(No Model.) 2 Sheets—Sheet 1.

L. S. FLATAU.

CAR WHEEL AND AXLE.

No. 539,256. Patented May 14, 1895.

Fig. 1.

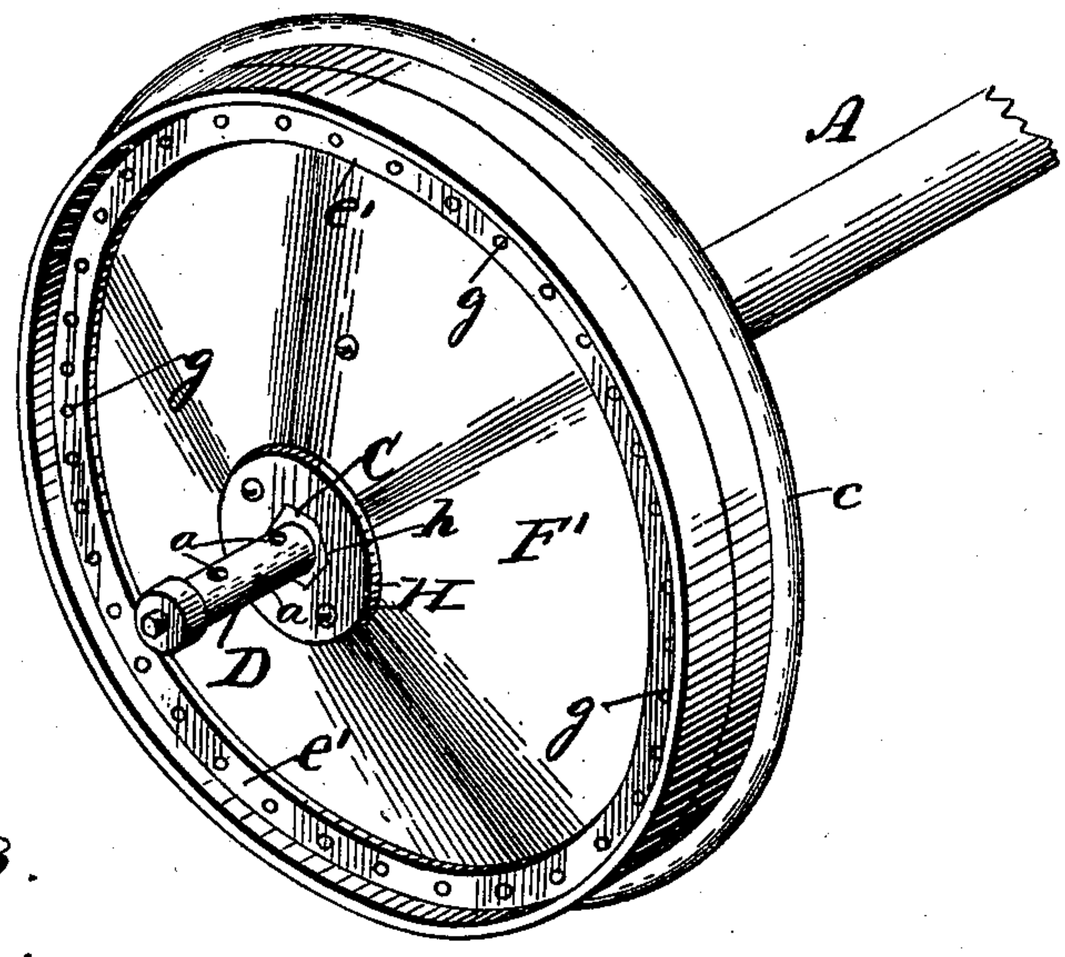


Fig. 8.

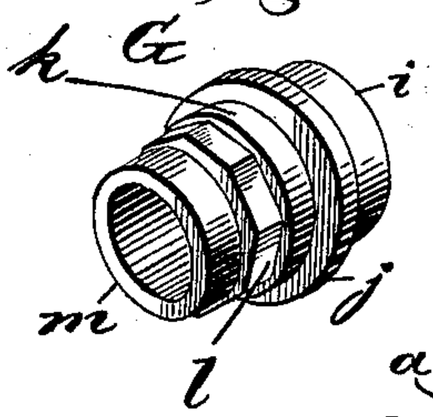


Fig. 2.

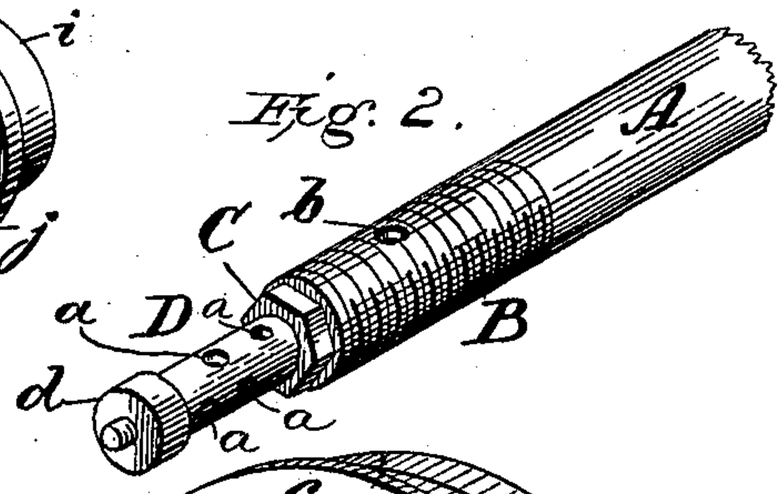


Fig. 9

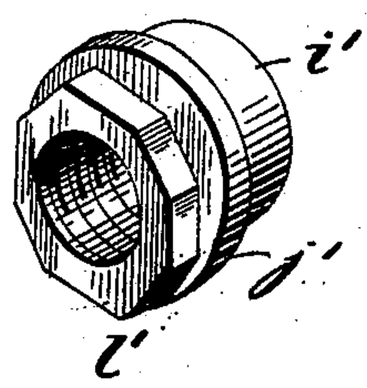
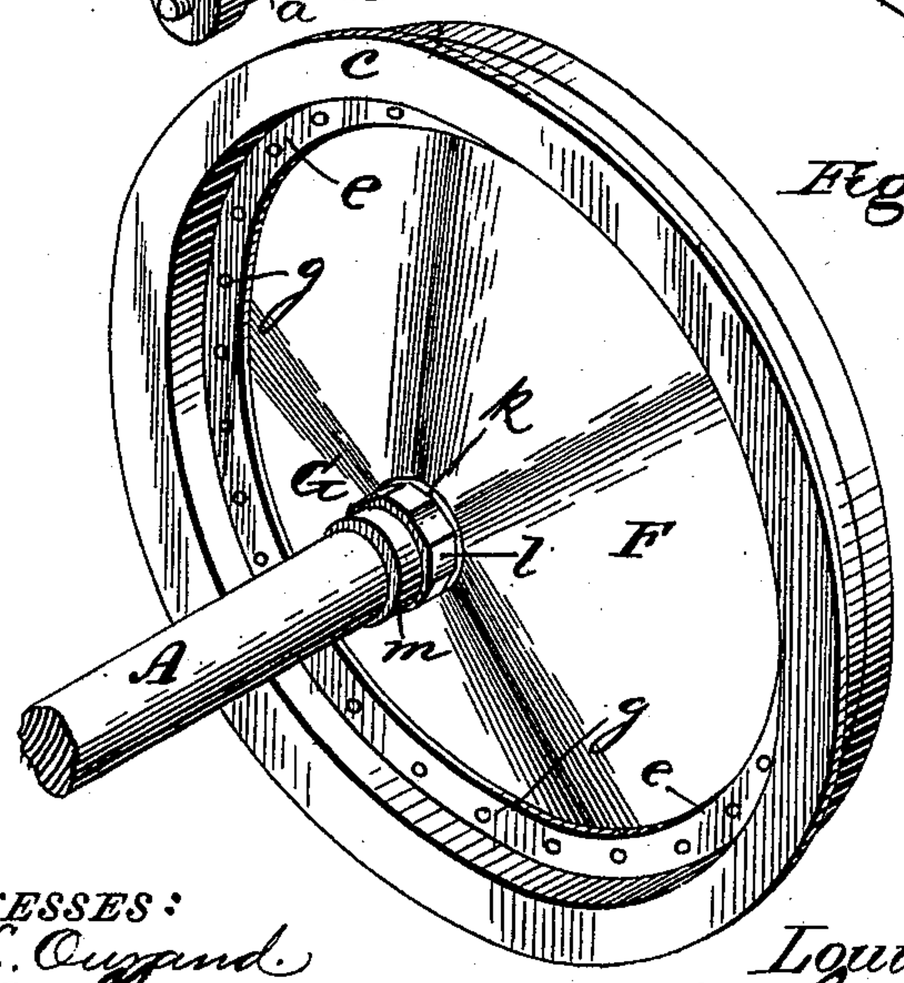


Fig. 3



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(No Model.) 2 Sheets—Sheet 2.

L. S. FLATAU.

CAR WHEEL AND AXLE.

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Fig. 4.

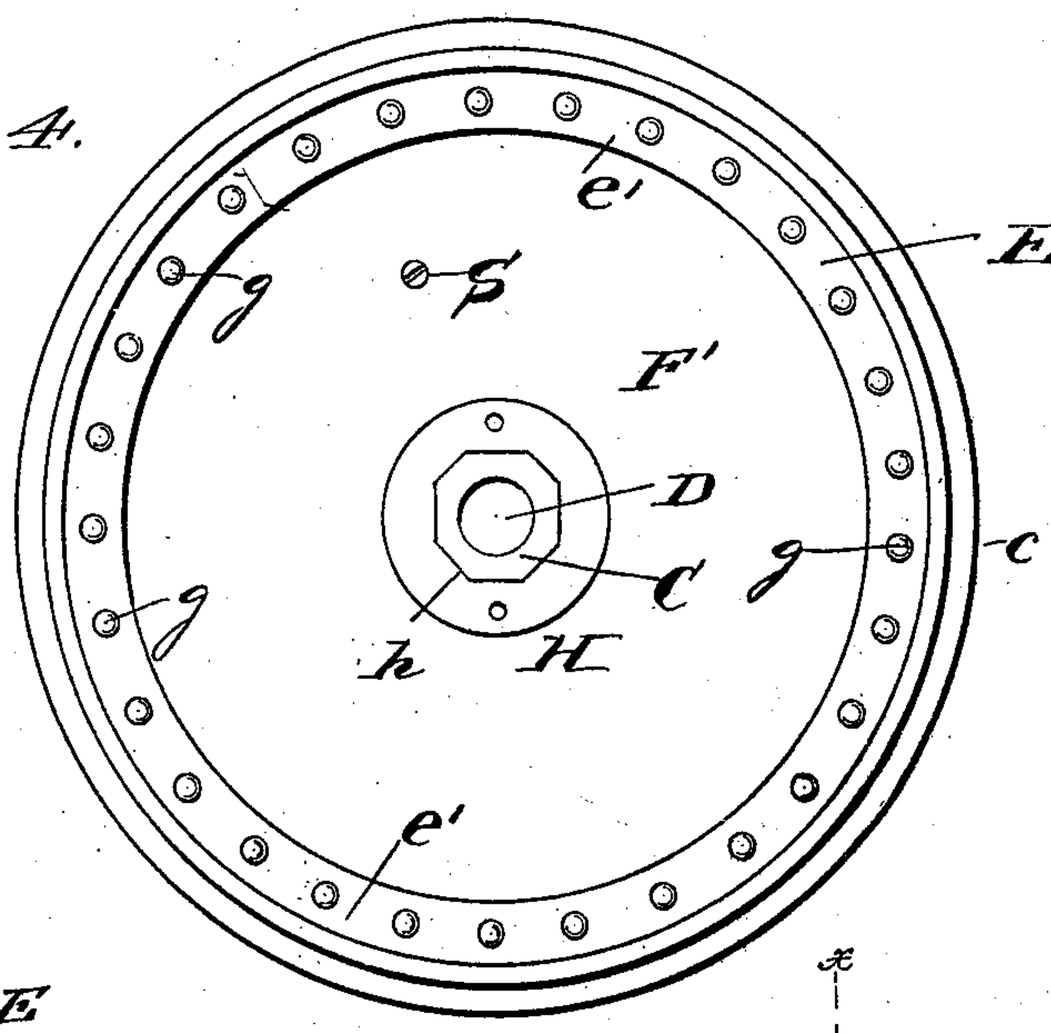


Fig. 5.

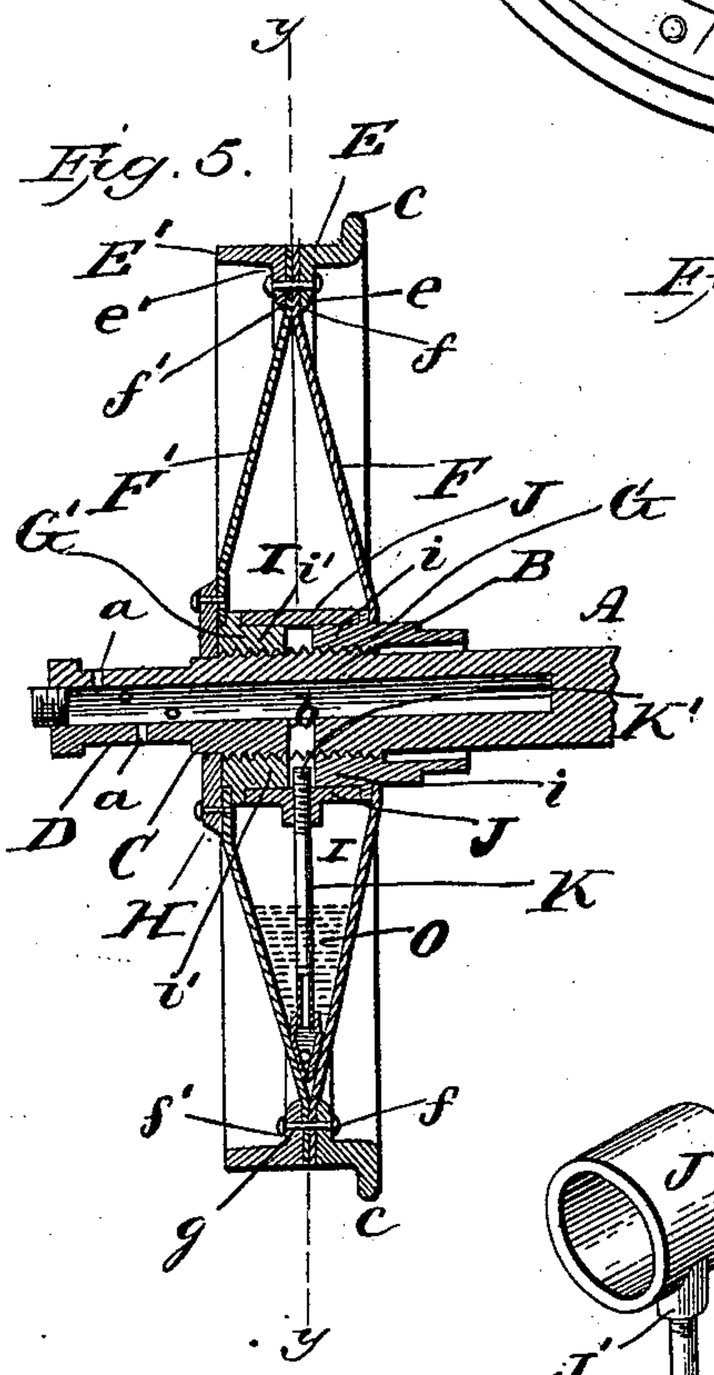


Fig. 6.

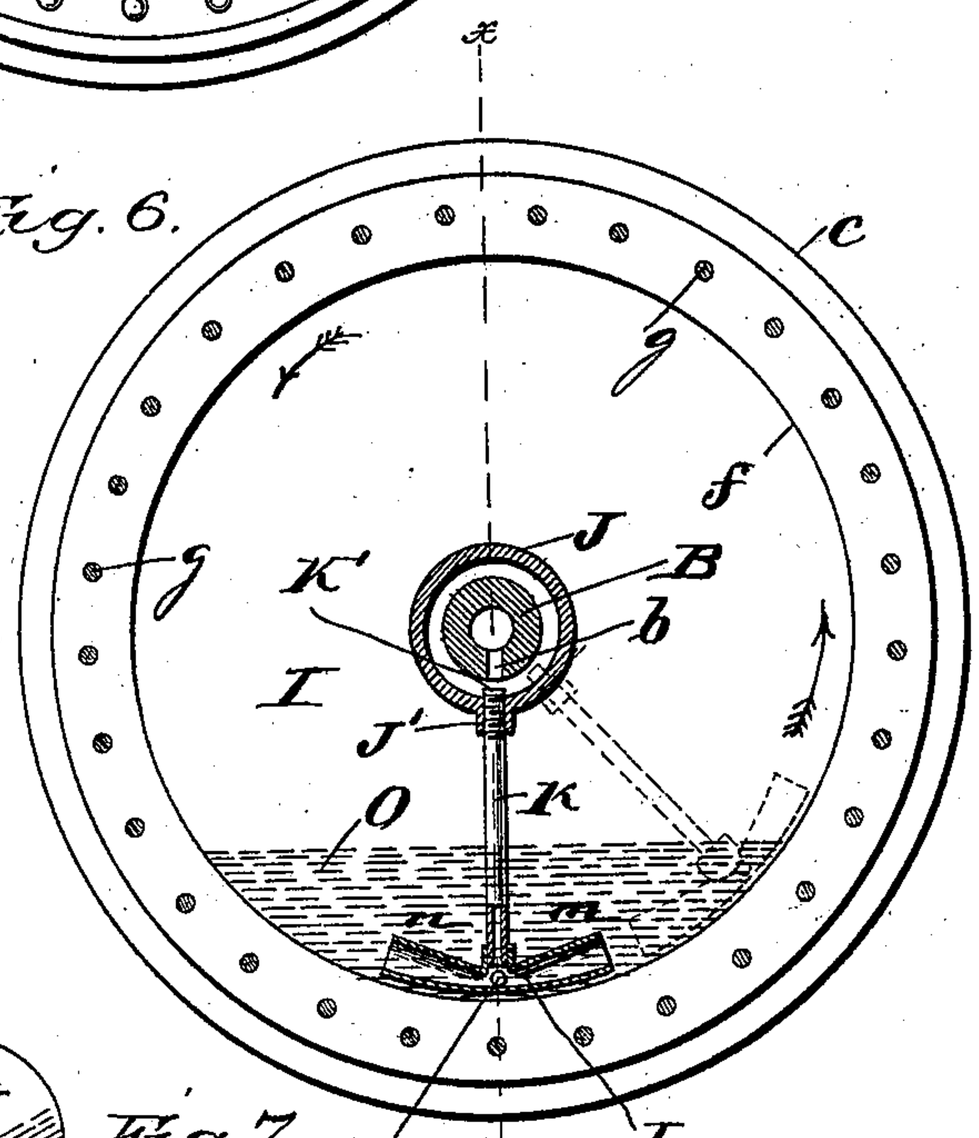
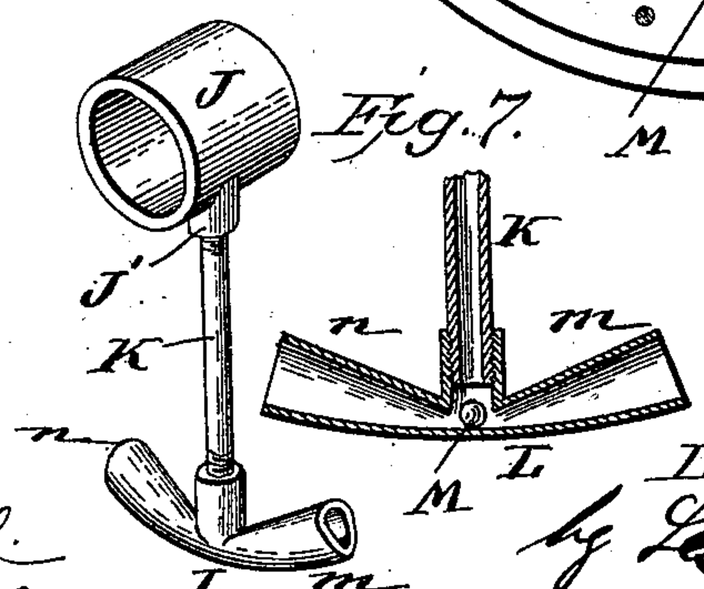


Fig. 7.



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UNITED STATES PATENT OFFICE.

LOUIS SPENCER FLATAU, OF DALLAS, TEXAS, ASSIGNOR OF ONE-HALF TO SAMUEL H. SHANNON, OF SAME PLACE.

CAR WHEEL AND AXLE.

SPECIFICATION forming part of Letters Patent No. 539,256, dated May 14, 1895.

Application filed February 14, 1895. Serial No. 538,358. (No model.)

To all whom it may concern:

Be it known that I, LOUIS SPENCER FLATAU, a citizen of the United States, and a resident of Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Car Wheels and Axles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved car wheel and axle. Fig. 2 is a perspective view of one end of the axle with the wheel removed. Fig. 3 is a perspective view of the inner face or side of the wheel upon the axle. Fig. 4 is a side view of the wheel with the outside lock-plate removed. Fig. 5 is a transverse sectional view through the center of the wheel on the diametrical broken line marked *x x*. Fig. 6 is a longitudinal sectional view of the wheel transversely to the axle on line *y y* in Fig. 5. Fig. 7 is a detail view of the inside lubricating-tube, with its cross-head and collar, which feeds the lubricant to the appropriate journal; and Figs. 8 and 9 are perspective detail views of the central axle-nuts or hub-nuts G and G′ detached from the wheel.

Like letters of reference designate corresponding parts in all the figures.

While my invention relates primarily to car-wheels (*i. e.*, wheels for railway cars and locomotive-trucks), I desire it to be understood that I do not limit its application to that or any other particular and specific purpose; inasmuch as wheels and axles of my improved construction may be adapted with advantage to many other uses, as for example, the wheels of traction engines, agricultural machinery, pulleys, &c. In the present description and illustration of my invention, I have, however, shown the same as applied to the wheels and axle of a railway car; my invention relating to an improved construction and combination of both, as will be hereinafter more fully described and claimed.

Referring to the accompanying two sheets of drawings, the letter A denotes the axle, which may either be solid or tubular; but is, in all cases, constructed with hollow or tubular, exteriorly screw-threaded, ends B, terminating in the reduced cylindrical journals D, between which and the screw-threaded end of the axle is a hexagonal or polygonal offset or section C. The journal terminates, as usual, in a flange or collar *d*, and has a number of small apertures *a a* leading from the hollow inside to the outside. Another and larger aperture, *b*, is bored through the screw-threaded tubular part B of the axle.

The wheel is a "compound" or "built-up" wheel, comprising the two-part rim E E′, dished side plates F F′, flanged hubs or axle-nuts G G′, and exterior lock-plate H, the central aperture *h* in which fits over and upon the hexagonal offset or shoulder C on the axle. I prefer to construct the conical or dished side-plates or body-plates F and F′ of sheet-steel, properly shaped by striking them up in dies, by spinning or by any other suitable process for giving metal disks this form; their converging circular rims *f* and *f′* being confined and clamped between the parallel inwardly-projecting circular flanges *e* and *e′* of the wheel rim E E′. This rim may in itself constitute the tire, as in the construction shown on the drawings; or a separate tire (either flanged or plain) may be shrunk upon the two-part rim E E′. In the example shown on the drawings, the steel rim of the wheel constitutes in itself the tire, and is therefore (this being a car-wheel) provided with the usual flange *c*. The sides or plates F F′ are securely fastened to each other, and to and between the rim-flanges *e e′* by means of rivets *g*.

The inner axle-nut G (see Fig. 8) comprises five separate parts or sections in one piece, viz., the inside collar *i*, inside collar flange *j*, bearing collar *k*, a polygonal section *l*, adapted to be grasped by a key or wrench, and the cylindrical sleeve or axle-collar *m*. This nut, which, in conjunction with the corresponding nut G′ on the opposite side of the wheel, forms, so to speak, the hub of my improved compound wheel, is inserted through the central aperture in the inner plate F, with its inside flange *j* bearing or pressing up against the inner face of said plate F around the central aperture, the edge of which bears against

the collar *k*, and is screwed upon the threaded tubular section B of the axle, as represented more clearly in Figs. 3 and 5. The corresponding opposite or outer nut G′ consists of the inside collar *i′*, inside collar-flange *j′*, and polygonal section *l′*, which latter fits closely into the hexagonal central aperture in plate F′ on that side of the wheel, and is, like its mate G, screwed up upon the threaded and hollow axle section B. It is covered on the outside by the circular lock-plate H, which is fastened upon plate F′ by means of bolts or screws, with its central hexagonal aperture *h* fitting upon the hexagonal axle-shoulder or offset C, between the threaded tubular axle-end B and the projecting tubular journal D.

Within the central part of the hollow circular chamber I formed within the wheel is a sleeve J, which works loosely upon the two inside collars *i* and *i′*, appertaining to the axle-nuts or hub-nuts G and G′ respectively. This sleeve J has an interiorly threaded projecting socket J′ on one side, into which is screwed the inner end of a radial tube K, with its contracted nozzle K′ projecting through the sleeve J opposite to the axle. Upon the other or outer extremity of this radial tube K is screwed a T or cross head L, the head of which is curved to conform to the curvature of the inner periphery of the wheel, and made with flaring or funnel-shaped openings *m* and and *n* one at each end. The middle part of this cross-head, where this is screwed upon the outer end of tube K, forms a chamber or cage for the ball-valve M, which is of such size that it cannot enter the contracted inner ends of the mouths or inlets *m* and *n*, which are in alignment with each other.

From the foregoing description, taken in connection with the drawings, the operation of this automatic lubricating device will readily be understood.

When the wheel is at rest, the lubricating tube, K L, swinging with its sleeve J loosely upon the collar-bearings *i i′*, concentric to the axle, will, by gravity, assume the perpendicular position illustrated in full-line in Figs. 5 and 6. Prior to starting the train, the hollow or chamber I within the wheel is partially filled with oil, O, or any other suitable liquid lubricant, by means of an aperture in one of the wheel disks F or F′, closed by a screw-plug or other suitable stopper S; and as the wheel revolves, this body of oil is, by the centrifugal force, thrown against the inner rim or periphery of the wheel, so as to form a ring or annulus of oil. When this takes place, the position of the perpendicularly depending lubricating-tube K with its cross head L will, impelled by the revolving body of oil, assume a position within the wheel as indicated by the dotted lines in Fig. 6, *i. e.*, approximately at an angle of about forty-five degrees, more or less; depending in part upon the weight of the tube and cross head, and partially upon the velocity of the wheel and the momentum of the annular body of oil within it,—so that, by this momentum, a portion of this oil will be forced into the inlet opening *n* in the cross head (assuming that the wheel rotates in the direction indicated by the arrow); pushing the ball-valve M against the inner reduced end of the opposite inlet *m*, and thus passing up through tube K and out through the outlet or nozzle K′ at the inner end of the tube upon the axle; but as the axle at this point is tubular and provided with the aperture *b*, a portion of this oil will enter said aperture and fill the hollow bore in the axle and journal D, from which it escapes through the small outlet apertures *a a* into the journal-box (not shown); any excess of oil fed to the journal and journal-box through said small outlets *a a* being absorbed by and stored in the cotton waste with which the box is packed around the journal, as usual. Any oil which is forced up through tube K, in its inclined position, and escapes at its inner end without finding its way into the axle-aperture *b*, is ejected upon the axle and serves to lubricate the sleeve J and its bearings *i* and *i′*, so that said sleeve will always run easily upon its collars or bearings *i i′*, and with a minimum of friction; any excess of oil dropping back into chamber I within the wheel, so that there is absolutely no waste of lubricant.

Instead of using a ball-valve M in the cross-head L, the latter may be constructed with a central partition or diaphragm separating the inlets *m* and *n* at their inner ends, in alignment with the median line of tube K, which will answer the same purpose as the ball, *i. e.*, prevent the oil from passing through the cross-head without being forced up into the tube.

It will be obvious that if the wheel is rotated in the opposite direction, the depending lubricating-tube will, by the momentum of the revolving body of oil, be swung into the opposite direction at approximately the same angle; the oil now entering tube K through the funnel-shaped inlet *m*, and seating the ball-valve M against the contracted inner end of the opposite inlet *n*, so as to close the same from the inside. Besides this self-lubricating feature, it will be seen that my improved compound or built-up wheel combines lightness with strength, durability and a certain amount of elasticity, in an eminent degree. It is (when properly made, of good materials) practically unbreakable, easy-running, and cannot possibly cause injury to the axle and journals, however fast it may be running, by a "hot-box," due to the steady and even flow of lubricant to the journal and journal-box.

Having thus described my invention, I claim, and desire to secure by Letters Patent of the United States—

1. A compound or built-up metallic wheel, comprising the dished side-plates F F′, flanged and riveted rim E E′, hub-nuts G G′, and lock-plate H; constructed and combined substantially as and for the purpose shown and set forth.

2. The combination with the axle having

hollow screw-threaded ends B, hexagonal offsets C and tubular journals D, of the adjustable hub-nuts G G′, lock-plate H, dished side-plates F F′, and flanged and riveted rim E E′; substantially as and for the purpose shown and set forth.

3. The combination with the hollow wheel body, tubular axle and tubular journal, having inlet aperture *b* and outlets *a*, of the interior radial lubricating feed-tube K provided with the crosshead L and collar J journaled loosely upon the axle within the wheel; substantially as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

LOUIS SPENCER FLATAU.

Witnesses:
E. B. GIVENS,
J. P. TUFTS.