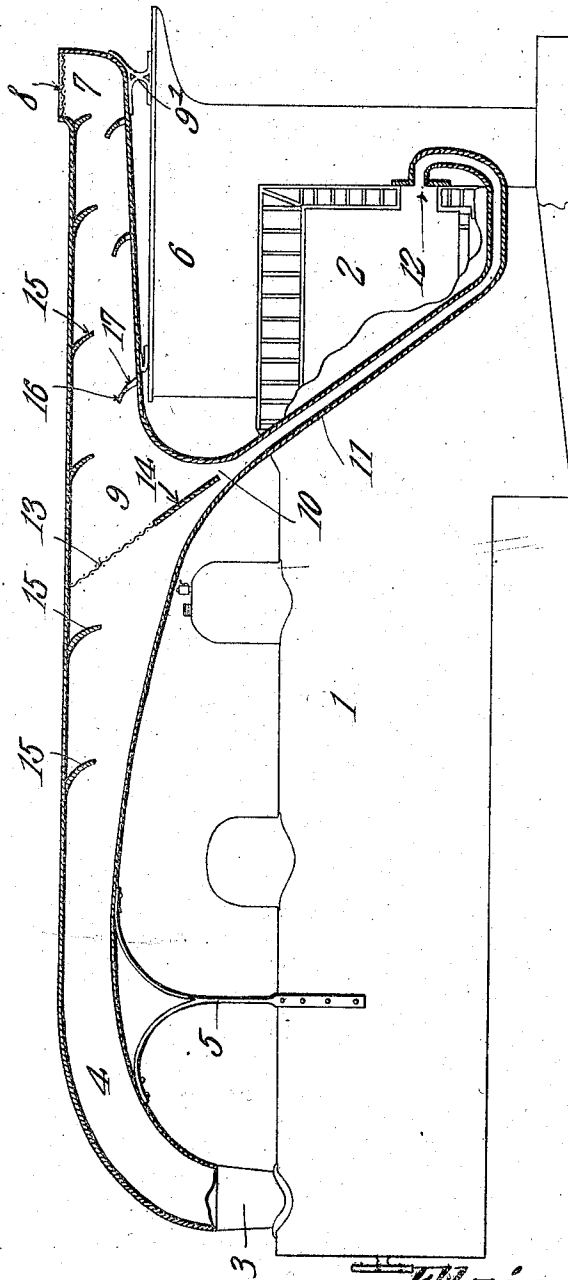


E. L. RIDGWAY.
 SPARK ARRESTER.
 APPLICATION FILED FEB. 23, 1909

939,444.

Patented Nov. 9, 1909.



Witnesses

F. J. Chapman
 F. J. Chapman

Inventor

E. L. Ridgway.

By *C. Snow & Co.*
 Attorneys

UNITED STATES PATENT OFFICE.

ELZIE L. RIDGWAY, OF FROST, TEXAS.

SPARK-ARRESTER.

939,444.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed February 23, 1909. Serial No. 479,327.

To all whom it may concern:

Be it known that I, ELZIE L. RIDGWAY, a citizen of the United States, residing at Frost, in the county of Navarro and State of Texas, have invented a new and useful Spark-Arrester, of which the following is a specification.

This invention has reference to improvements in spark arresters and its object is to provide a means, especially adapted to locomotive engines for preventing the escape of sparks blown out of the smoke stack and for preventing the loss of unburned portions of the fuel and for directing the same to the fire-box of the locomotive. Furthermore, the smoke escaping from the engine is discharged at such a point as not to interfere with the vision of the locomotive engineer.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawing which is an elevation partially in section of a portion of a locomotive engine with the spark arrester attached thereto, the said spark arrester being shown in longitudinal section.

Referring to the drawing there is shown a locomotive engine 1, only such parts being shown as are deemed necessary for the understanding of the present invention, and there is shown in section a portion of the fire-box 2. The locomotive engine may be of any desired type and the particular type shown in the drawing is to be taken as illustrative only.

To the smoke-stack 3 of the engine there is secured a curved conduit 4, this conduit rising from the smokestack and curving gradually backward and is elevated above the boiler but a short distance, being supported adjacent to the smoke stack by a bracket 5 fast on top of the boiler. The extent to which the conduit 4 may rise above the top of the boiler will be determined by the height of the tunnels and bridges along the line of way.

The conduit 4 extends backward over the boiler and over the cab 6 of the engine to near the rear end of the latter where the conduit is upturned as indicated at 7, and is provided with a discharge opening covered by a suitable screen 8, the discharge being in an upward direction. This end of the conduit is supported by a suitable bracket 9

fast on the top of the cab of the engine. Other supporting brackets are provided as needed.

As the conduit 4 approaches the cab of the engine it is increased in diameter to form a chamber 9 which chamber merges into a funnel 10 in communication with a small conduit 11 leading downward alongside the boiler and fire-box and finally entering the fire chamber 2 through a suitable opening 12 provided for the purpose.

In the chamber 9 there is located a slanting screen 13, which screen it will be understood, extends entirely across the width of the chamber 9 and the lower end of the screen 13 is continued by a solid diaphragm 14 slanted like the screen 13 and entering for a distance into the throat of the funnel 10.

At various points along the roof of the conduit 4 there are provided curved baffles 15 and along the bottom of the conduit 4 between the end 7 and the chamber 9 are other baffles 16 each having however a passage 17 between the baffle 16 and the bottom of the conduit.

With a structure such as described the discharge from the smokestack 3, which discharge not only contains smoke and gases of combustion but carries along with it burning masses of cinders or live coal and often times very material quantities of fine coal drawn from the fire chamber by the blast, is directed by the conduit 4 toward the rear end of the engine and ultimately escapes through the discharge end 7 upwardly the same as occurs from the smoke stack 3. On the movement of the smoke from the smokestack along the conduit 4 certain portions of the cinders or other solid matters carried by the discharge from the engine are caught by the baffles 15 and because of the downward and rearward curve of these baffles the larger materials carried by the discharge from the engine are directed toward the bottom of the conduit, and at this point the bottom of the conduit slopes downward toward the funnel 10 so that these larger particles will naturally gravitate toward the funnel 10 and ultimately find their way into the conduit 11 to be finally drawn into the fire chamber and resubmitted to the action of the fire. Some particles however find their way to the screens 13 and are so large as to be unable to pass through this screen

and are directed thereby toward the funnel 10, being assisted in this movement by the solid partition or diaphragm 14.

Since the smoke and gases have free passage through the screen 13 they will not tend to create a strong current around the lower end of the diaphragm or partition 14 and thus there is no strong current of gases to interfere with the gravitation of the arrested particles of solid matter into the funnel 10 and so through the conduit 11 into the fire chamber 2. Some of the finer particles will find their way through the screen 13 since this screen must be of coarse enough mesh not to interfere materially with the free flow of the smoke and gases of combustion out through the conduit for otherwise there would be too much resistance to the action of the blast creating the forced draft through the fire chamber 2.

In order to arrest any of the smaller particles which may find their way through the screen 13 the baffle plates 15 are continued between this screen and the outlets 7 and these baffle plates tend to direct any such particles toward the bottom of the conduit 4 between the chamber 9 and the escape end of the conduit. Since gravity is constantly acting on these particles which may pass through the screen 13 the baffles 16 are provided on the bottom of the conduit which between the chamber 9 and the escape end 7 has a slight downward inclination toward the chamber 9. The small spaces 17 below the baffles 16 are provided to prevent interference with the gravitation of these particles along the slanting bottom of the conduit 4 from the escape opening 7 toward the chamber 9 and when they reach this chamber 9 the walls of the funnel 9 slope so quickly downward that the particles find an easy path into the conduit 11.

The screen 8 will prevent the escape of any particles which may have passed through the screen 13 and escape arrest by the baffles 15 and 16.

What is claimed is:—

1. A spark arrester for locomotives comprising a conduit connected at one end to the smoke stack of the locomotive and having an outlet at the other end and also at an intermediate point having another outlet leading from the under side of the conduit, a pervious screen in the conduit extending across the same above the intermediate outlet, deflectors or baffles in the conduit on the

upper wall thereof on both sides of the screen, and other baffles on the lower wall of the conduit between the screen and the outlet of the conduit at the end remote from the smoke stack.

2. A spark arrester for locomotives comprising a conduit leading from the smoke-stack to a point of discharge near the rear end of the locomotive, said conduit having at an intermediate point a funnel outlet toward which the bottom walls of the conduit slope, another conduit leading from the funnel to the fire-box of the locomotive, a slanting screen depending from the top of the first named conduit at a point coincident with the funnel outlet, and a non-pervious continuation of said screen entering the throat of the funnel.

3. A spark arrester for locomotives comprising a conduit leading from the smoke-stack to a point of discharge near the rear end of the locomotive, said conduit having at an intermediate point a funnel outlet toward which the bottom walls of the conduit slope, another conduit leading from the funnel to the fire-box of the locomotive, a slanting screen depending from the top of the first named conduit at a point coincident with the funnel outlet, a non-pervious continuation of said screen entering the throat of the funnel, and deflectors or baffles within the first named conduit.

4. A spark arrester for locomotives comprising a conduit leading from the smoke-stack to a point of discharge near the rear end of the locomotive, said conduit having at an intermediate point a funnel outlet toward which the bottom walls of the conduit slope, another conduit leading from the funnel to the fire-box of the locomotive, a slanting screen depending from the top of the first named conduit at a point coincident with the funnel outlet, a non-pervious continuation of said screen at the throat of the funnel, deflectors or baffles within the first named conduit on the upper wall thereof, and other baffles on the lower wall thereof between the funnel and the discharge end of the conduit.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ELZIE L. RIDGWAY.

Witnesses:

R. KNOX,
SAM McCORD.