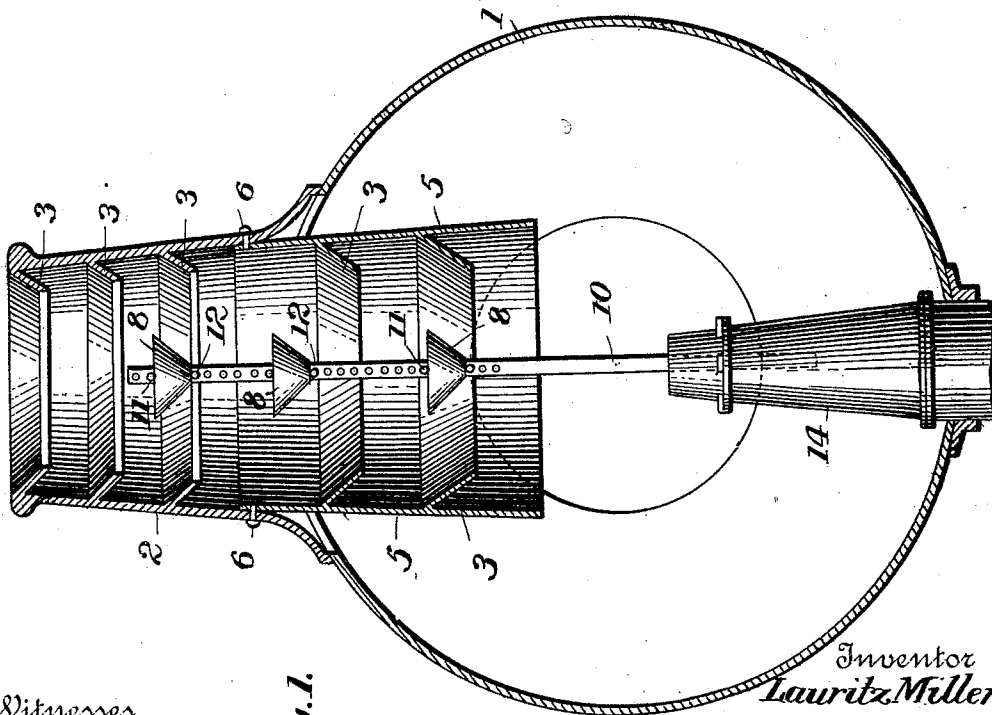
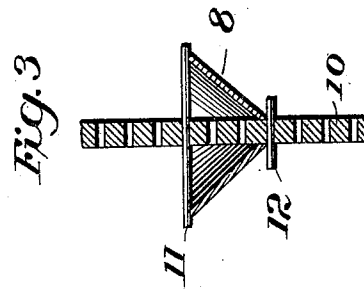
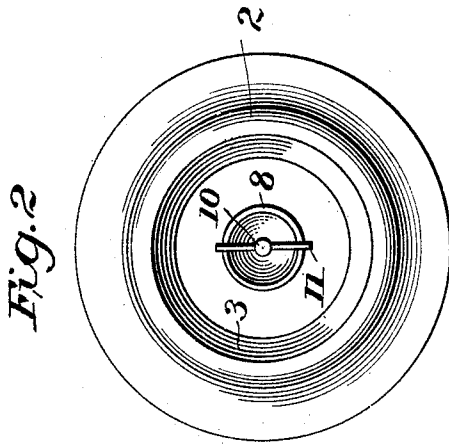


L. MILLER.
 SPARK ARRESTER.
 APPLICATION FILED JUNE 14, 1909.

946,804.

Patented Jan. 18, 1910.
 2 SHEETS—SHEET 1.



Witnesses
J. G. Stinzel
 Charles N. Murray.

Fig. 1.

Inventor
Lauritz Miller
 by
Eugene C. Brown
 Attorney

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Fig. 5.

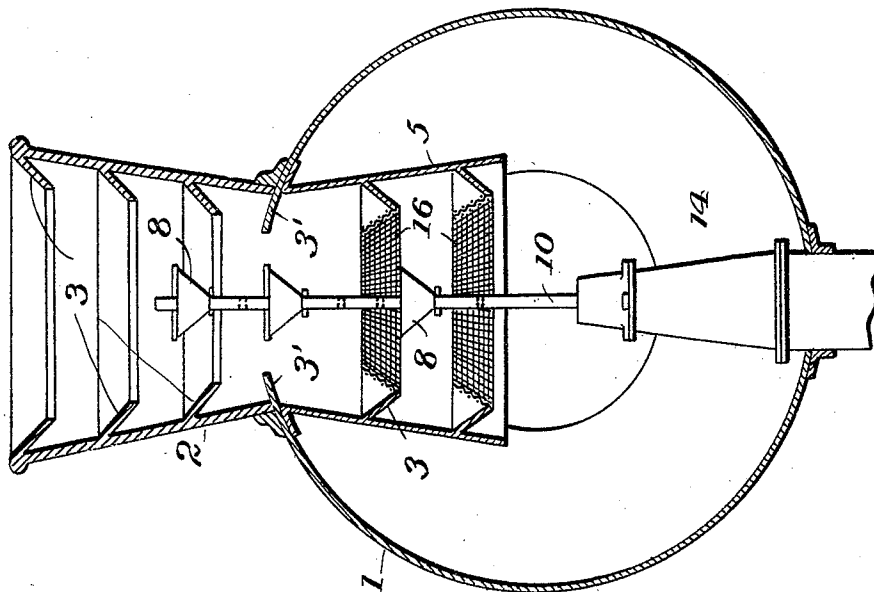
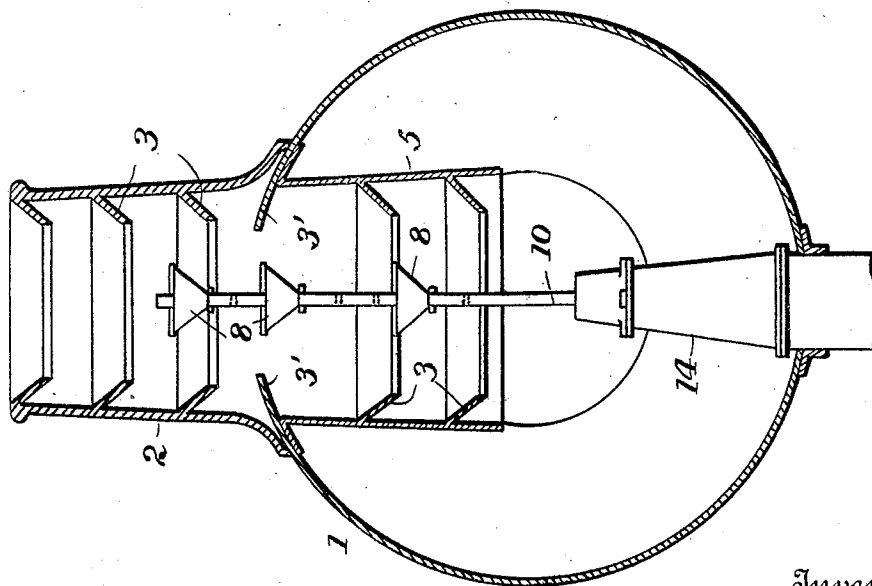


Fig. 4.



Witnesses
J. G. Stinckel
Charles N. Murray.

Inventor
Lauritz Miller
by *Eugene C. Brown*
Attorney

UNITED STATES PATENT OFFICE.

LAURITZ MILLER, OF LARAMIE, WYOMING.

SPARK-ARRESTER.

946,804.

Specification of Letters Patent.

Patented Jan. 18, 1910.

Application filed June 14, 1909. Serial No. 502,105.

To all whom it may concern:

Be it known that I, LAURITZ MILLER, a citizen of the United States, residing at Laramie, in the county of Albany and State of Wyoming, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification.

This invention relates to spark arresters, and is more especially adapted for use in connection with the smoke stacks of locomotives for the purpose of arresting sparks and cinders that are ejected with the exhaust from the engine.

Heretofore spark arresting devices have been placed almost exclusively in the smoke stack. In my present invention I propose to extend the spark arrester into the smoke box of the locomotive in a manner to receive the more direct impact of the exhaust and to arrest a large proportion of the larger cinders and sparks before they enter the smoke stack. The deflectors which I employ in connection with the spark arresting flanges or pockets are adjustable with relation thereto in order to secure the most efficient relationship between the parts of the arrester.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of my spark arrester, showing its position with relation to the locomotive smoke box; Fig. 2 is a top plan view of the arrester; Fig. 3 is an enlarged cross-section of one of the deflectors, showing the means for securing it in position; and Figs. 4 and 5 are modifications of the arrangement shown in Fig. 1.

1 represents an ordinary locomotive smoke box to which is secured the stack 2, preferably of cast material, and provided, in accordance with my invention, with annular downwardly inclined flanges 3 forming pockets to receive the outwardly deflected sparks and cinders as hereinafter explained. For the purpose of continuing the arrester downwardly into the smoke box, I provide a cylindrical petticoat 5, which may be of sheet material, and is provided with depending inverted frusto-conical flanges in the same manner as the stack. This petticoat is adapted to fit snugly within the lower portion of the stack, and may be secured by means of bolts or other fastening means 6. Coöperating with the annular flanges are conical deflectors 8, each of which

is slidably mounted upon a central operating rod 10, and held in any desired position by means of pins 11; 12, the supporting rod being securely mounted within the nozzle of the steam exhaust pipe 14. The deflectors 8 are adjusted to such positions upon the rod 10 that they will most efficiently deflect the exhaust steam and gases to cause the cinders and sparks to be thrown outwardly into the annular pockets within the depending flanges 3. The position which each deflector will occupy with relation to the flange with which it coöperates will depend upon the velocity of the escaping steam and gases at the particular point within the petticoat or stack, and the bell or deflector 8 will be adjusted to correspond therewith. I have shown three deflectors, but it is evident that I may use a larger number, and if necessary, may employ one for each annular flange. I have shown the conical walls of the spreaders deflected at an angle of 45°, but it is evident that the angle may be varied more or less if found desirable to produce the most efficient results.

In the prior constructions with which I am familiar, the spark arresting devices have been confined to the stack proper, but I have found that I can enormously increase the efficiency of my spark arrester by combining with the stack a cylindrical petticoat provided with spark arresting devices, in order to bring the arrester for a considerable distance within the smoke box. In this manner the lower flanges in the petticoat receive the more direct impact from the steam exhaust, and the cinders and sparks are thus deflected more violently into the pockets of the lower flanges, and the majority of the heavier particles are removed before the escaping smoke and gases enter the smoke stack proper. I construct the stack and petticoat of sufficiently large diameter to compensate for the obstruction due to the spark arresting devices and leave sufficient room or capacity to provide the proper exhaust for the engine.

Instead of cutting away the arch of the smoke box to allow the petticoat to pass up into the stack, I may make the opening in the arch of a diameter merely sufficient to provide the proper exhaust and secure the petticoat to the under side of the arch, as shown in Figs. 4 and 5, leaving a rim of the arch projecting into the path of the exhaust at 3" and forming an additional annular

flange to arrest the sparks and cinders. Furthermore, a fine wire screen, preferably frusto-conical in shape, may be attached to the flanges, tapering in the opposite direction, which will serve to arrest and extinguish the sparks by throwing them into the ascending column of steam in the exhaust. I have shown such annular foraminous extensions 16, in Fig. 5, attached to the flanges 10 in the petticoat portion, but in some instances it may be desirable to also place them upon some or all of the flanges in the smoke stack. In Fig. 5 I have also shown an arrangement of stack and petticoat pipe 15 which may be advantageously employed in some cases, in which the stack and petticoat are tapering or flaring and reversely arranged with the smaller ends abutting.

The advantages to be derived from the particular arrangement of flanges and adjustable deflectors and the use of the petticoat extending down into the smoke box, will be appreciated by engineers and those skilled in the art without further description.

It is evident that minor details and features of construction may be changed without affecting the scope of my invention or departing from the spirit thereof, since

What I claim is—

1. A spark arrester comprising a tubular exhaust channel adapted to extend into the smoke box of a locomotive engine, a series of downwardly directed annular flanges 35 upon the interior walls thereof, a stationary vertical rod within said tubular exhaust channel, a series of inverted conical deflectors vertically adjustable on said rod cooperating with said flanges and arranged to receive the impact of the exhaust from the engine.

2. A spark arrester comprising a smoke stack having integral annular interior flanges and a separable auxiliary depending cylindrical extension provided with annular flanges depending from the interior walls thereof, annular foraminous extensions secured to said flanges, and deflectors the deflecting surfaces of which are substantially 50 at an angle similar to that of the annular flanges, and adapted to direct the sparks and solid particles of the exhaust into the annular pockets or channels formed by the said flanges.

3. In a spark arrester, a smoke stack comprising an upper stack and a lower cooperating petticoat portion, said upper and said lower portion being provided with interiorly arranged integral frusto-conical flanges, means for deflecting the cinders and other 60 solid particles into channels formed by said flanges, and stationary means independent of the said sectional stack for supporting said deflecting means.

4. In a spark arrester, a smoke stack comprising an upper stack and a separable depending cylindrical extension, said stack and said extension being provided with similarly formed frusto-conical flanges integral with said stack and said extension, 70 stationary means mounted within the exhaust pipe and deflecting means adjustable on said stationary means with relation to the said frusto-conical flanges, for purposes set forth.

5. A spark arrester comprising a smoke-stack and an independent separable depending extension cooperating therewith, said stack and said extension provided with annular flanges depending from the interior 80 walls thereof, a stationary vertical rod mounted within the nozzle of the exhaust pipe, and extending through the said smoke stack and said cylindrical extension, deflectors mounted on said rod and adapted 85 to direct the sparks and other solid particles of the exhaust into the annular pockets or channels formed by the flanges, and means for adjusting the said deflectors with relation to the said rod and flanges.

6. In a spark arrester, an upper stack portion, provided with annular flanges integral with the inner walls thereof, a depending cylindrical extension or petticoat cooperating with said stack and provided 95 with flanges similar to those upon the stack portion, and integral with said cylindrical extension, and adjustable deflecting means mounted upon a stationary means within the said stack for deflecting the cinders and 100 other solid material in the exhaust into pockets formed by the said flanges.

In testimony whereof I affix my signature in presence of two witnesses.

LAURITZ MILLER.

Witnesses:

JOHN FENWICK,
OLE THOMPSON.