G. V. CARR.

CONVERTIBLE BODY FOR VEHICLES.

APPLICATION FILED DEC. 14, 1916.

1,257,187.

Patented Feb. 19, 1918.

3 SHEETS—SHEET 1.

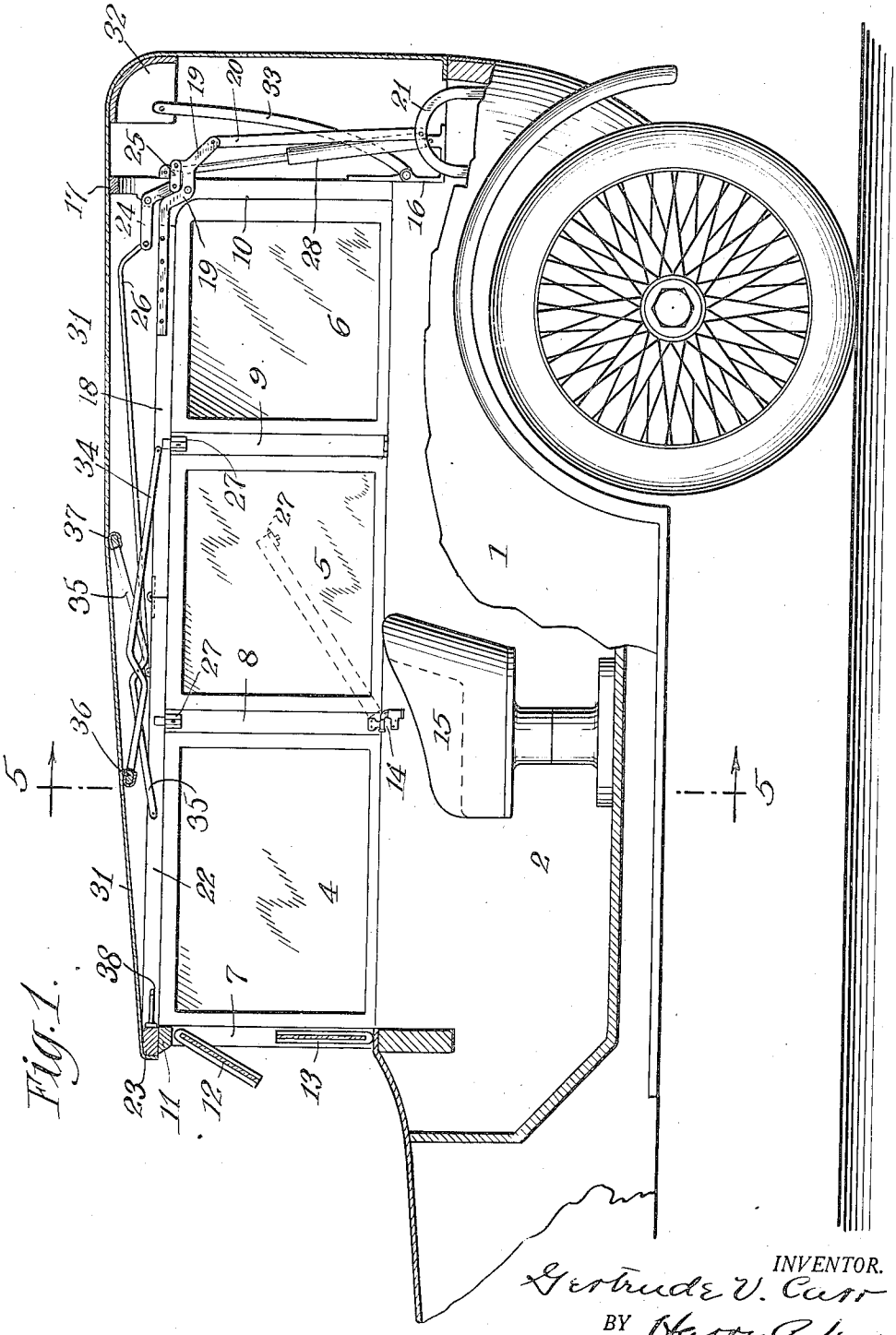


Fig. 1.

INVENTOR.
Gertrude V. Carr
BY Harry C. Lewis
ATTORNEYS.

G. V. CARR.

CONVERTIBLE BODY FOR VEHICLES.

APPLICATION FILED DEC. 14, 1916.

1,257,187.

Patented Feb. 19, 1918.

3 SHEETS—SHEET 2.

Fig. 2.

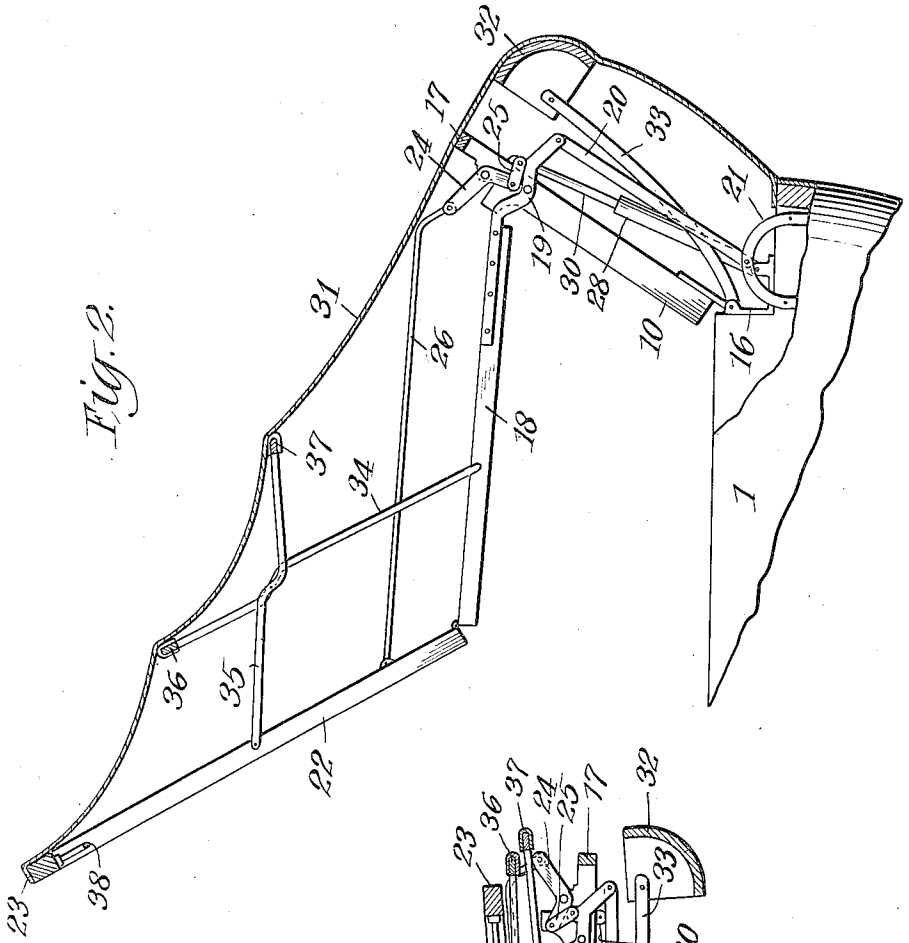
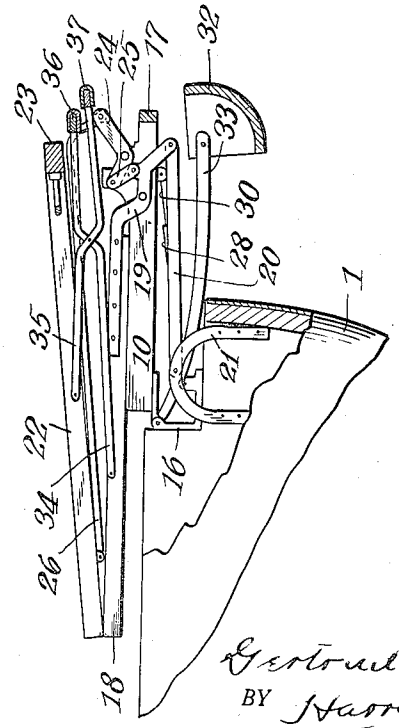


Fig. 3.



INVENTOR.

Gertrude V. Carr

BY Harry C. Brown's

ATTORNEYS.

G. V. CARR.

CONVERTIBLE BODY FOR VEHICLES.

APPLICATION FILED DEC. 14, 1916.

1,257,187.

Patented Feb. 19, 1918.

3 SHEETS—SHEET 3.

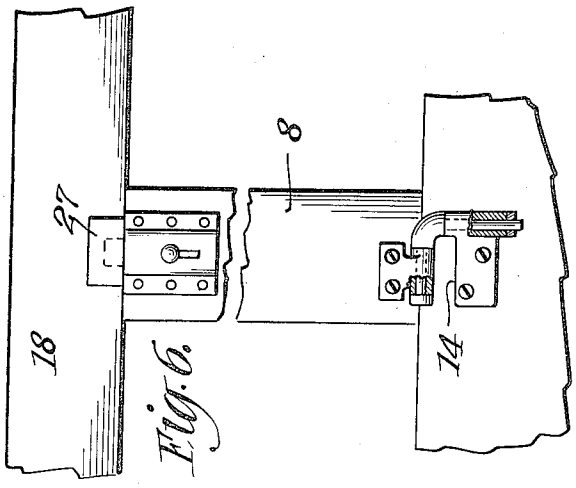


Fig. 6.

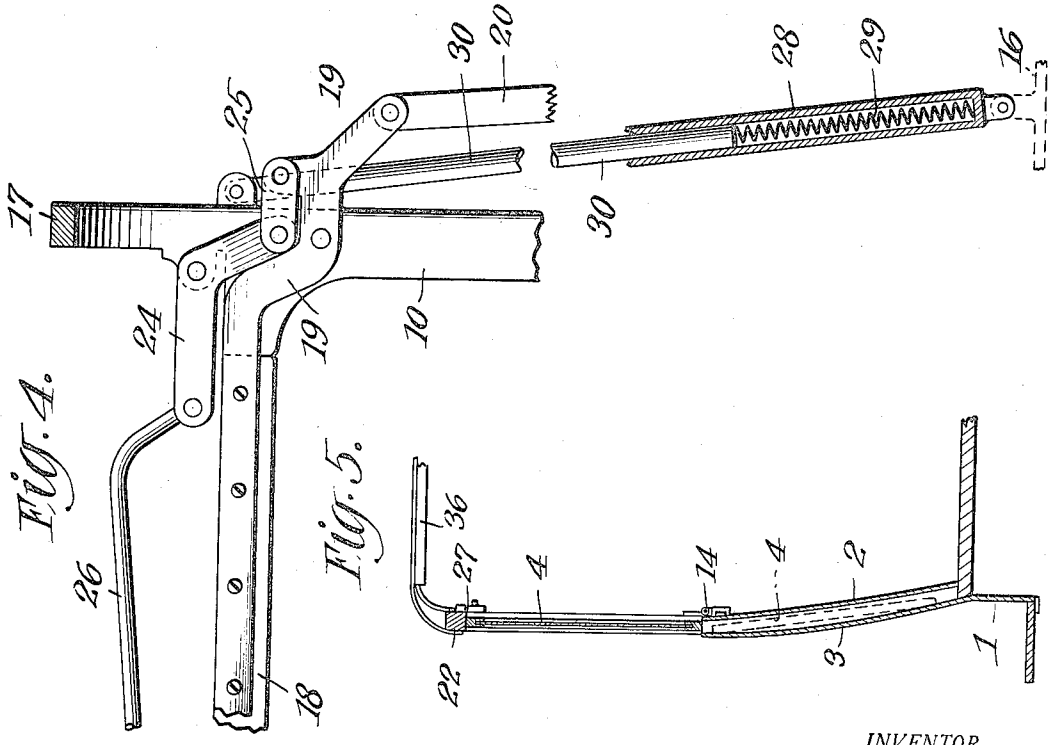


Fig. 4.

Fig. 5.

INVENTOR.

Gertrude V. Carr

BY

Howard Howard

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GERTRUDE V. CARR, OF BROOKLYN, NEW YORK.

CONVERTIBLE BODY FOR VEHICLES.

1,257,187. Specification of Letters Patent. Patented Feb. 19, 1918.

Application filed December 14, 1916. Serial No. 136,872.

To all whom it may concern:

Be it known that I, GERTRUDE V. CARR, a citizen of the United States, residing at the borough of Brooklyn, city of New York, county of New York, and State of New York, have invented a certain new and useful Improvement in Convertible Bodies for Vehicles, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to convertible bodies for vehicles, such, for example, as those of motor cars which are adapted to be converted from the open or touring type to the closed or limousine type, or vice versa.

An object of my invention is to produce a vehicle body which more effectively accomplishes this result as to convertibility than has heretofore been produced; and in this connection to produce a body which when open is the usual touring body and which when closed is the usual limousine body. Another object of my invention is to produce a body which may be readily and easily opened or closed from the inside of the car by one person and with need of only slight effort and strength; this result not having heretofore been accomplished, so far as I am informed, the commonly so-called "one man" tops heretofore constructed being so in name only.

Other objects of my invention are simplicity of construction, inexpensiveness of manufacture, reliability, durability, strength, lightness, and other objects and advantages which will hereinafter appear.

My invention includes features of construction and combinations of parts, as will appear from the following description.

I shall now describe the convertible motor car body embodying my invention illustrated in the accompanying drawings and shall thereafter point out my invention in claims.

Figure 1 is a longitudinal section with parts in elevation and parts omitted of a motor car body embodying my invention shown as in the completely closed condition to form an inclosed or limousine body, the windows being closed.

Fig. 2 is a similar view with the windows open and the top partly folded and illustrates an intermediate stage in the opening or closing of the folding top.

Fig. 3 is a similar view with the top completely folded to the open position.

Fig. 4 is an enlarged inside elevation showing parts of the folding means for the top.

Fig. 5 is a partial vertical transverse section on a plane indicated by the line 5—5 of Fig. 1 as viewed from the left.

Fig. 6 is an enlarged inside elevation of the first intermediate window-supporting pillar which appears in Fig. 5 and also at the left of the middle in Fig. 1.

The convertible motor car body embodying my invention illustrated in the accompanying drawings has a lower or main body part 1 having inner and outer spaced side walls 2 and 3 which provide pockets, as shown in Fig. 5, for the reception of slidable drop windows 4, 5 and 6 in the lowered condition of these windows, as is indicated in broken lines in Fig. 5. The windows 4, 5 and 6 are adapted to slide vertically between and be guided by vertical side pillars 7, 8, 9 and 10 of which the pillar 7 is a rigid front pillar, the pillar 8 a first intermediate folding pillar, the pillar 9 a second intermediate folding pillar, and the pillar 10 a folding rearmost pillar, it being understood, of course, that the side pillars 7, 8, 9 and 10 are duplicated at each side of the car. The upper ends of the two front pillars 7 are connected by a stationary front cross-bar 11, and between these front pillars there are mounted upper and lower windshield sections 12 and 13 of a usual or any suitable construction.

The first intermediate pillar 8 is hinged at its lower end to the lower body part 1 on a double hinge 14, so as to turn pivotally and fold rearward at the inside of the upper edge of the inner side wall 2, as will be clear from an inspection of

Figs. 1, 5 and 6. This double hinge arrangement provides for the clearance of the usual front seat 15 by the pillar 8.

The second intermediate pillar 9 is hinged at its lower end to the lower body part 1 to fold inward transversely and downward at the inside of the inner wall 2, as is clear from Fig. 1.

The rearmost pillar 10 is hinged at its lower end by means of an angular foot piece 16 to the lower or main body part 1 to fold backward from the vertical position appearing in Fig. 1 to the substantially horizontal position appearing in Fig. 3. The body part 1 is notched or offset at the rear of the rearmost pillar 10 and to receive the angle piece 16, for a purpose which will presently appear. The upper ends of the two rearmost pillars 10 are connected together by a rear cross-bar 17.

A horizontal rear cant rail or rear upper side rail 18 extends forward from and is pivoted at its rear end to the upper part of the rearmost pillar 10 at a distance below the upper end thereof, by means of a downwardly offset rigid extension piece 19 which projects rearward and downward beyond its pivot point, as clearly appears in the drawings. The rear cant rail or side rail 18 is adapted to fold rearward and downward with and alongside of the rear pillar 10 substantially without changing its horizontal position and therefore substantially without angular movement, from the upper and forward position appearing in Fig. 1 to the lower and rearward position appearing in Fig. 3, in which the rear cant rail 18 projects forward beyond the hinged end of the rearmost pillar 10, as shown in Fig. 3.

To accomplish the folding and unfolding of the rear cant rail 18 in proper relation to the rearmost pillar 10, a nearly vertical rail-folding link 20 for the rear cant rail 18 is pivoted at its upper end to the end of the rigid extension 19 and at its lower end is pivoted to a bracket or anchor 21 firmly secured to the lower body part 1 and shown as extending well down thereon. It is to be noted that the lower pivot of the rail-folding link 20 is at the rearmost of and below the lower pivot of the rearmost pillar 10, so that the two pivot points of the link 20 and the two pivot points of the rearmost pillar 10 form nearly, but not quite, a parallelogram, the distance between the two upper pivots being shown as slightly greater than that between the two lower pivots.

A forward cant rail or forward upper side rail 22 is hinged at its rear end to the forward end of the rear cant rail 18 in alinement therewith. At its front end the forward cant rail is supported by the front pillar 7, and the two forward cant rails are connected at their front ends by a front cross-bar 23 which rests upon the stationary cross-bar 11, to which it may be detachably secured in any convenient way.

The forward cant rail 22 is adapted to fold backward over the rear cant rail substantially through an angle of one hundred and eighty degrees, from the horizontal extended position appearing in Fig. 1 to the nearly horizontal reversed position appearing in Fig. 3, and at the same time the forward cant rail 22 is carried bodily rearward by the rear cant rail 18. It should be noted that the cant rails or side rails 18 and 22 are considerably longer than the rearmost pillar 10 so that the hinged ends of the cant rails project forward a good distance beyond the lower pivot of the rearmost pillar 10 in the folded condition of these parts, appearing in Fig. 3.

The forward cant rail 22 is caused to be guided and folded in correct relation with the folding of the rearmost pillar 10 and rear cant rail 18 by movement-reducing connections now to be described. A two-arm bent lever 24, shown as of substantially bell-crank form, is pivoted on the rearmost pillar 10 at a substantial distance above the pivot point of the rear cant rail 18 and has, as clearly appears in the drawings, a front or forwardly extending arm and a rear arm shown as extending at an angle downward. A short, nearly horizontal link 25 connects the downwardly inclined rear arm of the bent lever 24 to an upstanding lug on the rear extension 19 of the rear cant rail 18, at the rear of the pivot point of the rear cant rail. A long substantially horizontal link or rod 26, shown as bent near its rear end for better folding of the parts, connects the front and somewhat longer horizontal arm of the bent lever 24 to the forward cant rail 18 at a distance forward of its hinge or pivot, this distance being shown as slightly greater than the length of the front arm of the lever 24. It will be noted that the short link 25 forms a toggle with the shorter rear arm of the lever 24 and thereby assists in reducing the one hundred and eighty degree angular movement of the forward cant rail 18 to the ninety degree movement of the rearmost pillar 10, as will be readily understood.

In the extended position of the cant rails appearing in Fig. 1 they rest upon the upper ends of the intermediate pillars 8 and 9 which are shown as connected thereto by means of latches 27 (Figs. 1, 5 and 6), the front cant rail 22 engaging the first intermediate pillar 8 and the rear cant rail 18 engaging the second intermediate pillar 9.

To help maintain the balance of the foldable parts, particularly during the last part of the folding movement or the first part of the unfolding movement, a telescopic spring device is provided. A lower socket member

28 containing a coiled thrust spring 29 (Fig. 4) is pivoted at its lower end on the lower body part 1 and is shown as connected to the angle piece or foot 16. A rod 30 telescoping into the tubular socket 28 and adapted to compress the spring 29 is pivotally connected at its upper end to the rearmost pillar 10.

A flexible cover or top 31 of suitable fabric or other material is secured at its edges to the movable front bar 23, the two forward cant rails 22, the two rear cant rails 18, the two rearmost pillars 10 and the upper edge of the main body part 1 at the rear. The top or covering 31 is supported by the rear cross-bar 17. At the rear of the cross-bar 17 a shaping device is provided comprising a rounded shell 32 supported at its ends by side arms 33 pivoted to the lower body part 1 and shown as pivoted concentric with the rearmost pillars 10 to fold therewith, as appears in Figs. 2 and 3. The notching of the rear end of the main body part 1, hereinbefore mentioned, provides for the reception of the lower ends of the links 20, the sockets 28 and the arms 33.

For supporting the flexible cover 31 at intermediate points, folding scissor-arms 34 and 35 are provided and are pivoted together. The two longer arms 34 at their rear ends are pivoted to the rear cant rails 18 and at their forward ends carry a cross-bar or top-supporting stick 36. The two shorter arms 35 are pivoted at their forward ends to the forward cant rails 22 and at their rear ends carry a top-supporting stick or bar 37. The scissor-arms 34 and 35 and sticks 36 and 37 fold together with the cant rails 18 and 22, as clearly appears in Figs. 2 and 3.

A handle 38 is provided on the inside of the front cross-bar 23, by grasping which the above described foldable parts may be easily either folded or extended from the inside of the car body by a slight effort of one person.

The above described construction of the foldable upper parts of the body, including the lever and link arrangement, has been found to provide an almost perfect balance of the parts at all stages of movement between the extended and the folded positions and vice versa, so that very small effort is required for raising or lowering the folding top structure. It should be noted that with the top up or extended, the windows 4, 5 and 6 may be dropped and the intermediate pillars 8 and 9 folded, and the car used with the body in this partly open condition, as well as in the entirely inclosed condition illustrated in Fig. 1 or in the entirely open condition appearing in Fig. 3.

It is obvious that various modifications may be made in the construction shown in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. A convertible vehicle body having, in combination, a rear pillar, a rear cant rail pivoted at its rear end to the upper part of the rear pillar, a forward cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter, and rail-folding connections between the front cant rail and the rear pillar, such connections comprising a lever pivoted on the rear pillar, a link connecting said lever to the rear cant rail at the rear of the pivot point of the latter, and a link connecting said lever to the forward cant rail.

2. A convertible vehicle body having, in combination, a rear pillar hinged to the vehicle at its lower end to fold backward, a rear cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith, rail-folding means connecting the rear cant rail to the vehicle, a forward cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter, and rail-folding connections between the front cant rail and the rear pillar, such connections comprising a lever pivoted on the rear pillar, a link connecting said lever to the rear cant rail at the rear of the pivot point of the latter, and a link connecting said lever to the forward cant rail.

3. A convertible vehicle body having, in combination, a rear pillar hinged at its lower end to the vehicle to fold backward substantially through an angle of ninety degrees from a substantially vertical to a substantially horizontal position, a rear horizontal cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith substantially without changing its horizontal position, a rail-folding link for the rear cant rail pivoted thereto and to the vehicle, a forward horizontal cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter substantially through an angle of one hundred and eighty degrees, and movement-reducing rail-folding connections from the forward cant rail to the rear pillar, such connections comprising a lever pivoted on the rear pillar above the pivot point of the rear cant rail, a short link connecting said lever to the rear cant rail at the rear of the pivot point of the latter, and a long link connecting said lever to the forward cant rail.

4. A convertible vehicle body having, in combination, a rear pillar, a rear cant rail pivoted at its rear end to the upper part of the rear pillar, a forward cant rail hinged at its rear end to the forward end of the

rear cant rail to fold backward over the latter, a two-arm lever pivoted on the rear pillar above the pivot point of the rear cant rail, a short link connecting one arm of said lever to the rear cant rail at the rear of the pivot point of the latter and forming a toggle with said lever arm and a long link connecting the other arm of said lever to the forward cant rail forward of its pivot point.

5. A convertible vehicle body having, in combination, a rear pillar hinged at its lower end to the vehicle to fold backward substantially through an angle of ninety degrees from a substantially vertical to a substantially horizontal position, a rear horizontal cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith substantially without changing its horizontal position and carrying a rigid extension which projects rearward beyond the pivot point, a rail-folding link for the rear cant rail pivoted at its upper end to said rear extension and its lower end pivoted to the vehicle at the rear of the pivot point of the rear pillar so that the two pivot points of such link and the two pivot points of the rear pillar form substantially a parallelogram, a forward horizontal cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter substantially through an angle of one hundred and eighty degrees, a two-arm bent lever pivoted on the rear pillar above the pivot point of the rear cant rail and having a front arm and a rear arm, a short link connecting the rear arm of said lever to the said rear extension of the rear cant rail at the rear of the pivot point of the latter and forming a toggle with said rear lever arm, and a long link connecting the front arm of said lever to the forward cant rail forward of its pivot, said bent lever and links forming rail-folding connections for folding the forward cant rail through one hundred and eighty degrees of angular movement while the rear pillar folds through ninety degrees of angular movement.

6. A convertible vehicle body having, in combination, a lower main body part, a rear pillar hinged to the main body part at its lower end to fold backward, a rear cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith, rail-folding means connecting the rear cant rail to the main body part, a forward cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter, a front pillar supporting the front end of the forward cant rail, an intermediate folding pillar engaging one of the cant rails and disconnectible therefrom, drop windows slidable between the pillars, and rail-folding connections between the front cant rail and the rear pillar, such connections comprising a lever pivoted on the rear pillar, a link connecting said lever to the rear cant rail at the rear of the pivot point of the latter, and another link connecting said lever to the forward cant rail.

7. A convertible vehicle body having, in combination, a rear pillar hinged at its lower end to the vehicle to fold backward substantially through an angle of ninety degrees from a substantially vertical to a substantially horizontal position, a rear horizontal cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith substantially without changing its horizontal position and carrying a rigid extension which projects rearward beyond the pivot point, a rail-folding link for the rear cant rail pivoted at its upper end to said rear extension and its lower end pivoted to the vehicle at the rear of the pivot point of the rear pillar so that the two pivot points of such link and the two pivot points of the rear pillar form substantially a parallelogram, a forward horizontal cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter substantially through an angle of one hundred and eighty degrees, a two-arm bent lever pivoted on the rear pillar above the pivot point of the rear cant rail and having a front arm and a rear arm, a short link connecting the rear arm of said lever to the said rear extension of the rear cant rail at the rear of the pivot point of the latter and forming a toggle with said rear lever arm, a long link connecting the front arm of said lever to the forward cant rail forward of its pivot, said bent lever and links forming rail-folding connections for folding the forward cant rail through one hundred and eighty degrees of angular movement while the rear pillar folds through ninety degrees of angular movement, a front pillar supporting the front end of the forward cant rail, an intermediate folding pillar hinged at its lower end to the vehicle and joined to one of the cant rails and disconnectible therefrom at its upper end, and drop windows slidable between the pillars.

8. A convertible vehicle body having, in combination, a rear pillar hinged at its lower end to the vehicle to fold backward, a rear cant rail pivoted at its rear end to the upper part of the rear pillar to fold rearward and downward therewith and having a rigid extension which projects rearward beyond the pivot point, rail-folding means connecting the rear cant rail to the vehicle, a forward cant rail hinged at its rear end to the forward end of the rear cant rail to fold backward over the latter, a two-arm lever piv-

oted on the rear pillar above the pivot point of the rear cant rail and having a front arm and a rear arm inclined downward, a long link pivoted at its ends and connecting the front arm of said lever to the forward cant rail forward of its pivot, and a short link pivoted at its rear end to the rear extension of the rear cant rail at the rear of the pivot point of the rear cant rail and extending forward and pivoted at its front end to the rear and downwardly inclined arm of the two-arm lever, said short link forming a toggle with the said rear extension of the rear cant rail which opens as the cant rails and pillars are folded and said short link forming another toggle with the rear and downwardly inclined arm of said two-arm lever which has a closing movement as the cant rails and pillars are folded.

GERTRUDE V. CARR.