July 21, 1931. R. BIENAIME 1,815,181

LOCKING DEVICE

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Fig. 1.

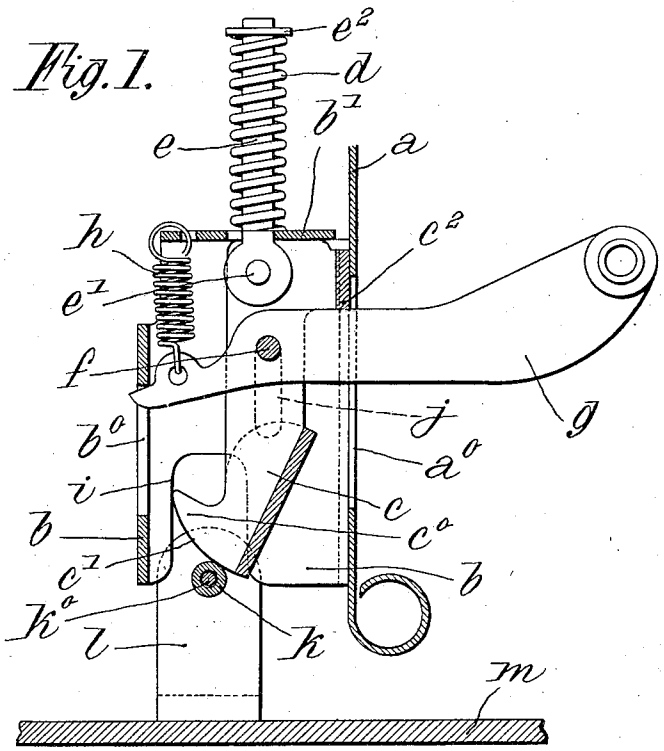
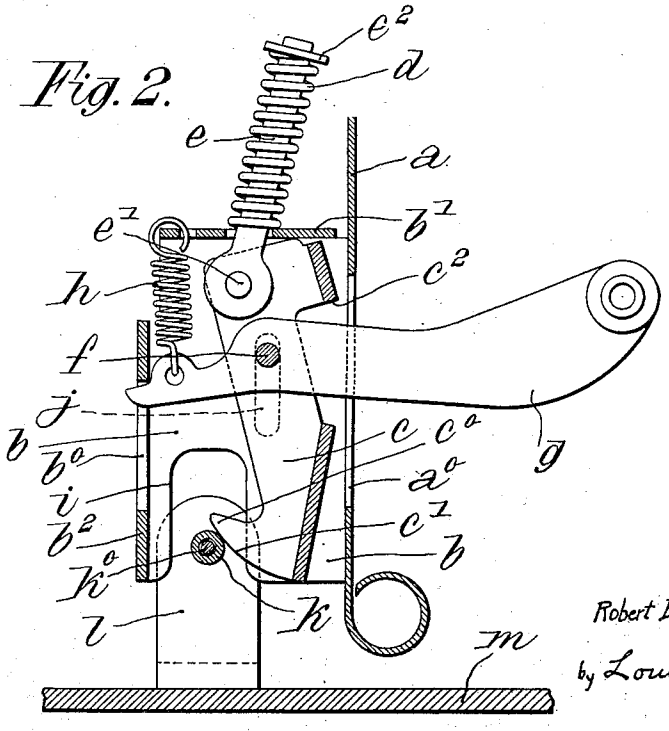


Fig. 2.



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Fig. 3.

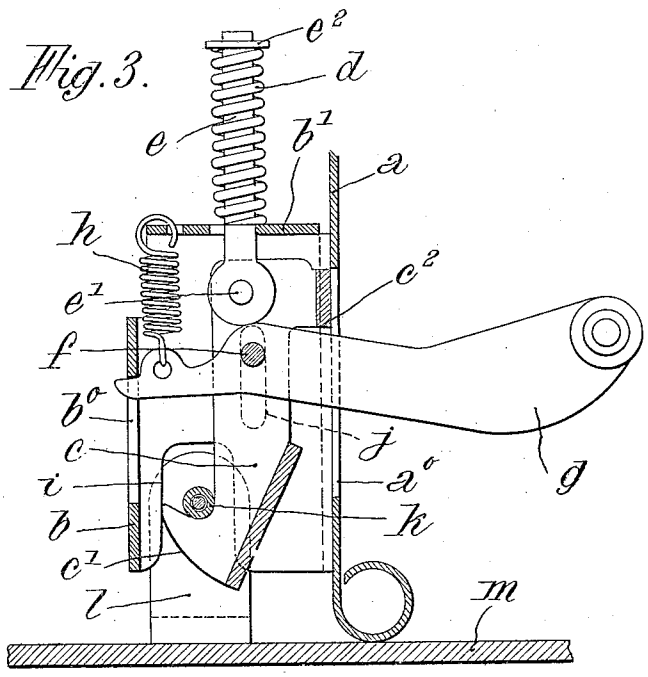
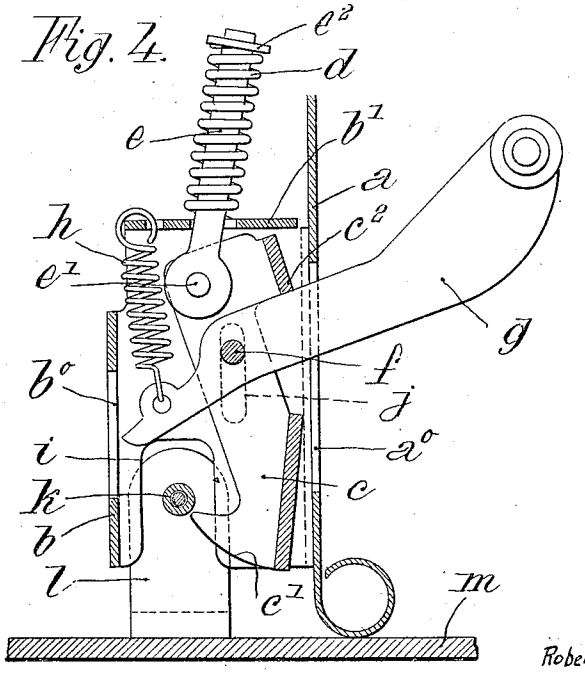


Fig. 4.



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UNITED STATES PATENT OFFICE

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LOCKING DEVICE

Application filed December 27, 1929, Serial No. 416,774, and in Belgium September 14, 1929.

The present invention relates to locking devices and, more especially, to those of the type adapted for use on automobile hoods and the like.

One of the objects of the invention is to provide a device in which the locking and releasing movements take place in the same direction as the movement of the hood.

Another object is to provide an assembly which functions to lock and release the hood independently of play and deformations produced in the latter by wear and use.

A further object is to provide a device in which the strains during locking and release take place in directions substantially parallel to the plane of the hood (lateral portion) whereby deformation of the latter is avoided.

Still further objects will appear in the course of the detailed description now to be given with reference to the accompanying drawings, in which:—

Figs. 1 to 4 are sections showing one illustrative embodiment of the invention at various phases of the locking and releasing operations.

Referring to the various figures of the drawings, there is shown the lateral portion of an automobile hood a having a slot a^0 formed therein,—a shell b rigidly attached to a and including a horizontal portion b^1 and a vertical portion b^2 provided with end and lateral slots b^0, i, i and j, j,—a latch c mounted inside shell b and provided with a nose c^0 having a curved "cam" portion c^1,—a pin e engaging pivotally at e^1 with latch c and carrying a spring d abutting at opposite extremities against a stop e^2 and element b^1,—a lever g traversing slot a^0 and provided with a pin f rigidly attached thereto, said pin engaging pivotally with latch c, lever g being of sufficient length to engage in slot b^0 during certain phases of its operation,—a spring h tending to move the distal end of lever g upward,—and a fixed assembly mounted on a frame m and a rotatable roller k mounted on a transverse rod k^0 rigidly supported on lateral supports l, l.

The various operating elements should be designed so that point e^1 is somewhat out of vertical alignment with roller k when the device is in closed position. Similarly in this same position, pin f should be somewhat out of vertical alignment both with point e^1 and the point where latch c engages with roller k (Fig. 3). With a structure so designed proper turning couples may be exerted to effect the various opening and closing movements and latch c once engaged tends to maintain hood a firmly in position.

The device operates as follows:

Assuming that the hood is being lowered from its raised position, curved surface c^1 of nose c^0 first contacts with roller k (Fig. 1) then, as pressure is exerted on hand-lever g, rides over the latter (Fig. 2) until nose c^0 engages under roller k; spring d then functions to draw nose c^0 snugly into place (Fig. 3) and, when lever g is released, the hood is in closed position and tends to remain so under the action of spring d. During the downward movement of lever g, pin f, which follows the movement of latch c, slides vertically downward in lateral guide slots j, j formed in shell b, while the distal end of the lever, under the action of spring h, bears against the upper extremity of slot b^0. Lateral slots i, i in shell b merely serve to provide clearance and as guides for the movement of shell b over roller k. When an opening movement is to be effected, lever g is moved upward thereby engaging with shoulder c^2 so as to rotate latch c about point e^1 (Fig. 4) until nose c^0 rolls out from under roller k to release the hood, the distal end of lever g moving downward out of contact with slot b^0.

It is to be noted that pin f and the various operating elements such as latch c cooperating therewith move in more or less parallel relation to the hood wall and that the tension exerted by spring d is exerted in substantially the same direction, thereby reducing deformation and strain on the hood to a minimum. Moreover, when, after a certain amount of use, the hood becomes loose, the operation of the locking device is not affected thereby since spring d always exerts an upward pull and thus renders the locking structure inde-

pendent of any play developing at points thereabove in or on the hood.

Finally, as noted in describing the operation of the apparatus, lever *g* moves in the same direction as the hood i. e. downward for a closing, and upward, for a releasing, operation.

What I claim is:—

1. In combination, a fixed frame, a movable closure element, a rod mounted on said fixed frame at a fixed distance therefrom, a shell rigidly attached to said movable closure element, a pin traversing said shell, a spring tending to move said pin outwardly relatively to said shell, a latch oscillatably suspended from said pin, and adapted to engage with said rod, and a lever engaging with said latch and having a portion thereof formed to bear against said shell.

2. In combination, a fixed frame, a movable closure element, a rod mounted on said fixed frame at a fixed distance therefrom, a shell rigidly attached to said movable closure element, a pin traversing said shell, a spring tending to move said pin outwardly relatively to said shell, a latch oscillatably suspended from said pin and formed to lockably engage with said rod, said latch having a shoulder formed thereon, and a lever engaging with said latch and having a portion thereof adapted to bear against said shell, said lever when moved away from the fixed frame engaging with said shoulder of the latch so as to oscillate the latch about its point of suspension from the pin as a center and when moved towards the fixed frame exerting a pull on said latch tending to move the latter into locking engagement with the rod against the action of said spring.

3. A structure as defined in claim 2 in combination with a spring opposing movement of the lever towards the fixed frame.

4. In combination, a fixed frame, a movable closure element, a rod supported at a fixed distance from said fixed frame, a shell rigidly attached to said movable closure element and having a guiding slot formed therein, a pin traversing said shell, a spring tending to move said pin outwardly with relation to said shell, a latch pivotally suspended from said pin and having a hooked portion formed thereon adapted to engage with said rod, said hooked portion having an exterior surface formed to facilitate sliding movement thereof over said rod, said latch having a shoulder formed thereon, an oscillatable lever capable of engaging with said shoulder to oscillate said latch, a spring tending to move said lever away from the fixed frame, and a pin traversing said lever and latch at a point lying, outside of a plane parallel to the movable closure element and passing through the point of suspension of the latch, said last-named pin engaging in said guiding slot.

5. In combination, a fixed frame, a movable closure element, a rod supported on said fixed frame at a substantially constant distance from the latter, a shell rigidly attached to said movable closure element and having an elongated guiding slot formed therein extending substantially parallelly to the movable closure element, a pin traversing said shell, a spring tending to move said pin outwardly with relation to said shell, a latch pivotally suspended from said pin and having a hooked portion formed thereon adapted to engage with said rod, said hooked portion having an exterior surface formed to facilitate sliding movement thereof over said rod, said latch having a shoulder formed thereon, an oscillatable lever capable of being displaced to contact with said shoulder so as to oscillate the latch, a spring tending to move said lever away from the fixed frame, and a pin traversing said lever and latch at a point lying, when the latch and rod are in engagement, outside of a plane parallel to the movable closure element and passing through the point of suspension of the latch, said last named pin engaging in said guiding slot.

In testimony whereof I affix my signature.

ROBERT BIENAIMÉ.