(No Model.) 2 Sheets—Sheet 1.

J. & H. McLAREN.

SPEED ALTERING OR ADJUSTING MECHANISM FOR SHAFT GOVERNORS.

No. 569,512. Patented Oct. 13, 1896.

Fig. 1.

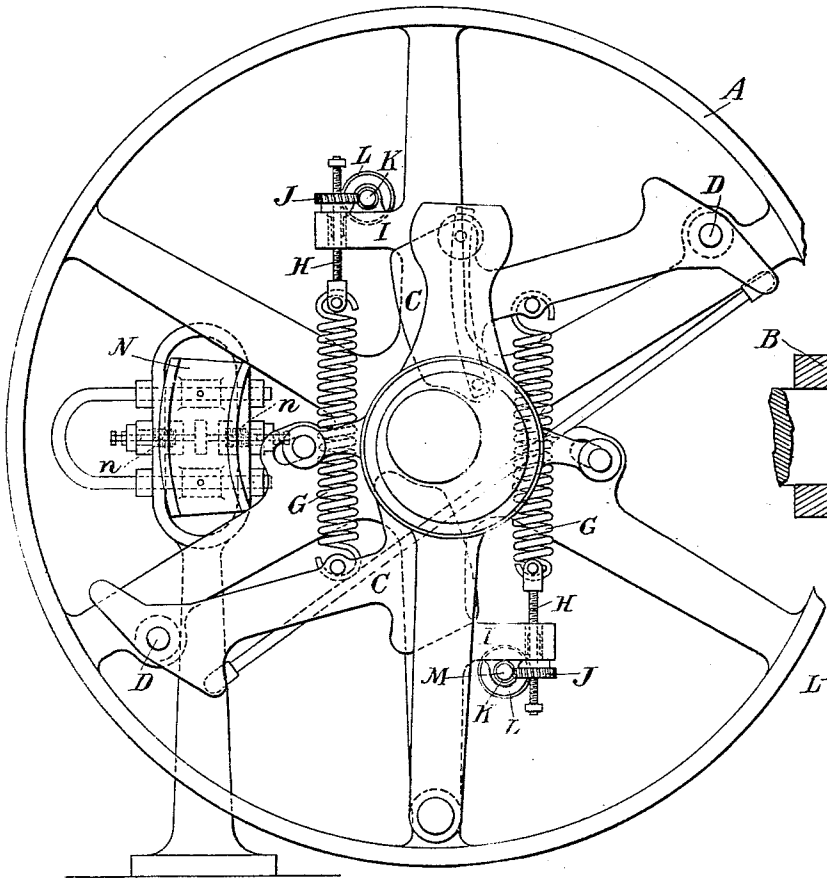
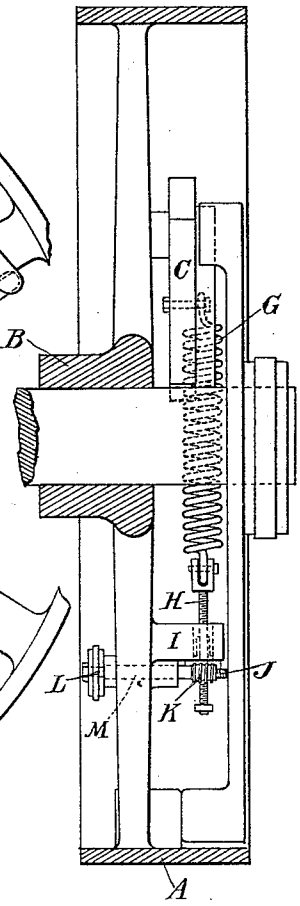


Fig. 2.



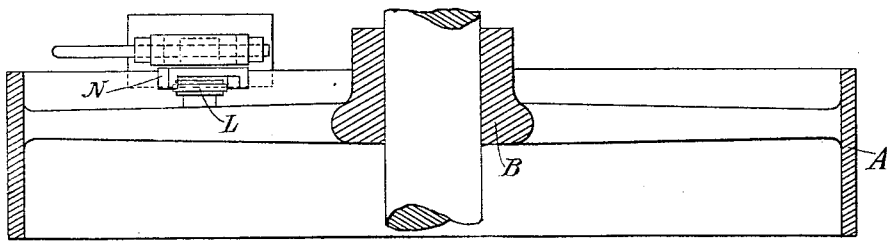


Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

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SPEED ALTERING OR ADJUSTING MECHANISM FOR SHAFT GOVERNORS.

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Fig. 4.

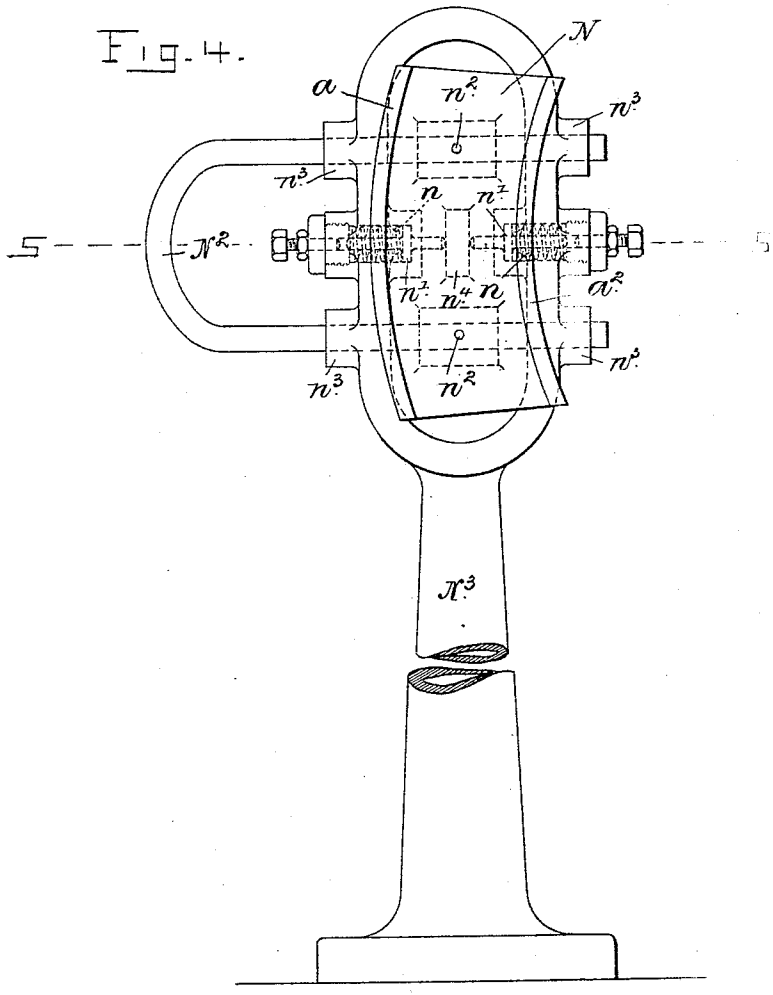
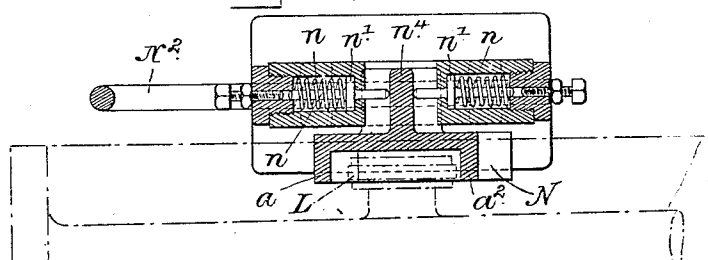


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN McLAREN AND HENRY McLAREN, OF LEEDS, ENGLAND.

SPEED ALTERING OR ADJUSTING MECHANISM FOR SHAFT-GOVERNORS.

SPECIFICATION forming part of Letters Patent No. 569,512, dated October 13, 1896.

Application filed April 20, 1896. Serial No. 588,319. (No model.)

To all whom it may concern:

Be it known that we, JOHN McLAREN and HENRY McLAREN, engineers, subjects of the Queen of Great Britain and Ireland, and residents of Midland Engine Works, Hunslet, Leeds, in the county of York, England, have invented certain Improvements in Speed Altering or Adjusting Mechanism for use with Automatic Expansion or Shaft Governors, of which the following is a specification.

The object of this invention is to provide simple and efficient means whereby the tension or compression on the spring or springs of automatic expansion or shaft governors can be adjusted or varied as required without stopping the engine.

According to our invention the spring (or each spring) is attached at one end to the governor-weight (or governor-weights) pivoted to the engine-wheel as usual, the other end of the spring being attached to a screw carried by the said wheel, which screw can be moved longitudinally, but not rotate. On this screw a screw-nut can be rotated; but it cannot move longitudinally, so that, when rotated, it moves the screw longitudinally to distend or compress the spring to put greater or lesser tension or compression thereon. The screw-nut is rotated while the engine is in motion by a friction-bowl, star-wheel, or the like, mounted on an axis carried by the wheel constituting the governor-casing, which axis also carries a worm, or bevel-wheel, or other suitable gear, by which the screw-nut is rotated. In proximity to the said wheel is a standard or support carrying a duplex device situated in the plane in which the friction-bowl or the like rotates, which device can be brought into contact with either side of the friction-bowl or the like, so as to cause it to rotate in either direction as it is carried in contact therewith by the rotation of the wheel, and in accordance with which side of the periphery of the friction-bowl or the like is acted upon the compression or tension on the spring will be lessened or increased and the speed of the engine altered. When a friction-bowl is used, it can be conveniently made of a pair of disks with leather or equivalent material pinched between them, so as to present a periphery of leather or the like to the duplex device with which it comes in contact. The said duplex device may consist of any suitable projections to operate the friction-bowl, star-wheel, or the like, such as pins in the case of a star-wheel or curved surfaces in the case of a friction-bowl, and the said device is so supported that it can be moved by the attendant in the standard or support to one side or the other to press on or engage with the friction-bowl or the like from one side or the other, so as to rotate it in one direction or the other, according to whether the speed of the engine is to be increased or diminished.

To maintain the duplex device out of contact with the friction-bowl or the like, except when the said device is operated by the attendant, springs may be used to press on the device from each side, so as to normally maintain the said device in mid-position, the said springs acting, preferably, on pins with projections which limit the motion of each pin to the proper place for mid-position of the duplex device, so that should either of the springs break the other will not force the device beyond the mid-position. To prevent the said duplex device from being moved too far by the attendant to give more than just a good contact between the friction-bowl or the like and the surface of the duplex device with which it comes in contact, adjusting-screws may be provided to limit the movement of the said duplex device in each direction, so that by setting these screws the desired amount of frictional contact is obtained. The friction-bowls or the like can be loaded at one side, so that under the centrifugal force they are prevented from turning except when in contact with the said duplex device.

In order that this invention may be well understood, we will describe, with reference to the accompanying drawings, the manner in which the same may be performed. We do not, however, limit ourselves to the precise details hereinafter described and illustrated.

Figure 1 is a side view, and Figs. 2 and 3 are sections at right angles to each other. Fig. 4 is a side view, drawn to a larger scale, of a detail; and Fig. 5 is a section thereof, taken on line 5 5 of Fig. 4.

A represents a cast-iron rim or casing with spokes radiating from the central boss B, which is fixed on the crank-shaft of the engine.

The weights C C are carried by arms cen-

tered on pins D and have a tendency to fly outward under the action of centrifugal force when the governor revolves. By any suitable arrangement of links and dies or other suitable gear in connection with the weights the movement of the slide-valve is controlled, the travel being either increased or diminished, according as the weights are nearer to the rim of the governor or to the boss.

The arc through which the weights C move is limited by and the force required to send them outward is dependent upon the resistance of the springs G. When these springs are tightly screwed up, the speed necessary to force the weights to their outward position near the rim of the governor is necessarily greater than when the tension of the springs is reduced, and therefore by varying the tension of the springs the outward movement of the weights may be retarded when the engine is required to run fast and the outward movement of the weights may be accelerated when the engine is required to run slow. For this purpose each spring G is secured at one end to the arm of the weight C and at the other end to a screw H, carried in a projection I on one of the arms of the governor-casing. This projection carries a nut J, provided with a worm-wheel around its periphery and engaging with a worm K on a spindle M, which also carries a friction-wheel L, the said spindle M being mounted in a bearing on the projection I on the wheel A and projecting to outside the governor-casing.

When it is desired to alter the speed of the engine, a shoe or rubber N, (see detail views, Figs. 4 and 5,) having two projecting rims or rubbing surfaces a a^2, is moved into position to cause the friction-wheel L (as the governor or shaft rotates) to come into contact with one or other of the said rims or surfaces and by the frictional contact therewith receive motion of partial rotation. The friction-wheel L will thus transmit, through the worm K, rotation to the worm-wheel and nut J in one direction or the other, according to which of the two rims or surfaces a a^2 is in position to act on the wheel L. The screw H, by the rotation of the nut, is moved longitudinally in one direction or the other, and consequently the tension of the spring is increased or decreased accordingly. The shoe or rubber N is connected by pins or screws n^2 to a bent rod N^2, constituting a handle by means of which the said shoe or rubber can be moved outward or inward and held in position until the required speed is obtained, the said handle or bent rod sliding in guides n^3 in the standard N^3. In pockets or recesses in the standard N^3 are springs n and plungers n', which plungers, when the handle N^2 is released, are pressed by the springs n against the opposite sides of a projection n^4 on the back of the shoe or rubber N. The rubber is thus restored to and retained in its neutral position with the rims or surfaces a a^2 out of the track of the friction-wheels L, so that there is no risk of damage by the shoe or rubber being left, through forgetfulness or carelessness, in a position to contact with the said wheels.

The springs may be in compression instead of in tension, if preferred, the adjustment being effected by the same means, the details being altered to put compression on and take it off the springs, as will be readily understood without particular description.

Instead of a friction-wheel we may use a spur, star, miter, or other gearing to communicate the power from the shoe or rubber to the regulating-screw H.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In expansion or shaft governors which are controlled by springs, the combination of a screw to which one end of the controlling-spring is attached, a nut on the said screw and gearing to rotate the said nut, with a movable contact piece or shoe capable of being brought into position to act on the gearing so as to rotate the nut in either direction to increase or reduce the tension of the spring, substantially as hereinbefore described.

2. In expansion or shaft governors which are controlled by springs, the combination of a screw to which one end of the controlling-spring is attached, a nut on the said screw, and gearing to rotate the nut, with a movable contact piece or shoe capable of being moved into position to contact with the gearing so as to increase or decrease as required the tension of the spring, and springs acting on the contact piece or shoe to normally maintain it in its inoperative position, substantially as hereinbefore described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN McLAREN.
HENRY McLAREN.

Witnesses:
ARTHUR MITCHELL,
WILLIAM WALKER.