

A. CHAMBERS.

PNEUMATIC SIGNALING APPARATUS.

No. 175,422.

Patented March 28, 1876.

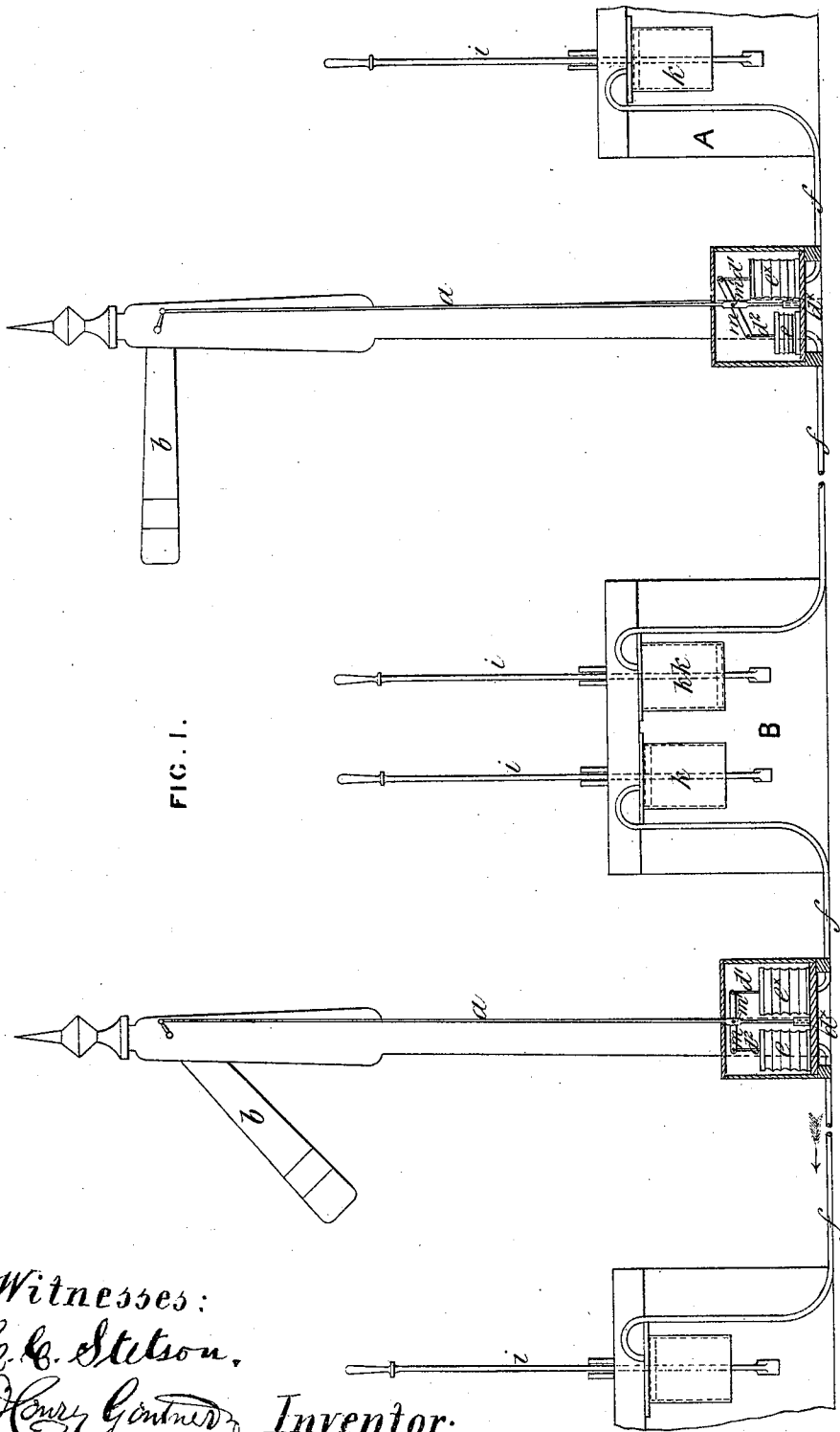


FIG. 1.

Witnesses:
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Henry Gontard

Inventor:
A. Chambers
by his attorney C. C. Stetson.

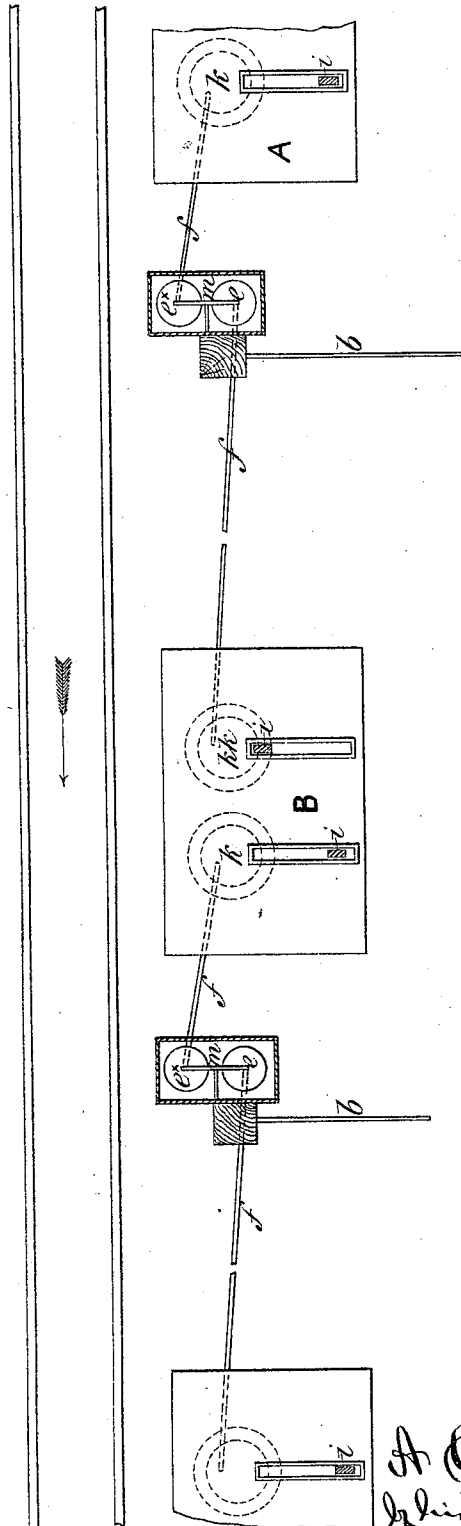
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FIG. 2.



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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. 125,422, dated March 23, 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 consists in an arrangement of apparatus designed to meet the requirements of cases in which the concurrence of two signal-men, stationed at different places, is needed to move the signaling object into the position indicating that a train may pass. In this arrangement the rod of each semaphore-arm or signaling object works at its lower end in a guide, and is formed with a slot, through which is passed a pin, forming the fulcrum of a lever or scale-beam, having its fulcrum at or near its center. To each end of the said lever or scale-beam is jointed a rod, the one rod being attached to the weighted upper end or moving part of a collapsible vessel or chamber, and the other rod to the weighted upper end or moving part of a second collapsible vessel or chamber. The collapsible vessel or chamber of one station (say station A) communicates by its pipe with a compressor of the same station, and the other vessel or chamber of the same station communicates by its pipe with a compressor of the next station, (say B.) In like manner one collapsible vessel or chamber of station B communicates with one compressor of that station, and its second collapsible vessel or chamber with a compressor at

the next station in the direction in which trains are to proceed. By this arrangement, supposing the actuating-lever at one station to be moved into the position for compressing the air in its pipe, it will cause the expansion of the collapsible vessel or chamber with which such pipe communicates, and, through the scale-beam, will cause a corresponding additional depression of the moving part of the other collapsible vessel or chamber of the pair, without, however, moving the semaphore arm until the actuating-lever of the compressor connected with the second collapsible vessel or chamber has been moved over, so as to compress the air and expand the second collapsible vessel or chamber connected to the same scale-beam.

Figure 1 is an elevation, (with the signal-posts turned;) and Fig. 2 is a plan, showing an arrangement of apparatus according to my invention.

In this arrangement the rod *a* of each semaphore-arm works at its lower end in a guide, *d*^x, and is formed with a slot, through which is passed a lever or scale-beam, *m*, having its fulcrum at *m'*. To each end of the lever *m* is jointed a rod, *d*¹ *d*², the rod *d*¹ being attached to the weighted upper end of a collapsible vessel, *e*^x, and the rod *d*² to the weighted upper end of a second collapsible vessel, *e*. The collapsible vessel *e*^x of station A communicates by its pipe *f* with the compressor *k* of the same station, and the collapsible vessel *e* of station A communicates by its pipe *f* with the compressor *k* of station B. In like manner the collapsible vessel *e*^x of station B communicates with the compressor *k* of that station, and its collapsible vessel *e* with a compressor at the next station in the direction of the arrow. By this arrangement, supposing the lever *i* at one station to be moved into the position for compressing the air in its pipe *f*, it will cause the expansion of the collapsible vessel with which such pipe communicates, and, through the scale-beam *m*, will cause the corresponding additional depression of the other collapsible vessel, as shown at *e*^x and *e*, (station A,) without, however, moving the semaphore-arm *b* until the lever *i* of the compressor *k*, connected with the second collapsible vessel *e*, has been moved over, so as

to compress the air and expand the collapsible vessel *e*, as shown at station B.

It will be evident that the apparatus may be readily modified, so that the signals shall be moved into the "safety" position on rarefying the air in the apparatus, instead of by compression.

Having described the nature of my said invention, and the manner of carrying it into practical effect, I claim—

In a pneumatic signaling apparatus for railways, the combination, with a semaphore-

arm or its equivalent, of a slotted rod, *a*, lever or scale-beam *m*, and two collapsible vessels, *e e*^x, operated from independent stations or places, as above set forth, for the purpose specified.

AUSTIN CHAMBERS.

Witnesses:

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