Oct. 30, 1945. H. PETERS 2,388,075

LATCHING MECHANISM FOR END GATES

Filed Oct. 5, 1944 3 Sheets-Sheet 1

Fig. 1

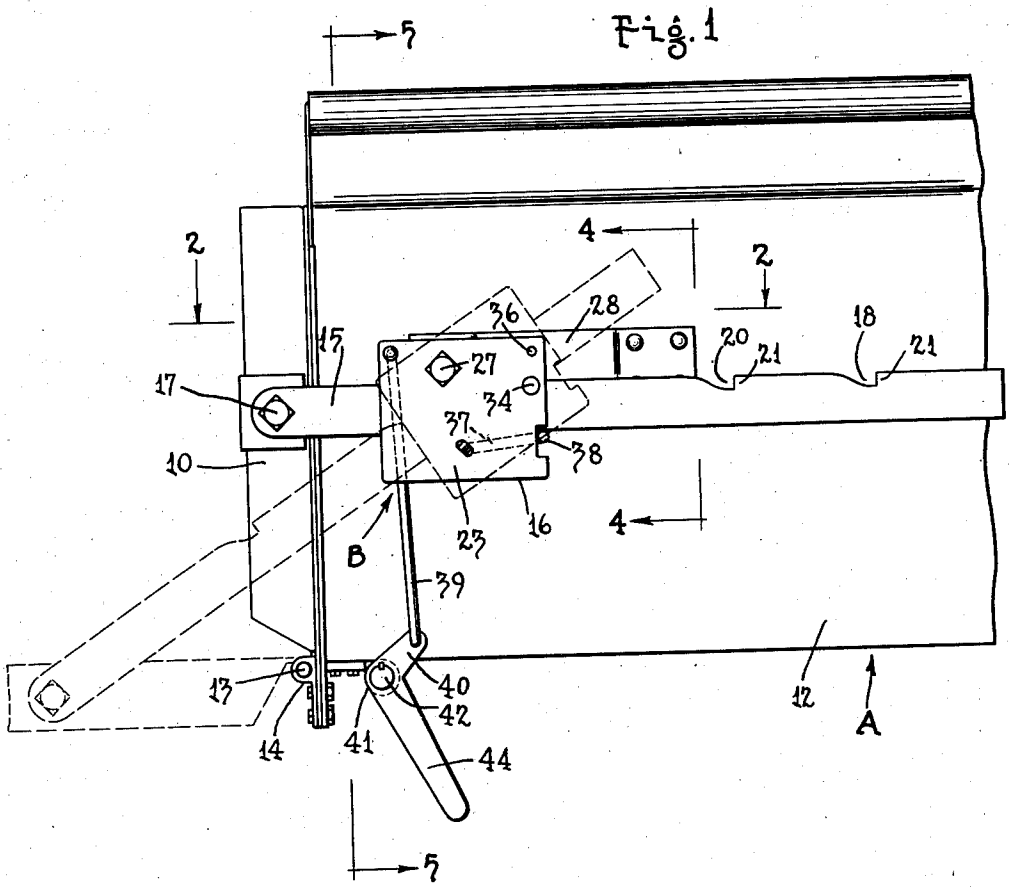
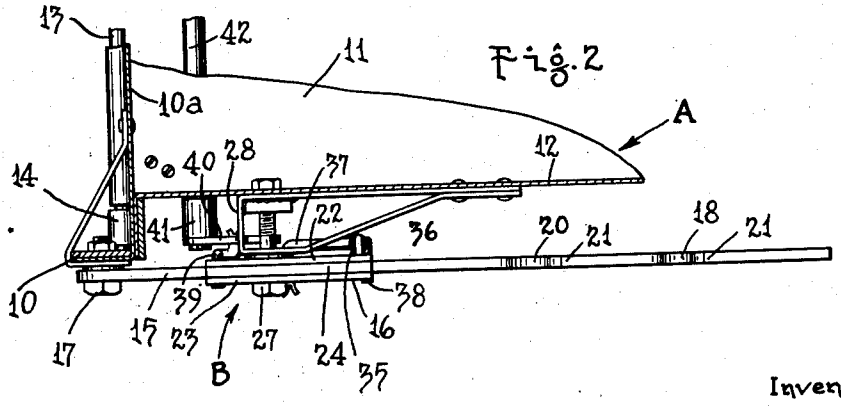


Fig. 2



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Fig. 3

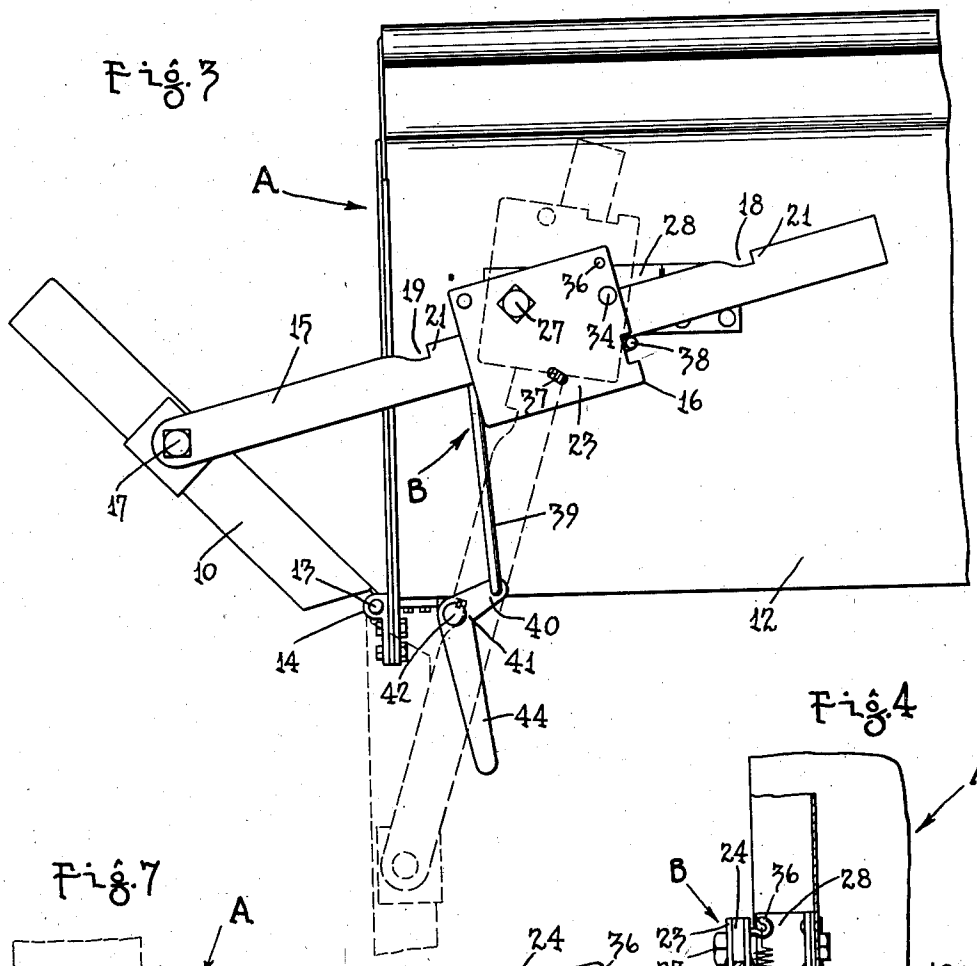
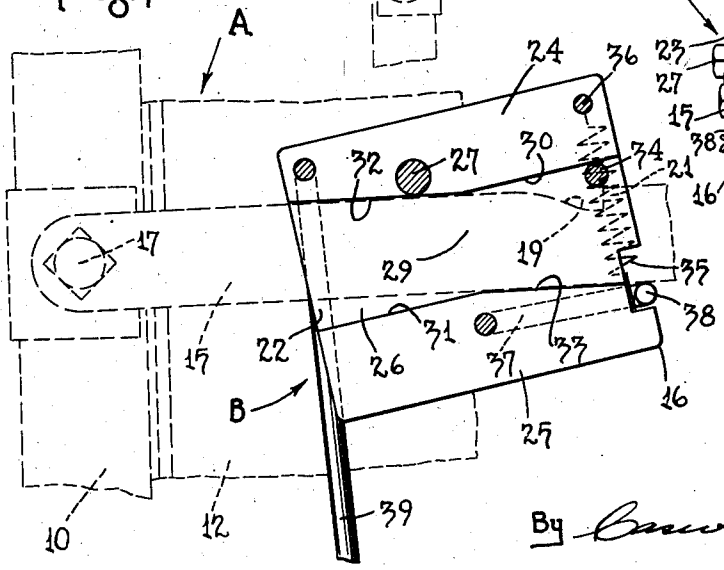


Fig. 4

Fig. 7



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Fig. 5

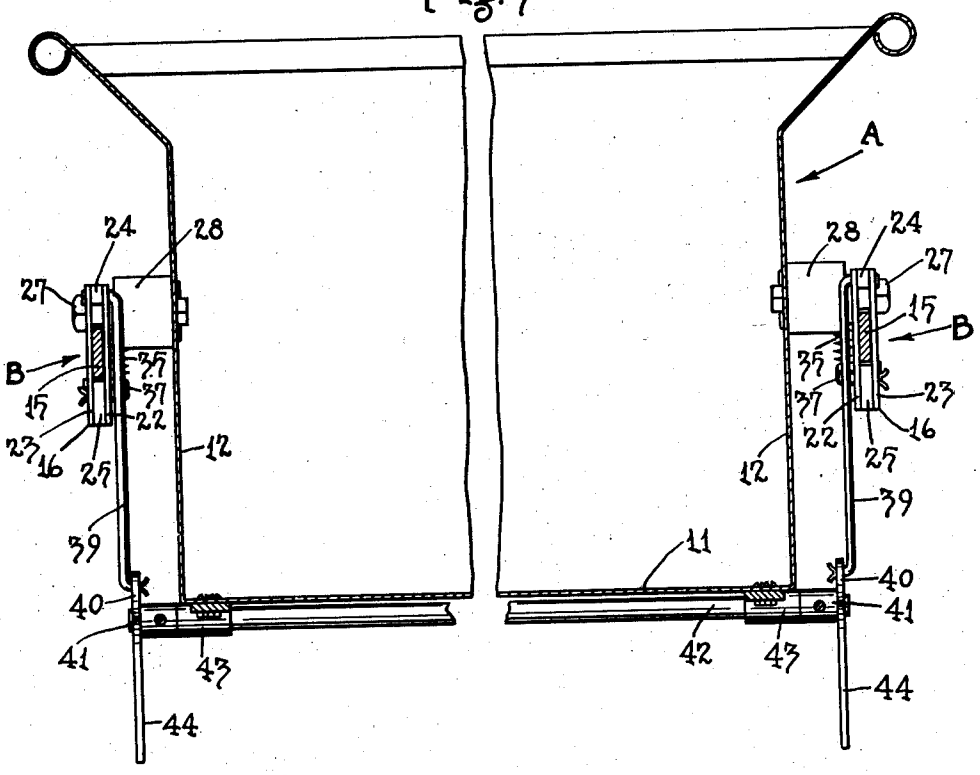
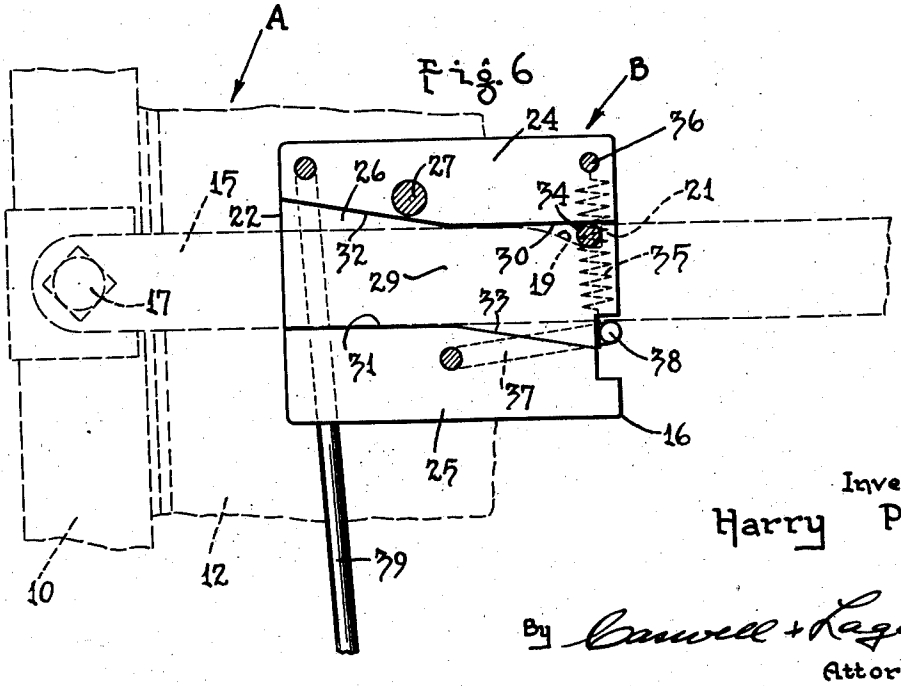


Fig. 6



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UNITED STATES PATENT OFFICE

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LATCHING MECHANISM FOR ENDGATES

Harry Peters, Scribner, Nebr.

Application October 5, 1944, Serial No. 557,307

11 Claims. (Cl. 292—267)

My invention relates to improvements in latching mechanisms for hingedly mounted end-gates of vehicle bodies, an object of the invention being to provide a simple, durable and efficient mechanism of such character adapted securely to latch an end-gate in one or any one of several selected positions and operable quickly and easily to enable the user to adjust the end-gate as desired.

More specifically, it is an object of my invention to provide a latching mechanism of the instant nature including a notched latch-bar pivoted to an end-gate and a latch-block or guide for the latch-bar equipped with a pawl and pivoted to the vehicle body, such latch-block being tiltable relative to the latch-bar to engage said pawl with and disengage the same from said latch-bar.

Another object of the invention is to provide a simple and effective spring means carried by the latch-block for yieldingly tilting the same relative to the latch-bar in a direction to effect the engagement of the latching pawl with said latch-bar.

An additional object of the invention is to provide a way in the latch-block for the latch-bar and to pivotally mount the latch-block in a manner inducing the gravitational tilting of the same in accord with the tilting thereof by said spring means to augment and provide for the simplification of such spring means and to serve as a safety feature in the event of failure of said spring means.

A further object of my invention is to supply readily accessible and easily operated trip means for tilting the latch-block in a direction to release its latching pawl from the latch-bar and thereby enable the end gate to be lowered from any of its latched positions.

Another object of the invention is to provide a mechanism as above which admits of the closing of the end gate, from any one of its open positions to any more nearly closed position thereof simply by swinging the end-gate in closing direction.

A still further feature of my invention resides in duplicating the latch-bars, latch-blocks and trip-means at either side of the vehicle body and in coordinating the operation of the trip-levers so that, upon the operation of either trip-lever, both thereof will function to tilt their respective latch-blocks and release their respective latch-bars.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the accompanying drawings, Fig. 1 is a side elevational view of the rear portion of a vehicle body of simple construction suitable for light trucks, the same being equipped with an end-gate latching mechanism constructed in accordance with my present invention, the end-gate being shown, in solid lines, in an upstanding, fully closed position and, in dotted lines, in a horizontal position opened ninety degrees; Fig. 2 is a fragmentary sectional view taken as on the line 2—2 of Fig. 1; Fig. 3 is a view similar to Fig. 1 showing the end-gate, in solid lines, in a position opened forty-five degrees and, in dotted lines, in a depending position open one hundred and eighty degrees; Fig. 4 is a vertical sectional view in detail taken as on the line 4—4 of Fig. 1; Fig. 5 is a vertical sectional view taken transversely of the truck body as on the line 5—5 of Fig. 1 and showing the duplicate latching mechanisms at either side of the truck body with their trip-levers coordinated; Fig. 6 is a side elevational view of one of the latch-blocks with its outer side-plate removed, said latch-block being shown in association with a portion of the latch-bar, illustrated in dotted lines, and with portions of the truck body and end-gate, likewise illustrated, said latch-block appearing angularly disposed in its latched relation with respect to the latch-bar wherein the latching pawl is received in one of the notches of the latch-bar; Fig. 7 is a view similar to Fig. 6, the latch-block being shown in its unlatched relationship relative to the latch-bar, wherein the latching pawl is removed from engagement with the notched portion of said latch-bar.

Having reference to the drawings, in which similar parts are designated by similar reference characters throughout the several views, it will be seen that the illustrated embodiment of my invention, shown as applied to a truck body A having a hinged end-gate 10, comprises similar latching mechanisms B at either side of the body A.

Essentially, the illustrated truck body A comprises a bottom 11 and side-boards 12 and the end-gate 10 comprises a closure panel 10*a* hinged along its lower edge to the bottom 11 of the body A by means of a hinge pin 13 journaled in bearings 14 secured to said body. Features of the vehicle body and end-gate, other than as above noted, will require no special comment.

In the latching mechanisms B applied to the opposite sides of the body A, each mechanism includes a latch-bar 15 and a latch-block or guide 16 therefor. The latch-bar 15 is pivoted at its rear end to the end-gate 10 by means of a pivot-bolt 17 and is formed at its upper edge with front and rear notches 18, 19 and with an intermediate notch 20, each of said notches being so shaped as to provide a shoulder or catch 21 in the stock of the latch-bar 15 forwardly of the notch.

The latch-block or guide 16 consists of inner and outer side plates 22, 23 horizontally spaced apart in parallel relation by means of upper and

lower spacer-plates 24, 25 which are slightly thicker than the thickness of the latch-bar 15 and which are welded or otherwise suitably secured to said side plates in vertically spaced relationship. The space provided between the inner faces of the side plates 22, 23 and the lower and upper edges of the upper and lower spacer-plates 24, 25, provides a way 26 through the latch-block 16 from rear to front thereof in which the latch-bar 15 is slidably received. The latch-block 16 is pivotally mounted on one of the side-boards 12 of the vehicle-body A as by means of a bolt 27 which extends through a bracket 28 fixed to such side-board for the purpose of spacing said latch-block outwardly therefrom. In said way 26, the distance between the side-plates 22, 23 is uniform and only slightly greater than the thickness of the latch-bar 15 closely to accommodate the same in such dimension thereof. Said way 26, however, in the distance between the lower and upper edges of the upper and lower spacer-plates 24, 25, is not uniform. Instead, it has a constriction or throat 29 approximately mid-length thereof. The dimension of this throat 29 from one of the spacer-plates 24, 25 to the other is such that the latch-bar 15, at its upper and lower edges, is closely accommodated between said spacer-plates at the locality of said throat. As shown in Figs. 6 and 7, the lower edge portion 30 of the upper spacer-plate 24 forwardly of the throat 29 parallels the upper edge portion 31 of the lower spacer-plate 25 rearwardly of said throat, while the lower edge portion 32 of said upper spacer-plate 24 rearwardly of the throat 29 parallels the upper edge portion 33 of the lower spacer-plate 25 forwardly of said throat. In providing said throat 29 and in constructing the adjacent edges of the spacer-plates 24, 25 in relation to said throat 29, as above described, the pivotally supported latch-block 16 is able to tilt, not only along with the latch-bar 15, but also through a limited range relative thereto.

The latch-block 16 is supplied at its forward end with a pawl 34 of suitable construction adapted to be received, selectively, in the notches 18, 19 and 20 of the latch-bar 15 and to be engaged by the respective locking shoulders 21 on said latch-bar adjacent said notches. This pawl 34, in the form shown, consists of a pin spanning the space between the side-plates 22, 23 and anchored at its ends to said side-plates.

Normally, the latch-block 16 is yieldingly held in an angular relationship relative to the latch-bar 15, so that the pawl 34 rides the upper edge of said latch-bar and automatically catches in the notches therein upon the retraction of the same from said latch-block, as occasioned by the lowering of the end-gate 10. In accomplishing such end, I provide spring means including a tension spring 35 which is caught at its upper end on a hook 36 fastened to the inner side of the latch-block 16 near its upper forward corner. Pivoted to the lower portion of the latch-block 16 and extending forwardly along its inner face is an arm 37 having an outwardly turned terminal portion or shoe 38 under-reaching the lower edge of the latch-bar 15. The lower end of said tension spring 35 is caught around said arm 37 near the shoe 38 and said spring 35 acts yieldingly to hold the shoe 38 against the lower edge of the latch-bar 15 and to urge the tilting of the latch-block 16 relative to the latch-bar 15 to cause the pawl 34 to ride upon the upper notched edge of said latch-bar 15.

Manually operated trip means are provided for conveniently tilting the latch-block 16 relative to the latch-bar 15, against the action of the spring 35, to disengage the pawl 34 from either of the notches in said latch-bar 15 in which said pawl may be lodged. Said trip means includes a depending link 39 pivoted at its upper end to the latch-block 16 near its upper rear corner and extending along the inner face of said latch-block. This link 39 is pivoted at its lower end to a forwardly extending arm 40 of a bell-crank 41 keyed to a cross-shaft 42 journaled in bearings 43 mounted on the underside of the bottom 11 of the vehicle body A. The other arm 44 of the bell-crank 41 constitutes a trip-lever extending downwardly in a position conveniently to be grasped and operated by a user to tilt the latch-block 16 relative to the latch-bar 15 and thereby remove the pawl 34 from its latching position in whatever notch it may occupy in said latch-bar 15.

The bell-cranks 41 of the two latching mechanisms B at opposite sides of the vehicle body A are both keyed to the one cross-shaft 42 so that both mechanisms are simultaneously operated to free their respective latch-bars 15 upon the manipulation of either of said trip-levers 44.

The bolt 27, upon which the latch-block 16 of each latching mechanism B is pivotally mounted, extends through such latch-block above and to the rear of its center of gravity and to the rear of the throat 29 therein upon the bottom of which the pivoted latch-bar 15 rests. Overbalanced to swing downward at its forward end, and acted upon thus to swing by the latch-bar 15, through gravity, the latch-block 16, without the effect of the spring 35, tends to carry its pawl 34 into engagement with the notched upper edge of the latch-bar 15. This feature minimizes the strength of the spring 35 that will be employed and, correspondingly, minimizes wear of parts contacted through the action of said spring. It also makes for safety in the event of failure of said spring 35.

While the notches 18, 19 and 20 in the latch-bar 15 of each latching mechanism may have shoulders or catches rearwardly of each thereof like the shoulders or catches 21, I prefer to employ the ratchet type of notch, as shown, so that without touching either of the trip-levers 44, the end-gate 10 may be swung in a direction to close it merely by pushing upon the same. Thus, the end-gate can be quickly and easily swung from any open position to closed or any other more nearly closed position, wherein the latching mechanism will function automatically to latch the end-gate.

In the fully closed position of the end-gate 10 (solid lines, Fig. 1) in which the latching pawl 34 of each of the two mechanisms B is lodged in the rearmost notch 19 of its latch-bar 15 behind the shoulder or catch 21, said end-gate is securely latched closed at both ends thereof. Yet, a slight rearward pull upon either of the trip-levers 44 will disengage the pawl 34 of each mechanism B from its respective latch-bar 15 freeing the end-gate 10 to such other adjustment thereof as may be desired within the range provided. The adjustment of the end-gate 10 into position open at forty-five degrees as shown in solid lines in Fig. 1, bringing pawl 34 into the intermediate notch 20, or the adjustment of said end-gate 10 into position open at ninety degrees as shown in dotted lines in Fig. 1, bringing pawl 34 into the foremost notch 18, results, in either case, in automatically

latching the end-gate securely against further opening movement. While I have not shown a notch in the latch-bar 15 for latching the end-gate in its depending position, open at one hundred and eighty degrees as shown in dotted lines in Fig. 3, it will be readily comprehended that a notch of the ratchet type could be provided to keep the depending end-gate from swinging rearward and that a notch with a latching shoulder rearwardly as well as forwardly thereof could be provided to keep the depending end-gate from swinging in either direction.

Changes in the specific form of my invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A structure of the character described for releasably latching an end-gate pivoted to a vehicle body, said structure including similar latching mechanisms at opposite sides of the vehicle-body, each mechanism comprising a latch-bar pivoted at one end to its respective end of said end-gate and formed with a series of notches therealong, a latch-block pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from such notched portion of said latch-bar upon the reverse tilting of said latch-block relative to said latch-bar, spring means acting yieldingly to tilt the latch-block in said first direction and cause the engagement of said pawl with any of said notches encountering the same, releasing means for opposing the action of said spring means and effecting the said reverse tilting of said latch-block to cause said pawl to be disengaged from such notch, said releasing means including a trip-lever, the trip-levers of the two mechanisms being connected together and coordinated in their movements whereby, upon the operation of either trip-lever, both mechanisms will be actuated to free their respective pawls from their respective latch-bars.

2. A structure of the instant nature for latching an end-gate pivoted to a vehicle-body, said structure including similar latching mechanisms at opposite sides of the vehicle-body, each mechanism comprising a latch-bar connected at one end thereof to the end-gate, a latching member mounted on the vehicle-body, said latch-bar being movable along said latching member upon the opening and closing of the end-gate, bar engaging means on said latching member for releasably engaging said latch-bar, and releasing means for rendering said bar engaging means ineffective, said releasing means including a trip-member remotely disposed relative to said latching member, the trip-members of the two mechanisms being connected together and coordinated in their movements, whereby upon the operation of either trip-member both of said releasing means will be actuated to render their respective bar engaging means ineffective.

3. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a series of latching notches therealong, a latch block pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from said notched portion of said latch-bar upon reverse tilting of said latch-block relative to said latch-bar, spring means acting against the latch bar and latch-block to tilt the latch-block in said first direction and cause the engagement of said pawl with any of said notches encountering the same, and trip-means for effecting the said reverse tilting of said latch-block against the action of said spring means to cause said pawl to be disengaged from such notch, said spring means consisting of an arm pivoted to the latch-block, a shoe on said arm engageable with said latch-bar, and a spring interposed between the arm and latch-block and serving to engage said shoe with said latch-bar and exert a force upon the latch-block for tilting the same relative to said latch-bar.

4. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a series of latching notches therealong, a latch block pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from said notched portion of said latch-bar upon the reverse tilting of said latch-block relative to said latch-bar, spring means acting against the latch-bar and latch-block to tilt the latch-block in said first direction and cause the engagement of said pawl with any of said notches encountering the same, and trip-means for effecting the said reverse tilting of said latch-block against the action of said spring means to cause said pawl to be disengaged from such notch.

5. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a latching notch therein, a latch-block pivotally mounted on the vehicle-body and formed with a way therein slidably receiving said latch-bar, said latch-block being tiltable with said latch-bar and serving slidably to guide the same upon the opening and closing of the end-gate, said way being formed with a constriction therein against the bottom of which the lower edge of the latch-bar slidably bears, said way having substantial play relative to the upper and lower edges of the latch-bar except at said constriction, said latch-block being tiltable relative to said latch-bar within the range of such play, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from said notched portion of said latch-bar upon the reverse tilting of said latch-block relative to said latch-bar, said latch-bar pivoting on an axis located with respect to its center of gravity to induce the tilting thereof, by gravity, in said first direction, and said constriction in said way being located with respect to such pivotal axis to cause the gravitating effect

of the latch-bar to contribute to such tilting of the latch-block and bring said pawl into engagement with said latching notch upon being encountered thereby, spring means acting against the latch-bar and latch-block to tilt the latter in accord with the gravitational tilting thereof, and trip-means operable to effect the said reverse tilting of said latch-block and cause said pawl to be disengaged from said notch.

6. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a latching notch therein, a latch-block pivotally mounted on the vehicle-body and formed with a way therein slidably receiving said latch-bar, said latch-block being tiltable with said latch-bar and serving slidably to guide the same upon the opening and closing of the end-gate, said way being formed with a constriction therein against the bottom of which the lower edge of the latch-bar slidably bears, said way having substantial play relative to the upper and lower edges of the latch-bar except at said constriction, said latch-block being tiltable relative to said latch-bar within the range of such play, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from said notched portion of said latch-bar upon the reverse tilting of said latch-block relative to said latch-bar, said latch-bar pivoting on an axis located with respect to its center of gravity to induce the tilting thereof, by gravity, in said first direction, and said constriction in said way being located with respect to such pivotal axis to cause the gravitating effect of the latch-bar to contribute to such tilting of the latch-block and bring said pawl into engagement with said latching notch upon being encountered thereby, and trip-means operable to effect the said reverse tilting of said latch-block and cause said pawl to be disengaged from said notch.

7. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a series of latching notches therealong, a latch-block pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative thereto and disengageable from said notched portion of said latch-bar upon the reverse tilting of said latch-block relative thereto, spring means acting to tilt the latch-block in said first direction and cause the engagement of said pawl with any of said notches encountering the same, and trip-means operable in opposition to said spring means to effect the said reverse tilting of said latch-block and cause said pawl to be disengaged from such notch, the notches in said latch-bar being ratcheting notches serving in cooperation with said pawl to latch the end-gate against opening movements only, whereby said end-gate is enabled to be swung closed without resort to said trip-means.

8. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a series of notches therealong, a latch-block pivoted to the vehicle-body and slidably guiding said latch-block upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative thereto and disengageable from said notched portion of said latch-bar upon the reverse tilting of said latch-block relative thereto, spring means acting to tilt the latch-block in said first direction and cause the engagement of said pawl with any of said notches encountering the same, and trip-means operable in opposition to said spring means to effect the said reverse tilting of said latch-block and cause said pawl to be disengaged from such notch.

9. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate and formed with a latching notch therein, a latch-block pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said latch-block being tiltable together with said latch-bar and also tiltable relative thereto, a pawl carried by the latch-block, said pawl being engageable with the notched portion of the latch-bar upon the tilting of the latch-block in one direction relative to the latch-bar and disengageable from such notched portion of said latch-bar upon the reverse tilting of said latch-block relative to said latch-bar, means acting constantly to tilt the latch-block in said first direction and cause said pawl to engage in said notch upon the encountering of said notch by said pawl, and trip-means operable in opposition to the action of said first means to effect the said reverse tilting of said latch-block and cause said pawl to be disengaged from said notch.

10. Latching mechanism for an end-gate pivoted to a vehicle-body, said mechanism comprising a latch-bar pivoted to the end-gate, a guide pivoted to the vehicle-body and slidably guiding said latch-bar upon the opening and closing of the end-gate, said guide being tiltable about a single axis together with and relative to said latch-bar, latching means on the guide for engaging the latch-bar upon tilting movement of the former relative to the latter, and releasing means connected to said guide and serving to tilt the same relative to the latch-bar and render said latching means ineffective.

11. Latching mechanism for a vertically swingable end gate pivoted to a vehicle body, said mechanism comprising a latch-bar pivoted to the end-gate to swing in a vertical plane, a guide pivoted to the vehicle-body to swing also in a vertical plane, said guide slidably guiding said latch-bar upon the opening and closing of the end-gate and being tiltable about a single axis together with and oppositely in a first direction and a second direction relative to said latch-bar, said guide having a tendency to tilt by gravity in said first direction, latching means on the guide for engaging the latch-bar upon tilting movement of said guide in said first direction relative to said latch-bar, said latching means being releasable from the latch-bar upon tilting movement of the guide in said second direction relative to the latch-bar.

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