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VALVE FOR CAR CARRIED MECHANISM OF TRAIN STOPPING APPARATUS.
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Witnesses

By Victor J. Evans
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To all whom it may concern:

Be it known that I, GIRARD E. LABIT, a citizen of the United States, residing at Galveston, in the county of Galveston and State of Texas, have invented new and useful Improvements in Valves for Car-Carried Mechanism of Train-Stopping Apparatus, of which the following is a specification.

This invention relates to improvements in train-stopping apparatus and has particular application to the car carried mechanism.

In carrying out the present invention, it is my purpose to improve and simplify the general construction of the car carried mechanism of train stopping apparatus and to provide mechanism of the class described whereby the propelling power of the motor car will be cut off when conditions warrant.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawings: Figure 1 is a fragmentary longitudinal sectional view through a trackway and motor car thereon showing an appropriate form of track instrument and my improved car carried stopping mechanism. Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1. Fig. 3 is a vertical sectional view through a detail of the invention. Fig. 4 is a horizontal sectional view through the motor for cutting off the propelling power of the car, and Fig. 5 is a vertical sectional view through one of the controlling valves.

My invention is particularly designed for use in conjunction with the block signal system now in general use, although I wish it to be understood that the invention in its application is not limited to use with any particular type of road signal system.

Referring now to the accompanying drawings in detail, A designates the track instruments, one of such instruments being located adjacent to the entrance to each block of the trackway, preferably adjacent to the tread side of one line of rails.

The car carried mechanism comprises a motor formed, in the present instance, of a cylinder 63 in which is mounted for sliding movement a piston 64. Connected to the piston 64 and projecting outwardly of one end of the cylinder is a piston rod 65 mounted for sliding movement within a tubular guide 66 coaxial with the cylinder and formed with a longitudinal slot 67 in which works an ear 68 connected to the outer end of the piston rod 65 and depending therefrom. This motor is suspended from the roof of the cab of the engine above the cab end of the boiler and fulcrumed between its ends upon a bracket 69 on the boiler is a lever 70 having the upper end thereof pivoted to the ear 68 and the lower end pivotally connected with the outer extremity of a horizontal rod 71 passed through the boiler shell and having the inner end thereof terminating in proximity to the steam pipe and formed or bifurcated as at 72.

The engine throttle valve is indicated at 73 and comprises, in the present instance, a cylindrical casing 74 in open communication with the steam pipe and having the bottom closed and the top formed with an inwardly projecting annular flange 75 formed to provide a valve seat 76. Passed through the bottom of the casing 74 and arranged centrally of the seat 76 is a stem 77 having the lower end connected to one limb of a bell crank lever 78 fulcrummed upon a bracket 79 carried by the vertical portion of the steam pipe below the throttle valve, the other limb of the bell crank lever 78 being connected with the usual throttle rod 80. Loosely encircling the stem 77 above the seat 76 and adapted to engage the latter to shut off the flow of steam from the boiler to the engine cylinders by way of the steam pipe is a valve disk 81, while fixed to the stem above the disk 81 is a collar 82 by means of which the valve disk is moved downwardly to engage the seat 76 when the stem 77 is moved downwardly under the action of the bell crank lever 78 and the throttle rod 80, the latter being operated from the usual hand lever under the control of the engineer. Loosely surrounding the stem 77 is a relatively short sleeve 83 having the upper end abutting the under surface of the disk 81 and the lower end engaged by one extremity of a coiled expansion spring 84 surrounding the lower portion of the stem 77 and having the lower end thereof engaging a shoulder formed at the junction of the stem with the pivotal connection between such stem and the bell crank lever 78, such spring and sleeve acting in conjunction with the collar 82 to maintain the valve disk 81 normally against sliding movement along the stem 77. Encircling the upper end of
the valve stem and the collar 82 is a ring 85 and connected to the ring 85 at diametri-
cally opposite points and depending there-
from are links 86, 86 connected to bell crank
7 levers 87, 87, each bell crank lever 87 com-
prising a short horizontal limb 88 pivoted
as at 89 to the casing 74 and a relatively long
vertical limb 90, the lower extremities of the
vertical limbs 90 being connected with the
free extremities of the limbs of the bifurcated
end 72 of the rod 71. By means of this con-
struction, it will be seen that when fluid is
admitted to the cylinder 63 the piston 64 will
slide therein and so transmit motion to the
piston rod 65 whereby the lever 70 will be
swung about its pivotal connection with the
bracelet 69. In the swinging movement of
the lever 70, the rod 71 is moved inwardly
of the boiler whereby the bell crank levers 87,
87 are swung about their pivotal connec-
tions with the throttle valve casing 74 so
that a downward pull is exerted upon the
links 86 and the ring 85 thereby sliding the
valve disk 81 along the stem 77 against the
action of the spring 84 and into engagement
with the valve seat 76. Thus, the flow of
steam from the boiler to the drive cylinders
of the engine is cut off. On the other hand,
when it is desired to manipulate the throttle
valve manually the engineer’s throttle lever
is swung about its fulcrum so that sliding
motion is imparted to the throttle rod 80 and
the latter through the medium of the bell
crank lever 78 and the stem 77 moves the
valve disk 81 to open or closed position ac-
cording to the swinging movement of the
throttle lever, the spring 84 and the sleeve 88
cooperating with the collar 82 to form, in
effect, a fixed connection between the valve
disk 81 and the stem 77. From this con-
struction, it will be seen that the connection
between the motor and the throttle valve
is entirely independent of the connection be-
tween the manually operable lever and the
valve so that the valve may be operated
under usual conditions by the engineer with-
out affecting the motor.

The brake pipe of the car or train is in-
dicated at 91.

Disposed at opposite sides of the longi-
tudinal center line of the engine and de-
pending therefrom are valves 92, 92, each
comprising a cylindrical casing 93 of any
suitable construction and formed interiorly
adjacent to the upper end thereof with a
valve seat 94 and at a point below the valve
seat with a web or spider 95. Arranged
within the casing 93 is a valve stem 96 ca-
pable of sliding movement within the solder
95 and provided at its upper end with a
valve disk 97 designed to engage the seat 94.
Pivotedly connected to the lower end of the
casing 93 at diametrically opposite points
are the upper extremities of the limbs of a
yoke 98 normally lying in a vertical plane
and having the interconnecting member
thereof disposed in the path of movement
of the stem 96 and engaging the lower end
of such stem to support the latter and hold
the valve disk 97 against the seat 94. De-
pending from the interconnecting member
of the yoke 98 is a rod 99. Leading into the
upper end of the casing 93 is a pipe 100
tapped into the brake pipe 91, while leading
out of the casings 93 below the valve seats
94 therein are branch pipes 101, 101 connected,
in the present instance, by means of a T-
coupling 102 with the lower end of a fluid
conducting pipe 103 connected with one end
of the cylinder 63 of the motor and located
in the pipe 103 is a check valve 104 designed
to prevent back flow from the cylinder to
the brake pipe. Pivoted to each casing 93
is a horizontal lever 105 having the inner
end thereof connected with the valve stem
96 and the outer end pivotally secured to
the lower extremity of a vertical rod 106
provided with a foot plate 107 arranged
within the cab within convenient reach of
the foot of the engineer or motorman. Sur-
rounding each valve stem 96 is a coiled ex-
pansion spring 108 having one end abutting
the spider 95 on the lower end in engage-
ment with the adjacent extremity of the
lever 105.

In practice when a track instrument A is
set in active position and a train enters the
danger zone against the danger signal,
the lower end of the rod 99 at the respective
side of the engine rides upon the inclined
surface of the obstacle, thereby swinging the
yoke 98 out of the path of movement of the
valve stem 96 so that the valve disk 97 will be
moved to open position under the action of
the spring 108. Upon the opening of the
valve the air from the brake pipe flows into
the respective end of the cylinder 63 and
actuates the piston 64 therein to close the
throttle valve as previously described.
Should the engineer desire to regain control
of the train or motor car, the respective foot
plate 107 is depressed thereby swinging the
lever 105 about its pivotal connection with
the valve casing 93 whereby the valve disk
is restored to closed position against the
action of the spring 108, the yoke 98 drop-
ning to normal position upon the upward
movement of the stem 96.

In order that the pressure behind the pis-
ton 64 may be released succeeding the clos-
ing of the previously opened valve 92, a
pipe 109 is connected to the end of the cylin-
der with the pipe 103 and located in the
pipe 109 is a duplex valve 110 comprising,
in the present instance, a valve casing 111
having a straight of way passage 112 commu-
nicating with the pipe 109 and a similar
passage 113 arranged at right angles to the
first-mentioned passage and to one side
thereof. This casing is formed with a bore
114.
intersecting the passages 112 and 113 and rotatably mounted within the bore is a turn plug 114 provided with a port 115 adapted to open the passage 112 and with a port 116 designed to open the passage 113, one end of the plug being provided with an operating handle 117. Connected to one end of the passage 113 is an audible signal as a whistle 118, while connected to the opposite end of such passage is a fluid conducting pipe 119 tapped into the main air reservoir of the air brake system or other source of fluid supply. In the normal condition of the valve 110, the plug 114 is in the position shown in Fig. 3 so that communication between the rear end of the cylinder and the atmosphere, by way of the pipe 109, is cut off and communication between the whistle 118 and the source of fluid supply cut off.

On the other hand, when the valve plug is rotated through one-half a revolution, the port 115 opens the passage 112, while the port 116 opens the passage 113 thereby permitting the air to flow from the cylinder to the atmosphere by way of the pipe 109 and the fluid from the source of supply to pass through the whistle 118 and so sound the latter. As long as the valve 110 is in this position the whistle sounds thereby advising the engineer that the fluid end of the cylinder of the motor is in communication with the atmosphere so that such engineer may restore the valve 110 to normal position and so put the car carrying stopping mechanism in condition for further operation.

Upon the release of the pressure from the fluid side of the cylinder 63 the throttle valve moves to open position under the action of the spring 84, while the piston within said cylinder is restored to normal.

An outwardly opening pressure operated valve 120 is connected to each valve casing 93 below the valve seat 94 at a point diametrically opposite the branch pipes 101 and opens under the pressure of the air from the train line air pipe or brake pipe immediately succeeding the piston within the cylinder 63 completing its movement to close the throttle valve, whereby the pressure in the brake pipe is reduced to cause an application of the brakes.

In order to maintain the throttle valve in closed position succeeding the movement of the piston within the cylinder 63 so as to prevent opening of the valve in the event of the air behind the piston within the cylinder 63 escaping, I employ an automatic catch 121. In the present instance, this catch embodies a pair of horizontal spring arms 122, 123 spaced apart in parallelism and each having one end thereof fastened to a block 124 depending from the outer end of the guide tube 66, while the confronting faces of the spring arms adjacent to the free ends thereof are equipped with cooperating dogs having the adjacent faces inclined to form an entrance mouth. By means of this construction, it will be seen that when the lug 68 moves outwardly under the action of the piston within the cylinder 63, such lug will ride into the space between the arms 122, 123 by way of the entrance mouth formed by the adjacent faces of the dogs 124, the dogs springing back into place, succeeding the passing of the lug 68 into the arms, whereby accidental movement of the piston within the cylinder 63 to normal position is prevented. Mounted upon a pin disposed between the arms 122 is an oblong button 125 adapted to be rotated by the engineer or motorman of the engine or car to swing the arms 122, 123 outwardly when it is desired to relieve the lug 68 of the influence of the dogs 124.

While I have herein shown and described one preferred form of my invention by way of illustration, I wish to be understood that I do not limit or confine myself to the precise details of construction herein described and delineated, as modification and variation may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. In train stopping apparatus, a throttle valve comprising a casing having a valve seat formed therein, a valve disk movable into and out of engagement with said seat, a stem passed through said seat centrally thereof and through said valve disk, a collar on the upper end of said stem, a spring encircling the stem and holding said disk normally in engagement with the collar whereby the disk will move with the stem, means for reciprocating said stem to move the disk into and out of engagement with the seat, and means for sliding said disk along said stem against the action of said spring to engage the disk with the seat independently of said stem.

2. In train stopping apparatus, a throttle valve comprising a casing having a valve seat formed therein, a valve disk movable into and out of engagement with said seat, a stem passed through said seat centrally thereof and through said valve disk, a collar on the upper end of said stem, a spring encircling the stem and holding said disk normally in engagement with the collar whereby the disk will move with the stem, means for reciprocating said stem to move the disk into and out of engagement with the seat, a ring encircling said stem and bearing upon the same face of said disk as said collar, and means for actuating said ring to slide said disk along said stem into engagement with said seat independently of the movement of said stem.

3. In train stopping apparatus, a throttle valve comprising a casing having a valve
seat formed therein, a valve disk movable into and out of engagement with said seat, a stem passed through said seat centrally thereof and through said valve disk, a collar on the upper end of said stem, a spring encircling the stem and holding said disk normally in engagement with the collar whereby the disk will move with the stem, manually operable means for reciprocating said stem to move the disk into and out of engagement with the seat, and a motor for sliding said disk along said stem against the action of said spring to engage the disk with the seat independently of said stem.

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

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