Nov. 11, 1930. A. S. TOROK 1,781,610

GOVERNOR ATTACHMENT

Filed Oct. 31, 1928 2 Sheets-Sheet 1

Fig. 1.

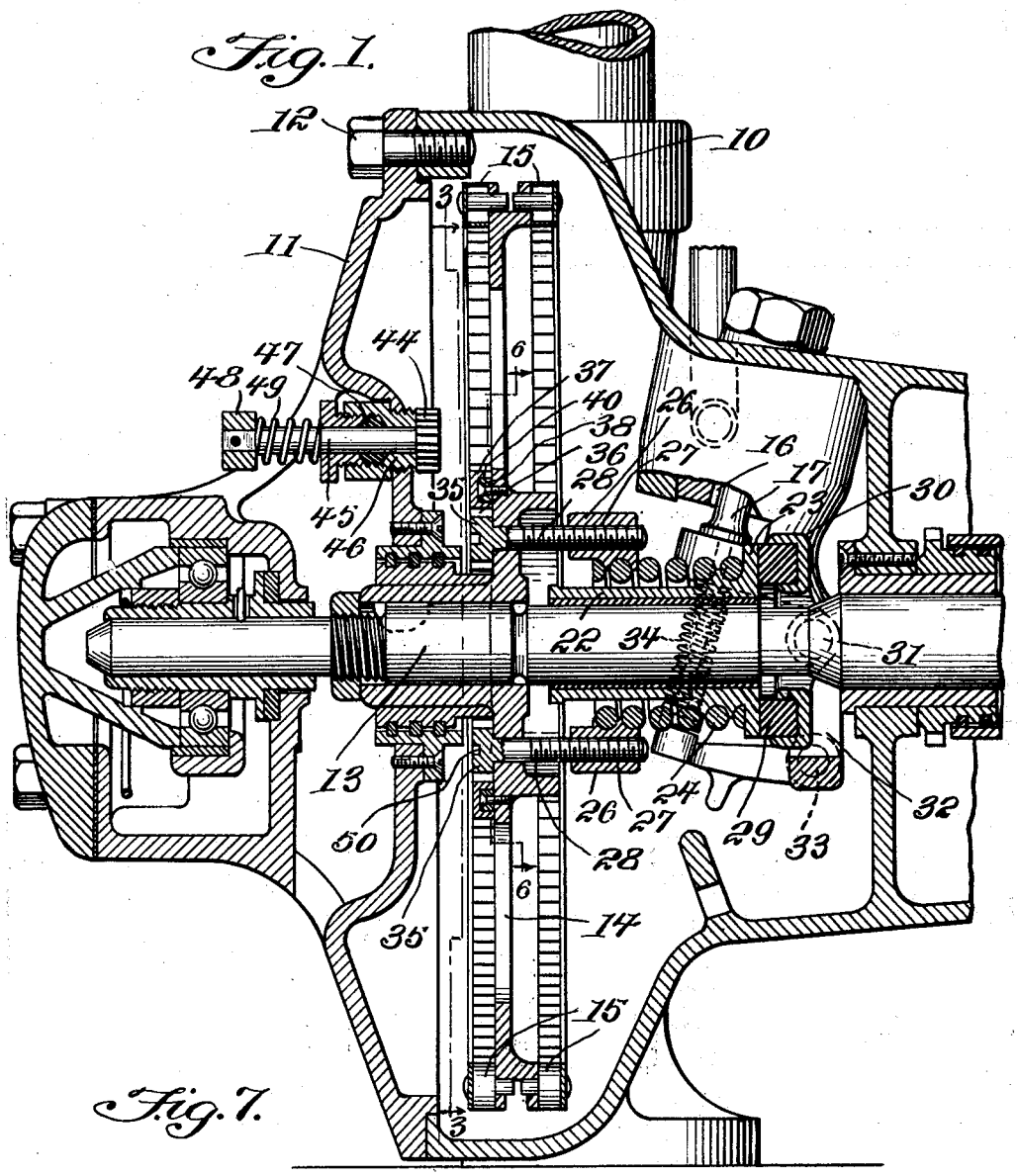
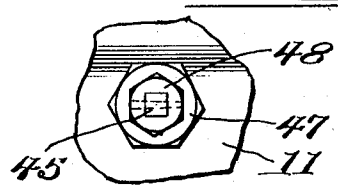


Fig. 7.



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Fig. 3.

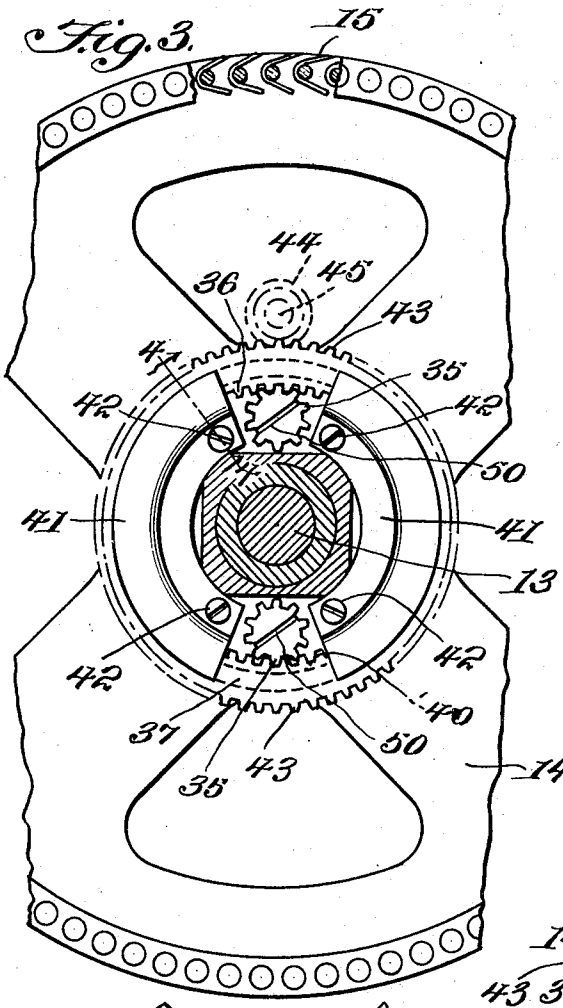
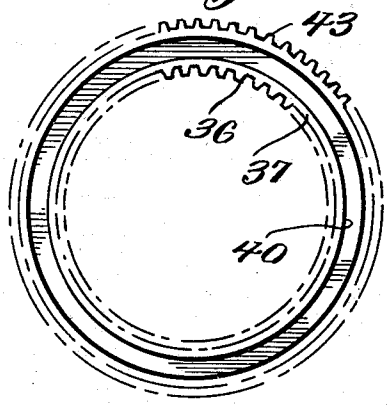


Fig. 5.



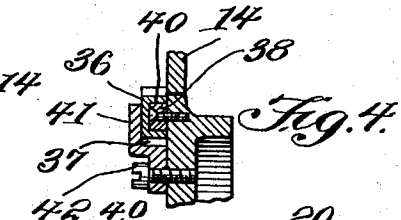


Fig. 4.

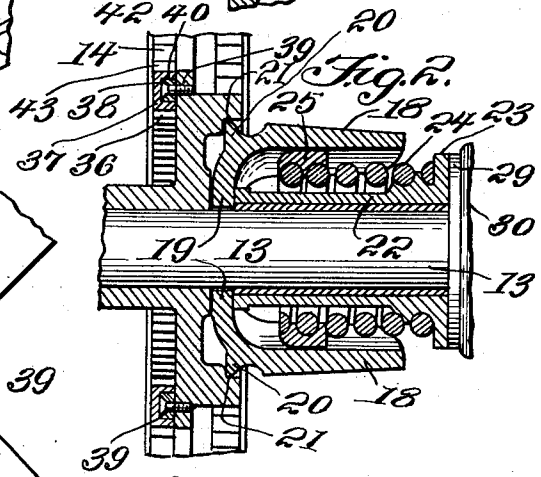


Fig. 2.

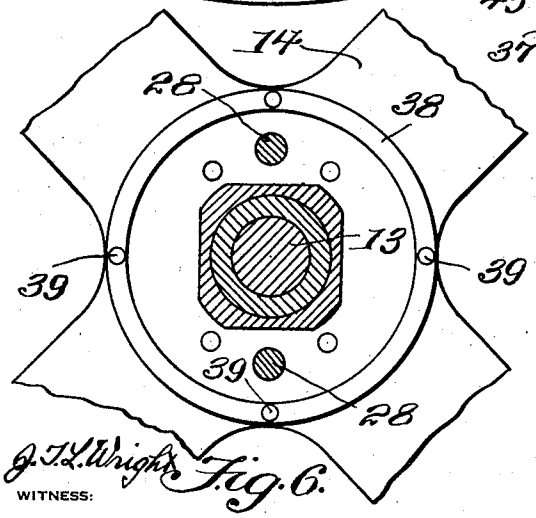


Fig. 6.

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UNITED STATES PATENT OFFICE

ATILLA S. TOROK, OF CUMBERLAND, MARYLAND

GOVERNOR ATTACHMENT

Application filed October 31, 1928. Serial No. 316,229.

This invention relates to improvements in turbines and has especial relation to turbine governors and means for adjusting the latter to control the operation of the governor and thereby control the operation of the turbine.

In some types of turbines, and especially in those commonly used upon locomotives for driving the generators for the electric light equipment, it is necessary to remove the cover of the turbine housing to effect adjustment of the governor which controls the steam inlet valve. This adjustment is necessary from time to time in order to keep the turbine operating at a more or less uniform speed, as the parts of the governor are subject to wear and this wear increases the degree of movement of the governor with a constant increase of the degree of opening movement of the steam inlet valve and the speed of operation of the turbine.

The present invention overcomes the above and other disadvantages by providing means for adjusting the governor from the outside of the turbine housing, so that adjustment may be quickly made without removing the cover.

Another object of the invention is the provision of a governor adjusting means which may be applied to the turbine governor without changing the construction of the latter and with very little expense.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a sectional view illustrating the invention applied to the governor for controlling a turbine.

Figure 2 is an enlarged fragmentary section taken longitudinally of the turbine shaft and at right angles to Figure 1.

Figure 3 is a fragmentary section taken on the line 3—3 of Figure 1.

Figure 4 is a detail section on the line 4—4 of Figure 3.

Figure 5 is a face view of the ring gear.

Figure 6 is a fragmentary section on the line 6—6 of Figure 1.

Figure 7 is an end view of the operating member showing a fragmentary portion of the cover of the turbine housing.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the reference character 10 indicates the housing of a turbine which is provided with a cover 11. This cover is removably secured in place by bolts 12 so that access may be had to the interior of the housing.

The shaft of the turbine is indicated at 13 and is mounted in suitable bearings and may be operatively connected with the shaft of a generator or other machine or device. Mounted upon the shaft is a turbine wheel or rotor 14 which is provided around its periphery with buckets 15, while steam or other fluid is admitted to the housing for passage through the buckets through an inlet port 16. A nozzle or other suitable means (not shown) may be employed for directing the fluid to the rotor.

The port 16 is controlled by a valve 17 and the position of this valve is automatically controlled by means of a governor.

The governor referred to includes oppositely located weights 18 whose inner ends 19 are concaved to accommodate the shaft 13. The weights are provided with beveled lugs 20 which operate upon seats 21 provided upon the turbine wheel or rotor 14. The weights 18 are thus mounted for pivotal movement so that they may move outwardly by centrifugal force.

Outward movement of the weights is resisted by means of a sleeve 22 whose inner end bears against the ends 19 of the weights and whose outer end is provided with an annular flange 23. A retractile spring 24 has one of its ends threadedly engaged with the sleeve 22 adjacent the flange 23 while the opposite end of this spring is threadedly engaged with a yoke or collar 25. This collar occupies a position between the weights 18 and is provided with diametrically located extensions 26 which project outward between the opposed edges of the weights and are

provided with interiorly threaded bores 27. Screws or bolts 28 extend through openings provided in the turbine wheel 14 and engage the threads of the bores 27, so that by means of these screws, the yoke or collar 25 may be moved axially of the shaft 13 to adjust the tension of the spring 24.

Bearing against the flange 23 at the end of the sleeve 22 is an anti-friction member 29 which is carried by a channel-shaped holder 30 and this holder has pivotally secured thereto as shown at 31 one end of a bell crank lever 32, the latter being pivotally mounted within the housing as shown at 33. The other arm of the lever 32 is yieldingly forced outward under the action of a spring 34 which yieldingly holds the valve 17 in open position.

As thus far described, operation of the wheel 14 will, when the wheel reaches a predetermined speed, cause the weights 18 to move outward. This movement is resisted by the sleeve 22 whose inner end bears against the inner ends 19 of the weights 18. Any outward movement of the arms however will cause the sleeve 22 to be moved axially of the shaft 13 so that the bell crank lever 32 will be moved upon its pivot 33 to move the valve 17 in a direction to close or partly close the inlet port 16 and thus cut down or cut off the supply of steam. The construction and operation thus far described forms no part of the present invention, the latter relating to means for operating the screws 28.

Heretofore in this type of turbine it was necessary to remove the cover 11 to obtain access to the screws 28 so that the latter might be adjusted to adjust the tension of the spring 24 and thus control the movement of the sleeve 22 and the automatic operation of the valve 17. In addition to initial adjustment of these screws, wear upon the inner ends 19 of the weights 18 and the points of contact of these arms with the sleeve 22 and the adjacent portion of the turbine wheel, requires that adjustment of the governor be made from time to time to compensate for this wear. To overcome the disadvantage of having to remove the cover 11, the present invention provides pinions 35 around the heads of the screws 18 and these pinions are engaged by the internal teeth 36 of a ring gear 37. This gear is mounted for rotation upon an annular rib or flange 38 which is secured to the turbine wheel by means of screws 39 and for this purpose, the gear 37 is provided with an annular groove 40 to receive this rib or flange. The gear 37 is held in position by means of segmental retaining plates 41 which are secured to the turbine by means of screws 42.

The gear 37 is also provided with external teeth 43 and these teeth are adapted to be engaged by a pinion 44 which is mounted upon the inner end of a shaft 45 which extends through the cover 11. This shaft is mounted for longitudinal sliding movement in a bearing 46 and extends through a packing gland 47, and is provided upon its outer end with a head 48 whose shape and size conforms to the shape and size of the heads of the bolts 12, so that the same wrench may be used for these members. A spring 49 surrounds the shaft 45 between the packing gland 47 and the head 48 and acts to yieldingly force the head outward so that the pinion will be normally disengaged from the teeth 43 of the ring gear 37.

When it is desired to adjust the tension of the spring 24 for the purposes previously mentioned, the shaft 45 is moved inward so that the pinion 44 will engage the teeth 43, whereupon the screws 28 may be simultaneously rotated to move the yoke 25 axially of the shaft 13 and increase or decrease the tension of the spring 24.

If desired, the screws 28 may have their heads provided with kerfs 50 so as to permit of the use of a screw driver or other tool in initially positioning the screws.

While the governor adjusting means is shown and described in connection with a turbine, it is of course obvious that it may be used upon other types of machines where a governor of this character is employed.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:

1. In a turbine, a housing, a turbine wheel mounted for rotation therein, a valve controlled inlet port, a centrifugal governor located within the housing and operatively connected to the turbine wheel, means acted upon by the governor to operate the valve of the inlet port and control the speed of the turbine wheel, means to adjust the governor to regulate the operation of the valve, and means operable from the outside of the housing and normally disengaged from the governor adjusting means to operate the latter.

2. In a turbine, a housing, a turbine wheel mounted for rotation therein, a valve controlled inlet port, a centrifugal governor located within the housing and operatively connected to the turbine wheel, means acted upon by the governor to operate the valve of the inlet port and control the speed of the turbine wheel, means including rotatable elements to adjust the governor and regulate the operation of the valve, and means extending through the housing to operate the rotatable elements.

3. In a turbine, a housing, a turbine wheel mounted for rotation therein, a valve controlled inlet port, a centrifugal governor

located within the housing and operatively connected to the turbine wheel, means acted upon by the governor to operate the valve of the inlet port and control the speed of the turbine wheel, rotatable elements engageable with the governor to regulate the operation of the latter, a gear carried by the turbine wheel and operatively connected with the rotatable elements, and means extending through the housing and normally disengaged from the gear to engage and operate the latter to operate the governor adjusting means.

4. In a turbine, a housing, a turbine wheel mounted for rotation therein, a valve controlled inlet port, a centrifugal governor located within the housing and operatively connected to the turbine wheel, means acted upon by the governor to operate the valve of the inlet port and control the speed of the turbine wheel, rotatable elements engageable with the governor to regulate the operation of the latter, a gear carried by the turbine wheel and operatively connected with the rotatable elements, a shaft mounted for axial and rotary movement from one wall of the housing, and a pinion carried by the shaft and adapted to be moved into engagement with the gear to operate the governor adjusting means.

In testimony whereof I affix my signature.

ATILLA S. TOROK.