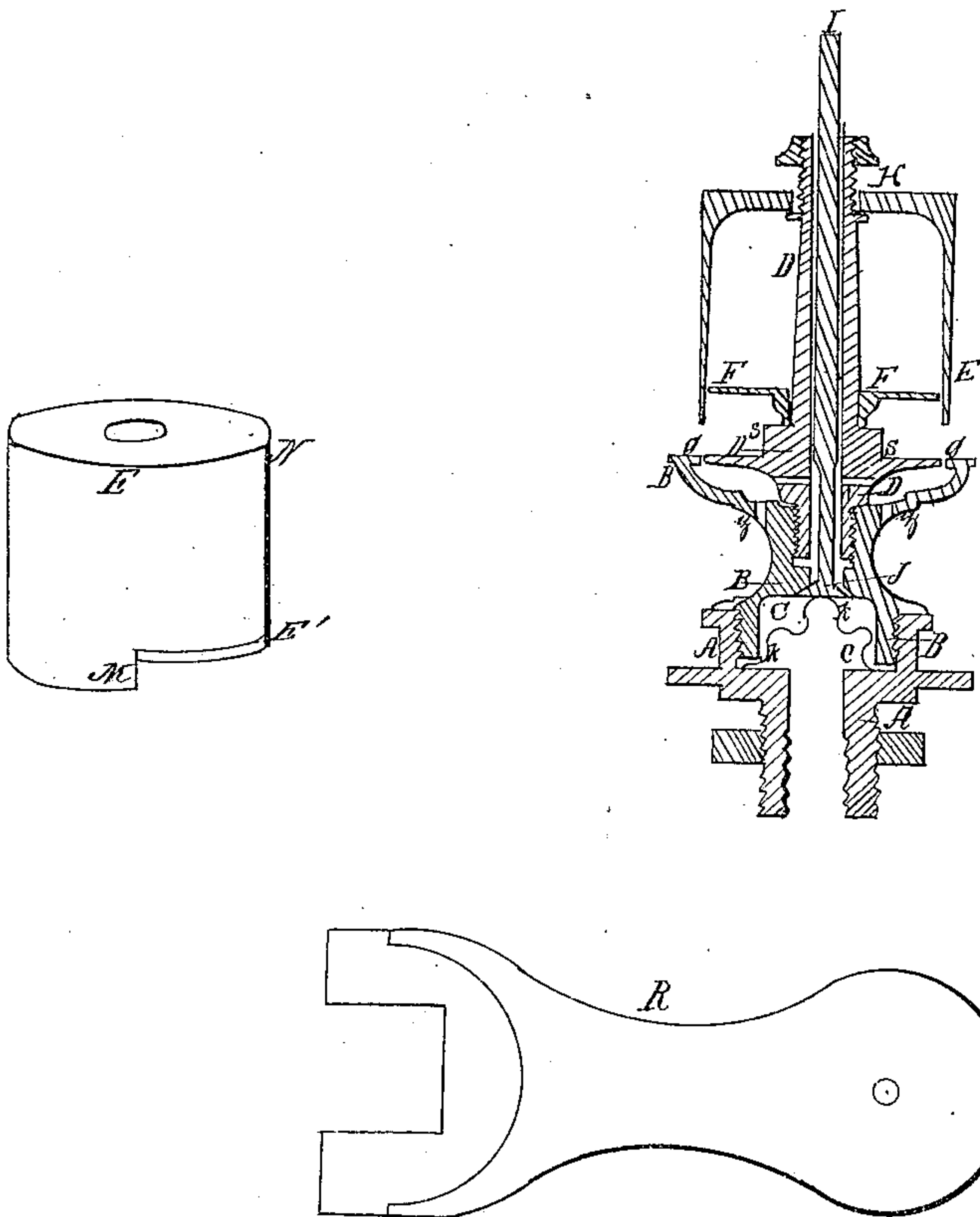


*L. E. Lincoln,*  
*Steam-Boiler Indicator.*  
*N<sup>o</sup> 44,006.                      Patented Aug. 30, 1864.*



*Witnesses:*  
*Hippau W. French,*  
*G. S. Huntton.*

*Inventor:*  
*Levi E. Lincoln.*

# UNITED STATES PATENT OFFICE.

LEVI E. LINCOLN, OF LOWELL, MASSACHUSETTS; ELIZABETH K. LINCOLN  
ADMINISTRATRIX.

## IMPROVEMENT IN STEAM-WHISTLES.

Specification forming part of Letters Patent No. 44,006, dated August 30, 1864.

*To all whom it may concern:*

Be it known that I, LEVI E. LINCOLN, of Lowell, county of Middlesex, State of Massachusetts, have invented certain Improvements in Steam-Boiler Whistles; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, with letters of specification marked thereon.

Whereas steam-boiler whistles have heretofore been made in manner such as to require special adjustment for all pressures materially different from that to which each one was adapted or proportioned, the nature of my invention is such as to make each whistle adjusted, or to be self-adjustable, according to the tension of steam which may at any time attack it, and to make it also adaptable to a boiler without the intervention of a shut-off cock, while at the same time it may be cleaned and tightened without the necessity of removal.

A A is the base of the whistle, and by it the whistle is connected to the boiler.

B B B is a flanged double-cavities cylinder screwing into A A, and forming the chamber C C.

D D D is the bell-post or guiding-post of the whistle, screwing into B B, and forming with it the annular opening *g g*.

E E is the bell of the whistle, supported by the post D, and kept in line with the annular opening *g g* by the radial arms F F. In the perspective view the walls E M N E' are seen to be of slightly unequal depth, and the edge of E' N is seen to be sharpened by an outside chamfer. An inside chamfer is made upon the side E M.

H is the neck of the bell-post, up and down which the head of the bell may move freely.

I J is the valve spindle extending up through the bell post, and, when in position, stopping the steam-passage from C C.

K K is a spring beneath J, which, when the spindle is not forcibly depressed, keeps the valve-passage closed.

z z are openings in the discharge-chamber of the whistle, about two-thirds of the capacity of the steam-inlets in the bell-post, and their office is to discharge excess of steam. The whistle at a low pressure gives its tone while the bell rests down upon the projections standing out from the neck of the bell-post; but when subjected to extreme pressure, the consequent steam force and quantity, which, if

the bell were fixed, would fill it to choking, thus preventing any whistle tone, buoys up the bell, the radial arms still guiding the edges of its mouth into the issuing stream, and the bell gives its tone while being up-borne by or floating in the steam. That tone is constant, but variant according to the pressure.

R is a wrench, which, being placed beneath the bell, fits the shoulders s s. By this wrench the bell-post may be raised or removed, while the valve J, though made accessible, remains closed.

The purpose of the different depths E M N E', as also of the reverse or alternate chamfering of the bell's edges, is to afford, in the same bell, surfaces differently impinged by the same current.

What I claim as my improvement and invention, and wish to secure by Letters Patent, is—

1. The use of radial arms within or without the bell of a steam whistle, by which to retain said bell in the annular steam-current.

2. The use of openings in the discharge-chamber of a steam-whistle, in addition to the annular opening thereof, to the effect of preventing excessive discharge through said annular opening into or upon said whistle's bell.

3. The use of a steam-bell the edges of whose mouth, sectionally or wholly, are unequally distant from the plane of the whistle's annular opening, to the effect of providing bell-surfaces differently attacked by the same current.

4. The making of the edges of the mouth of a steam-bell in arcs of unequal radii, to the effect of securing upon said bell a unitive or an alternate and changing impact.

5. The fitting of the bell of a steam-whistle loosely around its supporting or guiding post in such manner that said bell may rise perpendicularly, and float above the annular opening of the whistle, in and by the force of the steam that attacks it.

6. The combination, in a steam-whistle, of a valve-seat and valve, with a bell whose edges of impact are in arcs of unequal radii, or with a bell whose edges, wholly or sectionally, are unequally distant from the plane of the whistle's annular opening, substantially as set forth and described.

Witnesses: LEVI E. LINCOLN.  
THOS. J. DAY,  
G. S. HUNTOON.