

JOHN R. MOFFITT.

Improvement in Spark-Arresters.

No. 127,091.

Patented May 21, 1872.

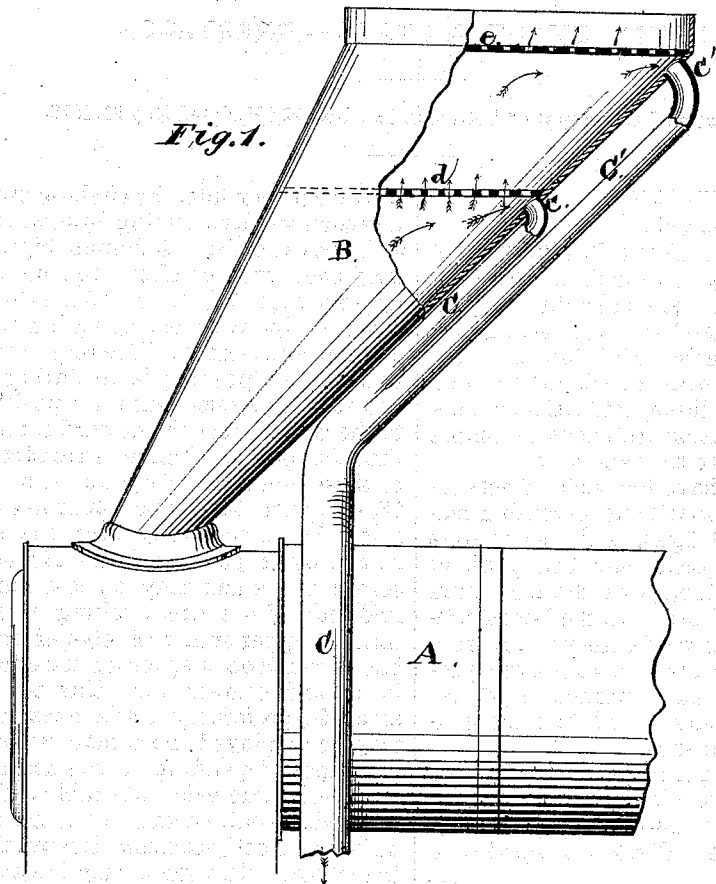
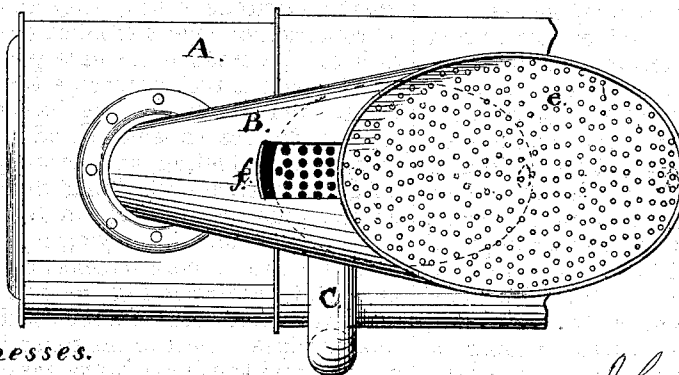


Fig. 2.



Witnesses.

W. Bradford.
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UNITED STATES PATENT OFFICE.

JOHN R. MOFFITT, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. 127,091, dated May 21, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, JOHN R. MOFFITT, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Smoke-Stacks of Locomotive-Engines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My improvements have for their objects increased length of stack without increasing materially or at all the height, at the same time that the utmost simplicity and cheapness of construction are attained with the maximum attainable length of flue; also, the better prevention of the discharge of cinders, &c., from the top of the stack; also, an improved provision for preventing an accumulation of cinders, &c., within the stack, and for a more effective disposal of the same.

In the drawing, Figure 1 is an elevation of my improved smoke-stack and spark-arrester (shown partly broken away) applied to the boiler of a locomotive. Fig. 2 is a top view of the same.

A represents the boiler of a locomotive-engine; B, the smoke-stack; and C C', conducting-pipes for conveying cinders, sparks, &c., from the stack downward, and for discharging the same either into a water-tank, the ash-pan, the open air, or otherwise, to a low point, so as not to be carried back to the inconvenience or injury of the passenger. The smoke-stack is made of conical form, so that it may be formed of a single piece of metal, and is set at an angle with the boiler, inclining backward therefrom, its rear line being placed at about an angle of forty-five degrees therewith. This position allows of material increase of length of flue and of draught. Within the stack, toward its top, is placed a horizontal screen, *d*, the openings or meshes of which are of proper size to arrest the passage of all sparks, &c., except the very smallest ones; and some distance above this is placed another screen, *e*, having finer perforations, but more in number, the area of the screen being considerably larger. From the rear of the stack, and at a point just beneath the junction at an acute angle of the screen *d*

with such rear line, the cinder-conveying pipe C is connected, extending downward, as shown and above stated. A similar pipe, C', is similarly connected at about the junction of the upper screen, this latter pipe either discharging into pipe C or having an independent discharge, as preferred. The receiving-mouths of both these pipes may be as flaring as desired, and it will be seen that their position relative to the screens and the upward currents is such that the sparks and cinders are carried directly to these mouths. The junction of the pipes C C', &c., with the smoke-stack need not necessarily be immediately near the screen, but at any other point desired. Beyond the first screen the stack may be less flaring or cylindrical, if preferred, taking care, however, that the upper or more finely-perforated screen has as much open space for the currents as the lower and coarser one. The top line of the stack is, preferably, made horizontal. There may be employed more than two screens and two pipes, depending on the character of the fuel used, more being desirable with wood-fuel than with coal, because of more sparks and more imperfectly-consumed material rising with the smoke. The stack may have a slide-door in it, if desired, as at *f*.

The conical backward-inclined stack has great advantage in simplicity and cheapness of construction over a crooked or curved one, as it can be made of a single piece of metal, and because it avoids any objectionable curvatures, which, while affording the desired length of draught, are expensive, and require much piecing and riveting, and actually check the outgoing currents by giving them a winding or circuitous route. The advantages of having two or more cinder-conveying pipes in connection with two or more screens are, that sparks and solid matter passing the first or an intermediate screen would, without such additional pipe or pipes, collect in the space between the screens, and thus have no means of being discharged or disposed of, and also that, after passing the first screen, the steam being more condensed and more nearly converted into water as it approaches the top of the stack, has more efficiency in extinguishing the fire of the sparks or cinders; and also the finer perforations will arrest the smaller sparks that

may have passed a lower screen, and, in connection with the much larger area due to the conical form of the stack, there is no check to the upward currents, the aggregate of all the finer perforations of any one of the upper screens equaling or exceeding the aggregate of the fewer but larger ones of the next lower screen, while the whole stack is constantly kept clear of all cinders by means of the pipes C C', &c.

I am aware that a curved smoke-stack has been used, the curved portion only extending backward, and that two screens have been employed within such curved part, but with no outlet for cinders, &c., collecting between the

screens, and with no graduation in the degree of fineness of the perforations. Such a construction I do not claim.

I claim—

An inclined conical smoke-stack, having two or more graduated screens, combined with two or more downward-discharging cinder-pipes at the rear of the stack, substantially as shown and described.

JOHN R. MOFFITT.

Witnesses:

W. BRADFORD,
WILLIAM FITCH.