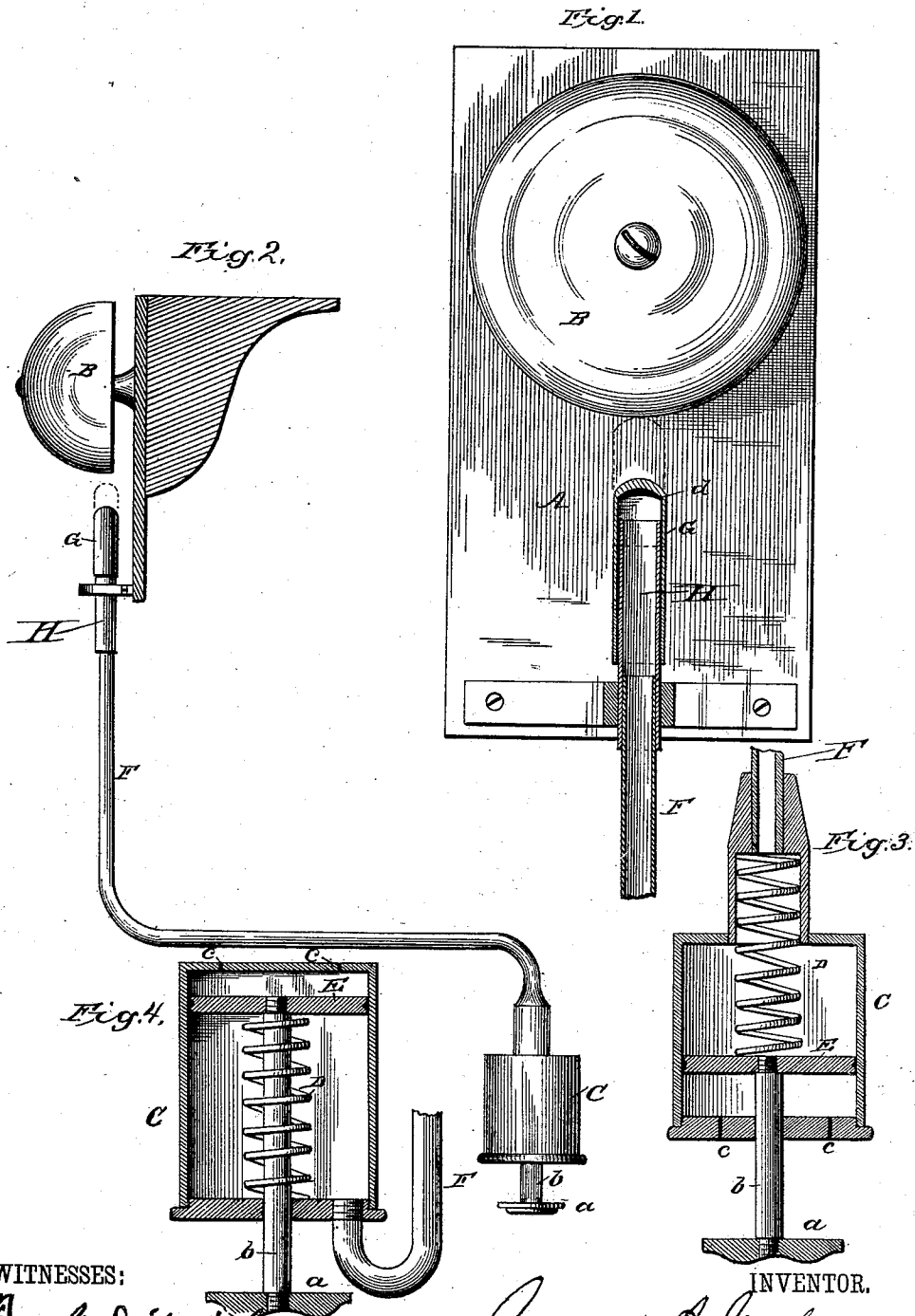


J. A. MALONEY.  
PNEUMATIC SIGNAL BELL.

No. 347,183.

Patented Aug. 10, 1886.



WITNESSES:

*And. S. Dietrich*  
*Wm. C. Dyer*

INVENTOR.

*James A. Maloney*  
*By Johnston, Reinhardt & Dyer*  
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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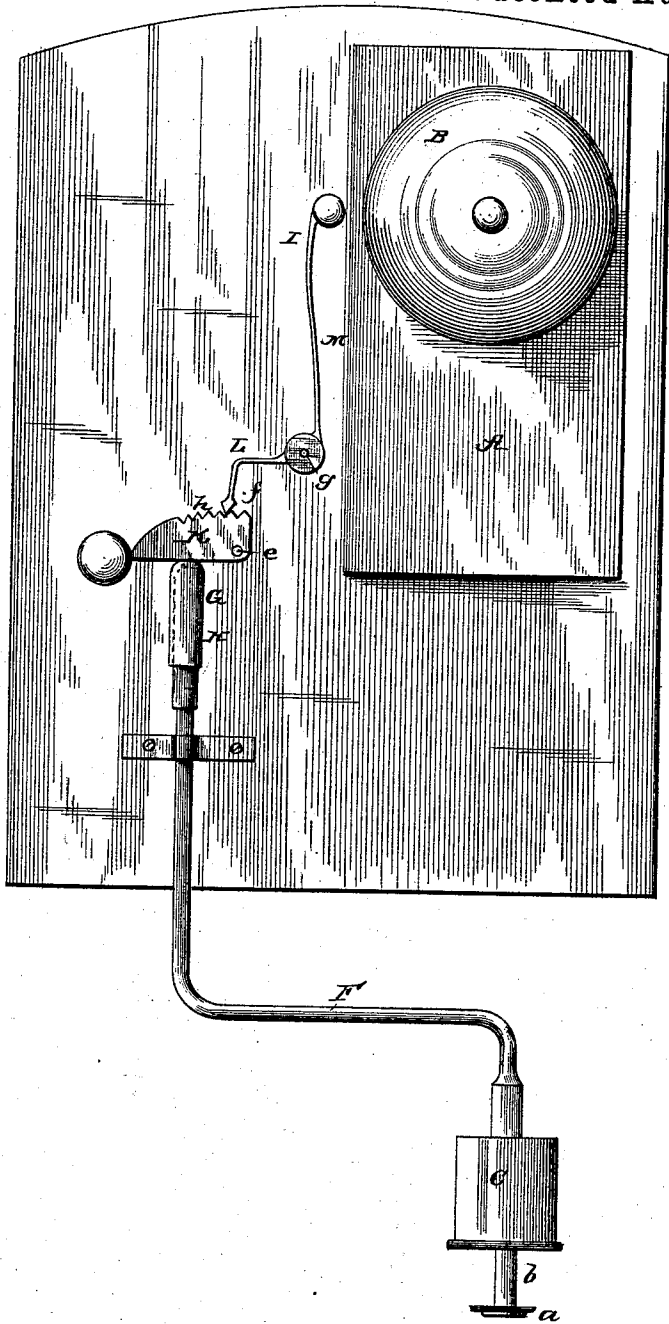


Fig. 5.

WITNESSES:

*A. S. Dietrich*  
*Wm. E. Dyer*

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*James A. Maloney*  
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# UNITED STATES PATENT OFFICE.

JAMES A. MALONEY, OF WASHINGTON, D. C., ASSIGNOR TO THE PNEUMATIC SIGNAL AND TELEPHONE COMPANY, OF SAME PLACE.

## PNEUMATIC SIGNAL-BELL.

SPECIFICATION forming part of Letters Patent No. 347,183, dated August 10, 1886.

Application filed October 24, 1885. Serial No. 180,882. (No model.)

### *To all whom it may concern:*

Be it known that I, JAMES A. MALONEY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Pneumatic Signal-Bells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to produce a signal-bell to be operated by the action of compressed air, and which may be used for general purposes.

The invention consists in the construction hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a front elevation of the bell and a vertical section of the end of the air-tube and the bell-hammer. Fig. 2 is a side view. Fig. 3 is a longitudinal section of the air-pump. Fig. 4 is a similar view of a modification of the pump; and Fig. 5 represents a front elevation showing a vibrating bell-hammer.

Reference being had to the drawings and the letters of reference marked thereon, A represents a suitable board, to which the bell B is secured in the usual manner; C, an air-pump provided with a spring, D, for returning the piston E after it has been moved in a direction to expel the air and strike the bell. A disk, *a*, on the end of the piston-rod *b* affords a means for the operator to push against or pull the piston. One end of the pump-cylinder is provided with small passages *c c* for the escape of air when the piston is being returned to its normal position by the spring.

When the structure or device is to be used as an ordinary signal-bell, such as is used with annunciators, or for telephone lines or other like purposes, where a push-button is used, the construction of pump-cylinder shown in Fig. 3 is applied. When used as a door-bell or a heavy gong on shipboard, the discharge-pipe is attached to the outer end of the cylinder and the air-passages *c c* are applied to the inner cylinder-head, as shown in Fig. 4, and the stroke produced by pulling the piston outward.

A tube, F, is attached to the pump-cylinder, and conducts compressed air to the bell-hammer. The free end of the tube F is arranged vertically below the bell, and is surrounded by a hollow cylindrical piston or hammer, G, which slides freely over the tube H, which forms an extension of the tube F. Between the exterior surface of the tube H and the interior of the cylinder an annular space or passage is formed, which provides a ready means for the escape of air when the piston or hammer has been raised by the pressure of the air acting on the closed end of the cylindrical piston, which in practice has been found to occur after the piston has ascended beyond the median line of its upstroke, and a means of ingress for air when the piston or hammer is descending to its seat and the return-stroke of the pump-piston E is being effected by the resiliency of the spring D bearing against it. The return-stroke of the pump-piston E also draws air from the chamber formed in the hollow piston or hammer and the tube F, and causes the hammer to descend very quickly by its gravity, assisted by the pressure of the atmosphere acting upon its exterior surface. In setting the bell and its hammer in position on the board A, they should be separated so as to permit of the movement of the piston, set forth.

The upper or closed end of the hollow piston G is made thicker than the wall or sides, to form a hammer and to add to its weight, which will accelerate its descent; and to prevent the noise occasioned by the hollow piston seating itself upon the end of the tube H, a cushion, *d*, of leather, india-rubber, or other analogous material is inserted in the upper end thereof, as shown in Fig. 1.

When it is desired to produce a rattling sound of the bell, such as is produced by electrical signals, a vibrating hammer, I, is provided, as shown in Fig. 5. A gravitating arm, K, is pivotally secured at *e* above the piston G with its lower surface resting thereon. The upper surface of the arm is curved or sector-shaped, and is provided with a series of notches, *h*, with which the head *f* of the arm L engages when the arm K is raised by the piston G, and also when it is returning to its

normal position, thus causing the angular lever M to vibrate freely upon its pivot g and produce an effective rattling signal.

By the construction shown and described, the air from the pump is retained in the hollow piston or bell-hammer until the work of striking the bell has been effected, and a rapid descent of the hammer is assured by its gravity and atmospheric pressure, whereby a very sensitive signal-bell, capable of striking a number of signals in quick succession, is produced.

The hollow piston G excludes dust and other foreign matter from the tubes H and F, and also acts as a valve, controlling the ingress and egress of air to and from the pump-cylinder.

Having thus fully described my invention, what I claim is—

1. The combination of a pump, a conducting-tube, and a hollow piston or hammer inclosing the discharge end of said tube, substantially as described.

2. The combination of a pump, a conduct-

ing-tube, and a hollow piston or hammer inclosing the discharge end of said tube and forming an annular passage between the tube and the piston, substantially as described. 25

3. The combination of a pump, a conducting-tube, a hollow piston inclosing the discharge end of said tube, and an interposed cushion, substantially as described. 30

4. In a pneumatic signal-bell, the combination of an air-pump, a conducting-tube, a piston inclosing the end thereof, and a vibrating bell-hammer, substantially as described. 35

5. In a pneumatic signal-bell, the combination of an air-pump, a conducting-tube, a piston inclosing the end of said tube, a gravitating arm having a notched surface, and a vibrating bell-hammer, substantially as described. 40

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

JAMES A. MALONEY.

Witnesses:

S. A. TERRY,

WM. E. DYRE.