E. TYDEN.

INDICATOR LOCK.

APPLICATION FILED SEPT. 29, 1913.

1,093,662. Patented Apr. 21, 1914.

3 SHEETS—SHEET 1.

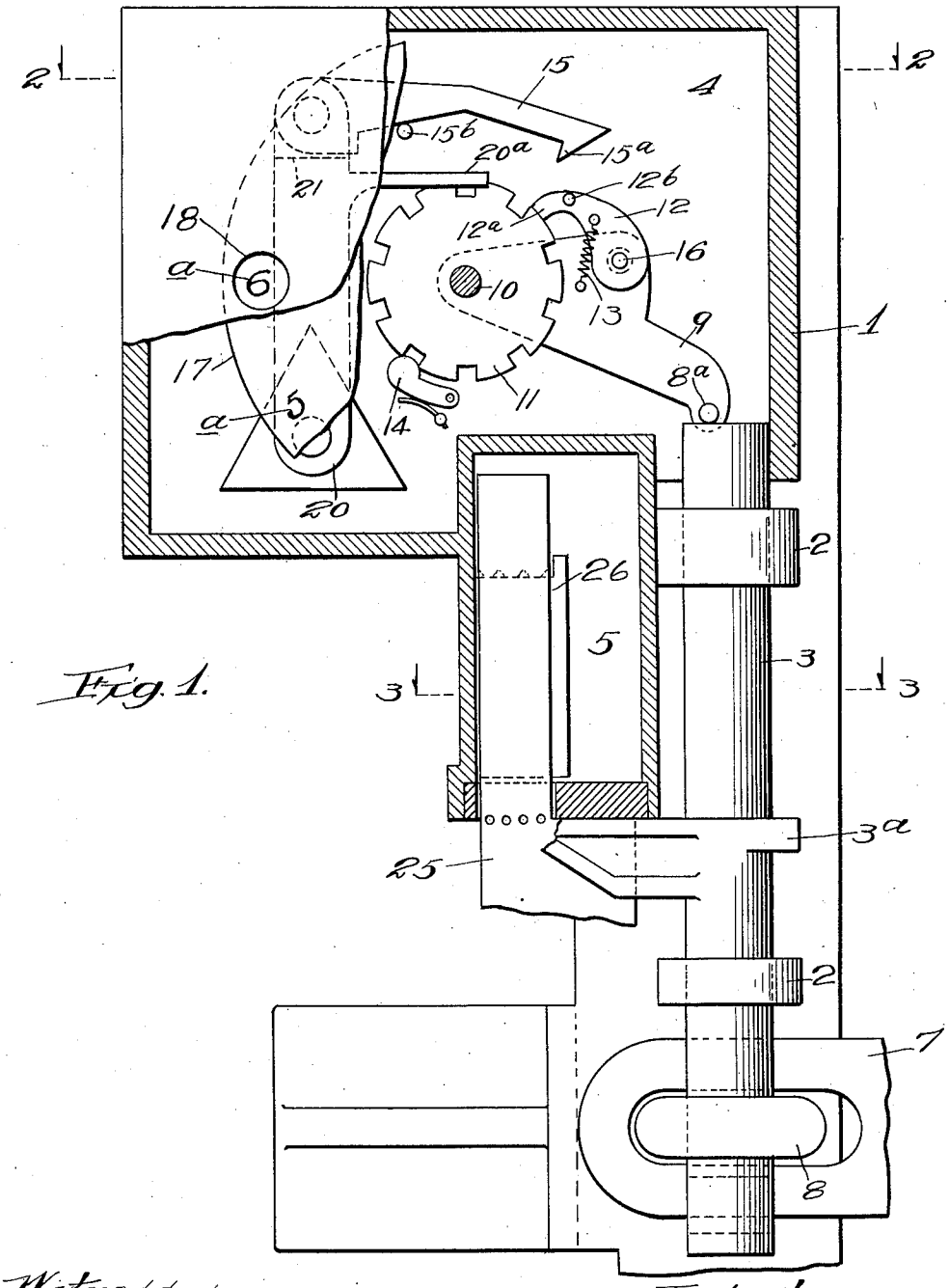


Fig. 1.

Witnesses:

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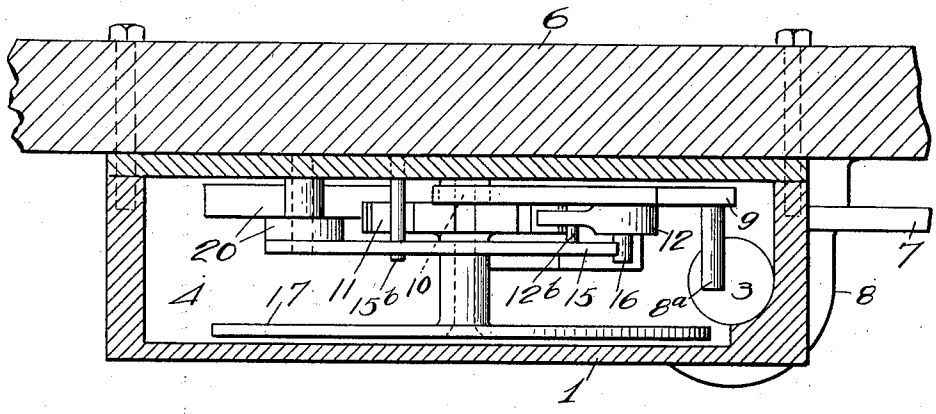


Fig. 2.

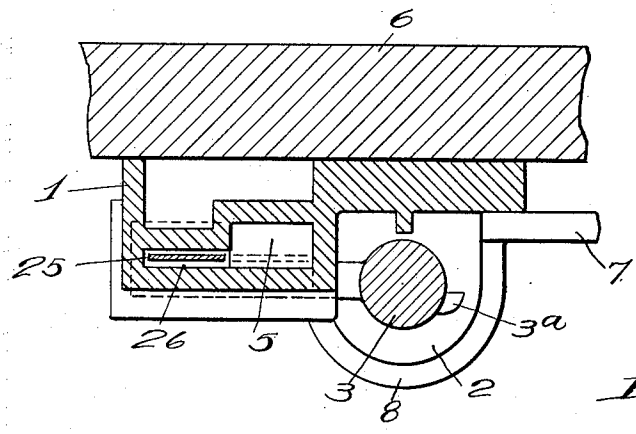


Fig. 3.

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3 SHEETS—SHEET 3.

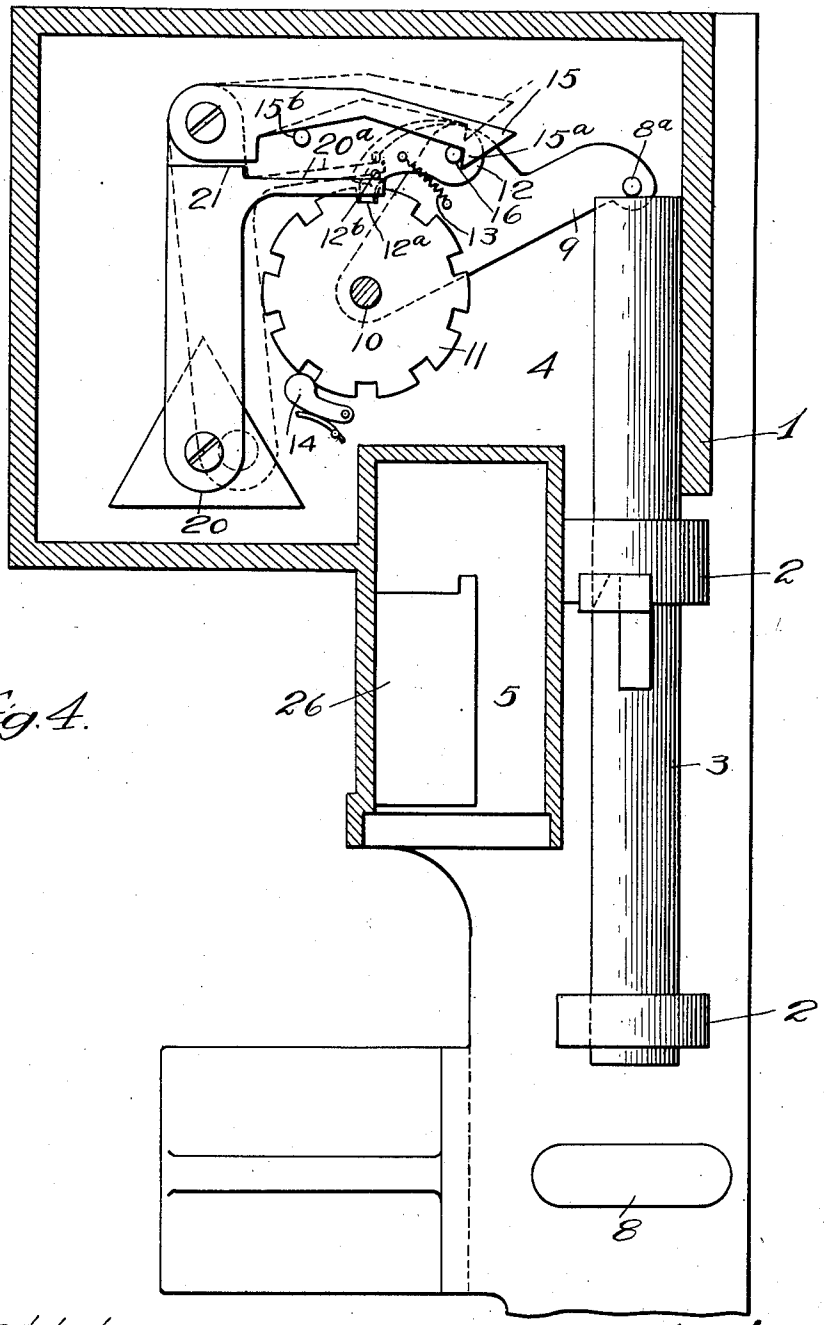


Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF HASTINGS, MICHIGAN.

INDICATOR-LOCK.

1,093,662. Specification of Letters Patent. Patented Apr. 21, 1914.

Original application filed August 23, 1912, Serial No. 716,595. Divided and this application filed September 29, 1913. Serial No. 792,336.

To all whom it may concern:

Be it known that I, EMIL TYDEN, a citizen of the United States, residing at Hastings, in the county of Barry and State of Michigan, have invented new and useful Improvements in Indicator-Locks, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This application is a division of my application No. 716,595, filed August 23, 1912.

The purpose of this invention is to provide an improved form of a lock with particular reference to the requirements of such a lock as applied to a railway car, adapted to afford means of locating the place or point in the history of the car at which it may have been unauthorizedly opened.

It consists in the elements and features of construction shown and described as set out in the claims.

In the drawings:—Figure 1 is a front elevation of a lock embodying this invention having the front portion of the casing in part broken away to disclose interior details. Fig. 2 is a detail section at the line, 2,—2, on Fig. 1. Fig. 3 is a section at the line, 3,—3, on Fig. 1. Fig. 4 is a view similar to Fig. 1, but having the entire front plate removed instead of merely broken away and showing the parts in unlocked position.

In the lock shown in the drawings there is provided a casing, 1, which comprises bearings, 2,—2, for a sliding locking member in the form of a bolt, 3; and which also comprises a chamber in which there is located certain indicating mechanism, hereinafter mentioned as the indicator chamber, 4, and a seal chamber, 5.

The device will first be described without reference to the seal, which may be used or omitted according to the requirements of the particular situation in which the lock is put in service.

The casing, 1, is designed to be mounted upon the body of a car or other receptacle to be protected by the lock; preferably, for reasons which will hereafter appear, it is not mounted upon any sliding element, as the door of the car, but upon a fixed portion which may be termed the body of the car, and which may be understood to be indicated by the timber piece indicated at 6, which represents the wall of the car body.

7 represents a hasp engaging the staple, 8, of the lock after the usual manner of securing sliding car doors, the bolt, 3, being adapted to be shot through the staple in front of the hasp as represented in Fig. 1. The said bolt, 3, has between the two journal bearings, 2,—2, a stop lug, 3^a, which is adapted to limit the throw of the bolt vertically by stopping upon said bearings at the upper and lower limits of its throw, respectively. Above the upper bearing, 2, said bolt extends up into the indicator chamber, 4, where its upper end is overhung by a pin, 8^a, on the end of a lever, 9, which is fulcrumed in the casing, this being effected by pivoting it on the stud axle, 10, of a notched wheel, 11, which is by means of the same shaft mounted in the casing for rotation about its axis.

12 is a dog pivoted on the lever, 9, having its nose, 12^a, adapted to engage the notches of the notched wheel, 11, said notches and said dog being square-cornered for the purpose of adapting the dog to lock the wheel, and the wheel for being locked, against rotation in either direction with respect to the dog. A light spring, 13, connects the dog with the lever for throwing the nose of the dog into the notches of the wheel. The parts are proportioned so that the throw of the bolt, 3, from locked to fully unlocked position is sufficient to first move the dog from the disengaged position shown in Fig. 1 into position for engaging with the nearest notch in advance of it of the wheel, 11, and then for rotating said wheel the distance from center to center of consecutive notches. A detent dog, 14, is suitably positioned with respect to the wheel to engage the notches so as to yieldingly hold the wheel at the positions in which said notches reach the detent dog at the limit of the wheel-actuating movement of the dog, 12. The position of the pivot of the dog, 12, on the lever, 9, is such with respect to the fulcrum of the lever and the circumference of the notched wheel that the retraction of the lever,—that is, its movement downward at the end which is encountered by the bolt,—will cause the dog to ride up out of any notch with which it may be engaged, notwithstanding the notch and nose of the dog are both square-cornered. Rigid with the notched wheel, 11, there is an indicator disk, 17, which revolves close behind the forward wall of the indicator chamber, 4. This disk has

upon its forward face a series of indicating characters such, for example, as a consecutive series of numerals, *a;* and in said forward wall of the indicator case there is an aperture, 18, positioned for disclosing one of said characters on the indicator disk when the latter is halted with such character registered with the aperture, as seen in Fig. 1.

The position of the characters on the disk is properly related to the position of the notches of the wheel, 11, and the position of the dog, 12, when advanced by the upthrust of the bolt, as seen in Fig. 4, so that said characters on the disk will at the halted positions of the notched wheel, register with the aperture successively as the wheel is rotated step by step by the bolt. Pivoted in the casing there is a latch, 15, which is lodged on a stud, 15^b, and whose hook nose, 15^a, when it is thus lodged is in position to engage the stud, 16, which forms the pivot of the dog, 12, (it being merely a matter of convenience to use this pivot stud rather than another which might be provided for this special purpose) when the lever, 9, has been lifted to its highest position by the throwing of the bolt to unlocked position, as seen in Fig. 4. The presence of the latch has the effect that when the bolt has once been withdrawn from locked to unlocked position and has in such action caused the dog, 12, to actuate the notched wheel, 11, one step, that is, the distance from one notch to the next notch of the wheel, further operation of the bolt,—that is, dropping it to closed position and again lifting it to open position,—will have no effect upon the devices in the indicator chamber until something occurs to release the lever, 9, and allow it to drop into position to be encountered by the unlocking movement of the bolt. When, therefore, a car equipped with this lock, after being loaded, is locked by dropping the bolt, the shipper, or party responsible for the contents of the car, will note the character, *a*, which is disclosed at the aperture, 18. The next time the bolt is raised to unlocked position, the indicator will be advanced one point and will show the next succeeding character through the aperture, 18, and the next inspection of the car will disclose the fact that it has been unlocked.

The purpose of the devices which will now be described, is to make it possible to locate the stage in the history of the car's movement after it was loaded and locked, at which such unlocking occurred.

Pivotally suspended within the chamber, 4, is a weighted pendulum device, 20. This pendulum device is most conveniently suspended upon the pivot of the latch, 15, and it has an arm, 20^a, which extends under a stud, 12^b, on the dog, 12, and a shoulder, 21, which is positioned for encountering the lower edge of said latch near its pivot when the pendulum device swings to the right, the said lower edge of the latch being cut away in an arc about its pivot at the left side so that the swinging of the pendulum to the left does not actuate the latch. The normal position of the parts when the pendulum is at rest, suspended directly from its pivot, is shown in Fig. 4, at which the lever, 9, is shown engaged by the latch, 15. It is to this position that the parts will be brought by the first unlocking movement of the bolt, and in this position they will be left when the bolt is dropped to locked position, because the latch engaged with the stud, 16, upholds the lever, 9. If while the parts are in this position, the car is moved on the track in the manner in which such movement will occur when it is attached to the train for moving it off from the side track on which it may be presumed to have been standing while loading, it will cause the pendulum device to be oscillated and to lift the dog, 12, by means of the arm, 20^a, out of engagement with the wheel, 11, and lift the latch, 15, disengaging it from the lever, 9, which will then drop back to the position shown in Fig. 1, withdrawing the dog, 12, from the notch with which it was engaged and back over the circumference of the wheel, 11, to the position shown in Fig. 1, leaving the wheel unchanged in position and the exposed character of the indicator disk unchanged; this will be the condition of the lock and indicator, therefore, during the subsequent movements of the car until and unless the bolt is operated for unlocking. But the first time after the car is moved from the side track and the pendulum device thereby oscillated, that the bolt is thus moved to unlocked position, such movement will cause the dog, 12, moved by the lever, 9, upon the up-thrust of the bolt, to advance the indicator disk one step and disclose through the aperture, 18, the next succeeding character. When this is done, the device will be locked as before, by the latch, 15, and subsequent repetitions of the unlocking movement of the bolt will produce no change in the indication. It will be seen, therefore, that the effect of this expedient is that after a car has been loaded and locked on the shipper's side track, before it has been moved therefrom by the usual methods, the car may be unlocked and locked again any number of times without causing any change in indication. But when the car, having once been attached to the train and pulled off the side track, if thereafter it is unlocked, the indicator will be advanced one step and the indication changed one point. It is presumed that such unwarranted unlocking of the car will occur only while the car is standing at rest on the track somewhere in its transit; and inspection of the train which is made at comparatively

short intervals,—usually at all division points or points where change is made in the train crew,—will disclose any changes in the indication of the locks which has occurred since the car was attached to the train, or since the last preceding inspection, and will thus fix the place along the line of travel at which the locking bolt was withdrawn as being at one of the stops made between the two points of inspection. Usually this, with other circumstances in the memory of the train crew as to the particular trip, will be sufficient to locate the station or stopping place at which the tampering with the car occurred.

It will be evident that if it were possible for one tampering with the car by repeated operations of the bolt to give the indicator device one complete revolution, and to leave it standing at the point at which it was before the tampering began, and thus conceal the evidence of tampering, and it is for this reason that the device is constructed as described, so as to make it necessary that the car should be moved and the pendulum device thereby actuated in order to make it possible for the operation of the bolt to change the indication.

The lock above described may be provided with a seal for the usual purpose for which such seals are provided, and in the drawings it is shown thus provided with a seal, 25, of sheet metal which is inserted into the housing, 26, which has coöperating features adapting the seal to prevent the unlocking movement of the bolt unless the seal is broken, as may be sufficiently understood from the drawings without further description.

The construction of the lock in respect to its coöperation with the seal, and of the seal, is contained in my application No. 716,595, of which this is a division, and does not constitute a part of the application contained in this invention.

I claim:—

1. A lock for cars comprising in combination with a casing adapted to be mounted on the car body, a locking member mounted in the casing for locking and unlocking movement, an indicator mounted in the casing for step-by-step movement to change its indication; a device by which one full movement of the locking member actuates the indicator one step; means for engaging the indicator-actuating device and positioned for such engagement when the latter is out of position for such actuation by the locking member; an oscillator mounted for oscillation by the bodily movement of the casing, and means by which the oscillator releases the indicator-actuating device.

2. A lock for cars comprising in combination with a casing adapted to be mounted on the car body, a locking bolt mounted for reciprocation in the casing for locking and unlocking, a dial mounted in the casing for step-by-step rotation; a device by which one unlocking movement of the bolt rotates the dial one step at the limit of such unlocking movement; means for engaging the dial-rotating device and positioned for such engagement when the latter is out of position for actuation by the bolt; an oscillating member mounted for oscillation by the bodily movement of the casing, and means by which its oscillation releases the dial-rotating device.

3. A lock for cars comprising a casing adapted to be mounted on the car body; a locking bolt mounted for reciprocation in the casing; an indicator mounted in the casing for step-by-step movement to change its indication; a device by which one complete reciprocation of the bolt actuates the indicator one step; means for engaging the indicator-actuating device to hold it out of position for such actuation; an oscillator mounted for oscillation by the bodily movement of the casing, and means by which said oscillator releases the indicator-actuating device.

4. A lock comprising in combination with a casing, a locking member mounted on the casing for locking and unlocking movement; an indicator comprising a toothed wheel mounted on the casing for step-by-step rotation to change the indication of the indicator; a dog engaging such toothed wheel for rotation of the latter in one direction; a lever which carries said dog extending into the path of the locking member for actuation thereby in the movement of the latter; means for engaging the lever to hold the dog out of position for engaging the wheel; an oscillator and means by which its oscillation releases the lever.

5. A lock comprising in combination with a casing, a locking member mounted in the casing for locking and unlocking movement; an indicator comprising a toothed wheel mounted in the casing for step-by-step movement to change the indication; a dog for engaging such toothed wheel for rotation of the latter in one direction, the dog and the wheel being correlatively formed to adapt the dog to lock the wheel against rotation relatively to the dog in either direction; a lever which carries the dog extended into the path of the locking member for actuation by the latter; a latch for engaging the lever to hold it out of position for actuation by said locking member; an oscillator and means by which, when oscillated, it releases the latch and disengages the dog from the wheel.

6. A lock comprising in combination with a casing, a locking member mounted in the casing for locking and unlocking movement; an indicator comprising a toothed wheel

mounted in the casing for step-by-step rotation to change the indication; a dog to engage the wheel in one direction adapted when engaged to lock the wheel positively against rotation relatively to the dog in either direction; a lever by which the dog is carried for its wheel-actuating movement, said lever being extended into the path of the locking member for actuation thereby; a latch which engages the lever to hold it out of position for actuation by the locking member; a pendulous member mounted in the case for oscillation; means by which the pendulous member, when oscillated, releases the latch, said pendulous member having an arm which engages the dog to disengage it from the toothed wheel in the latch-releasing movement of said pendulous member.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 24th day of September, 1913.

EMIL TYDEN.

Witnesses:
ROBT. N. BURTON,
EDNA M. MACINTOSH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."