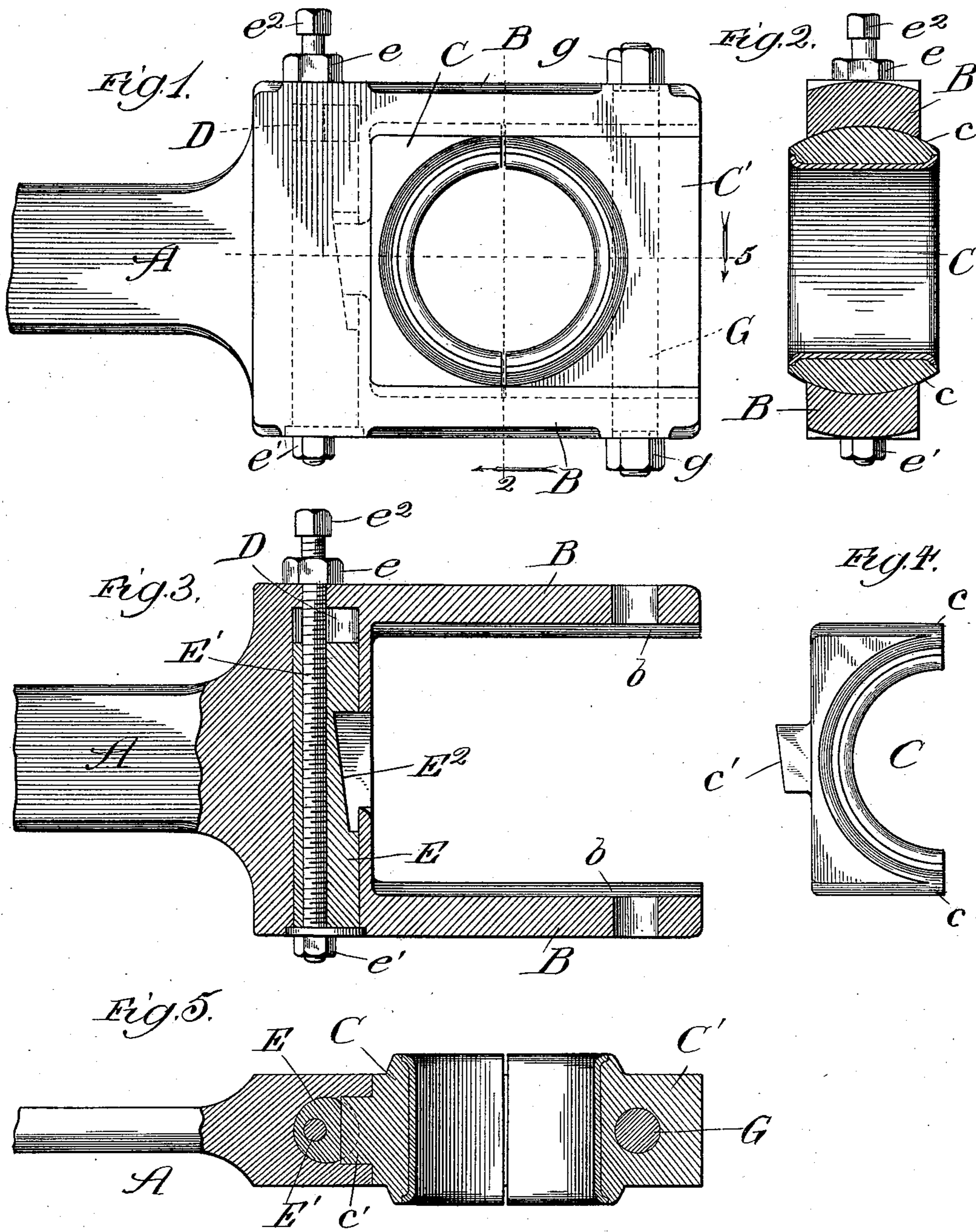


(No Model.)

F. F. FISCHER.  
CONNECTING ROD END FOR ENGINES.

No. 592,109.

Patented Oct. 19, 1897.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

FRED F. FISCHER, OF CHICAGO, ILLINOIS.

## CONNECTING-ROD END FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 592,109, dated October 19, 1897.

Application filed December 11, 1896. Serial No. 615,276. (No model.)

*To all whom it may concern:*

Be it known that I, FRED F. FISCHER, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Connecting-Rod Ends for Engines, of which the following is a specification.

The object of my invention is to provide a simple, economical, and efficient connecting-rod end, adapted for use in connection with all kinds of engines; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a connecting-rod end made in accordance with my improvements; Fig. 2, a transverse section taken on line 2 of Fig. 1; Fig. 3, a side sectional elevation of the end with the brasses removed; Fig. 4, a side elevation of one of the brasses, and Fig. 5 a longitudinal sectional view taken on line 5 of Fig. 1.

Heretofore in this art it has been customary to make the connecting-rod end of all flat, plane surfaces, the finishing of which was dependent entirely for its accuracy on hand labor, which is necessarily expensive. Further, the parts were made in such manner that the combined weight was considerable, necessitating a heavy balance on the crankshaft, disk, or wheel. The principal reason for the heavy weight of the parts was due to the fact that where a strap end was used to form a portion of the connecting-rod end, it has been secured to the connecting-rod by means of one or more bolts, so that in order to present as much resistance as possible to bending "moments" the parts had to contain considerable material. Further, it is well known that this renders it impossible to make the different parts of the connecting-rod interchangeable by hand labor—that is, operatives, working with hand-tools only, could make the different parts interchangeable with each other and with parts made by other workmen only at enormous expense. My invention therefore is intended primarily to obviate the above-named objections and provide a connecting-rod end that can be made principally by machinery, relying little, if any at all, upon hand labor for the fit-

ting parts, so that such parts will be interchangeable and may be applied to engines already in use, or any other way of construction, with the certainty that they will fit the place for which they are designed.

In constructing a connecting-rod end in accordance with my improvements, I make a rod A, of the desired size, shape, and strength necessary for the amount of work to be done and the size of the engine with which it is intended to be used. This rod is provided with integral forked-end pieces B B, the interior surfaces *b b* of which are bored out to form longitudinally parallel cylindrical inner surfaces. The boring of such parts can be done in a boring-machine or lathe of ordinary construction. The brasses C C' are turned off in a lathe, so as to present, when finished, longitudinally-parallel outer surfaces *c c*, of a size and curvature necessary to fit snugly into the forked ends of the connecting-rod.

To securely hold the parts in place and provide for interchangeability as well, I bore or drill and ream an opening D transversely in the body of the connecting-rod and to the rear of the forked ends, and in this transverse opening I insert a cylindrical plug E, of a size to snugly and easily fit the same. This plug is provided with a threaded opening into which an adjusting-screw E' is fitted, said adjusting-screw being provided with lock-nuts *e* and *e'* at each end thereof, and with a head portion *e<sup>2</sup>*. The cylindrical plug is provided with a tapered surface E<sup>2</sup>, adapted to be contacted by a tapered cylindrical boss or projection *c'* on the inner brass, so that by moving the plug up and down the brasses are brought into the desired position.

In order to secure the parts together, I bore through the free ends of the fork and through the outer brass and insert a bolt G therein having securing-nuts *g* at each end thereof. This securing-bolt is preferably at its threaded ends of a smaller diameter than the body portion, so that I may use as small nuts as possible to perform the work and securely hold the parts in position.

From the foregoing description and examination of the drawings, it will be seen that all of the parts that have to be finished and fitted to other parts are made cylindrical, so

that they may be bored out or drilled and reamed to provide uniform sizes; and it will be seen, further, that brasses made to fit one connecting-rod end will readily fit another  
 5 connecting-rod end, due to the fact that the structural features present problems for machines only. It will be seen that by making the forked ends and connecting-rod in one integral piece the section of the end of  
 10 the fork and connecting-rod where they are joined together resists bending moment with the minimum amount of material that can be used to perform the maximum work, thus making as light a connecting-rod end as possible,  
 15 so that the balance can be of minimum weight. This will allow an economical structure particularly adapted for high-speed engines.

I claim—

20 1. A connecting-rod end, provided with inner longitudinally parallel cylindrical surfaces, brasses located therein and provided with outer corresponding cylindrical surfaces, and means for securing the parts together,  
 25 substantially as described.

2. A forked connecting-rod end made in one integral portion, the forks of which are provided with inner substantially longitudinally parallel cylindrical surfaces, brasses located  
 30 therein and provided with outer corresponding cylindrical surfaces where they fit the forked ends, and means for securing the parts together, substantially as described.

3. A forked connecting-rod end made in one

integral piece, the forks of which are provided with inner substantially longitudinally parallel cylindrical surfaces to fit the brasses, and a transverse cylindrical opening for an adjusting-plug, brasses provided with outer  
 35 substantially longitudinally parallel cylindrical surfaces to fit the forked ends, a cylindrical adjusting-plug in the transverse opening, means for securing the brasses and forked  
 40 ends together and means for adjustably operating and holding the cylindrical plug in its different positions, substantially as described.  
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4. A forked connecting-rod end made in one integral piece, the forks of which are provided with substantially longitudinally parallel cylindrical inner surfaces and the body portion  
 50 of which is provided with a transverse cylindrical opening, a pair of brasses provided with substantially longitudinally parallel cylindrical outer surfaces to fit the forked ends, a  
 55 cylindrical boss or projection for one of such brasses, means for holding the brasses in position, a cylindrical adjusting-plug in the transverse opening of the forked end arranged to contact the cylindrical projecting boss of  
 60 the brasses, and screw mechanism for operating such plug and holding it in its various positions, substantially as described.

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Witnesses:

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