

(No Model.)

L. WARFIELD.  
MOTOR TRUCK.

No. 553,022.

Patented Jan. 14, 1896.

FIG. 1.

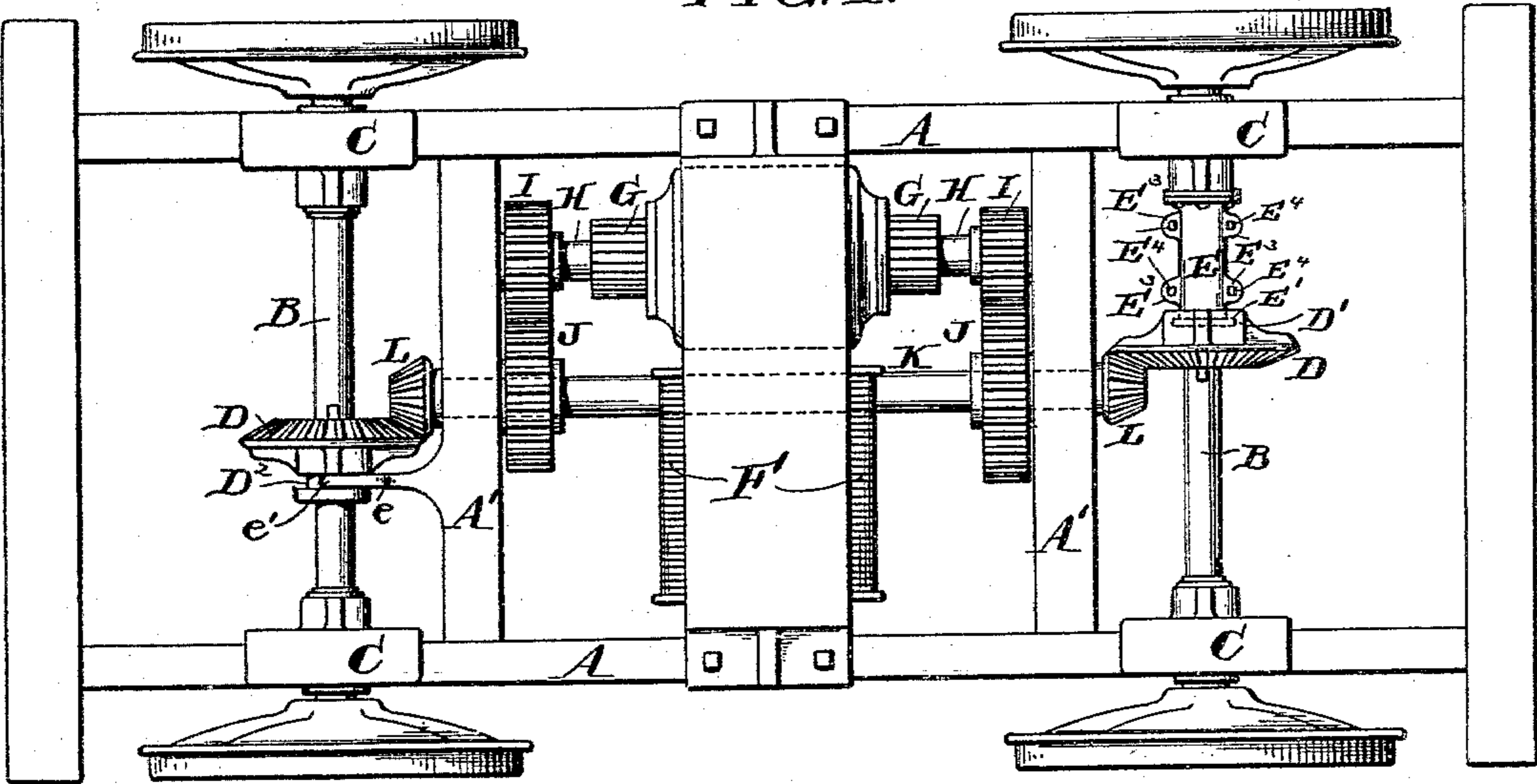


FIG. 2.

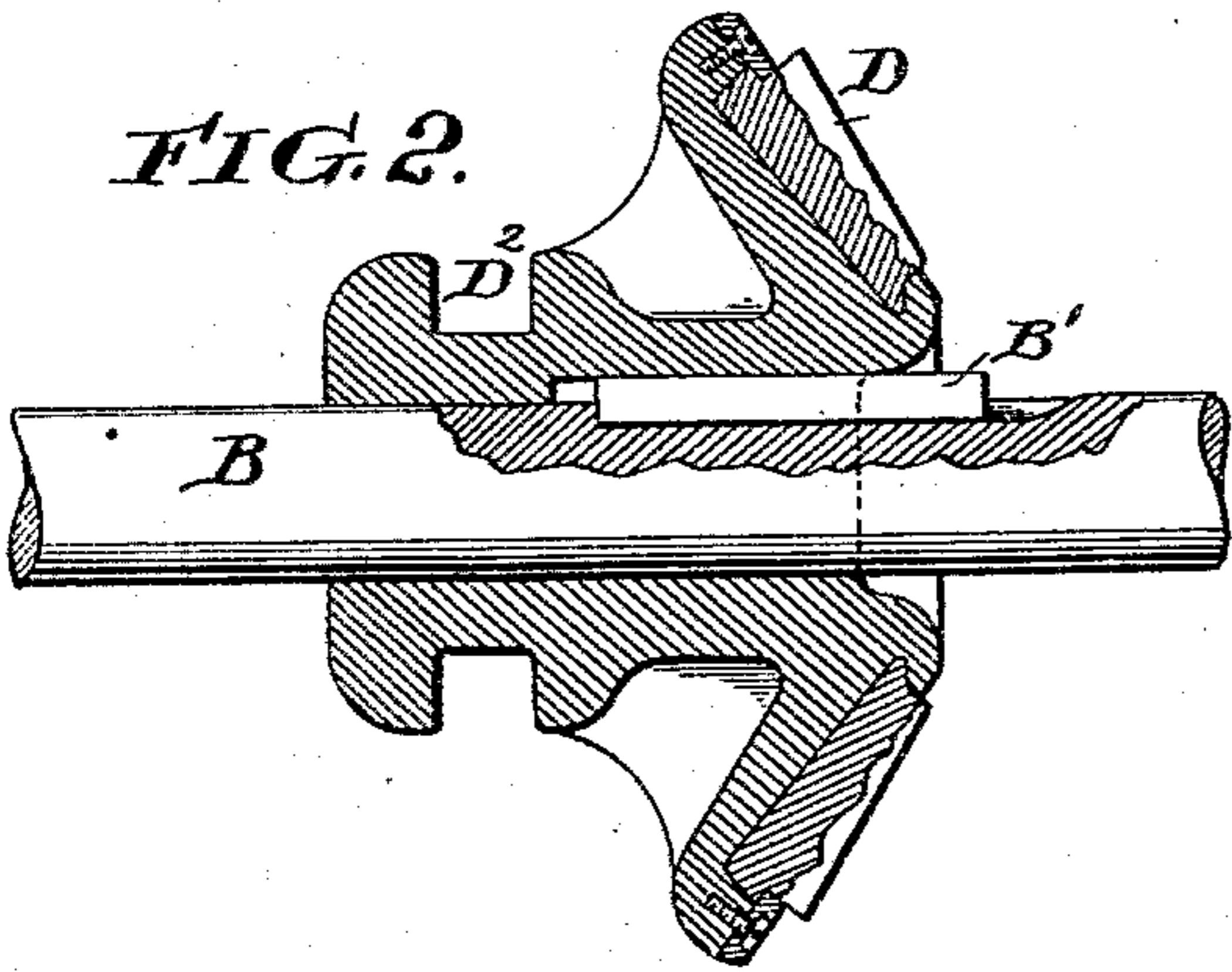


FIG. 3.

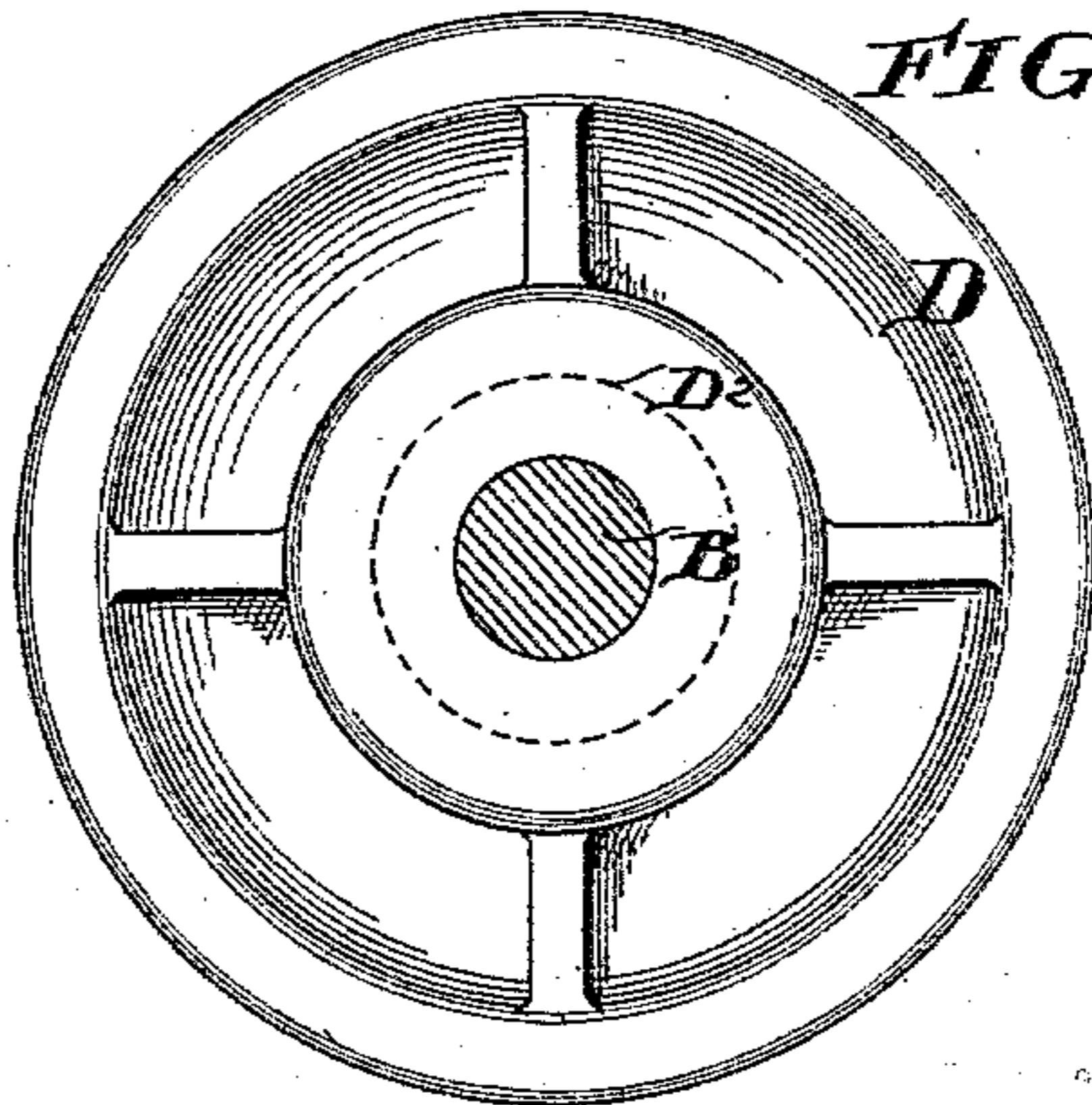


FIG. 4.

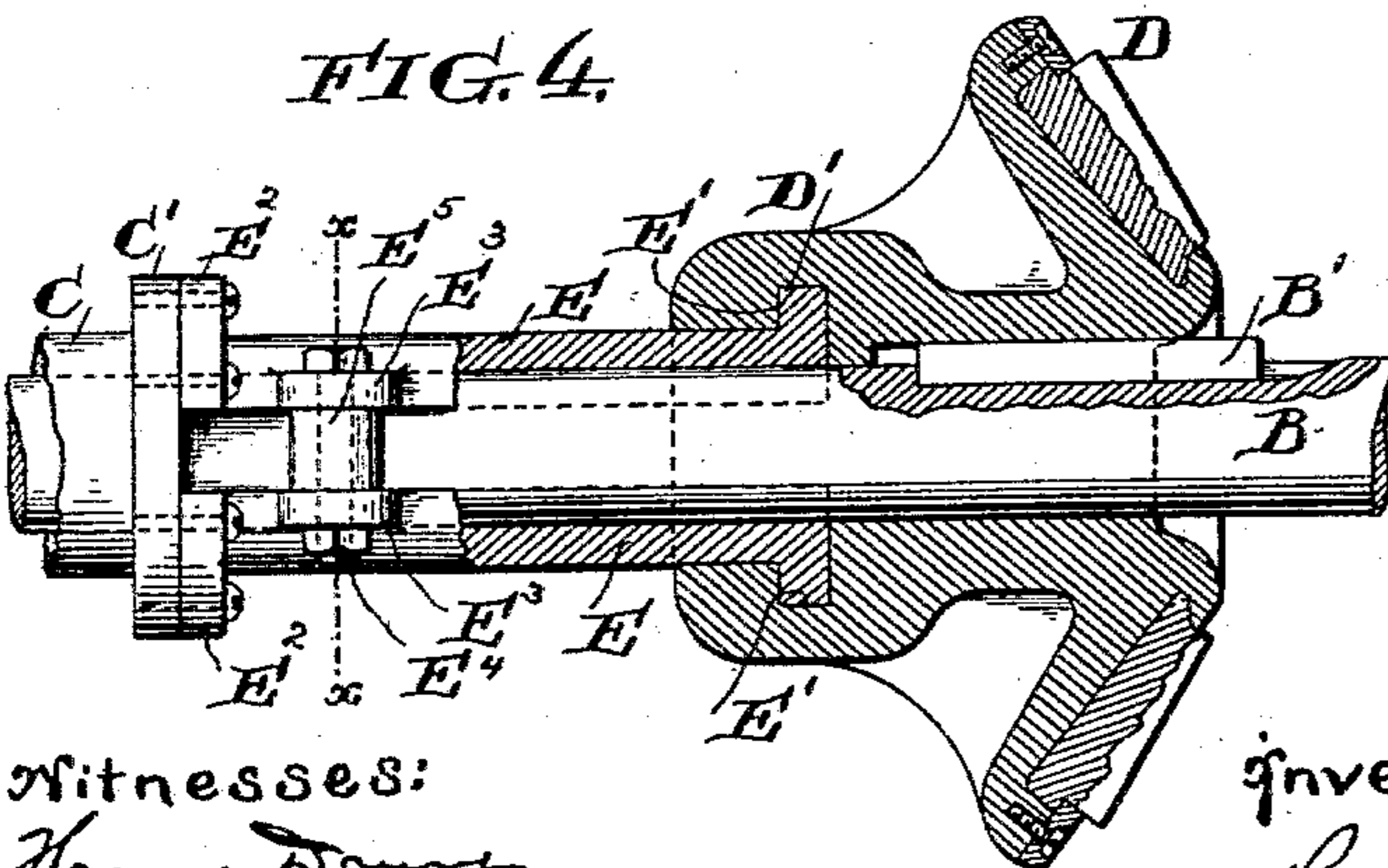
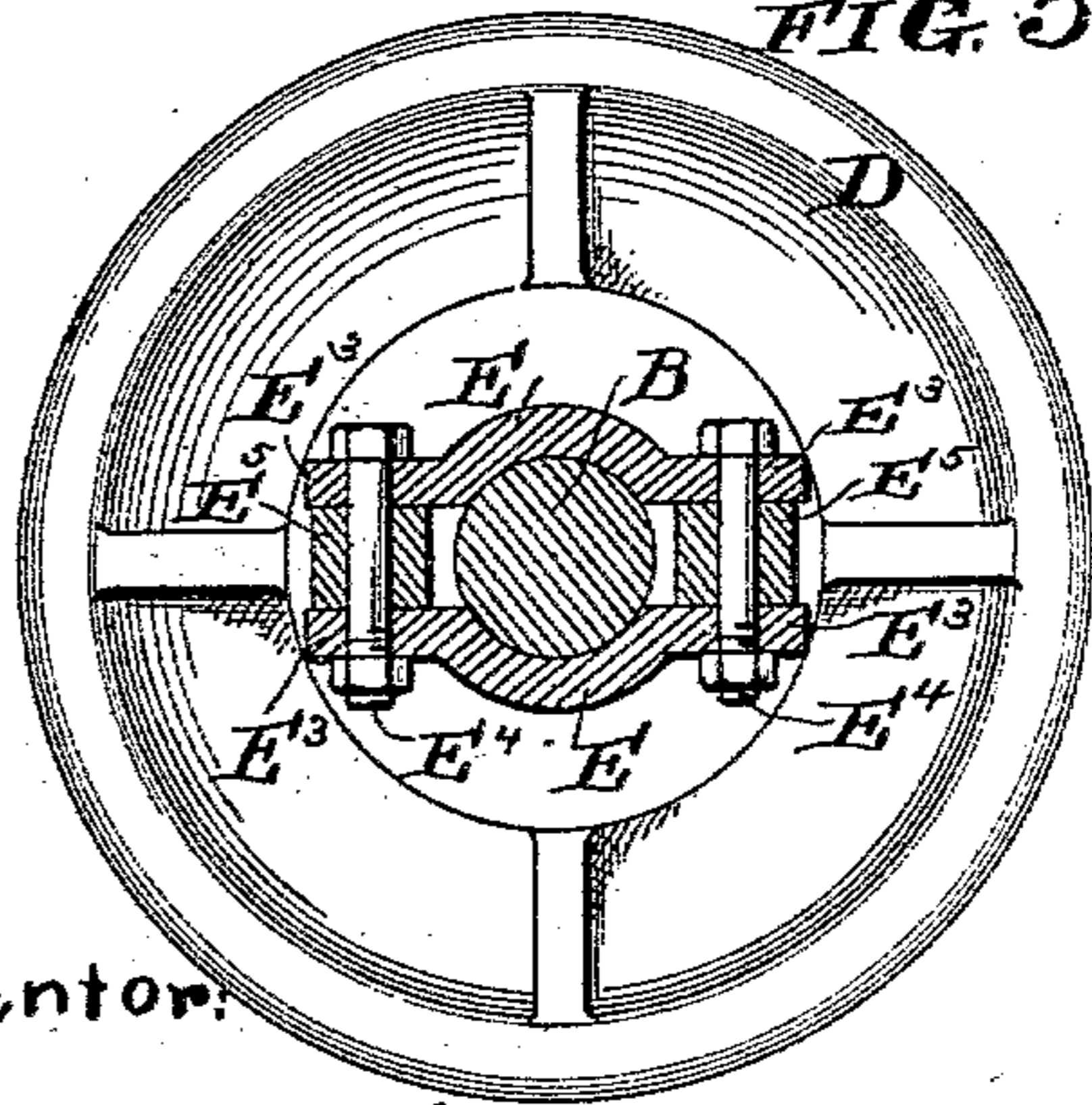


FIG. 5.



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# UNITED STATES PATENT OFFICE.

LOUIS WARFIELD, OF DETROIT, MICHIGAN.

## MOTOR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 553,022, dated January 14, 1896.

Application filed November 18, 1891. Serial No. 412,278. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS WARFIELD, of the city of Detroit and county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Motor-Trucks, of which the following is a true and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to the trucks of electric motors—such, for instance, as are used for street-cars.

My object is to provide a simple and efficient device for communicating motion from the motor to the axles. Heretofore, when gears were used, it has been the general custom to firmly secure the immediate driving-gear to the axle or axles, and to attempt to hold it in proper uniform position with the rest of the gearing by thrust-boxes, &c., arranged to prevent longitudinal movement in the axles. This is, however, very difficult to do; but I have overcome this recognized difficulty by securing the gear on the axle, so that while turning with it it is free to move longitudinally along it, and by securing the wheel in a fixed position with respect to the frame and the other gearing by direct communication therewith independent of the axle, but which connection does not impede the free motion of the gear on the axle.

Reference being now had to the drawings illustrating my invention, Figure 1 is a plan view of a truck equipped with my device; Fig. 2, a side view in section of the axle and attached gear as shown by the left of Fig. 1. Fig. 3 is an end view of Fig. 2. Fig. 4 is a side view, partly in section, of the axle-journal-box gear, &c., as shown to the right of Fig. 1. Fig. 5 is an end view of Fig. 4 on the section line *x x*.

A A A' A' indicate the frame of the truck, B B axles, C C, &c., journal-boxes for the axles secured on the frame.

D D are miter-gears, which are secured to the axles B by feathers B', which permit them longitudinal motion.

F is the motor supported by the frame; G, the armature; H, the armature-shaft; I I, the gears on said shaft; J J, gears on counter-shaft K, and said gears meshing with gears I, and said shaft having at its ends miter-gears L L, which engage gears D D.

As shown, it is only necessary to provide means for holding the gears D in a fixed position with respect to the frame in order to insure the proper and permanent engagement of the gears, and this is accomplished by extending out from the frame an arm which will engage the gear D, so as to hold it in a fixed position while permitting it to rotate freely. Such arm may be of any convenient form. In the drawings I have shown two. Thus at the right of Fig. 1 and in Figs. 4 and 5 I show the hub of wheel D with an interior annular groove D', in which fit the turned-out ends E' of a split tube E E, which is secured by flanges E<sup>2</sup> to a flange C' of the box C. The two parts of E E are, as shown, secured together by bolts E<sup>4</sup> and blocks E<sup>5</sup> arranged between ears E<sup>3</sup> of the parts E; but a single tube can be used and slipped over the end of the axle before it is inserted in the bearing-box.

At the left of Fig. 1 and in Figs. 2 and 3 the hub of wheel D is provided with an outer groove D<sup>2</sup> in which the fingers *e* of an arm *c* rest, both devices serving the same purpose of holding the gear in a fixed position.

It will be noticed that by my construction the freedom of the gear-wheel to move on the axle is not interfered with, as would be the case if the weight of the frame rested upon it.

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

The combination with a truck frame A, of an electric motor supported entirely from the frame A, an axle journaled in said truck frame, a gear wheel D having a grooved hub secured on the axle so as to turn therewith while free to move longitudinally thereon, an arm secured to the truck frame and having a flange or finger arranged to engage with the groove in the hub of the gear wheel and keep it in a fixed position relatively to the motor frame, and a suitable gear, actuated by the motor meshing with the gear wheel D, all substantially as and for the purpose specified.

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