J. N. SMITH.
Car-Axle Box.

No. 212,756. Patented Feb. 25, 1879.

Fig. 1.

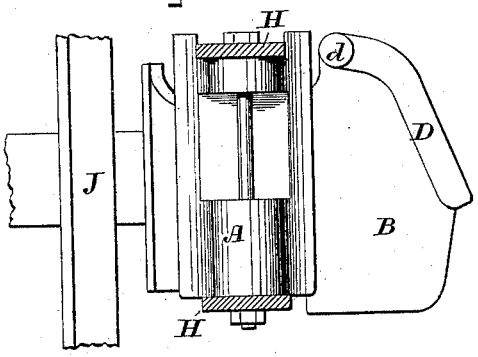


Fig. 2.

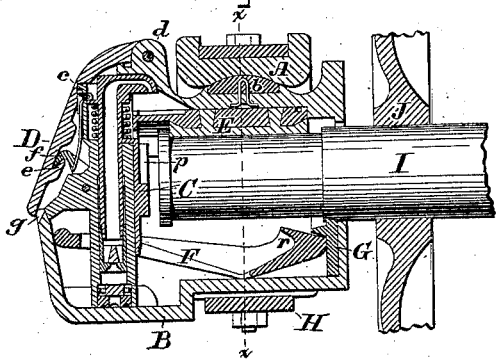
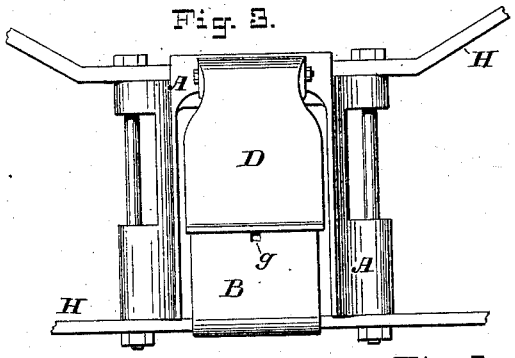


Fig. 3.



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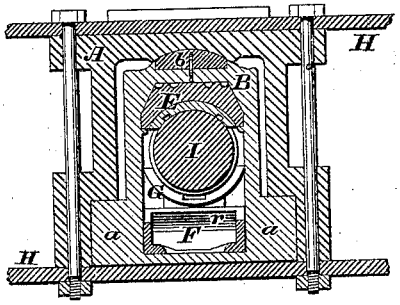


Fig. 5.

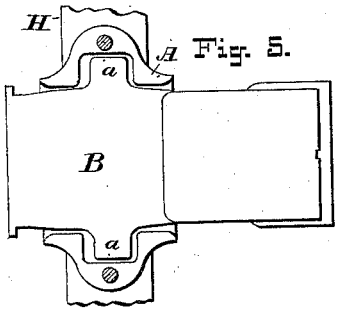


Fig. 6.

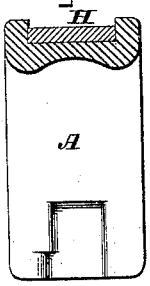


Fig. 7.

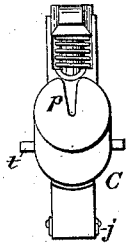


Fig. 8.

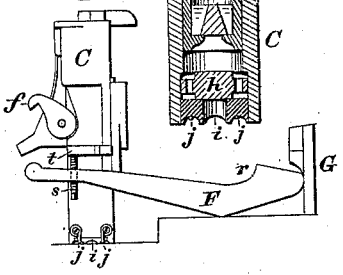


Fig. 9.

Fig. 10.

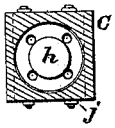


Fig. 11.

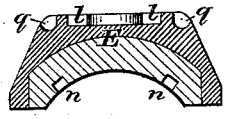


Fig. 12.

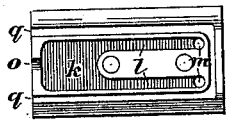
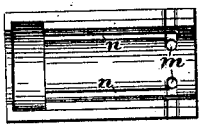


Fig. 13.



ATTEST:

Leo. H. Fraser
Joseph Goodrich

INVENTOR:

Joseph Nottingham Smith.
By his Attorneys,
Burke, Fraser & Connett

UNITED STATES PATENT OFFICE.

JOSEPH NOTTINGHAM SMITH, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN CAR-AXLE BOXES.

Specification forming part of Letters Patent No. **212,756**, dated February 25, 1879; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, JOSEPH NOTTINGHAM SMITH, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Axle-Boxes for Railway-Carriages, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same.

This invention relates in part to the construction and arrangement of the box-housing and its adaptation to the saddle, and in part to the oiling apparatus whereby the journal is lubricated, all of which will be more fully and definitely hereinafter set forth.

In the drawings, Figure 1 is a side view of the axle-box, showing it in position on the journal. Fig. 2 is a vertical mid-section of the same, taken in a plane parallel with the axle-journal. Fig. 3 is an end or front elevation of the box. Fig. 4 is a transverse section of the box and journal, taken in the plane of the line *x x* in Fig. 2. Fig. 5 is a plan of the bottom of the box and saddle. Fig. 6 is a sectional view of the saddle. Figs. 7, 8, 9, and 10 are detached elevation and sectional views of the oiling apparatus. Figs. 11, 12, 13 are, respectively, a sectional view and plan views of the cap which rests upon the journal.

The box is herein shown as adapted to skeleton trucks; but many of the novel features are as well adapted to be used in pedestals of special or common forms.

A is the saddle, which is provided with bored or tubular lugs to receive bolts which secure it between the straps of the truss. The lower lugs of the saddle are recessed to receive lugs *a a* cast on the housing B, while a spherical segment, *b*, on the latter rests in a corresponding concave or hollow in the roof-plate of the saddle.

A ball-and-socket support is shown in a former patent granted to me, and I make no broad claim to it here; but in that case the ball was cast with and formed a part of the housing. This construction is objectionable, inasmuch as the ball should be chilled to adapt it to the end in view, and this, from the unequal strains produced, hazards the integrity of the housing.

In my present invention the spherical segment *b* is cast separately, of chilled iron, and adapted to fit in a recess or socket in the roof of the housing. It is attached by means of a wire staple, preferably cast in the segment, the ends of which pass through holes in the roof of the housing, where they are clinched on the inside. The lugs *a a*, on the lower edge of the housing, do not fit snugly into the recesses in the saddle, but have considerable play, as indicated on Fig. 5, so as to permit a moderate degree of lateral swing to the car. They serve, however, to check too much movement.

The stopping-bar C, which is hollowed to receive the vibrating oil-pump shown in a former patent granted to me, rests between lugs at the bottom of the housing, and the upper corner engages a notch or recess, *c*, in the door D of the same. To add further support to the stopping-bar, it is provided with a lug at the back, which bears against the beveled front of the housing, just below the door-opening. The bar is prevented from moving in the other direction by the cap E, which is interposed between it and a shoulder formed in the roof of the housing, and by the upper end of the bar resting against lugs on the side walls. The door D is hinged above at *d*, and is provided with a catch, *e*, on its inner face, which engages, when the door is shut, a spring-hook, *f*, pivoted preferably to the stopping-bar. A groove at *g* in the edge of the opening below the door permits the insertion of a slender rod, by which the hook may be lifted and the door released.

Improvements in the oil-pump relate, chiefly, to the lower valve in the chambered stopping-bar, and to the method of securing a bottom to said chamber.

Referring to Figs. 9 and 10, it will be seen that the chamber is enlarged for the reception of the valve *h*.

The bottom *i* is a plate with a central opening and grooves across its under side. These latter serve to admit oil from the well to the pump-chamber, and to receive the fastening-wires *j j*. These wires extend across the plate, and are secured by wrapping around pins or lugs on the sides of the chamber, as indicated in Figs. 7, 8, and 10.

The valve *h* is a disk, which fits somewhat

loosely into the enlarged chamber, the shoulder formed by the enlargement limiting its lift. This valve has a hub or boss and holes or apertures in its thinned margin around the boss, (see Fig. 10,) which do not coincide, when the valve is seated, with the aperture in the plate *i;* but when the valve is lifted the oil may pass up through both, as well as around the valve.

Referring to Figs. 11, 12, and 13, the two latter show, respectively, the upper and under sides of the bearing-cap E, which rests upon the journal.

In the shell of the cap is formed a recess, *k*, into which the oil from the pump falls. From this extends a channel or channels, *l*, which lead the oil to openings *m*, which communicate with a channel or channels, *n*, in the lining of the bearing. These channels are arranged in the flanks of cap, and not in the crown, and they open out at the end of the cap adjacent to the stopping-bar C.

By this arrangement the oil is first delivered to the journal at the inner or back end, and thence finds its way to the front again.

At *o* is a notch or outlet from the recess *k*, which permits some portion of the oil to find its way down the groove *p* in the stopping-bar, (see Fig. 7,) and onto the face of the axle-button. Should any oil escape from the recess or channels in the cap, it will find its way into an overflow-channel, *q*, which will lead it to the front.

The head of the vibrating pump is housed on three sides by the chambered stopping-bar C, and its nozzle or spout vibrates between two adjacent lugs on the side walls. This prevents the oil from splashing and flying back of the pump, and insures the spray all re-entering the pump.

The spout is arranged to direct the jet forward, so as to spatter as little as possible.

F is a lever-shoe, the inner end of which catches underneath a flange on a dust-excluding half-collar, G, in such a manner as to keep the latter snugly pressed against the re-enforce on the axle.

The outer or front end of the shoe is adapted to engage the beveled front of the housing, so as to drive the shoe to the back, and thus keep the collar G pressed closely against the back wall of the housing.

By reference to Fig. 8, it will be seen that the nose of the shoe is rounded and fitted to engage the hollowed fillet on the collar. This collar is adapted to catch and return to the well such oil as may be thrown or collect upon the re-enforce.

The shoe F is hollowed out and provided with an overhanging lip, *r*. The purpose of this is to catch, deflect, and throw back the oil to the well should it be driven inward by the lateral surging of the car.

The upward play of the front end of the shoe is limited by a suitable stop or shoulder on the bar C. For this purpose I provide an adjustable pin, *s*, suitably secured in a hole or cavity in the shoe, the upper end of which abuts against a shoulder, *t*, on the stopping-bar when the outer end of the shoe is raised. This pin may be screw-threaded, or it may be secured in place by a set-screw, or in any other good or convenient way.

In addition to the collar G, I contemplate using a dust-excluding device located outside of the housing, similar to one described in a former patent granted to me.

H H are the bars or straps of the truss. I is the car-axle, and J J represent the wheels.

I claim—

1. The saddle A, provided with bored or tubular lugs, and adapted to be bolted between the straps H H of the truss, and provided with a recess at the top to receive a spherical segment, and recesses in its lower lugs to receive lugs on the housing B, all arranged substantially as herein set forth.

2. The combination of the saddle A, provided with a hollow or recess in its roof or top and recesses in its sides or lugs at the bottom, with the housing B, provided with a chilled or hardened segment, *b*, fixed in a recess in its roof, and lugs *a a* on its sides, to engage the recesses or cavities in the saddle, and the straps or plates H H, bolted or secured to the saddle, substantially as shown.

3. The removably-attached hardened spherical segment *b*, mounted upon the roof of the housing, substantially as and for the purpose set forth.

4. The housing provided with a recess in its roof, and a chilled or hardened spherical segment fixed into said recess and attached to said housing, substantially as set forth.

5. The combination of the door D, hinged at its upper edge, and adapted to close by gravity, the catch *e*, formed on or attached to the back of the door, the spring-hook *f*, hinged to some interior part and adapted to engage the catch, and the housing or door provided with a groove or channel, *g*, whereby a rod may be inserted to lift the hook *f* and disengage it, substantially as set forth.

6. The stopping-bar C, provided with an angular upper corner and a lug or brace on the back to bear against the housing, in combination with the housing and the door D, provided with a notch or recess, *c*, all substantially as and for the purpose set forth.

7. The chambered bar C, arranged to extend to the top of the vibrating pump, and to house its top on three sides, substantially as set forth.

8. The chambered bar or post C, provided with an apertured bottom, *i*, cross fluted or grooved to admit the oil, and attached to the chamber by means of wires *j j*, substantially as set forth.

9. In combination with the vibrating plunger and cylindrically-chambered bar C, the disk-valve *h*, arranged to be guided in its lift by the walls of the chamber, and having a thickened boss and apertures in its thinned margin, and the bottom *i*, having a central

aperture adapted to be closed by the boss of the valve, all as herein set forth.

10. The bearing-cap E, provided with grooves *n n* in the flanks of its inner face, opening out at the front end of the cap, and communicating with oil-holes *m m* at the back or inner end only of the cap, whereby a continuous current of oil or other lubricating-fluid is kept up through said grooves or channels and along the journal, substantially as set forth.

11. The cap E, provided with an overflow-channel, *q*, arranged substantially as set forth.

12. The lever-shoe F, constructed and arranged to operate substantially as set forth.

13. The lever-shoe F, hollowed out and provided with a lip, *r*, in combination with the half-collar G and the housing B, the shoe being arranged to hold the collar up to the re-enforce with a yielding pressure by the excess of weight at its outer end, substantially as set forth.

14. The lever-shoe F, arranged to take under and press against the axle a dust-excluding half-collar, G, by the excess of weight of its outer end, provided with an adjustable stop-pin, *s*, adapted to abut against a stationary shoulder, *t*, to limit its vertical play, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH NOTTINGHAM SMITH.

Witnesses:
ARTHUR C. FRASER,
HENRY CONNETT.