

A. GROSS.
PROPELLER FOR DIRIGIBLE BALLOONS.
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1,008,965.

Patented Nov. 14, 1911.

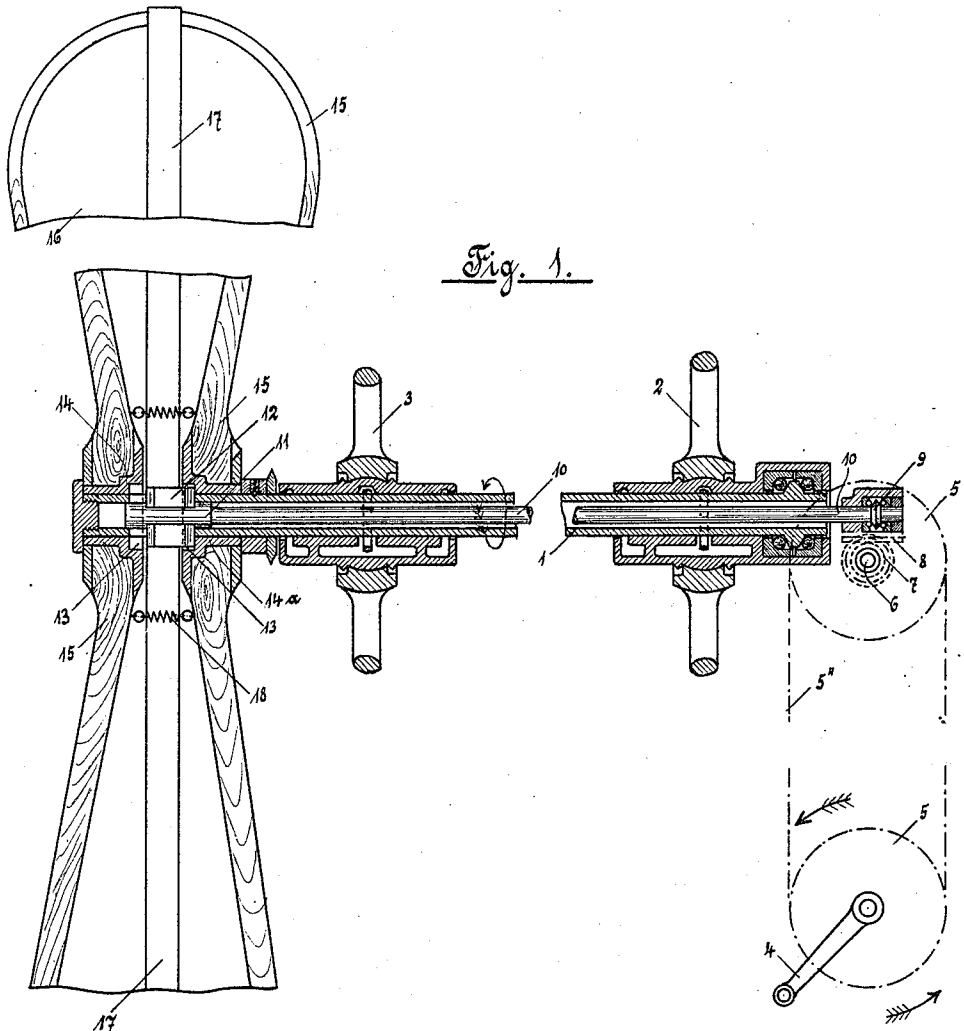
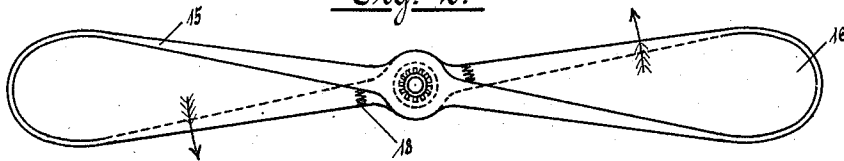


Fig. 2.



Witnesses.
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PROPELLER FOR DIRIGIBLE BALLOONS.

1,008,965.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed November 4, 1910. Serial No. 590,690.

To all whom it may concern:

Be it known that I, ALBERT GROSS, erector, a subject of the King of Prussia and German Emperor, residing at Bad-Ems, in the Kingdom of Prussia and German Empire, have invented new and useful Improvements in Propellers for Dirigible Balloons, of which the following is a specification.

My invention relates to improvements in propellers for dirigible balloons.

It is already known to provide the air propellers for dirigible balloons with elastic blades arranged in the axial plane of the propeller-shaft, the connection being such that said blades are bent or curved into a helical form by the action of the air-pressure. Generally, the anterior part of the blades was up to the present rigidly fixed to the propeller-shaft, while the posterior part of said blades obtained the desired bend.

According to my invention the propeller, in distinction to the known dispositions, is so arranged that the bow-frames of the blades, provided with a suitable cover, are attached to separate sleeves or coupling-members, the one sleeve or coupling-member being connected to the propeller-shaft by means of a coupling which may be displaced so as to reverse the motion of the propeller, while the other sleeve or coupling-member can move loosely or freely upon the shaft.

In the accompanying drawing forming a part of this specification and in which similar numbers refer to corresponding parts throughout the several views, Figure 1 is a longitudinal section of a constructional form of my improved propeller; Fig. 2 a front view of the same.

The propeller-shaft 1 is supported by the bearings 2 and 3 which are carried by stays connected to the frame of the balloon. From the crank 4 the motion is imparted by means of the wheels 5, 5' and the transmission 5'' to a pinion 7 keyed upon the same shaft 6 as the wheel 5, said pinion 7 meshing with a rack 8 which, on being moved by the pinion 7, affords by means of a suitable controlling-bar the adjustment of the propeller so as to produce a forward or a backward action of said propeller. The rack 8 has a cavity forming a bearing which takes up the end of the controlling-bar 10 located in the inside of the hollow propeller-shaft 1. Said controlling-bar 10 is provided at its outer end 11 with coupling-wedges 12

which, when the crank 4 and consequently the controlling-bar 10 is moved, are so displaced as to interlock with the recess 13 of either of the sleeves or hubs 14 or 14^a respectively of the propeller-shaft. Said sleeves or hubs 14 and 14^a are connected together by means of bows or hoops 15 which are provided with a cover 16 of canvas or other tissue.

17 is a brace or tie-rod and 18 are springs which provide a resilient limitation of the pitch of the propeller.

Of course, the propeller-shaft 1 is driven in a known manner by a motor.

During or after the engagement of the coupling-wedge 12 with the sleeve or hub 14, the latter is set in rotation together with the propeller-shaft 1, while the second sleeve or hub 14^a, which is connected with the sleeve or hub 14 by the bow or hoop 15, sits loosely upon the propeller-shaft 1. Consequently, the two arms of the bows or hoops 15 which are connected to the sleeve or hub 14, run ahead of the two other arms of said bows or hoops 15, whereby the pitch of the propeller is formed.

Now, in order to adjust the propeller which in the position represented in the drawing drives the balloon or air vehicle forward so that the same drives backward, the crank 4 is turned in the direction of the arrow of Fig. 1. By this means the controlling or coupling rod or bar 10 moves the wedge or wedges 12 into the corresponding recess or recesses 13 and, in consequence thereof, the sleeve or hub 14^a is taken along with the hoop-arm 15 in the direction of the arrow in Fig. 1, while the sleeve or hub 14 which at present sits loosely upon the propeller shaft 1 runs behind. Owing to this coupling the two arms of the bows or hoops 15 which are connected to the sleeve or hub 14^a run ahead of the two other arms of said bows or hoops 15 so that the propeller now acts so as to move the balloon or air vehicle backward.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States:—

1. In a propeller for dirigible balloons or air vehicles provided with blades disposed in the axial plane of the propeller-shaft, said blades being capable of being bent out in a helical form under the influence of the air-pressure, the combination of blades consisting of hoops provided with a cover of can-

vas or other suitable material, of two sleeves
or hubs arranged upon the hollow propeller-
shaft, each sleeve having attached to it one
of the ends of each of the hoops forming the
5 propeller blades, and of means for coupling
the source of power with either of said
sleeves, so that the propeller correspondingly
acts to drive the balloon or air vehicle either
forward or backward, substantially as de-
10 scribed.

2. In a propeller for dirigible balloons or
air vehicles, the combination of blades capa-
ble of being bent out in a helical form under
the influence of air-pressure, and said blades
15 consisting of hoops provided with a cover
of canvas or other suitable material, of two
sleeves or hubs arranged upon the hollow

propeller shaft, each sleeve having attached
to it one of the ends of each of the hoops
forming the propeller blades, of a rod mov- 20
able forward or backward in the interior of
the propeller shaft, and of wedges connected
to said rod, said wedges being intended to
be moved forward or backward so as to in-
terlock with either of the sleeves or hubs 25
connected to the ends of the hoops of the
propeller blades, substantially as described.

Subscribed by me this 11th day of October
1910, in the presence of two witnesses.

ALBERT GROSS.

Witnesses:

WILHELM MAY,
Gg. GEORG GROHE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
