A. CHAMBERS.

PNEUMATIC SIGNALING APPARATUS.

No. 175,820. Patented April 11, 1876.

FIG. 1.

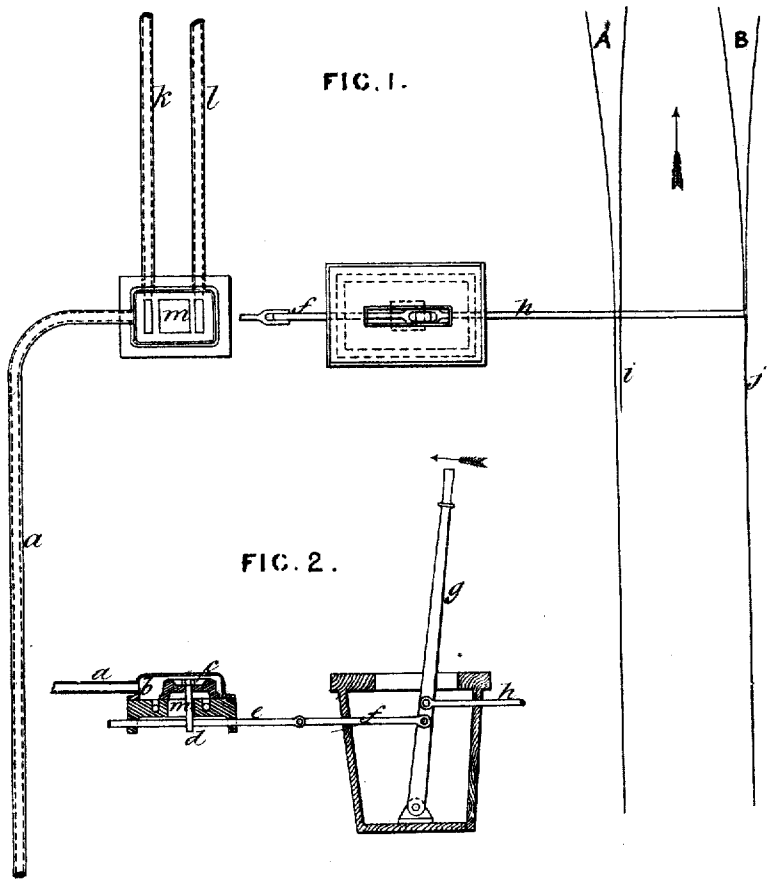

FIG. 2.

Witnesses:

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Inventor.

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by his attorney

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UNITED STATES PATENT OFFICE.

AUSTIN CHAMBERS, OF No. 258 MARYLEBONE ROAD, GREAT BRITAIN.

IMPROVEMENT IN PNEUMATIC SIGNALING APPARATUS.

Specification forming part of Letters Patent No. **175,820**, dated April 11, 1876; application filed November 18, 1875.

To all whom it may concern:

Be it known that I, AUSTIN CHAMBERS, of No. 258 Marylebone Road, in the county of Middlesex, Kingdom of Great Britain and Ireland, signal engineer, have invented Improvements in Pneumatic Signaling Apparatus for Railways, of which the following is a specification:

This invention has for its object improvements in pneumatic signaling apparatus for railways, and has reference, mainly, to improvements upon and further developments of, the invention forming the subject of Letters Patent granted to me the 11th day of May, 1875, No. 163,152, in which the semaphore arms or signaling objects or bodies are operated pneumatically in such wise that when the pressure of the external atmosphere prevails in the pipes, tubes, or passages establishing communication between the signaling station or place and the device which moves the semaphore-arm or other signaling object, the latter is in the position indicative of "danger."

My invention relates to the combination, with a lever or its equivalent for moving railway points or switches, of a pipe, tube, or passage charged with air or other elastic fluid, and means for increasing or diminishing the pressure thereof above or below the external atmospheric pressure, such pipe, tube, or passage having branches or connections to the respective semaphore-arms or other signaling objects or bodies, and being provided with apparatus operated by the movements of the said lever or its equivalent for opening and closing communication between the main pipe, tube, or passage and its respective branches, as well as between the latter and the external atmosphere in such manner as to insure correct signaling.

Figures 1 and 2 show the application of my invention to the points or switches at a railway-junction.

a is the pipe from the compressor, or from a reservoir of compressed air. This pipe terminates in a valve-box, *b*, in which works a slide-valve, *c*, connected by a stud, *d*, guided rod *e*, and link *f*, to the point-lever *g*, which lever is connected by a rod, *h*, to the points or switches *i j*. From the face of the valve-box *b* there are three ports. One of these ports communicates with a pipe, *k*, for actuating the semaphore arm or signal of the line A. Another communicates with a pipe, *l*, for actuating the semaphore arm or signal of the line B; while a third, *m*, communicates with the external atmosphere. The drawing shows the parts in position for a train to pass along the line A. The pipe *a* is in communication, by the port and pipe *k*, with the signaling-arm of line A, which is, consequently, lowered to the position indicating that a train may proceed, while the pipe *l* is in communication, through the valve *c* and port *m*, with the external atmosphere, so that as the normal atmospheric pressure prevails in the pipe *l* the signal-arm of the line B is in the horizontal or "danger" position.

It will be evident that on moving the lever *g* over in the direction of the arrow, so as to place the points in position for a train to proceed from the line A onto the line B, the valve *c* will be moved over, so that the signals will be reversed accordingly.

The arrangement shown is obviously capable of modification without departing from my invention, which is applicable in cases where the signaling object is moved into the "safety" or "pass-on" position by rarefying the elastic fluid in the pipes instead of by compressing it.

Having described the nature of my said invention and the manner of performing it, I claim—

In combination with the point-lever *g*, rod *h*, pipe *a*, and box *b*, the link *f*, guided rod *e*, stud *d*, slide-valve *c*, working in the box *b*, and operating in connection with ports communicating, respectively, with the pipes *k* and *l* leading to the respective signals and with the external atmosphere for actuating through a fluid medium the semaphore arms or signals of the lines A and B, all as shown and above described, for the purpose specified.

AUSTIN CHAMBERS.

Witnesses:

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