

A. O. JOHNSON.
 TRAIN STOPPING APPARATUS.
 APPLICATION FILED APR. 4, 1913.

1,092,718.

Patented Apr. 7, 1914.

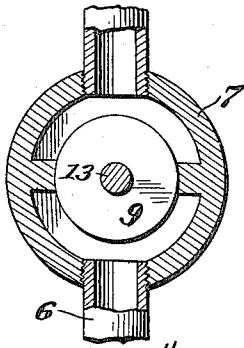


Fig. 1.

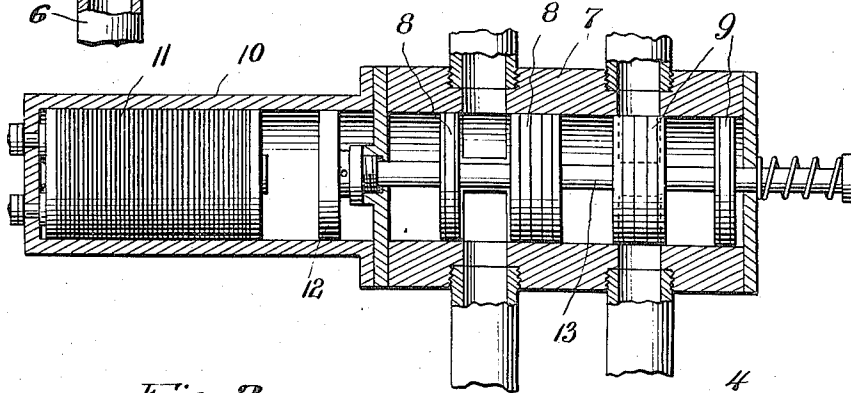


Fig. 3.

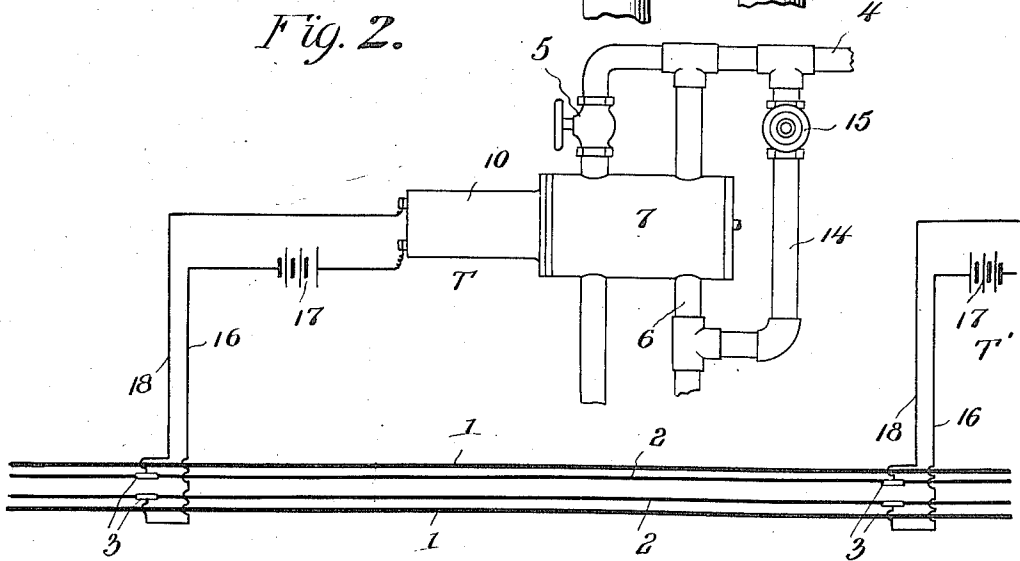


Fig. 2.

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TRAIN-STOPPING APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARNOLD O. JOHNSON, a citizen of the United States, residing at Elnora, in the county of Daviess and State of Indiana, have invented new and useful Improvements in Train- Stopping Apparatus, of which the following is a specification.

This invention relates to improvements in train stopping apparatus and has particular application to an automatic apparatus of this character.

In carrying out the present invention, it is my purpose to provide an apparatus of the type set forth whereby when two trains are approaching head on and in dangerous proximity to each other the supply of steam to the engine cylinders will be cut off and the brakes applied so as to bring such trains to an immediate stop.

Furthermore, I aim to provide an apparatus of the class described which will embrace the desired features of simplicity, efficiency and durability and which may be installed and maintained at a minimum cost.

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 cross sectional view through the controlling valve. Fig. 2 is a diagrammatic view. Fig. 3 is an enlarged longitudinal sectional view through the controlling valve and operating means therefor.

Referring now to the accompanying drawings in detail, the numerals 1, 1 indicate parallel lines of rails forming the trackway. Located between the lines of rails 1, 1 are conductors 2, 2 spaced apart in parallelism and extending throughout the entire length of the trackway, while suitably secured to the under side of the locomotive or other car operating over the trackway and depending therefrom are contact rollers 3, 3 bearing upon the conductors 2, 2 and designed to traverse the same in the travel of the engine.

The steam main of the locomotive leading from the steam dome of the boiler to the drive cylinders is indicated at 4 and at an appropriate point in its length is provided with a throttle valve 5 by means of which the flow of steam from the boiler to the engine cylinders may be controlled and regulated. In the present instance, the brakes of the engine, or train as the case may be, are

operated by steam pressure and for this purpose a brake pipe 6 is tapped onto the steam main and leads to the brake cylinders so that when communication is established between the brake pipe and the steam main the brakes will be applied.

Located in each engine operating over the line and common to the steam main and fluid brake pipe is a cylinder 7 connected in the steam main and brake pipe 6, while slidably disposed within the cylinder is a valve controlling the flow of steam through the steam main and the passage of the fluid through the brake pipe. This controlling valve comprises a pair of disks 8, 8 suitably spaced apart and normally lying at the opposite sides of the path of the steam through the cylinders, and a pair of disks 9, 9 suitably spaced apart from each other and from the disks 8, 8 and controlling the flow of fluid to the brake cylinders. In the normal position of the controlling valve the innermost disk 9 obstructs the flow of fluid through the brake pipe, while the disks 8, 8 are disposed at the opposite sides of the path of the steam through the cylinder so that under normal conditions, the brake system will be inactive and the engineer enabled to control the flow of steam to the engine cylinders by means of the throttle valve 5. Also suitably mounted with each locomotive in axial alinement with the cylinder 7 is a cylindrical casing 10 housing an electromagnet 11 and having slidably mounted therein an armature 12 disposed within the influence of the magnet and connected to one extremity of a stem 13 interconnecting the disks 8, 8 and 9, 9 of the controlling valve so that such disks will move simultaneously. A by-pass 14 is established between the steam main and the fluid brake pipe around the controlling valve and such by-pass is equipped with an engineer's brake valve 15 so that the engineer may have manual control of the brakes as usual. Connected to one terminal of the winding of the electromagnet 11 is a conductor 16 including in series a suitable source of electrical energy such, for instance, as a battery 17 and having the free end thereof tapped onto one of the contact rollers 3, while to the free terminal of the winding of the electromagnet 11 is connected a conductor 18 having the free end thereof electrically connected to the remaining contact roller 3.

In the form of my invention selected for illustrative purposes, the automatic train

stopping apparatus on each train is adapted to operate when two trains are approaching each other head on and when such trains are within dangerous proximity to each other, the danger zone of the approaching trains being determined by the strength of the batteries 17 thereon. In order that the apparatus of approaching trains will operate, the batteries 17 on following trains have like poles connected to the conductors 2, 2, while the batteries on approaching trains present unlike poles to the conductors so that such batteries will be connected in series when the trains are within the danger zone. To insure the proper connections between the batteries and the conductors 2, 2 pole changers may be employed if desired.

Assuming two trains as T and T' approaching each other, as illustrated in Fig. 3 and within the danger zone, it will be seen that the batteries 17, 17 of such trains will be connected in series so that the magnet 11 on such engine cab will be energized with the effect to attract the armature 12 and so slide the disks of the controlling valve out of normal position, one of the disks 8, 8 obstructing the flow of steam to the steam main, while the respective disk of the set 9 is withdrawn from the path of the fluid through the brake pipe so that such fluid may flow into the brake cylinders and effect an application of the brakes to the wheels. Thus, it will be seen that the approaching trains will be brought to an immediate stop.

It will be seen that in the normal position of the controlling valve, the disks 8, 8 being, at the opposite sides of the path of the steam have the confronting faces thereof in contact with the steam thereby balancing the valve so that when the magnet is energized, the pressure of the steam will not have to be overcome, while when the valve is out of normal position, one of the disks 8 will obstruct the flow of steam from the steam dome of the boiler to the engine cylinders, while the valves 9, 9 will be disposed at the opposite sides of the path of the brake fluid through the cylinder 7 thereby balancing the valve so that the latter may be easily restored to normal position when conditions warrant.

From the foregoing description taken in connection with the accompanying drawings, the construction, mode of operation and manner of employing my invention will be readily apparent.

While I have herein shown and described one preferred form of my invention by way

of illustration, I desire to have it 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 and without departing from the spirit of the invention.

I claim:

1. In train stopping apparatus, the combination with a locomotive steam main and fluid brake pipe, of a cylinder common to both of said pipes and in communication therewith, a valve slidably disposed within said cylinder and comprising a pair of disks one of which normally obstructs the flow of fluid through the brake pipe, while the other is adapted to act as a balancing disk, and a second pair of disks, the members of said second pair being normally disposed at opposite sides of the path of steam through the cylinder and acting to balance the valve, a stem interconnecting said disks for simultaneous movement, an armature on said stem, a cylindrical casing connected to said cylinder at one end thereof and surrounding said armature, a magnet in said casing and controlling said armature, an electric circuit including said magnet and designed when closed to energize the magnet whereby the disks will be moved out of normal position to shut off the flow of steam through the steam main and permit the flow of fluid through the brake pipe.

2. In train stopping apparatus, the combination with the locomotive steam main and fluid brake pipe, of a cylinder common to both of said pipes and in communication therewith, a valve slidably disposed within said cylinder and comprising a pair of disks one of which normally obstructs the flow of fluid through the brake pipe, while the other is adapted to act as a balancing disk, and a second pair of disks, the members of said second pair being normally disposed at opposite sides of the path of the steam through the cylinder and acting to balance the valve, and means for actuating said valve whereby the disks will be moved out of normal position to shut off the flow of steam through the steam main and permit the flow of fluid through the brake pipe.

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

ARNOLD O. JOHNSON.

Witnesses:

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