Feb. 26, 1935. C. H. NEHLS 1,992,759

HUB CAP

Filed June 6, 1932

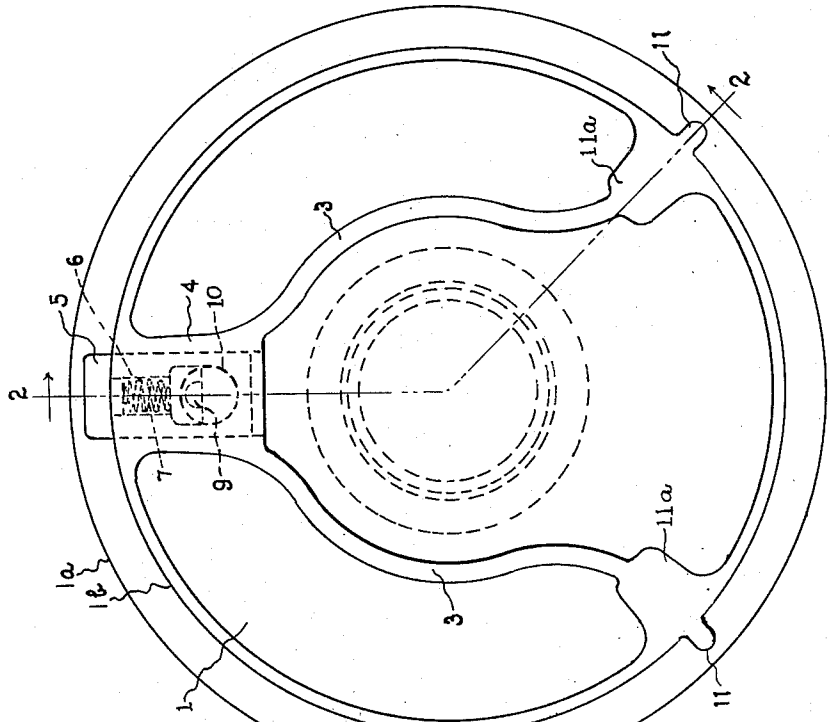


Fig-1-

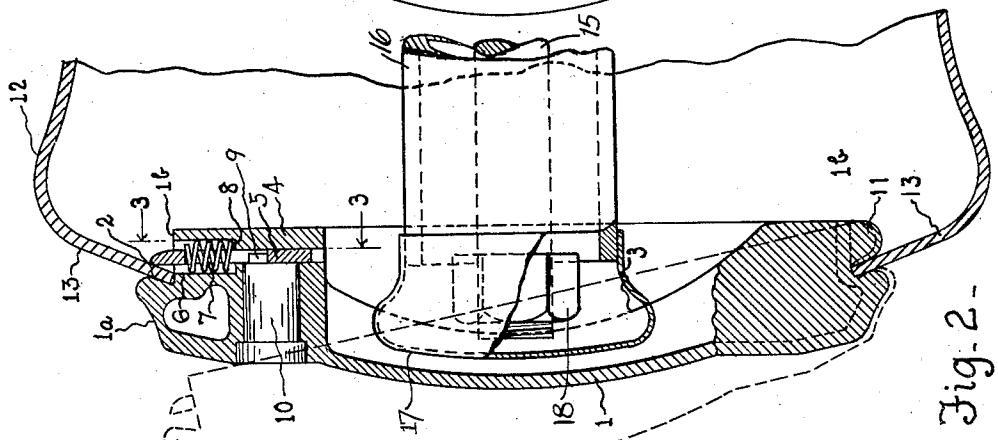


Fig-2-

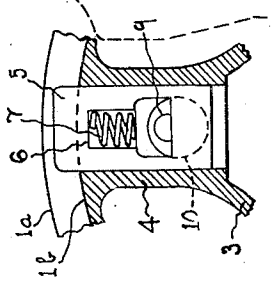


Fig-3-

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HUB CAP

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4 Claims. (Cl. 301—108)

This invention relates to hub caps, and particularly to hub caps for motor vehicle wheels.

An object of the invention is to equip a hub cap with a lock for securing said cap to a wheel hub and to so form said cap and position said lock thereon, as to afford clearance to the axle on which the wheel is mounted.

Another object of the invention is to equip a hub cap with a simple and inexpensive lock, safeguarding the cap against accidental detachment or unauthorized removal.

A further object is to apply such a lock adjacent to the periphery of a hub cap, so that the bolt of the lock may engage the flange of the hub.

A still further object is to provide said cap with means adjacent to its periphery for rotationally counterbalancing the weight of said lock.

These and various other objects the invention attains by the construction hereinafter described, and illustrated in the accompanying drawing, wherein:

Fig. 1 is a vertical sectional view of the improved hub cap, showing the same in locked engagement with the wheel hub.

Fig. 2 is a view of the hub-engaging face thereof.

Fig. 3 is a sectional detail of the lock mechanism, taken upon the line 3—3 of Fig. 1.

In these views, the reference character 1 designates a hub cap, illustrated as a casting, but not necessarily so formed. Said cap has an approximate cup shape, minimizing its weight, and its peripheral face is formed with an annular shoulder 2, separating the front portion 1*a* of said face from a lesser diameter rear portion thereof. It is preferred to reinforce the hub cap in its cast form by interior ribs 3, diverging from one point of the cap rim to relatively remote points thereof, as clearly appears in Fig. 2. Formed integrally with said cap, in interior proximity to its rim, is a lock casing 4, positioned preferably at the juncture of the ribs 3. Said casing receives a radial bolt 5 having an end portion outwardly projecting through the peripheral face 1*b*, and spaced slightly from the shoulder 2. Said bolt, which is preferably a sheet-metal stamping, has an approximately central opening 6 in which is disposed a coiled spring 7, urging the bolt outwardly. The inner end of said spring seats upon shoulders 8 formed in the casing 4 at front and back of the bolt 5. The bolt opening 6 extends inwardly beyond said shoulders to receive a pin 9 terminally and eccentrically carried by a lock barrel 10, containing any suitable and well-known arrangement of key-actuable tumblers (not shown) for rotating said barrel. The pin 9 contacts the inner margin of the opening 6 when the bolt 5 is projected, and on rotation of the barrel 10, the thrust of said pin against said margin retracts the bolt.

At one or more points remote from the described lock, the face 1*b* of the cap carries one or more outwardly projecting teeth 11, spaced from the shoulder 2, similarly to said bolt. As illustrated, one of said teeth radially registers with each rib 3. The ribs 3 have enlargements 11*a* adjacent to the hub cap rim for rotationally counterbalancing the lock mechanism.

In applying the described hub cap to a wheel hub 12, the cap is initially inserted in the hub in the tilted position indicated in dash lines in Fig. 1, the flange 13 marginal to the hub opening engaging between the shoulder 2 and lugs 11. The cap is then tilted into complete engagement with the hub as shown in full lines in Fig. 2, the outer portion of the lock bolt being beveled to permit the hub flange 13 to automatically retract the bolt during such tilting.

It is to be noted that the lock barrel 10 may be of either a key-operable or permutation type.

The described hub cap may be very quickly and easily attached or removed, but its removal requires a key fitting the described lock or manipulation of the latter according to a predetermined combination of numerals.

It is an important advantage of the described construction that the lock is fully counterbalanced by the projections 11 and enlargements 11*a*, so as not to interfere with smooth rotation of the wheel, nor tend toward uneven wear.

It is also advantageous that the described cap may be applied in any rotative position, and grips the hub under sufficient friction to maintain such position under normal stresses, while yieldable rotatively under any blow, having a circumferential component, such as might be applied in an attempt to destroy the lock.

It is important to note that the above mentioned construction has been designed for application to both spare wheels and running wheels, and in order to accommodate the latter wheels of modern design, it has been so constructed as to provide a minimum outward extension of the wheel hub shell 12 to thus minimize possibility of the hub cap striking against objects during the operation of the vehicle of which it forms a part. Particularly in view of the fact that in modern wheels of the type shown the wheel axle or spindle 15, as the case may be, depending upon whether it is a driving wheel or not, may extend

to and even beyond the outer edge of the shell 12, and where the wheel is not a driving wheel the hub 16 may be provided with a grease sealing cap 17 enclosing the outer end of the axle 15 and the securing nut 18 and projecting outwardly beyond the end of the axle 15, the problem of preventing an excessive outward projecting of the hub cap beyond the outer end of the hub shell offers certain difficulties of attainment that have heretofore not been met.

It will be observed that these problems have been met in the construction described by positioning the lock casing 4 and the lock barrel 10 carried by it radially between the shaft 15, hub 16 and/or cap 17, and the inner edge of the flange 13, thus permitting the casing 4 and barrel 10 to project axially inwardly of the outer ends of these parts in spite of the fact that they may project axially outwardly beyond the end of the hub shell 12. Although this feature renders the casing 4 and lock barrel 10 an eccentric mass which would cause "hopping" of the associated wheel when running at high speeds, the possibility of such an undesirable effect is eliminated by the provision of the counterbalances 11*a*.

The reinforcing ribs 3, in order to enable achievement of the advantages above set forth, are curved in the manner shown so as not to interfere with the proper reception of the axle 15, hub 16 and/or cover 17 as the case may be in the hub cap, and it will be observed in the particular construction shown that the counter weights 11*a* are formed as a part of the ribs 3, thereby reinforcing the same and enabling less metal to be used in the whole structure, and additionally the ribs 3 and counter-weights are formed as extensions of the teeth or lugs 11, or the teeth or lugs 11 as extensions of them, and thereby serve to reinforce them in a material and efficient manner.

While it is apparent that the illustrated embodiment of my invention is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

What I claim is:

1. In combination, a rotatable wheel hub shell having an open end, an inturned flange portion on said shell defining said opening, a wheel axle positioned centrally of said shell and terminally projecting axially approximately into the plane of the inner margins of said flange, a cover for said opening, rigid means fixed to said cover at one side thereof and arranged for interlocking engagement with said flange to lock the adjacent portion of said cover against axial disengagement with respect to said flange, a lock barrel mounted on the diametrically opposite side of said cover from said means and projecting inwardly from the outer face thereof to a point axially inwardly beyond the end of said axle, a bolt carried by said cover in position to engage said flange and operable through said barrel to releasably lock said opposite side of said cover against axial displacement with respect to said flange, and means carried by said cover for counterbalancing the off center weight of said locking means during rotation of said shell and cover.

2. In combination, a rotatable wheel hub shell having an open end, an inturned flange portion on said shell defining said opening, a wheel axle positioned centrally of said shell and terminally projecting axially approximately into the plane of the inner margins of said flange, a cover for said opening, rigid means fixed to said cover at one side thereof and arranged for interlocking engagement with said flange to lock the adjacent portion of said cover against axial disengagement with respect to said flange, a protuberance on the inner face of said cover at that edge thereof diametrically opposite said means and extending axially inwardly of said shell between said shell and axle, a lock barrel housed within said protuberance and projecting inwardly from the outer face thereof to a point axially inwardly beyond the end of said axle, a bolt carried by said cover in position to engage said flange and operable through said barrel to releasably lock said opposite side of said cover against axial displacement with respect to said flange, and means carried by said cover for counterbalancing the off center weight of said locking means during rotation of said shell and cover.

3. In combination, a rotatable wheel hub shell having an open end, an inturned flange portion on said shell defining said opening, a wheel axle positioned centrally of said shell and terminally projecting axially approximately into the plane of the inner margins of said flange, a cover for said opening, rigid means fixed to said cover at one side thereof and arranged for interlocking engagement with said flange to lock the adjacent portion of said cover against axial disengagement with respect to said flange, a protuberance on the inner face of said cover at the edge thereof diametrically opposite said means and extending axially inwardly of said shell between said shell and axle, a lock barrel mounted on the diametrically opposite side of said cover from said means and projecting inwardly from the outer face thereof to a point axially inwardly beyond the end of said axle, a bolt carried by said cover in position to engage said flange and operable through said barrel to releasably lock said opposite side of said cover against axial displacement with respect to said flange, and means carried by said cover for counterbalancing the off center weight of said locking means during rotation of said shell and cover, the last mentioned means projecting into the space radially between said shell and axle.

4. A hub cap adapted to be secured to the inturned end flange portion of a wheel hub shell comprising a body portion, rigid means fixed to said body portion at one side thereof and arranged for interlocking engagement with said hub flange to lock the adjacent part of said body portion against axial displacement with respect to said flange, a lock barrel mounted on the diametrically opposite side of said body portion from said means and projecting inwardly from the outer face thereof, a bolt carried by said body portion in position to engage said hub flange and operable through said barrel to releasably lock said opposite side of the body portion against axial displacement with respect to said flange, and means carried by said body portion for counterbalancing the off-center weight of said locking means during rotation of said hub shell and body portion.

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