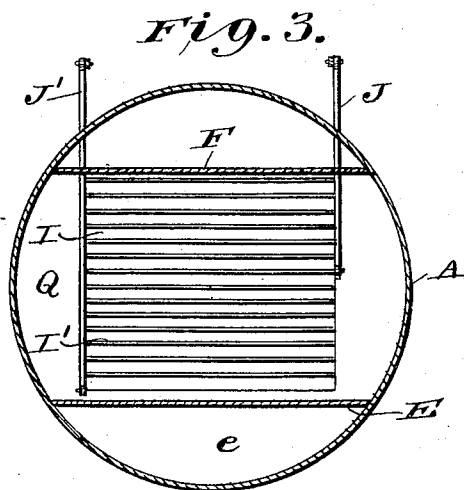
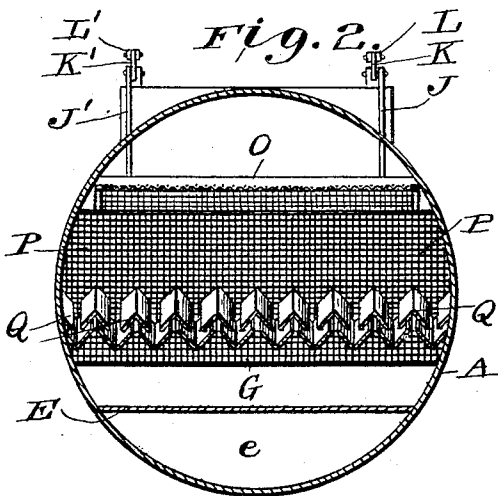
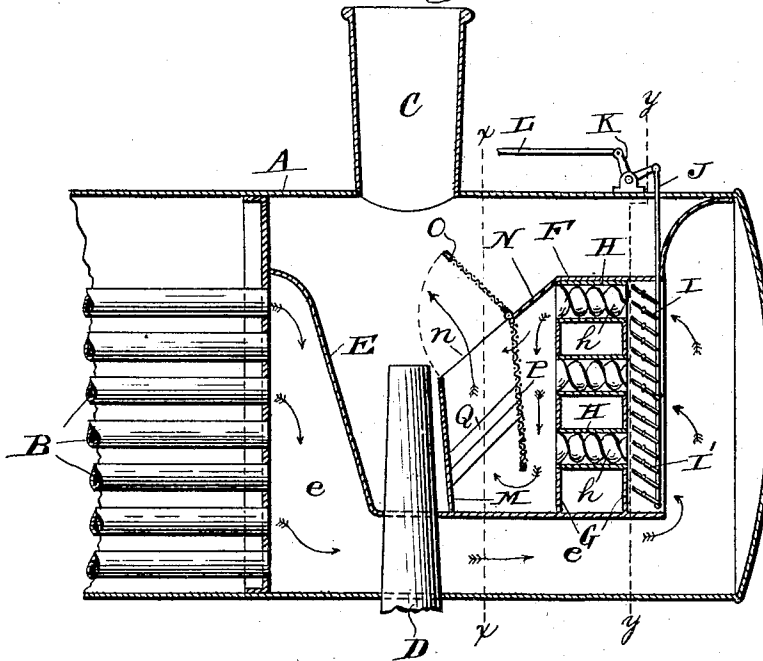


No. 792,209.

PATENTED JUNE 13, 1905.

J. C. GREGORY.
SPARK ARRESTER.
APPLICATION FILED OCT. 5, 1904.

Fig. 1.



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UNITED STATES PATENT OFFICE.

JOHN C. GREGORY, OF MILFORD, UTAH.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 792,209, dated June 13, 1905.

Application filed October 5, 1904. Serial No. 227,313.

To all whom it may concern:

Be it known that I, JOHN C. GREGORY, a citizen of the United States, residing at Milford, in the county of Beaver and State of Utah, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification.

In railroading a fruitful source of expense to the railroad arises from damages caused by fire adjacent to the road-bed from flying sparks which are caused by the forced draft.

My invention relates to devices for breaking these sparks so that they issue from the smoke-stack in the shape of dust.

To this end my invention consists of providing a number of tubes containing helicoids through which the smoke passes and then through passages formed by angular plates, having a row of said plates secured with their angular portions downward on parallel lines and their edges spaced apart and another row with their angular portions upward and their edges also spaced apart and extending into the gutters formed by the first-mentioned plates.

The construction and advantages of my invention will be fully described hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a view in vertical longitudinal section of a fragment of a locomotive-boiler, showing my invention in place; Fig. 2, a cross-section on the line *x x* of Fig. 1, and Fig. 3 a cross-section on the line *y y* of Fig. 1.

In the drawings similar reference characters indicate corresponding parts throughout the several views.

A represents the casing of a locomotive-boiler; B, the flues; C, the smoke-stack, and D the blast-pipe.

E represents a partition extending downwardly from above the topmost flues B to nearly the bottom of casing A and then forward to nearly the front of the locomotive, thus forming a smoke-passage *e*.

F represents a horizontal plate secured near the top of casing A, and G two vertical plates connecting partition E and plate F and extending the full width of the casing.

H represents tubes connecting the two

plates G and having therein helicoids *h*. In front of the tubes H is provided a damper consisting of two series of pivoted slats I and I', operated by means of rods J and J', secured to the respective series of slats, said rods J and J' being secured to one arm of bell-crank levers K and K', mounted on casing A, and L and L' rods connecting the free arms of levers K and K', respectively, with the cab.

M represents the rear wall of the arrester, which is mounted upon the horizontal portion of partition E at a distance from the tubes H and slants backwardly slightly toward the blast-pipe D, so as to give a freer draft through the arrester.

N represents a slanting plate connecting plates F and M, having an opening *n* therein, over which is pivotally mounted a damper-plate O, which should be operatively connected with the locomotive-cab. The damper-plate O preferably consists of a frame containing a wire-gauze fabric, as shown in the drawings, so as to permit the passage of smoke when the damper is shut.

P represents a diaphragm secured to plate N at the point where the damper-plate O is hinged and extending downwardly substantially parallel with the rear wall M to nearly the partition E, said diaphragm P being preferably made of a wire-gauze fabric.

Q represents angular plates secured to and connecting rear wall M and diaphragm P, said plates being arranged with a row having their angular portions downward and their edges spaced apart and another row with their angular portions upward and their edges also spaced apart, the spaces between the plates in each row being opposite the angular portions of the plates in the other row. The plates Q are set in a slanting position on lines parallel with the plates N, so as to equally distribute the draft on the tops of said angular plates.

When my device is in operation, the smoke, carrying with it the sparks and other products of combustion, passes from the flues B into the chamber *e*, where heavy particles of coal, &c., are deposited. The smoke then passes upward and through damper-slats I and I'

into the tubes H, where it is compelled to take a spiral course by the helicoids *h*. The smoke then passes through the diaphragm P, while the sparks that cannot get through the diaphragm pass downwardly under the lower edge of said diaphragm and then upwardly between plates Q and out through the opening *n* and on through the smoke-stack C to the open air. It will be understood that because of the obstacles in the path of the smoke, consisting of the slats of the dampers I and I', which may be set at the angle desired by the engineer, the helicoids in tubes H, the perforated diaphragm P, the angular plates Q, and the perforated damper-plate O, which may be opened to allow free egress of the products of combustion or closed so that nothing but smoke and the finer particles may get out, the sparks, which usually consist of easily-disintegrated masses, are broken up and leave the smoke-stack in the shape of a harmless dust. As stated above, the heavier pieces of burned coal, &c., are left in the passage *e*, and any desired means may be provided for cleaning them out, as also the interior of my arrester, it not being considered to be necessary to show any construction with this end in view.

Having thus described my invention, what I claim is—

30 1. In a spark-arrester, in combination with a locomotive smoke-box and a smoke-stack, a compartment in said smoke-box and forward of the smoke-stack, a damper at the entrance to said compartment to control the passage of smoke thereto, baffles in said compartment to impede the passage of the smoke therethrough, and a perforated damper to control the passage of the smoke out of the compartment, substantially as shown and described.

40 2. In a spark-arrester, in combination with a locomotive smoke-box and a smoke-stack, a compartment in said smoke-box and forward of the smoke-stack, a slatted damper at the entrance to said compartment to control the passage of smoke thereto, a plurality of tubes in said compartment having helicoids therein, and a perforated damper to control the passage of smoke from said compartment, substantially as shown and described.

3. In a spark-arrester, in combination with a locomotive smoke-box and a smoke-stack, a compartment in said smoke-box, and forward of the smoke-stack, a slatted damper at the entrance to said compartment to control the passage of smoke thereto, a plurality of tubes in said compartment having helicoids therein, a perforated diaphragm at the delivery end of said tubes, baffle-plates on the farther side of said diaphragm, and a perforated damper to control the passage of smoke from said compartment, substantially as shown and described.

4. In a spark-arrester, a compartment containing tubes provided with means to impede the passage of the smoke, a perforated diaphragm, and angular plates so arranged that the smoke is forced to take a zigzag passage therethrough, a damper comprising a plurality of slats arranged for simultaneous swinging on their axes to control the admission of the smoke into said compartment, and a perforated damper to control the passage of the smoke out of the compartment, substantially as shown and described.

5. In a spark-arrester, a compartment containing tubes provided with helicoids, a perforated diaphragm, angular plates also in the path of the smoke, a row of said plates having their angular portions downward and their adjacent edges spaced apart, and a row of said plates above the other row having their angular portions upward and over the spaces between the other plates and spaced apart over the angular portions of the other plates, a damper comprising a plurality of slats suitably journaled and arranged for simultaneous swinging to control the admission of the smoke into said compartment, and a perforated damper to control the passage of the smoke out of the compartment, substantially as shown and described.

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

JOHN C. GREGORY.

Witnesses:

C. H. CODY,
ED BELL.