No. 654,589. Patented July 31, 1900.

J. B. BARNES.

EXHAUST TIP FOR LOCOMOTIVES.

(Application filed July 21, 1899.)

(No Model.)

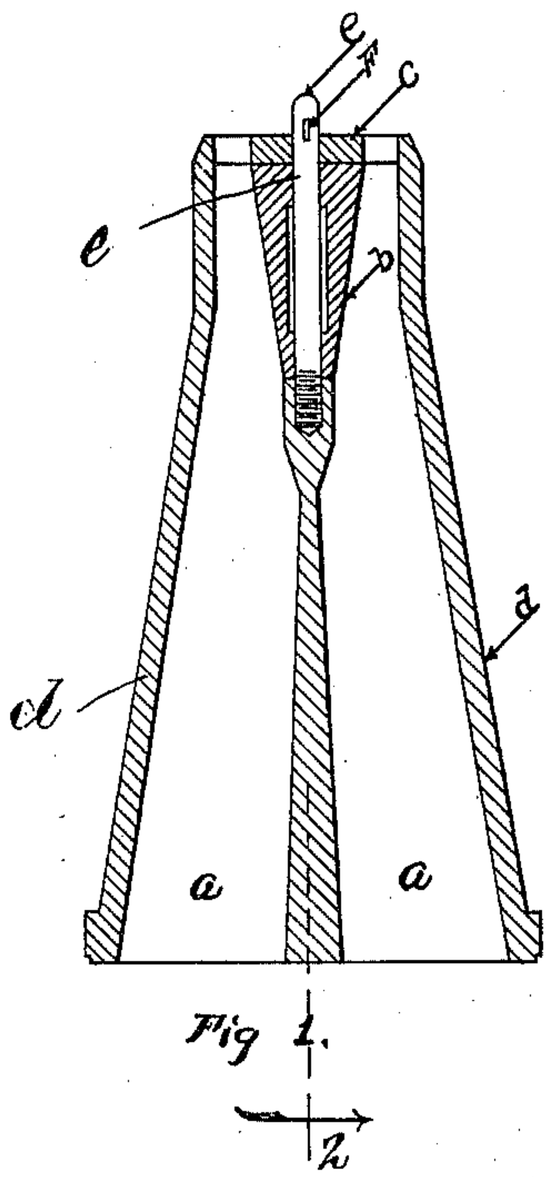

Fig 1.

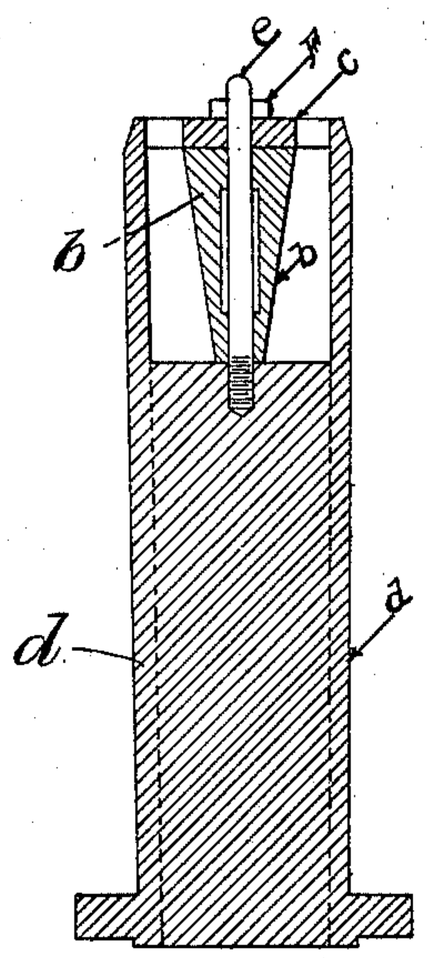

Fig 2.

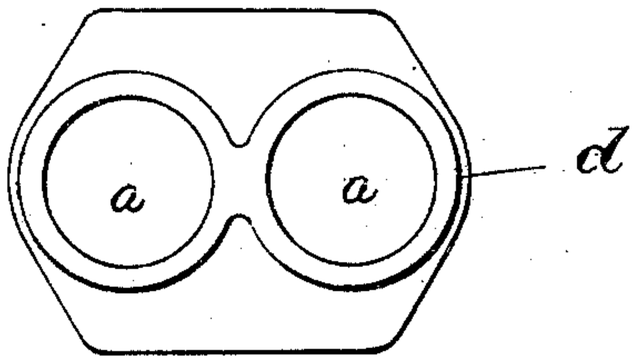

Fig. 3.

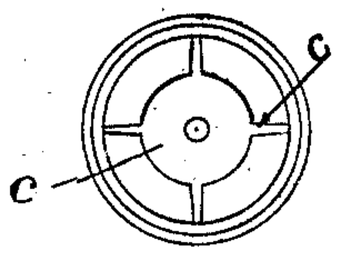

Fig. 4.

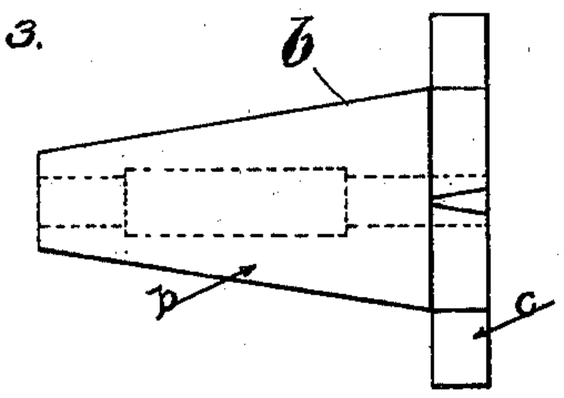

Fig. 5.

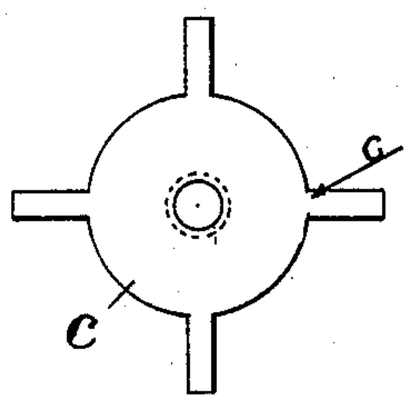

Fig. 6.

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JOSHUA BARTLETT BARNES, OF SPRINGFIELD, ILLINOIS.

EXHAUST-TIP FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 654,589, dated July 31, 1900.

Application filed July 21, 1899. Serial No. 724,643. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA BARTLETT BARNES, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Exhaust-Tips for Locomotives, of which the following is a specification.

My invention relates to that class of exhaust-tips that are used in connection with the steam-exhaust ports of locomotive-cylinders; and the principal object of the invention is to provide a simple, economical, and efficient exhaust-tip.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of an exhaust-tip constructed in accordance with my improvements, taken through the longitudinal center of the same; Fig. 2, a similar view taken on the line 2 of Fig. 1; Fig. 3, a plan view of the improvement looking at it from below; Fig. 4, a plan view of the top of the tip, showing the spider portion; Fig. 5, a side elevation of the conical and spider portions, and Fig. 6 an end view of the same.

In constructing an exhaust-tip in accordance with my improvements I use a pipe *d*, which is provided with the discharge-passages *a a'*, through which the exhaust-steam from the cylinders passes into the outer air. This exhaust-pipe is of the usual form and as is generally understood in the art is connected with the exhaust-passages of the two cylinders of a locomotive-engine. In the prior art an exhaust-nozzle was used in connection with this pipe; but it was objectionable in that the opening at the top of the pipe was reduced by the nozzle and permitted the steam under pressure to escape in the form of a solid cylinder. One of the objects of my invention is to remove this objectionable feature and, if possible, to exhaust the steam in the shape of a hollow cylinder without diminishing the size of the opening. To accomplish this result, I provide an expander *b*, which is set in the opening at the upper part of the exhaust-pipe at the point where the two passages meet and which is secured in place by means of a stud *e* and pin F. It will be noticed that this "expander," as I term it, is made in the shape of an inverted cone and is provided at its upper end with a spider portion C, having its arms bearing against the internal opening of the exhaust-pipe and which serves to hold the cone *b* central. This construction and arrangement forms an annular passage through which the steam is exhausted in the shape of a hollow cylinder and acts thereby to minimize the objectionable feature of the exit of a cylinder of steam as it issues from the exhaust-tip.

The principal advantage of my improved exhaust-tip is that it admits providing for an opening of greater diameter than the ordinary pipe and at the same time obtaining substantially the same area of opening, so that the steam may escape in a large circular or hollow cylinder, thereby causing less resistance, and consequently less back pressure, in the cylinder. A further advantage is that the cylinder of steam may be regulated so as to practically fill the smoke-stack, and thus create a stronger draft for the fire-box.

I claim—

1. The combination of a tapered pipe forming a single upwardly-tapered chamber provided with two openings at its lower end for admitting steam into the chamber with a single opening at the upper small end, a single inverted-cone-shaped expander arranged entirely and rigidly within the mouth of the upper opening in the tapered pipe leaving an unobstructed vertical passage between the top rim of the expander and the inner wall of the pipe, arms extending from the expander to the inner wall of the pipe for holding the expander in a central position, a wall across the center of the lower end of the chamber dividing the lower portion of the chamber perpendicularly only, substantially as described.

2. The combination of a tapered pipe forming a single upwardly-tapered chamber provided with two openings at its lower end for admitting steam into the chamber with a single opening at the upper small end, a single inverted-cone-shaped expander arranged entirely and rigidly within the mouth of the upper opening in the tapered pipe leaving an unobstructed vertical passage between the top rim of the expander and the inner wall of

the pipe, arms extending from the expander to the inner wall of the pipe for holding the expander in a central position, a wall across the center of the lower end of the chamber dividing the lower portion of the chamber perpendicularly only, a stud through the center of the expander screwed into the top of the perpendicular wall for holding the expander rigidly in place, substantially as described.

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Witnesses:
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