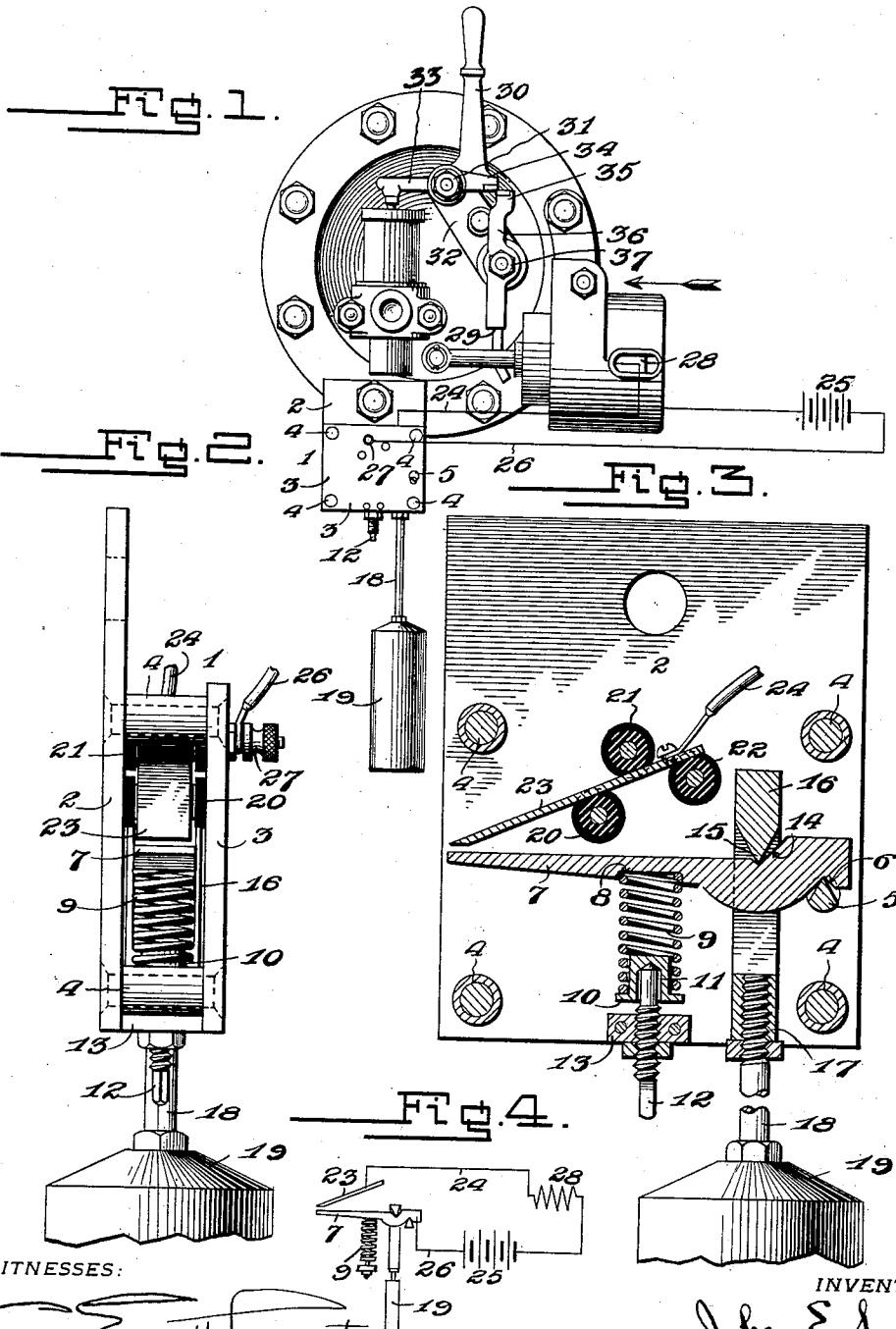


J. E. SNYDER.
VIBRATION STOP GOVERNOR.
APPLICATION FILED OCT. 11, 1910.

1,023,886.

Patented Apr. 23, 1912.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN E. SNYDER, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLONIAL TRUST COMPANY, TRUSTEE, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

VIBRATION STOP-GOVERNOR.

1,023,886.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed October 11, 1910. Serial No. 586,498.

To all whom it may concern:

Be it known that I, JOHN E. SNYDER, a citizen of the United States, and a resident of Swissvale, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Vibration Stop-Governors, of which the following is a specification.

This invention relates to means for cutting off the motive fluid supply to the motor when there is undue vibration of one of the parts thereof.

As an example of one of the uses to which my invention may be put, it may be stated that under service conditions the blades of turbines are liable to rub against the stator and cause vibration thereof. If the blades of the rotor happen to rub against the stator for any reason; for example, in the event that the blades become loose, serious damage might result. A blade might become loose from its carrying element and owing to the high velocity under which the rotor is normally run, a whole row of blades, or indeed a number of rows, might be torn loose before the machine could be shut down. If the turbine should happen to speed up from any cause, vibration would be set up with the attendant disadvantages. It is the purpose of my invention to provide means whereby the motive fluid supplied will be shut off instantaneously upon undue vibration of one of the parts of the motor and to become effective when the vibration takes place from any cause.

I have shown my invention as applied to the end of the turbine and it is illustrated in connection with an automatic stop governor valve, of the type illustrated in the United States patent to J. Breslove, No. 953,590, patented March 29th, 1910.

In the drawings: Figure 1 is an end view of a turbine with a stop governor valve showing my invention applied; Fig. 2 is an end view of my invention; Fig. 3 is an enlarged sectional view of the invention; and Fig. 4 is a diagrammatical view thereof.

Referring now to the drawings by numerals of reference, 1 designates the housing or support comprising a back plate 2 and a front plate 3 spaced apart and secured together by the fastening devices 4 of which there are four shown in the drawings.

5 designates a fulcrum having a knife edge on which rests the notched portion 6 of a vibratory lever 7 which is provided with a seat 8 bearing upon a spring 9, one end of said spring resting upon an adjustable collar or seat 10. The seat 10 is provided with a recess 11 to receive one end of an adjusting screw 12 engaging a block 13 held by the plates 2 and 3. The upper edge of the lever 7 is provided with a notch 14 to receive the knife edge 15 on the horizontal bar 16 of a weight supporting yoke 17 in the lower portion of which is screwed the stem 18 of the weight 19.

20, 21 and 22 are contact supports which insulate the contact 23 from the plates 2 and 3 and said contact 23 is connected to a conductor 24 in circuit with a battery 25 which is also electrically connected to a conductor 26 terminally engaging a binding post 27 on the plate 3.

Interposed between the terminals of the conductor 24 is a motor comprising a solenoid 28, which, when the circuit comprising the conductors 24 and 26 and the battery 25 is closed, will move in the direction indicated by the arrow in Fig. 1 and strike against the finger 29 of the stop governor on the end of the turbine. This stop governor may briefly be described as comprising a lever 30 fulcrumed on a pin 31, which is suitably mounted on a lug 32. The lever 30 is provided with arms 33 and 34. The end of the arm 33 is connected to a suitable exhaust mechanism illustrated in detail in the said Breslove patent and the end of the lever 34 will normally rest upon the end of the lever 36 which is pivoted on the pin 37 and which carries the finger 29. If the finger 29 is moved in the direction indicated by the arrow the end 35 will be moved out of contact with the end of the lever 34 and the stop governor will operate in precisely the same manner as set forth in the said Breslove patent, the only difference in the operating being that the solenoid 28 here takes the place of the weights in the Breslove patent.

The operation of the device is as follows: Assuming that all the parts are properly assembled, the adjusting block 12 will set the lever 7 so that it will vibrate under normal conditions without coming in contact

with the contact 23. It should be here stated that the lever 7 is really a contact, inasmuch as it is not insulated from the plate 3 to which the binding post is connected. If the element to which the plate 2 is connected is subjected to undue vibration, either from blades rubbing or from excessive speed, the vibration of the weight on the lever 7 will set up vibration in the spring 9 so that the contacts 7 and 23 will come together and close the circuit, energizing the solenoid so that it will move in the direction of the arrow to strike against the finger 29 and throw the end 35 of the lever 36 out of contact with the end of the lever 34 and cause the stop governor to cut off the motive fluid supply. It is obvious that the weight and the spring are opposite to each other and that the screw 12 may be manipulated to set the lever 7 to close the circuit at any given number of vibrations. Attention is also directed to the fact that the arrangement herein disclosed affords a very sensitive device which will promptly operate at a predetermined time or under predetermined conditions and shut down the motor before any serious damage is done.

Having thus described my invention, what I claim is:

1. The combination with means for closing the fluid admission port to a motor, of operating means therefor comprising mechanism which will operate by vibration of a part of the motor.
2. The combination of means for closing the admission port to a motor and operating means therefor rendered effective by vibration of a part of the motor.
3. In combination with a cut off valve, a vibratory responsive device adapted to con-

trol said valve and rendered effective by a vibrating part of the motor.

4. Means for operating a cut off valve for a motor comprising mechanism sensitive to vibrations of a motor part.

5. Means for operating a cut off valve comprising an electrical circuit, a motor in the circuit, contacts in the circuit and means for causing said contacts to close upon vibration of a motor part.

6. Means for operating a cut off valve comprising a motor and a motor operating mechanism rendered effective by a vibratory part on the motor carrying the cut off valve.

7. Means for operating a cut off valve comprising a circuit, a motor in the circuit and contacts, one of which is vibratory and the other stationary and means for closing said circuits by bringing the contacts together.

8. Means for operating a cut off valve comprising a normally open electrical circuit having a motor therein, contacts for closing said circuit and responsive to the vibrations of a motor part.

9. Means for operating a cut off valve comprising an electric circuit, a motor therein, contacts, one of which is adjustable with relation to the other, and means for causing said contacts to close the circuit when the vibrations of the motor containing the cut off valve become excessive.

In testimony whereof, I have hereunto subscribed my name this 8th day of October, 1910.

JOHN E. SNYDER.

Witnesses:

C. W. MCGHEE,
J. A. GRISWOLD.