April 5, 1932. N. A. MEARS ET AL 1,852,056

HOOD LATCH

Filed May 10, 1929 2 Sheets-Sheet 1

Fig. 1

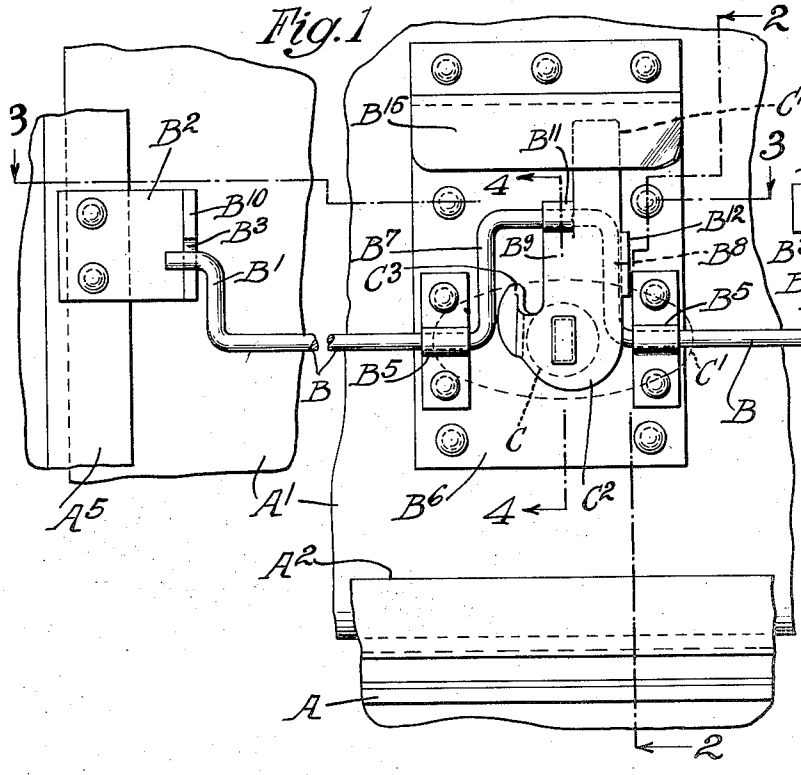

Fig. 2

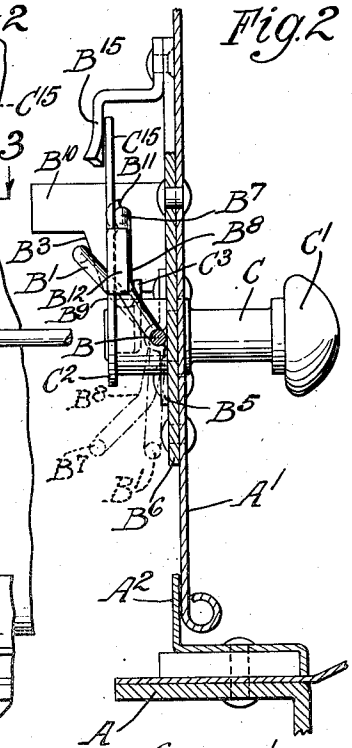

Fig. 3

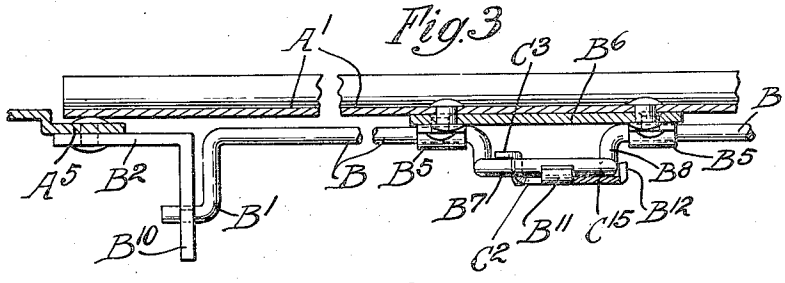

Fig. 4

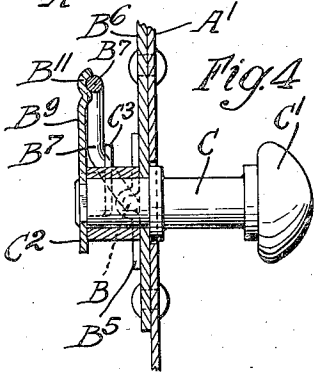

Fig. 5

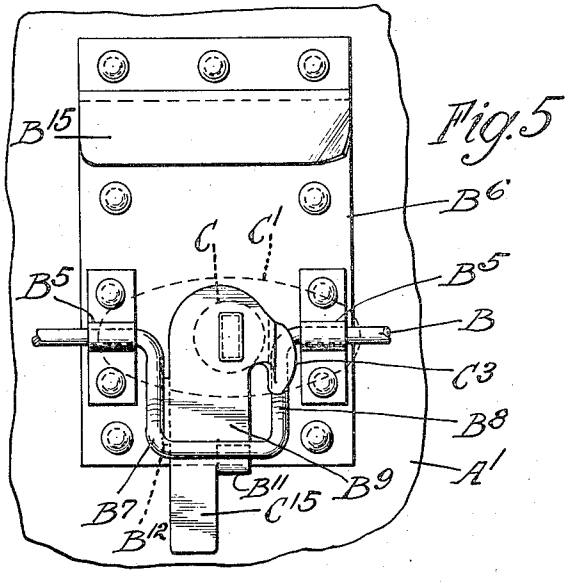

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Fig. 6

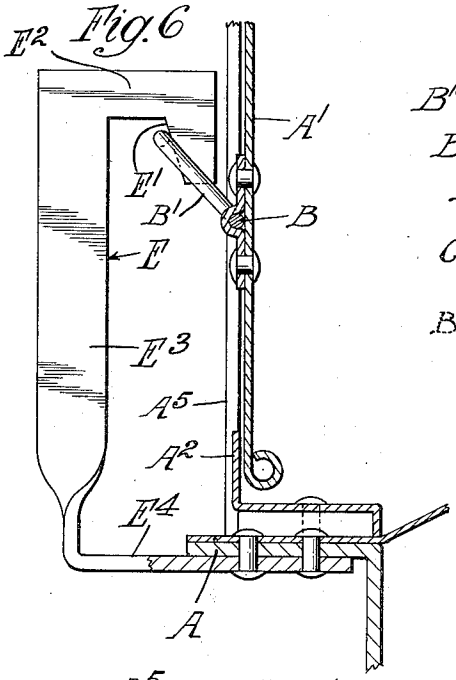


Fig. 8

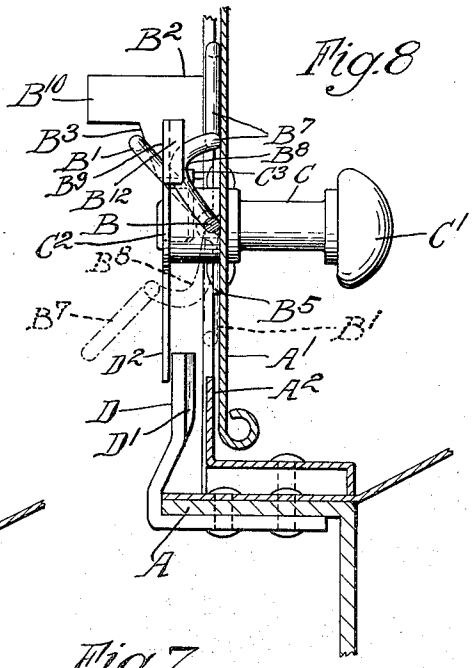
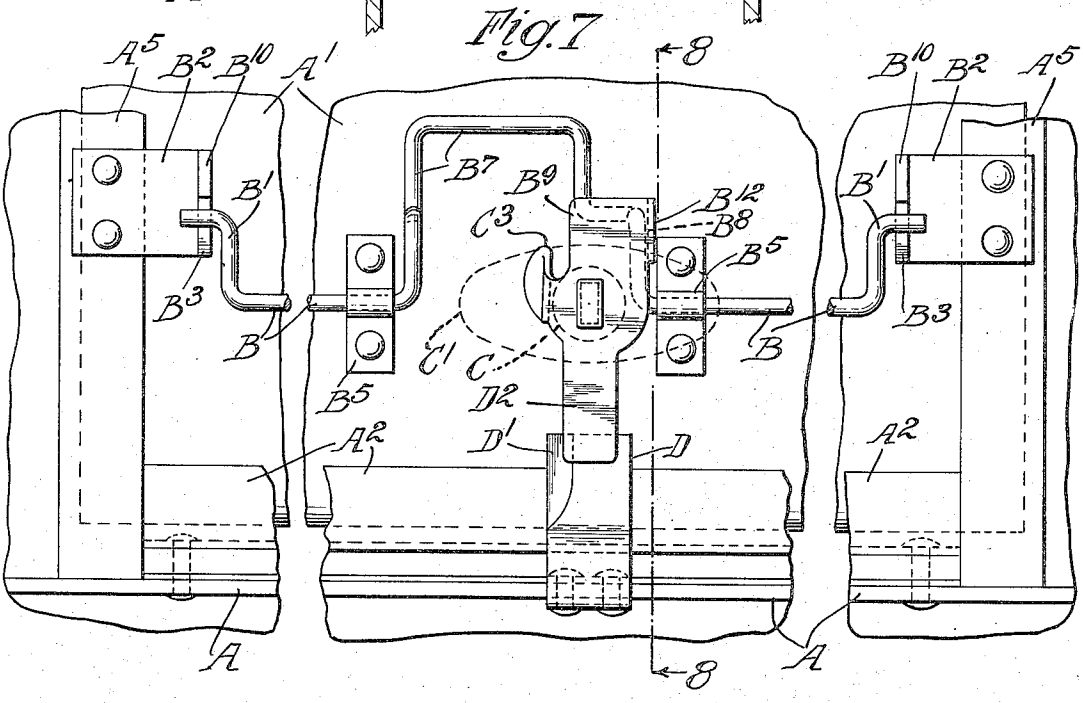


Fig. 7



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UNITED STATES PATENT OFFICE

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HOOD LATCH

Application filed May 10, 1929. Serial No. 361,934.

Our invention relates to locking or latching means for closures and is herein shown as applied to an automobile hood. One purpose is the provision of simple and easily operated means for securing an automobile hood in closed position. Another object is the provision of means for drawing the hood downwardly and inwardly against its abutment on the frame of the automobile. Another object is the provision of means for permitting the actuation of a plurality of hood latching means by a single handle adapted both to latch and unlatch the hood and to raise and lower the hood. Other objects will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a side elevation;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is a side elevation showing the parts in different position;

Figure 6 is a vertical transverse section through a variant form;

Figure 7 is a side elevation of a variant form;

Figure 8 is a section on the line 8—8 of Figure 7.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring first to Figures 1 and 2 A generally indicates the frame of the vehicle and A^1 a hinged hood member. A^2 indicates a hood abutment secured to the frame and adapted to limit the inward movement of the lower edge of the hood A^1.

Mounted within the hood is the rock shaft generally indicated as B, having the terminal offset portions or cranks B^1 B^1 adapted to engage locking abutments B^2 B^2 which may be mounted on the end abutments A^5 of the hood. The abutments are shown as having faces B^3 inclined upwardly and inwardly from the hood. B^{10} indicates a projection at the upper end of each such face. The rock shaft may be mounted as in the bearings B^5 secured to the hood. As an example of one method of securing them we illustrate them as secured on the unitary base B^6 which may be secured as a whole to the inner face of the hood. The rock shaft, between the bearings B^5 is indicated as offset or deformed, as at B^7, the offset portion including what may be called a cam portion B^8 which may be curved or angular as shown in Figure 2.

C indicates the handle or control shaft with the exterior handle C^1, the shaft passing through the hood. At its inner end is mounted the cam member generally indicated as C^2 which may have the hook or horn C^3 adapted to cooperate with the portion B^8 of the offset B^7. It is further provided with an apron B^9 which, when the device is in the locking position in which it is shown in Figure 1, overrides or overlies the offset portion B^7 of the rock shaft. It is provided with a side flange B^{12} which engages the side B^8 of the offset portion, and limits further counter-clockwise movement, taking the parts in the position in which they are shown in Figure 1. This limit is preferably so arranged that at that position the handle C^1 is horizontal, for convenience. It will be understood that when the parts are in position as shown in Figure 1 the offsets or crank arms B^1 are thrust into locking engagement with the inclined edges B^3 of the abutments B^2 and the result is the drawing downwardly or inwardly of the lower edges of the hood. B^{11} indicates a depression in the apron B^9, adapted to hold the parts locked when it engages the offset portion B^7.

Taking the parts in the position in which they are shown in Figure 1, when the cam is rotated clockwise, the horn C^3 engages the offset B^8 and exerts a camming action against its lower inclined portion and thus rotates the entire rock shaft in such fashion as to withdraw the cranks B^1 from the abutments B^2. The cam body and its apron are preferably so proportioned as to limit the rotation of the handle to an arc of 180 degrees, in such fashion that the handle is in horizontal position when the cranks B^1 have been removed

to inoperative position, and is therefore in the most convenient position for the manual lifting of the now released hood.

D indicates an additional stop which may be mounted for example on the frame A, within the abutment A^2 and which extends upwardly therefrom, as shown in Figure 8. It may have an outwardly curved or inclined portion D^1. Opposed to the member D, in the form of the device shown in Figures 7 and 8, is a stop or holding member generally indicated as D^2, which may be formed integrally with or may be secured to the cam structure which may be identical with that above described.

The parts are preferably so spaced that when the hood is lowered into the position in which it is shown in Figure 8, and the handle C^1 is rotated to effect the locking action of the cranks B^1 in relation to the abutments B^2, the member D^2 is at the same time moved into the position in which it is shown in Figures 7 and 8, whereby outward movement of the hood from the abutment is prevented.

Referring to Figure 6 in the place of the abutments B^2 mounted upon the members A^5 we may employ abutment means mounted on the frame A. The abutment member proper, E, with its upwardly and inwardly inclined edge E^1 is mounted at the end of the horizontal arm E^2 supported by a vertical arm E^3 connected at its bottom by the horizontal member E^4 with the frame A. An advantage of this structure is that it may be positioned at any desired point between the edges of the hood.

It will be realized that whereas we have described and shown a practical device, nevertheless many changes might be made in the size, shape, number and disposition of parts without departing from the spirit of our invention. We therefore wish our description and drawings to be taken as in a broad sense illustrative and diagrammatic rather than as limiting us to our specific showing.

The use and operation of our invention are as follows:

In securing the hinged hood portions of automobiles and plates, securing means are desirable which hold the hood firmly in position, which draw the lower edge of the hood downwardly, to hold it tight, and which also draw it inwardly or prevent it from outward movement. We have provided means for effecting these results which are simple and efficient and which respond to the movement of a single handle member. This handle member, being preferably situated midway between the ends of the hood, not only serves to control the hood latching means, but also serves as a handle for lifting the hood when the latches are disengaged. We preferably employ a handle of somewhat elongated form, to serve conveniently as a lifting as well as a turning means. We preferably so proportion the parts that the handle C^1 is in generally horizontal position when the latch members B^1 are disengaged. We find it convenient to limit the rotation of the handle to an arc of 180 degrees, whereby the handle is also in horizontal position when the hood is latched.

In order to provide simple means for latching the hood in position we employ a rock shaft the ends of which may be bent or deformed to form crank arms or the equivalent of crank arms. In other words some part of the rock shaft, preferably the ends is so far offset from the center of rotation of the body of the rock shaft, that rotation of the rock shaft imparts such movement to the end or ends as will cooperate with a latch abutment to have the desired locking effect.

Referring for example to Figure 1, latch abutments B^2, mounted on the members A^5, receive the cranks B^1. In the form of Figure 6 latch abutments are mounted directly on the frame A. In either case in response to a locking rotation of the handle C^1 the crank ends of the rock shaft are given what in Figures 2 and 8 would be a clockwise rotation. They engage the inclined surfaces B^3 or E^1, the result being a camming effect, whereby further rotation of the rock shaft tends to draw the lower edge of the hood both downwardly and inwardly. The shaft being flexible, and being provided with relatively long lengths free from restricting bearings, a certain spring action or play is permitted which adds to the locking effect, and at the same time compensates for irregularities and prevents undue strain on any part of the device.

In some circumstances it may be desirable to employ additional means for limiting the outward movement of the lower edge of the hood. In such case we may provide the opposed members D and D^2, as shown in Figures 7 and 8, whereby, when the hood is in closed position and the handle C^1 is rotated to move the cranks B^1 into locking position, the member D^2 is at the same time moved into locking position in relation to the abutment D.

In order to prevent cocking or tilting of the axis of the shaft C and handle C^1 we provide the flange B^{15}, shown for example in Figures 1, 2 and 5 which is engaged by the upper edge portion C^{15} of the cam structure, when the cam is in locking position. In Figures 1 and 5 we illustrate this flange B^{15} as mounted on the unitary base B^6. It will be understood, however, that we do not wish to be specifically limited to this arrangement except so far as we limit ourselves to it in the language of the individual claims. Whether mounted on the base or not, the effect of the flange B^{15} is to maintain the axis of the con-

trol shaft C in perpendicularity to the face of the hood, resisting any torsion effect of the rock shaft due to this rotation against the abutments B^2.

In the description and claims herein it will be understood that in using the term "cam" or "camming action" we wish to cover any equivalent of the action obtained by the rotation or movement of the cam member in relation to the offset portion B^8 of the rock shaft. The result is a camming action, causing the rotation of the shaft.

We claim:

1. A latching device for an automobile hood which includes a plurality of latch abutments within the hood, laterally inwardly spaced therefrom when the hood is in closed position, a rock shaft adapted to be supported upon the interior of said hood, said shaft having an intermediate offset portion, a cam member, adapted to engage said offset portion, rotatably mounted within and upon the hood, exterior means for rotating said cam member, and additional offset portions on said shaft adapted to engage said latch abutments, and means for preventing movement of the cam in response to torsion of said shaft resultant from locking engagement of said offset portions with said abutments, including means carried by said cam member and engageable with the rock shaft for releasably locking the parts in position when the offset portions of the shaft are in locking engagement with the latch abutments.

2. A latching device for an automobile hood, which includes a plurality of latch abutments within the hood, a rock shaft having an intermediate offset portion and additional offset portions aligned with and adapted to engage said abutments, a cam rotatably mounted on the hood and adapted to engage the intermediate offset portion of the rock shaft, and means for rotating it, and means, for holding said cam in its normal plane, during the latching engagement of the offset portions of the rock shaft with the latch abutments, comprising a flange adapted to engage and overlie said cam member.

3. A latching device for an automobile hood, which includes a plurality of latch abutments within the hood, a rock shaft having an intermediate offset portion and additional offset portions aligned with and adapted to engage said abutments, a cam rotatably mounted on the hood and adapted to engage the intermediate offset portion of the rock shaft, and means for rotating it, and means for holding said cam in its normal plane, during the latching engagement of the offset portions of the rock shaft with the latch abutments, comprising a flange adapted to engage and overlie said cam member, the cam member having a portion adapted, when the cam is in engagement with the flange, to limit the rotation of the cam beyond a predetermined point.

4. A latching device for an automobile hood, which includes a plurality of latch abutments within the hood, a rock shaft having an intermediate offset portion and additional offset portions aligned with and adapted to engage said abutments, a cam rotatably mounted on the hood and adapted to engage the intermediate offset portion of the rock shaft, and means for rotating it, and means for holding said cam in its normal plane, during the latching engagement of the offset portions of the rock shaft with the latch abutments, comprising a flange adapted to engage and overlie said cam member, the cam member having a portion adapted, when the cam is in engagement with the flange, to limit the rotation of the cam beyond a predetermined point, and means for limiting the arc of movement of the cam in the opposite direction of rotation.

5. A latching device for an automobile hood which includes a plurality of latch abutments positioned within the hood and laterally and inwardly spaced therefrom when the hood is in closed position, a rock shaft supported upon the interior of said hood, said shaft having an intermediate offset portion, and additional offset portions adapted to engage the latch abutments, and means for rotating the rock shaft, including a cam member adapted to engage the intermediate offset portion of the rock shaft, an additional abutment, positioned within the hood, a locking member associated with the cam and adapted to engage said additional abutment when the offset portions of the rock shaft are in engagement with the first mentioned latch abutments to prevent cocking of the cam, and a second locking member associated with the cam member and engageable with the rock shaft to releasably lock the parts in position.

6. A latching device for an automobile hood, adapted to draw the lower edge of a double hinged hood closure downwardly and inwardly into engagement with the opposed portions of the automobile, which includes a rock shaft mounted on the inner face of the closure for rotation about a generally horizontal axis, cranks associated with said rock shaft, cam members positioned within said closure for engagement with said cranks, said cranks being normally at all times in camming relationship with said cam members when the closure is locked, said cranks being adapted, in response to their engagement with the cam members, to draw the lower edge of the hood closure downwardly and inwardly against the opposed portions of the automobile, and means for rotating said cranks into camming locking engagement with the cam members, including an intermediate offset portion of said rock shaft, an additional cam member, adapted to engage said offset por-

tion, rotatably mounted within and upon the hood, a rotatable support for said additional cam member and exterior means for rotating said additional cam member and support, and means for preventing cocking of said additional cam and support in response to torsion of said rock shaft resulting from locking engagement of the cranks and the first mentioned cam members, said additional cam member including a lug provided with a depression engageable with the rock shaft when the cranks of the shaft are in locking engagement with the first mentioned cam members to releasably lock the parts against movement in response to torsional stresses in the rock shaft.

7. A latching device for an automobile hood, adapted to draw the lower edge of a double hinged hood closure downwardly and inwardly into engagement with the opposed portions of the automobile, which includes a rock shaft mounted on the inner face of the closure for rotation about a generally horizontal axis, cranks associated with said rock shaft, cam members positioned within said closure for engagement with said cranks, said cranks being normally at all times in camming relationship with said cam members when the closure is locked, said cranks being adapted, in response to their engagement with the cam members, to draw the lower edge of the hood closure downwardly and inwardly against the oposed portions of the automobile, and means for rotating said cranks into camming locking engagement with the cam members, including an intermediate offset portion of said rock shaft, an additional cam member, adapted to engage said offset portion, rotatably mounted within and upon the hood, a rotatable support for said additional cam member and exterior means for rotating said additional cam member and support, and means for preventing cocking of said cam member and support in response to torsion of said rock shaft resulting from locking engagement of the cranks and the first mentioned cam members, including a keeper element mounted on the hood and adapted to engage said additional cam, and means to limit the arc of rotation of said additional cam member in locking direction including a lug carried by the cam member and engageable with the intermediate offset formation of the rock shaft.

8. A latching device for an automobile hood, adapted to draw the lower edge of a double hinged hood closure downwardly and inwardly into engagement with the opposed portions of the automobile, which includes a rock shaft mounted on the inner face of the closure for rotation about a generally horizontal axis, cranks associated with said rock shaft, cam members positioned within said closure for engagement with said cranks, said cranks being normally at all times in camming relationship with said cam members when the closure is locked, said cranks being adapted, in response to their engagement with the cam members, to draw the lower edge of the hood closure downwardly and inwardly against the opposed portions of the automobile, and means for rotating said cranks into camming locking engagement with the cam members, including an intermediate offset portion of said rock shaft, an additional cam member, rotatably mounted within the hood, said additional cam member including separate cam portions spaced axially of the axis of rotation of said additional cam member and engaging opposite faces of said intermediate offset portion of the rock shaft to rock the same into locking and release positions, respectively, a rotatable support for said additional cam member and exterior handle means for rotating said additional cam member and support, said additional cam member including means engageable with another portion of said intermediate offset portion of the rock shaft to limit the rotation of said additional cam member in one direction.

9. A latching device for an automobile hood, adapted to draw the lower edge of a double hinged hood closure downwardly and inwardly into engagement with the opposed portions of the automobile, which includes a rock shaft mounted on the inner face of the closure for rotation about a generally horizontal axis, cranks associated with said rock shaft, cam members positioned within said closure for engagement with said cranks, said cranks being normally at all times in camming relationship with said cam members when the closure is locked, said cranks being adapted, in response to their engagement with the cam members, to draw the lower edge of the hood closure downwardly and inwardly against the opposed portions of the automobile, and means for rotating said cranks into camming locking engagement with the cam members, including an intermediate offset portion of said rock shaft, an additional cam member, rotatably mounted within the hood, said additional cam member including separate cam portions spaced axially of the axis of rotation of said additional cam member and engaging opposite faces of said intermediate offset portion of the rock shaft to rock the same into locking and release positions, respectively, a rotatable support for said additional cam member and exterior handle means for rotating said additional cam member and support, said additional cam member including means engageable with another portion of said intermediate offset portion of the rock shaft to limit the rotation of said additional cam member in one direction.

9. A latching device for an automobile hood, adapted to draw the lower edge of a double hinged hood closure downwardly and inwardly into engagement with the opposed portions of the automobile, which includes a rock shaft mounted on the inner face of the closure for rotation about a generally horizontal axis, cranks associated with said rock shaft, cam members positioned within said closure for engagement with said cranks, said cranks being normally at all times in camming relationship with said cam members when the closure is locked, said cranks being adapted, in response to their engagement with the cam members, to draw the lower edge of the hood closure downwardly and inwardly against the opposed portions of the automobile, and means for rotating said cranks into camming locking engagement with the cam members, including an intermediate offset portion of said rock shaft, an additional cam member, rotatably mounted within the hood, said additional cam member including separate cam portions operating in spaced planes substantially perpendicular to the axis of rotation of the additional cam member and engaging opposite faces of the intermediate offset portion of the rock shaft to move the same to locking and release positions, respectively a rotatable support for said additional cam member and exterior handle means for rotating said cam member and support, said additional cam member also including an arm lockingly engageable with the intermediate offset portion of the rock shaft when the latter is in locking position to restrain the parts against movement due to torsional stresses in the rock shaft.

10. A latching device for the hinged section of an automobile hood which includes a rock shaft mounted on the inner face of the hood, latch abutments positioned within the hood, the rock shaft being provided with latching offsets engageable with the abutments, and with an actuating offset, operating means engageable with the actuating offset to rock the shaft to latching and release positions, the latching offsets and the actuating offset of the rock shaft lying in different radial planes, the plane of the latching offsets having a substantial angle of lead in the direction of release movement of the rock shaft with respect to the plane of the actuating offset whereby the latching offsets are moved into close proximity to the inner face of the hood to clear said latch abutments in release position of the rock shaft.

11. A latching device for the hinged section of an automobile hood which includes a rock shaft mounted on the inner face of said section, latch abutments positioned within the hood, the rock shaft being provided with plural axially offsets portions, rock shaft operating means carried by the hinged section of the hood, operative connections between said rock shaft operating means and one of said axially offset portions whereby the shaft may be rocked from latching to release positions, the remaining axially offset portions of the rock shaft being cooperatively positioned with respect to the latch abutments to latchingly engage the same upon predetermined movement of the rock shaft, said last mentioned offset portions of the rock shaft lying in a radial plane having a substantial angular lead in the direction of release movement of the rock shaft with respect to the radial plane of the first mentioned axial offset, whereby the last mentioned offsets are moved closely adjacent to the inner face of the hinged hood section in release position of the rock shaft.

12. A latching device for the hinged section of an automobile hood which includes a rock shaft mounted on the inner face of the hood, latch abutments positioned within the hood, the rock shaft being provided with latching offsets engageable with the abutments, and with an actuating offset, operating means engageable with the actuating offset to rock the shaft to latching and release positions, the latching offsets and the actuating offset of the rock shaft lying in different radial planes, the plane of the latching offsets having a substantial angle of lead in one direction of release movement of the rock shaft with respect to the plane of the actuating offset, whereby, when the actuating offset is moved into unlatched position, the latching offsets are moved closely adjacent to and in substantial parallelism with the inner face of the hood, to clear said latch abutments in release position of the rock shaft, the actuating offset lying at the termination of its unlatching excursion, at a substantial angle to the inner face of the hood.

Signed at Chicago, county of Cook and State of Illinois, this 7th day of May, 1929.

NORTON A. MEARS.
DIBRELL P. HYNES.