June 15, 1937. K. A. FRANZEN 2,083,702

TRUNK LOCK

Filed May 9, 1935

Fig. 1

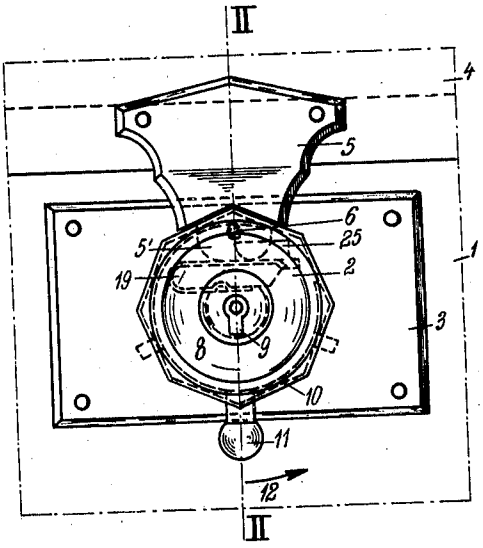


Fig. 2

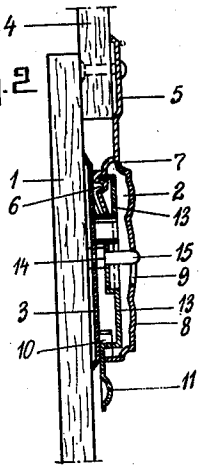


Fig. 3

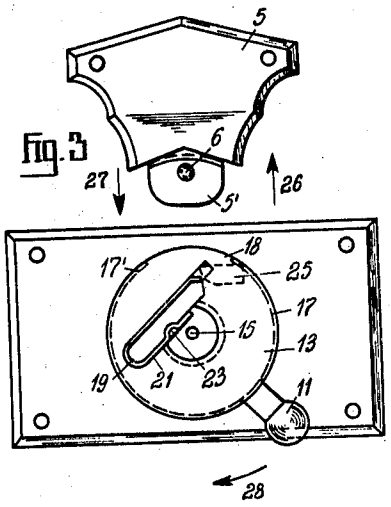


Fig. 4

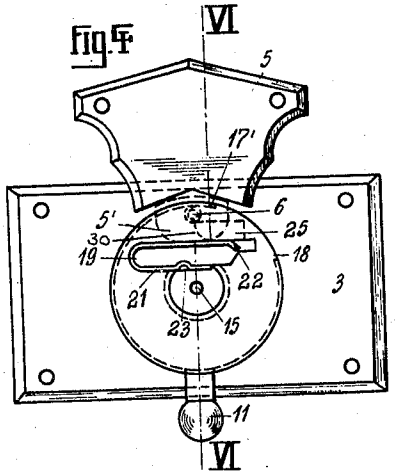


Fig. 6

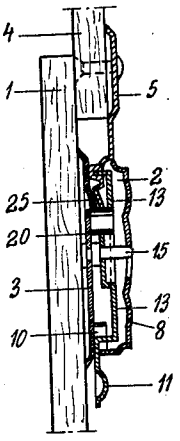
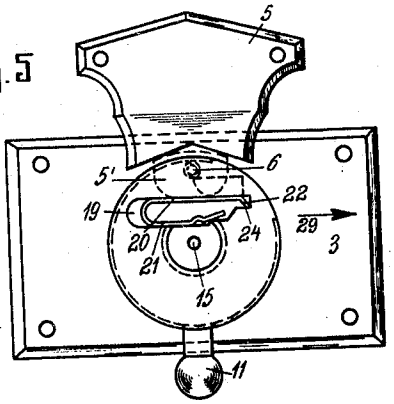


Fig. 5



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UNITED STATES PATENT OFFICE

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TRUNK LOCK

Karl August Franzen, Solingen, Germany

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In Germany July 11, 1934

18 Claims. (Cl. 70—70)

This invention concerns improvements in or relating to trunk locks.

The object of this invention is to provide a trunk lock which is an improvement over known constructions of the type which require no special hand manipulation of the hasp when the trunk is locked.

Moreover, it is an object of the invention to provide a lock of this kind which provides the additional advantage that upon releasing the locking parts from engagement with one another the lid is adapted immediately to fly open or to move upward under the action of the lock parts and without manual assistance.

A trunk lock constructed in accordance with the invention is simple and efficient in its operation.

In order that the invention may be clearly understood and readily carried into practice, reference will now be made to the appended sheet of drawings, in which one embodiment of the invention is illustrated by way of example and in which:—

Figure 1 is a front elevation of one form of lock constructed in accordance with this invention and applied to a trunk which is shown closed,

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

Figure 3 is a front elevation of the lock shown in Figures 1 and 2 the lock being free of the trunk, open or released, and with the cover plate of one part of the lock removed,

Figure 4 shows the lock parts illustrated in Figure 3 in the closed or latched position,

Figure 5 is a section on line VI—VI Figure 4,

Figure 6 shows the same lock as Figures 1 to 5 with its parts in a positively locked position.

The lock shown in the drawing comprises a part **2** secured to the front vertical wall of a trunk receptacle part **1**. The part **2** comprises a base plate **3** from which projects perpendicularly a shouldered key pin **15**, which passes through a central hole **14** in a rotatable disc or latch plate **13** having a peripheral flange or rim **17** perpendicular to its main part. The flange **17** has a cut away part or gap **18**. The latch plate also has a radially extending handle lever **11** formed integrally with the plate as shown in the drawing. Furthermore the centre part of the latch plate is recessed inwardly also as shown.

In the latch plate **13** is formed, on a chord of the plate, a segmentally disposed slot **19** in which is mounted, on its side, a U shaped spring closely fitting into the slot, as shown in the drawing. The two arms of the spring are marked **20** and **21** respectively and the arm **20** is longer than the arm **21** and is downturned or inturned at **22**, whilst the arm **21** has a notch **23** spaced from its free end and in which notch may engage the ward of a key pushed on to the key pin **15**.

The slot **19** in the latch plate has an extension **24** into which the part **22** of the U spring may pass to prevent the upper arm **20** of the spring flexing on attempted rotation of the latch plate **13**. A small projection **31** extends into the slot, and is arranged to act as an abutment for the outer end of the part **21** of the U-spring.

The base plate **3** has, as shown, a projection or abutment **25** the front end of which is rounded off as at **30** and the end **22** of the U spring is adapted to engage under this projection (as shown in Figures 1, 2, 4, 5, and 6) in certain positions of the latch plate **13**. Engagement and disengagement of the spring arm **20** with the abutment **25** is facilitated by the curved part **30** of the latter and the curved end **22** of the spring.

The lock includes a further part **5** (hereinafter called the "catch plate") secured to the front vertical flange of the lid **4** of the trunk. The part **5** is provided with a nose 5^1 adapted, when the latch plate **13** is in the position shown in Figure 3 and when the lid **4** is being closed, to pass into the gap **18** in the rim **17** of the latch plate **13** and which gap corresponds in width to the nose 5^1.

The nose 5^1 is provided with a catch or projection **6** behind or over which the part 17^1 of the latch plate rim **17** is adapted to engage to latch the two lock parts **2** and **5** together.

A cover or shield **8** is provided over the latch plate **13** and this cover or shield has a key-hole **9**, and also has an entrance opening **7** at its upper part through which the nose 5^1 may pass. The cover or shield has in addition a slot **10** in which is movable the handle lever **11** of the latch plate.

The operation of the lock described above is as follows:—

Assuming parts to be in the positions indicated in Figure 3, on closing the lid **4** of the trunk the nose 5^1 of the lock part **5** passes through (in the direction of arrow **27**) the entrance **7** of the cover or shield and then through the gap **18** of the rim **17** of the latch plate **13**.

As the lid **4** is pressed home the lower part of the nose 5^1 bears and presses on the free end of arm **20** of the U spring and this presses the arm **20** towards the arm **21** and compresses the spring and also depresses the end **22** of arm **20** relative to the abutment **25** on the base plate **3**.

The U shaped spring is so disposed that when

the catch or projection 6 has passed inwardly beyond the rim 17 the pressure now on the spring causes this to force the latch plate 13 to swing about the key pin 15 in the direction of arrow 28 and so to cause the part 17^1 of the latch plate rim 17 to engage behind or over the catch or projection 6 so automatically latching the lock parts 2 and 5 together.

As this operation occurs the end 22 of the U spring arm 20 passes under the abutment 25 and into the position shown in Figures 1, 2, 4, and 5. In this position the latch plate is stable and will remain so unless pressure is applied to the handle 11 in the direction of arrow 12. If this latter pressure is applied to the handle 11 the latch plate rotates about the key pin 15 and the arm 20 of the U spring is forced again towards the arm 21. At the same time the end 22 of the spring arm 20 slides along the under side of the abutment 25 and in due course is released by the abutment at just about the time the rim 17 of the latch plate disengages the catch or projection 6 of the nose 5^1. When these things occur the arms of the U spring fly open to their normal relative positions and so cause the lock parts 2 and 5 to separate, the part 5 moving in the direction of arrow 26.

If it is desired positively to lock the trunk then a key is pushed on to the key pin 15 and the key ward is engaged in the notch 23 of the U spring arm 21. Insertion of the key raises the extremity of the spring arm 21 above the small projection 31 and frees the U spring so that on rotation of the key in a clockwise direction the spring is bodily slidden along the slot 19 in the direction of arrow 29 to bring the end 22 of the spring arm 20 into the extension 24 of the slot 19 in which position the spring arm 20 cannot move either towards or away from the arm 21, whereby the latch plate 13 is locked against rotation relative to the base plate 3.

When the lock parts are in the position shown in Figure 3 the latch plate is retained against rotation by the engagement of the handle 11 against the end of its slot in the shield or cover 8 and by the engagement of the U spring end 22 with the abutment 25. The latch is however automatically released on depression of the spring arm 20 by the nose 5^1.

What I claim is:—

1. A lock for trunks or the like comprising a base plate for attachment to one of the relatively movable parts of the trunk or the like, a latch member carried by the base plate and turnable about an axis perpendicular to the latter, a catch plate for attachment to the other of the relatively movable parts of the trunk or the like, a catch on said catch plate, a catch engaging part on said latch member, and a resilient arm carried by said latch member and located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning movement, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

2. A lock for trunks or the like comprising two parts, one for attachment to the trunk lid and the other for attachment to the receptacle part of the trunk, these lock parts being adapted to be brought together when the lid is closed, a catch on one lock part, a movable latch member on the other lock part and adapted automatically to engage the said catch when in locking relation with the latter, and a U shaped spring associated with the latch member and located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

3. A lock for trunks and the like comprising two parts, one for attachment to the lid and one for attachment to the receptacle part of the trunk or the like, the one lock part including a base plate, and a latch plate mounted on said base plate for rotation about an axis perpendicular to the latter, said latch plate having a peripheral flange provided with a gap, the other locking plate having a nose part adapted to pass in a direction transverse to the axis of rotation of said latch plate through the gap in said latch plate flange when the latch plate is in a released or open position, a catch on said nose part which said flange on the latch plate is adapted to engage when rotated to a locked position, and a spring member carried by the latch plate and located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

4. A lock for trunks or the like comprising a base plate for attachment to one of the relatively movable parts of the trunk or the like, a latch member carried by the base plate and turnable about an axis perpendicular to the latter, a catch plate for attachment to the other of the relatively movable parts of the trunk or the like, a catch on said catch plate, a catch engaging part on said latch member, and a spring comprising a length of spring metal of U form and carried by said latch member, said spring being arranged with the lengths of said arms along chords of imaginary circles in a plane parallel to said base plate and having its centre point coincident with the axis about which said latch member is turnable, and having a portion thereof lying at one side of said center point, and said catch plate being adapted, on closing the trunk or the like, to approach said latch member in a direction transverse to the axis of rotation of the latter, and finally to assume a position in which said catch and the catch engaging member may engage, the catch plate being also adapted, in being brought to position in engagement with said portion, to compress said spring, and the latter being adapted, when so compressed, to cause rotation of said latch plate about its axis for interengaging the catch and the catch engaging part of the latch.

5. A lock for trunks or the like comprising a base plate for attachment to one of the relatively movable parts of the trunk or the like, a latch member carried by the base plate and turnable about an axis perpendicular to the latter, a catch plate for attachment to the other of the relatively movable parts of the trunk or the like, a catch on said catch plate, a catch engaging part on said latch member, a spring of U form carried by said latch member located in the path of movement of the catch plate, said catch plate

being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member, and the spring being mounted movably on said latch member and adapted to be slidden endwise to a positively locking position by engaging the ward of a key in said notch and turning the key, substantially as described.

6. A lock for trunks or the like comprising a base plate for attachment to the receptacle part of the trunk or the like, a latch plate carried by said base plate, a pin perpendicular to said base plate, said latch plate being rotatably mounted upon said pin, a catch plate for attachment to the lid of the trunk or the like, a nose part on said catch plate, a catch mounted upon said nose part, a peripheral flange perpendicular to said latch plate and having a gap to admit entrance of said nose part within the flange of the latch plate, said latch plate having a slot provided with a constricted extension at one end, said latch plate having a small projection extending into the lower part of said slot, a handle lever on said latch plate, an abutment on said base plate, a U shaped plate spring slidingly disposed in said slot in said latch plate, the upper arm of said plate spring being extended beyond the end of the other arm and the extended end of said upper arm being bent inwardly toward the lower arm of the spring, said lower arm being provided with a notch adapted to be engaged by inserted key ward and its extremity being adapted to abut against said small projection in the lower part of the slot, a cover or shield for said latch plate said cover or shield having an opening for admission of said key ward and having an opening at the part thereof nearest to the catch plate and also a gap through which said handle lever passes, substantially as described.

7. A lock for trunks or the like comprising a base plate for attachment to one of the relatively movable parts of the trunk or the like, a pivot pin projecting perpendicularly from said base plate, a latch plate of peripherally flanged form rotatably mounted on said pin, the flange of the latch plate having a gap, a catch plate for attachment to the other of the relatively movable parts of the trunk or the like, a catch on said catch plate, adapted to be engaged by said latch plate flange, means for manually moving said latch plate to the release position, a U shaped plate spring mounted on said latch plate and having one arm adapted to be engaged by said catch plate when the trunk or the like is being closed, and an abutment on said base plate beneath which one arm of said spring is adapted to slip when the trunk or the like is being closed, substantially as described.

8. A lock for a trunk or the like according to claim 7 wherein said latch plate is a disc mounted centrally on said pivot pin and has its peripheral flange perpendicular to its main plane, and said means for manually moving said latch plate constituting a radially projecting handle on the latter.

9. A lock for a trunk or the like according to claim 7 wherein said latch plate comprises a disc having a segmentally disposed slot in which is mounted said U shaped plate spring, the latter projecting laterally from one surface of said disc and having one arm bearing on the bottom of said recess and the other adapted to engage under said abutment on the base plate when the disc is in the latching position.

10. A lock for a trunk or the like according to claim 7 wherein said latch plate comprises a disc having a segmentally disposed slot in which is mounted slidably said U shaped plate spring, the latter projecting laterally from one surface of said disc and having one arm bearing on the bottom of said recess and the other adapted to engage under said abutment on the base plate when the disc is in the latching position, the abutment engaging arm of said spring being longer than the other arm and being adapted on endwise sliding of the spring relative to the latch plate, to engage in a narrow extension of the slot in the latch plate substantially as described.

11. A lock for trunks or the like comprising a base plate for attachment to one of the relatively movable parts of the trunk or the like, a latch plate of flanged disc form mounted rotatably on said base plate, the flange of said latch plate having a gap, and the disc having a segmentally disposed slot, a U shaped plate spring mounted in said slot for endwise movement and having one arm longer than the other, the free end of said arm lying at one side of a radius extending from the center of rotation of the latch member the longer arm being bent inwardly towards the other arm at its free end, said plate spring projecting laterally from the said disc, an abutment on said base plate under which the longer arm of the U spring is adapted to slip when the latch plate is moved into the locking position said abutment having a curved forward surface for engagement with said longer arm of the spring, a catch plate for attachment to the other of the relatively movable parts of the trunk or the like, a projection on said catch plate over which said latch plate flange is adapted to engage after the projection has been passed through the gap in the flange of the latch plate to the interior thereof, and said catch plate having a nose adapted as it is moved towards said latch plate to engage and depress the longer arm of said U shaped spring, substantially as and for the purposes specified.

12. A lock for trunks or the like comprising a base plate for attachment to one of the movable parts of the trunk or the like, a latch member, means for mounting said latch member rotatably upon said base plate, a catch plate for attachment to the other of the movable parts of the trunk or the like, a catch on said catch plate, a catch engaging member on said latch member, a resilient arm carried by said latch member, and said arm having a bent end portion located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

13. A lock for trunks or the like comprising a part for attachment to one of the movable parts of the trunk, a part for attachment to the other movable part of the trunk, a catch on one lock part, a rotary catch engaging member on the other lock part adapted for engagement with said catch in the locking position, a U-shaped spring carried by said catch engaging member and adapted to be compressed by the direct action of said first named lock part, to tension the said

spring by imparting an angular movement thereto, the energy expended in imparting such angular movement to the spring serving to convert the compression of said U-shaped spring into a rotational movement of the catch engaging member and a consequent engagement of the latter with the catch.

14. A lock for trunks or the like comprising a base plate for attachment to one of the movable parts of the trunk or the like, a latch member having a peripheral flange provided with a gap, means for mounting said latch member rotatably upon said base plate, a nose on the other locking part, adapted to pass in a direction transverse to the axis of rotation of said latch member through said gap in the latch plate when in the unlocked position, a catch on said nose adapted for engagement with the flange of said latch member in the locked position, a spring member carried by the latch member and located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

15. A lock for trunks or the like comprising a base plate for attachment to one of the movable parts of the trunk or the like, a latch member, means for mounting said latch member rotatably upon said base plate, a catch plate for attachment to the other of the movable parts of the trunk or the like, a catch on said catch plate, a catch engaging member on said latch member, a U-shaped spring carried by said latch member and located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

16. A lock for trunks or the like comprising a base plate for attachment to one of the movable parts of the trunk or the like, a pivot pin projecting perpendicularly from said base plate, a latch plate having a peripheral gapped flange and rotatably mounted on said pin, a catch plate for attachment to the other of the movable parts of the trunk or the like, a catch on said catch plate adapted for engagement with the peripheral flange on said latch plate, a U-shaped plate spring mounted on said latch plate located in the path of movement of the catch plate, said catch plate being adapted to contact with the resilient arm during the closing movement of the lock at such a point as to apply to the latch member a turning moment, thereby automatically to effect the rotation of the latter on its axis for automatically interengaging the catch and the catch engaging member.

17. A lock for trunks or the like according to claim 16, characterized in that the U-shaped spring is mounted in a slot in said latch plate, said slot having an extension of reduced width, and that the U-shaped spring is adapted for displacement relatively to the latch plate, so that one extremity of the spring may be accommodated in said slot extension.

18. A lock for trunks or the like according to claim 11 wherein said slot has a narrow extension and the shorter arm of said U-shaped spring is provided with means to abut a key ward, the longer arm of said spring adapted to slip when the latch plate is moved into locking position, and, on the movement of the spring in one endwise direction, to engage in said narrow extension of the said slot in the latch plate, substantially as described.

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