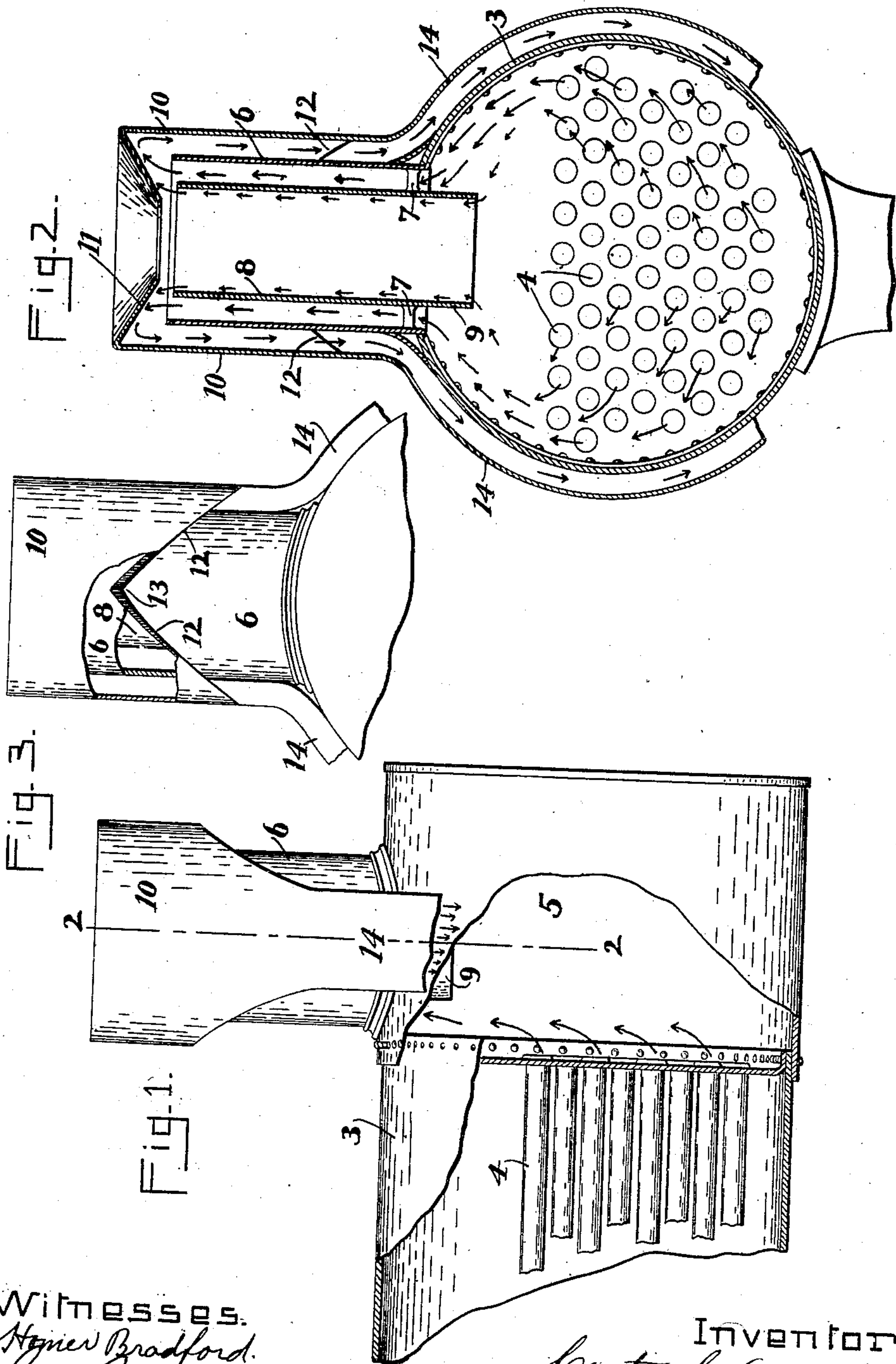


No. 863,895.

PATENTED AUG. 20, 1907.

C. C. ARMSTRONG.
SPARK ARRESTER.

APPLICATION FILED JUNE 27, 1906.



Witnesses.
Homer Bradford.
Geo. Brommer.

Inventor.
Carter C. Armstrong
by Alfred Mallin
Atty.

UNITED STATES PATENT OFFICE.

CARTER C. ARMSTRONG, OF CINCINNATI, OHIO.

SPARK-ARRESTER.

No. 863,895.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed June 27, 1906. Serial No. 323,654.

To all whom it may concern:

Be it known that I, CARTER C. ARMSTRONG, a citizen of the United States, residing in Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of devices constructed and arranged to be applied to locomotive smoke stacks for the purpose of arresting and separating out the sparks and cinders from the smoke, and while particularly adapted to locomotive stacks, it may also be applied to other classes of boilers and engines with good results.

My invention aims to take advantage of the fact that under the usual conditions of powerful or forced draft the tendency is for sparks, cinders and other heavy particles of smoke to seek and hug the walls of the flue or stack, through which the smoke and products of combustion are passed, and the invention consists of that certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed.

In the drawings Figure 1 is a side elevation of my improved device, as attached to a locomotive boiler with a portion of the casing broken away. Fig. 2 is a central transverse section taken on the lines 2—2 of Fig. 1. Fig. 3 is a front elevation of the smoke stack and spark arrester with the casings partly cut away.

3 is the casing or shell of an ordinary locomotive boiler, 4 the flues, and 5 the smoke compartment or box in front of the boiler.

Riveted or otherwise secured to the upper portion of the smoke box is the stack or pipe 6. This pipe is of somewhat larger diameter than the usual smoke stack and secured by braces 7—7 concentrically within the pipe 6 is a stack or smoke pipe 8 of the usual diameter for the size of the boiler to which it is applied, so that a space of some two or three inches is left between the pipes 6 and 8. The smoke pipe 8 is extended downward into the smoke box a short distance, so as to form a shield or guard 9, and to prevent the entrance into the pipe 8 of any smoke following the walls of the smoke box.

Secured around the upper portion of the outer stack 6 is a cylindrical casing 10 provided with an inwardly depressed annular flange 11, which extends inwardly a short distance over the pipe 8. This cylindrical cas-

ing is provided with downwardly sloping floors 12—12, 50 extending on each side from the uppermost point 13 down into discharge pipes 14—14, which discharge pipes are curved around the boiler and open below the boiler for the discharge of sparks and cinders. The lower ends of these discharge pipes may open into a receptacle 55 provided with a trap, so that the contents of the box may be discharged at intervals, or each discharge pipe may be provided with a damper at the lower end for the same purpose, or the discharge pipes may be opened directly below the boiler and discharge their contents 60 at all times.

As the smoke carrying the sparks and cinders and other unconsumed particles of the fuel is forced into the smoke box 5, the tendency is for the heavy particles suspended in the smoke to be driven to the circular 65 sides of the smoke box, as shown by the arrows in Fig. 2, while the light unladen smoke rises through the smoke pipe 8. The heavier smoke with the cinders and sparks will pass up in the direction of the arrows around the smoke pipe 8, and coming in contact with 70 the flange 11 of the cylindrical casing will be carried in the direction of the arrows down on to the floor 12—12 of this casing, and into the discharge pipes 14—14, whence they will be discharged underneath the boiler to the ground. If the smoke that ascends through the 75 pipe 8 also should carry some cinders or sparks, the tendency will be for these particles to be driven to the wall of the pipe, and as they are discharged from the pipe 8, these particles will also come in contact with the flange 11, and be carried into the casing 10 and 80 down through the discharge pipes 14.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a spark arrester, the combination, with the smoke box, of a pair of imperforate smoke pipes, one mounted 85 within the other, with a space between the pipes, the inner pipe, provided with a free uninterrupted inlet and passage therethrough, and having an extension below the inlet of the outer pipe to form a guard to direct the cinders into the outer pipe, a casing surrounding the 90 upper portion of the pipes, with a deflecting plate extending from the casing over the opening between the pipes, and a discharge outlet from said casing.

2. In a spark arrester, the combination, with a cylindrical smoke box, of a pair of concentric imperforate 95 smoke pipes, one mounted within the other, with an annular space between the pipes, the inner pipe provided with a free uninterrupted inlet and passage therethrough, and having an extension below the inlet of the outer pipe to form a guard to direct the cinders into the outer pipe, 100 a casing surrounding the upper portion of the pipes, with

a deflecting plate extending from the casing over the annular opening between the pipes, and a discharge outlet from said casing.

3. In a spark arrester, the combination with the smoke
5 box, of a pair of imperforate smoke pipes, one mounted within the other, with a space between the pipes, the inner pipe provided with a free uninterrupted inlet and passage therethrough, and having an extension below the inlet of the outer pipe to form a guard to direct the
10 cinders into the outer pipe, a casing surrounding the

upper portion of the pipes, with a deflecting plate extending from the casing over the opening between the pipes, and over the outer edge of the inner pipe, said casing having sloping floors to carry the cinders downward, and a discharge from said casing to a point below the boiler.

CARTER C. ARMSTRONG.

Witnesses:

GEORGE BROEMMER,
FRANK H. KUNKEL.