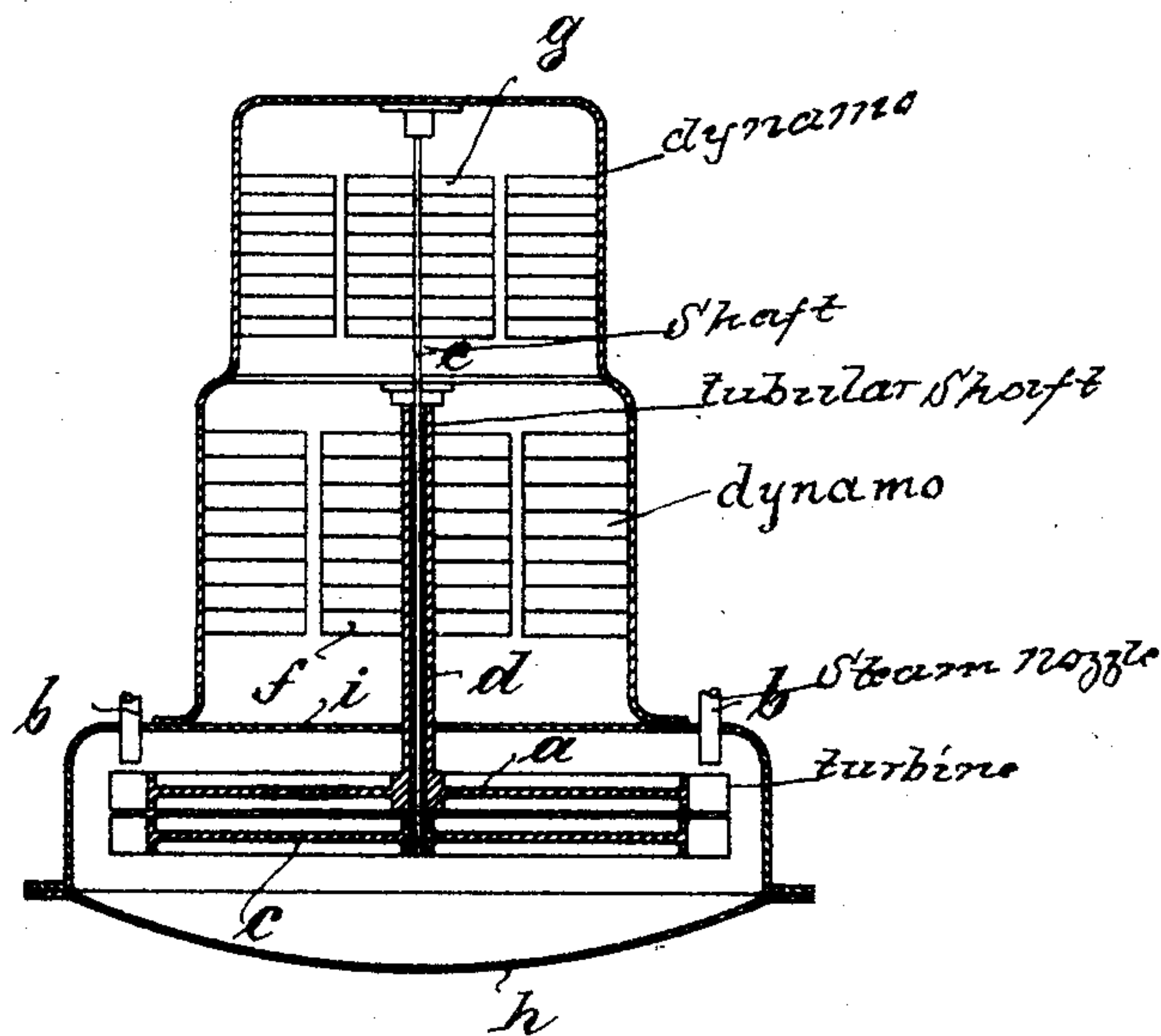


No. 777,865.

PATENTED DEC. 20, 1904.

J. STUMPF.
STEAM OR GAS TURBINE.
APPLICATION FILED SEPT. 3, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHANN STUMPF, OF CHARLOTTENBURG, GERMANY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

STEAM OR GAS TURBINE.

SPECIFICATION forming part of Letters Patent No. 777,865, dated December 20, 1904.

Application filed September 8, 1903. Serial No. 172,245.

To all whom it may concern:

Be it known that I, JOHANN STUMPF, a subject of the King of Prussia, German Emperor, and a resident of 27 Rankestrasse, Charlottenburg, near Berlin, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Steam or Gas Turbines, of which the following is an exact specification.

10 My invention relates to improvements in steam or gas turbines, and more especially to a turbine for driving two dynamos of different size.

It often occurs in practice that two dynamos
15 of different size are to be driven, so, for instance, in case one dynamo is sufficient for the normal work to be done in a factory it is mostly advantageous to have a small additional dynamo, which is only used in case the work
20 to be done surpasses the normal limits. It also often occurs that two different dynamos—as, for instance, an alternating-current dynamo and a continuous-current dynamo or a synchronous and an asynchronous dynamo are
25 necessary. In all these cases it is advantageous to drive the two dynamos, by means of a steam or gas turbine, with two turbine-wheels rotating in opposite direction, one of which wheels is impinged upon by fresh steam, while
30 the other one is fed by the exhaust-steam of the first one. In such turbines the primary wheel—that is, the wheel impinged upon by fresh steam—has always a greater useful effect than the secondary wheel. I therefore construct
35 my turbine in such manner that the primary turbine-wheel is coupled with the larger dynamo and the secondary wheel with the smaller dynamo. In order to make this more clear, I refer to the accompanying drawing, which
40 shows a scheme of the construction forming the object of my invention.

In the drawing, *a* is the primary turbine-wheel.

b represents the steam-admission nozzles.

45 *c* is the secondary turbine-wheel.

The primary turbine-wheel *a* is fixed to a tubular shaft *d*, and the secondary turbine-wheel *c* is fixed to a shaft *e*, situated within the tubular shaft *d*. To the tubular shaft *d*

the larger dynamo *f* is coupled, while the 50 smaller dynamo *g* is driven by means of the shaft *e*. The main idea of the invention consists in having both dynamo-machines situated upon one side of the turbine, hereby attaining that the turbine-wheels can easily be 55 reached by taking off the cover *h* of the turbine-casing *i*.

As mentioned above, the invention is advantageously used in case an alternating-current dynamo and a continuous-current dy- 60 namo are to be driven, in which case the alternating-current dynamo, which, as well-known, can rotate with high speed, is coupled to the primary turbine-wheel, whereas the continuous-current dynamo, the speed of 65 which must be smaller on account of the construction of the armature, the windings of which do not allow high speeds, is coupled with the secondary turbine-wheel.

It will be understood that the dynamo *f* may 70 be an asynchronous alternating-current dynamo and the dynamo *g* a synchronous alternating-current dynamo. On account of both dynamos being situated on one side of the turbine the construction may advantageously be 75 used in case a condenser is to be connected to the turbine, in which case the condenser can be directly fixed to the cover *h* of the turbine-casing.

Having thus fully described the nature of 80 my invention, what I desire to secure by Letters Patent of the United States is—

1. In a steam or gas turbine for driving dynamos, the combination of two turbine-wheels rotating in opposite directions, one of said 85 wheels being impinged upon by fresh elastic fluid, the second one being impinged upon by the exhaust fluid of the first one, with a tubular shaft to which one of the turbine-wheels is fixed, and a second shaft to which the other 90 turbine-wheel is fixed, said second shaft being situated within said tubular shaft, a dynamo, directly coupled to the shaft of the turbine-wheel impinged upon by fresh fluid, and a second dynamo directly coupled to the shaft 95 of the second turbine-wheel, substantially as described and for the purpose set forth.

2. In a steam or gas turbine for driving dy-

namos, the combination of two turbine-wheels rotating in opposite directions, one of said wheels being impinged upon by fresh steam, the second one being impinged upon by the exhaust-steam of the first one, with a tubular shaft to which one of the turbine-wheels is fixed, and a second shaft to which the other turbine-wheel is fixed, said second shaft being situated within said tubular shaft, a dynamo of given capacity directly coupled to the shaft of the turbine-wheel impinged upon by fresh steam, and a dynamo of smaller capacity directly coupled to the shaft of the second turbine-wheel, substantially as described and for the purpose set forth.

3. In a steam or gas turbine for driving dynamos, the combination of two turbine-wheels rotating in opposite directions, means for supplying elastic fluid to said wheels, concentric shafts for said turbine-wheels and dynamos coupled to said shafts, substantially as described.

4. In a steam or gas turbine for driving dynamos, the combination of two turbine-wheels rotating in opposite directions, means for sup-

plying motive fluid to one wheel, the second wheel being impinged upon by the exhaust fluid of the first, separate shafts for said turbine-wheels, a dynamo coupled to the shaft of the first turbine-wheel, and a second dynamo coupled to the shaft of the second turbine-wheel, substantially as described.

5. In a steam or gas turbine, the combination of two turbine-wheels, means for supplying motive fluid to said wheels, a shaft for each wheel, and a dynamo coupled to each shaft, substantially as described.

6. In a steam or gas turbine, the combination of a plurality of turbine-wheels, means for supplying elastic fluid to said wheels, a shaft for each wheel, and a dynamo coupled to each shaft substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN STUMPF.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.