(No Model.)

# H. R. FRISBIE.

## WHISTLE.

No. 571,357. Patented Nov. 17, 1896.

FIG. 1

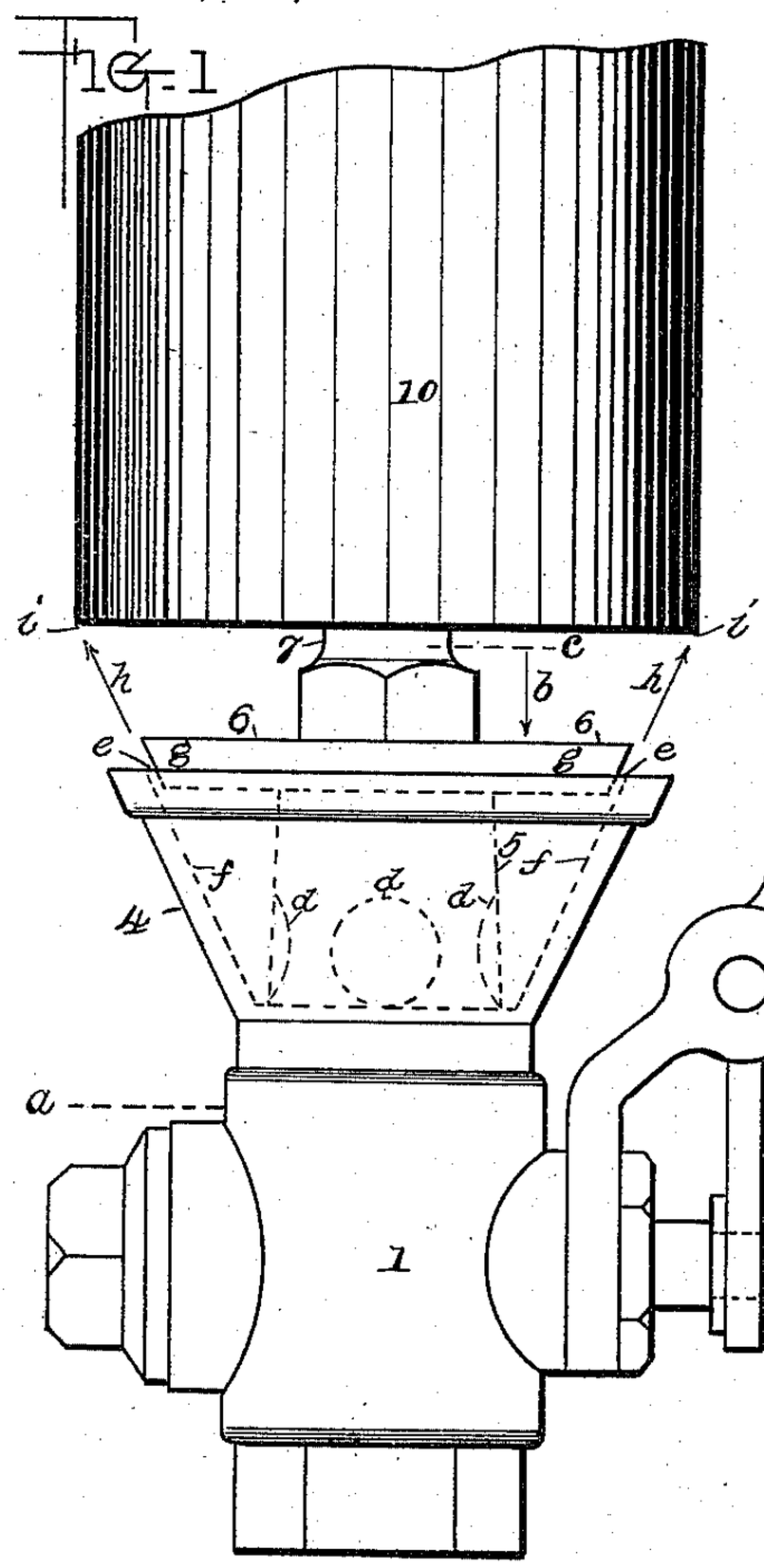



FIG. 2

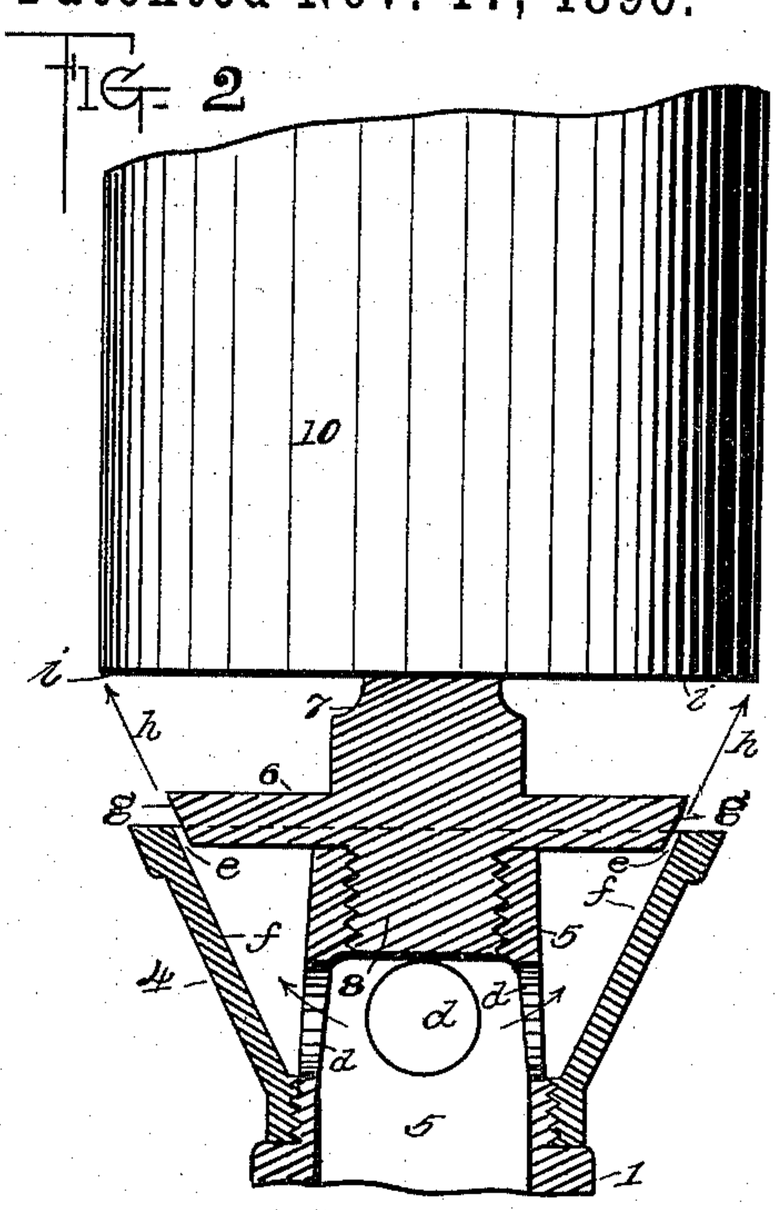



FIG. 3

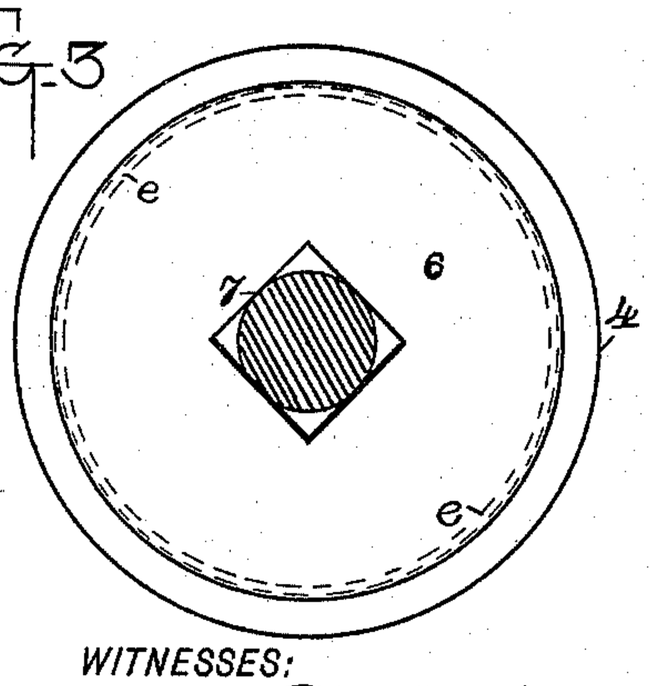
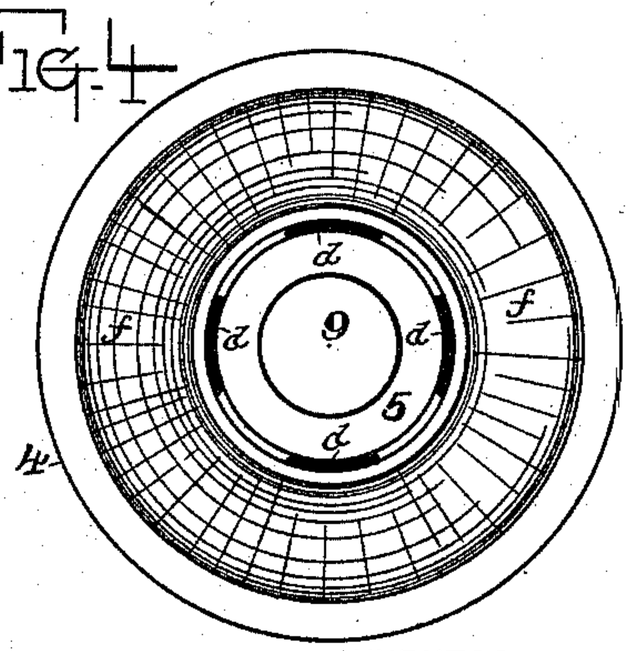



FIG. 4




WITNESSES:

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# UNITED STATES PATENT OFFICE.

HENRY R. FRISBIE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE EASTWOOD WIRE MANUFACTURING COMPANY, OF BELLEVILLE, NEW JERSEY.

## WHISTLE.

SPECIFICATION forming part of Letters Patent No. 571,357, dated November 17, 1896.

Application filed August 24, 1894. Serial No. 521,254. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY R. FRISBIE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Whistles, of which the following is a specification.

My invention relates to steam-whistles, and has for its object the production of sound at a minimum pressure.

With this object in view my invention consists in constructing the steam-bowl to resemble the inverted frustum of a cone whose inner divergent sides form an angle that will carry the outgoing steam directly to the lower circumferential rim of the bell, combined also with a bowl-plate projecting above the surface of the bowl to assist in obtaining such results, all of which improvements will be more fully set forth in the following specification.

To enable others to readily understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a whistle embodying my invention, showing a broken section of the operating-valve handle and upper portion of the bell. Fig. 2 is a broken section of the valve-body on line *a* of Fig. 1, broken section of the upper portion of the bell, central sectional elevation of the bowl, bowl-plate, bell-supporting stud, and steam-column within the bowl. Fig. 3 is an upper plan view, looking in the direction of arrow *b*, Fig. 1, of the bowl and plate, also sectional view of the bell-supporting stud through line *c*. Fig. 4 is a view similar to Fig. 3 with the bowl-plate removed.

Its construction and operation are as follows:

1 is the valve-body carrying a valve (not shown) whose projecting stem 2 and operating-lever 3, not being subjects of the present invention, need no further description.

4 is the angularly-constructed steam-bowl, which may be integrally formed with the valve-body 1 or screwed to the base of the steam-column 5, as shown in Fig. 2. This column is provided with the outlet-ports *d*, through which the steam passes to the blowing-orifice *e* between the inclined faces *f* of the bowl and *g* of the bowl-plate 6. The bowl-plate 6 and bell-supporting stud 7, as shown, are made in one piece, although they can be made separate, if desired. The lower threaded end 8 is screwed into the hole 9, Fig. 4, of the steam-column 5.

It will be observed that the bowl-plate projects above the surface of the bowl, so as to maintain the angular or divergent course of the steam caused by the interior angular construction of the bowl after it leaves such bowl, and will thus assist in guiding it in the direction of arrows *h* to the lower edge *i* of the bell 10.

Heretofore the bowls of whistles have been constructed of a semispherical shell with the steam-orifice therein placed in a vertical line with circumferential edge of the bell. It is a well-known fact that in order to obtain a clear tone with a small expenditure of force, whether such force is represented by a concentrated volume of air or steam, the current must pass across the sounding-orifice at an angle therewith. Therefore in the old construction the volume of steam impinges directly against the lower edge of the bell, and consequently much of it is forced up into the inside or dome, so as to deaden the sounding-chamber and thus greatly reduce the tone of the bell. This occasions a loss of volume which, in a measure, can only be counteracted by increasing the force or pressure of the escaping steam.

In my improved construction the orifice of the bowl is so placed with respect to the edge of the bell that the escaping steam will strike the edge of the bell at the proper angle to give the clear tone desired and avoid filling the sounding-chamber. To assist in directing the current of steam in the proper direction, the inside of the bowl is tapered to suit this angular path. This angular or V shape, which the interior of the bowl is made to assume, assists very materially in compressing the steam into a smaller space before escaping, so that it emerges from the orifice *e* with an increase of force over its initiatory pressure. To continue the advantage gained by

the angular construction of the interior of the bowl, I prefer to extend the bowl-plate 6 above the surface thereof, so that the projecting angular edge *g* of said plate, which, as before mentioned, is of the same angle as the interior of the bowl, and thus, as it were, preserve the alinement of the steam-current after it leaves the bowl. This feature of directing the escaped current may be attended with equally as good results by making the bowl-plate level with the upper surface of the bowl and forming an upward-projecting lip around the orifice *e* on the upper surface of said plate, or in any other suitable manner that would be the equivalent of the projecting plate.

To save stock, as well as add to the symmetry of the whistle, I prefer to make the outer surface or sides of the bowl to conform to the same angular construction as the interior.

The construction above described will produce a clearer tone at a lower pressure than any device, so far as known, yet designed for the purpose.

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

A whistle, comprising in combination, the valve-body 1 having column 5 projecting therefrom and integral therewith, lateral steam-ports in the base of said column, steam-bowl 4 whose exterior and interior surfaces are both cone-shaped, said bowl removably attached to the base of said column, bell-stem 7 carrying the plate 6 whose circumferential edge *g* has the same inclination as the said bowl, so that the inclined edge thereof combined with the inclined inner wall of the bowl, and placed in the proper relation to the ports of the said column, will guide the steam in a direct and unobstructed course from the column to the edge of the bell mounted on the bell-stem.

Signed at Newark, in the county of Essex and State of New Jersey, this 10th day of August, A. D. 1894.

HENRY R. FRISBIE.

Witnesses:
W. S. HAMLIN,
JAMES MARSHALL.