(No Model.)

C. HOLTMANN & N. SCHMIDT.

DEVICE FOR PREVENTING RAILROAD COLLISIONS.

No. 522,757. Patented July 10, 1894.

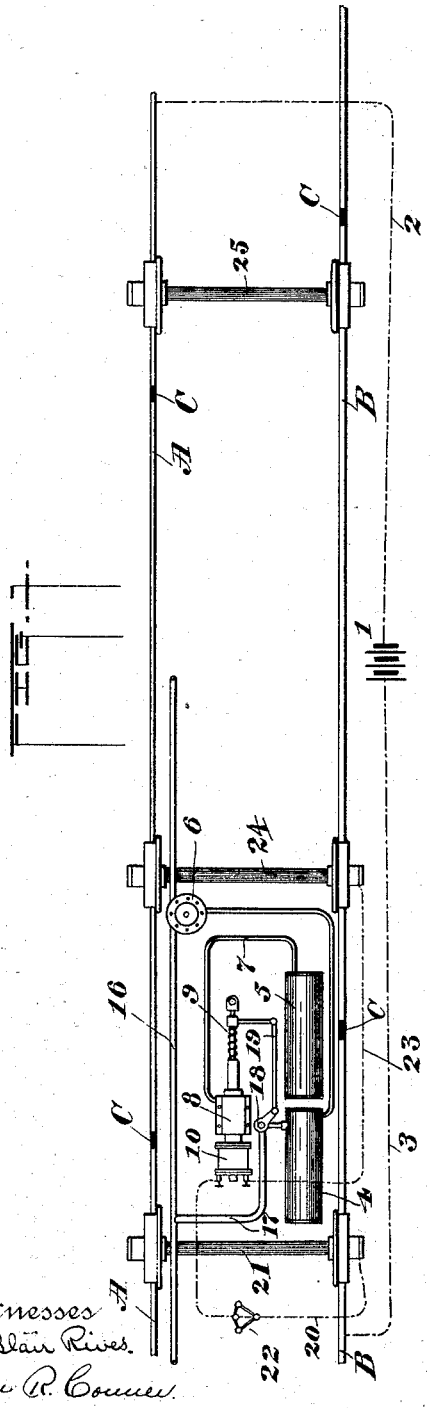

FIG. 1.

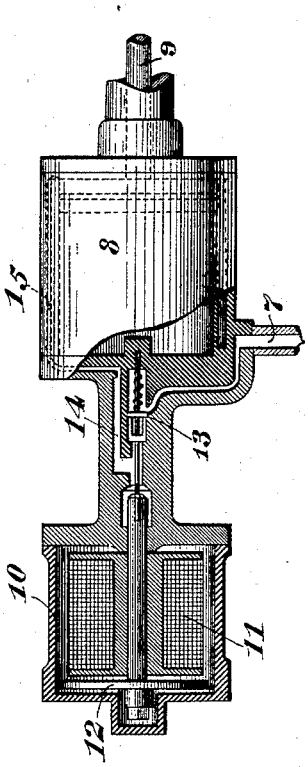

FIG. 2.

Witnesses
Frank Blair Rives.
Edwin R. Conner.

Charles Holtmann and
Nickolaus Schmidt
Inventors
by J. H. Stevenson,
Attorney

UNITED STATES PATENT OFFICE.

CHARLES HOLTMANN AND NICKOLAUS SCHMIDT, OF PITTSBURG, PENNSYLVANIA.

DEVICE FOR PREVENTING RAILROAD COLLISIONS.

SPECIFICATION forming part of Letters Patent No. 522,757, dated July 10, 1894.

Application filed November 14, 1893. Serial No. 490,956. (No model.)

To all whom it may concern:

Be it known that we, CHARLES HOLTMANN and NICKOLAUS SCHMIDT, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Preventing Railroad Collisions; and we 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, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to an improved automatic device for operating air brakes to prevent collisions on railways and it consists in a track battery for each "block" and an instrument or apparatus in connection with the ordinary air brake which will set the said brakes should any two trains enter one block at the same time, together with certain details of construction and combination of parts as will be fully described hereinafter.

In the accompanying drawings Figure 1 is a diagrammatic plan view of our improved apparatus for setting the brakes showing the same connected and arranged with the main pipe of the air brake system. Fig. 2 is an enlarged sectional elevation of the magnetic instrument, and means for admitting the air thereto when a circuit has been completed to the track battery.

To construct and operate our invention the track is divided into "blocks" and the rails A B at the terminus of each of the said blocks insulated as at *c c*, care being taken to not arrange the said insulation of one rail directly opposite to the other. Each of these blocks is provided with a battery, 1, the one pole being connected by a suitable conductor 2 to the rail A of one block, and the other pole by a wire 3 to the rail B of the adjoining block.

In connection with the ordinary air brake apparatus now in common use we arrange at a suitable position beneath the engine, an apparatus consisting of two pressure reservoirs 4 and 5, and fit the same with air pipes and pumps 6, capable of maintaining a pressure of about eighty (80) pounds in the one 5 and about one hundred and twenty five (125) pounds in the other 4. Connected to one of these reservoirs, 5 by means of a pipe 7 is a cylinder 8 in which a piston is made to operate a rod 9. Formed integral with this cylinder 8 is a casing 10 in which a magnet, 11 is placed. This magnet operates an armature 12 which moves the valve 13 and admits air through an opening 14 to a port, 15, leading to the rear of the piston. This valve 13 is recovered by means of a spiral spring arranged about the stem of the same.

Connected to the main air pipe 16 of the air brake apparatus is a pipe 17 which leads to the reservoir 4 and the said pipe 17 fitted with a valve 18. This valve 18 is connected to the piston rod 9 and is operated to open and close the valve by the movement of the said piston rod. The magnet 11 is connected by a wire 20 to the box of one of the axles 21 and a switch 22 arranged at a convenient point within reach of the engineer. The extremity of this magnet 11 is connected by a wire 23 to an axle box of one of the other axles 24 of the truck.

In operation, should another train enter a block already occupied, the air brakes will instantly be set to stop both trains. When the front axle of the approaching train is in position shown in Fig. 1, the circuit will be completed, commencing at the battery 1 through the wire 3 to the rail B, thence through the wheel to the wire 20, through the same to and about the magnet 11, through the conductor 23 and rail B to axle 25, to rail A, thence by the wire 2 to the other pole of the battery. When this circuit has been completed the armature 12 is attracted by the magnet 11 thereby moving the valve 13 and permitting the air from the tank 5 to enter the cylinder through the port 15 to move the piston and rod 9. This movement of the piston opens the valve 18 and permits the air from the tank 4 to enter the main pipe 16 and operates or sets the brakes on the entire train, thereby stopping the same and giving the engineer warning and notice that there is danger of proceeding farther, but to be cautious.

It will be seen that when trains are thus equipped collisions will be quite impossible, as the two trains cannot occupy the one block

at the same time without their brakes being set automatically as aforesaid, until the switch 22 is operated to break the circuit and the train not having the right of the block leaves the same. When the circuit has been broken the armature is recovered by the spiral spring in front of the valve 13, and the brakes are released in the ordinary manner.

It is obvious that this apparatus may be used to automatically operate the engineer's brake valve to set the brake or the same may be used to shut off the steam from the cylinders to stop the engine; or it may be applied to sound the whistle of the engine to give an alarm without departing from the spirit of our invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for automatically controlling the brakes of a railway train, the combination with suitable air brake apparatus, of two auxiliary pressure reservoirs, a cylinder connected with one of said reservoirs, a valve connected with the armature of an electro magnet and adapted to open or close the connection between said cylinder and pressure reservoir, the poles of said magnet being connected with conductors of an electric circuit adapted to be completed through the rails of the track and the axles and wheels of a truck on one of the cars of the train, a piston fitted within the cylinder, a pipe connecting the other pressure reservoir with the main pipe of the brake apparatus, and connections between the stem of the piston in the cylinder and a valve in said pipe, substantially as shown and described, for the purpose specified.

2. In an apparatus for automatically controlling the brakes of a railway train, the combination with suitable air brake apparatus, of two auxiliary pressure reservoirs, a cylinder connected with one of said reservoirs, a valve connected with the armature of an electro magnet and adapted to open or close the connection between said cylinder and pressure reservoir, the poles of said magnet being connected with conductors forming part of an electric circuit adapted to be completed through the rails of the track and the axles and wheels of a truck on one of the cars of the train, a piston fitted within the cylinder and having its stem projecting beyond one end thereof, a coiled spring arranged around said stem beyond the cylinder and bearing against the end thereof, a valved pipe connecting the other pressure reservoir with the main pipe of the brake apparatus, and a rod connecting the valve in said pipe with the stem of the piston in rear of the cylinder, substantially as shown and described, for the purpose specified.

In testimony that we claim the foregoing we hereunto affix our signatures this 23d day of October, A. D. 1893.

CHARLES HOLTMANN. [L. S.]
NICKOLAUS SCHMIDT. [L. S.]

In presence of—
JAS. J. MCAFEE,
WM. EVANS.