(No Model.)

G. J. MAXWELL.

Car Axle Box.

No. 238,242. Patented March 1, 1881.

Fig. 1

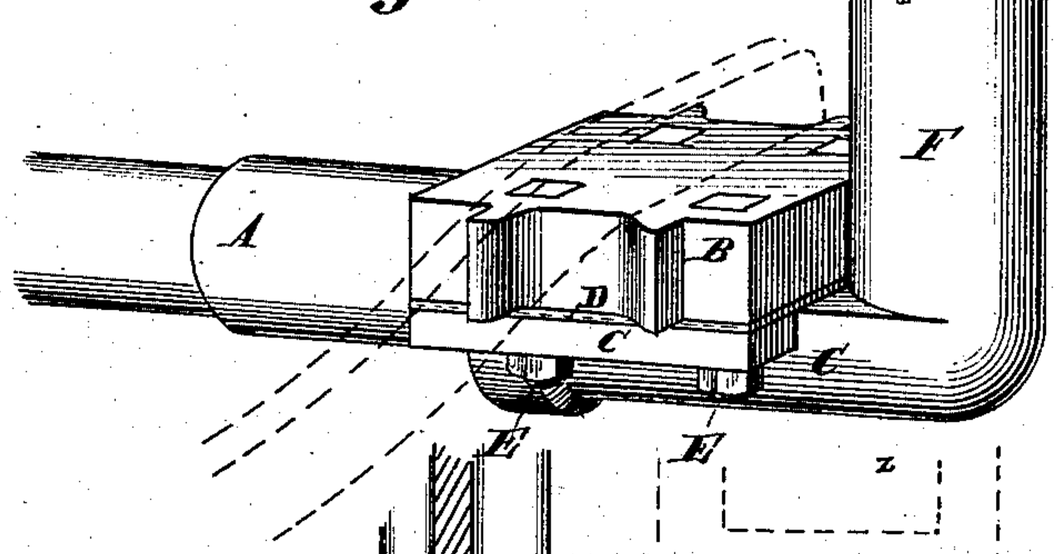

Fig. 4

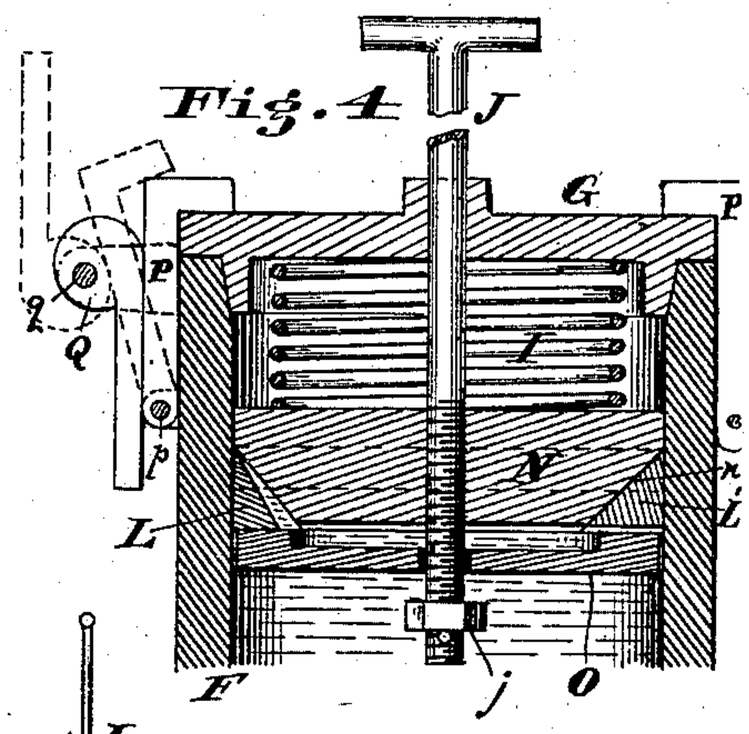

Fig. 2

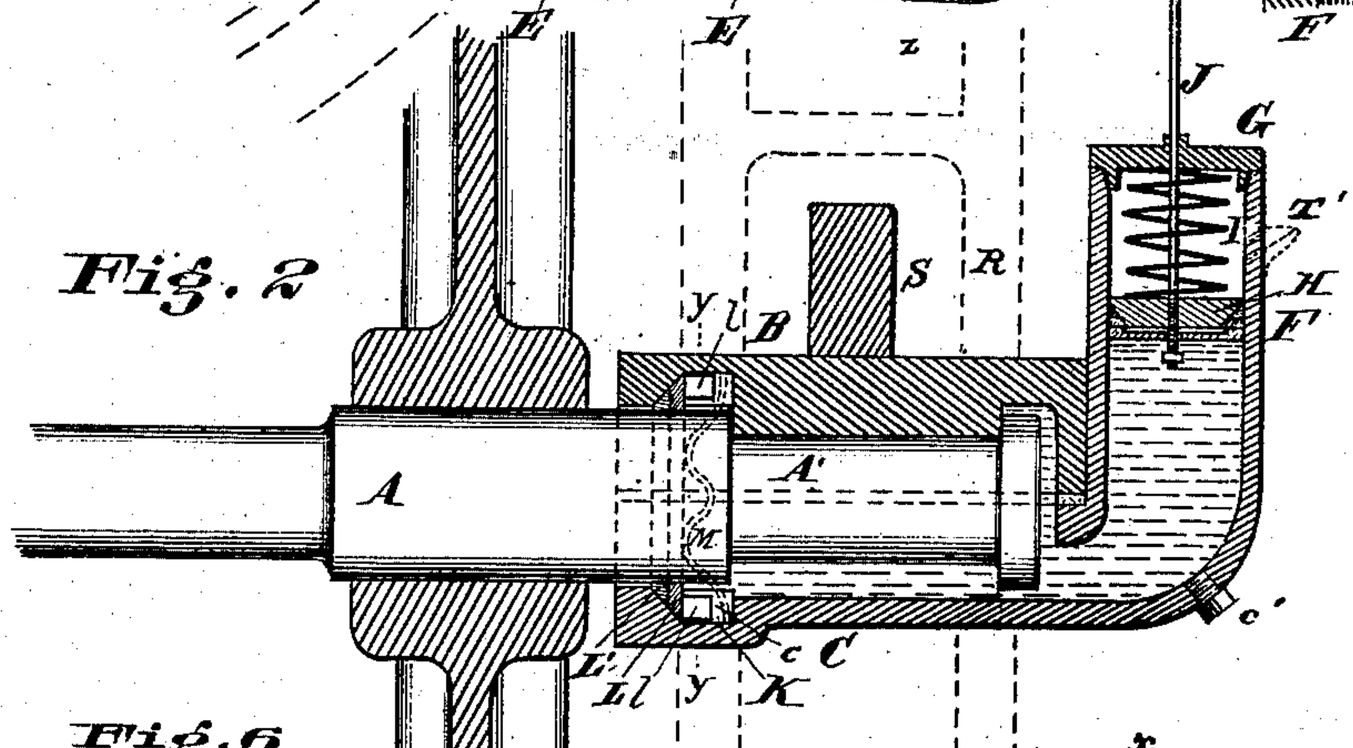

Fig. 5

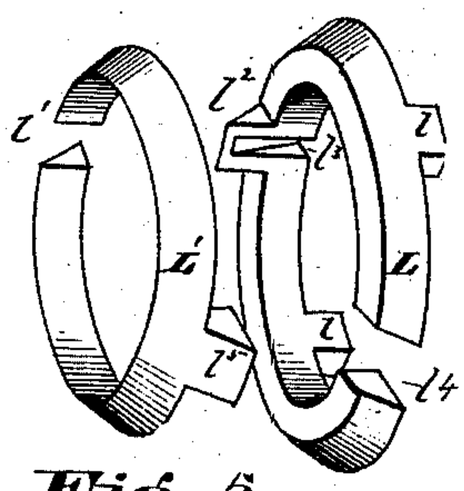

Fig. 6

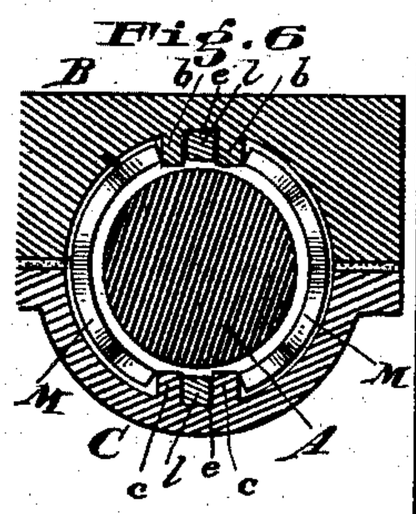

Fig. 3

Witnesses:

L. F. Matos.

Inventor.

Gifford J. Maxwell

By his atty.

UNITED STATES PATENT OFFICE.

GIFFORD J. MAXWELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-FIFTH TO RUDOLPH M. HUNTER, OF SAME PLACE.

CAR-AXLE BOX.

SPECIFICATION forming part of Letters Patent No. 238,242, dated March 1, 1881.

Application filed October 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, GIFFORD J. MAXWELL, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Axle-Boxes, of which the following is a specification.

My invention relates to an improvement in axle-boxes in general, but more particularly those on railroad-cars; and it consists in mechanism whereby an oil or other lubricator is continually fed under pressure to the bearing, and lubricates the same directly and without the use of cotton-waste or other similar material; further, in mechanism which indicates the quantity of oil in the box; and, finally, in the detailed construction of the various parts, all of which are now fully described in the following specification, shown in the accompanying drawings, and referred to in the appended claims.

Heretofore axle-boxes have been so constructed that the oil was allowed to flow, by gravity, from a receptacle onto the bearings, or was contained in a reservoir below the axle, and was carried up through the agency of capillarity produced by cotton-waste or cork, as in the car-axle boxes in general use, or the oil was carried from a reservoir, below the axle, above and poured over the bearing by means of small pumps, bucket-wheels, and similar devices. All of these have their objections, as they are not to be relied upon, for when cotton-waste is used the box catches on fire, and it is almost impossible to tell when oil is needed, and there is a great loss both of oil and cotton-waste. Where pumps are used the oil must be liquid, the axle must revolve before becoming oiled after a rest, and the complication of the mechanism is objectionable. When the oil is fed by gravity alone it is almost impossible to keep a regular and continuous supply, as it will run down to the lower reservoir and become useless. Besides, the cold weather, which becomes so intense at times in certain sections of the country, will freeze the oil and render lubrication difficult unless direct contact is obtained, and an auxiliary pressure used to induce to such contact.

My object is to cause a continuous and constant contact under pressure of the lubricant upon the bearing, whether the car is at rest or in motion, and at the same time make the mechanism indicate the quantity of the lubricating material within the box without opening the same.

In the drawings, Figure 1 is a perspective view of my improved axle-box as applied to car-axles. Fig. 2 is a vertical section of same on line *x x* of Fig. 3. Fig. 3 is a cross-section of same on line *z z* of Fig. 2. Fig. 4 is an enlarged sectional view of the top of the pressure-reservoir. Fig. 5 is a perspective view of the packing between the box and axle and encircling the pressure-piston. Fig. 6 is a cross-section of axle and box on line *y y* of Fig. 2.

A is the axle, carrying wheel T, and A′ is the bearing. The bearing A′ works in the upper box, B, which slides in pedestal R, and which supports part of the weight of the car through the agency of the equalizing-bar S, one end of which rests upon it. Under the bearing and not in contact with it is the lower box, C, which is bolted to the upper box, B, by countersunk bolts E, and there is an oil-tight packing, D, of leather or analogous material between them. By this construction the upper box is removable when worn out and easily replaced.

Opening from the lower box, C, in front, and forming part of it, is the pressure-reservoir F, which is very slightly bell-mouthed at the top, to allow easy admittance of the piston H, and is covered by a cap, G, which may be held in place by bolts or by hooks P, pivoted at *p*, which are pressed over said cap G by eccentric cams Q, pivoted at *q*. When the cap is to be removed the cams Q are turned over and the hooks thrown out, as indicated by dotted lines, Fig. 4. The rod J, provided at the top with a cross or any suitable device or handle, passes through the cap G, and is secured to the piston H, which is pressed down upon the oil or other lubricator by the spring I. The construction of the piston I prefer will be hereinafter described.

To fill the reservoir F and axle-box with lubricating material, the cap G may be withdrawn, also removing the piston H; or, if liquid oil is used, the piston may be withdrawn to the

highest point above a small opening, T′, Fig. 2, and the reservoir filled with oil without removing the cap. The lower box may be furnished with a small pin or screw, c', the removal of which will allow the box to be drained.

When the boxes B and C are bolted together there is an annular groove, K, near the inner end, the inner side of which is beveled to correspond with the bevel on the packing-rings L and L′. These rings are constructed substantially as shown in Fig. 5, in which they are seen to be split at l' and l^4, and respectively provided with opposite projecting pieces, l^5 and l^2, the latter of which fits the opening l' in the ring L′, and the former fits the opening l^4 in ring L. The two rings when put together form a circular knife-edge, which fits between the axle and beveled side of groove K and encircles the former, as shown in Fig. 2. On the back of ring L are two projections, l, directly opposite, which fit loosely into recesses e, made by projections b b in the groove K in the upper box, and c c in the lower box, as shown in Fig. 6, and they are thus kept from rotating with the axle.

Resting between the rings and the box are springs M, which press the rings together and into the annular V-groove, thereby compressing them and making a liquid-tight joint. The pressure of the lubricator also tends to make a tight joint, and lubricates the surface, between the rings and the axle, by the lubricant passing down the feeding-groove l^3 in the projection l^2 on the ring L, Fig. 5.

The construction I prefer for making the piston H liquid-tight is similar to the packing just described, except that the beveled knife-edge is on the inside instead of on the outside, and the lugs or projections l are left off, so I shall designate its parts by the same letters of reference.

The back or body N may be of metal or any other suitable material, and is provided with beveled edge n, against which the rings L L′ fit. This back N is screwed securely upon the rod J, which projects slightly below it. Over the end is placed the plate O, which slides loosely upon the rod, and is kept upon it by nut j. This plate O is to keep the packing-rings from falling out, and when the piston is being removed the plate O falls and allows the rings to become loose. The pressure of the spring I, forcing the piston down upon the lubricant, causes the latter to make the packing-rings tight by means of the upward pressure thus caused by the projections on the upper side of plate O against them. By this construction there is nothing to catch fire, and the lubricant is fed to the bearing under pressure, thereby keeping it always in a condition to work easily, and insures perfect lubrication, and as the lubricator becomes used up and before it is all gone, the cross of the rod J, attached to the piston H, has descended to the top of the cap G, indicating that the reservoir requires refilling. There will be no loss, and the reservoir can be made large enough to last several times as long as the ordinary car-axle lubricators.

If desired, the reservoir F may be on the end or beneath, or in any other desired position; but I prefer it as shown.

Any other method of packing the joint between the axle and box and around the piston may be used without altering my invention, but I prefer the construction shown; or the spring I may be modified or dispensed with, in which latter case the piston could be made heavy, performing the same function through gravity that the spring did by elasticity; but I prefer to use the spring.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An axle-box for railway-cars, consisting of a hollow journal-box which contains one end of the axle, the bearing of which is only upon the top, the lower half of its circumference, or thereabout, being open or exposed to the lubricator, in combination with an oil-tight packing about the axle, between the bearing and wheel, and mechanism to feed the lubricating material to the bearing under pressure, substantially as and for the purpose specified.

2. In a railway-car, the combination, with its truck-frame, of the pedestals R, equalizing-bars S, axle A, carrying wheels T, and having bearings A′, which are inclosed within liquid-tight axle-boxes C B, adapted to slide in said pedestals, said boxes having open lubricating-spaces under the bearing or journal, liquid-tight joints between the axle and bearings, and located within the boxes, and mechanism to force lubricating material under pressure.

3. An axle-box for railroad-cars, made liquid-tight between the axle and its bearing, in combination with a reservoir provided with a liquid-tight piston working therein to force the lubricating material into the box and around the bearing, substantially as and for the purpose specified.

4. In an axle-box for railroad-cars, &c., the upper and lower boxes, or their equivalent, a bearing working within such boxes, an oil-tight joint between the bearing and the axle proper, a reservoir in connection with said boxes, a piston working in said reservoir, a spring or its equivalent to force the piston down upon the oil, and a projecting rod or other equivalent device to indicate the position of the piston in the reservoir, substantially as and for the purpose specified.

5. In an axle-box for railroad-cars, &c., the combination of upper replaceable box, B, lower box, C, reservoir F, piston H, consisting of back N, provided with packing-rings L L′, and plate O, spring I, or its equivalent, cap G, rod J, means of securing the cap on the reservoir, groove K, packing-rings L L′, provided with lugs l l, which fit into recesses e e, springs M, axle A, and bearing A′, all constructed substantially as and for the purpose specified.

6. In an axle-box, the liquid-tight packing between the box and axle, consisting of annu-

lar groove K in the box, provided with a beveled side and recesses *e e*, in combination with split rings L and L′, respectively provided with projections *l*, *l*², and *l*⁵, and springs M, or their equivalent, substantially as shown and described, and for the purpose specified.

7. A liquid-tight reservoir, F, for an axle-box, in combination with a piston, consisting of a backing, N, provided with bevel-edge *n*, and secured to the rod J, which is provided on the bottom with a nut or its equivalent, split packing-rings L L′, respectively provided with projections *l*² and *l*⁵, which fit into the corresponding openings or splits in the rings, and a movable plate or cap, O, free to slide on the rod J, and which plate prevents the rings from displacement, substantially as shown and described, and for the purpose specified.

8. In a reservoir to force oil under pressure into an axle-box, the reservoir proper, F, piston H, rod J, cap G, spring I, or its equivavalent, hooks P, and cam-locks Q, or their equivalent, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

GIFFORD J. MAXWELL.

Witnesses:

R. M. HUNTER,

JAMES C. CLARK.