(No Model.) 2 Sheets—Sheet 1.

E. LUNKENHEIMER.

STEAM WHISTLE.

No. 476,472. Patented June 7, 1892.

Fig. 1.

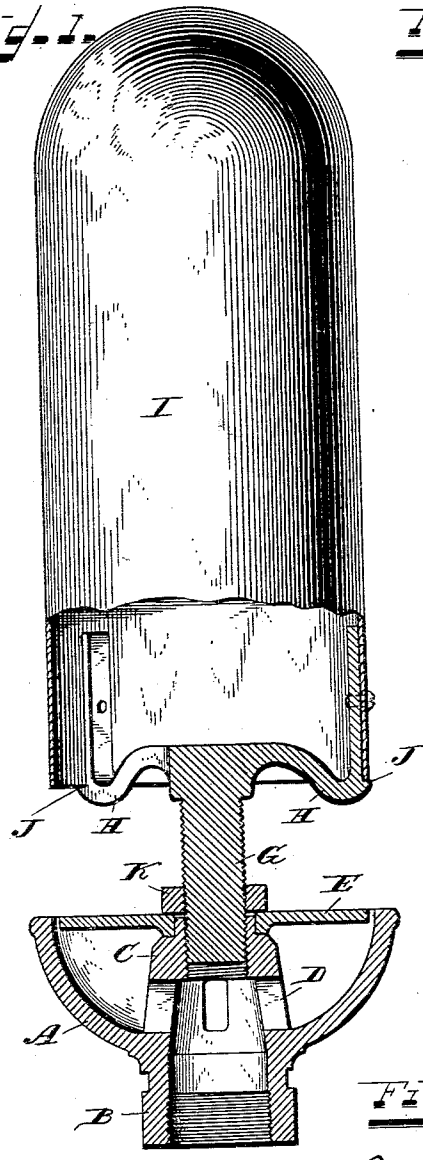


Fig. 2.

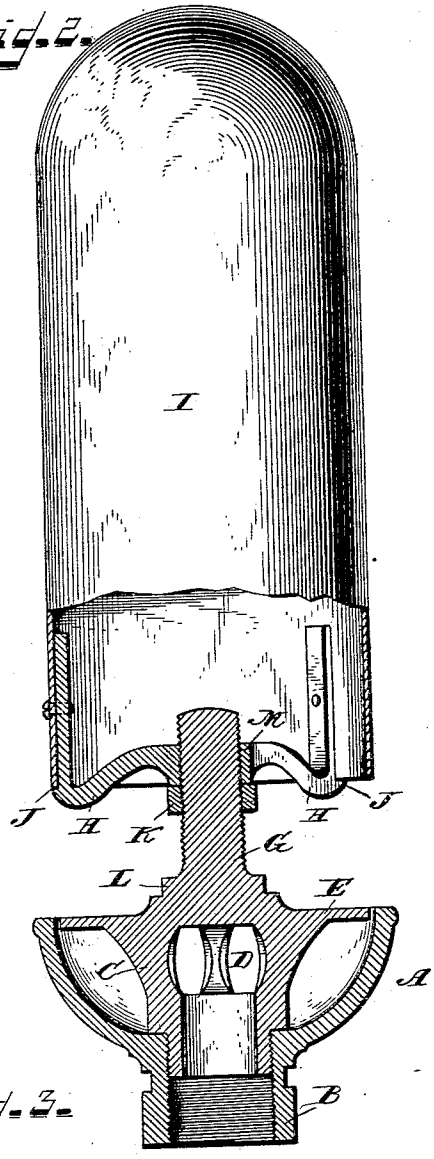
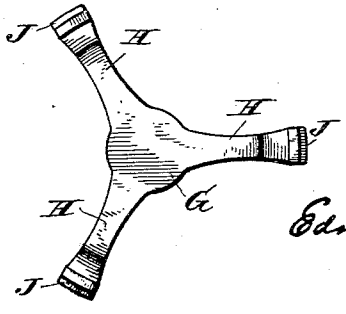


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

E. LUNKENHEIMER.

STEAM WHISTLE.

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Fig. 4.

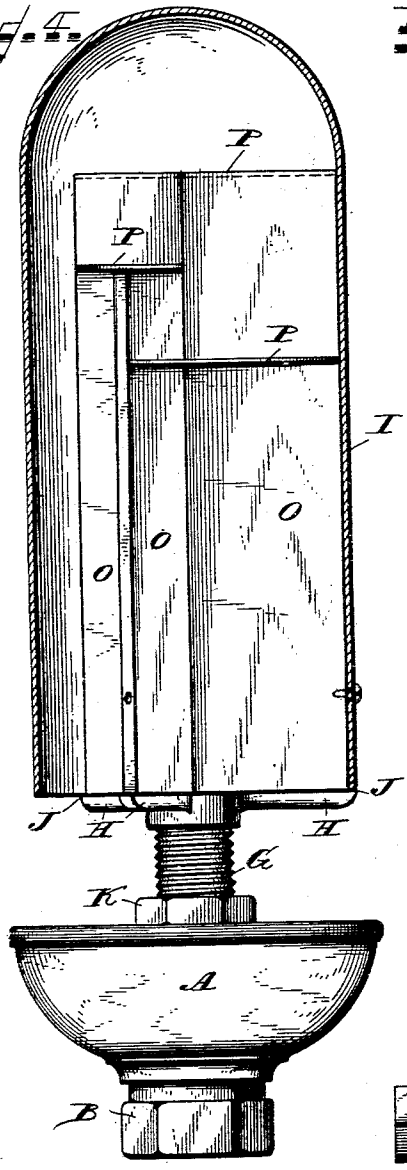


Fig. 5.

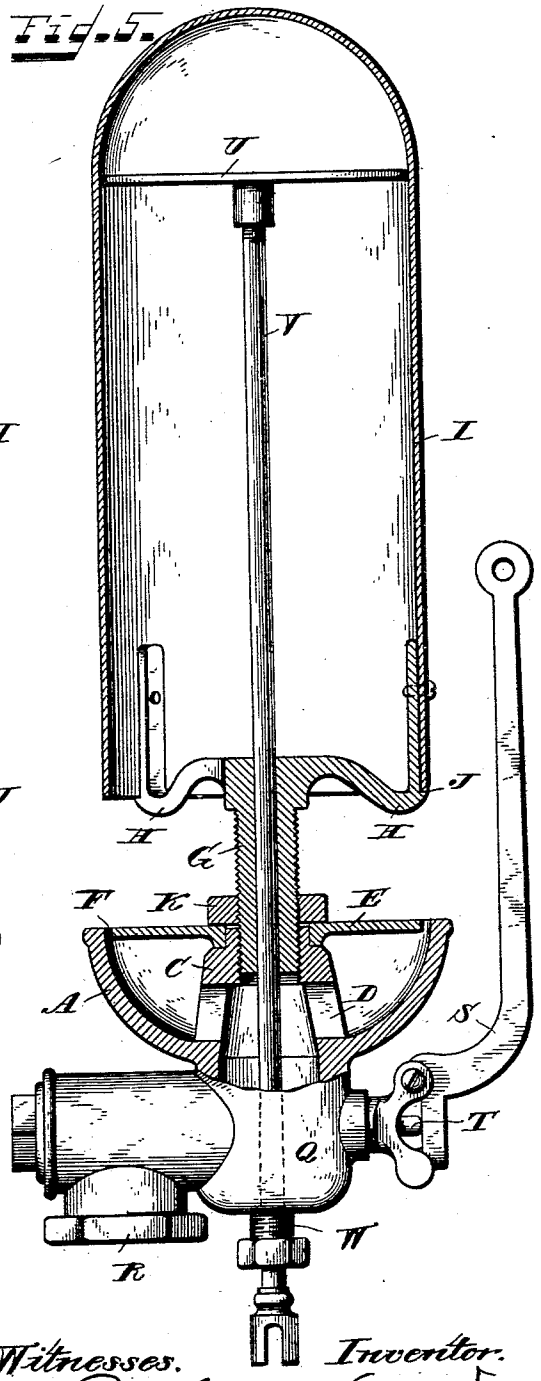
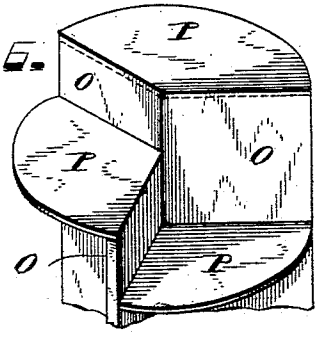


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDMUND LUNKENHEIMER, OF CINCINNATI, OHIO.

STEAM-WHISTLE.

SPECIFICATION forming part of Letters Patent No. 476,472, dated June 7, 1892.

Application filed January 20, 1892. Serial No. 418,625. (No model.)

To all whom it may concern:

Be it known that I, EDMUND LUNKENHEIMER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Steam-Whistles, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates principally to the method of supporting and adjusting the whistle-bell, and its novelty will be herein set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 represents an elevation, partly in central section, of a whistle embodying my invention in one form; Fig. 2, a corresponding view illustrating my invention in another form. Fig. 3 is a top plan view of the supporting-arms for the bell; Fig. 4, an elevation, partly in section, of a chime-whistle embodying my invention; Fig. 5, a vertical section of a piston-whistle embodying my invention, and Fig. 6 a perspective view of the upper ends of the chime-partitions.

The same letters of reference are used to indicate identical parts in all the figures.

Heretofore in steam-whistles in which a single cylindical bell has been supported upon a base having an annular slit concentric to the bell for the escape of the steam against the lower edge of the latter the point of connection of the bell to its support has generally been its top. In most instances a central stem supported in the base has extended up through the bell and the latter has been screwed upon its upper end. In others rods or standards, likewise supported in the base, have extended up on the outside of the bell and been connected by cross-pieces or a disk, to which latter the bell was connected at the center of its top. All methods of supporting the bell from its top are more or less objectionable, because of the difficulty of adjusting and maintaining the lower edge of the bell concentric to the annular steam-slit in the base, which is necessary to the perfect operation of the whistle. It is generally desirable to make the bell adjustable toward and from the base to suit varying steam-pressures, and to this end, as well as to afford a firm connection to its support, it has been usual to provide the bell with a heavy cast-metal top, whether this top were screwed directly upon the threaded upper end of a central stem or supported in some other manner. Extreme accuracy was required in securing the bell to its support, and when once properly secured and adjusted the lower end of the bell was easily thrown out of proper position by any accidental shock or pressure. Besides, the cast-metal top made the bell objectionably heavy and, together with the extreme accuracy of construction and adjustment required, increased its cost.

In my improved whistle the bell is supported upon a central stem projecting upward from the base and carrying radial arms whose outer ends fit against the inner surface of the bell and to which the bell is secured by screws or rivets passed through its sides. This method of supporting the bell by its sides instead of its top renders unnecessary the heavy cast-metal top heretofore employed and permits one of light sheet metal to be used, or, if desired, the whole bell can be formed of a single piece of metal of uniform thickness pressed or spun into shape. Furthermore, this method of supporting the bell by its sides upon the outer ends of a number of radial arms carried by a central stem gives the bell a much firmer support than where it is supported at a single point in its top and securely holds the lower edge of the bell in proper position concentric to the steam-slit in the base. This is especially true where the bell is secured to the outer ends of the radial arms near its lower end or at any point below its middle, as hereinafter described. In such case, too, the central stem may be short and need not project up into the bell any considerable distance, if at all, so that the entire interior of the bell may be left free from obstructions. This is very desirable in some classes of whistles hereinafter mentioned and is another reason why the old method of supporting the bell at its top upon a central stem extending up through the bell is objectionable.

In whistles of this character it is generally desirable to have the bell adjustable toward and from the base to suit varying steam-pressures, and in my improved whistle provision for such adjustment is made either by rais-

ing and lowering the central supporting-stem (in which case the radial arms may be integral with or rigidly secured to the stem) or by raising and lowering the arms upon the stem, all as will be hereinafter described.

In Fig. 1 the base of the whistle is composed of the bowl A, the steam-pipe connection B, and the central support C, all cast integral. The part C is provided with ports D for the passage of steam from the steam-pipe to the bowl A, and upon its upper end is fitted the circular disk E. The annular space F between the outer edge and the upper inner edge of the bowl A forms a slit for the escape of the steam to the bell. The part C has a central threaded bore, into which is secured the lower end of the bell-supporting stem G. This stem is provided at or near its upper end with two or more (in this instance three) radial arms H, extending from the stem to the inner surface of the bell I. Their upturned outer ends fit against the inner surface of the bell, and the latter is secured to them by screws or rivets. In constructing the whistle after the stem G and integral arms H are cast, I place them in a lathe and turn off the outer sides of the upturned ends of the arms to the exact internal diameter of the bell, preferably leaving shoulders at J, against which the lower edge of the bell may rest, as shown. These upturned ends of the arms H, closely fitting the inner surface of the bell and made of considerable length, afford guides and supports for maintaining the bell in true vertical position. A jam-nut K is placed upon the stem G and bears against the disk E. To adjust the bell toward and from the base, it is only necessary to loosen the nut K and turn the bell by hand, which will raise or lower it, according to the direction in which it is turned, and it can be firmly secured in its new position by tightening up the nut K again. As before stated, this method of supporting the bell enables me to dispense with the heavy top for the bell, which has heretofore been necessary, and I can either use a very light top or form the whole bell of a single piece of metal pressed or spun into shape, as shown in the drawings. In the latter case the entire outer surface of the bell may be perfectly smooth and highly finished, and in either case the external appearance of the bell is improved by the absence of the jam-nut and the hollow ornament which have heretofore been necessary upon the top of the bell to hold it in adjusted positions and to hide the upper end of the central supporting-stem which projected through the top of the bell.

In the construction shown in the drawings the bell is secured to the outer ends of the radial arms H near its lower end, and its lower edge rests upon the shoulders J of said arms. While this is a desirable construction and serves both to hold the lower edge of the bell firmly in position and to leave the interior of the bell free from obstructions, yet some of the advantages of my invention may be obtained, even though the stem G and arms H extend farther up into the interior of the bell and the latter be secured to the outer ends of the arms at some point above the middle of the bell. In such case the vertically-extended outer ends of the arms H, which closely fit the inner surface of the bell, will maintain it in proper vertical position much more securely than could be done under the old construction, where the top of the bell was screwed directly upon the upper end of a central supporting-stem.

In Fig. 2 is shown a modification in construction, in which the supporting-stem G, the disk E, and the part C are cast integral, the latter having an exteriorly-threaded lower end by which it is screwed into the bottom of the bowl or upper end of the pipe connection, as shown. The base of the stem G has a polygonal perimeter at L for the application of a wrench in screwing the part C into position. In this case the arms H, which support the bell, are not cast integral with the stem, but with a hub or collar M, which is interiorly threaded and screwed upon the upper threaded end of the stem. The bell is adjusted up and down by turning it and the arms H upon the stem G and is secured in adjusted position by the jam-nut K, which in this instance bears against the under side of the hub M.

Another advantage of my novel method of supporting the bell is that bells of different lengths may be used with the same supporting stem and arms. Heretofore with the bell supported at its top upon the upper end of a central stem or by the upper ends of several exterior rods or stems the length of the stem had to correspond to the length of the bell, so that a manufacturer, in order to supply the demand for whistles of different lengths, was obliged to make stems of different lengths to correspond to the bells of different lengths. Thus a stem of one length was required for an eight-inch whistle, another for a ten-inch whistle, and so on. Under my improved construction the same stem and arms may be combined with a bell of any desired length, so that it is only necessary for the manufacturer to make one set of stems and arms for each diameter of whistle. When a whistle of a given length is ordered, he can apply a bell of the desired length to the proper stem and arms.

In Fig. 4 I have shown the application of my invention to a chime-whistle. In this instance the interior of the bell is divided into three longitudinal compartments by partitions O, carried by the stem G, and preferably formed integral with the arms H. The compartments formed by these partitions are preferably of equal area in cross-section, but of different lengths, their tops being formed by segmental webs P, as shown in Fig. 6. The outer walls of the compartments are formed by the bell itself, which is slipped over the partitions and secured to the latter

by screws or rivets entering their outer edges, as shown. The outer edges of the partitions may be turned off in a lathe to the exact internal diameter of the bell. The difference in the lengths of the three compartments causes them to produce different tones in the blowing of the whistle, the combination of which tones produces the chime. The bell may be adjusted toward and from the base and secured in adjusted position in the same manner as in Fig. 1.

In the construction shown in Fig. 4 there are no distinct arms H, the partitions and arms being cast integral; but it is not essential that they should be so cast. Indeed the partitions may be formed of sheet metal and properly supported upon the stem G (by the arms H or otherwise) and the bell be secured to their outer edges, as in Fig. 4, or be supported upon the independent arms H.

I am aware that it is not broadly new to divide the interior of a cylindrical whistle-bell into longitudinal compartments by means of partitions similar to the partitions O; but my improvement in this respect consists in supporting the partitions upon the same central stem G, by which the bell is supported in the manner described, for this method of supporting the bell leaves its entire interior free from obstructions, so that the partitions may be cheaply made and readily inserted therein, which is not the case where the bell is supported at its top upon a central stem extending up through it.

In Fig. 5 I have shown the application of my invention to a piston-whistle. In this case the bell is supported upon the arms H of a central stem G, adjustable in the base, as in Fig. 1. At the bottom of the bowl A is an angle-valve of the usual construction, having a steam-pipe connection at R and a lever S for operating its stem T, as is common in steam-whistles of this character. Within and closely fitting the bell I is a diaphragm U, supported upon a rod V, extending down through a central bore in the stem G and through the valve-chamber, as shown. A stuffing-box W surrounds the rod at the bottom of the valve-chamber to prevent escape of the steam. Any suitable operating device may be attached to the lower end of the rod to slide it up and down in its bearings and move the diaphragm up and down in the bell I. When the piston is in its uppermost position, as shown in Fig. 5, the bell will give forth its deepest tones and will sound a higher and higher key as it is drawn down toward the lower end of the bell.

There is nothing novel in a piston or diaphragm whistle operating in this manner, and they are in common use; but where the bell is supported at its top upon a central stem extending up through it the piston-rod has to pass longitudinally through the central stem nearly to its upper end, the diaphragm has to fit around and slide upon the stem, and the latter has to be provided with one or more longitudinal slots through which the pin or screw by which the diaphragm is secured to its rod may pass. To obviate this complicated construction, some manufacturers have gotten rid of the central stem and left the interior of the bell free and unobstructed for the diaphragm and its rod by supporting the bell upon rods extending upon the outside of the bell, as heretofore referred to; but this construction is not only unsightly and expensive, but is objectionable, because the bell is still supported by its top. It will therefore be seen that my improved method of supporting the bell is particularly applicable both to chime and piston whistles.

Having thus fully described my invention, I claim—

1. In a steam-whistle, the combination of the base, the central supporting-stem G, the radial arms H, carried by the stem G, and the independent bell I, fastened to and carried by the arms H, substantially as described.

2. In a steam-whistle, the combination of the base, the central supporting-stem G, the arms H, carried by the stem G and having vertically-extended outer ends, and the bell I, fitting over and secured to said outer ends of the arms H, substantially as described.

3. In a steam-whistle, the combination of the base, the central stem G, the radial arms H, carried by the stem G, and the independent bell I, secured to and supported by the arms H near its lower end, substantially as described.

4. In a steam-whistle, the combination of the base, the central stem G, the arms H, carried by the stem G and having upturned outer ends provided with shoulders J, and the bell I, fitting over the upturned ends of the arms H and resting upon the shoulders J, substantially as described.

5. In a steam-whistle, the combination of the base, the central supporting-stem G, the arms H, carried by the stem G and adjustable toward and from the base, and the bell I, supported by the arms H, substantially as described.

6. In a steam-whistle, the combination of the base, the central supporting-stem G, threaded at its lower end and screwed into the base, the arms H, carried by the stem G, and the bell I, carried by the outer ends of the arms H, substantially as described.

7. In a steam-whistle, the combination of the base, the central supporting-stem G and radial arms H, cast integral, the lower end of the stem being threaded and screwed into the base and the arms H having upturned outer ends and shoulders J, and the bell I, fitting over and secured to the upturned ends of the arms H and resting upon the shoulders J, substantially as described.

8. In a steam-whistle, the combination of the base, the central stem G, the chime-partitions O, carried by the stem G and having

tops P, and the single bell I, fitting over the partitions O and supported by the stem G, substantially as described.

9. In a steam-whistle, the combination of the base, the central stem G, the radial supporting-arms H, the chime-partitions O, carried by the stem G and having tops P, and the bell I, fitting over the partitions O and supported by the arms H, substantially as described.

10. In a steam-whistle, the combination of the base, the central stem G, the radial arms H, carried by the stem G, and the bell I, formed of a single piece of metal and supported by the arms H, substantially as described.

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