

(No Model.)

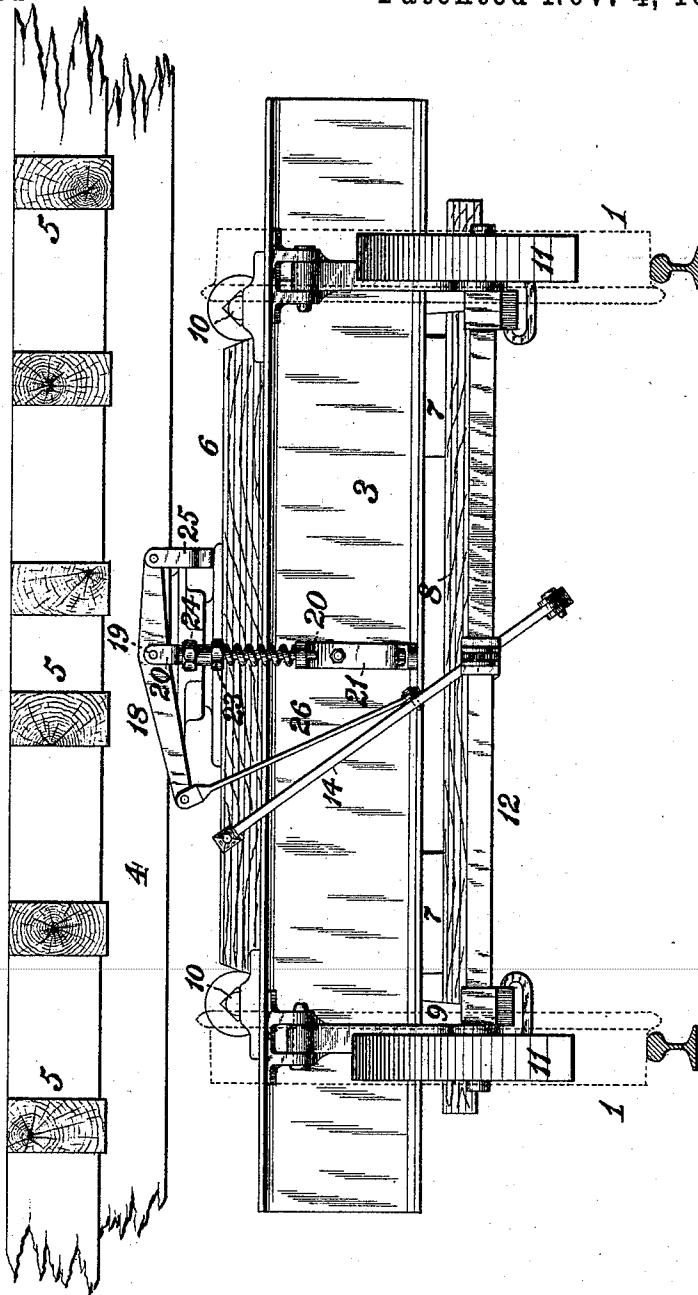
2 Sheets—Sheet 1.

G. WESTINGHOUSE, Jr.
AUTOMATIC BRAKE REGULATOR.

No. 440,082.

Patented Nov. 4, 1890.

FIG. 1.



WITNESSES:

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FIG. 2.

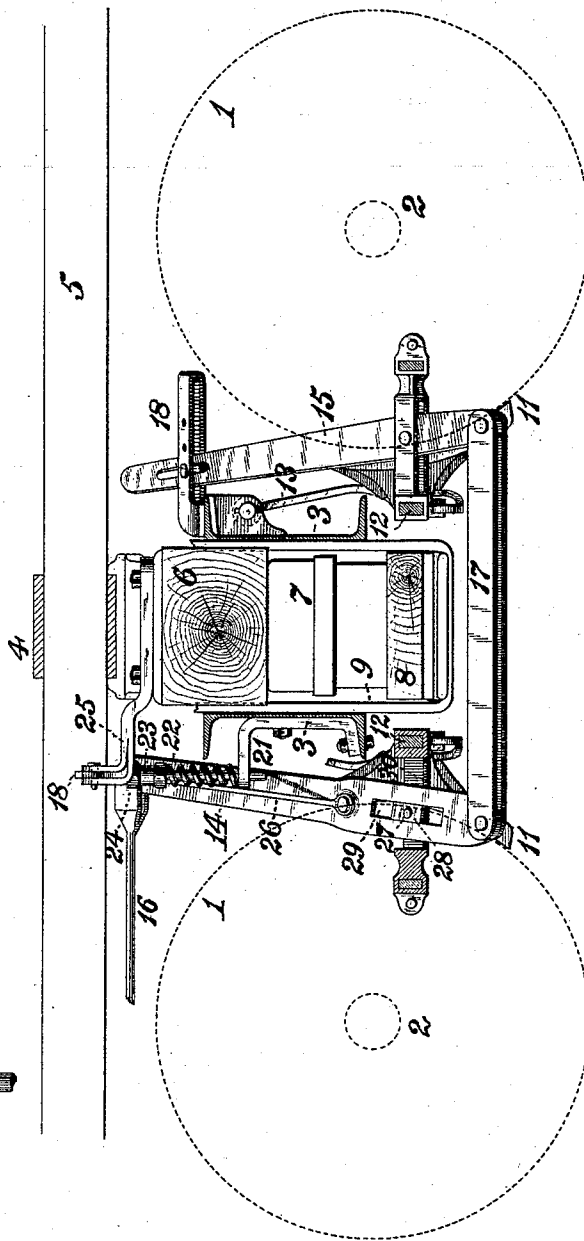
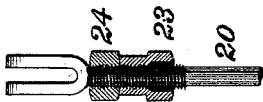


FIG. 3.



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UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

AUTOMATIC BRAKE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 440,082, dated November 4, 1890.

Application filed December 1, 1888. Serial No. 292,391. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Automatic Brake-Regulators, of which improvement the following is a specification.

My invention relates to the regulation of the degree of power exerted in effecting the application of car-brakes in accordance with and proportionately to variations in the weight imposed upon the wheels to which the brakes are applied; and its object is to provide simple and effective means for automatically varying and adjusting the leverage of a lever through which braking-power is transmitted to a car-wheel by and in correspondence with increase or diminution of the load borne by the wheel.

To this end my invention, generally stated, consists in the combination of an adjusting-lever fulcrumed upon a truck member having no substantial degree of vertical movement, and having an arm coupled to a member of the truck or car-body, which is normally subject to vertical movement by variation of load, and a brake-lever coupled to the opposite arm of the adjusting-lever and movable longitudinally relatively to a connected brake-beam. The improvement claimed is herein-after fully set forth.

It has been demonstrated by experience and is now well recognized that to attain maximum efficiency in the application of brakes to railroad-wheels the force with which they are applied should not be sufficiently great to cause the sliding of the wheels upon the rails, and, inasmuch as the power required to effect the sliding of the wheels decreases proportionately with the decrease of load thereon, and vice versa, a corresponding diminution or increase, as the case may be, of braking-power becomes necessary to maintain the effectiveness of the braking mechanism of a car, which, under the conditions of the duty for which it is designed, varies materially in gross weight from time to time by reason of difference in weight of or the entire absence of load.

In systems of continuous brakes (which are now largely in use in freight service) the application of power to the braking mechanism of the several cars of a train is uniform throughout, irrespective of their difference in load, and while in the use of hand-brakes variation in their application upon different cars, relatively to load, is not impossible it is necessarily a matter wholly dependent upon the good judgment, skill, and attention of the brakemen, and not one of determined and positive regulation.

My improvement is applicable with equal facility to continuous and to single or non-continuous brake apparatus and without involving complicated or expensive elements or accessories effects automatic variation and regulation of applied braking-power in and by the action of the variations of load by which such variation of braking-power is demanded.

In the accompanying drawings, Figure 1 is an end view in elevation of a car-truck and a partial transverse section through the frame of a car supported thereon, illustrating an application of my invention; Fig. 2, a longitudinal section through the truck; and Fig. 3, a view, partly in elevation and partly in section and on an enlarged scale, of the fulcrum-supporting pin of the adjusting-lever and the nuts thereon.

The application of my invention is herein exemplified in connection with a four-wheeled swing-truck of the ordinary construction, having wheels 1 fixed upon axles 2, rotating in suitable boxes secured in side frames, which are connected by transoms 3, under which construction the transoms are not subject to vertical movement, other than such slight degree thereof as is due to jar in passing over low joints or inequalities in the track. The car-body, of which only the body-bolster 4 and longitudinal sills 5 are shown, is, as in the usual practice, supported by a truck-bolster 6, which rests upon springs 7, supported upon a spring-plank 8, which is suspended by swing-hangers 9 upon swing-hanger pivots 10, bearing on the tops of the transoms 3. It will be seen that the truck-bolster will be varied in vertical position relatively to the transoms and other connected members of the truck-

frame, accordingly as the springs are compressed to a greater or less degree by increase or decrease of load carried by the car-body.

The brake-shoes 11, which are secured to
5 brake-beams 12, are applied to the wheels in
the braking operation by brake-levers 14 15,
actuated by a brake-rod or pull-rod 16, which
may be connected with the piston of a brake-
cylinder or with the chain of a hand-brake or
10 other suitable means for effecting the appli-
cation of braking-power. The live-lever 14
is, as in the ordinary arrangements, coupled
at its upper end to the pull-rod 16, and has
its opposite end connected by a lower brake
15 rod or bar 17 to the lower end of the dead-
lever 15, which is pivoted adjacent to its up-
per end to a stop or guide 18, secured to one
of the transoms 3.

A double-armed adjusting-lever 18 is ful-
20 crumed on the transom adjacent to the live-
lever, its fulcrum-pin 19 being, for a purpose
presently to be described, coupled to a yoke
formed on the upper end of a pin or stem 20,
which is supported by an arm or bracket 21,
25 secured to the transom. A helical spring 22
surrounds the stem 20 and bears at its ends
against the top of the bracket 21 and against
a nut 23, engaging a thread on the stem, a
lock-nut 24, engaging said thread, being also
30 provided to secure the nut 23 in any adjusted
position. The spring 22 provides a support
for the fulcrum-pin of the adjusting-lever,
which is sufficiently elastic to compensate the
jars and concussions induced in passing over
35 low joints and inequalities of track, and there-
by to maintain the fulcrum-pin in substan-
tially the same horizontal plane, or, in other
words, to render it practically exempt from
vertical movement. By means of the nut 23
40 and lock-nut 24 the fulcrum-pin 19 of the lever
18 may be varied and adjusted in verti-
cal position, as may from time to time be re-
quired. The adjusting-lever 18 is coupled at
or near one end to a bracket 25, bolted to the
45 truck-bolster 6, or to a portion of the car-body
which rests thereon, so that the bracket and
the connected end of the adjusting-lever may
be raised and lowered with the bolster and
car-body in the vertical movements of the
50 latter due to the compression and extension
of the truck-springs under increase and de-
crease of load of the car, respectively. The
opposite arm of the adjusting-lever is in turn
coupled by a rod or link 26 to the brake-lever
55 14, so that downward or upward movement
of the end of the adjusting-lever, which is
connected to the bracket 25, will, respectively,
coincidentally and proportionately raise or
lower the brake-lever, in order to effect cor-
60 responding variation of its leverage on the
brake-beam 12 and connected brake-shoes 11,
through which the braking-power exerted
upon the brake-lever is transmitted and ap-
plied to the wheels. The brake-lever and
65 brake-beam are coupled in any suitable man-
ner adapted to admit of the longitudinal

movement of the former relatively to the lat-
ter, which is required for such variation of
leverage. In this instance the pin 27, by
which the brake-lever is coupled to the brake-
70 beam, and which is fixed in an arm 30, se-
cured to the brake-beam, is pivoted in a block
or die 28, which is fitted freely in a longitudi-
nal slot or guideway 29 in the brake-lever.
As an equivalent construction the brake-lever
75 may be fitted to slide freely in the brake-beam
bracket and to bear against lateral stops or
abutments thereon. The raising and lower-
ing of the brake-lever will consequently
shorten and lengthen, respectively, its resist-
80 ance-arm—that is to say, the distance be-
tween its fulcrum-pivot on the lower brake-
rod 17 and the coupling-pivot 27 of the brake-
beam and under equal exertion of braking-
power upon the brake-lever from the pull-
85 rod 16 will cause a greater or less pressure to
be applied to the wheels in accordance with
and proportionately to the greater or less
weight which may be supported thereon.

While I have illustrated my improvement
90 as applied only to the live-lever of the brake
mechanism, it will be obvious that correspond-
ing adjustment of leverage of the dead-lever
may be correspondingly affected by the em-
ployment in connection therewith of a con-
95 struction similar or equivalent to that de-
scribed and shown.

I claim as my invention and desire to se-
cure by Letters Patent—

1. The combination, in a brake mechanism, 100
of a brake beam and shoes, a brake-lever
coupled thereto with the capacity of longi-
tudinal movement relatively to said brake
beam and shoes, and an adjusting-lever ful-
crumed upon a truck member having no sub-
105 stantial degree of vertical movement and
coupled at opposite ends to a car-body or to a
member of a truck which is normally sub-
ject to vertical movement by variation of
load, and to the brake-lever, respectively, sub-
110 stantially as set forth.

2. The combination, in a brake mechanism,
of a brake-beam and connected brake-shoes,
a brake-lever provided with a longitudinal
115 slot or guideway, a block pivoted to the
brake-beam and fitting said slot, a double-
armed adjusting-lever fulcrumed upon a truck
member having no substantial degree of ver-
tical movement, an arm or bracket which is
secured to a portion of a car-body or to a
120 truck member supporting the same and nor-
mally movable vertically therewith and is
coupled to one arm of the adjusting-lever, and
a rod or link coupling the opposite arm of
the adjusting-lever to the brake-lever, sub-
125 stantially as set forth.

3. The combination, in a brake mechanism,
of a brake beam and shoes, a brake-lever
coupled thereto with the capacity of relative
130 longitudinal movement, an adjusting-lever
coupled to the brake-lever, and a spring in-
terposed between the fulcrum of the adjust-

ing-lever and a truck member having no substantial degree of vertical movement, substantially as set forth.

4. The combination, in a brake mechanism, of a brake beam and shoes, a brake-lever coupled thereto with the capacity of relative longitudinal movement, a double-armed adjusting-lever coupled at opposite ends to a car-body or to a member of a truck which is normally subject to vertical movement by variation of load and to the brake-lever, re-

spectively, a rod or stem coupled by a fulcrum-pin to the adjusting-lever, and a spring supporting said rod or stem upon a truck member having no substantial degree of vertical movement, substantially as set forth. 15

In testimony whereof I have hereunto set my hand.

GEO. WESTINGHOUSE, JR.

Witnesses:

W. D. UPTGRAFF,

J. SNOWDEN BELL.