

No. 653,482.

Patented July 10, 1900.

R. L. MORGAN.
PISTON FOR SINGLE ACTING ENGINES.

(Application filed Jan. 11, 1899.)

(No Model.)

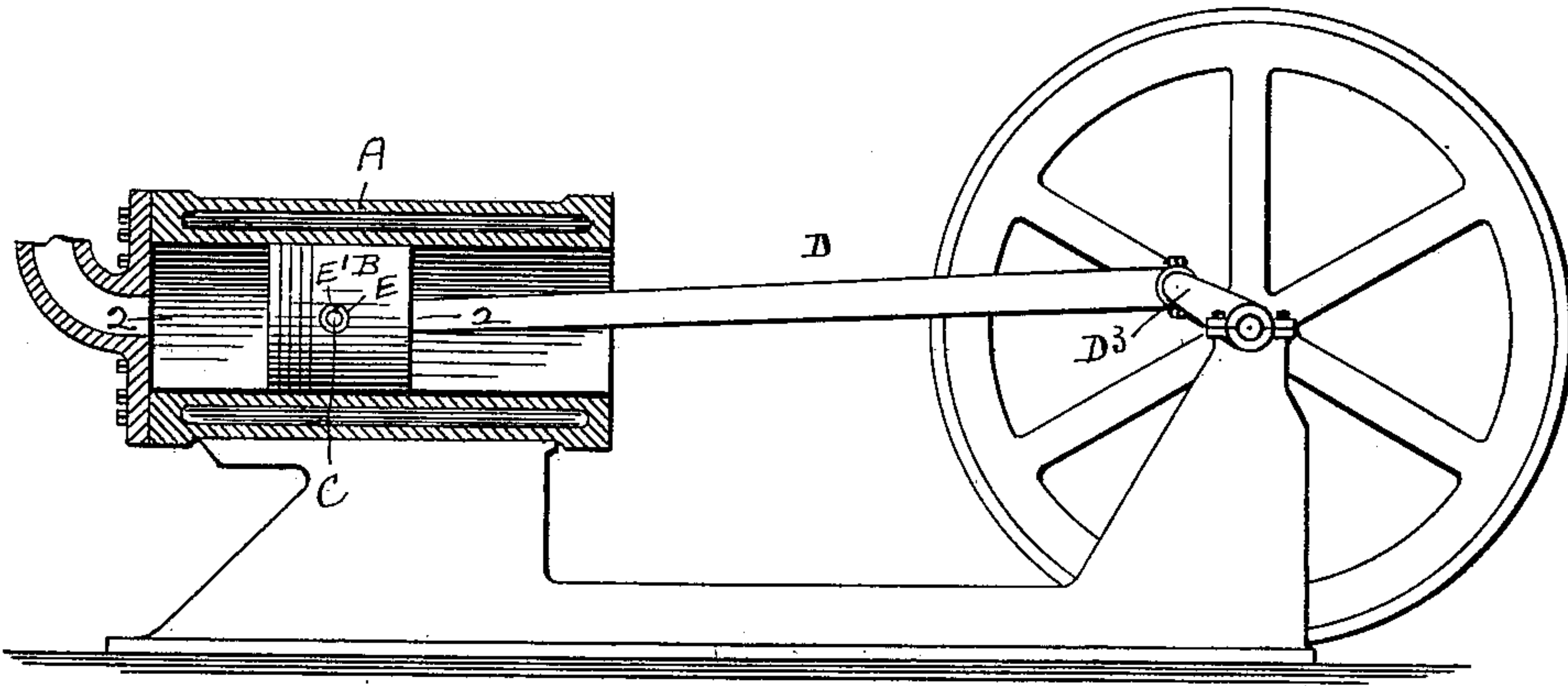


Fig 1.

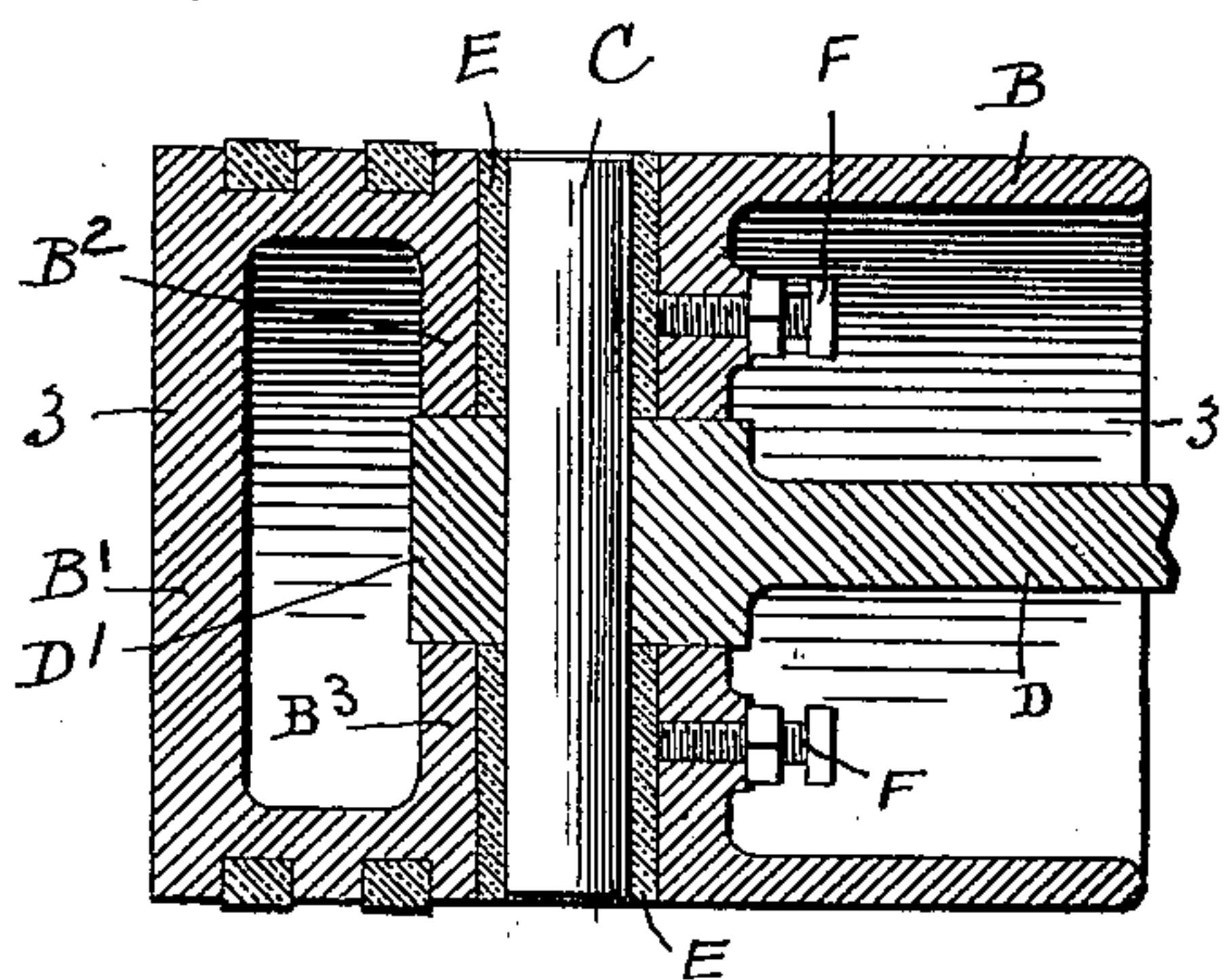


Fig 2.

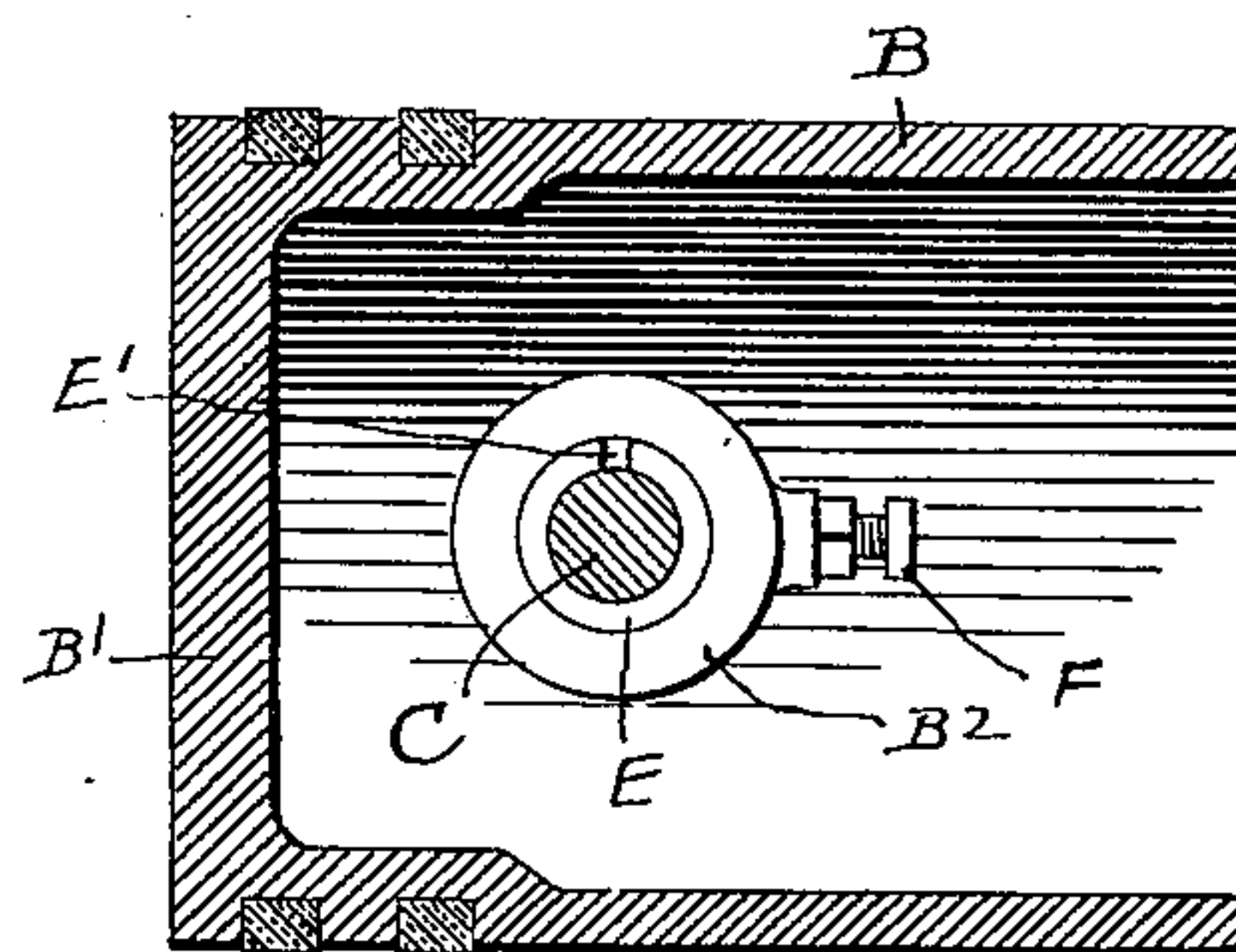


Fig 3.

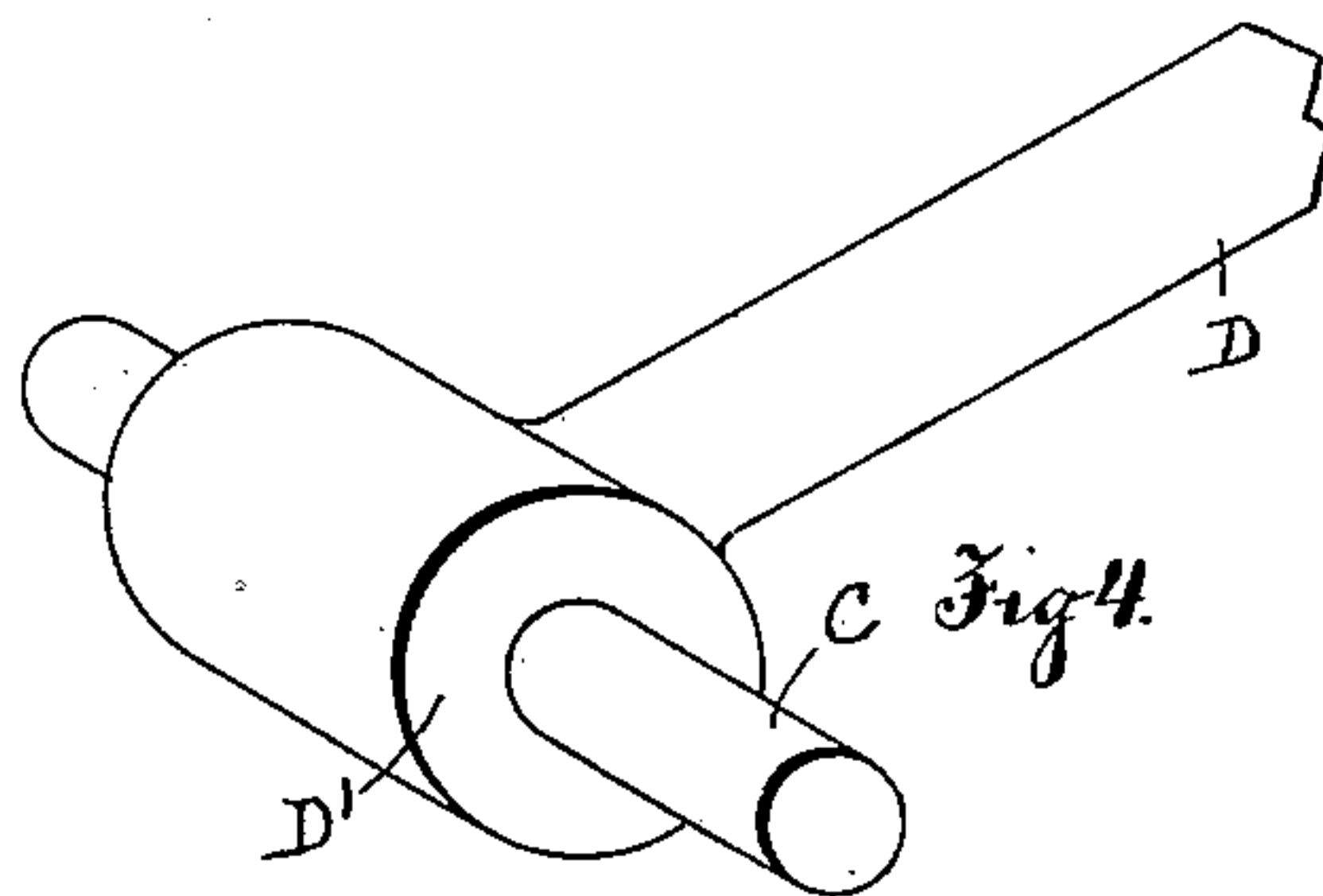


Fig 4.

Witnesses:

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UNITED STATES PATENT OFFICE.

RALPH L. MORGAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE MORGAN CONSTRUCTION COMPANY, OF SAME PLACE.

PISTON FOR SINGLE-ACTING ENGINES.

SPECIFICATION forming part of Letters Patent No. 653,482, dated July 10, 1900.

Application filed January 11, 1899. Serial No. 701,876. (No model.)

To all whom it may concern:

Be it known that I, RALPH L. MORGAN, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Pistons for Single-Acting Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, and in which—

Figure 1 represents a central sectional view of the cylinder of a gas-engine inclosing a piston embodying my invention. Fig. 2 is a central sectional view of the piston on line 2 2, Fig. 1. Fig. 3 is a sectional view of the piston on line 3 3, Fig. 2. Fig. 4 is a perspective view of the end of the piston-rod and pin contained therein by which the piston-rod is pivotally connected with the piston.

Similar reference-letters refer to similar parts in the different views.

The object of my present invention is to provide an improved connection between the piston of a gas-engine and its piston-rod whereby its construction is simplified, the wearing-surface increased, and means are provided for their lubrication; and it consists in the construction and arrangement of parts, as hereinafter described, and set forth in the annexed claims.

Referring to the drawings, A denotes the cylinder of a gas-engine shown in central sectional view, and B the piston contained therein. The piston B consists of a hollow cylindrical shell open at one end and closed at its opposite end by the head B'.

Upon opposite sides of the inner wall of the tubular piston B are bosses B² B³, having holes in diametrical alinement to receive a pin C, held in a fixed position in the piston-rod either by a pin passing transversely through the piston-rod and pin C or by being driven tightly into the end D' of the piston-rod D, which is connected at its opposite end with the crank D³ of the engine in the usual manner. The pin C fits tightly and is thereby held from turning within the end D' of the piston-rod, and its ends are capable of a rocking motion within the bosses B² B³ to provide for the annular movement of the pis-

ton-rod as the crank D³ rotates. The bosses B² B³ are each provided with bushings E E, which are cut apart upon one side, forming slots E' E'. The bushings E E are capable of being compressed and their diameter reduced by means of screws F F, held in the bosses B² B³ and bearing against one side of the bushings, whereby any wear between the pin C and the bushings E E may be taken up. The slots E' E' in the bushings E E are considerably wider than is needed to compensate for the wear between the pin and bushings, so that an open channel is always maintained by means of the slots between the bearing-surfaces of the pin C and the outside of the piston in order that lubricating material between the piston and cylinder can find access to the bearing-surfaces of the pin C through the open slots E' E', thereby causing the pin C to be constantly lubricated in common with the lubrication of the cylinder.

Whenever any wear occurs between the bearing-surfaces of the pin C and the bushings E E, the bushings are compressed by means of the screws F F, and when the bushings become too much worn they can be readily replaced by new bushings by withdrawing the piston from the cylinder, and the pin C can also be readily driven out of the piston-rod and a new pin substituted. As the pin is held in a fixed position in the end of the piston-rod, it is caused to oscillate by the movement of the piston-rod within the bushings E' E', thereby increasing the area of surface subject to wear and distributing it equally over the ends of the pins C in contact with the bushings E' E', which are capable of being taken up as they become worn by means of the screws F F, which are accessible through the open end of the piston.

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

1. The combination with the hollow piston of a single-acting engine provided with interior tubular bosses, of a piston-rod, a pin carried by said rod and having its ends journaled in said tubular bosses, bushings partially inclosing the ends of said pin, said bushings being cut apart to form slots, leading from the outside of the piston to the bearing-

surface of said pin and means for compressing said bushings to compensate for wear, substantially as described.

2. The combination with the cylinder and
5 the hollow piston of a single-acting engine having interior tubular bosses, of a piston-rod, a pin carried by said piston-rod and held from turning therein with its ends entering
10 said tubular bosses and split bushings partially inclosing the ends of said pin, whereby slots are formed to provide access to the bearing-surface of said pin for lubricating material from the interior of the cylinder, substantially as described.

15 3. The combination with the cylinder of a single-acting engine, of a hollow piston B having interior bosses B², B³, which are provided

with holes in diametrical alinement and extending entirely through said bosses, a piston-rod D having its end D' pivotally connected 20 to said piston, a pin C held from turning in the end of the piston-rod with its ends journaled in said bosses, bushings E, E, cut apart on one side forming slots E', E', extending the entire length of said bushings and tightening-screws F, F, held in said bosses with 25 their ends bearing against one side of said bushings, substantially as described.

Dated this 3d day of January, 1898.

RALPH L. MORGAN.

Witnesses:

RUFUS B. FOWLER,
ELIZABETH GRAY.