

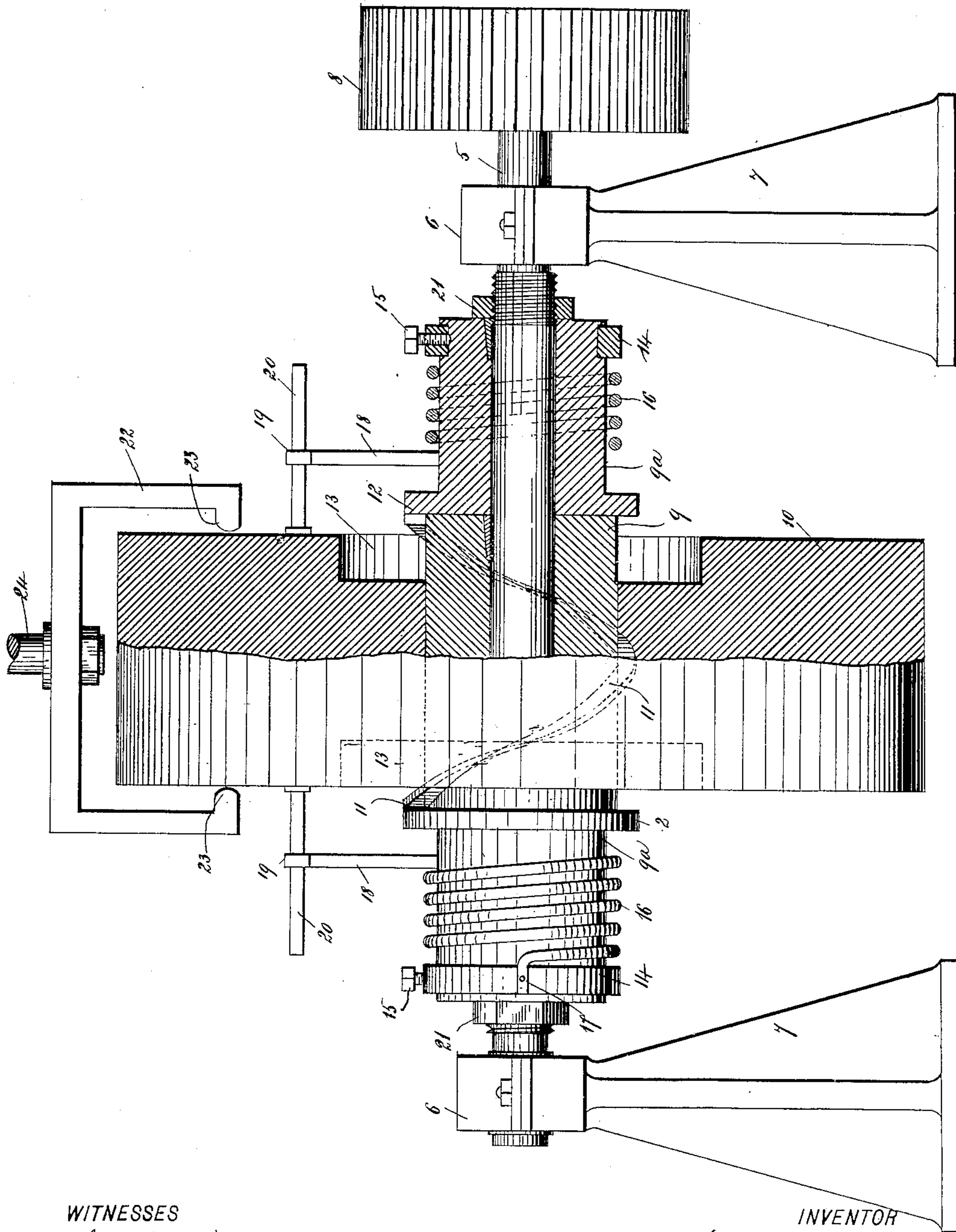
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Patented Dec. 19, 1899.

L. TROUBETZKOY.  
REGULATOR FOR POWER OR PROPELLER SHAFTS.

(Application filed Apr. 7, 1899.)

(No Model.)



WITNESSES

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# UNITED STATES PATENT OFFICE.

LUIGI TROUBETZKOY, OF MILAN, ITALY.

## REGULATOR FOR POWER OR PROPELLER SHAFTS.

SPECIFICATION forming part of Letters Patent No. 639,470, dated December 19, 1899.

Application filed April 7, 1899. Serial No. 712,050. (No model.)

*To all whom it may concern:*

Be it known that I, LUIGI TROUBETZKOY, a subject of the King of Italy; residing at Milan, Italy, have invented certain new and useful  
5 Improvements in Regulators for Power or Propeller Shafts, of which the following is a full and complete specification, such as will enable those skilled in the art to which it ap-  
10 pertains to make and use the same.

This invention relates to apparatus for regu-  
15 lating the speed of the power-shafts of steam-engines; and the object thereof is to provide an improved apparatus of this class which is particularly adapted for use in regulating the  
20 speed of the propeller-shaft of a steam vessel, so as to prevent the propeller from racing when it is raised out or partially out of the water, a further object being to provide a de-  
25 vice of the class specified which will operate automatically under all conditions and which is simple in construction and operation and comparatively inexpensive.

The invention is fully disclosed in the fol-  
30 lowing specification, of which the accompany-  
35 ing drawing forms a part, said drawing being a sectional side elevation of the apparatus which I employ.

In the drawing forming part of this speci-  
40 fication the separate parts of my improvement are designated by numerals of reference, and in the practice of my invention I provide a  
45 central shaft 5, which is mounted in bearings 6, formed on or connected with suitable sup-  
50 ports 7, or said shaft 5 may be supported in any desired manner.

The shaft 5 is provided at one end with a gear-wheel 8, which in practice is geared in  
55 connection with the propeller-shaft or other shaft the speed of which it is desired to regu-  
60 late, and keyed thereon, centrally thereof, is a hub 9, on which is mounted a fly-wheel 10. The hub 9 is provided with a spiral thread 11, and the central bore of the fly-wheel 10 is cor-  
65 respondingly grooved to receive said thread, and the said fly-wheel is thus capable of lon-  
70 gitudinal movement on the hub 9. The shaft 5 is also provided at each end of the central  
75 hub 9 with a supplemental hub 9<sup>a</sup>, and these hubs 9<sup>a</sup> are also keyed to the shaft 5 and pro-  
80 vided at their inner ends with annular flanges 12, and the fly-wheel 10 is preferably provided  
85 at its opposite sides with annular recesses 13,

one of which is shown in full and the other in dotted lines.

The annular flanges 12 on the hubs 9<sup>a</sup> are  
55 designed to limit the movement of the fly-wheel 10 in either direction, and the annular recesses 13 are designed to receive said flanges in the lateral movement of said wheel.

Each of the hubs 9<sup>a</sup> is preferably provided  
60 at its outer end with a collar 14, which may be secured thereto in any desired manner and which, as shown in the drawing, are held in place by set-screws 15, and wound on each of  
65 said hubs 9<sup>a</sup> is a strong spiral spring 16. One end of each of the springs 16 is secured to the  
70 corresponding collar 14, as shown at 17, and the other ends are projected upwardly to form  
75 arms 18, provided with heads 19, and secured to the opposite sides of the fly-wheel 10 are  
80 rods or bars 20, which pass loosely through the heads 19 of the arms 18 and are free to slide therein, and the hubs 9<sup>a</sup> are held in po-  
85 sition and prevented from lateral movement by set-nuts 21. I also employ a yoke-shaped  
90 device 22, the arms of which are preferably provided with inwardly-directed projections  
95 23, which are adapted to bear on the opposite sides of the fly-wheel 10, and said yoke-shaped  
100 device is connected with a shaft 24, which in practice is connected in any desired manner with the throttle of the engine and designed to operate the same.

The operation of the device will be readily  
85 understood from the foregoing description when taken in connection with the accompa-  
90 nying drawing and the following statement thereof.

It will be understood that, as hereinbefore  
95 described, the propeller-shaft or other power-shaft the speed of which it is desired to regu-  
100 late is in practice geared in connection with the shaft 5 of the regulator, the wheel 8 forming a part of this gearing, or any suitable gears may be employed for this purpose. In the  
normal operation of said power-shaft the  
regulator-shaft 5 revolves therewith and at a  
rate of speed governed by the character of  
the gearing by which the shafts are connected.  
It will also be understood that all the parts  
connected with the shaft 5 revolve therewith,  
including the hub 9, the hubs 9<sup>a</sup>, and the fly-  
wheel 10 and the parts connected with said  
hubs 9<sup>a</sup> and with said fly-wheel. If at any



time the revolutions of the said power-shaft or propeller-shaft should be unduly increased, the speed of the regulator-shaft 5 will be correspondingly increased, and this increase of the speed of the regulator-shaft 5 will cause the fly-wheel 10 to be moved longitudinally thereon, this result being accomplished by the increased strain thrown on the fly-wheel and the tendency of the hub 9 to revolve therein, and this tendency or force will cause the fly-wheel 10 to move longitudinally on said hub by reason of the spiral thread 11 on said hub and the corresponding spiral groove in said wheel. As the wheel 10 moves longitudinally on the hub 9 the yoke 22 is operated thereby, and the shaft 24, which, as hereinbefore described, is connected with the throttle-valve of the engine, which is not shown, will operate said valve and will cut off the flow of steam from the engine, and the speed of the propeller or power shaft will at once be decreased. This operation of the fly-wheel 10 as described winds the springs 16 tightly on the hubs 9<sup>a</sup>, and when the motion of the propeller or power shaft and the regulator-shaft 5 is reduced to the normal condition the springs 16 operate torsionally to return the wheel 10 to its normal position, in which operation said wheel 10 is again moved longitudinally of the hub 9 or into the position it occupied before the increase of the revolutions of the propeller or motor shaft and the shaft 5.

The entire device is simple in construction and operation and is also perfectly adapted to accomplish the result for which it is intended and may be applied to power-shafts of all kinds and classes, so as to regulate the motion thereof, and it will be apparent that changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages, and I reserve the right to make all such alterations therein as fairly come within the scope of my invention.

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

1. A device of the class described, comprising a revoluble cylindrical part provided with a spiral rib, a fly-wheel mounted thereon and provided with a corresponding spiral groove, whereby said wheel is adapted to revolve with said revoluble part when the latter moves normally, and to move longitudinally on said part when the speed thereof is unduly increased, means for limiting the longitudinal movement of said wheel, spiral springs coiled on said revoluble part on the opposite sides of said wheel, and provided at their ends with radial extensions, said wheel being also provided on its opposite sides with arms which project through said radial extensions, and devices operated by the said wheel for controlling the throttle-valve of an engine, substantially as shown and described.

2. In a device of the class described, a shaft, a hub keyed centrally thereto, and provided with a spiral rib, a fly-wheel mounted on said hub and provided with a corresponding spiral groove, other hubs keyed to said shaft at each end of said central hub, a spiral spring wound on each of said last-named hubs, one end of each of said springs being secured to said hub, and the other ends thereof being extended radially of said wheel, and rods connected with said wheel and passing loosely through the ends of the extensions of said springs, and devices operated by said wheel for controlling the throttle-valve of an engine, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 6th day of April, 1899.

LUIGI TROUBETZKOY.

Witnesses:

F. A. STEWART,  
V. M. VOSLER.