

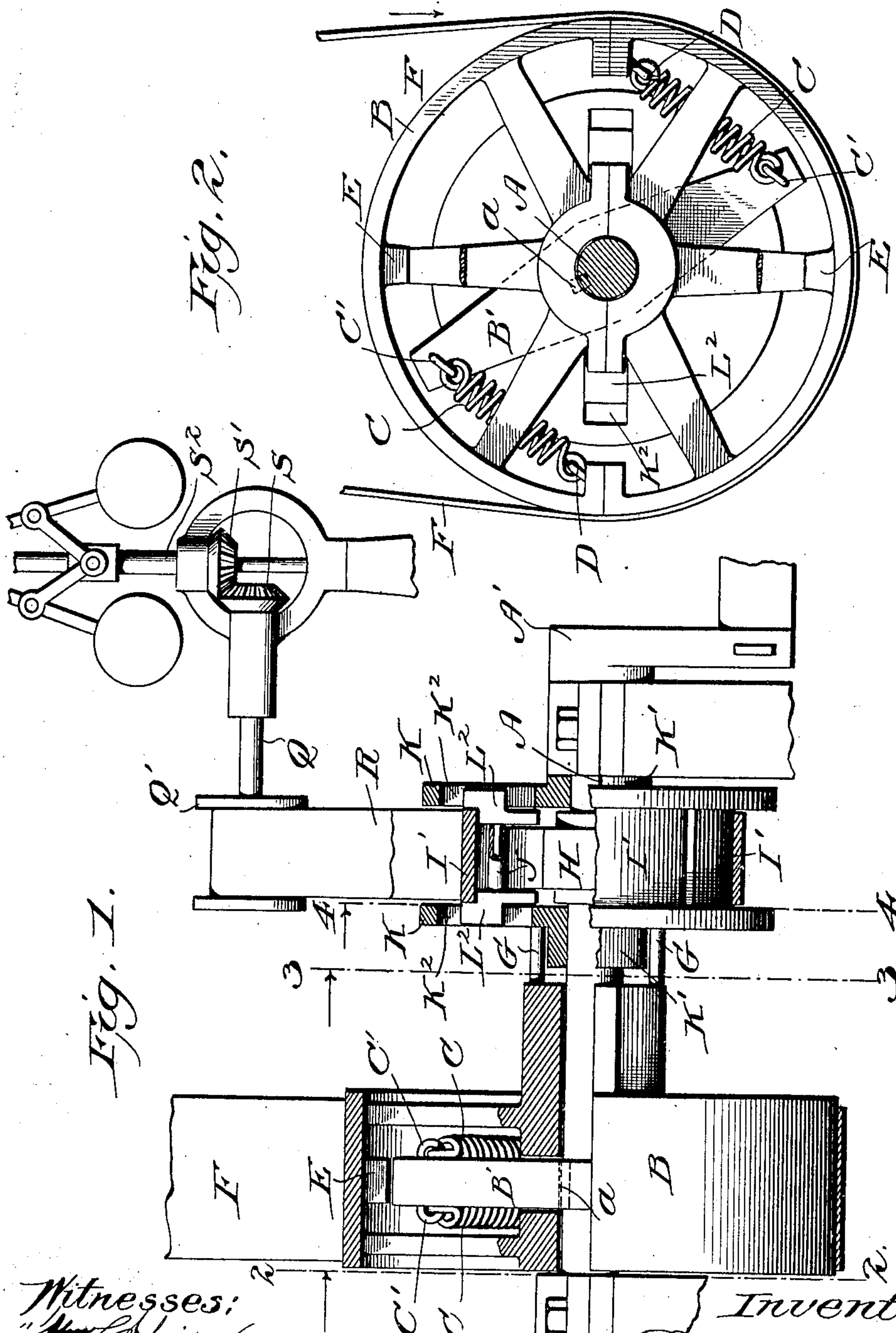
No. 881,917.

PATENTED MAR. 17, 1908.

W. E. GANNON.  
GOVERNOR MECHANISM FOR ENGINES.

APPLICATION FILED NOV. 18, 1907.

2 SHEETS—SHEET 1.



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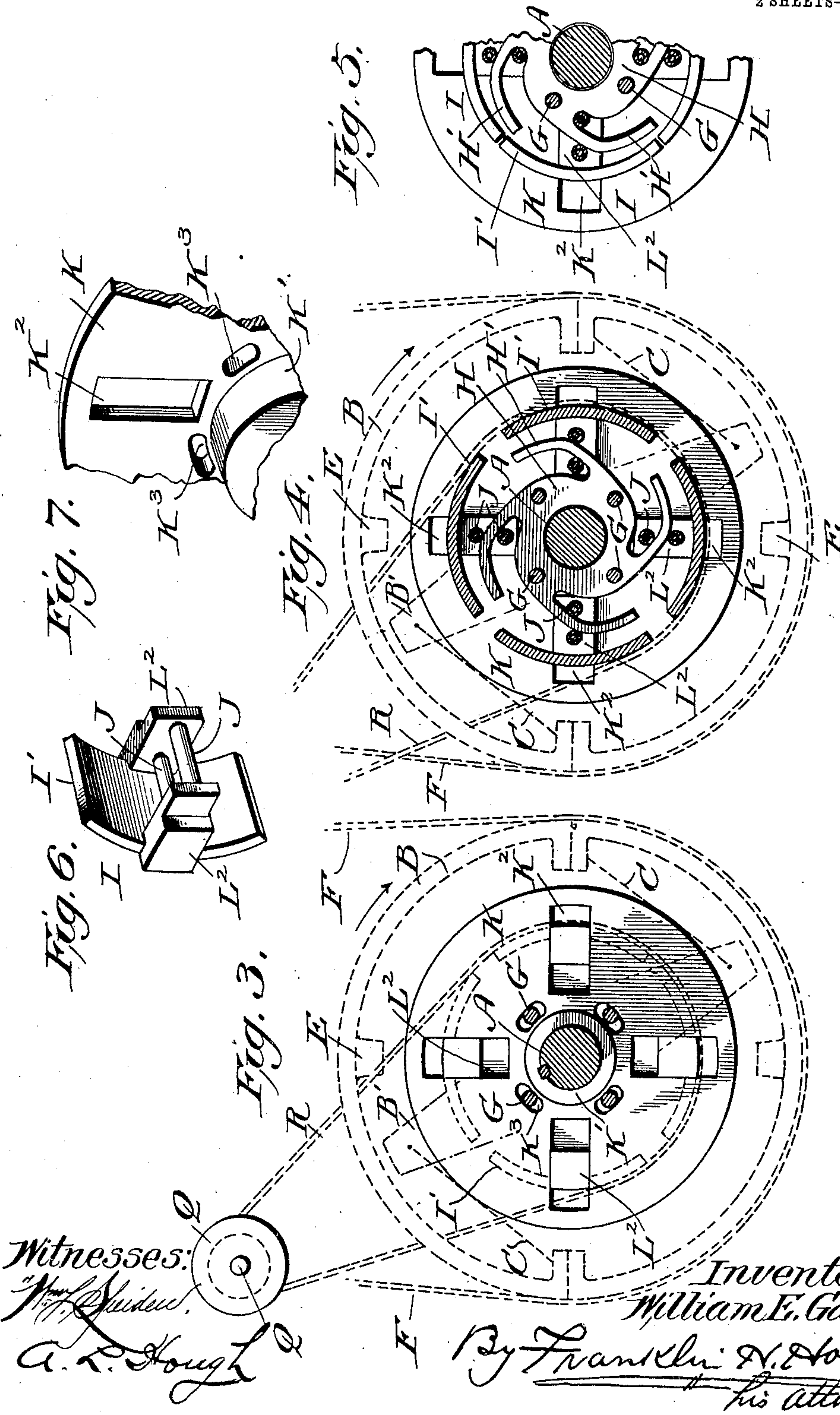
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# UNITED STATES PATENT OFFICE.

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## GOVERNOR MECHANISM FOR ENGINES.

No. 881,917.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed November 18, 1907. Serial No. 402,711.

*To all whom it may concern:*

Be it known that I, WILLIAM E. GANNON, a citizen of the United States, residing at McDavid, in the county of Escambia and State of Florida, have invented certain new and useful Improvements in Governor Mechanism for Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in attachments to governors of steam engines, the purpose being to allow the engine to take full steam without slowing down, when an extra load comes upon the engine, the apparatus being designed for use in connection with any form of driven apparatus.

More specifically, the invention comprises an expansible pulley made up of a plurality of sections which are adapted to have belted connection with a shaft governing mechanism, and so arranged that when a load comes upon a driven shaft, the sections of the pulley may be made to contract, thereby reducing its diameter allowing the governor to slow down under the load, and permit the engine to take full steam without slowing down.

The invention comprises various other details of construction and combination and arrangements of parts which will be hereinafter fully described and defined in the appended claims.

I illustrate my invention in the accompanying drawings, in which,

Figure 1 is a side elevation of the apparatus showing parts in section. Fig. 2 is a sectional view taken on line 2—2 of Fig. 1. Fig. 3 is a sectional view taken on line 3—3 of Fig. 1. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is an enlarged detail in elevation of a portion of the expansible pulley, showing means for moving the segments of the pulley. Fig. 6 is a detail perspective view of one of the expansible segments of the pulley, and Fig. 7 is a detail perspective view of a portion of the flange and hub of the expansible pulley.

Reference now being had to the details of the drawings by letter, A designates a crank

shaft of an engine and A' the crank secured thereto, the other features of the engine not being illustrated. Mounted loosely upon said shaft is a pulley B and B' designates a bar which is made fast to the shaft A by means of the key *a* shown clearly in Figs. 1 and 2 of the drawings.

C—C designate springs which are arranged in pairs and connect the eyes C' and D, the former of which are mounted on said bar B and the latter upon the rim of the pulley. Projecting from the inner surface of the flange of the pulley B are stops E against which the ends of said bar are adapted to contact to cause the pulley and bar to rotate. While I have shown two springs secured to each end of said bar, one spring in the place of each pair may be utilized if sufficiently strong to accomplish the same purpose. A suitable belt, designated by letter F, passes about the pulley B and is adapted to connect the latter with any shaft, not shown, to be driven.

Projecting from the hub of the pulley B are the rods G, shown in section in Figs. 3, and 4, and in elevation in Fig. 1. Said rods are fixed to a cam member H shown clearly in Figs. 4 and 5 of the drawings, which cam member is mounted upon the shaft A and is provided with curved arms H' preferably of the shape shown in Figs. 4 and 5 of the drawings. I designate expansible segments of a pulley, each segment having a convexed bearing surface I', and each segment having a laterally projecting portion L<sup>2</sup> with rollers J spaced apart and connecting the inner faces of the laterally projecting portions of the segments as shown clearly in Fig. 6 of the drawings.

K designates two disks each having a hub section K' and each provided with four elongated slots or openings K<sup>2</sup>, radially formed, as shown clearly in Figs. 3 and 4 of the drawings. Each disk is provided with curved slots K<sup>3</sup> through which the rods G pass, as shown clearly in Fig. 3 of the drawings. Each laterally projecting portion L<sup>2</sup> of an expansible segment is positioned in a slot or opening K<sup>2</sup>, in a disk K and is guided in its radial movements by the opposite marginal edges of the opening K<sup>2</sup>.

It will be noted upon reference to Fig. 4 of the drawings that a curved cam arm H' passes between each pair of rollers J, and as the cam member H is given a slight rotary



movement with the shaft upon which it is mounted, that the segments will be expanded by the outer convexed edge of each arm H' bearing against the outer of the pairs of rollers J, and upon a reverse movement of the cam member the inner marginal edges of the arm H' will contact with the inner rollers J of each pair and cause the expansible segments to contract thus increasing or decreasing the diameter of the expansible pulley, accordingly as it may be desired to allow a less or greater amount of steam to be fed to the cylinder of the engine, through the medium of the governor.

A governor operating shaft Q shown in Fig. 1 of the drawings is mounted in suitable bearings and provided with a flanged pulley Q' which has belted connection R with the expansible pulley described, and S designates a bevel gear wheel which is fixed to the shaft 2 and is in mesh with a similar gear wheel S' upon the vertically disposed governor shaft S<sup>2</sup> which is regulated by the governor balls.

The operation of my apparatus is as follows:—Assuming that the engine is running under a slight load, the parts of the expansible pulley will assume the positions shown in Fig. 4 of the drawings in which the pulley segments are thrown toward their outward limits, the springs C being balanced. In the event of the expansible segments being at their farthest outward limit the expansible pulley will have attained its largest diameter and will cause the governor to be actuated so that the supply of steam will be reduced somewhat, but when a load comes upon the countershaft which has belted connection with the pulley B, there will be a tendency to slacken the movement of the pulley B. As the pulley B has a slight movement independent of the shaft upon which it is mounted, the tendency to slacken the movement of the pulley B will cause the springs C to be placed under tension, and the cam disk H which is fixed to said pulley B will cause the segments of the pulley to be contracted or drawn toward the shaft A by the inner edges of the arms H' bearing against the inner of the rollers J, thereby reducing the diameter of the expansible pulley. When the segments of the expansible pulley are at their innermost throw they will assume the position shown in Fig. 5, the opposite ends of the bar B' will come into contact with the stops E, and thereafter said bar and pulley B will move with the shaft upon which they are mounted. By the contraction of the segments of the expansible pulley the speed of the governor will be slackened allowing the engine to take full steam under the extra load. While the engine remains under its extra load, the segments of the expansible pulley will keep the position shown in Fig. 5 of the drawings in which they are at their innermost throw, and the bar B' will still be

bearing frictionally against the lugs E and the springs C will be under tension. When the pulley B is relieved of its load the springs C will have a tendency to draw the bar B' from the lugs E, and the segments of the expansible pulley will be thrown outward and the supply of steam being fed to the engine through the medium of the governor mechanism will be cut off.

It will be noted therefore in the construction of the apparatus as shown and described, that a simple and efficient means is afforded for regulating the supply of steam to an engine under varying loads without slackening the speed of the engine.

It will be understood that my device may be applied either directly or indirectly in connection with an engine and utilized for various purposes such as dynamos or any driven mechanism, in which it may be desired to regulate the rotary movement of a shaft according to the load which may come upon the same.

What I claim to be new is:—

1. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley connected upon said shaft, connections between said expansible pulley and governor mechanism, and means for expanding the pulley, as set forth.

2. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, means fixed to said loosely mounted pulley for expanding and contracting said segments, belted connections between the expansible pulley and governor mechanism, as set forth.

3. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft, and connections between said member and said loosely mounted pulley, said member adapted to expand and contract said segments, and connections between the expansible pulley and governing mechanism, as set forth.

4. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley



loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft and connections between said member and said loosely mounted pulley, curved arms upon said cam member adapted to actuate said segment members whereby the diameter of the expansible pulley may increase or diminish, and belted connections between said expansible pulley and governor mechanism, as set forth.

5. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft and connections between said member and said loosely mounted pulley, curved arms upon said cam member, rollers upon said segments adapted to be actuated by the arms of the cam member whereby the diameter of the expansible pulley may be increased or diminished, and connections between the expansible pulley and governor, as set forth.

6. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft, and connections between said member and said loosely mounted pulley, said member adapted to expand and contract said segments, means for guiding the segments as they expand and contract, and connections between the expansible pulley and the governor mechanism, as set forth.

7. An apparatus for regulating the feeding of steam to an engine when the latter is under load without slowing the engine, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft, and connections between said member and said

loosely mounted pulley, said member adapted to expand and contract, said segments, disks upon the shaft provided with openings therein, projections upon said segments positioned in said openings in which they have a play, and connections between the expansible pulley and the governor mechanism, as set forth.

8. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft and having yielding connections with said pulley, an expansible pulley made up of movable segments, a cam member upon the shaft, said member having curved arms, rollers connecting said member with said loosely mounted pulley, rollers fixed to said segments and between which the arms of said member extend, and against which the arms are adapted to bear to expand or contract the segments, and connections between the expansible pulley and the governor mechanism, as set forth.

9. An apparatus for regulating the feeding of steam to an engine when under load without slowing the latter, comprising an engine shaft and governor mechanism, a pulley loosely mounted upon said shaft, a bar fixed to said shaft, springs connecting the ends of said bar with the pulley, stops upon the inner circumference of the pulley against the ends of which said bar is adapted to contact, a cam member mounted upon said shaft and having curved arms, rollers connecting said member with the said loosely mounted pulley, disks loosely mounted upon said shaft and provided with radial openings, expansible pulley segments mounted between said disks and having lateral projections extending into the openings of the latter and serving as guides to the segments as they are expanded and contracted, rollers carried by the segments and between which a pair of curved arms are adapted to extend and connections between the expansible pulley segments and the governor mechanism, as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM E. GANNON.

Witnesses:

A. L. HOUGH,

FRANKLIN H. HOYT.