2 Sheets—Sheet 1.

# J. N. SMITH.

## Car-Axle Box.

**No. 208,993.** **Patented Oct. 15, 1878.**

*Fig.1.*

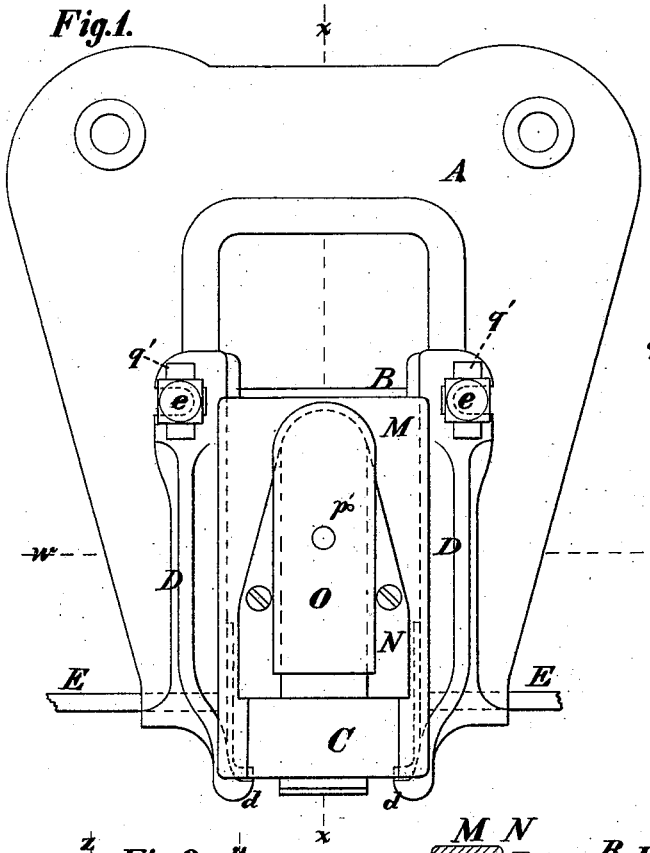



*Fig.2.*

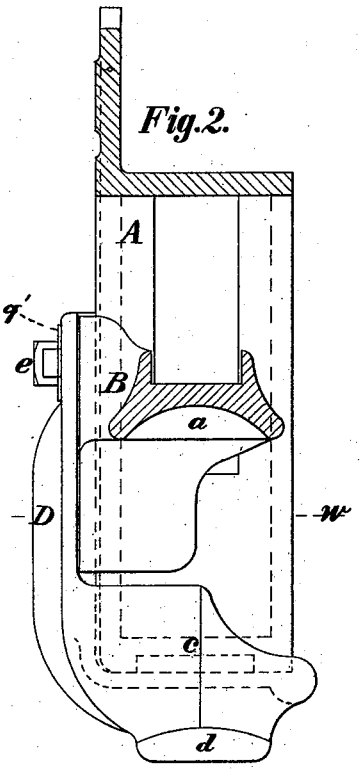



*Fig.3.*

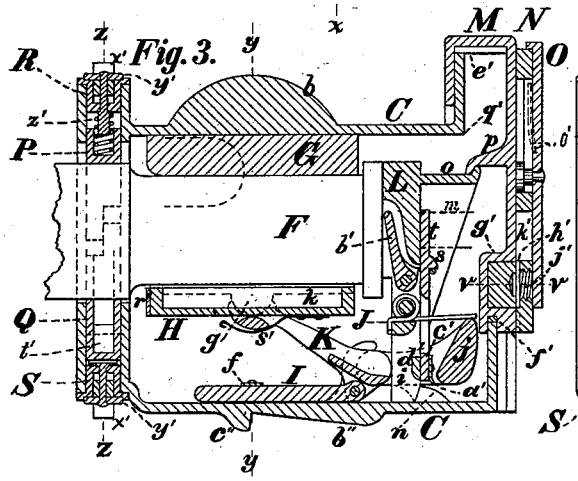



*Fig.4.*

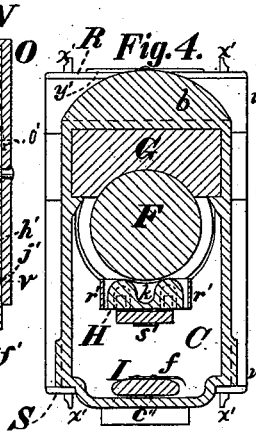
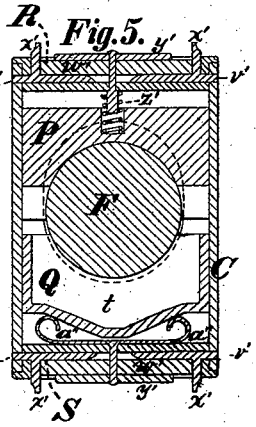



*Fig.5.*

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Car-Axle Box.

No. 208,993. Patented Oct. 15, 1878.

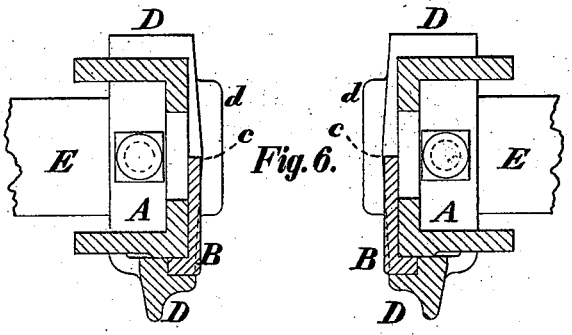



Fig. 6.



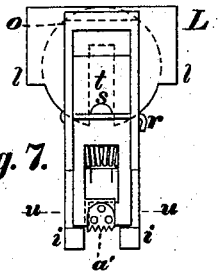




Fig. 7.


Fig. 9.

Fig. 8.

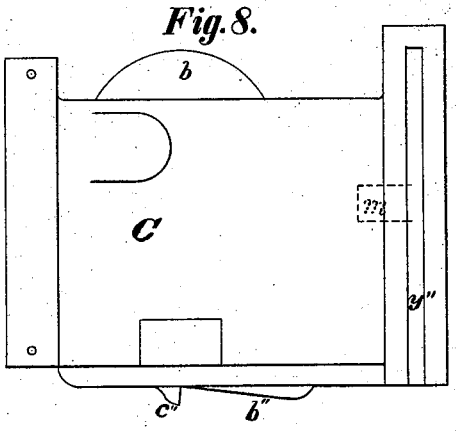



Fig. 10.

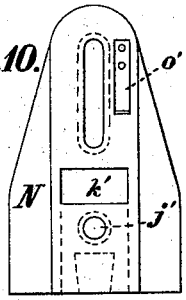



Fig. 11.

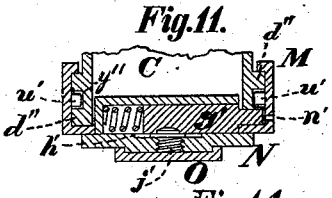



Fig. 12.

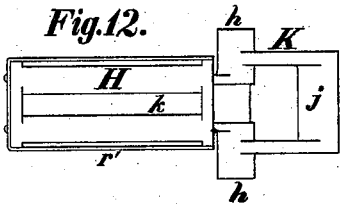



Fig. 13.

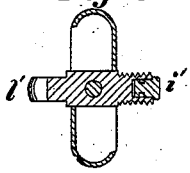
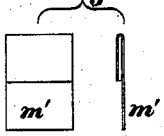



Fig. 14.

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# UNITED STATES PATENT OFFICE.

J. NOTTINGHAM SMITH, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN CAR-AXLE BOXES.

Specification forming part of Letters Patent No. **208,993**, dated October 15, 1878; application filed October 30, 1875.

*To all whom it may concern:*

Be it known that I, J. NOTTINGHAM SMITH, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain Improvements in Car-Axle Boxes and Oilers, of which the following is a specification:

My invention relates to that kind or class of axle-boxes and oilers in which the housing and its contents are, by means of a ball-and-socket joint, permitted to follow and conform to the motions and positions of the axle, and thus to avoid the cramping of the bearings and their consequent heating and cutting.

My invention consists in certain modifications in the form and arrangement of the housing and the brackets which secure the saddle or slide to the pedestal, whereby I am enabled to make the said brackets stronger, without making them so large as to prevent their application to the pedestals now in use; also, in an improved lock-washer, in combination with the pedestal and brackets and their connecting-bolts, to prevent the bolts from coming out.

My invention consists, further, in certain modifications and improvements in the details of construction, whereby I am enabled to provide more effectually for the removal and insertion of the housing; for the oiling of the journal-bearing and the stopping-bar; for the exclusion of dust from the interior of the housing; and for effectually securing, locking, and sealing the door or lid to the housing, all of which are hereinafter described.

In the accompanying drawings, which illustrate an axle-box and oiler embodying my invention, Figure 1 is a front elevation of a pedestal with my axle-box and oiler properly attached thereto. Fig. 2 is a vertical section of the pedestal, slide, and brackets on the line *x x*, Fig. 1; and Fig. 3 is a similar section of the housing and contents. Fig. 4 is a vertical cross-section of the housing and contents on the line *y y*, Fig. 3; and Fig. 5 is a similar section on the line *z z*. Fig. 6 is a horizontal section of the pedestal, slide, and brackets on the line *w w*, Figs. 1 and 2. Fig. 7 is a front elevation, in detail; and Fig. 9 is a cross-section on the line *u u* of the stopping-bar. Fig. 8 is a side elevation, in detail, of the housing. Fig. 10 is a front elevation, in detail, of the devices for locking and sealing the door. Fig. 11 is a cross-section, in detail, of the door and locking and sealing devices on the line *v v*, Fig. 3. Fig. 12 is a top view of the oiler-pad. Fig. 13 is a central section, parallel to one of the sides, of the key or tool for sealing and unsealing the door-lock; and Fig. 14 is a side and an edge view, in detail, of the seal and stamp or ticket used in sealing the door.

A is a pedestal, of the ordinary form, as I intend to apply my axle-box and oiler to the pedestals now in use. B is the sliding carriage or saddle, in which a socket, *a*, is formed to receive the ball *b* on the housing C. The saddle B is held in place and is permitted to slide up and down by the brackets D D, which are secured to the pedestal by the bolts *e e*. The bolts are prevented from unscrewing and coming out by the stop-washer *q'*, one point of which is turned down on the bracket and another point is turned up on the bolt-head. The brackets D D extend in between the housing and the pedestal, at the lower end of the latter, and their faces which come next to the housing are thicker in the middle, as seen at *c*, in order to permit the housing to swing on a vertical axis between these brackets.

Heretofore these swells have been formed on the sides of the housing, and bore either on the flat inner faces of the pedestal or on the depending sides of the saddle B; but the present construction is cheaper, easier made and adjusted, and the parts are stronger than in the construction heretofore patented or used.

The stirrup-strap E E is cut away between the jaws of the pedestal A to let in the brackets D D, which are carried down to give sufficient depth for the housing C and saddle B, and their lower ends are turned inward, forming hooks *d d*, to keep the housing in the pedestal.

By means of this construction the brackets D D and housing C may be removed from the pedestal without disturbing the stirrup-strap E, simply by removing the two bolts *e e*.

The stirrup-strap also is left in the same position as heretofore with reference to the other parts of the truck, and there is therefore no necessity for making any changes in the truck to admit my improved housing other than the cutting away of the stirrup-strap, as shown, and the drilling of two holes for the bolts *e e*, which secure the brackets D D.

The axle F enters the housing C, and the

bearing G, which supports the weight of the car, fits into the housing and rests upon the axle in the usual manner. The bottom of the housing is filled with oil, which is conveyed to the journal and bearing G by an endless wick passing around the oiling-pad H, and also around the jumper or feeding-clack I. This clack is pivoted or hinged to the frame K, and has on it a spur, *f*, which catches into one side of the wick when the clack is thrown up by the jolting of the car, and the weight of the clack is thus made to draw the wick around the pad. By this means the wick is drawn through the oil and carried directly to the pad, whereby an ample supply of oil is insured to the running surface or journal. The spring *r'* is open at the ends to admit the wick, and serves to hold the wick in place. The pad H is hung loosely on the bearing *g*, so as to be free to adapt itself to the motion and position of the journal, while it is held up to the journal by means of the spring J, which bears on one end of the vibrating frame K, on the other end of which is the bearing *g*. The spring *s'* keeps the pad H on its bearing *g*, and insures its coming out with the frame K when the latter is removed from the housing. The frame K is hung on trunnions *h h*, which are inserted into half-sockets formed in the inner surfaces of the side walls of the housing, and are held in their bearings by the legs *i i* of the stopping-bar L. A counterweight, *j*, is cast with the frame K, to partially balance the combined weight of the other end of the frame K, the pad H, the jumper I, and the wick loaded with oil. In the pad H a cup or cavity *k* is made to receive a solvent, such as potash, for example, which serves to dissolve any gum which may form and collect on the wick.

The stopping-bar L is inserted by bringing its top up to a level with the inner surface of the top wall of the housing, and pushing it in until its face strikes the end of the axle. It is then lowered. Its sides at *l l* drop behind lugs or projections cast on the inner faces of the side walls of the housing, (shown in dotted lines at *m*, in Figs. 3 and 8,) and the lower ends of its legs *i i* drop down between the lugs *n* and the trunnions *h h* on the frame K. The stopping-bar is held in position, and prevented from rising as well as from falling inward, by the hooked flange or bracket *o*, cast on its back, which interlocks with another similar bracket, *p*, cast on the inside of the sliding door or lid M. If preferred, the bracket *o* may be carried up at the sides, so as to rest against the corner *q'* of the housing when the stopping-bar is down, and thus limit the forward motion of the stopping-bar. On the outer surface of the stopping-bar L a sliding jumper or clack, *t*, is fitted. This is kept in place by the pin *r*, and is kept from dropping down too low by a stud, *s*, which is cast on the face of the clack *t*. An endless wick is passed around the tumbler *b'*, and around the bars *c'*, and *d'* on the stopping-bar, and the clack *t*. At the lower end of the clack *t* a spur, *a'*, is secured, which catches into the outer ply of the wick when the clack is thrown up by the jolting of the car, and the weight of this clack is made to draw the wick around, and thus keep the bearing-face of the stopping-bar and the end of the axle well lubricated. The bars *c'* and *d'* are cut away at their opposite ends, respectively, as seen in Fig. 9, so as to admit the wick.

The housing is closed at the front end by a sliding door, M, the edges of which fit around and interlock with the ribs or projections *d''* on the vertical front corners of the housing C, and thus keep the door in place. This door is packed at the top and bottom with felt or other elastic packing, (shown at *e'* and *f'*,) and is held down by a spring-bolt, *g'*, which is let into the outer face of the door, its outer end locking into a socket or recess in the side of the housing. The bolt *g'* has a cavity sunk into its face to receive a seal, which is inserted into and securely held in the slot *h'* in the plate N, and it has its center portion driven into the cavity in the bolt by screwing the end *i'* of the tool, Fig. 13, into the tapped hole *j'* in the plate N, thereby preventing the withdrawal of the bolt and the opening of the door.

Any suitable inscription or device may be formed on the end *i'* of the tool, and it will thus be impressed into the seal.

An engraved or written stamp or ticket, as shown in Fig. 14, may be wrapped around the seal, and the date of oiling and any other particulars desired may be written upon it. The end or tag *m'* of the stamp or ticket may be left standing in the opening *k'*, through which the seal, Fig. 14, is inserted, so that it may be read without removing the seal.

To remove the seal, the end *l'* of the tool, Fig. 13, is screwed into the tapped hole *j'*, and the cutters at its extremity will cut away the seal and release the bolt. After the seal is removed the bolt is pushed back, to permit the raising of the door or lid M by a small wire key inserted into the hole *n'* in the side of the door. When the door is raised the end of the bolt *g'* shoots into another cavity or socket in the side of the housing, from which it is forced by the wire key to permit the door to be closed.

To keep the dust, rain, and snow out of the seal-lock, a sliding cover, O, is provided, which falls down and covers the openings *j'* and *k'*, and is held down by the spring *o'*. This spring is pushed back to permit the cover O to be raised by the wire key inserted into the hole *p'*.

The door M has studs *w' w'* riveted into its sides, which studs slide in the channels *y''* in the corners of the housing C, and prevent the door from becoming detached from the housing.

The end of the housing through which the axle enters is closed by a dust-excluder, consisting of two plates, P and Q, each of which

partly encircles the axle, and the two are halved together at the center, thus making a dust-proof joint, as shown in dotted lines in Fig. 3. The upper plate, P, is made solid, and the lower one, Q, hollow, in order that any dust or dirt which may get in between the axle and the bearing-faces of these plates may have an opportunity to drop into the cavity *t'* instead of passing into the housing. The plates P and Q are fitted into a box or channel formed on the rear end of the housing in the usual way, and are held in place and kept in contact with the axle by the stoppers or covers R and S. These stoppers are alike, and consist of a shell or case, which fits into the channel in which are the plates P and Q, with a flange which rests against the edges of the walls of the channel. Two sliding bolts, *v' v'*, actuated by a square rubber spring, *w'*, enter holes in the walls of the channel, as shown, and keep the stoppers in position. The bolts *v' v'* are retracted by the thumb and finger pressing the studs *x' x'* together. These rubber springs and bolts are held in place by plates *y' y'*, riveted to the shells. The upper plate, P, is held down on the axle by a spiral spring, *z'*, which bears upon it and reacts against the upper shell. The lower plate, Q, has a double incline formed on its lower edge, on which the rolling spring *a''* bears and keeps the plate up against the axle.

The spring *a''*, by its tendency to roll up toward the center, acting on the inclines on the plate Q, raises the plate, while the weight of the plate and the momentum imparted to it by the jolting of the car are borne by the barrel or rolled-up portion of the spring. I have thus a very light or weak spring for pushing the plate Q up against the axle, whereby excessive friction is avoided, while the power to resist crushing in the barrels or rolled-up portions of the spring is comparatively very great, and thus the plate is prevented from jolting away from the axle.

The inclines should be so low that no amount of pressure exerted directly downward would cause the ends of the spring to unroll.

At the bottom of the housing an incline, *b''*, terminated by a rib, *c''*, is formed. This gives a bearing for the flat head of a jack, so that when the jack is worked the housing rolls in the ball-joint, and thus permits the lining or bearing G to be withdrawn by merely raising the housing enough to release the rear end of the bearing from pressure.

Having thus fully described my invention, I claim—

1. In combination with the pedestal A and housing C, having flat sides, the brackets D D, extending in between the pedestal and housing, and having swells *c c* formed on them, substantially as and for the purpose set forth.

2. In combination with the pedestal A, brackets D D, and bolts *e e*, the lock-washers *q' q'*, substantially as and for the purpose set forth.

3. In combination with the pedestal A and brackets D D, the strap E, cut away between the jaws of the pedestal, substantially as and for the purpose set forth.

4. The combination and arrangement of the housing C, having half-socket bearings formed in its sides for the trunnions *h h* of the rocking frame K and the legs *i i* of the stopping-bar, which hold said trunnions in said half-sockets, substantially as and for the purpose set forth.

5. In combination with the rocking counterbalanced frame K, the pad H, having a cup or cavity formed in its upper surface, substantially as and for the purpose set forth.

6. In combination with the pad H, hung on the bearing *g* in the frame K, the spring *s'*, substantially as and for the purpose set forth.

7. In combination with the frame K and pad H, the clack or jumper I, having a spur, *f*, on one side of it for propelling the wick, substantially as and for the purpose set forth.

8. In a car-axle box or housing, in combination with the stopping-bar L, the clack or jumper *t*, having a spur, *a'*, for propelling the wick, substantially as and for the purpose set forth.

9. In a car-axle box or housing, the stopping-bar L, having a hooked bracket, *o*, in combination with the vertically-sliding door M, having a hooked bracket, *p*, substantially as and for the purpose set forth.

10. In a car-axle box or housing, in combination with the sliding door M and plate N, the cover O, provided with a spring-catch, *o'*, substantially as and for the purpose set forth.

11. In a car-axle box or housing, the dust-excluder consisting of two plates, P and Q, halved together at the center, and the plate Q having a dust-collecting cavity, *t'*, in it, substantially as and for the purpose set forth.

12. In a car-axle box connected to the pedestal by a ball-and-socket joint, the incline *b''* and rib *c''*, substantially as and for the purpose set forth.

J. NOTTINGHAM SMITH.

Witnesses:
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T. E. WHITING.