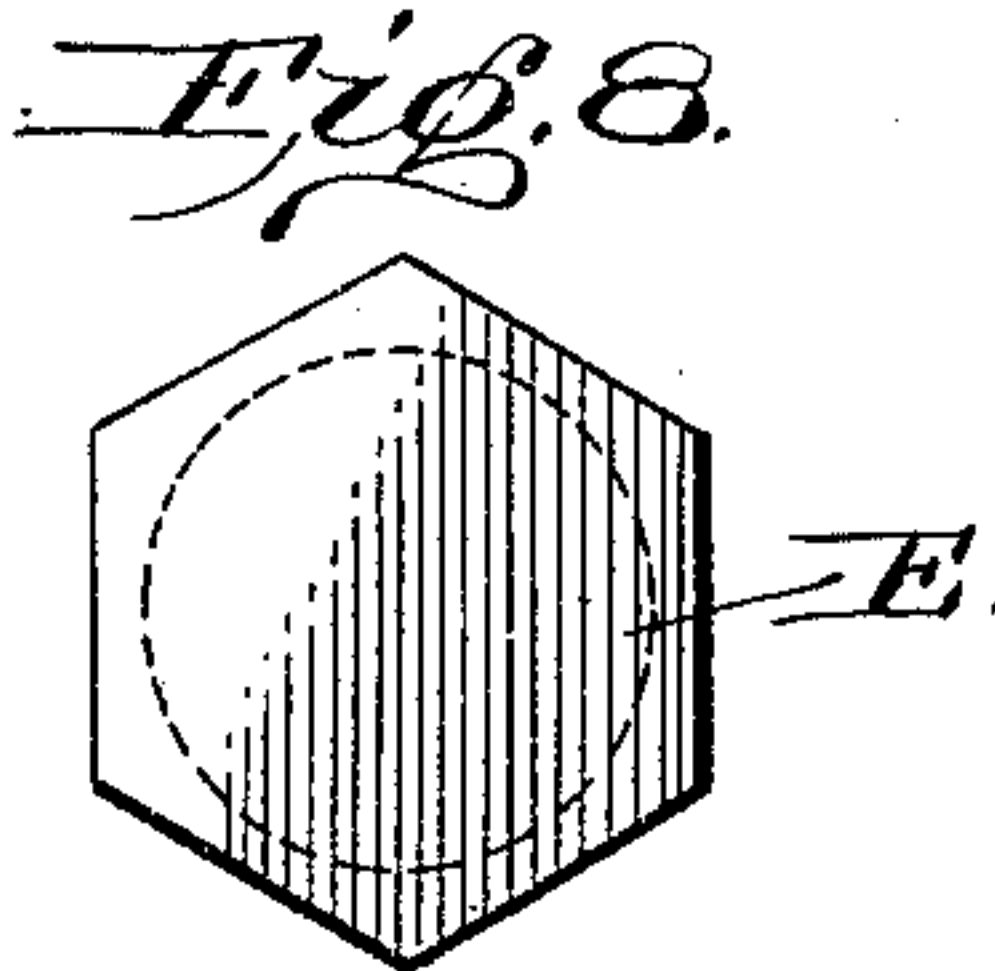
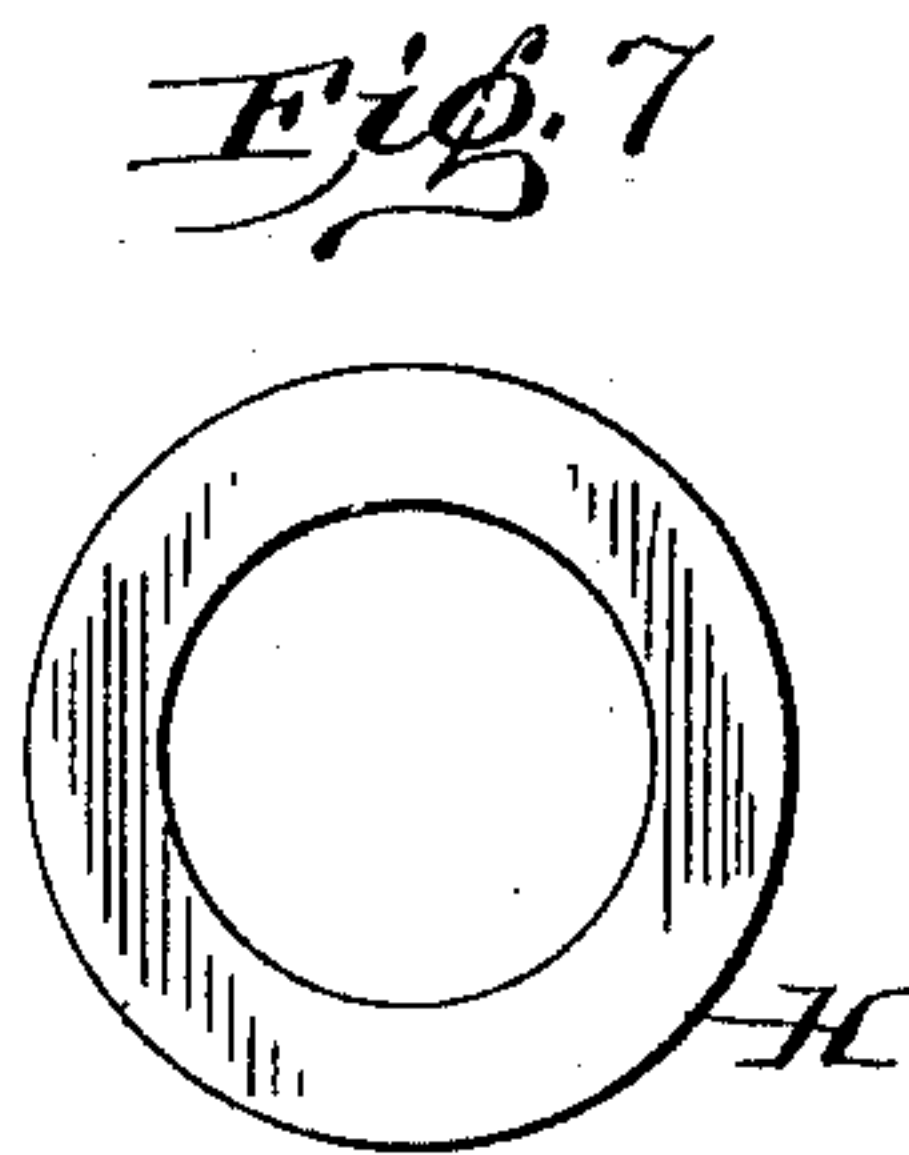
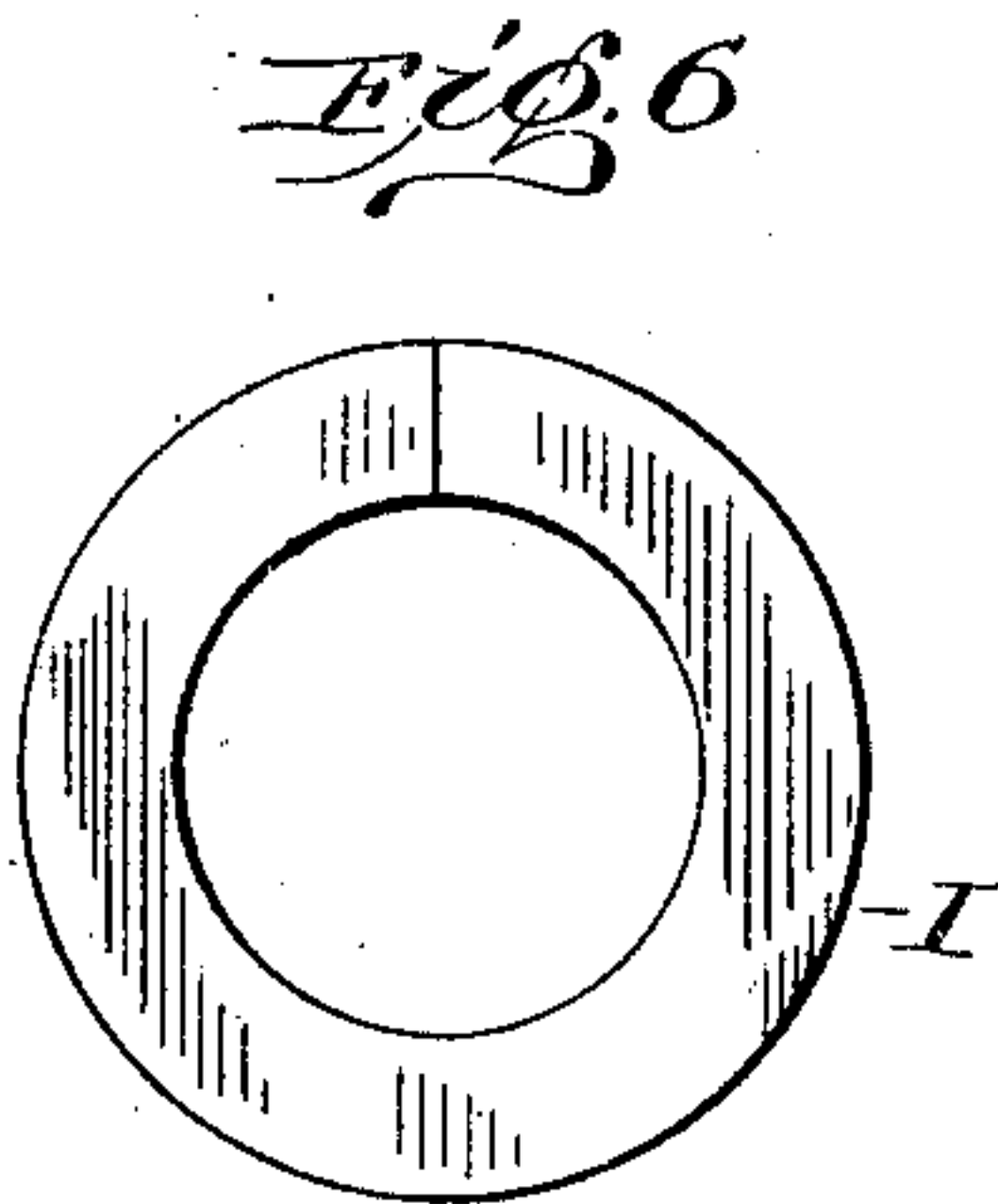
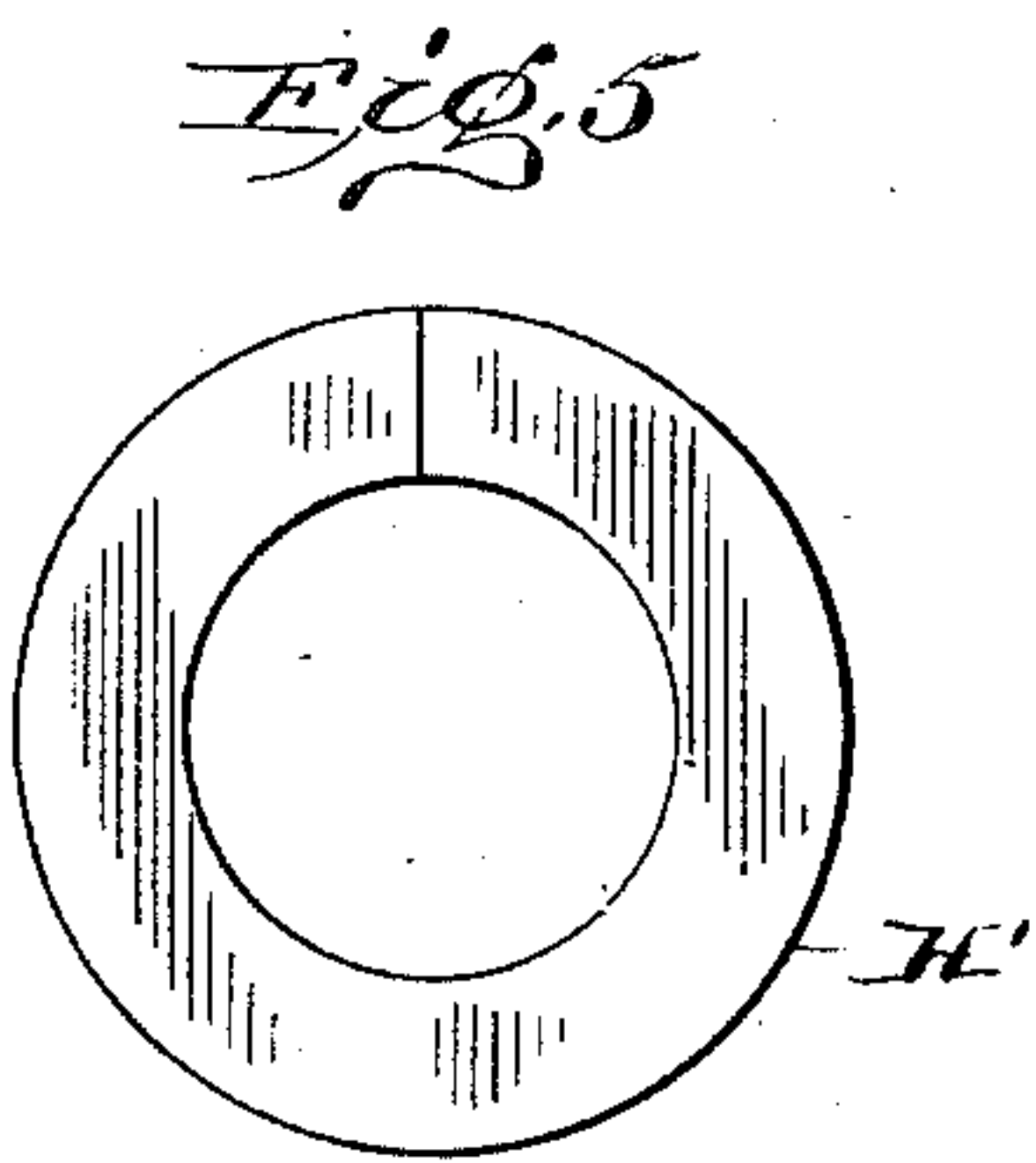
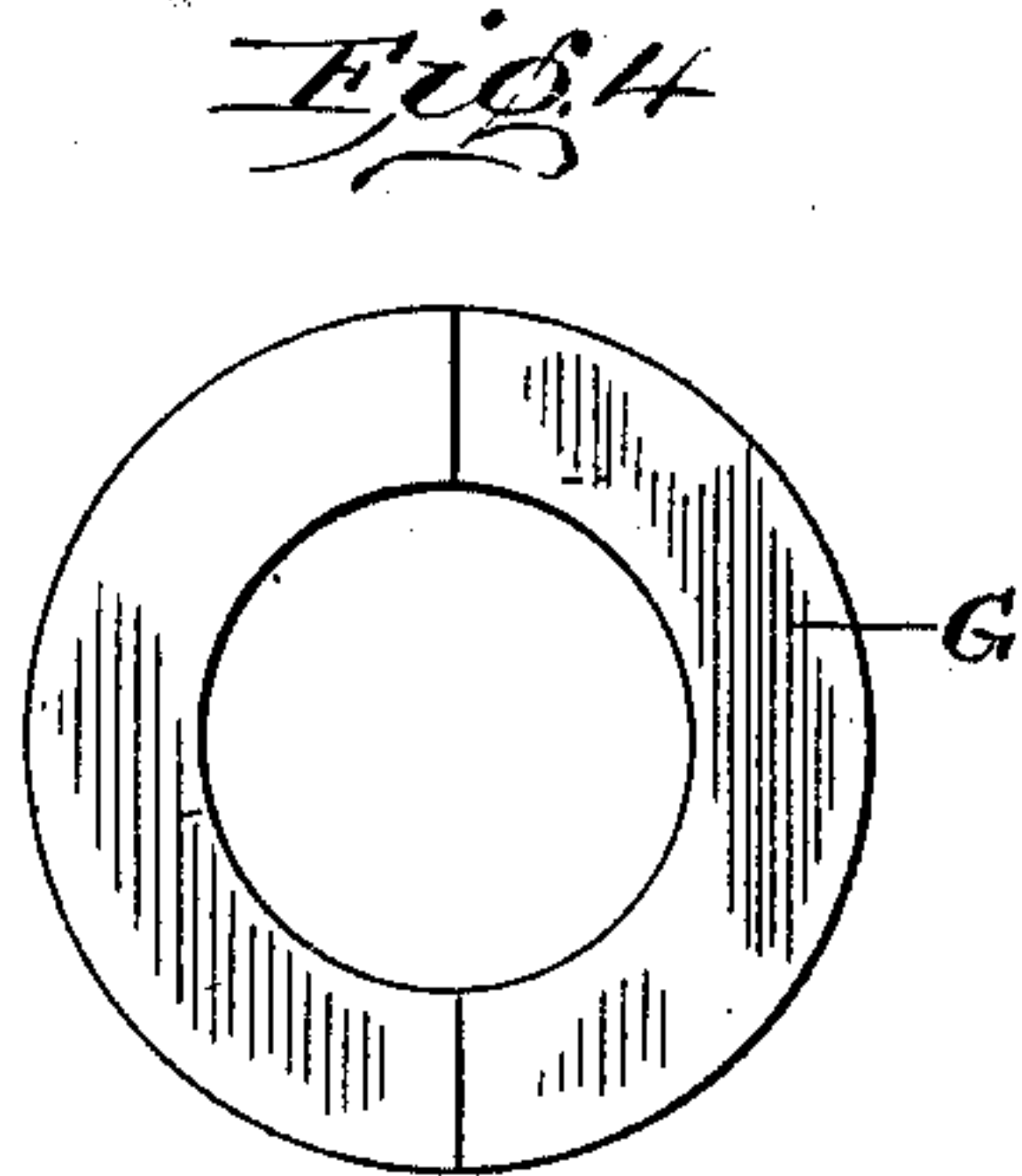
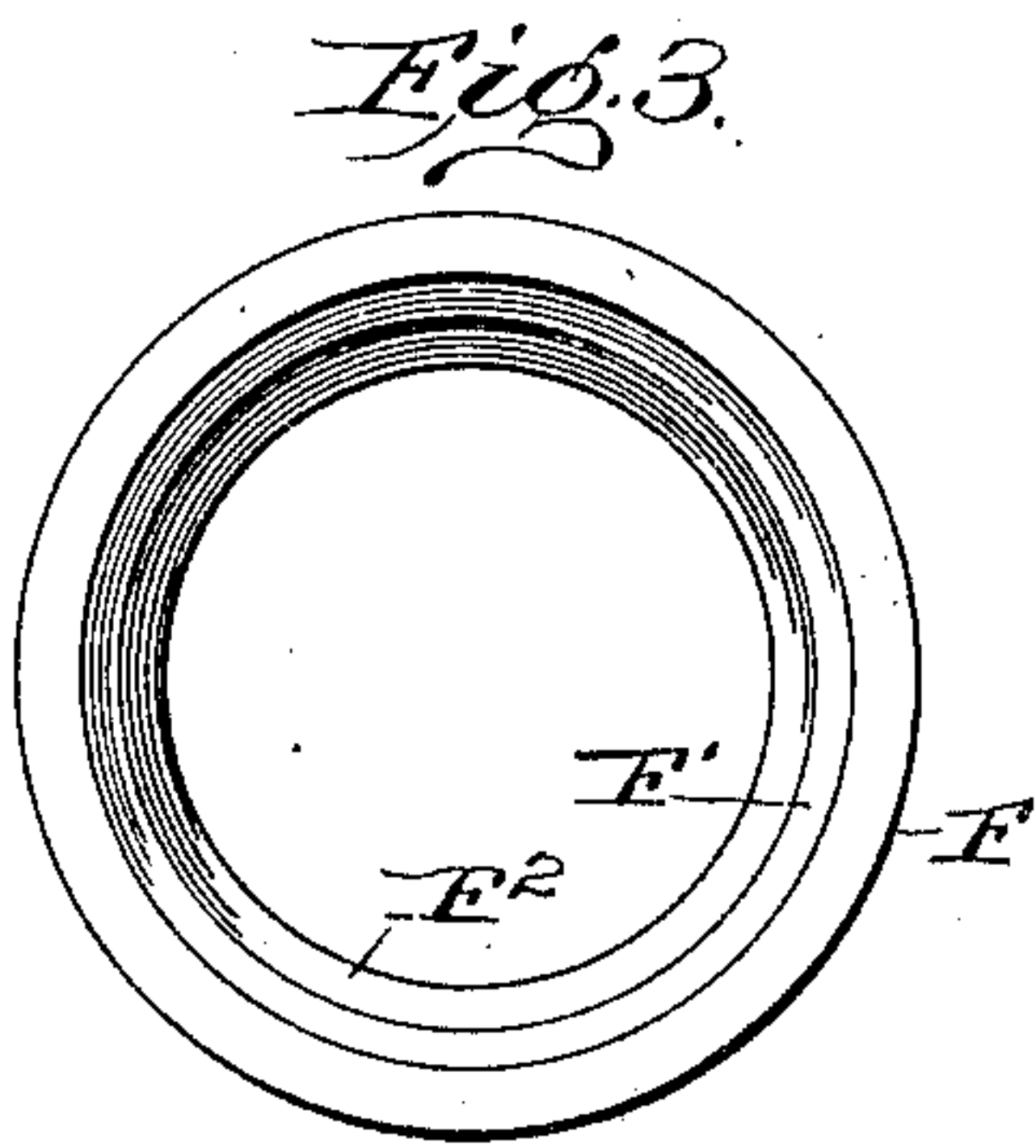
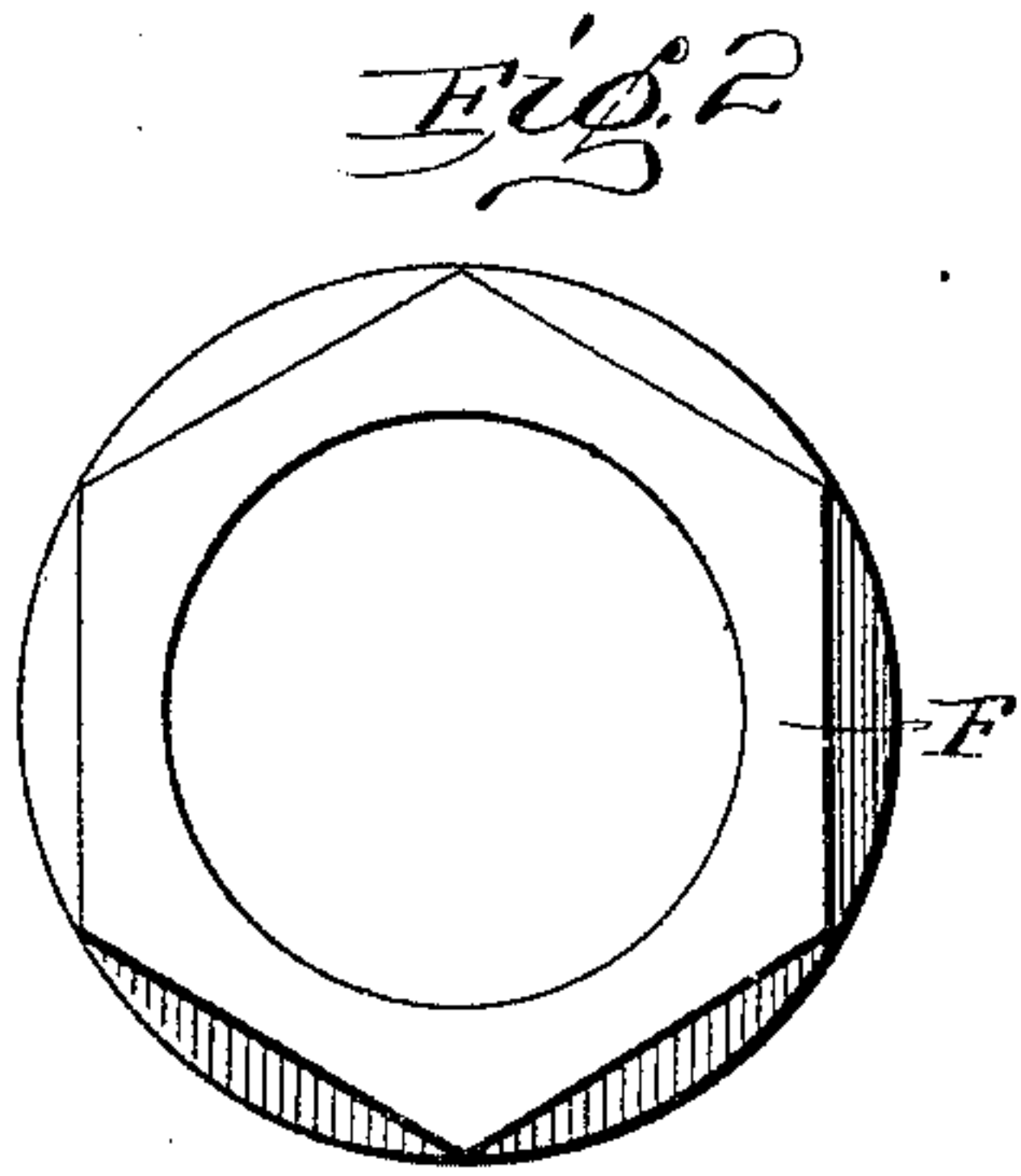
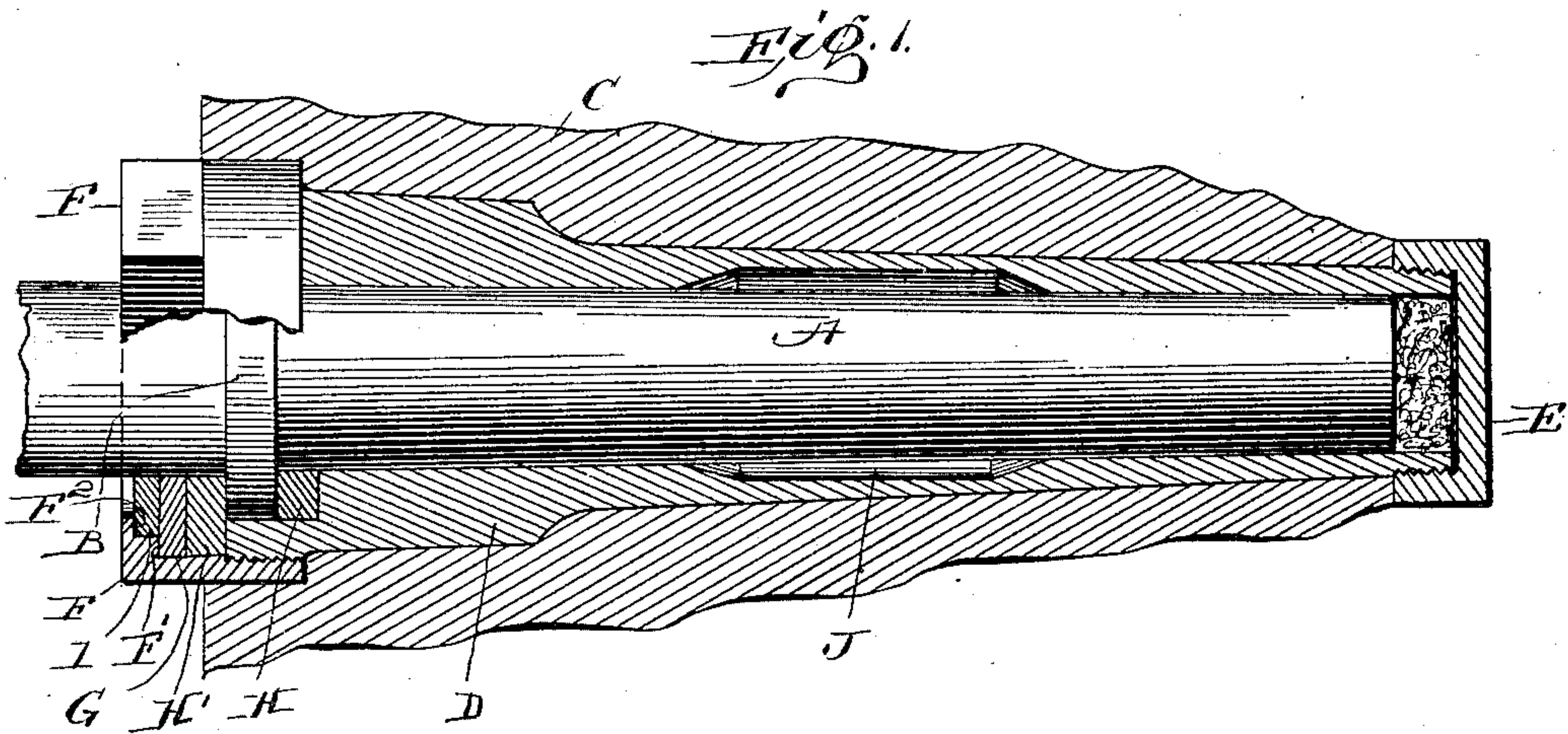


No. 687,976.

Patented Dec. 3, 1901.

M. W. BROOKS.
AXLE AND AXLE BOX.
(Application filed July 16, 1901.)

(No Model.)



Witnesses:
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Atty

UNITED STATES PATENT OFFICE.

MOSES W. BROOKS, OF SIDNEY, NEW YORK.

AXLE AND AXLE-BOX.

SPECIFICATION forming part of Letters Patent No. 687,976, dated December 3, 1901.

Application filed July 16, 1901. Serial-No. 68,493. (No model.)

To all whom it may concern:

Be it known that I, MOSES W. BROOKS, a citizen of the United States, residing at Sidney, in the county of Delaware and State of New York, have invented certain new and useful Improvements in Axles and Axle-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates particularly to the axles and axle-boxes of road-vehicles; and its objects are to exclude dust, improve appearance, obviate the necessity for frequent oiling, and secure true, easy, and noiseless running by simple, inexpensive, and cleanly devices. To attain these ends, the axle-box is made to project beyond the end of the axle and is hermetically closed by a nut, thereby forming an oil-reservoir, while the inner end of the axle-box is enlarged to pass over a fixed collar upon the axle and to form a shoulder limiting such inward movement and is engaged by a sleeve-nut upon the axle large enough to pass readily over the collar just mentioned, but prevented from returning by placing upon the axle, between the collar and an offset or shoulder within the nut, a steel washer not large enough to pass over the collar and externally too large to allow the shoulder to pass over it. When the nut is advanced, it acts against the collar and reacts upon the axle-box, drawing the shoulder of the latter toward the collar, whereby the latter, between the steel washer and the shoulder, prevents all longitudinal movement of the hub on the axle without materially interfering with its rotation thereon. Other peculiarities in the devices will be described hereinafter.

In the drawings, Figure 1 is a side view of a part of an axle and a hub, the latter and the axle-box being shown in central longitudinal section. Figs. 2, 3, 4, 5, 6, 7, and 8 are detached views of parts hereinafter mentioned.

In the figures, A represents an axle having an integrally-formed or rigidly-attached collar B, and C the central portion of any suitable hub containing an axle-box D, which projects beyond the end of the axle and is hermetically closed by a nut E, thereby form-

ing an oil-reservoir, which may be filled with waste or other oil-carrying material. The box is internally enlarged near its middle to form a receptacle J for oil and other matter and again enlarged at its inner end to allow this portion to pass over the collar C, the movement being limited by the shoulder formed by the enlarging.

Upon the axle is a loose sleeve-nut F, large enough to pass readily over the collar, provided with two internal shoulders or offsets F' F² and in threaded engagement with the inner end of the axle-box. Between the shoulder F' and the collar is placed a two-part annular steel washer G, whose internal diameter is less than the external diameter of the collar and whose external diameter is greater than the internal diameter of that part of the nut beyond the first offset. Leather washers H H' are placed between the collar and the shoulder of the axle-box on one side and the steel washer on the other, and the latter washer is divided on one side in order that it may be easily placed in position or removed, it being unnecessary for this purpose to make it in two parts, as in the case of the steel washer, because it is of flexible material. It follows from the construction that when the nut is advanced by rotation it first presses the washer H' against the collar and then by reaction draws the other washer against the opposite side of the same, thus making it impossible for the hub to move longitudinally upon the axle, although not binding the parts so firmly as to materially affect rotation. A felt washer I is placed within the nut, where it is held by the second shoulder F², but not compressed when the nut advances. This washer is also divided like the washer H' and for like reasons. Normally the nut F lies partly within the hub and the projecting portion is adapted to be engaged by a wrench or the like, so that it may be forcibly rotated.

In assembling the parts the sleeve-nut is placed upon the axle and passed over the collar. The felt washer, the steel washer, and the divided leather washer are then placed in position, the outer end of the axle-box is closed by its nut, and the oil-reservoir being filled with oil and the washer H being in position the hub is placed upon the axle and the

sleeve-nut is rotated until the washers H H' press with some degree of firmness upon opposite side of the collar, when this portion of the vehicle is ready for use. The oil gradually works its way inward and distributes itself over all the bearing-surfaces, a portion collecting in the cavity J, in which also collects slowly in long use of the vehicle some solid matter. It is preferred to saturate the felt washer with oil at the outset, though if this be not done it will become saturated by oil from the working surfaces. Practically vehicles provided with these devices have run more than a thousand miles without any attention whatever and at the end of the distance have been found in excellent condition and apparently not needing attention for a long time thereafter. Grit and dust are absolutely excluded, not because of joints too close to admit it, for that is perhaps impossible, but because a constant slight exudation of oil arrests the dust and closes the opening with a gradually-changing body of greasy matter which no dust can pass. In removing the hub it is only necessary to unscrew the sleeve-nut without removing any part, and when the wheel is removed it is the only part set free.

What I claim is—

1. The combination with an axle having a fixed collar near the inner end of its hub-bearing portion, of an axle-box enlarged at its inner end to pass over the collar and to form a shoulder opposing the outer face of the same, a sleeve-nut provided with an internal shoulder and adapted to pass freely over the collar and to engage the threaded inner end of the axle-box, and a two-part metal washer adapted to be interposed between the collar and the shoulder in the sleeve-nut; whereby the collar lies between the axle-box shoulder and the washer, and the nut, by its shoulder and threads, draws the last two together, fixing the position of the axle-box upon the axle.

2. The combination with an axle having a rigid collar near the inner end of the hub-bearing portion, of an axle-box having its inner end recessed to receive said collar, a divided metal washer encircling the axle and

opposing the inner side of the collar and extending outward over the end face of the axle-box, and a sleeve-nut inclosing the washer, in threaded engagement with the axle-box, and provided with an internal shoulder to engage the outer marginal portion of the washer's adjacent face; whereby the washer's marginal portion is rigidly clamped between the shoulder and axle-box while its inner portion prevents the outward movement of the hub.

3. The combination with an axle having a fixed collar near the inner end of the hub-bearing portion, of an axle-box recessed at its inner end to receive said collar and projecting beyond the axle at the other end, a nut closing the outer end of the axle-box, a sleeve-nut having an internal annular shoulder and adapted to pass freely over said collar and to engage the threaded end of the axle-box, a divided metal washer placed in the sleeve-nut between its shoulder and said collar to prevent the nut's passing outward over the latter, and a washer of felt or the like closing the annular space between the inner end of the nut and the axle.

4. The combination with the axle having the fixed collar, of the axle-box extending beyond the free end of the axle and having its inner end enlarged to pass over the collar and to form an internal shoulder opposed to the collar, a nut closing the outer end of the axle-box, a leather washer between said shoulder and collar, a divided leather washer upon the opposite side of the collar, a divided metal washer resting against the inner side of the washer last named, a felt washer near the inner side of the metal washer, and a sleeve-nut inclosing the three washers, in threaded engagement with the inner end of the axle-box, and provided with a shoulder to engage the metal washer and a shoulder to engage the felt washer, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MOSES W. BROOKS.

Witnesses:

CHARLES W. SPENCER,
WILLIAM F. WANGER.