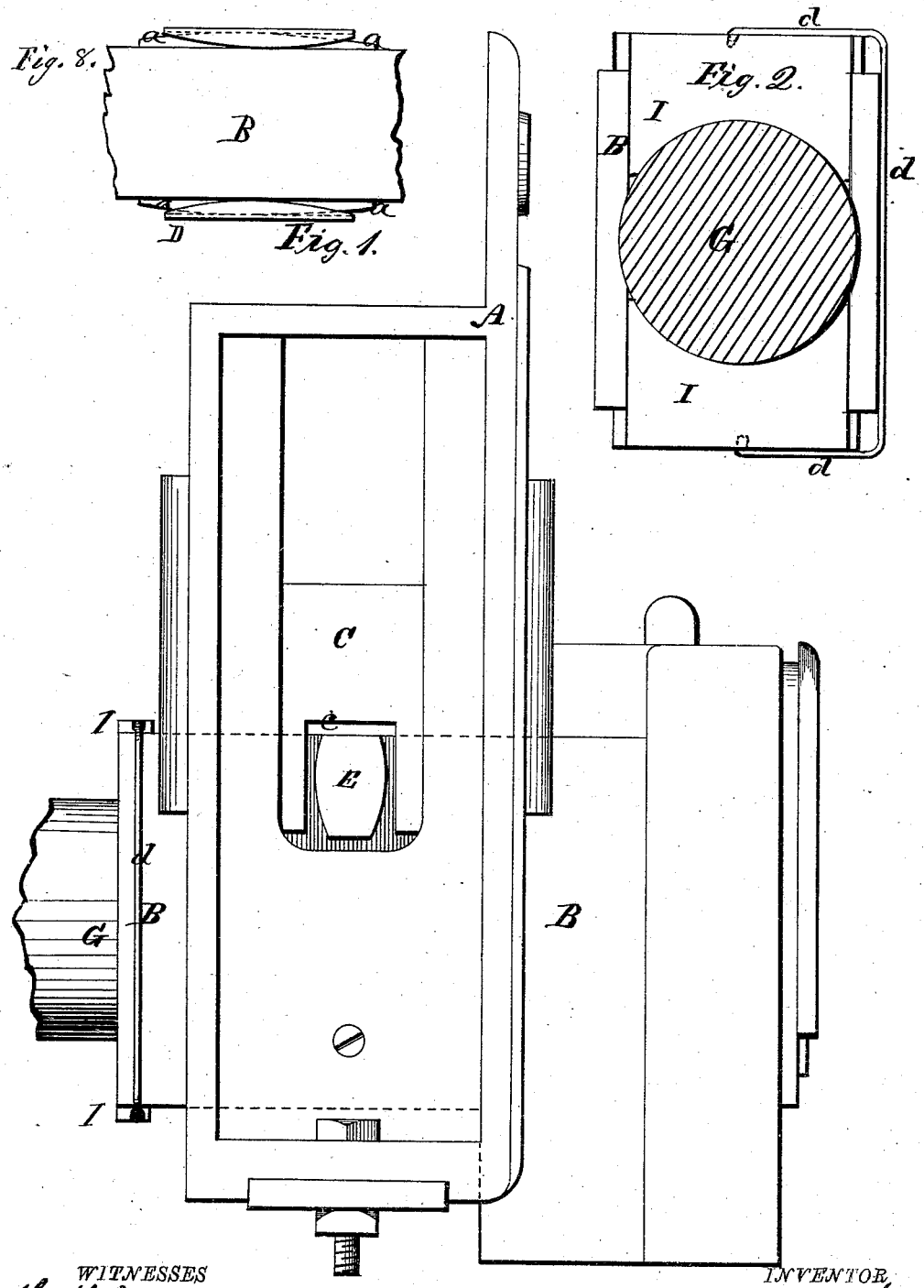
2 Sheets—Sheet 1.

J. N. SMITH.

CAR AXLE BOX AND OILER.

No. 182,609. Patented Sept. 26, 1876.



WITNESSES

E. M. Gallaher.

W. C. Chaffee

INVENTOR,

By Joseph Nottingham Smith

J. S. Brown

His Attorney.

2 Sheets—Sheet 2.

J. N. SMITH.

CAR AXLE BOX AND OILER.

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Fig. 3.

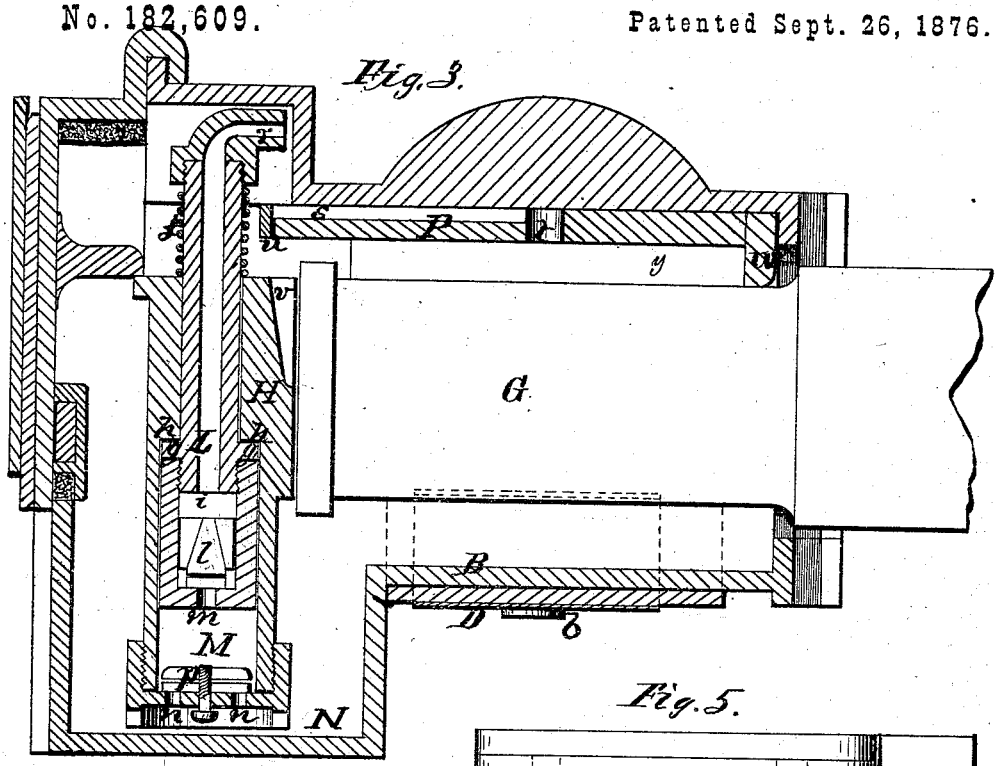


Fig. 4.

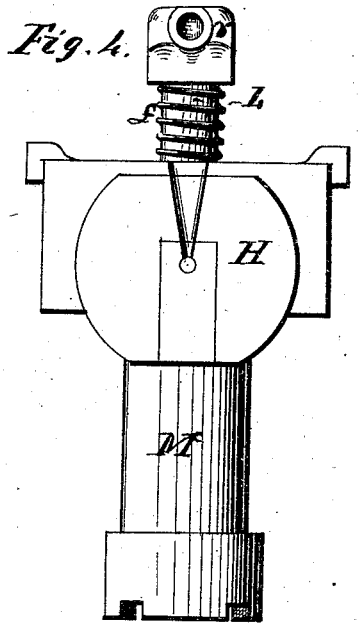


Fig. 5.

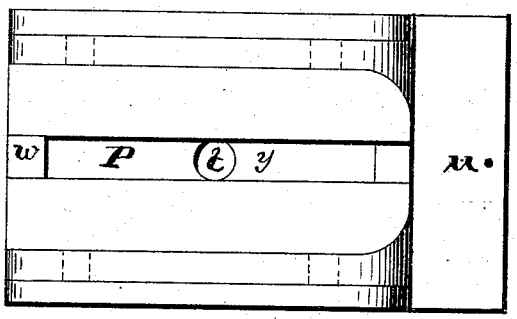


Fig. 6.

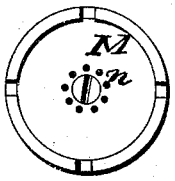
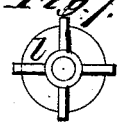


Fig. 7.



WITNESSES

E. McGallaher

W. E. Chaffee

INVENTOR,

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By J. S. Brown his Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH NOTTINGHAM SMITH, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN CAR-AXLE BOXES AND OILERS.

Specification forming part of Letters Patent No. **182,609**, dated September 26, 1876; application filed May 17, 1876.

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 an Improved Car-Axle Box and Oiler; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a side view of a car-axle box embodying my improvements and arranged in a pedestal; Fig. 2, a rear or inner end view of the car-axle box, the axle being in cross-section; Fig. 3, a central, longitudinal, vertical section of the car-axle box and car-axle therein; Figs. 4, 5, 6, 7, and 8, views of parts detached.

Like letters designate corresponding parts in all of the figures.

My invention consists in the employment of a shoe-piece, as hereinafter described, in which the axle-box is inserted in the pedestal, so as to cover the bottom of the opening in the pedestal wherein the axle-box is inserted; in the employment of certain lugs or projections on the sides of the housing of the axle-box, arranged, as hereinafter described, to play in notches in the flaps of the saddle, to secure the saddle from removal, or flying from the ball-and-socket joint which connects the said saddle and axle-box; and in an improved device for automatically supplying oil to the axle-journal from an oil-reservoir in the axle-box, all substantially as hereinafter specified.

First. I employ a shoe-piece, D, which may be formed of sheet-steel or boiler-iron, to fit over the bottom of the axle-box B and cover the bottom opening in the pedestal A, and to extend up around the sides of the axle-box in the said opening opposite to the swells *a a*, and opposite to the slots in the sides of the pedestal, which swells I form on the sides of the axle-box concentric with the laterally turning or vibrating motion of the axle-box on the ball-and-socket connection, between the same and the saddle C. The lower side of the axle-box pivots concentrically with the same axis of motion in the bottom of this shoe, as at *b*. The swells *a a* on the sides of the axle-box being opposite to the inner sides of the shoe D, it offers no impediment to the said motion. By this device the opening in the pedestal for the reception of the axle-box is completely covered and defended from the dust, and the side slots in the pedestal are guarded from interference with the axle-box.

Second, I form lugs or projections E E on the sides of the housing of the axle-box, as shown in Fig. 1, and form notches *c c* in the lower edges of the flaps of the saddle C, within which notches the lugs E E play, not fitting close, but allowing space for any ordinary amount of vibration therein of the axle-box, and at the same time securing the saddle from removal out of the ball-and-socket connection with said axle-box, and arresting any unusual tendency to move the socket from the ball, such as by the end thrust of the axle-journal G against the stopping-bar H in going around curves under high speed. I form a dust-excluding device at the inner end of the axle-journal G, consisting of two covering-plates, I I, each fitting at the inner end of, and close around the, axle-journal, and sliding in ground or accurately-fitting ways in the housing of the axle-box; and in connection with these plates I employ a spring, *d*, turned over at its ends, so as to bear against the outer ends of both plates and press them toward each other, so as to keep them close to the axle-journal by holding the lower plate up thereto, and preventing the jumping up of the upper plate from the axle-journal when the car vibrates up and down, thus very effectually excluding the dust.

Third, the most important feature of my invention consists in a device for supplying lubricating-oil automatically and constantly to the top of the axle-journal G, substantially as follows:

The principle on which this part of my invention operates is the momentum of a vibratory plunger, acting suddenly on the lubricating-oil in a close reservoir or well, and thereby causing a portion of oil to be suddenly projected upward through a tube or passage, and to be discharged upon or over, so as to fall upon the top of the axle-journal; these momentum vibrations being produced automatically by the vibratory motions of the car, and, consequently, of the axle-box in which the device is located.

The mode in which I have applied this prin-

ciple is substantially as I have represented in the drawings, a specification of which I now proceed to give.

I find it convenient and preferable to make the momentum-plunger L tubular, to convey the oil raised by its vibrations to the height desired. I locate this tubular plunger in a vertical aperture or chamber in the stopping-bar H, so as to vibrate up and down freely therein. I thus render the construction compact, and locate the device just where it is best to apply the same. The plunger, being made of metal, has sufficient weight to secure the necessary momentum by its vibrations up and down; and to render its vibrations more sensitive and effectual I partially sustain its weight by a spring, (generally a coiled spring,) *f*, as shown in Figs. 3 and 4. Its upward movement may be limited by its upper end striking the top of the housing of the axle-box, as indicated in Fig. 3, or by a projecting flange, *g*, on its sides striking a shoulder or stop, *h*, on the stopping-bar, as shown in the same figure. Its lower end fits well, but so as to move quite freely in a well or barrel, M, which extends downward from the stopping-bar into the oil-reservoir N of the axle-box; and in the lower end of the plunger proper is a valve-chamber, *i*, in which plays a valve, *l*, the construction of which may be as shown by the top view thereof, Fig. 7, so that the oil can flow freely around it, while it covers the oil-inlet aperture *m* in the bottom of the plunger, when it is not raised for the moment, by the upward pressure of the oil as the plunger descends, and its momentum acts on the oil in the well. Thus, whatever oil is once forced into the plunger-chamber and its tubular aperture extending upward from the chamber is prevented from flowing back, so that the plunger-tube, being once filled, every time when a downward vibration of the plunger takes place a small quantity of oil is forced around the valve *l* into the plunger-chamber, and an equal quantity of oil is ejected from the upper end thereof. The oil-well M, also, is provided with an aperture or apertures, *n*, to admit oil into it from the reservoir N; and these apertures, likewise, are covered on the inside by a suitable valve, *p*, rising automatically by the pressure of oil in the reservoir below, as the plunger ascends, and closing down over the apertures to prevent the escape of oil back into the reservoir as the plunger descends. The upper end of the plunger terminates in a spout or nozzle, *r*, which is turned laterally to direct the oil ejected therefrom over the axle-journal.

In order to convey the oil to a central position over the axle-journal, I make a channel or trough, *s*, in the top of the bearing-plate P over the axle-journal, this trough leading to a central position in the plate and terminating in a hole, *t*, which allows the oil to flow down through the bearing-plate upon the axle, as shown in Figs. 3 and 5. Also, another quite small hole, *u*, extends from the outer end of the trough *s* down through the bearing-plate, to provide a passage for a little oil to drop upon the face of the stopping-bar H, there being a notch or channel, *v*, in the upper edge thereof to catch the oil and spread it over the face of the stopping-bar, and thus keep it lubricated. The raised oil continually flows down over and from the axle-journal and the face of the stopping-bar into the reservoir N beneath; and thus these parts are kept thoroughly lubricated at all times, and no heating thereof can take place. At the inner end of the bearing-plate there is a cross-bridge or stop, *w*, of the soft-metal lining in the middle, reaching across the channel *y* between the side pieces of the said lining down to the axle-journal, to prevent the oil's running back over the journal too far, and save the waste of oil thereby.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The shoe-piece D, constructed and arranged, substantially as described, around the bottom and sides of the axle-box, and covering the opening in the pedestal, substantially as and for the purpose herein specified.

2. The lugs or projections E E on the sides of the housing of the axle-box, in combination with notches *c c* in the flaps of the saddle, substantially as and for the purpose herein specified.

3. A plunger, L, having a free reciprocating up-and-down movement, and acting upon the lubricating-fluid by its momentum, produced automatically by the vibratory motions of the car running upon the track, substantially as and for the purpose herein specified.

4. The combination, with a plunger, L, having a free reciprocating up-and-down movement to act by momentum on the lubricating-fluid, of a spring, *f*, which partially supports the plunger, to equalize the up-and-down motions and give greater sensitiveness thereto, substantially as herein specified.

5. The combination of a freely-reciprocating momentum-plunger, for the purpose set forth, provided with an oil-sustaining valve, and a closed well, M, in which the plunger works, provided also with an oil-sustaining valve, substantially as herein specified.

6. The oil-conveying trough or channel *s*, formed as set forth in the bearing-plate P of the axle-box, and provided with apertures *t u*, for distributing oil to the top and end of the axle-journal, and arranged to catch the oil ejected from the oil-elevating plunger, substantially as herein specified.

7. The arrangement of the oil-elevating plunger L in an opening of the stopping-bar, substantially as and for the purpose herein specified.

Specification signed by me this 21st day of April, 1876.

J. NOTTINGHAM SMITH.

Witnesses:

J. S. BROWN;

T. C. DAY.