

W. FOSTER, Jr.

Pneumatic Signal Apparatus.

No. 142,224.

Patented August 26, 1873.

Fig. 1.

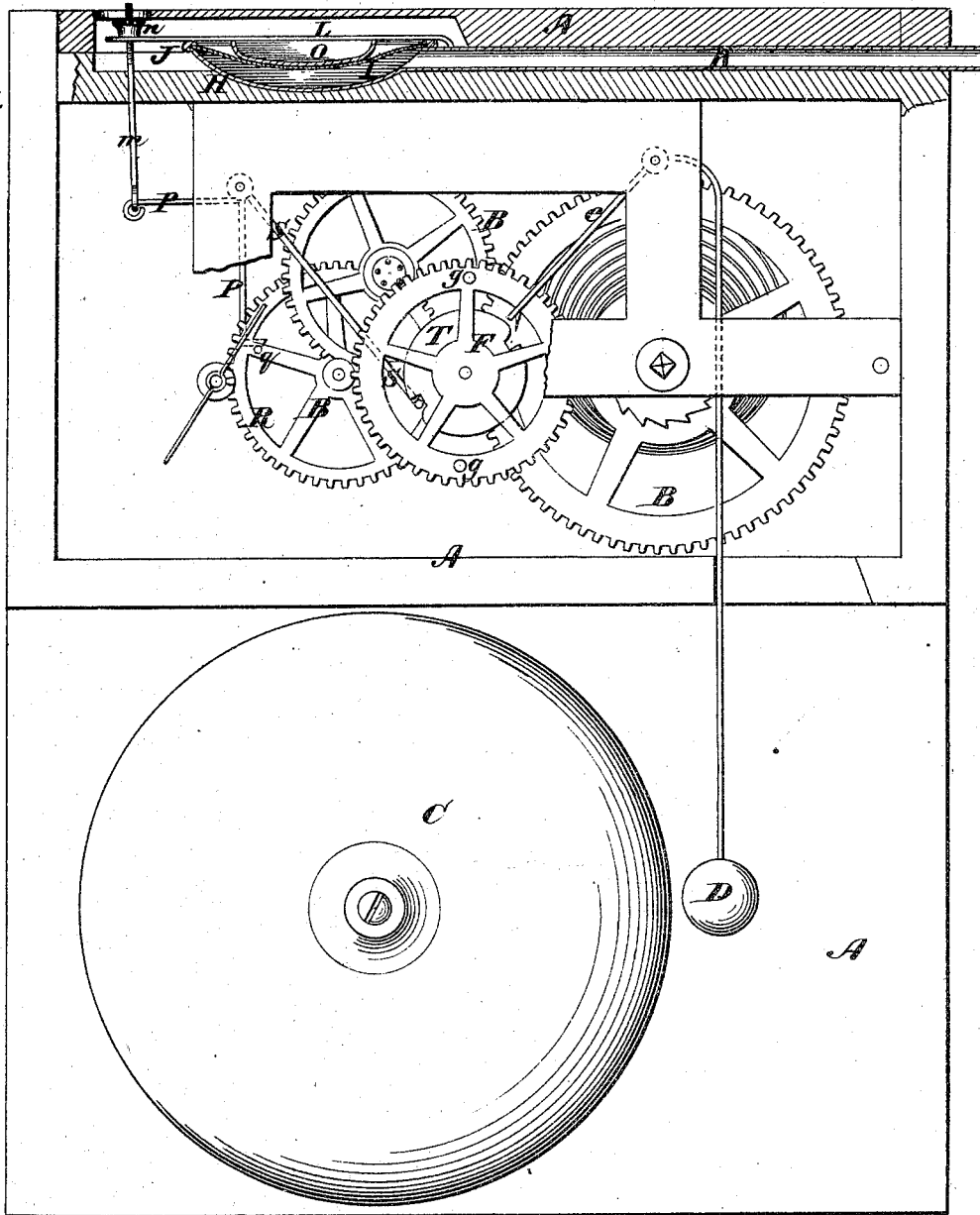
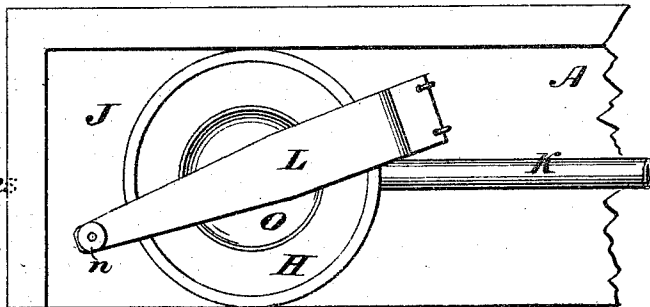


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PNEUMATIC SIGNAL APPARATUS.

Specification forming part of Letters Patent No. 142,224, dated August 26, 1873; application filed April 28, 1873.

To all whom it may concern:

Be it known that I, WILLIAM FOSTER, Jr., of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Pneumatic Signal and Telegraph Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a sectional elevation of a pneumatic signal and telegraph apparatus, showing the application of my improvements; and Fig. 2 is a detached plan view of the same.

Similar letters of reference denote corresponding parts in the several figures of the drawings.

The pneumatic signal and telegraph apparatus may be stated, in general terms, to consist in a system of clockwork, or other proper gearing, arranged within a suitable frame or case, a bell or other signaling device connected with the gearing, and a valve operated by atmospheric air to trip or unlock the gearing for sounding the bell. My invention has for its object to improve the operation and efficiency of such apparatus, whereby it is adapted for communicating signals from long distances with certainty and accuracy. To this end it consists in the combination of the tripping or unlocking mechanism, signal-gearing, and an adjusting-nut, spring-lever, and disk for regulating the pressure of the air-chamber, as is hereinafter more fully set forth.

In the accompanying drawings, A is a case, made of any suitable form and size, to contain the gearing B and bell C, the latter being arranged to receive the blows of a hammer, D. The arm of this hammer is made angular in shape, and pivoted at or near its angle to the frame of the gearing, so that its shorter arm, *e*, shall extend downward beside the gear-wheel F, and within the path of the stops *g* attached to said wheel. H is the valve, composed of two circular pieces of leather or other flexible non-elastic material, secured together at their edges so as to form an air-space, I. The valve is arranged within a chamber, J, in the upper part of the case A, and may be secured in place in any convenient manner. In this example of my inven-

tion I have shown it resting upon the bottom of the chamber J; but it may be suspended therein, or secured to any other part, as preferred. It may also be made of one piece, although, for economy of construction, I prefer to employ two pieces, as above described. In order to render the valve air-tight, I coat, saturate, or otherwise treat it with glycerine; this substance being employed because it is non-evaporating, and will not, therefore, permit the valve to leak after long-continued use. K is the air-tube, arranged in the top of the case A so as to communicate with the interior of the valve. It is composed of metal or some flexible material, and extends to a point remote from the apparatus, and constitutes a line of communication from one point to another. L is a flat spring, hinged at one end within the chamber J, so as to extend diametrically across the top of the valve and connect at the opposite end with a screw-rod, *m*, which rod passes through it to receive a set-nut, *n*, as shown. A button or disk, O, is secured to the under side of the spring, bearing directly upon the valve, for the purpose of forming sufficient bearing-surface to lift the spring when the valve is inflated. The rod extends downward through the bottom of the chamber J, and connects with one arm of an angular lever, P, pivoted to the frame of the gearing. The opposite arm of this lever is bent outward at the end to rest against a pin, *q*, projecting laterally from the face of the gear-wheel R. The lever P is also connected with an arm, S, extending to the gear-wheel F, where its bent end enters one or the other of the notches formed in a disk, T, secured to said wheel or to its axle.

When the various parts are in the positions shown in the drawings, and hereinbefore described, the apparatus is out of operation. If, however, air is suddenly forced into the tube K, or moved therein by any suitable means, the valve will become inflated, lift the spring L, and, through the medium of the connecting-rod *m*, throw the lever P and rod S out of contact with the stop *q* and notched disk T, thereby allowing the gearing to operate. As this proceeds, the pins *g* upon the gear-wheel F trip the arm *e* of the hammer to sound the bell. A sudden puff or movement

of the air through the pneumatic tube is sufficient to operate the tripping mechanism and unlock the gearing, when the valve instantly resumes its former position, and drops the tripping mechanism into the proper positions to arrest the movement of the gearing by contact with the next set of stops on the wheels F R. Any desired number of stops may be arranged on these wheels; but I prefer to employ two or three only for each, so that the gearing may continue its movements after the tripping mechanism has been lifted and reset, thereby insuring certainty of action.

The force of air required to lift the valve is determined by the adjustment of the set-nut *n*, which may be effected through an opening in the top of the case, as shown. The valve may, therefore, be made sensitive to the slightest movement of the air, and this capability

adapts the apparatus for signaling from long distances.

Instead of making the piece L elastic, it may be made rigid, and weighted to bear upon the valve.

Having thus described my invention, what I claim is—

The combination of the tripping or unlocking mechanism, constructed as described, signal-gearing, and adjusting-nut *n*, spring-lever L, pneumatic valve H, and disk O, substantially as set forth, and for the purpose specified.

The above specification of my invention signed by me this 18th day of April, A. D. 1873.

Witnesses:

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