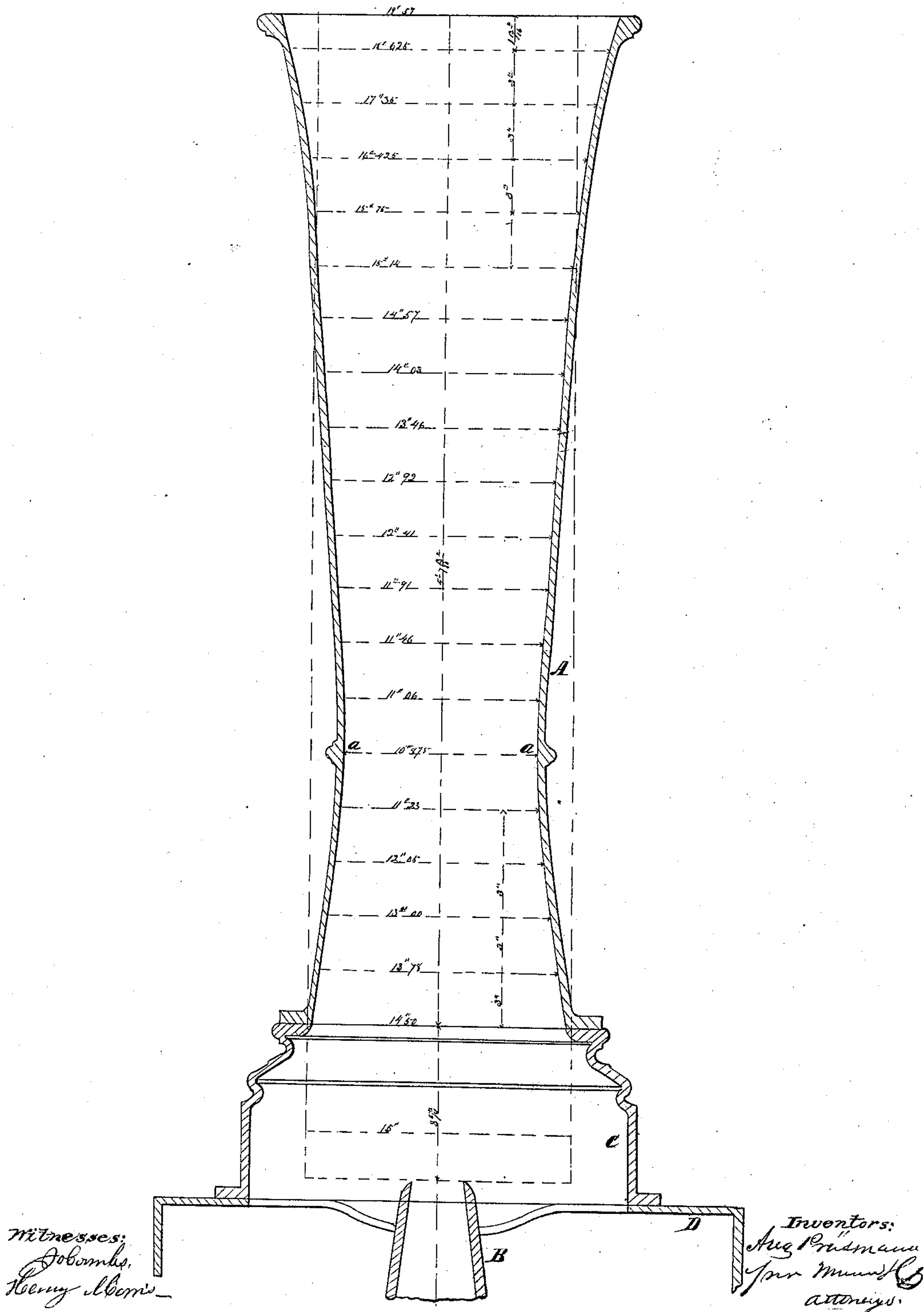


A. Prusmann,
Spark Arrester.

N^o 4,6308.

Patented Feb. 7, 1865.



UNITED STATES PATENT OFFICE.

AUGUST PRÜSMANN, OF LINGEN, HANOVER, GERMANY, ASSIGNOR TO
BERNHARD SCHAFFER AND CHRISTIAN BUDENBERG, OF NEW YORK,
N. Y.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. 46,308, dated February 7, 1865.

To all whom it may concern:

Be it known that I, AUGUST PRÜSMANN, of Lingen, in the Kingdom of Hanover, have invented a new and Improved Smoke-Stack for Locomotives; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

The drawing represents a vertical central section of this invention.

The object of this invention is to increase the draft created by the action of the exhaust on the column of air in the smoke-stack of locomotives.

The nature of the invention, and its peculiar advantages will be readily understood from the following description.

Usually the diameter of the cylindrical smoke-stacks of locomotives is equal to that of the steam-cylinders, and the exhaust-pipe is either made to extend up into the smoke-stack or to be flush with its lower edge, or sometimes it is placed below this lower edge. With this ordinary arrangement a certain pressure must exist in the exhaust-pipe in order to produce the requisite draft of air.

The improved smoke-stack, which is represented in the accompanying drawing, is constructed, in accordance with a large number of experiments, in such a manner that the same with equal pressure in the exhaust-pipe will produce a much larger draft than a cylindrical stack of the ordinary construction, or which, with a much smaller pressure in the exhaust-pipe, will produce the draft of an ordinary smoke-stack.

The exhaust-pipe suitable for the improved smoke-stack must necessarily be round, and the dimensions marked in the drawing relate to an exhaust-pipe of two and three-fourths inches diameter, such as generally used with fifteen-inch cylinders.

B represents the exhaust-pipe, the transverse section of which ought to be circular, and which must be placed directly under the center of the smoke-stack A. The smoke-

stack is represented by the circular foot C, which is rigidly attached to the top of the smoke-chamber D. The distance between the top edge of the exhaust-pipe and the bottom edge of the smoke-stack is equal to eight and five-eighths inches, and the diameter of the smoke-stack at its lower edge is equal to 14.5 inches, and its height, from bottom to top, is four feet and seven and three sixteenth inches. The internal diameter of the smoke-stack contracts up to a point, *a*, at a distance of fifteen inches from the bottom edge, where the same reaches its minimum, and thence it increases in a regular ratio up to within a distance of thirteen and thirteen-sixteenth inches from the top edge, when the increase becomes more rapid than in the lower parts of the stack, as clearly shown in the drawing. The diameter of the smoke-stack at the top edge is 19.57 inches.

If the smoke-stack is to be used with an exhaust-pipe of more or less than two and three-fourths inches, all the dimensions have to be changed accordingly. For instance, if the diameter of the exhaust-pipe is three inches, all the dimensions of the smoke-stack, as marked on the drawing, have to be multiplied by $\frac{3}{2\frac{3}{4}}$.

The superiority of a smoke-stack constructed according to the rules pointed out above has been established by numerous experiments, and by its use a great saving in fuel is effected.

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

A smoke-stack, A, for locomotives, expanding from the point *a* toward the top and bottom in about the proportion herein specified, and applied in combination with the exhaust-pipe B, in the manner and for the purpose described.

AUGUST PRÜSMANN.

Witnesses:

GEORG SCHWABE,
ERNST CARL VIETINGER.