opening through which a complete bale may be removed. It is convenient to have a hinged door to close such an opening rather than using a bar arrangement, for example, but since the door is subject to the compressional forces being applied to the waste materials, usual door latching expedients are found inadequate. Moreover, a latch for this purpose must not be subject to release or unlatching under the effect of the compressional forces acting in a reverse manner on the latch mechanism.

SUMMARY OF THE INVENTION

It is the object of this invention to provide a new and improved latch for baler doors. This latch allows the door to move out in a controlled action that relieves the bale pressure before the door is allowed to swing free. It is another object of the invention to provide a baler door latch which is simply actuated into latched or unlatched positions, in inexpensive to construct, easy to use, and not susceptible of unlatching by reason of any force acting solely on the door.

Various other objects, advantages, and features of novelty which characterize my invention are pointed out with particularity in the claims annexted hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and objects attained by its use, reference should be had to the drawing which forms a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing,

FIG. 1 is a perspective view of a portable baler incorporating my invention;

FIG. 2 is a fragmentary front elevation showing my improved latching mechanism;

FIG. 3 is a fragmentary sectional view along the line 3—3 of FIG. 1, showing the door in its latched condition;

FIG. 4 is a fragmentary sectional view along the line 4—4 of FIG. 2, showing the door in its latched condition; and

FIGS. 5 and 6 are fragmentary sectional views like FIG. 3 showing two stages in the unlatching of my improved latch.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawing a portable hydraulic baler **10** is shown to have frame **11**, a loading door **12**, and a bale door **13** hinged at one end **14** and made in two portions **15** and **16** hinged centrally at **17** to require less space around the baler when the door is to be opened. Except when a completed bale is to be removed, door **13** is maintained closed by my new latch mechanism **20.**

As best shown in FIG. **3** the frame **11** of the baler is formed to provide, or carries, a strike **21** extending vertically along the bale door opening. When the door is closed a latch bar member **22** of channel cross section

engages strike **21** along the inner surface of one of the channel legs **23.** The bar is carried on upper and lower pivot plates **24** and **25** for rotation about the vertical axis of a hinge pin **26** passing through holes in framing members **27** and **30** of the door.

I provide means to prevent bar **22** from rotating about its axis and allowing door **13** to open in response to compressional forces on the door. To this end a vertically extended shaft **31,** carrying a freely rotatable roller **32,** is carried in pivots **33** and **34** mounted near the ends of the other channel leg **35** of bar **22,** arms **36** and **37** being secured to rod **31** for this purpose. A control lever **40** is secured to and may comprise a continuation of rod **31;** it extends horizontally and lies parallel to the door **13** when the latch is closed. Lever **40** may be provided with a hand grip **41.**

My latch is shown in its closed condition in FIGS. **1–4.** It will be seen that roller **32** lies parallel and close to door **13,** and partially within the channel outline of bar **22.** Any force acting on door **13** will tend to act at **23** to rotate latch bar **22** clockwise about pin **26.** If this occurs, roller **32** is simply displaced, with very little rotation about pivots **33, 34,** until it contacts door **13,** whereafter no further latching bar movement can occur because the roller is in an over-center condition and the undesired forces can only reinforce this state.

Now when it is desired to open the door, lever **40** is rotated in a counterclockwise direction as seen in FIGS. **5** and **6.** This causes revolution of shaft **31** and roller **32** about the axis of pivots **33** and **34** past a center position, at which the line joining the axes of the roller and the pivots is perpendicular to and the roller is substantially tangent with the door, to the position shown in FIG. **5.** Here roller **32** contacts the surface of an abutment **42** carried by door **13.** Upon further movement of lever **40,** a toggle action takes place, the roller acting as a fulcrum to displace pivots **33, 34** and hence to rotate latching bar **22,** about pivot **26,** until leg **23** of the bar moves beyond strike **21** and allows the door to be opened; this is shown in FIG. **6.**

When the door is to be closed a reverse operation of lever **40** toggles the latch bar member back into engagement with strike **21,** and then displaces roller **32** into its over-center position: the door is again latched against undesired opening.

Numerous objects and advantages of my invention have been set forth in the foregoing description, together with details of the structure and function of the invention, and the novel features thereof are pointed out in the appended claims. The disclosure, however, is illustrative only, and changes may be made in detail especially in matters of shape, size, and arrangement of parts, within the principle of the invention, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A latch for a door vertically hinged in a doorway comprising an elongated vertical strike carried by the doorway and a latch mechanism carried by the free edge of the door, said latch mechanism comprising, in combination:

a latch bar member having an elongated lip;

vertical spaced means pivotally mounting said bar member on said door, for rotation about a first vertical axis aligned with the longitudinal axis of the bar member, from a locking position in whcih the inner surface of said lip engages behind said strike;

and over-center means for rotating said bar member into and out of said locking position, and for maintaining said bar member in said locking position in the presence of forces on said door tending to rotate said bar.

2. Apparatus according to claim 1 in which the last-named means includes a vertically extending shaft carrying a roller;

spaced pivot means carried by said bar member and having a second vertical axis;

means mounting said shaft for revolution parallel to itself about said second axis of said pivot means, at a predetermined radius therefrom, out of a position parallel to and adjacent said door when said bar member is in said normal position;

a control lever extending horizontally from said shaft to normally lie substantially parallel with the door, so that angular displacement of said lever horizontally causes said revolution of said shaft, the predetermined radius being such that said roller becomes substantially tangent to said door after a first portion of said rotation;

and means preventing reverse displacement of said roller in response to rotational forces applied to said bar and therethrough to said pivot means.

3. Apparatus according to claim 1 in which the last-named means comprises a vertically extending shaft carrying a roller;

spaced pivot means carried by said bar member and having a second vertical axis;

means mounting said shaft for revolution, parallel to itself, about said second axis of said pivot means, at a predetermined radius therefrom, out of a position parallel to and adjacent said door when said bar member is in said normal position;

a control lever extending horizontally from said shaft to normally lie substantially parallel with the door, so that angular displacement of said lever horizontally causes said revolution of said shaft, the predetermined radius being such that said roller becomes substantially tangent to said door after a first over-center portion of said rotation;

and abutment means carried by said door for engagement by said roller whereupon further displacement of said lever causes pivotal movement of said bar member on said door to disengage said bar from said strike, thereby permitting said door to be opened.

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