

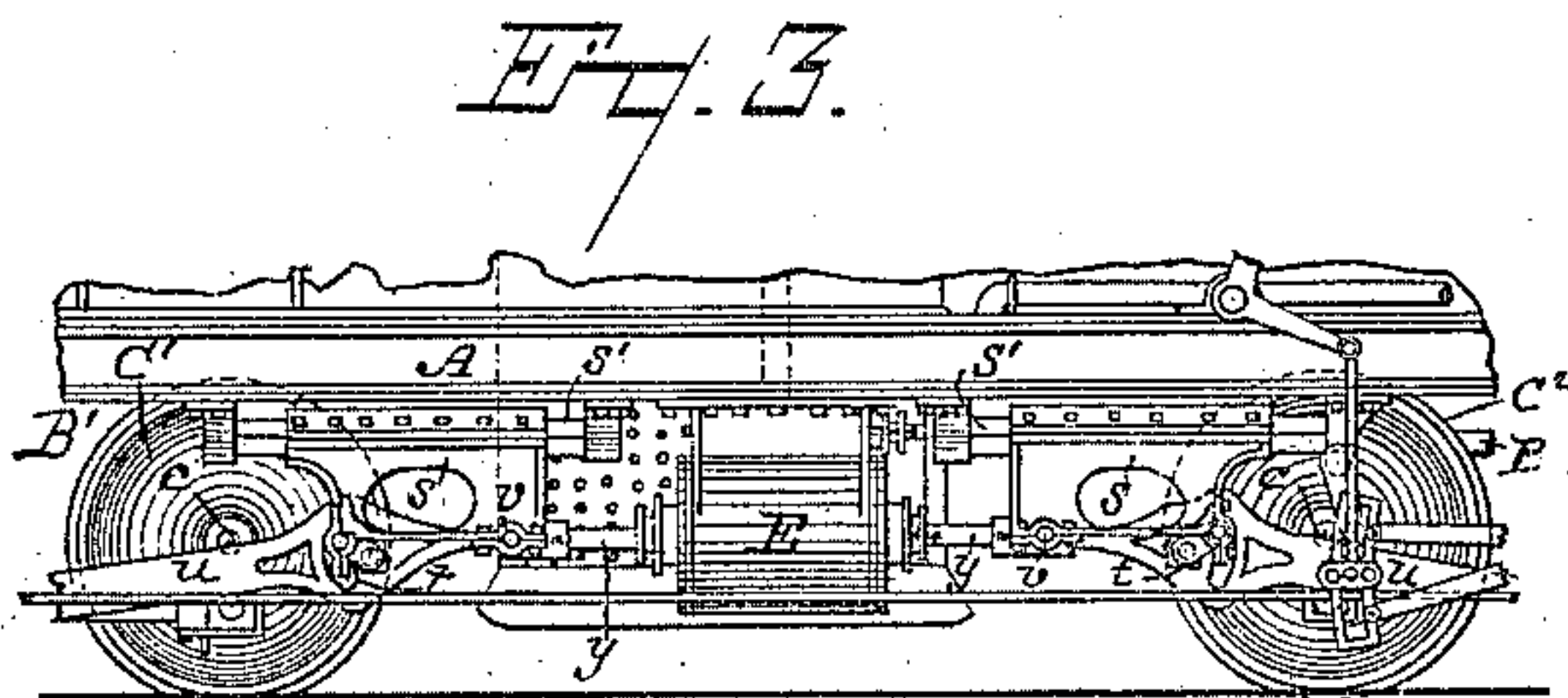
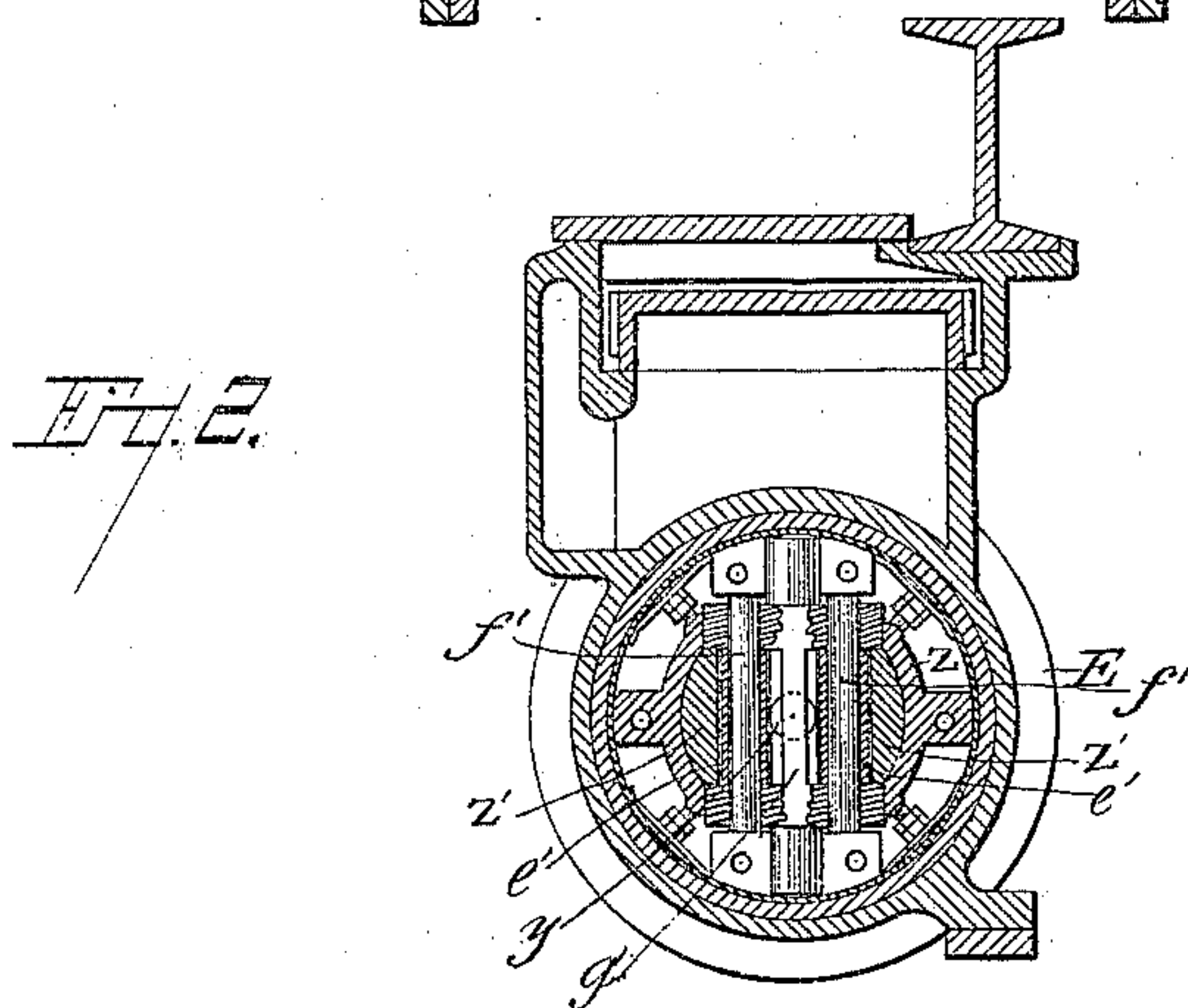
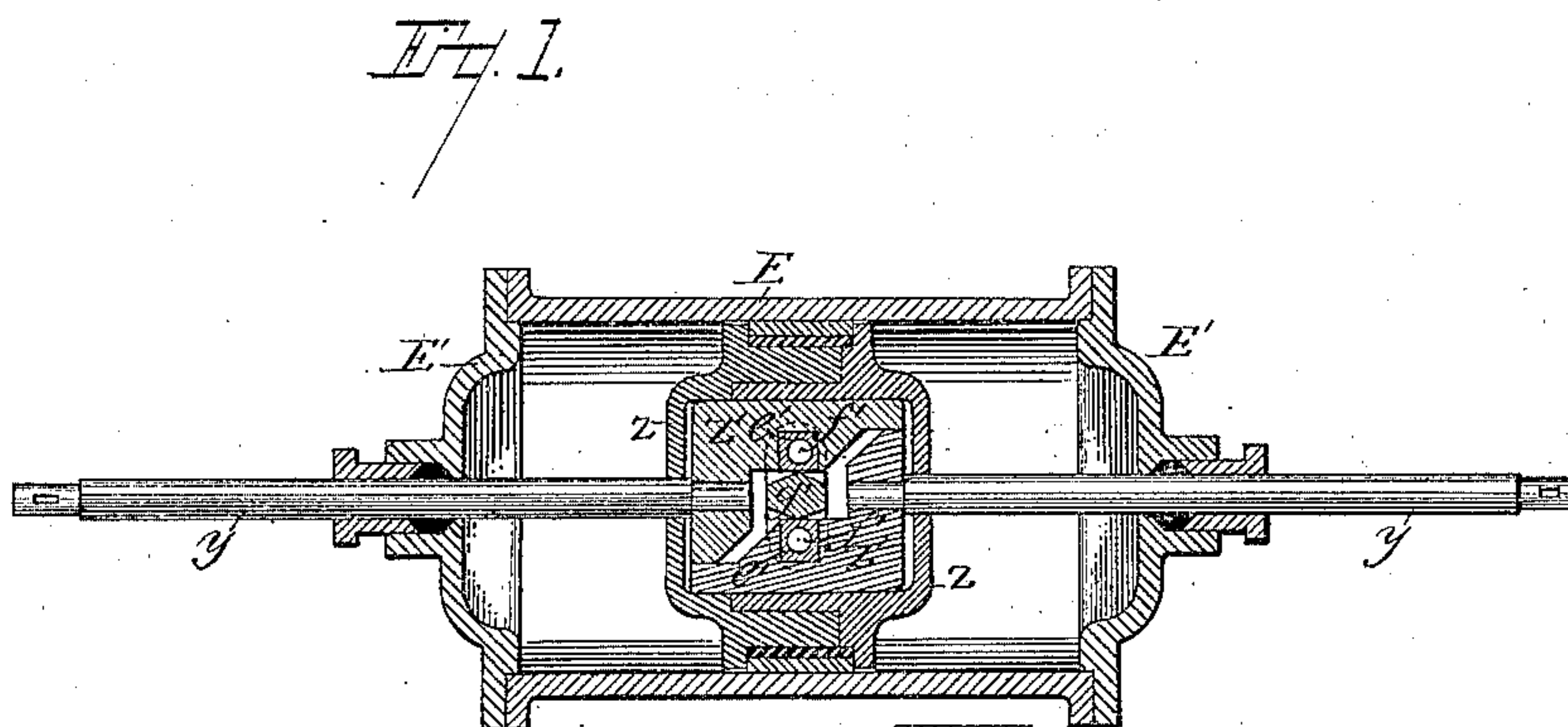
(No Model.)

E. P. COWLES.

PISTON FOR LOCOMOTIVE AND OTHER ENGINES.

No. 307,709.

Patented Nov. 4, 1884.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD P. COWLES, OF WEQUIOCK, WISCONSIN.

PISTON FOR LOCOMOTIVE AND OTHER ENGINES.

SPECIFICATION forming part of Letters Patent No. 307,709, dated November 4, 1884.

Application filed August 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. COWLES, of Wequiock, in the county of Brown, and in the State of Wisconsin, have invented certain new and useful Improvements in Pistons for Locomotive and other Engines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in pistons especially designed for use in locomotives, and will be fully described hereinafter.

In the drawings, Figure 1 is a vertical longitudinal section of an engine cylinder and piston, showing the construction of my improved compensating device; and Fig. 2 is a vertical cross-section of the same. Fig. 3 is an elevation of so much of the frame and truck of a locomotive-engine as is necessary to show the location and application of my device.

In my present invention I have shown my device as applied to a locomotive-engine such as is shown in my Patent No. 303,491, dated August 12, 1884, and I have shown in Fig. 3 only so much of a locomotive as is necessary.

A shows a part of the engine-frame, and B B' the trucks, each of which has six wheels, the front ones, C', and the rear ones, C'', of which are fastened to ordinary axles, c c, running in suitable bearings attached to the truck-frame.

E is the engine-cylinder, located between the rear wheels, C'', of the front truck, B, and the front wheels, C', of the rear truck, B'. Each of the trucks B B' has the crank of its shaft directly connected by the rod n to the piston of the engine-cylinder. This latter is suitably bolted to the under side of the frame A, midway between the trucks B B'. The piston-rod y extends through both heads E' E' of the cylinder, and each end of said rod y carries the cross-head s, working in the guide-rod s', suitably mounted in the under side of the engine-frame A. The front end of the piston is thus coupled with the front truck, B, while the rear end is coupled with the hind or rear truck, B', both ends working obviously together in the same vertical and horizontal planes.

The object of my invention is, primarily,

to provide a compensating device for the connections between an engine-piston and the drive-wheels of a locomotive-engine; but it is also applicable wherever unequal strains are produced; and I will next describe the construction of my piston, especially designed to accomplish the said result. This piston is composed of two parts, each of which has an end-play in the piston-head z. Secured to the inner end of each portion is a hub, z', and these hubs are so formed that the outer end of one overlaps the outer end of the other. In each of the overlapping ends of the hubs a slot is formed to receive a block, e', and these blocks are connected by means of the pins f' f' to the arms of a rocker, g', that has its bearings in the piston-head z. The hubs z' z' are cut and turned to fit each other nicely and the boring in the piston-head, in order to prevent their springing and to keep them perfectly in line. Owing to this construction, it is obvious that the power applied to the piston-head z will be equally distributed through the rocker g' to the respective portions of the piston. This latter will thus be left absolutely free to adjust itself to any variation in the distance between the cross-heads and the cranks of the driving-shafts, owing to the angularity of the connecting-rods at the lower and higher points of their strokes.

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

1. A piston composed of two parts, each of which is freely connected to one end of a lever centrally fulcrumed in the piston-head, whereby the power applied to the said piston-head is equally transmitted to each of the said parts, allowing them at the same time to adjust themselves to any variation produced in the distance between the cross-heads as the higher or lower points of the driving-shaft cranks are neared, substantially as set forth.

2. A piston composed of two parts, each of which has a play in the piston-head, wherein a hub fastened onto the end of one of said parts and shaped so as to overlap a similarly-shaped hub fastened onto the end of the other part is connected to the latter by means of a rocker working in the said piston-head, where-

by the piston-rods are adapted to adjust themselves to the varying distance between the cross-heads as the higher or lower points of the revolution of the driving-shaft cranks are
5 neared, substantially as set forth.

3. The piston having the head *z*, the hubs *z' z'*, block *e'*, pins *f' f'*, and rocker *g'*, in combination with the cylinder *E*, substantially as shown and described, and for the purpose set
10 forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Wequiock, in the county of Brown and State of Wisconsin, in the presence of two witnesses.

EDWARD P. COWLES.

Witnesses:

W. J. LANDER,
GEO. NAN.