S. Sweet,

Spark Arrester,

No. 10,172. Patented Oct. 25, 1853

Fig. 1.

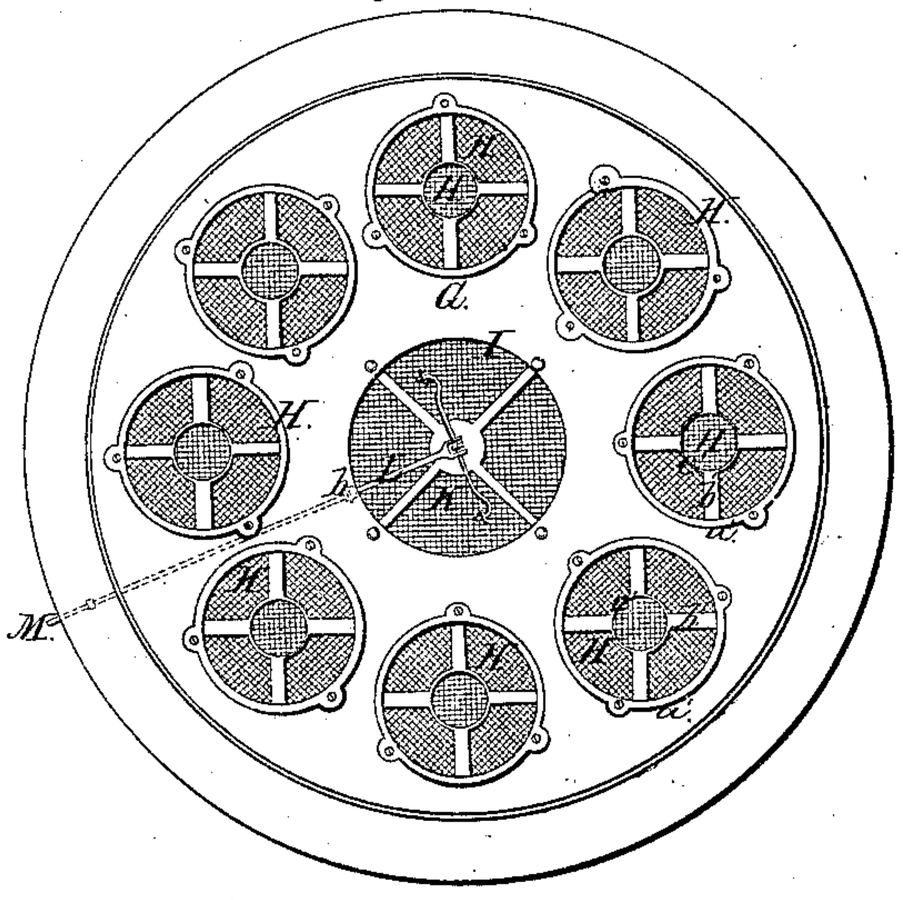
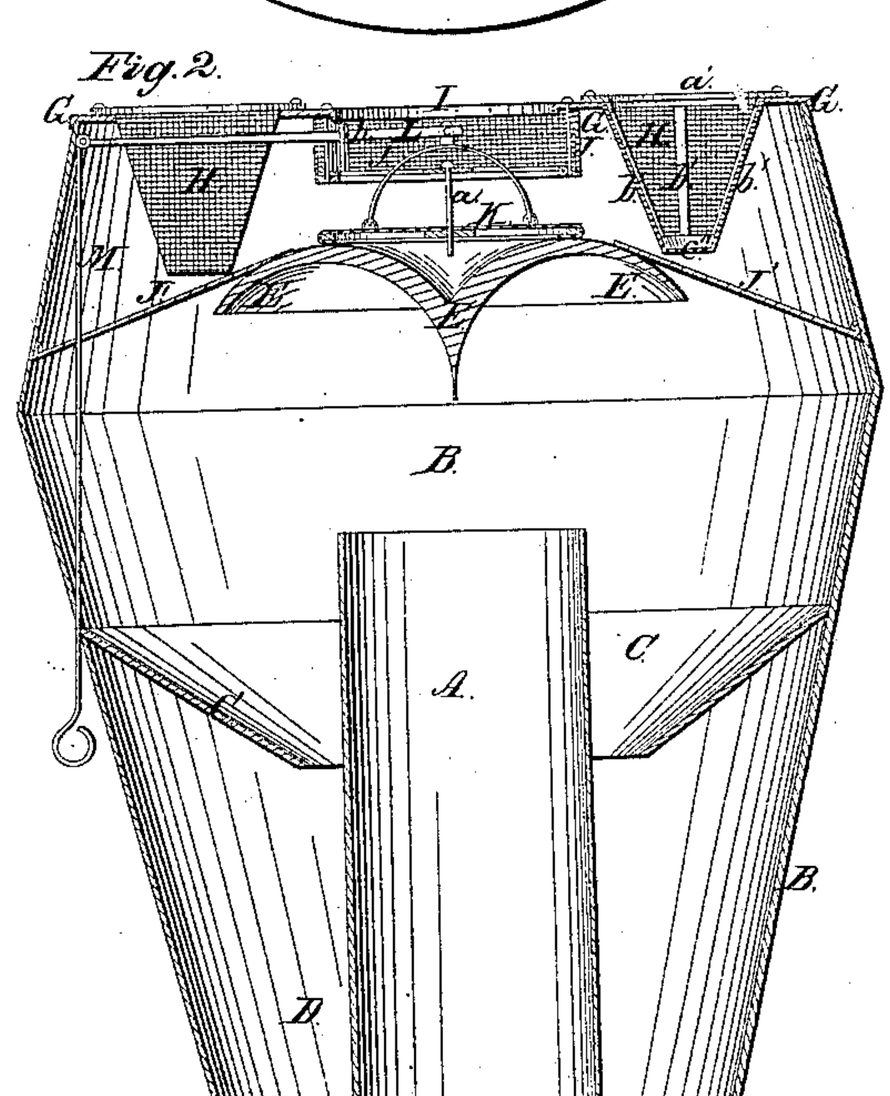


Fig. 2.



UNITED STATES PATENT OFFICE.

SAMUEL SWEET, OF NEW YORK, N. Y.

SPARK-ARRESTER.

Specification of Letters Patent No. 10,172, dated October 25, 1853.

To all whom it may concern:

Be it known that I, SAMUEL SWEET, of the city, county, and State of New York, have invented certain new and useful Improvements in Spark-Arresters 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 drawings, forming part of this specification, in which—

Figure 1 is a plan or top view of the spark arrester. Fig. 2 is a vertical central section of the same.

Similar letters of reference in each of the several figures indicate corresponding parts.

This invention relates to certain new and useful improvements in locomotive spark arresters, whereby the possibility of the sparks escaping can be avoided and the inconvenience of not having a sufficient escape surface for the draft through the meshes of the wire cloth top done away and the meshes of the gauze kept perfectly open and clean and an extra draft obtained in case of an emergency; and it consists in placing in a peculiar manner a deflector of novel construction or shape within and near the top of the outer case and directly over the top of the smoke pipe, so as to deflect the sparks as they rise and give them a direction downward into the chamber formed between the outer sloping case and the smoke pipe and in combination with the said deflector employing a metallic top plate or cover which has a series of inverted hollow conical wire cloth sieves or curved segments of a hollow sphere, set in and around it, and their lower tapering ends extending down some distance into the hood or outer chamber, the said funnel shape seives rendering the escape surface for draft very large and admitting of said deflector being employed, without the necessity of increasing the size of said hood, for it will be evident that each one presents almost as much draft surface as the entire top of the ordinary spark arresters and at the same time their shape and arrangement serve to aid in deflecting the sparks, for as they come against the surface of the funnel seives they are caused instantly to glide or slide up and strike the solid portion of metal top and as there is not draft to operate upon them they have a downward direction given to them and they fall upon an inclined partition, which guides them into the spark chamber. Thus it will be seen that these sieves not only present more draft surface but that their shape preserves them from being burned or injured by heat and from being clogged, and further that their meshes can be more easily kept clean and free from obstruction, for the steam in passing out acts with force on the entire surface of each sieve, owing to its tapering shape, and opens the meshes of the same, and consequently there is not mucln liability of the draft being stopped, and if it should be the said arrangement of sieves and deflector admits of a sunken valve, composed of wire gauze, being employed to supply an extra draft in case of such an emergency, the said valve being arranged directly over the top of the deflector and closing a large draft passage in the center of the top plate and at the bottom of a short wire gauze tube or pipe secured on the under surface of the top plate and surrounding the said large central opening. This valve rises and falls on a rod like an ordinary pump valve as it is opened and closed by the engineer. By making the valve and its seat of perforated metal or of wire gauze I also obtain a large amount of draft surface without increasing the size of the outer case.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A is the smoke pipe, surrounded by a second pipe B, sloping outward from it and having a wide or trumpet shape mouth or hood extending somewhat above that of the smoke pipe, up into which the sparks rise and are deflected again downward and caused to fall on the inclined partition C, and pass from off it by their gravity into the receptacle D, formed by the junction of the pipes A and B, from which they can be removed through sliding doors when desired.

E, is the deflector placed over the smoke pipe, and is strengthened by braces J′, J′, which are secured to the inside of the outer case, as seen in Fig. 1. This deflector E, meets the sparks as they come up through the smoke pipe and gives them a downward direction, and they then by their gravity and owing to no draft acting upon them fall upon the partition C, and pass into the receptacle provided for them, the smoke

and steam passing upward through the top of the hood and are not operated upon by the current which catches the sparks.

G is the metallic top plate, and H, H, are right reticulated inverted frustums of cones formed by covering skeleton frames consisting of the flanged rim a', ribs b' and ring c' with wire gauze, and set in a circle in said plate and secured by screws passing through the flanges of the top rim and the plate G, and their body or tapering portion extending down some considerable distance into the trumpet portions of the outer case, and partly surround the deflector, as seen in Fig. 2. These funnel shape sieves serve to give a very large amount of draft surface and also if any sparks should rise above the deflector and come in contact with their surface to cause them to pass freely up along their surface until they come in contact with the top plate G, whence they fall, as before stated. The difference between the action of the draft upon a flat or concave wire surface, in detaining the sparks, and the action upon such a surface as I have described will be apparent, as the tendency of the draft in the formed case is to cause them to adhere to, and the latter to slide upon the surface. A like benefit is derived from having the sieves of such shape for as the steam rises and strikes with force the surface of the sieves it strips the entire surface of dirt and frees it from all obstruction to draft.

I, is the central valve opening in the top plate and J, is the gauze seat for the wire gauze valve K, to play against. It is of the form of a cylinder and is secured to the under surface of the top plate and around the valve opening, and extends some distance down into the outer case, the valve playing against its bottom and sliding upon the rod a, secured in the center of the braces of the valve seat, as seen in Fig. 2. The valve K, is attached to the lever L, which turns on a fulcrum b, and has a rod M, for raising and lowering the valve over the rod a when it is desired to have an extra draft or to lessen the supply, the rod M being placed so as to be in reach of the engineer. This arrangement presents manifold advantages over anything heretofore known, for it effectually prevents the escape of sparks and ashes, an evil which has not heretofore been entirely remedied. It also presents sufficient draft surface to prevent any emergencies, which cannot be the case when a single wire gauze top is employed owing to the small amount of open surface and further an extra and powerful draft can always be obtained when necessary.

Having thus described my improvement in spark arresters, I desire it to be understood that I make no claim to originality of invention in the individual parts of the spark arrester separately considered; but

What I do claim as new and of my invention is—

The combination of the reticulated inverted frustums of cones H constructed and situated as described with the trumpet shaped deflector and guard E, the reticulated cylinder J under the opening I provided with the reticulated valve K, when these parts are arranged in the upper portion of an enlarged or expanded external pipe such as that represented at B in Figs. 1 and 2 of the drawing, the whole operating in the manner and for the purpose set forth in the foregoing specification.

SAMUEL SWEET.

Witnesses:
R. W. Fenwick,
S. H. Wales.