H. J. WARTHEN.

DEVICE FOR CONTROLLING THE SPEED OF RAILROAD TRAINS.

APPLICATION FILED OCT. 24, 1911. RENEWED FEB. 5, 1914.

1,090,807. Patented Mar. 17, 1914.

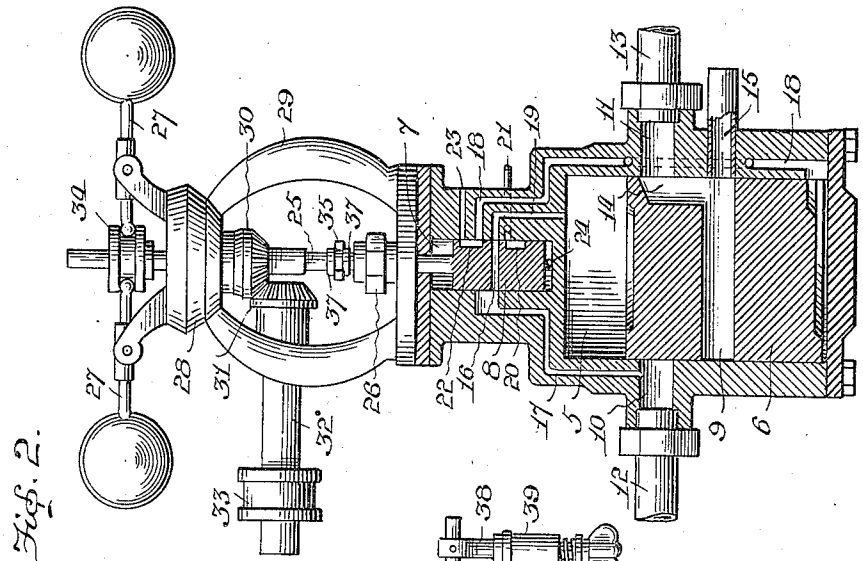


Fig. 2.

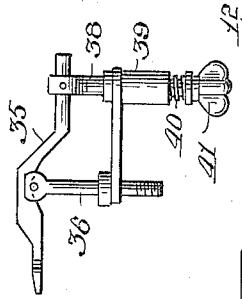


Fig. 3.

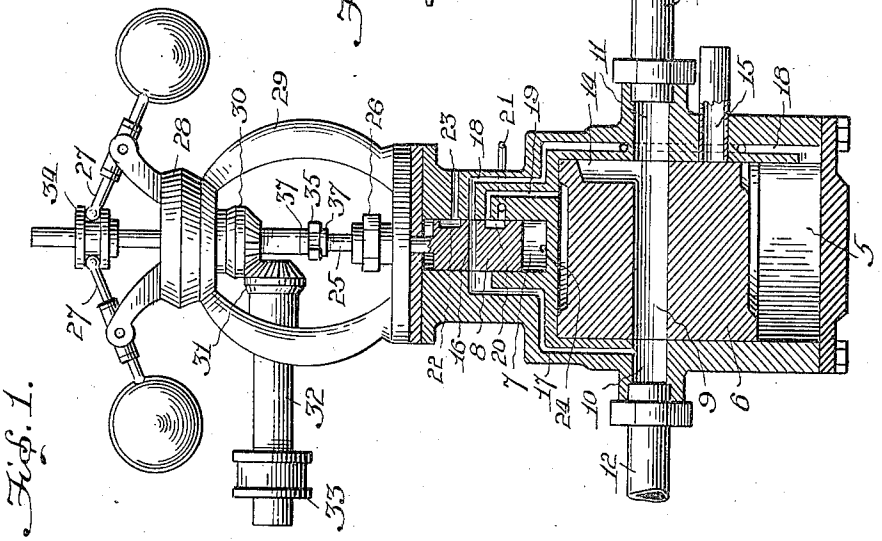


Fig. 1.

Witnesses

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DEVICE FOR CONTROLLING THE SPEED OF RAILROAD-TRAINS.

1,090,807. Specification of Letters Patent. Patented Mar. 17, 1914.

Application filed October 24, 1911, Serial No. 656,444. Renewed February 5, 1914. Serial No. 816,845.

To all whom it may concern:

Be it known that I, HARRY J. WARTHEN, a citizen of the United States, residing at Washington, District of Columbia, have invented a Device for Controlling the Speed of Railroad-Trains, of which the following is a full and complete specification.

My invention is an improvement in devices for controlling the operation of railroad trains, and relates more especially to the provision of a valve mechanism for use in connection with an air-brake system to limit the speed of the train for certain purposes.

The present invention is designed more especially for use in connection with a system of electrical and mechanical devices for controlling the operation of railroad trains, forming the subject-matter of a separate application for patent filed October 24, 1911; Serial No. 656,443.

The primary object of the present invention is to provide a particular form of valve-mechanism which may be applied in connection with the ordinary air-brake system of a train and is operated by a governor geared to an axle of the locomotive or any other part of the train so as to automatically apply the air-brakes in case the speed of the train should exceed a predetermined limit; all as hereinafter fully described in the following specification, and more especially set forth in the appended claims.

In the accompanying drawings, which form a part of this specification:—Figure 1 is a sectional view through a valve-mechanism constructed in accordance with my invention. Fig. 2 is a similar view, with the parts of the valve in the opposite position from that shown in Fig. 1. Fig. 3 is a detail view of the device for regulating the operation of the valve mechanism.

Like numerals of reference indicate like parts in all the figures of the drawings.

In carrying out my invention I provide a valve casing having two chambers formed therein, to wit: a large cylinder or chamber 5 for a piston-valve 6, and a small chamber or cylinder 7 for a slide-valve 8, said chambers being disposed preferably one above the other and connected by air-passages or ports, hereinafter referred to, so that the operation of the piston-valve may be controlled by the operation of the slide-valve. The piston-valve 6 is provided with a transverse passage 9, which when said piston is raised connects a port 10 at one side of the cylinder with a port 11 at the other side of the same, the port 10 being connected by pipe 12 to the main reservoir of the air-brake system, and the port 11 by pipe 13 to the engineer's control-valve. For the purpose of connecting the port 11 leading to the engineer's control-valve with an exhaust when the piston-valve is lowered, the latter is provided with a cavity 14, which connects said port 11 with an exhaust port 15 leading out at one side of the valve-casing, whereby air-pressure may be exhausted from the control-valve to apply the air-brakes. This piston-valve is raised and lowered by air-pressure let into the chamber or cylinder 5 above or below the piston by means of the slide-valve 8.

The slide-valve is provided with a transverse opening 16 therethrough communicating at all times with a passage 17 leading from the air-pressure supply by way of port 10, and adapted to connect said passage with either one of two passages 18 and 19, according to the position of the slide-valve. The air-passage 18 leads to the lower end of the chamber or cylinder 5, and air-passage 19 leads to the upper end of said chamber or cylinder, and the opening through the slide-valve is so disposed that when said valve is raised air-passage 17 connects with air-passage 18 to admit pressure below the piston to raise the same, and when the slide-valve is lowered said air-passage 17 connects with air-passage 19 to admit pressure above the piston-valve to lower the same; it being noted that the end of the air-pressure supply passage 17 adjacent the slide-valve is enlarged so as to communicate with the opening 16 of the slide-valve in either position of the latter. In order to exhaust air pressure from above the piston-valve when air-pressure is being admitted below the same by the slide-valve, and vice versa, the slide-valve is provided with a cavity 20, for connecting air-passage 19 to an exhaust-port 21, when said slide valve is raised, and with a cavity 22, for connecting air-passage 18 with an exhaust-port 23 when the slide-valve is lowered, and to permit of a free operation of the slide-valve the chamber 7 containing the same is provided with a vent 24 at its lower end.

The slide-valve is operated by an ordinary form of governor, in which the stem 25 operated by the governor-arms is connected directly to said valve, passing through a

suitable stuffing-box 26. The weighted governor-arms 27 are rotated as usual by a rotatable collar 28 mounted on the upper end of a frame 29 supported on the valve casing, said collar having a beveled-gearwheel 30 in mesh with a companion beveled-gearwheel 31 on a driving-shaft 32, and to the latter is fixed a pulley 33 by which it may be connected to a driven shaft of the locomotive, tender, or any other part of the train, for instance one of the axles. To the stem 25 is fixed the usual grooved collar 34 with which the inner ends of the weighted governor-arms 27 engage, whereby when the arms are moved upward by centrifugal force the inner ends thereof will be lowered to depress the stem and its slide-valve.

The governor may be constructed so as to operate or depress the slide-valve when the locomotive or train attains a certain rate of speed, say ten miles an hour, but in order to regulate the governor so that it will operate at any other predetermined rate of speed I provide a simple attachment or tension device which acts on the movable stem of the governor and valve to increase or diminish the amount of pressure required to depress the same. This device comprises a lever 35 centrally fulcrumed on a suitable support 36, threaded in the base of the governor-supporting frame 29 and bifurcated at its inner end to engage between collars 37—37 on the stem, and at its outer end connected to a rod 38 which passes through a tubular support 39 and is engaged by a compression spring 40 seated in the tubular support and interposed between said tubular support and an adjusting-nut 41 threaded on the lower end of the rod and adapted to increase or diminish the tension of the spring. As the spring-actuated lever is connected to the stem of the governor it will retard the downward movement of the stem according to the compression of the spring, and this may be regulated by the nut to vary the centrifugal force required and consequently vary the limit of speed necessary to actuate the slide-valve.

The operation of the speed-valve mechanism will be readily understood from the foregoing description, in connection with the accompanying drawings; for as the engineer's control valve is supplied with air-pressure through the piston-valve 6 the air-brake mechanism of the train may be operated in the usual manner only when said piston-valve is raised to the position shown in Fig. 1 of the drawings, and is held in this position by the raised position of the slide-valve which feeds air-pressure from the main-reservoir of the air-brake system into the passage 18 and into the lower end of the cylinder containing said piston-valve, and of course this position of the parts is maintained as long as the governor-arms are in lowered position. Therefore the train may be run in the usual manner up to the speed at which the governor-arms are thrown out to the position shown in Fig. 2 of the drawings, in which case the slide-valve is depressed connecting the air-pressure supply passage 17 with the feed-passage or port 19 and air-passage or port 18 with the exhaust port 23, causing air-pressure to be admitted above the piston and the pressure below same to be exhausted, whereby the valve is lowered cutting off the air-pressure supply to the engineer's control-valve and exhausting from said control-valve by way of the cavity 14 in the piston-valve and exhaust-port 15 to which the cavity connects. The exhausting of the air-pressure from the engineer's control-valve will of course apply the air-brakes automatically and in the same manner as by the manual operation of the control-valve.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. A speed control mechanism for use in connection with an air-brake system, comprising a piston-valve through which the air pressure passes for application of the air-brakes, means for admitting pressure to opposite sides of said piston-valve, respectively, and a governor for operating said means.

2. A speed control mechanism for use in connection with an air-brake system, comprising a piston-valve through which the air-pressure passes for application of the brakes, a slide-valve for admitting pressure to opposite sides of the piston-valve, respectively, and a governor operating the slide-valve, substantially as shown and described.

3. A speed control mechanism for use in connection with an air-brake system, comprising a piston-valve through which the air-pressure passes for application of the brakes, a slide-valve for admitting pressure to opposite sides of the piston-valve, respectively, a governor operating said slide-valve, and a tension device for regulating the governor, substantially as shown and described.

4. A speed control mechanism for use in connection with an air-brake system, comprising a piston-valve through which the air-pressure passes for application of the brakes, a slide-valve for admitting pressure to either side of the piston valve, a governor connected to the stem of the slide-valve for operating the latter, and a regulating device consisting of a lever connected to the stem, and a compression spring engaging said lever, substantially as shown and described.

5. A speed control mechanism for use in connection with an air-brake system, comprising a piston-valve through which the air-pressure passes for application of the

brakes, a slide-valve for admitting pressure to either side of the piston-valve, a governor connected to the stem of the slide-valve for operating the latter, and a regulating device consisting of a lever centrally fulcrumed on a support and engaging the stem, a rod connected to the outer end of the lever, an adjusting-nut threaded on the rod, and a compression-spring bearing against the nut, substantially as shown and described.

6. A speed control mechanism for use in connection with air-brake systems, comprising a casing having a piston chamber and slide-valve chamber, passages between the slide-valve chamber and opposite ends of the piston-chamber and between said slide-valve chamber and source of air-pressure supply, a piston through which the air-pressure passes for application of the brakes, and a slide-valve for connecting the air-pressure supply passage to the passages leading into the opposite ends of the piston-chamber, respectively, together with a governor connected to the slide-valve, substantially as shown and described.

7. A speed control mechanism for use in connection with an air-brake system, comprising a casing having a piston-chamber and a slide-valve chamber, passages between the slide-valve chamber and opposite ends of the piston-chamber, respectively, and between said slide-valve chamber and source of air-pressure supply, a slide-valve having an opening therethrough for connecting the air-pressure supply passage to either one of the passages leading to the ends of the piston chamber, and cavities in the slide-valve for connecting the air-passages from the piston-chamber to exhaust-ports; a piston having an opening therethrough for connecting the air-pressure supply to the engineer's control valve of the air-brake mechanism and a cavity for connecting said control-valve with an exhaust; together with a governor connected to the stem of the slide-valve, substantially as shown and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY J. WARTHEN.

Witnesses:
THOMAS R. BARENDALE,
ROY C. WEBSTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."