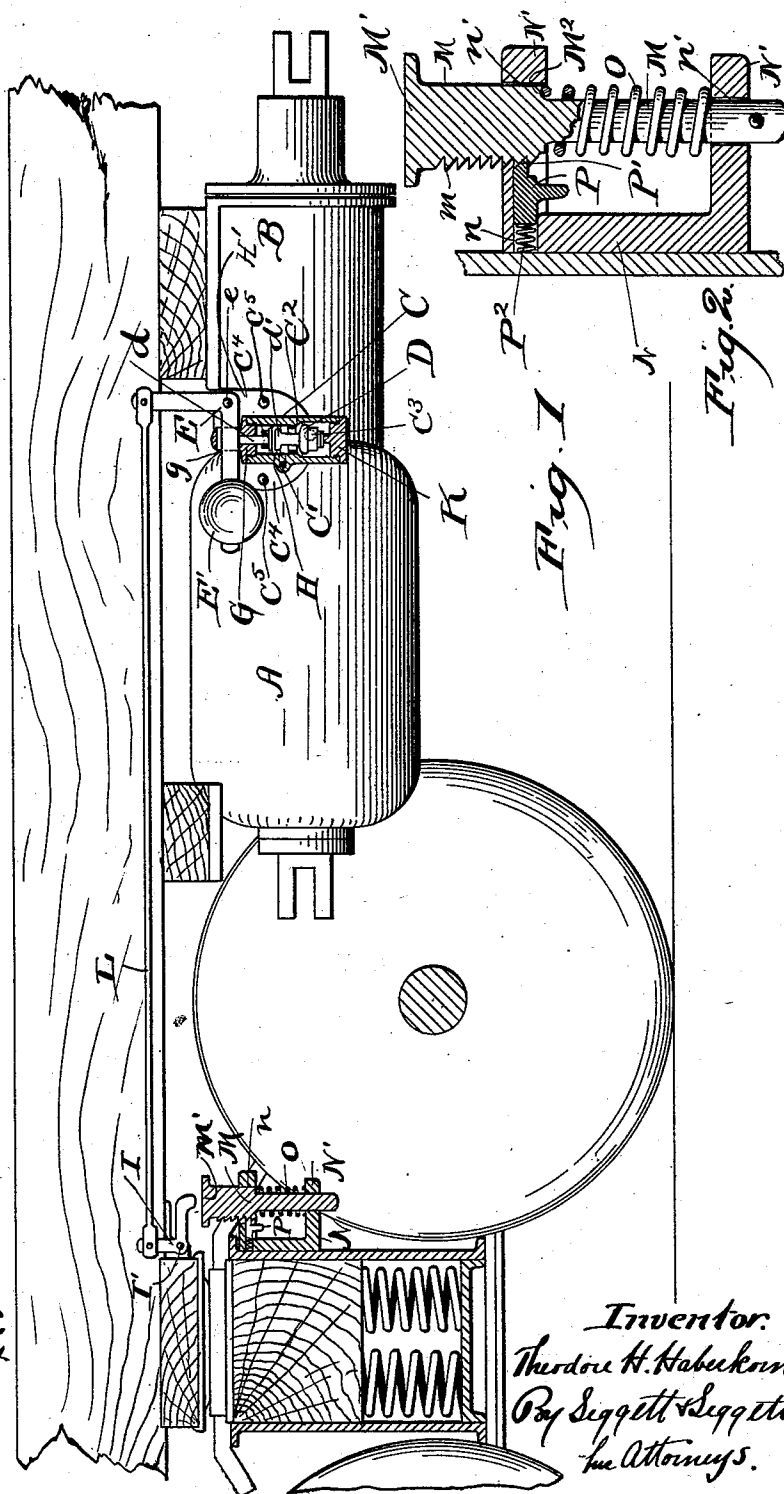


(No Model.)

T. H. HABERKORN.
GOVERNOR FOR AIR BRAKES.

No. 531,181.

Patented Dec. 18, 1894.



UNITED STATES PATENT OFFICE.

THEODORE H. HABERKORN, OF FORT WAYNE, INDIANA.

GOVERNOR FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 531,181, dated December 18, 1894.

Application filed October 9, 1893. Serial No. 487,588. (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 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 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; and it consists more especially in certain improvements of the governing mechanism disclosed in United States Letters Patent No. 413,253, granted to me October 22, 1889, and which consists, briefly described, of a governor-valve for controlling the air-pressure admitted to the brake-cylinder and automatically regulated to admit more or less air according to the load of the car.

In the accompanying drawings, Figure 1 is a side elevation of governing-mechanism embodying my invention, portions being in section to more clearly show the construction. Fig. 2 is an enlarged elevation, mostly in section, of a portion of the governor-valve regulating mechanism.

Referring to the drawings, A represents the so-called "auxiliary" air-reservoir with which each car is provided and B the brake-cylinder for operating the brakes by means of the air under pressure stored in such reservoir and admitted to the cylinder, the cylinder and reservoir being rigid or integral with each other.

The general features and operation of air-brakes are so well known that it is not considered necessary to illustrate such mechanism further than to show the action of my improved devices.

I would here remark that from the interior of reservoir A a lateral hole, duct or pipe (not shown) leads outwardly to a valve (not shown) and from such valve a return-hole, duct or port (not shown) communicates with port C' in the governor-valve-casing C, which port C' discharges into the chamber of said casing above the governor-valve seat C² and a port, duct or passage-way C³ leads from the chamber of the governor-valve casing below the governor-valve-seat to the brake-cylinder, the outside valve (not shown) hereinbefore

referred to, whatever its construction may be, being shifted to open and close communication between reservoir A and cylinder B and the air from reservoir A, in order to enter cylinder B, having to pass by the way of port or passage-ways C' C³. I would also remark 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 valves of the respective cars of a train of cars would be operated substantially alike and would set the brakes with approximately the same force on an empty and on a loaded car, and it is to remedy this difficulty that the governing-mechanism is provided.

In my previous construction, the valve-casing was located in the interior of the reservoir whereas in the present case it is provided with lateral flanges, C⁴, bolted or suitably secured, as at C⁵, to the outside of the reservoir and cylinder. My new construction, in the respect just indicated, is an improvement over the old in that it is more convenient.

D designates the governor-valve, that normally, is held in its extreme open position by means of a weighted lever, E, that is fulcrumed, as at e, for instance, to one of flanges C⁴ of the valve-casing. Lever E is of the bell-crank variety for the reason hereinafter made apparent, and the lateral and weighted arm thereof extends through a slot, g, in an externally screw-threaded plug G that engages a correspondingly-threaded hole in the upper end of the valve-casing, slot g being large enough to accommodate the operation of the lever, and E' representing the weight with which the aforesaid lever-arm is provided. The stem d of valve D extends upwardly through packing H that nicely engages the surrounding wall of the valve-chamber and is held in place upon shoulder or collar d' formed upon the valve-stem, by means of a nut H', mounted upon the valve-stem, the latter being suitably screw-threaded for receiving the nut. The valve stem extends upwardly through plug G that is suitably perforated for the purpose, and, at its upper end, the valve-stem is engaged by the aforesaid lateral or weighted arm or lever E.

K represents an externally screw-threaded plug that fits a correspondingly-threaded hole

in the lower end of the governor-valve-casing. By removing said plug access is had to the governor-valve.

The governor-valve is moved toward its closed position by means of the compressed air admitted to the valve-chamber.

The mechanism for regulating the governor-valve preferably comprises, among other things hereinafter described, and besides the weighted bell-crank-lever E already referred to, another bell-crank-lever, I, fulcrumed, as at I', to one of the car-sills or attachments of the latter and near one of the truck-bolsters. Levers E and I are arranged in the reverse positions shown and the upright arms thereof are coupled by a rod or link L. The lateral or weighted arm of lever E, as already indicated, is located directly above and serves as a variable stop to limit the upward movement of the governor-valve. The lateral arm of lever I is adapted to engage the upper end or head M' of a bar M that extends downwardly through holes, n', in lateral members N' of a bracket N that is suitably supported preferably from any member of the adjacent car-truck, or support, not affected by the truck-bolster-springs.

Bar M is preferably supported by a coil-spring, O, mounted and confined upon the bar between the lower lateral member N' of the supporting-bracket, and a shoulder M² formed upon the bar. Bar M is adjustable vertically, being provided on one side with a series of ratchet-teeth m for the purpose, the spaces or notches between said teeth being adapted to be engaged by the beveled outer end P' of a bolt, pawl or dog, P, that locks bar M as against automatic upward movement. Said locking-bolt, pawl or dog is adapted to reciprocate endwise of a hole n in the supporting-bracket, and a spring, P², confined within said hole at the inner end of the locking-bolt, pawl or dog, acts in the direction to retain said locking-device in its slot or locking position. The bevel or incline P' at the outer end of the locking-bolt, dog or pawl presenting upwardly, as shown, it follows that bar M is capable of being depressed against the action of spring O, but, as already indicated, cannot be automatically elevated, and the arrangement of parts is preferably such that in their normal position suitable for an empty car, and with the bolt, pawl or dog in engagement with the lowermost notch in bar M, as shown, the lateral arm or bell-crank-lever I shall not engage bar M, but shall be slightly separated therefrom, so that as the car is more or less loaded and the car-body consequently more or less depressed bar M shall engage the lateral arm of lever I and actuate the latter to draw endwise on connecting rod or link L, thereby tilting lever E in the direction to hold the governor-valve in its extreme open position, affording the maximum connection between the auxiliary reservoir and brake-cylinder, and by the construction hereinbefore described, bar M will automatically be adjusted to ex-

isting circumstances, that is, to the load carried by the car. As the load on the car is decreased and the car-body consequently rises, the lateral arm of lever I lowers by gravity, thereby actuating lever E to move in the direction to allow the governor-valve to rise whereby the air-supply to the cylinder is partially cut off, and with an empty car communication between the brake-cylinder and auxiliary reservoir 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 governing-mechanism of the variety indicated, such pressure is unequally 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 the time the brakes are applied.

I would have it understood that the mechanism for actuating the variable stop of the governor-valve and adapted to be operated by engagement with the automatically-adjustable stop supported by the car-truck or other member not a part of or rigid with the car-body, may be varied at pleasure without departing from the spirit and purpose of my invention.

I would also remark that the chamber of the governor-valve casing is reduced in transverse area at the valve-seat below port C', so that the air-pressure from the auxiliary reservoir and the air-pressure from the brake-cylinder co-operate in actuating the governor-valve toward its closed position, the surfaces exposed to the air-pressure of the auxiliary reservoir and presented by shoulder d' and packing H upon the valve-stem being larger in the aggregate than the area of the surface of the valve-proper that is exposed to the pressure from the auxiliary-reservoir.

What I claim is—

1. In a governor for air-brakes, a governor-valve located in the line of communication between the brake-cylinder and co-operating air-reservoir, valve-proper and valve-stem having two opposing surfaces, respectively, exposed to the air-pressure of the auxiliary reservoir, and the valve having a surface exposed to the air-pressure of the brake-cylinder, the reservoir-pressure-receiving surface with which the valve-stem is provided being larger in area than the reservoir-pressure-receiving-surface of the valve, thereby effecting a co-operation of the air-pressure of the auxiliary-reservoir and brake-cylinder to move the valve toward its closed position, suitable means for retaining the valve open, and a variable stop for limiting the closing movement of the valve, said stop being adapted to be automatically shifted in the direction of opening the valve by means of the depression of the car-body caused by the loading of the car, substantially as set forth.

2. In governing mechanism for air-brakes, the combination of a valve located in the line of communication between the air-reservoir and brake-cylinder, a lever E for actuating the valve to open, lever I operatively connected with lever E substantially as indicated, bar M depressibly supported, suitable means for locking said bar in the desired adjustment as against automatic upward movement, and means for automatically moving said bar upwardly, the arrangement of parts being substantially as shown, for the purpose specified.

3. In governing mechanism for air-brakes, the combination of a valve located in the line of communication between the air-reservoir and brake-cylinder, lever E for actuating the

valve to open, lever I operatively connected with lever E substantially as indicated, toothed or notched bar M depressibly supported, and a spring-actuated dog or bolt adapted to engage the notches or teeth of said bar and lock the latter as against moving upwardly automatically, the arrangement of parts being substantially as shown, for the purpose specified.

In testimony whereof I sign this specification, in the presence of two witnesses, this 25th day of March, 1893.

THEODORE H. HABERKORN.

Witnesses:

C. W. KUHNE.

C. H. DORER.