Aug. 27, 1935. A. SWARTZ 2,012,735

HUB LOCK FOR AUTOMOBILES

Original Filed Dec. 7, 1933

Fig. 1.

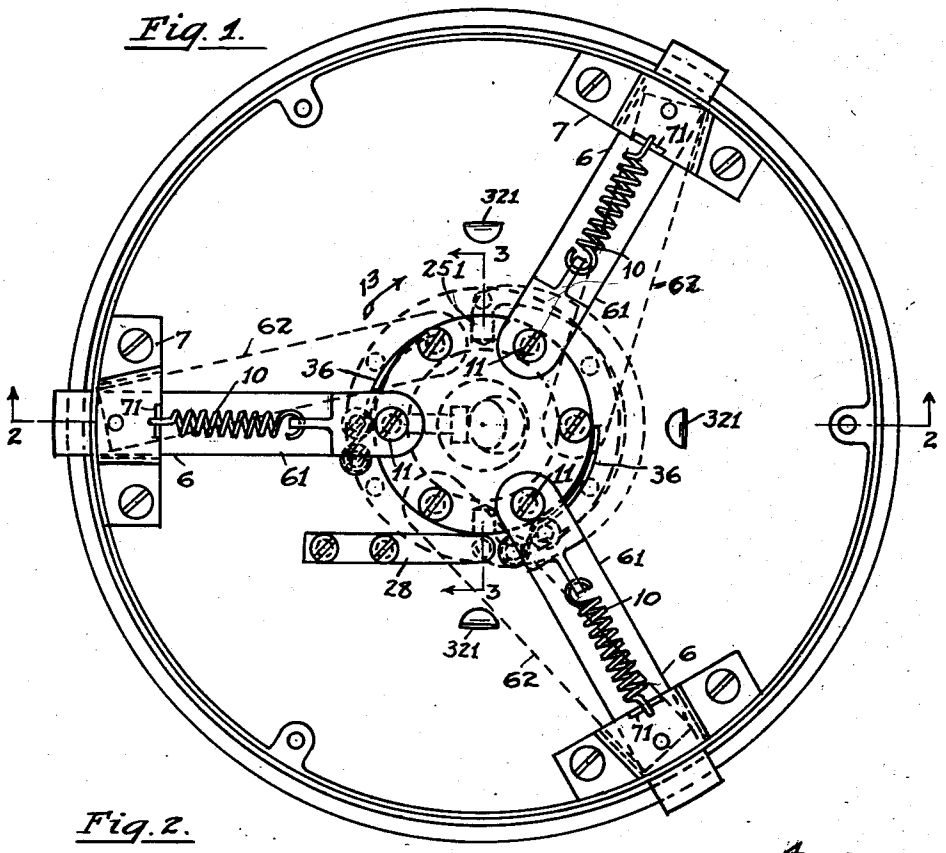


Fig. 2.

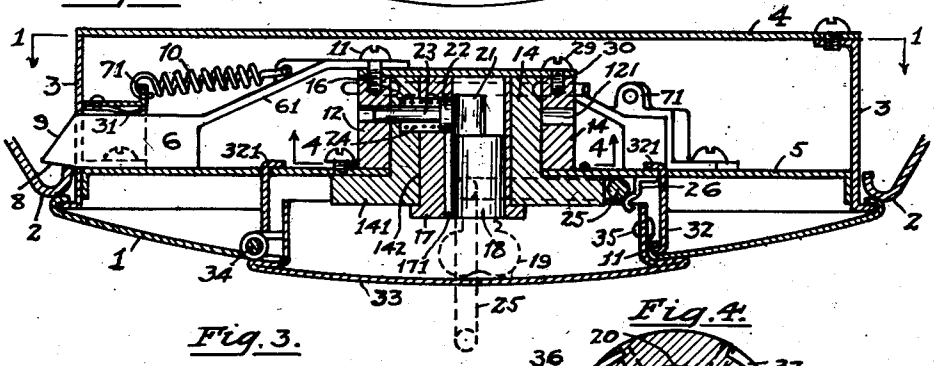


Fig. 3.

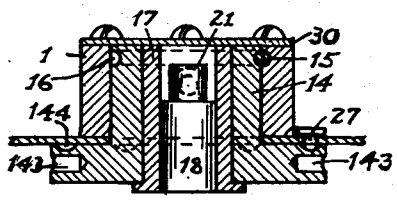
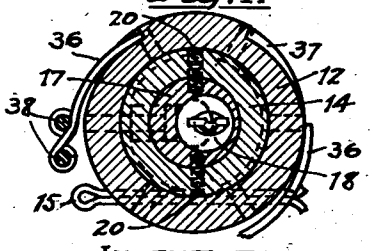


Fig. 4.



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HUB LOCK FOR AUTOMOBILES

Arthur Swartz, Detroit, Mich.

Application December 7, 1933, Serial No. 701,326
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2 Claims. (Cl. 70—90)

This invention relates to hub locks for securing hub caps upon the wheels of automobiles and other vehicles. Such locks as usually employed for this purpose consist of a barrel or tumbler lock of the "Yale" or similar type together with fastening means operated thereby for securing the cap upon the hub. In the case of hubs of such large size as are at present necessary in order to give access to the bolts which secure the wheel in place, it is found impossible to obtain the required strength in a locking device operated directly by a lock of the kind referred to of commercial size.

The object of the present invention is to provide a locking mechanism of heavy and rugged construction provided with manual operating means of proportionate strength, the said operating means being controlled by a key-operated lock of any common type.

Another object of the said invention is to provide a lock of the character referred to in which the main locking means is so enclosed as to be inaccessible, while at the same time the key-operated controlling means is protected from dirt and injury in ordinary use.

A further object of my said invention is to provide a device of the character referred to which is relatively of simple and economical construction having regard to its great strength and other advantages.

With these and other objects in view the invention consists in the improved construction, arrangement, and combination of parts which will be hereinafter fully described, reference being had to the accompanying drawing, which illustrates a preferred embodiment thereof, in which drawing—

Figure 1 is an elevation showing the construction of the main locking mechanism with the rear cover removed as indicated by line 1—1 of Figure 2.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1, and

Figure 4 is a section on line 4—4 of Figure 2.

Like characters designate corresponding parts throughout the several views.

1 is the hub cap of such diameter as to abut upon the inturned edge 2 which defines the opening in the body of the hub. Secured to the cap 1 is the housing 3, slidably fitted within the opening aforesaid and provided with a rear cover 4 and an intermediate diaphragm 5. Within the space between the cover and the diaphragm are locking bolts 6, preferably three in number and of rectangular cross section, which are slidably supported in brackets 7 secured to the diaphragm 5 by screws, as shown, or other means. These bolts are provided at their ends with surfaces 8 inclined at a slight angle to their adjacent faces which rest against the diaphragm 5. These inclined surfaces are so located and proportioned that when the bolts are moved outwards into the position shown in Figure 2 there is a wedging action between them and the co-acting edges of the hub 2 which tends to force the cap itself tightly in place. Upon the bolts are also the rear inclined surfaces 9, the purpose of which is to press the bolts inwards when the device as a whole is pressed into the opening in the hub, in case the said bolts shall not have been drawn inwards to the full extent by the manual means provided for the purpose. The bolts 6 are normally maintained in the outward or locked position as shown in the drawing by means of the helical tension springs 10, the inner ends of which are secured to extensions 61 upon the bolts, while the outer ends are secured to lugs 71 formed upon the upper surface of the brackets 7.

The inner ends of the extensions 61 of the bolts are secured by screws 11 to the rear surface of a sleeve 12 centrally located within the housing, the extensions being capable of pivotal movement around the screws so that when the sleeve is rotated in the direction indicated by the arrow 13 the bolts will be drawn inwardly against the action of their springs and at the same time moved into an angular position as indicated at 62 in Figure 1, to allow of which each bracket has one of its walls arranged at a corresponding angle.

The sleeve 12 is rotatably mounted upon the outside of a hub 14 and secured endwise in position thereupon by a cotter 15 which passes through an opening in the sleeve and fits tangentially within a semi-circular groove or cannelure 16 in the periphery of the hub. Integral with the hub 14 is the flange 141, the said flange bearing against the outer surface of the diaphragm 5 while the outer face of the sleeve 12 bears against the inner surface of the said diaphragm so that when the two are held in proper relation by the cotter 15, the assembly thus formed is also held rotatably in position within the central opening shown in the diaphragm. Within the hub 14 is a central bore 142 and within this bore is a shell 17 secured in position by set screws 20 so as to rotate with the hub. This shell has an eccentric bore adapted to receive the barrel 18 of the type used in tumbler locks above referred to. This barrel is provided with the usual key-operated tumbler mechanism by which it is allowed to rotate when the key 19 is inserted in the usual manner, and is prevented from rotation when the key is withdrawn, all of this mechanism together with the co-acting grooves 171 in the shell being of conventional design well known in the art and forms no part of the present invention. Upon the inner end of the barrel 18 is an eccentric pin 21 and in co-operative relation with this eccentric is the head 22 formed

integral with a pin 23. The body of this pin is guided in a hole in the outer periphery of the hub 14 while the head, as shown in Figure 2, is guided within a bore formed partly within the said hub and partly within the shell 17, and within this bore is the helical compression spring 24 by which the head of the pin is maintained in contact with the eccentric 21 so that it moves back and forth when the barrel 18 is rotated, as will be understood. Within the sleeve 12 and equally spaced around its periphery are a series of holes 121 in either of which the pin 23 may engage when the latter is forced outwards under the action of the eccentric 21, the parts then assuming the relative positions shown in Figure 2. Under these conditions it will be obvious that rotation of the hub 14 will cause the sleeve 12 to rotate also, so as to cause the bolts 6 to move in or out according to the direction of such rotation, which is effected manually through the handle 25 shown in its operative position in broken lines and in folded position in solid lines in Figure 2, the said handle being provided with inwardly bent ends 251 which pivotally engage in holes 143 in the flange 141 of the hub 14. The handle is maintained in folded position by a spring catch 26 secured to the outer face of the diaphragm 5.

It will be observed from the foregoing description and by reference to the drawing that when the key is inserted into the barrel 18 and the latter rotated so as to force the pin 23 into one of the holes 121, rotation of the hub in the direction of the arrow 13 in Figure 1 by means of the handle 25 will cause corresponding rotation of the sleeve 12, thereby withdrawing the bolts inwards until they occupy the position shown in broken lines at 62 in Figure 1. Withdrawal of the key however (which is only possible when the barrel is in a position at 180 degrees from the position shown in the drawing, and when the locking pin 23 is therefore out of engagement with the sleeve 12) disconnects the sleeve 12 from the hub 14 so that the latter may be rotated continuously by means of the handle 25 without producing any effect upon the locking bolts.

Rotation of the sleeve 12 is limited in both directions by spring detents 36 which engage in notches 37 in its periphery, the said detents being secured in position by screws 38 and so located in the present instance as to allow a rotation of 60 degrees which corresponds to the requirement movement of the bolts 6 and also to the spacing of the holes 121 in the sleeve and the depressions 143 in the flange of the hub, all as above described.

In order to enable the operator to bring the pin 23 into alignment with one of the holes 121 there are provided upon the inner face of the flange 141 a series of depressions 144 which are successively engaged by the dowel pin 27 mounted on the free end of the spring 28 secured to the diaphragm, in such manner that as the hub is rotated the operator can determine by the feel of the handle that the pin is in register with one of the holes. Secured to the inner end of the sleeve 12 by screws 29 is a cover 30, the said cover being interposed between the inner face of the sleeve and the extensions 61 of the bolts 6, as will be seen by reference to Figure 2 of the drawing. In Figure 2 also is shown a flat spring 31, one end of which is secured within the guides 7, adapted to press the corresponding bolt 6 against the diaphragm 5, thereby preventing chatter or vibration of the parts.

Upon the outer face of the diaphragm 5 is the annular member 32 which is secured to the diaphragm by ears 321 which pass through slots in the said diaphragm and are bent over in the well known manner. The outer edge of the member 32 is turned inwardly so as to engage within a bead 11 formed integral with the hub cap 1 and defining an opening through which access is obtained to the tumbler lock mechanism and to the handle 25. This opening is normally closed by the cover 33 hinged at 34 to the cap 1 and held in the closed position by the snap button 35 which yieldingly engages with the bead 11 in the manner well known in the art.

While I have herein described and shown a preferred embodiment of my invention, it will be readily understood by those skilled in the art that the same may be modified in various ways to meet any particular or peculiar requirement, without departing from the spirit of my invention.

Having thus described my said invention, what I claim and desire to secure by Letters Patent of the United States is:

1. A hub lock comprising a cap for closing an opening in the hub of a vehicle, a housing upon said cap fitting within said opening, a plurality of bolts slidable within said housing and adapted to engage the rim of said opening upon the inside thereof, spring means for maintaining said bolts in engaged position, an outer rotatable member connected to said bolts and adapted to withdraw them from engagement, an inner member within said outer member normally rotatable freely therein and having a handle, and means for locking said inner and outer members together in driving relation.

2. A hub lock comprising a cap for closing an opening in the hub of a vehicle, a housing upon said cap fitting within said opening, a plurality of bolts slidable within said housing and adapted to engage the rim of said opening upon the inside thereof, spring means for maintaining said bolts in engaged position, an outer rotatable member connected to said bolts and adapted to withdraw them from engagement, an inner member within said outer member normally rotatable freely therein and having a handle, and means for locking said inner and outer members together in driving relation, said last-named means comprising a series of holes in said outer member, a locking pin within said inner member and adapted to engage said holes, a barrel rotatable within said inner member including key-operated tumbler mechanism, an eccentric upon said barrel for moving said pin into engagement with one of said holes, spring means for retracting said pin when said barrel is turned into unlocked position thereby allowing said inner member and its handle to turn freely without rotating said outer member, a series of depressions in said inner member arranged in spaced relation corresponding to the spacing of said holes, and a spring-operated detent adapted to frictionally engage in either of said depressions, whereby the operator may position the locking pin for engagement in one of said holes.

ARTHUR SWARTZ.