Nov. 7, 1933. T. S. INGERSOLL 1,933,736

ELECTROMAGNETIC LOCK

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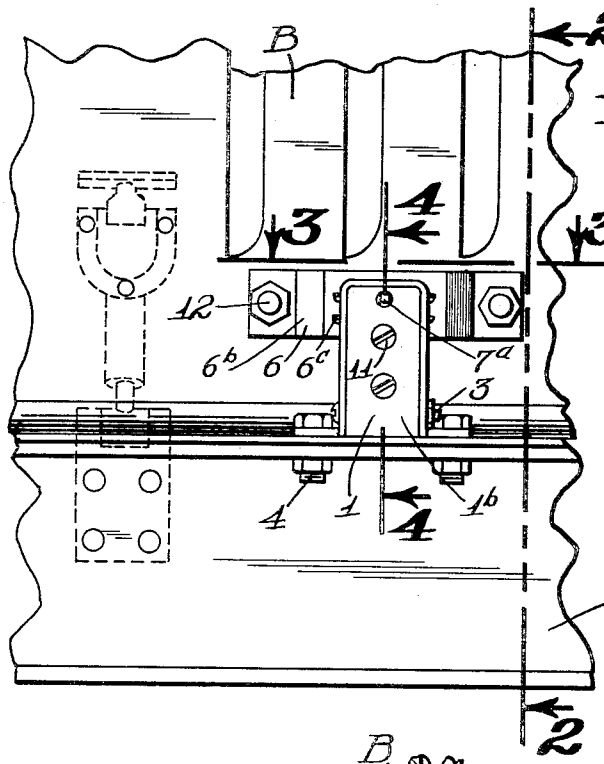


Fig. 1.

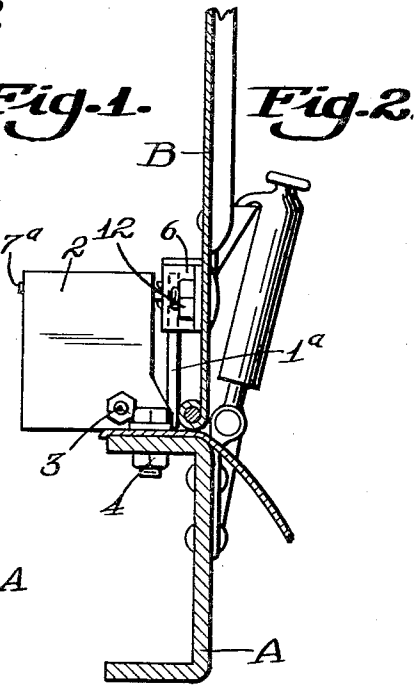


Fig. 2.

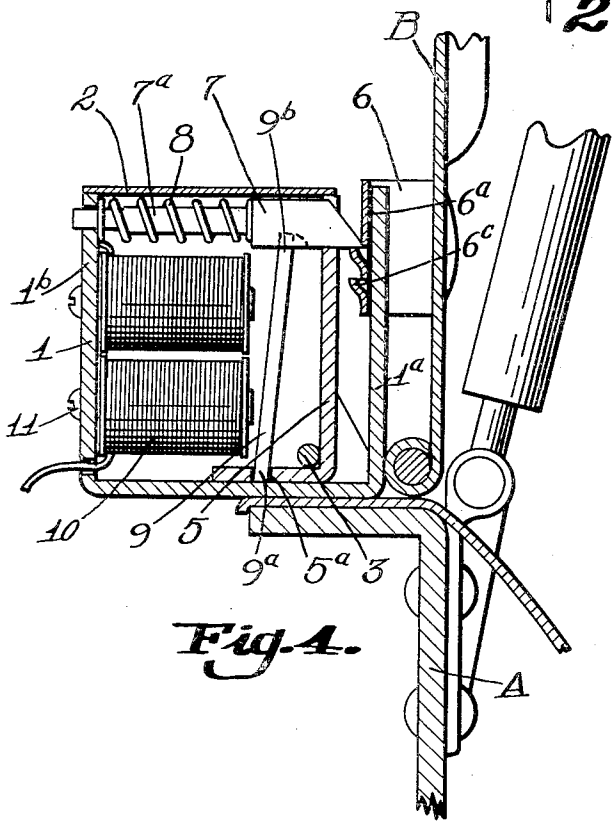


Fig. 4.

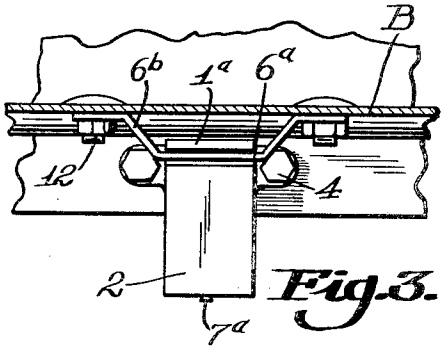


Fig. 3.

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Fig. 5.

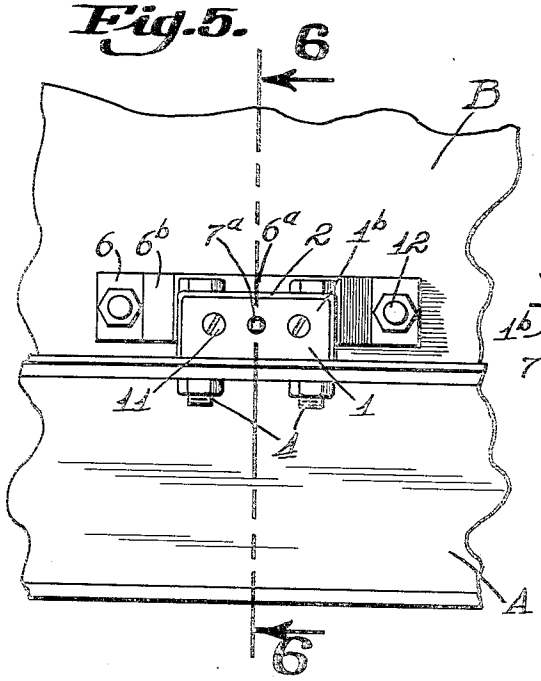


Fig. 6.

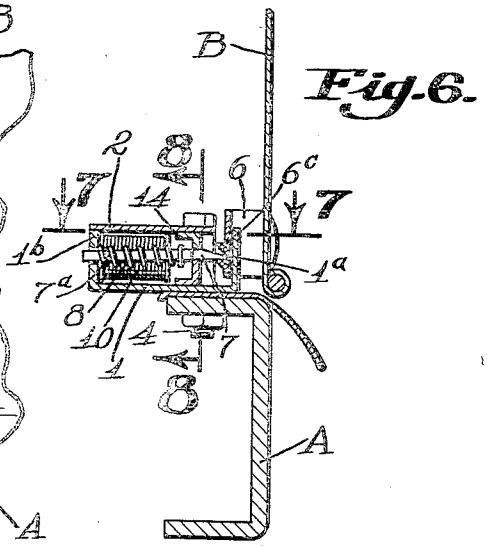
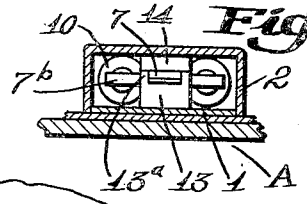


Fig. 8.



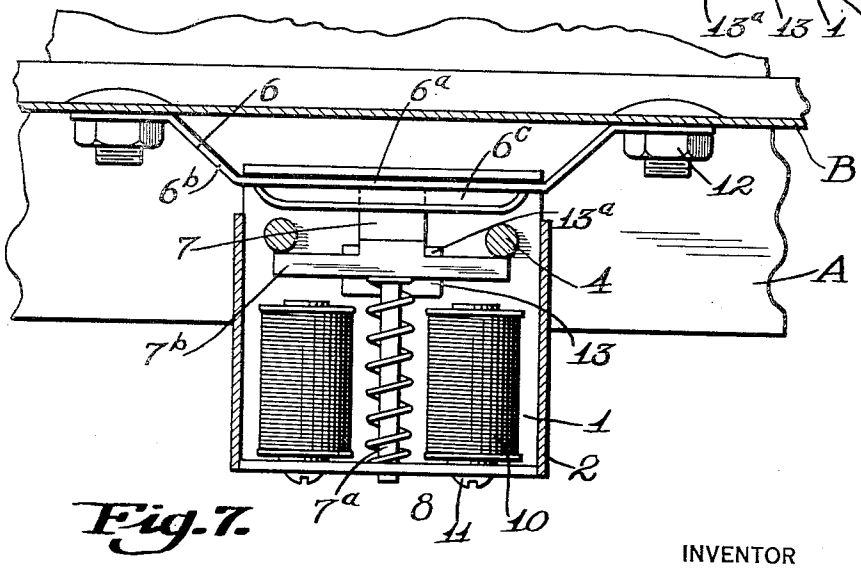


Fig. 7.

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UNITED STATES PATENT OFFICE

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ELECTROMAGNETIC LOCK

Thomas S. Ingersoll, Burbank, Calif., assignor to Ingersoll Magnetic Lock Company, Fresno, Calif., a corporation of California

Application April 16, 1931. Serial No. 530,605

2 Claims. (Cl. 70—50)

My invention relates to magnetic locks, and particularly to locks for locking engine hoods of automobiles in position, although the same is not limited to such use.

The objects of this invention are: first, to provide a lock of this class which is very simple and economical of construction and at the same time very rigid and strong, and one which will not readily wear out or otherwise deteriorate or get out of order; second, to provide a lock of this class having a simple reciprocating locking bolt or locking member which is normally forced from the lock casing by spring means and which is drawn into the casing by electromagnetic means arranged in a very efficient and compact manner with respect to the bolt and within the casing; third, to provide novel means in connection with the bolt or locking member and the electromagnets for drawing the bolt or locking member inwardly; fourth, to provide a novel arrangement of the several parts of the lock mechanism and the casing so that all of the parts are readily accessible and readily replaceable; and, fifth, to provide a simple, novel and efficient keeper for engaging the bolt or locking member in various positions of the keeper.

With these and other objects in view as will appear hereinafter, I have devised a magnetic lock having certain novel features of construction, combination and arrangement of parts and portions, as will be hereafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a fragmentary inside elevational view of an automobile frame and engine hood showing my magnetic lock in connection therewith for locking the hood in a closed position relative to the frame; Fig. 2 is a sectional elevational view thereof taken through 2—2 of Fig. 1; Fig. 3 is a fragmentary sectional view thereof in plan taken through 3—3 of Fig. 1; Fig. 4 is an enlarged fragmentary sectional elevational view thereof taken through 4—4 of Fig. 1 showing in detail the locking mechanism; Fig. 5 is a view of an automobile frame and engine hood, as shown in Fig. 1, but showing a slightly modified form of construction of my magnetic lock; Fig. 6 is a fragmentary sectional elevational view of the modified form of the lock and taken through 6—6 of Fig. 5; Fig. 7 is an enlarged fragmentary sectional view thereof in plan taken through 7—7 of Fig. 6; and, Fig. 8 is a fragmentary sectional elevational view thereof taken through 8—8 of Fig. 6.

Like characters of reference refer to similar parts and portions throughout the views of the drawings.

In conventional automobile construction, the frame of the automobile is provided with main side frame members, designated A in the drawings. Above the forward portion of the automobile is the hood for enclosing the engine and other mechanism of the automobile, this hood being here shown fragmentarily and designated B. My magnetic lock is here shown in combination with these two elements of the automobile.

The enclosing casing of the lock mechanism shown in the drawings consists of two members, the one in the form of a U-shaped frame 1, with the open side directed upwardly, and the other in the form of a cover 2 closing the upper portion and opposite sides of the frame, except as hereinafter described. The members 1 and 2 are held together by a single bolt 3 which clamps the opposite sides of the cover against the opposite sides of the frame member 1. The two members are, however, further held together by bolts 4 which secure the cover 2 to the automobile frame A, the bolts 4 extending through ears at the opposite lateral sides of the cover member.

Within the casing is mounted a bracket 5 which consists of a strap positioned parallel to and in spaced relation from the leg 1*a* of the U-shaped frame member 1, said leg of the U-saped frame member being positoned adjacent the hood. The space between the bracket 5 and the leg 1*a* is open at the upper portion and lateral sides, forming substantially a transverse slot at one end of the lock casing for the reception of a keeper mounted on the inside of the hood. The cover 2 terminates with one edge substantially flush with the bracket 5. Within the casing is reciprocally mounted a bolt 7, the locking portion of the bolt being supported and guided by the bracket 5 and normally extended with its end beyond the bracket and into the space between the bracket and the leg 1*a*. The opposite or rear end of the bolt 7 is reduced and preferably rounded as indicated by 7*a*. The rear end of the reduced portion is reciprocally supported in the rear leg 1*b* of the frame member 1. Around the reduced portion 7*a* of the bolt is positioned a compression coil spring 8 which normally forces the locking portion of the bolt from the enclosure against the inner sides of the leg 1*a*.

Within the casing, inwardly from the bracket 5, is positioned a bolt actuating arm 9. This arm consists primarily of a flat bar which is loosely positioned with its lower end 9*a* in a recess 5*a* in a backwardly extending leg at the lower end of the bracket 5. The upper end 9*b* of the bar is reduced and extends into a recess in the under side of the enlarged rectangular portion of the bolt 7. Within the casing and in the space between the arm 9 and the rear leg 1*b* of the frame member 1, are positioned a pair of superimposed electromagnets 10, the same being secured to the rear leg by screws 11. These electromagnets are so positioned that when the same are energized they force the arm 9 backwardly about the pivoted lower end of the arm and draw the bolt backwardly from the space between the bracket 5 and the front leg 1*a* of the frame member 1.

The keeper 6 performs the same function as the kepeers in the usual locks, except that in this instance the keeper is supported on the movable member, namely, the hood B. The keeper is preferably made of strap iron in the form of a shallow yoke or clevis having a straight portion 6*a* intermediate its ends and legs 6*b* at the ends which are secured, by means of bolts 12, to the inside of the hood. The straight portion 6*a* is spaced inwardly from the inside of the hood and is adapted to enter the space between the leg 1*a* and the bracket 5. This straight portion 6*a* is provided with seats 6*c* which are in the form of ledges positioned in spaced apart and parallel relation to each other and formed by punching inwardly a portion of the metal forming the straight portion 6*a*, as shown best in Fig. 4. As the keeper is forced downwardly, the bolt 7 is forced inwardly until one of the seats or ledges is positioned below the locking member or bolt, as shown.

In the modified structures shown in Figs. 5, 6, 7 and 8, the casing is flat and secured flatwise against the frame A, whereas in the structure described heretofore, the casing was positioned on edge upon the frame A. In this modified structure, the bolt 7 is provided between the rectangularly shaped locking portion and the backwardly extending reduced portion 7*a*, with a pair of arms 7*b* formed as a part of the bolt and extended to the opposite lateral sides of the bolt at right angles to the longitudinal extent of the bolt.

In this modification, the bolt is guided by and supported on a bracket 13 extending upwardly from the bottom of the frame member 1. The cover 2 is also provided with a bracket or clip 14 which extends downwardly from the upper portion of the cover and holds the bolt in position against the guide bracket 13. The bracket 13 may also limit the outward movement of the bolt by lugs 13*a* which hold the bolt against lateral movement and which also forms stops engaged by the arms 7*b* to limit the outward movement of the bolt.

In this instance, the electromagnets 10 are positioned at the opposite lateral sides of the reduced portion of the bolt and, when energized, are adapted to attract the laterally extending arms of the bolts 7. The keeper 6 in this modified structure may be the same as that heretofore described.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, and a certain modification thereof, I do not wish to be limited to this particular construction, combination and arangement, nor to the modification, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a lock of the class described, the combination with a pair of closure members, the one being adapted to swing and to be shifted directly toward and from the other, a frame secured to one of the closure members and open at its outer side, a cover positioned partly over the open side of the frame and the adjacent side, one edge of the cover being spaced from the opposite side of the frame forming a slot for the reception of a keeper, a bolt reciprocally mounted on the frame and retained in position by the cover and adapted to extend with one end in said slot, and a keeper adapted to enter the slot and to engage the inner side of the bolt, said cover holding the bolt positioned against the outward axis of the keeper.

2. In a lock of the class described, a casing, an arm extending longitudinally in spaced relation with one side of said casing forming therewith a slot, a locking member movably mounted within the casing and adapted normally to extend into said slot, and a looped keeper adapted to embrace said arm, said keeper having a plurality of spaced parallel seats at its outer portion within said slots between said arm and casing for engaging the inner side of the locking member.

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