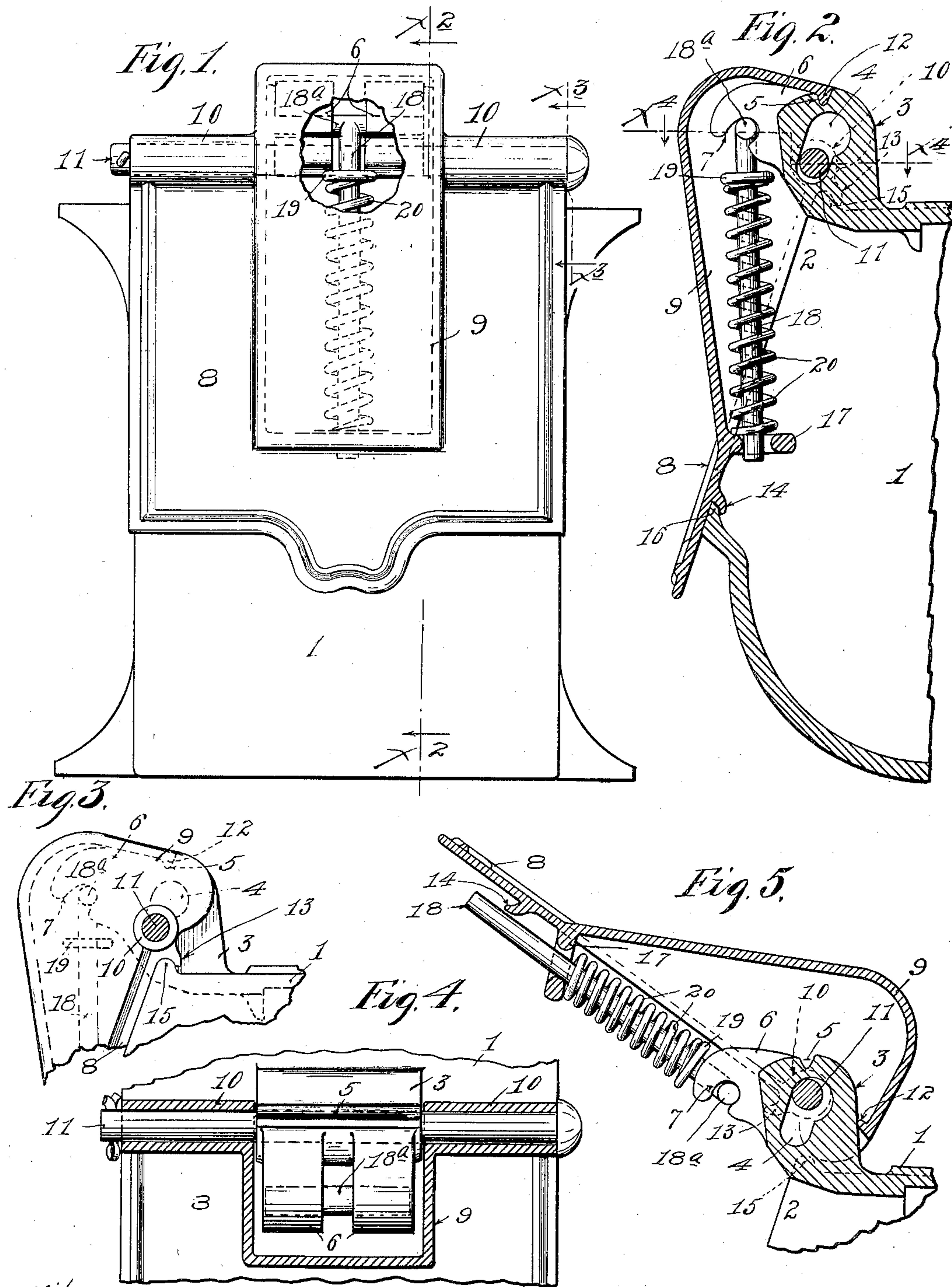


No. 803,155.

PATENTED OCT. 31, 1905.

W. G. DUNHAM.
CAR AXLE BOX LID.
APPLICATION FILED JULY 29, 1904.



Witnesses.
H. D. Kilgore
E. W. Jeppesen.

Inventor:
W. G. Dunham.
By his Attorneys,
William M. Merchant

UNITED STATES PATENT OFFICE.

WILLIAM G. DUNHAM, OF CHICAGO, ILLINOIS, ASSIGNOR TO ALVIN C. McCORD, OF CHICAGO, ILLINOIS.

CAR-AXLE-BOX LID.

No. 803,155

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed July 29, 1904. Serial No. 218,723.

To all whom it may concern:

Be it known that I, WILLIAM G. DUNHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Axle-Box Lids; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to car-axle-box lids, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation with some parts broken away, illustrating my invention as applied to a car-axle box of standard construction. Fig. 2 is a vertical section taken transversely of the car on the line $x^2 x^2$ of Fig. 1, some parts being broken away. Fig. 3 is a fragmentary detail in section on the line $x^3 x^3$ of Fig. 1. Fig. 4 is a fragmentary detail, in horizontal section, taken on the irregular line $x^4 x^4$ of Fig. 2; and Fig. 5 is a view corresponding to Fig. 2, but showing the lid in a raised position.

The numeral 1 indicates an axle-box of standard construction and which at its upper portion adjacent to its mouth 2 is formed with a heavy hinge-lug 3, having a vertically-elongated bolt-passage 4 and a detent-notch 5. A pair of laterally-spaced bearing-lugs 6 project outward from the hinge-lug 3 and are preferably formed with seats 7, for a purpose which will presently appear.

The lid 8, which is preferably constructed of malleable iron, is formed with a central pocket 9, that bulges outward and upward. On the opposite sides of the pocket 9 the lid 8 is formed with hinge-lugs 10, through which and the slot 4 of the hinge-lug 3 a hinge-bolt 11 is passed to pivotally connect the lid to the box, with freedom for a limited vertical-sliding movement. In this preferred construction the upper edge of the pocket 9 terminates in a lock-flange 12. The hinge-lugs 10 are formed with depending lock-flanges 13, and the lower portion of the lid is formed on its inner face with a depending lock-flange 14.

The said lock-flanges are so disposed that when the lid is in a closed position the lock-flange 12 will engage with the detent-notch 5 of the hinge-lug 3, the lock-flanges 13 will engage with ribs 15 on the top of the box 1, and the lock-flange 14 will engage with a rib 16, formed on the lower marginal portion of the lid-opening 2.

The lid 8 on its inner face, and preferably at the lower extremity of the pocket 9, has an integrally cast or otherwise rigidly-secured perforated bearing-lug 17. The stem of a T-bolt 18 works loosely through the said perforated lug 17, with its transversely-extended head 18^a pivotally mounted in the seats 7 of the bearing-lugs 6. This bolt 18 is preferably formed near its upper end with a fixed collar 19. A coiled spring 20 surrounds the stem of the bolt 18 and is compressed between the collar 19 thereof and the bearing-lug 17 of the lid and exerts a pressure tending to hold the lid in a closed position, as shown in Fig. 2, and against upward sliding and pivotal movements.

By reference to Fig. 2 it will be seen that when the lid is closed the axial line of thrust or endwise strain of the spring 20 transversely intersects the mouth of the box at an oblique angle between its uppermost and lowermost lid-engaging surfaces, and that the said spring, through the bolt 18, reacts at its upper end against the bearing-lugs 6 at a point outward of the axis of the hinge-bolt 11, and that the said spring at its lower end reacts against the intermediate portion of the lid. The spring 20 and bolt 18 make up what is herein designated, broadly, as a "spring thrust device." As is evident, the said spring thrust device exerts a downward pressure on the lid, tending to pivotally close the same and to slide the same downward on the lid-engaging surface of the mouth 2 of the box, and to thereby engage and tend to maintain engagement, respectively, between the lock-flanges 12 13 14 and the detent 5 and lock-ribs 15 and 16. It is further evident that when the lock-flange 14 is engaged with the rib 16 the latter serves as a fulcrum for the lower portion of the lid, so that the said thrust device when the lid is closed exerts a force pressing the upper portion of the lid, as well as the lower portion thereof, inward and against the mouth of the box. In fact, the flange 14 is not essential to this fulcruming action of the lid, because

whenever the lower portion of the lid engages the lower portion of the mouth of the box it becomes a fulcrum at such point of contact and the spring thrust device presses the upper portion of the lid against the upper portion of said box-mouth. By this simple means the lid is tightly pressed at all points against the mouth of the box, and a tight joint is thereby insured.

To open the lid constructed as illustrated in the drawings, it is necessary first to slide the same vertically upward far enough to disengage the lock-flanges 12, 13, and 14, respectively, from the detent 5 and lock-ribs 15 and 16, and this being done the lid may be turned pivotally upward into the position shown in Fig. 5, under which movement the hinge-bolt 11 moves upward in the slot 4 of the hinge-lug 3, and the lock-flange 12 rides over the back of the said hinge-lug. It is also important to note that in the open position of the lid, as illustrated in Fig. 5, the axis or line of strain of the thrust device is below the axis of the hinge-bolt 11, so that the said thrust device at such time exerts a force tending to hold the lid open. Stated in another way, the thrust device is so applied and the lid has such movement that in moving from an open position to a closed position, or vice versa, the spring thrust device is moved from one side to the other of a dead-center and changes its angle both with respect to the lid and to the mouth of the box. The said thrust device, it will be further noted, in all positions of the lid acts with a direct endwise strain or thrust, as distinguished from the action of a leaf-spring secured at one end and having a camming action at its other end on a fixed base of reaction, as hitherto frequently employed in connection with car-axle-box lids.

To close the lid, it is only necessary to move the same from the position indicated in Fig. 5 downward far enough to carry the axis of the thrust device below its dead-center with respect to a line drawn through the axis of the hinge-bolt 11 and the axis of the bolt-head 18^a, whereupon the said thrust device will automatically throw the lid into a closed position interlocked with the box, as already described.

Under the pivotal closing movement of the lid the lock-flange 12 rides over the rounded portion of the hinge-lug 3 and holds the lid upward far enough to cause the lock-flanges 13 and 14 to clear the lock-ribs 15 and 16, respectively. When, however, the lid is seated against the mouth of the box, the lock-flange 12 drops into the detent-notch 5, and the lock-flanges 13 and 14 engage with the lock-ribs 15 and 16 under a downward-sliding movement of the lid, imparted thereto by the spring 20.

The drawings illustrate what I at present believe to be the preferred form of the device. It will, however, be understood that I do not

limit myself to the detail construction illustrated in the drawings; but, on the contrary, the device is capable of many modifications as to its details of construction and arrangement of parts within the scope of my invention, as herein set forth and claimed.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with an axle-box, and a lid hinged thereto, of a spring thrust device reacting against the lid and against a seat in a fixed base of resistance outward of the axis of the lid-hinge, said spring thrust device having an angular oscillatory movement both in respect to the lid and the box, and so disposed that its line of force intersects the mouth of the box, when the lid is closed, substantially as described.

2. The combination with an axle-box, and a lid hinged thereto, of a spring thrust device reacting against the lid and against a seat in a fixed base of resistance outward of the axis of the lid-hinge, said spring thrust device having an angular oscillatory movement both in respect to the lid and the box, and so disposed that its line of force obliquely intersects the mouth of the box, when said lid is closed, said lid and its support being provided with means whereby movement of the lid carries said thrust device from one side to the other of a dead-center, substantially as described.

3. The combination with an axle-box, and a lid hinged thereto, with freedom for pivotal and limited sliding movements, said lid having interlocking engagement with said box under its sliding movement, of a yielding thrust device arranged to react against the lid and against a fixed base of resistance outward of the axis of the lid-hinge, said thrust device having an angular movement both in respect to the lid and the box, and so disposed that its line of force obliquely intersects the mouth of the box, when the lid is closed, said thrust device acting with a direct endwise thrust to impart pivotal closing movements and sliding interlocking movements to said lid, substantially as described.

4. The combination with an axle-box, and a lid hinged thereto, with freedom for pivotal and limited sliding movements, said lid having interlocking engagement with said box, under its sliding movement, of a yielding thrust device arranged to react against the lid and against a seat in a fixed base of resistance outward of the axis of the lid-hinge, said spring thrust device having angular movements both in respect to the lid and the box, and so disposed that its line of force obliquely intersects the mouth of the box, when the lid is closed, said lid and its support being provided with means whereby movement of the lid carries said thrust device from one side to the other of a dead-center, substantially as described.

5. The combination with an axle-box, hav-

ing a hinge-lug formed with an outwardly-projecting bearing-lug, of a lid hinged to said hinge-lug, with freedom for pivotal and interlocking sliding movements, and having, on
5 its inner face, an inwardly-projecting bearing-lug, a spring thrust device directly compressed between the bearing-lug of said box and the bearing-lug of said lid, with its line of strain intersecting the mouth of the box, when the
10 lid is closed, said thrust device having an angular movement both in respect to the lid and the box, under pivotal movements of the lid, substantially as described.

6. The combination with an axle-box having
15 a hinge-lug formed with a pair of outwardly-projecting bearing-lugs, of a lid hinged to said hinge-lug, with freedom for pivotal and limited sliding movements, said lid and

box having parts which interlock under sliding movements of the lid, and said lid having
20 an inwardly-projecting bearing-lug at its intermediate portion, a bolt working loosely through the bearing-lug of said lid and having a transversely-extended head pivotally
25 mounted in seats formed in the bearing-lugs of said box, and a coiled thrust-spring surrounding said bolt and compressed between the bearing-lug of said lid and a bearing on said bolt, substantially as described.

In testimony whereof I affix my signature in
30 presence of two witnesses.

WILLIAM G. DUNHAM.

Witnesses:

EDWARD DENEGRÉ,
MARY E. BLADE.