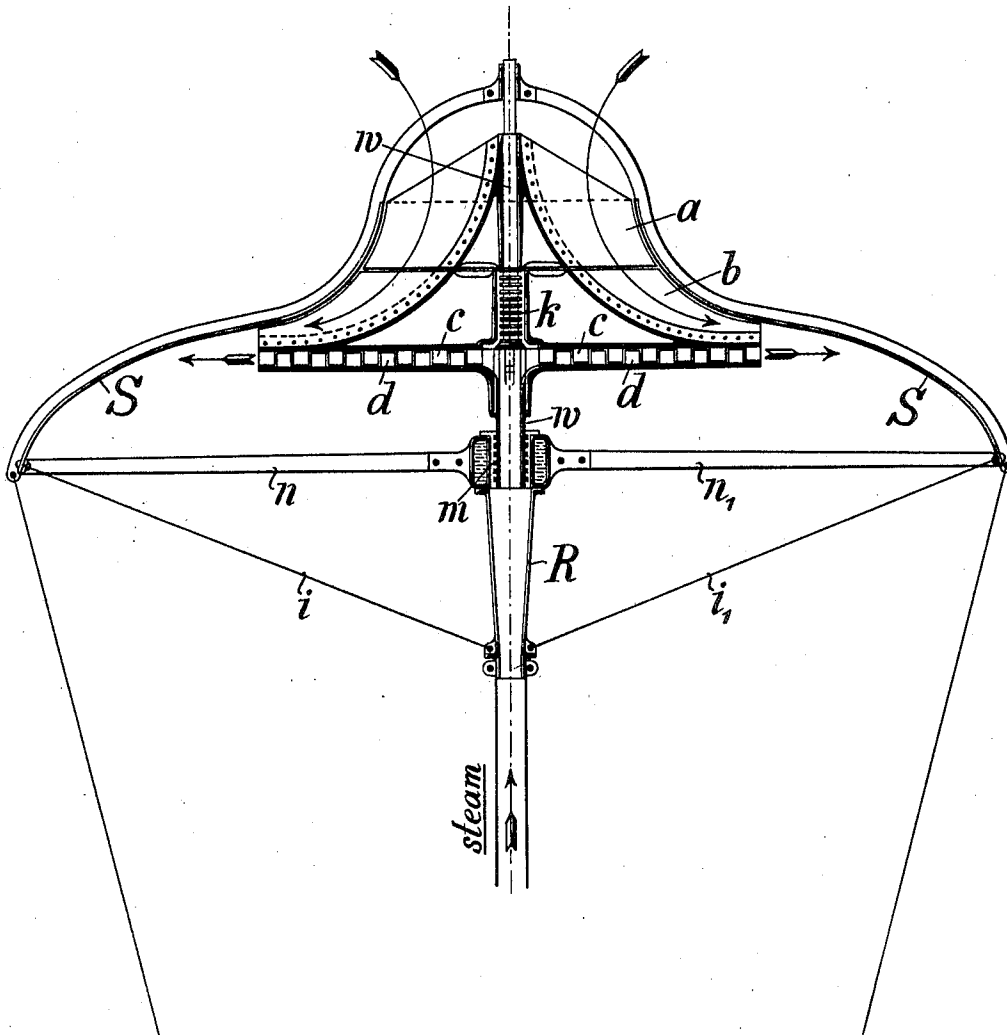


G. MEES.
 TURBINE DRIVEN HELICOPTER.
 APPLICATION FILED FEB. 12, 1910.

1,047,266.

Patented Dec. 17, 1912.



Witnesses:
 H. R. Schuly.
 E. H. Schorr.

Inventor:
 Gustav Mees
 by his attorney
 Frank W. Mesers

UNITED STATES PATENT OFFICE.

GUSTAV MEES, OF CHARLOTTENBURG, GERMANY.

TURBINE-DRIVEN HELICOPTER.

1,047,266.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed February 12, 1910. Serial No. 543,485.

To all whom it may concern:

Be it known that I, GUSTAV MEES, a citizen of Germany, residing at Charlottenburg, Germany, have invented new and useful Improvements in Turbine-Driven Helicopters, of which the following is a specification.

The subject of the present invention is a helicopter with a turbine-like propeller and steam turbine drive constructed for direct vertical ascension.

The drawing represents a vertical section of a helicopter embodying my invention.

The two oppositely revolving wheels *a* and *b* of the propeller are mounted within a screen *S* open at the top and provided with an upper contracted neck, and a lower flaring mouth. Wheels *a*, *b* are driven by the two blade rims *c* and *d* of a steam turbine likewise rotating in opposite directions, the upper rim *c* of which is rigidly connected to the lower propeller wheel *b*.

The propeller wheel *b* mounted on a thrust journal *k* of the turbine shaft *w* rotates thus with the upper steam blade rim *c* fixed thereto in the one direction; the turbine shaft itself with the steam blade rim *d* keyed to its lower part and the propeller wheel *a*, keyed to its upper end, so as to face the contracted neck of screen *S*, rotates, however, in the other direction. The lower end of the turbine shaft is constructed as a steam inlet pipe, and it is supported by means of a thrust journal in a suitable bearing fixed to a star-shaped frame or spider *n*, *n*¹, carried by screen *S*.

The necessary rigidity of the entire screen-construction is insured by the tension wires *i*, *i*¹, the steam inlet pipe *R* serving as a support.

The air drawn in and forced downward by means of the upper propeller wheel *a*, which has a fan-section, is thrown with great force at the parabolically curved plane or mouth of the supporting screen *S* by the lower wheel *b* which rotates at a very high peripheral velocity; in like manner also the exhaust steam from the steam turbine is thrown at the screen. The vertical component of the air and steam pressure so produced, assisted by the rarefaction of

the air, above the screen, enables the entire apparatus with the car attached to rise.

Owing to the opposite rotations of the two propeller wheels and of the steam blade rims, the reactionary moment of torsion is neutralized in a well known manner. This moment would otherwise cause the whole apparatus with the car to move in circles.

It is assumed that the necessary steam for operating the turbine is obtained from a tubular boiler, preferably heated with liquid fuel placed in the car. This steam is conducted to the turbine by means of a hose. The boiler can, however, obviously be fixed just as well on the supporting apparatus shown in the drawing.

The principle for the operation of the arrangement remains the same whether I employ pure steam or a mixture of combustible gas and superheated steam obtained from a suitably constructed working gas generator. A mixture of combustible gas and compressed air may be used for driving the turbine as well.

The driving of the propeller can be effected instead of by a steam or gas turbine by any other suitable engine. For example a rotary petrol engine may be used therefore, the cylinders of which, connected in a suitable manner with one of the propeller wheels would have to rotate in the one direction, while the crank shaft, connected with the other propeller wheel, would have to rotate in the other direction. The ideal driving machine for the propeller is, however, undoubtedly the steam or the gas turbine.

I claim:

A turbine driven helicopter comprising an apertured screen, an axially extending rotatable shaft, a first turbine-like propeller wheel fast on said shaft, a second turbine-like propeller wheel rotatable around the shaft, means for rotating the wheels in opposite directions, a spider carried by the screen, and a thrust bearing interposed between said spider and shaft.

GUSTAV MEES.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.