

J. H. FITZGERALD.
RAILWAY SIGNAL.

APPLICATION FILED FEB. 10, 1909. RENEWED JUNE 5, 1911,

1,049,351.

Patented Jan. 7, 1913.

3 SHEETS—SHEET 1.

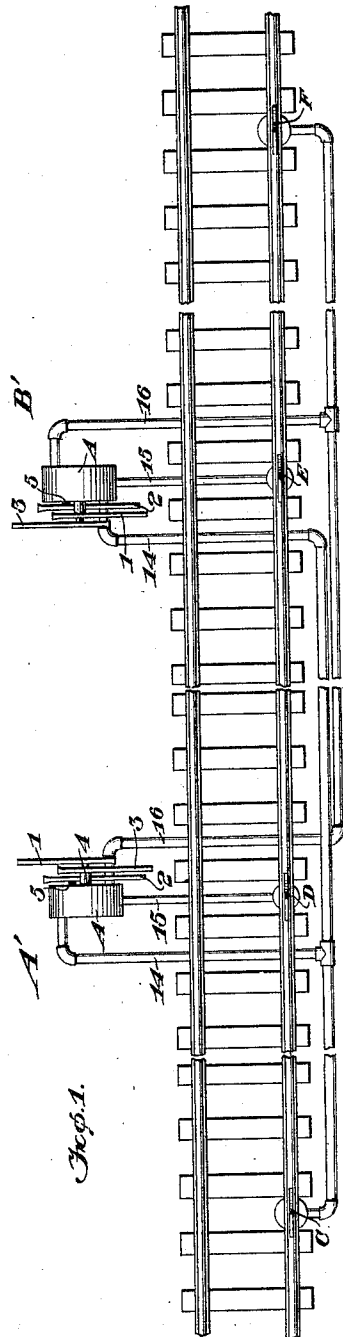


Fig. 1.

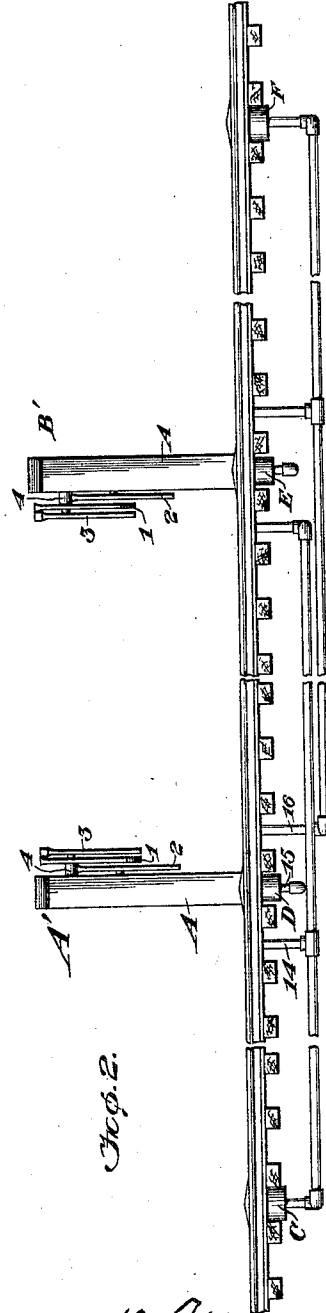


Fig. 2.

Witnesses
Lloyd W. Patch

Walter F. Estabrook

Inventor
James H. Fitzgerald
By *Samuel E. Hodges*
His Attorney

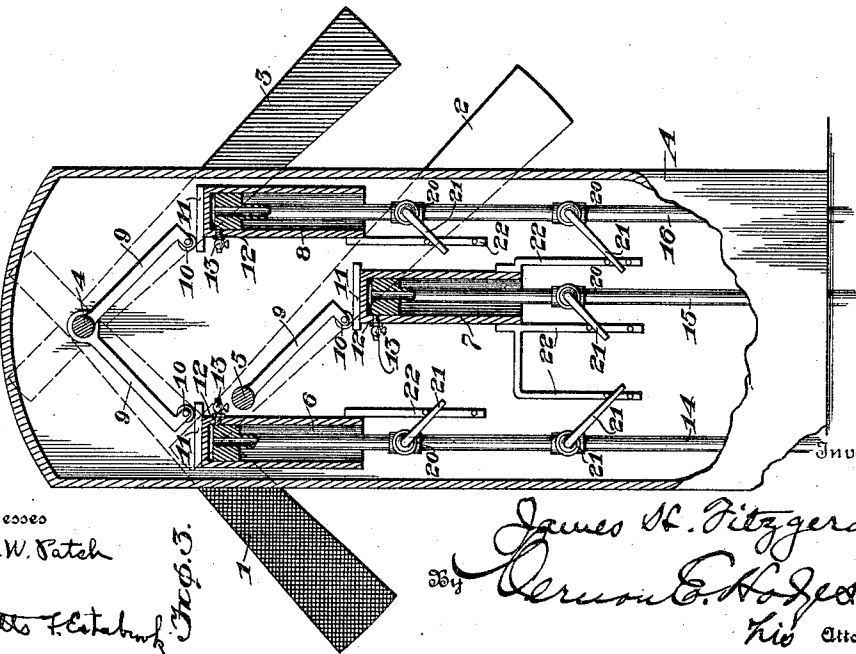
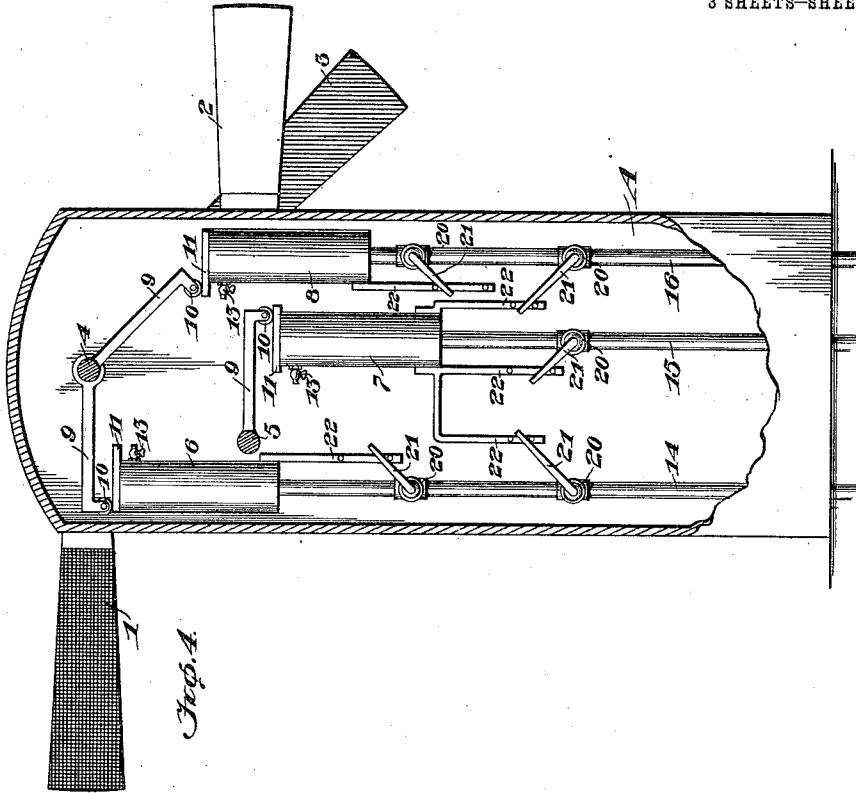
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Fig. 3.

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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JAMES HENRY FITZGERALD, OF DANVILLE, VIRGINIA.

RAILWAY-SIGNAL.

1,049,351.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed February 10, 1909, Serial No. 477,165. Renewed June 5, 1911. Serial No. 631,445.

To all whom it may concern:

Be it known that I, JAMES H. FITZGERALD, a citizen of the United States, residing at Danville, in the county of Pittsylvania and State of Virginia, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to an improvement in railway signals, and has for its object to prevent head-on or tail-end collisions by signaling sufficiently far in advance to preclude the possibility of such collisions.

With these objects in view, this invention consists in certain pneumatic means and other mechanism which will be hereinafter described and pointed out in the claims.

In the accompanying drawings:—Figure 1 is a plan view illustrating a section of track with signals applied, Fig. 2 is a view in side elevation, Figs. 3, 4, and 5 are views of the signal mechanism partly in section showing the different positions taken by the signals, Fig. 6 is a view of one of the compressors, Figs. 7 and 8 are sectional views of one of the valves, the former showing it closed, and the latter, open.

A, represents the housing of the signal stand, and 1, 2, and 3 are the ordinary signal blades or paddles, 1 and 3, being preferably concentrically mounted on the shaft 4, whereas 2 is mounted on the shaft 5. These blades or paddles are all operated by pneumatic cylinders 6, 7, and 8, respectively, all of which are substantially similar in construction, the blades being raised through the medium of arms 9, 9, secured to the shafts 4 and 5, and each having anti-friction rollers 10 thereon adapted to be engaged by a track 11 on the head of the cylinder. Each cylinder is provided with a vent 12, the size of which is capable of being regulated by a valve 13.

Pipes 14, 15 and 16, lead respectively to cylinders 6, 7, and 8, discharging beneath the heads thereof, whereby when air is forced through said pipes and discharged beneath the heads of the cylinders, the cylinders are made to rise and carry with them a blade or paddle. In these pipes 14, 15 and 16, are one or more valves 20 as shown in Figs. 7 and 8, the pipes 14 and 16 each having two of these valves, and the pipe 15 only one. This valve 20 is shown in its normal closed position in Fig. 7, and open in Fig. 8, which latter is the position of

all of the valves as shown in Fig. 3, namely open. These valves are controlled by arms 21, 21, projecting therefrom, and the bars 22, 22, secured to the cylinders as illustrated in Figs. 3, 4, and 5.

A form of compressor C is shown in Fig. 6, similar to the compressors illustrated and fully described in my pending application, Serial No. 431,503, filed May 7, 1908. This is a type of the several compressors shown in Figs. 1 and 2, of which there are four, designated C, D, E, and F.

In the operation of my improved signal, a train for instance, entering from the left or west, we will say, operates the compressor C, forcing air through pipe 14, and its branches, to the two signal stands A', B', the valves in the pipe being normally open, air discharges beneath the head of the cylinder 6, and the blade or paddle 1 is raised in each signal stand simultaneously, showing black to the rear and red to the front, or toward the east, which is a warning from signal stands A' and B' to a train coming in the opposite direction. As soon as the locomotive strikes the compressor D, the cylinder 7 is operated, raising the white blade or paddle 2, if it has not already been raised by a preceding train. If raised by the on-coming train, it indicates to the engineer that the outstanding signal blade 1 was raised by his locomotive, and that in consequence the track is clear ahead. But if white paddle 2 was already raised, when arriving at the signal, it would indicate that the white paddle 2 had been raised by a train ahead, which would be a warning to him against traveling farther. Supposing the track to be clear ahead, the train continues on its course, the signal blades gradually lowering back to normal position within a fixed time, and the valves again opening, and when the compressor E is operated, it raises the white blade or paddle 2 in the signal stand B', thus indicating to a following train a closed block ahead. As the train passes, compressors D and E, and the central cylinder 7 are raised successively, the outer depending bars 22 of this central cylinder has the effect of closing the lower valves 20, in pipes 14 and 16, and the consequence is when a train leaves the block and strikes compressor F, which would otherwise operate the signals, the closing of the valve 20, on the contrary, leaves the vent open as shown in Fig. 7, which permits air coming into pipe 16 to escape without

operating the signals. A train coming from the opposite direction, or from the east, operates the signals in precisely the same way. But suppose a condition where two trains are entering at substantially the same time from opposite directions. The third cylinder 8 is provided for this purpose, and the second train coming from the right or east, on operating compressor F forces air through pipe and branch pipes 16, into the two signal stands, raising the cylinder 8, and the blade or paddle 3, thus showing black toward the east, and red toward the west, thereby indicating the condition of the track to both engineers and avoiding a head-on collision. In this way, a comparatively simple mechanism is provided which will absolutely preclude the possibility of accident, so long as the parts operate as indicated.

It is evident that more or less slight changes might be resorted to in the form and arrangement of the several parts described without departure from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth, but:—

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a signal stand having a pivotally mounted signal blade or paddle, of a cylinder adapted to actuate the blade or paddle, a pipe leading thereto, a valve in the pipe normally open, means carried by the cylinder for automatically closing the valve when the cylinder is raised, and a compressor for forcing air into the pipe.

2. In pneumatic railway signals, the combination with a signal stand, two cylinders therein, compressors and pipes leading from the compressors to the two cylinders, of valves in said pipes, each cylinder controlling a valve in its own pipe and one cylinder controlling a valve in the other pipe as well as its own pipe, whereby under certain conditions to shut air out of the cylinders to which said pipes lead.

3. In pneumatic railway signals, the combination with a signal stand, three cylinders therein, compressors and pipes leading from the compressors to the three cylinders, of valves in said pipes, each cylinder controlling a valve in its own pipe, and one cylinder controlling a valve in each of the other pipes as well as its own pipe, whereby under certain conditions, to shut air out of the cylinders to which said pipes lead.

4. In pneumatic railway signals, the combination with a signal stand, three cylinders therein, compressors and pipes leading from the compressors to the three cylinders, of valves in said pipes, each cylinder controlling a valve in its own pipe, and one cylinder controlling a valve in each of the other pipes as well as its own pipe, whereby under certain conditions, to shut air out of the cylinders to which said pipes lead, and pivotally mounted blades or paddles, one of which is actuated by each cylinder.

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

JAMES HENRY FITZGERALD.

Witnesses:

J. F. RISON,

W. S. RENDLEMAN.