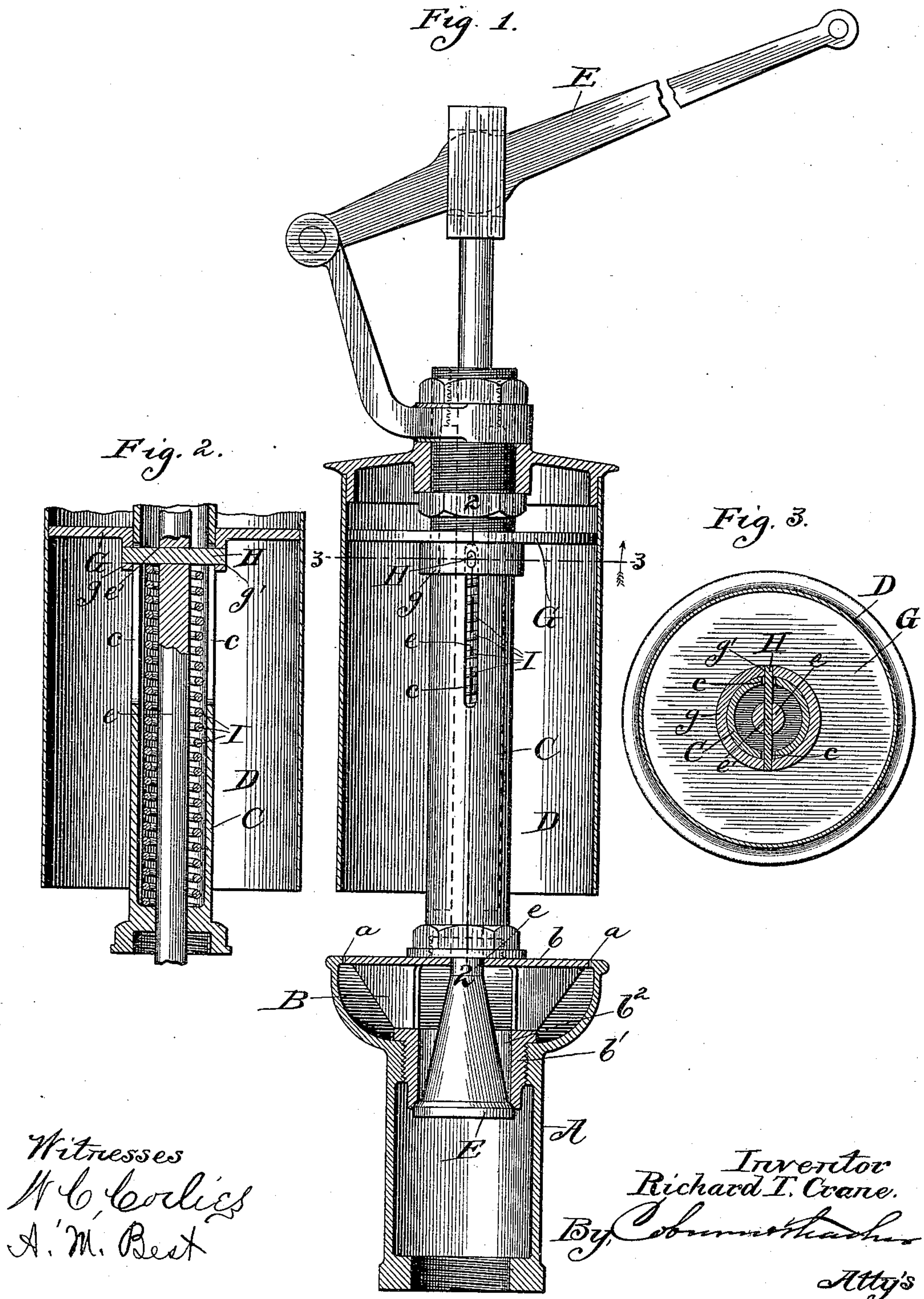


(No Model.)

R. T. CRANE.  
STEAM WHISTLE.

No. 448,127.

Patented Mar. 10, 1891.





# UNITED STATES PATENT OFFICE.

RICHARD T. CRANE, OF CHICAGO, ILLINOIS.

## STEAM-WHISTLE.

SPECIFICATION forming part of Letters Patent No. 448,127, dated March 10, 1891.

Application filed November 3, 1890. Serial No. 370,185. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD T. CRANE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Whistles, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical section of a whistle embodying my invention, the interior portions being in elevation; Fig. 2, a detail vertical section taken on the line 2 2 of Fig. 1; and Fig. 3, a plan section of the same, taken on the line 3 3 of Fig. 1.

My invention relates to that class of steam-whistles in which a piston is arranged within a bell and is movable vertically therein for the purpose of varying the tone of the whistle.

The invention consists in connecting the piston with the valve or devices for operating the latter, whereby the piston is moved together with the valve.

I will describe in detail the construction and operation of a whistle practically embodying my invention in one way, and will then point out more definitely in claims the special improvements which I believe to be new and wish to secure by Letters Patent.

In the drawings, A represents the usual cup which is applied to the end of the steam-pipe which supplies steam to the whistle. In this cup is the usual disk-plug B, the disk *b* filling the mouth of the cup, with the exception of the narrow annular opening *a*, as usual, for the escape of steam. The lower or solid portion *b'* of this plug is threaded into the stem of the cup and has the usual central opening *b<sup>2</sup>*. A tubular standard C is secured in any suitable way to the upper side of the disk and extends upward therefrom the required distance, and the bell D is fastened, as usual, to the upper end of this standard. A valve E is fitted to the opening *b<sup>2</sup>*, through which steam is emitted, the valve being seated on the under side of the plug *b'*, as seen in Fig. 1. The movement of the valve will therefore be inward or downward to open the steam-duct. In the drawings the valve is shown of conical form; but this is simply a matter of convenience. The valve-stem *e* is extended up through the disk into and through

the tubular standard and out through the upper end of the latter, and the operating-lever F is suitably connected to the upper end thereof above the bell. A piston G is nicely fitted within the bell and is sleeved upon the hollow standard C, so as to be movable vertically thereon. An annular flange *g* projects from the under side of the piston and surrounds the standard like a sleeve, as seen in Fig. 2. This piston is secured to the valve-stem by means of a pin H, which passes through holes *g'* in the sleeve of the piston and an aperture *e'*, bored through the valve-stem. The tubular standard is provided with two long lateral slots *c*, cut in opposite sides thereof for the accommodation of the fastening-pin, as shown in Fig. 2. Obviously the movement of the valve-stem for the opening of the valve will move the piston in the bell, owing to the connection of the latter with the valve-stem, as described, the lateral slots in the tubular standard permitting the fastening-pin to move up and down therein to accommodate the vertical motion of the piston. The valve-stem is somewhat smaller than the internal area of the tubular standard, and a spiral spring I is arranged in the space between the stem and the standard, being coiled around the former, as seen in Fig. 2. This spring is seated at its lower end upon the bottom of the standard and at its upper end will be held in place by the pin H. This spring is constructed so that it will be somewhat depressed or closed even when the piston is at its highest point within the bell, which, of course, is when the valve is closed. The spring will therefore be still more depressed when the piston is in the least moved downward, and therefore by its resilience will tend to raise the piston and so close the valve when released from the depressing force of the lever.

It will be seen from this description that the piston within the bell is operated by the valve-lever, and so no additional adjusting device is required for this sound-modulator, the whistle being provided with only the ordinary single operating-lever. The piston begins to move with the least opening of the steam-valve, and will be more and more depressed within the bell as the valve is opened wider and wider, while if the force applied to the lever is relaxed the spring instantly moves



the piston upward and closes the valve to the same extent. It is evident, then, that the sound of the whistle is modulated with the movement of the valve and changed at will  
5 by any vibration of the latter, whereby the escape of steam is also regulated.

The modulating-piston may be connected to the valve in other ways. Hence I do not wish to be understood as limiting my inven-  
10 tion to the special means herein shown and described for making this connection, though these particular devices are desirable because simple and inexpensive. Other means for this purpose may be substituted, however,  
15 and the construction and arrangement of the devices here shown may be modified to some extent, and the retracting-spring may be applied at other points.

Having thus described my invention, what  
20 I claim as new, and desire to secure by Letters Patent, is—

1. In a steam-whistle, the bell, in combination with a vertically-movable piston arranged therein and connected to the steam-valve,  
25 whereby the movement of the valve also adjusts the piston within the bell, substantially as and for the purposes specified.

2. In a steam-whistle, the bell D, in combination with the tubular standard C, valve-stem *e*, passing down through the standard, 30 and a piston G, sleeved on the standard and connected through slots in the latter to the valve-stem within, substantially as and for the purposes specified.

3. In a steam-whistle, the tubular standard 35 C, rising from the cup and provided with lateral slots *c*, in combination with the valve E, the stem *e* of which passes up through the said standard, the bell D, mounted on said standard, the piston G, arranged within the bell 40 and sleeved on the standard, the pin H, passing through the side slots in the standard and connecting the piston to the valve-stem, and the spring I, arranged below the piston within the space between the valve-stem and the 45 standard, substantially as and for the purposes specified.

RICHARD T. CRANE.

Witnesses:

CARRIE FEIGEL,  
A. M. BEST.