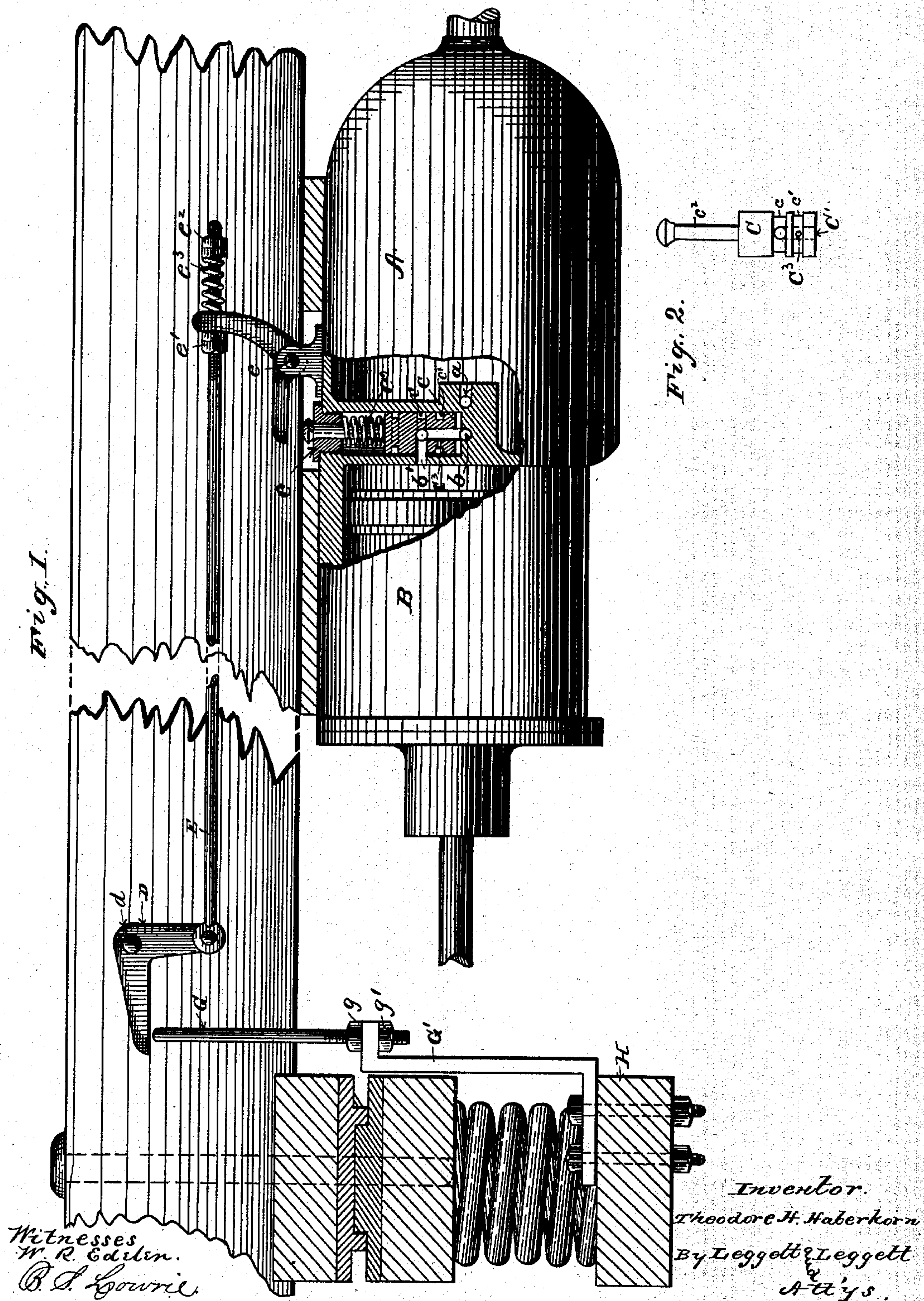


(No Model.)

T. H. HABERKORN.
GOVERNOR FOR AIR BRAKES.

No. 413,253.

Patented Oct. 22, 1889.



UNITED STATES PATENT OFFICE.

THEODORE H. HABERKORN, OF FORT WAYNE, INDIANA.

GOVERNOR FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 413,253, dated October 22, 1889.

Application filed April 26, 1889. Serial No. 308,704. (No model.)

To all whom it may concern:

Be it known that I, THEODORE H. HABERKORN, of Fort Wayne, in the county of Allen and State of Indiana, have invented certain
5 new and useful Improvements in Governors for Air-Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in governors for air-brakes, the invention consisting, essentially, of a governor-valve for
15 controlling the air-pressure admitted to the brake-cylinder, such valve being automatically regulated to admit more or less air, according to the load of the car.

My invention also relates to details of construction, hereinafter described, and pointed
20 out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, portions being broken away to show the internal construction. Fig. 2 is
25 an elevation of the governor-valve detached.

A represents the so-called "auxiliary" air-reservoir with which each car is provided, and B the air-cylinder for operating the brake
30 by means of the air under pressure stored in such reservoir and admitted to the cylinder. In the drawings the cylinder and reservoir are shown integral; but this is not material so far as carrying out my invention is
35 concerned, but such construction is more convenient.

C is the governor-valve, which, together with the mechanism for automatically regulating the throw of the valve, according to the
40 load on the car, constitutes the gist of my present invention.

The general features and operation of air-brakes are so well known that it is not considered necessary to illustrate such mechanism farther than to show the action of my
45 improved devices. From the interior of reservoir A a lateral hole, duct, or pipe, as the case may be, *a* leads outward to a valve, (not shown,) and from such valve a return hole, duct, or port *b* leads under valve C, discharging, of course, into the valve-chamber, and
50 such outside valve, whatever its construction may be, is shifted to open and close commu-

nication between reservoir A and cylinder B, and the air from reservoir A must pass out from thence through hole *a* and return through hole *b*, in order to enter cylinder B. 55
I may add that such outside valve is usually opened and closed by varying the pressure in the main air-supply pipe that extends along the car, and consequently the different
60 valves of the respective cars would be operated substantially alike, and would set the brakes with approximately the same force on an empty or loaded car, and it is to remedy this difficulty that my governing mechanism is intended. The valve-casing shown 65
is constructed in the division-wall between cylinder and reservoir, and has a cylindrical bore in which fits valve C nicely, hole *b*, as aforesaid, entering the valve-chamber below the valve. Through the wall of the valve- 70
casing is a hole or port *b'*, opening into cylinder B, hole *b'* being located some little distance above hole *b*. The lower portion of valve C is a hollow cylinder—that is to say, it has a bore *C'*, (shown in dotted lines in 75
Fig. 2,) leading from the lower end thereof part way up the valve and connecting with lateral holes *C²* and *C³*. The valve on the periphery thereof has circumferential grooves
80 *c* and *c'*, into which the respective holes *C²* and *C³* open. The valve is provided with a valve-stem *c²*, leading up through a hole in cap *A'*, and between the cap and the body of the valve is a spiral spring *c³*, coiled around the valve-stem and engaging the cap and 85
valve, the action of this spring serving to depress the valve. Hole or port *C²* is approximately of the same size as hole or port *b'* of the casing, while hole *C³* is much smaller. When the valve is depressed so that holes *C²* 90
and *b'* are in line with each other, hole *C³* and the co-operating groove *c'* are cut off and inoperative. When the valve is elevated so that holes *c²* and its co-operating groove *c* are above the line of hole *b'*, hole *C³* and groove 95
c' are opposite hole *b'*, the arrangement being such that just as groove *c* is being cut off from hole *b'* groove *c'* has commenced to open into hole *b'*—that is to say, the bridge between the two grooves is a trifle less than the 100
vertical dimension of hole *b'*, the result being a graduated discharge from the valve from

the full size of hole C^2 as a maximum to the reduced hole C^3 as a minimum; or, if the valve were raised still farther to close hole C^3 , the minimum discharge would extend to zero.

5 In admitting air from the reservoir into the cylinder by way of holes a b the first effect of the air acting on the bottom of the valve would be to instantly raise the valve against the action of spring c^3 , and thus cut off communication from the valve-chamber to the
10 cylinder by raising hole C^3 above the line of hole b' . It will therefore be seen that in order to have a full opening into cylinder B valve C must be held in position with hole C^2
15 in line with hole b' .

The mechanism for regulating valve C may be and preferably is substantially as follows, to wit: D and E are levers of the bell-crank variety, pivoted at d and e , respectively, at
20 the elbows thereof, lever D being pivoted usually to one of the four sills F of the car, although any attachment connected with the body of the car would answer the purpose, while lever E is pivoted, for instance, as
25 shown, to an attachment of the reservoir. These two levers are arranged in the reverse positions shown, and the upright arms thereof are coupled by rod E' . The lateral arm of lever E is located directly above valve-stem
30 c^2 and serves as a variable stop to limit the upward movement of valve C. The lateral arm of lever D rests on the upper end of rod G, and is held in such position by gravity. The lower end of rod G is screw-threaded
35 and extends through a hole in bracket G' , with jam-nuts g and g' , respectively, above and below the engaging member of the bracket. By manipulating these jam-nuts rod G is adjusted up or down, as required.
40 Bracket G' is bolted to the truck-bolster H, and as the latter is below the car-springs the bolster, bracket G' , and rod G are not affected vertically by any load that the car may carry. The parts are so adjusted that the maximum
45 load on the car, and with the consequent depression of the car-body, lever D, by its engagement with rod G, is tilted in the direction to draw endwise on rod E' , thereby tilting lever E in the direction to hold down valve C to
50 give a full opening through holes or ports b' C^2 . As the load on the car is decreased, and the car-body consequently raises, the lateral arm of lever D is depressed by gravity, maintaining its position on rod G. This causes the
55 depending arm of lever D to push on rod E' , thereby elevating the lateral arm of lever E, so that valve C may rise, whereby the air-supply to the cylinder is partially cut off, and with an empty car the air-supply to the cylinder
60 is reduced to a minimum. The engineer having applied such pressure to the brake-system as he considers necessary under the circumstances by means of my improved governor mechanism, such pressure is un-
65 equally distributed to the different cars, more force being applied to the brakes of the loaded car and less force being applied to the empty

or partially-loaded cars, so that each car has applied approximately the pressure necessary according to the load it may be carrying at
70 the time the brakes are applied. Rod E' is provided with jam-nuts e' for engaging the bell-crank lever on the one face thereof, and is provided with jam-nuts e^2 at or near the
75 end of the rod, and between these latter jam-nuts and the lever is a coil-spring e^3 , the yielding of which spring prevents the parts from being unduly strained. The bell-crank levers are not essential, and, in fact, this part of the mechanism could be varied indefinitely
80 without departing from the purpose and spirit of my invention.

A suitable valve for co-operating with the governor mechanism herein described and referred to in this specification as an "out-
85 side valve" is made the subject of application for United States Letters Patent, filed April 26, 1889, Serial No. 308,703.

What I claim is—

1. A governor for air-brakes, consisting, essentially, of a valve located in the line of
90 communication between the auxiliary air-reservoir and co-operating brake-cylinder, a spring for depressing the valve to its open position, the valve being raised to or toward
95 its closed position by means of compressed air from the reservoir admitted under the valve, and a variable stop for limiting the upward or closing movement of the valve, such stop being automatically depressed by the
100 down movement of the car-body caused by the load of the car, substantially as set forth.

2. In a governor for air-brakes, a valve located in the line of communication between
105 cylinder and co-operating air-reservoir, the valve being adapted, according to its position, to admit more or less air to the cylinder, a spring for opening the valve, the reverse or closing movement of the valve being effected
110 by compressed air admitted from the connected reservoir, and a stop for limiting the closing movement of the valve, such stop being automatically varied according to the load of the car, substantially as set forth.

3. In a governor for air-brakes, a valve located in the line of communication between
115 brake-cylinder and adjacent air-reservoir, such valve having graduated openings adapted to admit more or less air to the cylinder, according to the position of the valve, such
120 valve being closed by air-pressure and opened by the action of the spring, and a variable stop for limiting the closing movement of the valve, such stop being automatically shifted in the direction of opening the valve by means
125 of the depression of the car-body caused by the loading of the car, substantially as set forth.

4. In a governor for air-brakes, the combination, with reservoir, brake-cylinder, and valve
130 C, substantially as indicated, of connected bell-crank levers D and E, located substantially as shown and supported directly or indirectly from the body of the car, the former

lever engaging a stop connected with the car-
trucks and the latter lever constituting a
movable stop adapted to limit the closing
movement of the valve, whereby the valve is
5 held open with a maximum car-load and is
more or less closed by reducing the load, sub-
stantially as set forth.

In testimony whereof I sign this specifica-
tion, in the presence of two witnesses, this 15th
day of March, 1889.

THEODORE H. HABERKORN.

Witnesses:

JULIA M. BRIANT,
PAUL F. KUHNE.