(No Model.)

A. O. FRICK.

SPARK ARRESTER.

No. 293,445. Patented Feb. 12, 1884.

Fig. 1.

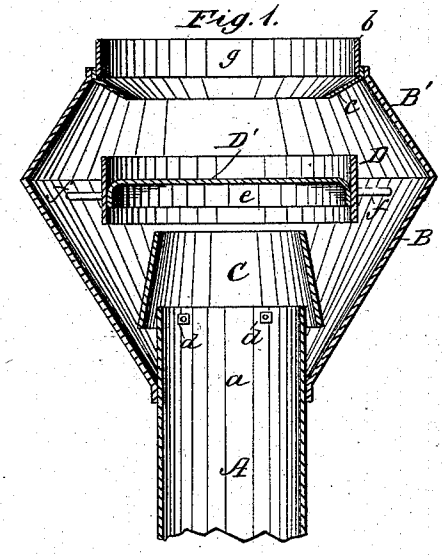


Fig. 2.

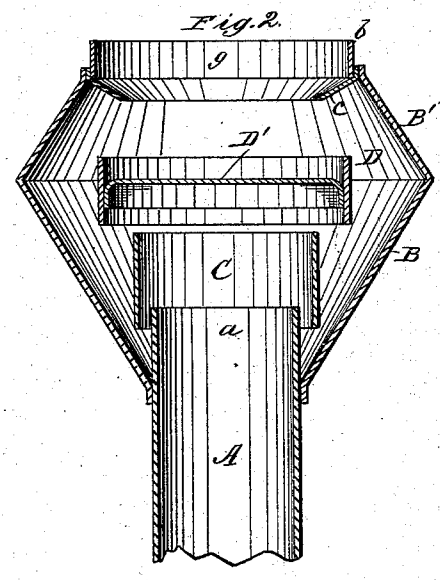


Fig. 3.

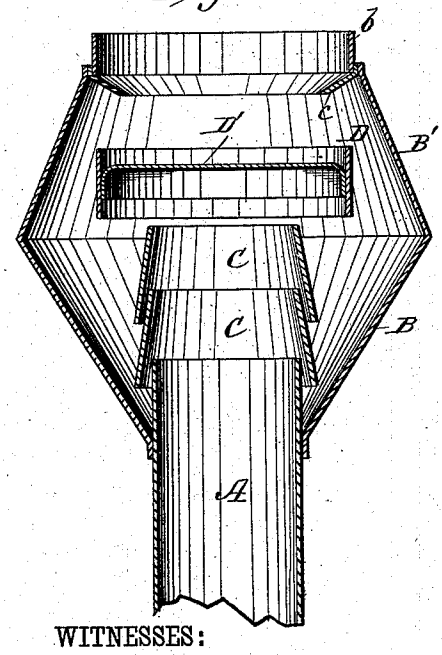
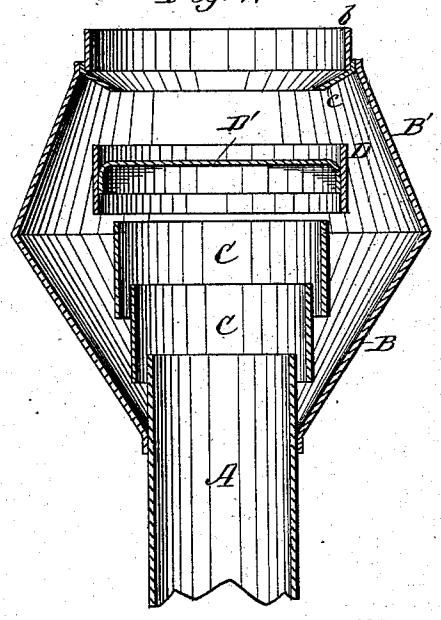


Fig. 4.



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UNITED STATES PATENT OFFICE.

ABRAHAM O. FRICK, OF WAYNESBOROUGH, PENNSYLVANIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 293,445, dated February 12, 1884.

Application filed November 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM O. FRICK, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a description.

Figure 1 is a vertical section of the spark-arrester at the upper end of the smoke-stack. Figs. 2, 3, and 4 are similar views of the modified forms of the same.

My invention relates to that class of spark-arresters in which the cone of the smoke-stack is provided inside with a sleeve, arranged concentrically around the upper end of the smoke-pipe, and above which sleeve is arranged a deflector.

My invention consists in the peculiar construction of said deflector, in combination with the other parts, as will be hereinafter fully described.

In the drawings, A represents the upper end of the smoke-stack of steam-boiler, and B B′ is the double conical upper end thereof, into which the pipe A protrudes a short distance, as at *a*. The lower portion, B, of the double cone tapers inwardly to the smoke-pipe, and the upper portion, B′, tapers inwardly to an opening, *g*, and is provided with an upwardly-projecting flange, *b*, and a downwardly-projecting flange, *c*.

C is a short sleeve arranged in the lower cone, B, concentrically with respect to the smoke-pipe A, and of a larger diameter than the same, and extending down a short distance upon the outside of the said smoke-pipe, upon which it is mounted by means of bolts *d*, and between which and the smoke-pipe there exists an annular space. The sleeve may be tapered convergently at the top, as in Fig. 1, or it may be a true cylinder, as in Fig. 2, and there may be one, as in Figs. 1 and 2, or more of the same, each higher one overlapping the lower one, as in Figs. 3 and 4. Just above the top of this sleeve is a deflector of peculiar construction. It consists of a horizontal ring or short cylinder, D, of sheet metal, in which and near its middle is placed a circular head, D′, having its edge flanged downwardly, as at *e*, to fit snugly in the sleeve. This deflector is of larger diameter than the subjacent sleeve, and is sustained in concentric relation thereto by radial braces *f*, extending to the outer cone. Now, when the exhaust blows up through the pipe A, the sparks are driven forcibly upward against the deflector D D′, and are more or less shattered and driven outwardly and downwardly against the lower cone section. At the same time the force of this blast induces a strong draft in the annular space between the sleeve C and the end *a* of the smoke-pipe, and this catches the sparks and solid particles and carries them into the central draft again, where they are again violently dashed against the deflector D D′ and still further shattered and reduced in size. This circulation of the larger sparks is continued in the direction of the arrows until they become ground up and broken into fine particles, which, as soon as they become fine enough to exert no dangerous influence, pass, by reason of their loss of inertia, along with the lighter vapor and gases out through the central opening, *g*, in the top of the smoke-stack. If any particles of sparks, by reason of their buoyancy, pass above the deflector, they are caught by the flange *c* and hurled down into the basin or receptacle formed upon the top of the deflector-head D′ by the upper projecting edge of the ring D, where they accumulate in a field of deposit which is comparatively quiescent or undisturbed by the activity of the draft. This deflector, it will be seen, is a feature of great simplicity and merit, for it is cheaply made of two pieces of sheet-iron, and while it performs the double function of a deflector and a receptacle for escaping sparks, it is very light and strong, and is free from the great inertia of cast-iron deflectors, which are objectionable, for the reason that they make the smoke-stack top-heavy, and when used on portable engines they are liable, from the jolting action in travel, to strain and loosen the bolt-connections. This objection is practically avoided by my deflector, and the head D, which is most subject to wear, is easily and quickly replaced in the ring D′ when worn out.

Having thus described my invention, what I claim as new is—

1. The spark-arrester consisting of the combination of the deflector D D′, composed of a ring of sheet metal with a circular sheet-metal flanged head inserted near its middle, the subjacent sleeve C, the double conical inclosure

B B′, and the smoke-pipe A, extending up and into the said sleeve, substantially as and for the purpose described.

2. The spark-arrester consisting of the combination of the deflector D D′, composed of a ring of sheet metal with a circular sheet-metal flanged head inserted near its middle, the double conical case B B′, having flanges *b* and *c*, the smoke-pipe A, protruding into the same, and one or more sleeves, C, having its lower end arranged to overlap the smoke-pipe A and leave an annular space between, substantially as shown and described.

ABRAHAM O. FRICK.

Witnesses:
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