

No. 754,439.

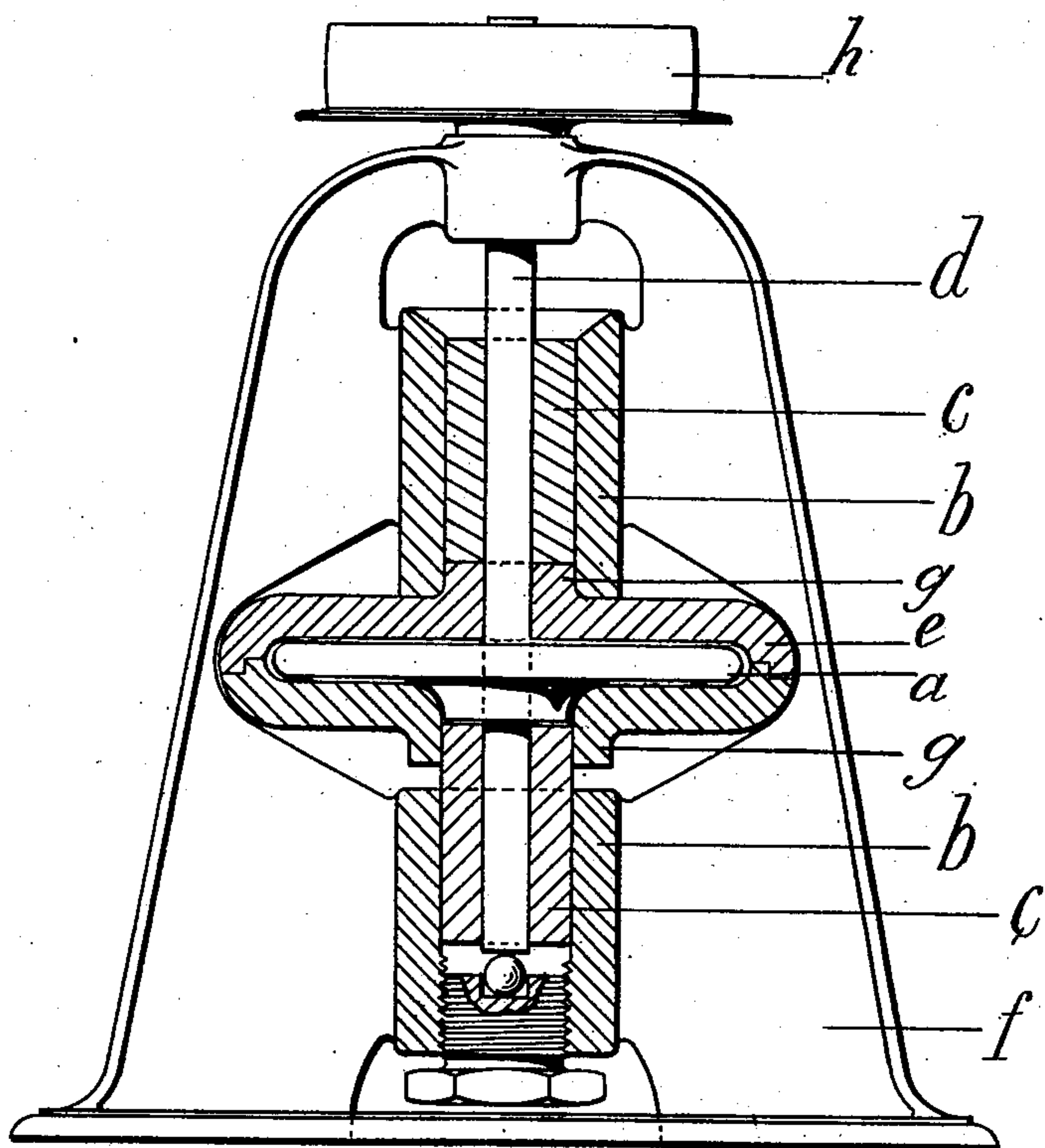
PATENTED MAR. 15, 1904.

E. E. F. FAGERSTRÖM.

STEAM TURBINE.

APPLICATION FILED FEB. 12, 1903.

NO MODEL.



WITNESSES

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UNITED STATES PATENT OFFICE.

ERNST ELIS FRIDOLF FAGERSTRÖM, OF SUNDBYBERG, SWEDEN.

STEAM-TURBINE.

SPECIFICATION forming part of Letters Patent No. 754,439, dated March 15, 1904.

Application filed February 12, 1903. Serial No. 143,116. (No model.)

To all whom it may concern:

Be it known that I, ERNST ELIS FRIDOLF FAGERSTRÖM, mechanical engineer, of Sundbyberg, in the county of Upland, in the Kingdom of Sweden, do hereby declare the nature of my invention for Improvements in Steam and Vapor Turbines and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement.

High-speed steam and vapor turbines running without load have been found to consume a considerable amount of power for overcoming the friction of resistance created by the surrounding air, especially at the sides of the turbine-wheel, and the present invention has for its purpose to so construct such turbines that this hurtful consumption of power will be obviated and the efficiency of the turbine accordingly increased.

In the accompanying drawing my improved steam-turbine is illustrated in a central vertical section mounted on a support or frame *f* and combined with a driving-pulley *h*.

I have found that the friction of the surrounding air against the turbine-wheel can be greatly reduced by locating the inside of the stationary turbine-case *e* as closely as possible to the two sides of the wheel *a*—i. e., by making the air-space or clearance between these parts a minimum—which can be done only by turning, grinding, or otherwise finishing them so as to make them fit closely together. In view of the fact, however, that one or both of the sides of the turbine-wheel are not plane, but curved, since for the sake of greater

strength the wheel is made of increasing thickness toward the center, there is the risk of the said closely-fitted surfaces being cut unless the axis of rotation of the disk always coincides with that of the case. In order to make these axes to coincide, the hub of the turbine-case *a* according to the present invention is provided with flanges *g* concentric to the inner circumference of the turbine-case and closely surrounded by the rigid frame-bearings *b* for the turbine-shaft *d*, as in the upper part of the figure, or surrounding said bearings or the bushings *c* of them, as in the lower part of the figure. It is evident that the guide may be formed by a single bearing (in place of two) which is surrounded by or surrounds the hub of the turbine-case. It is also evident that the flanges *g* may be dispensed with, and the rigid bearing or its bushing *c* may be surrounded by the hub directly.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In a steam and vapor turbine, the combination with the turbine-wheel and its shaft, of a support or frame, bearings in said frame for the turbine-shaft, a wheel-case formed separately and having a hub guided by said bearings, substantially as described.

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

ERNST ELIS FRIDOLF FAGERSTRÖM.

Witnesses:

H. TELANDER,
T. RISBERG.