

A. CHAMBERS.

PNEUMATIC SIGNALING APPARATUS.

No. 175,423.

Patented March 28, 1876.

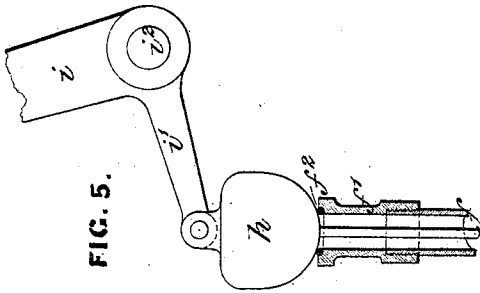


FIG. 5.

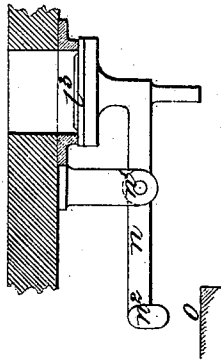


FIG. 4.

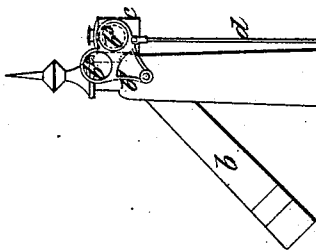


FIG. 2.

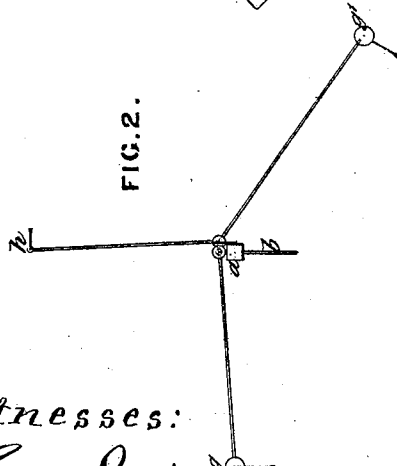


FIG. 3.

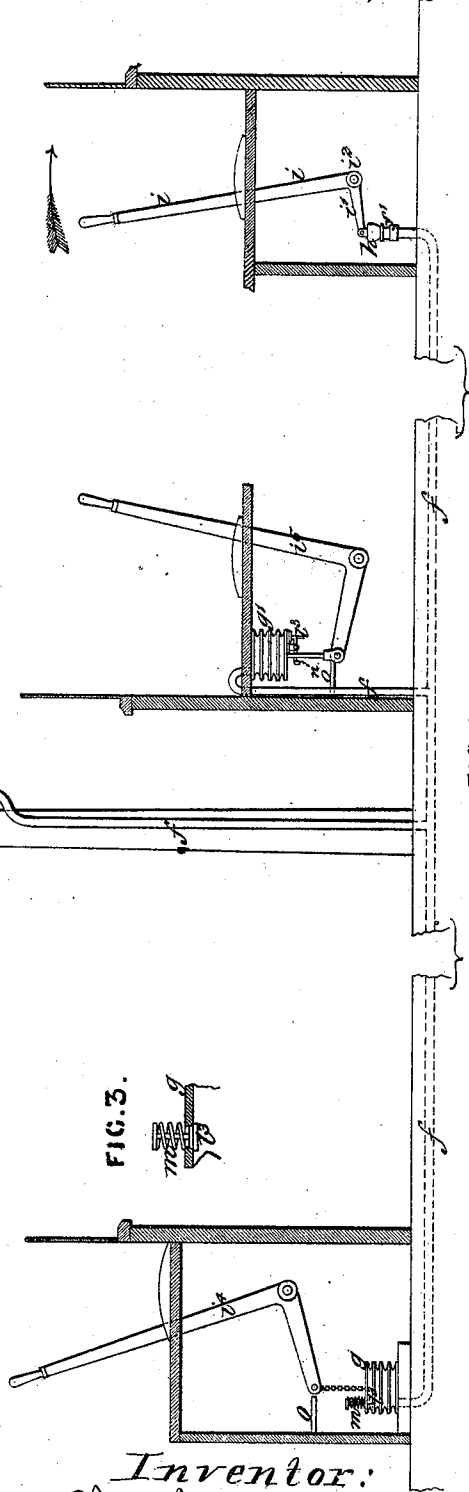


FIG. 1.

Witnesses:

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UNITED STATES PATENT OFFICE.

AUSTIN CHAMBERS, OF 258 MARYLEBONE ROAD, GREAT BRITAIN.

IMPROVEMENT IN PNEUMATIC SIGNALING APPARATUS.

Specification forming part of Letters Patent No. **175,423**, dated March 28, 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 present invention relates to the application and use, in the manner hereinafter described, of valves operating in conjunction with orifices in the elastic fluid-containing portions of the apparatus, said valves being actuated by the moving over of the levers by which the signals are governed in such manner as that, when any one of the said levers is in the position corresponding to the "danger" position of the signal, the valve governed by that lever shall be open, thereby establishing and maintaining the atmospheric pressure within the fluid-containing portions of the apparatus.

Figure 1 of the drawings shows a signaling apparatus embodying my invention, in which the concurrence of persons at three distinct and separate points or places is an essential preliminary to the moving of the signal into the "safety" or "pass-on" position. Fig. 2 is a plan to a reduced scale, showing the relative positions of the three several levers. Figs. 3, 4, and 5 are detached sectional views of the valve arrangements.

a is the signal-post; *b*, the semaphore-arm, to which is rigidly attached the frame *b*¹, carrying the colored glasses *b*² *b*³. *c* is the lamp; *d*, the rod for operating the signal-arm from

the collapsible vessel *e*; *f*, the air-pipe, communicating with the compressors *g* and *g'*, and with the nozzle *f*¹, provided with an elastic seat, *f*², in connection with which is arranged a heavy valve, *h*, carried by the arm *i*¹ of a lever, *i*, having its fulcrum at *i*². The compressors *g* and *g'* are operated, as shown, by means of similar levers *i*⁴ *i*⁵. Each of the compressors *g* and *g'* has its movable end weighted, and has an aperture in such end, provided with a valve, *l*³. In the case of the compressor *g* the valve is arranged to open inward, and is closed by a spring, *m*, as shown. In the case of the compressor *g'* the valve *l*³ is carried at one end of a small lever, *n*, having its fulcrum at *n*¹ and weighted at *n*².

When the compressors are expanded the valves will, in both cases, be opened by the stem or lever carrying the valve coming in contact with a stop or frame, *o*. Thus the establishment within the fluid-containing portions of the apparatus of the pressure of the external atmosphere will be insured. The same result is obtained by the moving over in the direction of the arrow of the lever *i*, whereby the weighted valve *h* is raised from its seat. The arrangement of the valve, as shown, in the compressor *g* also serves to admit air to the compressor on the return movement of the hand-lever, to facilitate the expanding of the vessel.

In Fig. 1 the whole of the levers are in the position corresponding to the "safety" or "pass-on" position of the signal, the two compressors being collapsed and the whole of the valves closed. It will be evident that, on any one of the levers being moved over, the corresponding valve will be opened, the pressure of the external atmosphere established in the air-containing portions of the apparatus, and the signal so moved into the horizontal or "danger" position.

It will be evident that the apparatus may be readily modified so that the signal 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 performing it, I claim—

1. In a pneumatic signaling apparatus for

railways, the combination, with an orifice in the elastic fluid-containing portion of the apparatus, of a valve so arranged in relation to the said orifice, and in connection with a signal-operating hand-lever, as that, on the lever being moved over to make the "danger" signal, said valve shall be caused to leave its seat and open the elastic fluid-containing portion of the apparatus to the external atmosphere, thereby establishing the atmospheric pressure in the apparatus, to insure the assumption of the "danger" position by the signal.

2. The combination, with the semaphore-arm *b*, collapsible vessel *e*, and pipe *f*, of the compressor *g*, with its valve *l*³, spring *m*, stop *o*, and lever *i*⁴, the compressor *g'*, with its valve *l*³, lever *n*, stop or frame *o*, and lever *i*⁵, and the valve *h*, with its lever *i* *i*¹, operating in connection with the elastic seat *f*² in the nozzle *f*¹, all substantially as and for the purposes specified.

3. In a railway-signaling apparatus having a collapsible compressor, and a pipe, tube, or passage charged with elastic fluid for operating, by change of fluid-pressure, a semaphore-arm or its equivalent, a valve operating in connection with an orifice in the end of the compressor, and so arranged in relation to a stop or stud that, when and so long as the compressor is in its expanded condition, the valve shall be maintained in its opened position, thereby establishing and maintaining the atmospheric pressure within the compressor until the latter is again moved or compressed, substantially as described.

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