

No. 814,148.

PATENTED MAR. 6, 1906.

H. LENTZ.
CYLINDER FOR STEAM LOCOMOTIVES.

APPLICATION FILED APR. 13, 1905.

Fig. 1.

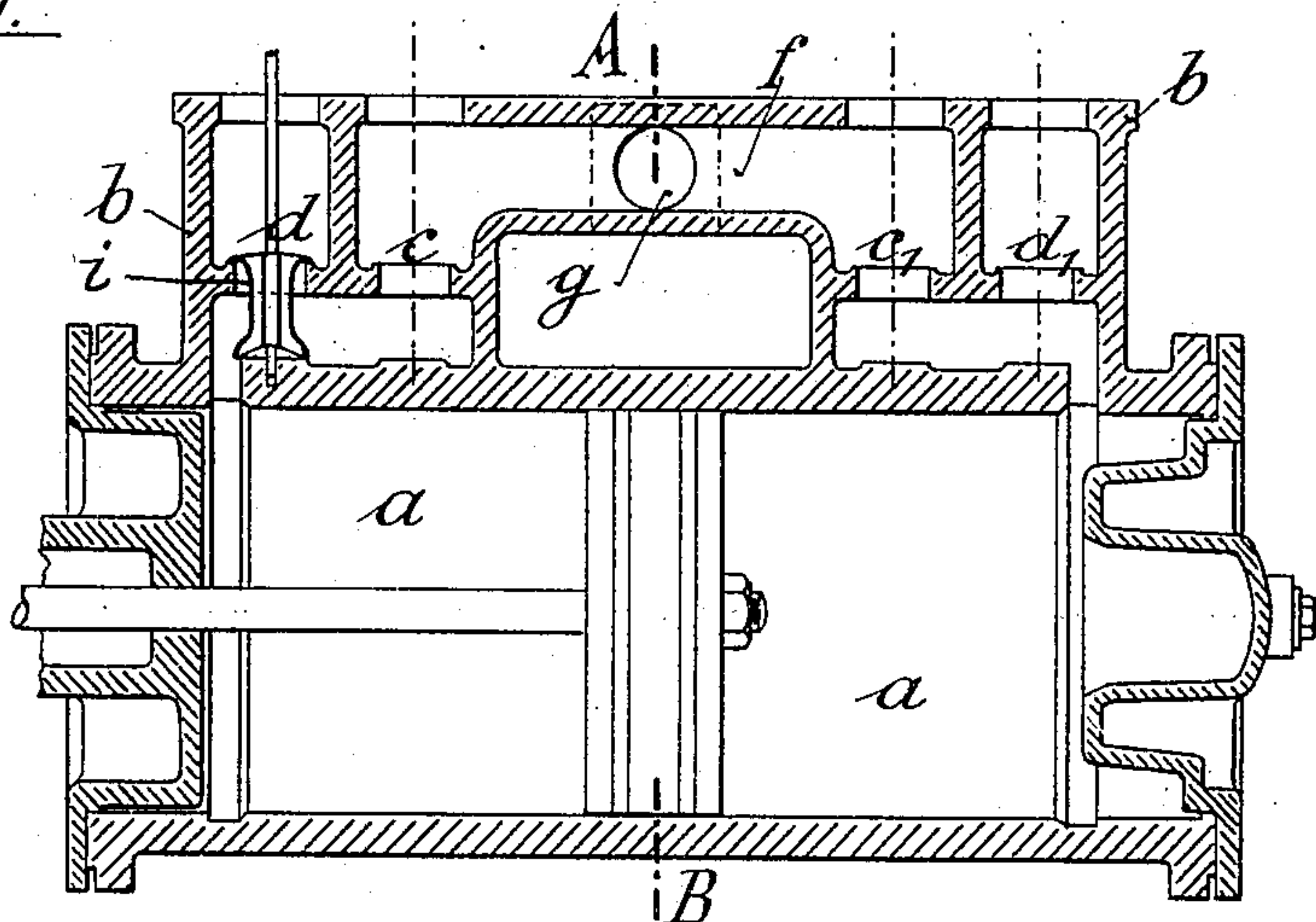


Fig. 2.

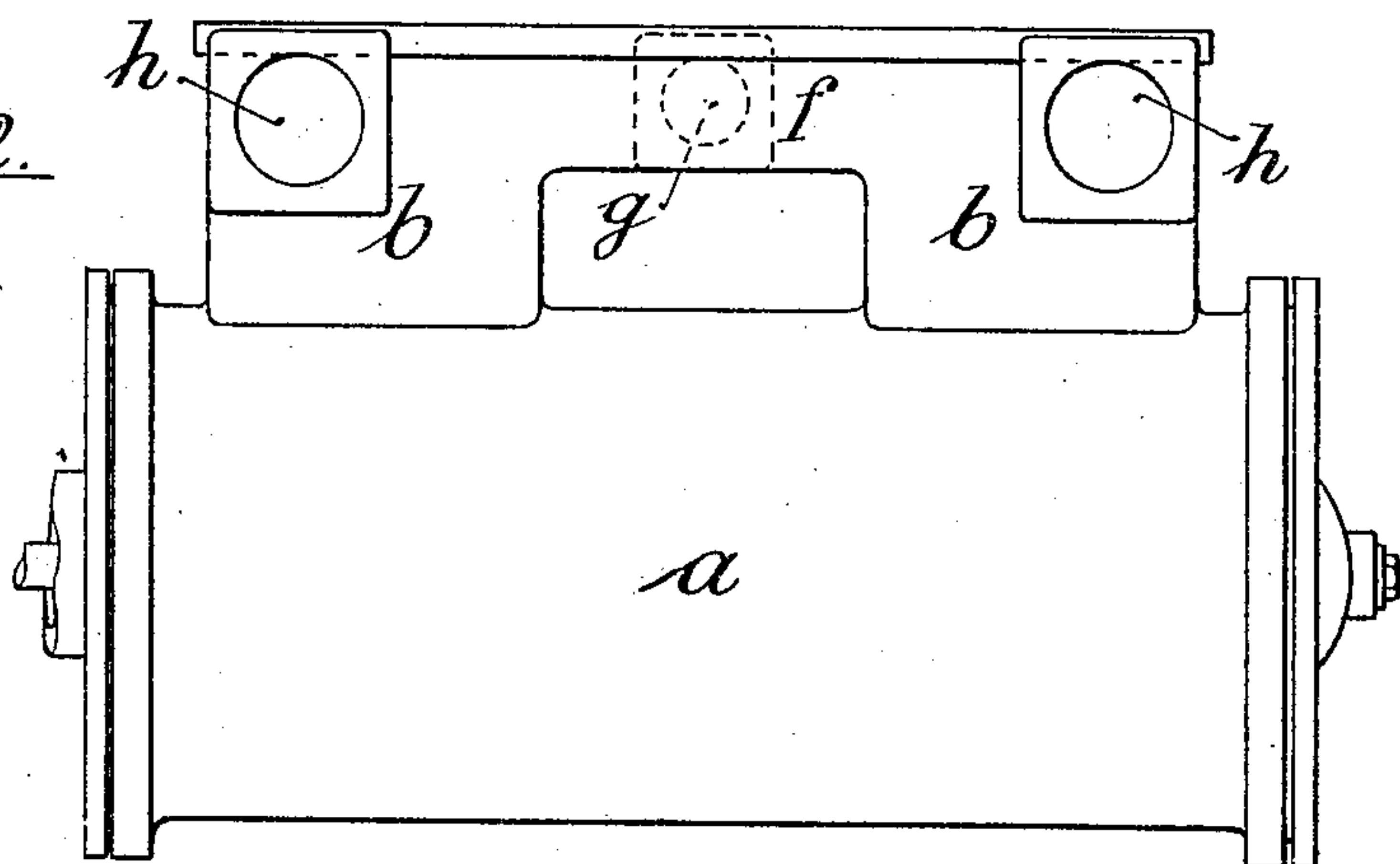
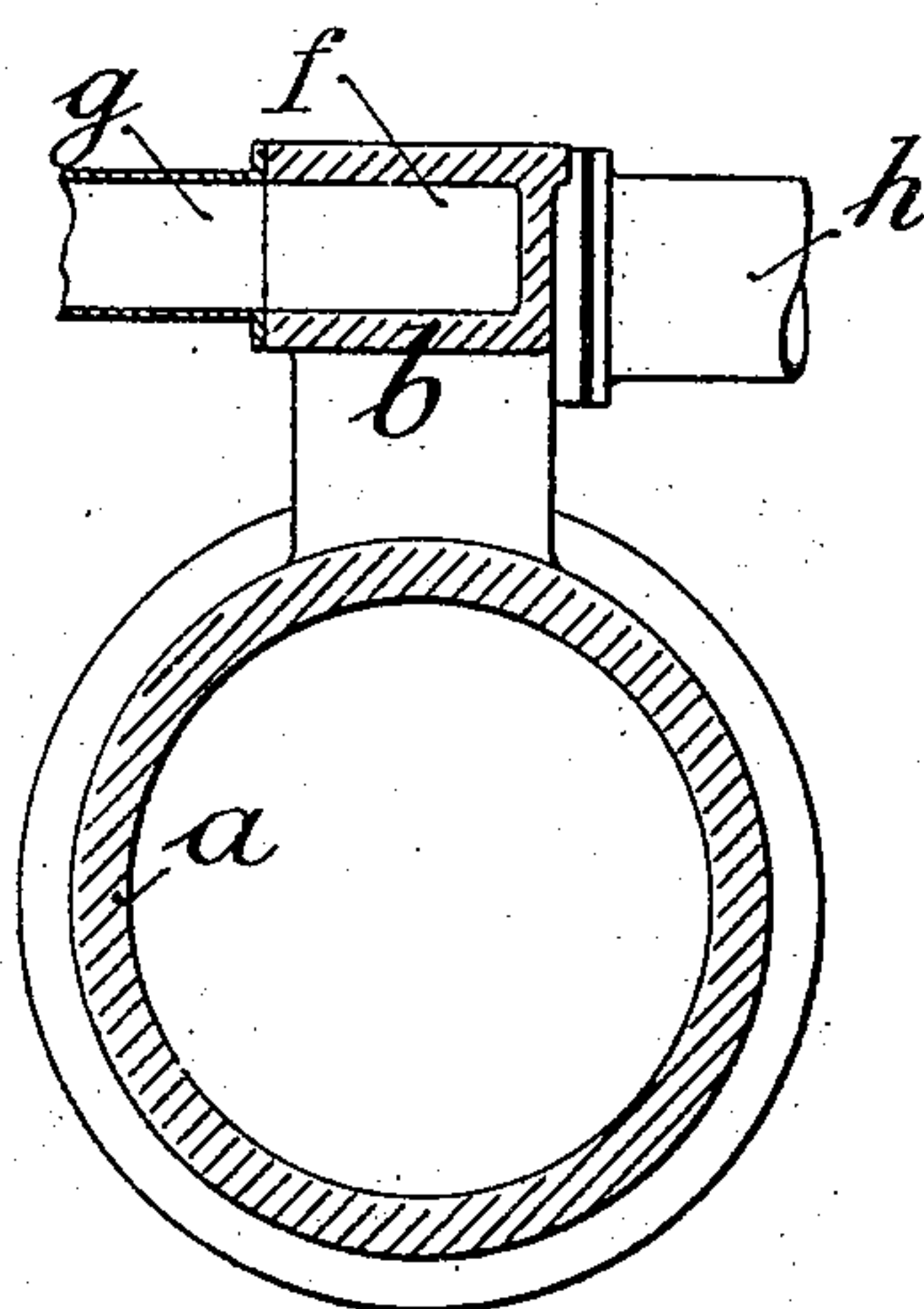


Fig. 3.



Witnesses:

Walter Haupt
Henry Hasper.

Inventor:

Hugo Lentz.

UNITED STATES PATENT OFFICE.

HUGO LENTZ, OF BERLIN, GERMANY.

CYLINDER FOR STEAM-LOCOMOTIVES.

No. 814,148.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed April 13, 1905. Serial No. 255,423.

To all whom it may concern:

Be it known that I, HUGO LENTZ, a subject of the German Emperor, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Steam-Cylinders for Hot-Steam Locomotives, of which the following is a specification.

My invention relates to an improved horizontal cylinder for hot-steam locomotives, the live-steam ports and valve-box being cast in one with the cylinder in peculiar manner.

In prior horizontal engines driven by hot steam the piston has always been so arranged that it slides on the bottom half of the working face of the cylinder, while a steam-tight joint is made on the top side by means of the piston-rings.

In order to insure easy working of the piston head and rings and a thoroughly steam-tight joint, it is important that the cylinder should as far as possible expand uniformly in all directions—that is to say, the mean temperature of all parts of the cylinder-wall should be the same and that likewise the ribs on the wall of the cylinder and the walls of the valve-box and steamways adjoining the same should not experience heating deviating from this mean cylinder temperature.

In hot-steam engines the usual practice is to make the valve-boxes and steam-ports separately and bolt them to the cylinder. There is thus the constant danger of leakage at the joints. The method of having the valve-box separate from the cylinder, moreover, renders the entire construction larger and the work more expensive.

For hot-steam engines it is important to have a cylinder occupying as little space as possible, which at the same time answers all the above-mentioned requirements for hot-steam working.

In the locomotive-cylinder for valve motion forming the subject of my present invention the requirements in question are met in the following manner: The actual cylinder, the valve-box, and the live-steam port are cast in one piece to render the construction compact. Further, in view of the nature of hot-steam working, the valve-box on the top of the cylinder is located parallel with the latter and is connected with the cylinder by two valve-casings at each end in such manner that in each pair of casings there is an inlet and an outlet valve, the whole of the

valves being likewise located one beside the other in the direction of the length of the cylinder.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through the new steam-cylinder. Fig. 2 is a side elevation of the same, and Fig. 3 a cross-section on the line A B of Fig. 1.

Similar letters refer to similar parts throughout the several views.

a is the steam-cylinder, above which and lying parallel therewith is located the valve-box *b*. This box contains the valve-casings *c d* and *c' d'*, located at the cylinder ends and lying in a line parallel with the longitudinal axis of the cylinder. The valves are puppet-valves, as shown at *i*, and the advantages of this structure are that at each lift of the valves two openings are simultaneously freed or uncovered and the valve-actuating mechanism and its housing can be made of compact or small dimensions. The valves are represented as movable longitudinally of their respective casings. The casings *c c'* receive the inlet-valves, and the casings *d d'* the outlet-valves.

f is the live-steam port, connecting the inlet-valve casings *c c'*.

g is the steam-supply pipe entering the steam-port *f*, while the outlet-valve casings are connected with the steam-outlets *h*, which, if desired, may be joined.

As the drawings show, owing to the arrangement adopted more than three-quarters of the circumference of the cylinder is quite free from steamways, so that those parts of the cylinder on which the piston slides will always remain perfectly round and will not become distorted, wherefore thoroughly steam-tight joints are insured and at the same time burning of the lubricant prevented. The top of the cylinder also is free from steamways, except at the part where the valve-casings are connected. The latter themselves are located, as already stated, at the ends of the cylinder and extend in the direction of the longitudinal axis of the same. The live-steam port is located above the valve-casings and exerts no influence upon the actual cylinder, despite the fact that it is cast in one piece with it for the purpose of insuring compactness of construction. In this manner the upper part of the cylinder also will expand uniformly, whereby distortion of the

working surface by heat will be prevented. In tandem cylinders both the high and the low pressure cylinders are constructed in this manner and the common valve-box extends
5 along the entire cylinder.

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

1. A steam-cylinder for hot-steam locomotives, comprising a body, a valve-box cast thereon and provided at each end with an inlet and an outlet valve casing, partitions for separating the casings, puppet-valves in the casing movable in the direction of the axis of
10 the same, the two inlet-valve casings being connected by the live-steam port, and all the valve-casings lying in a line parallel with the

longitudinal axis of the cylinder, substantially as described.

2. A steam-cylinder comprising a body and a valve-box provided with closed partitions, and inlets between the partitions, an outlet or exhaust between each partition and the end of the box, inlet puppet-valves between the partitions, and outlet puppet-valves out-
15 side said partitions.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HUGO LENTZ.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.