

*J. Marks,
Spark Arrester.*

N^o 21,687.

Patented Oct. 5, 1858.

Fig. 1

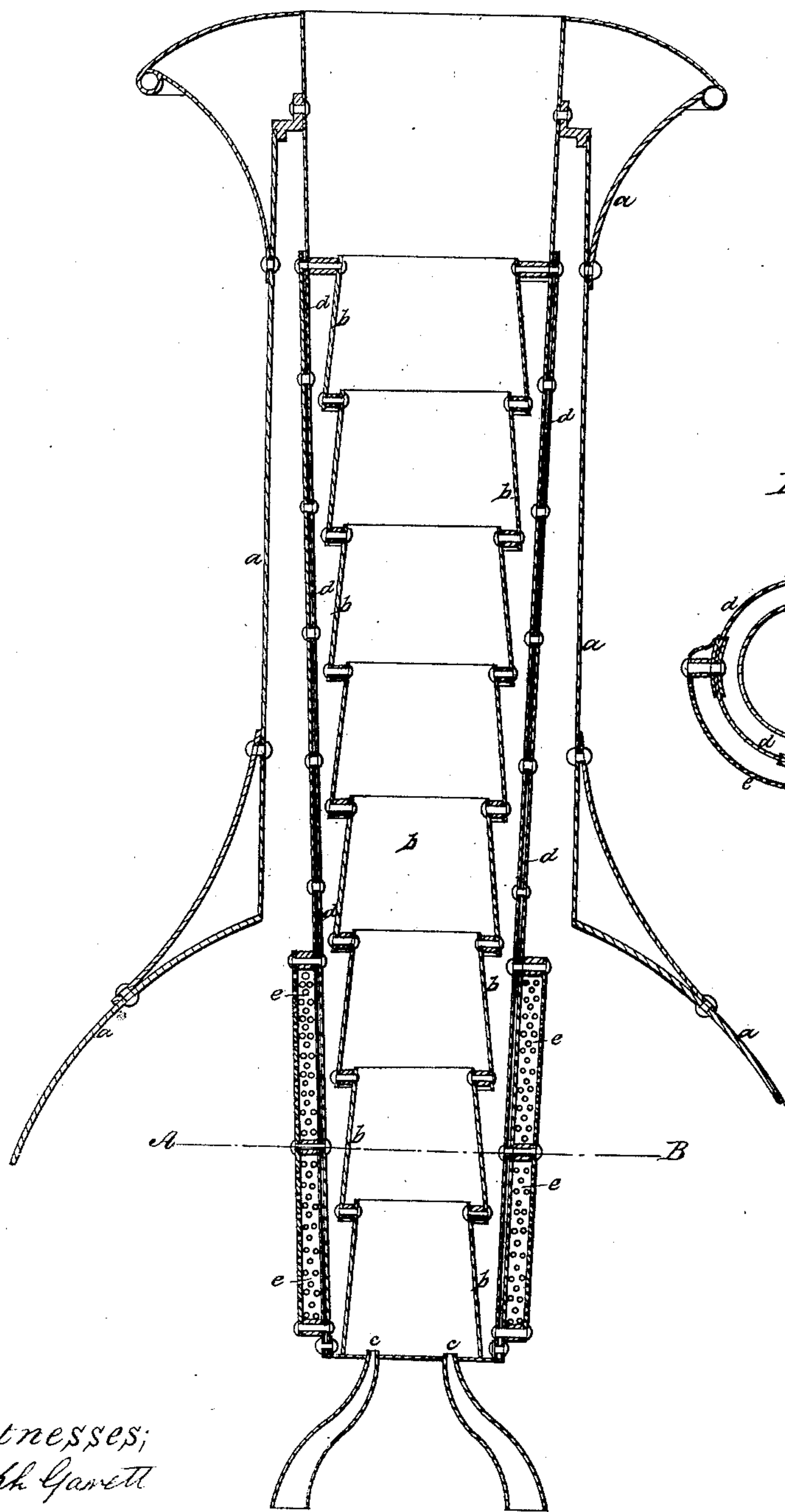
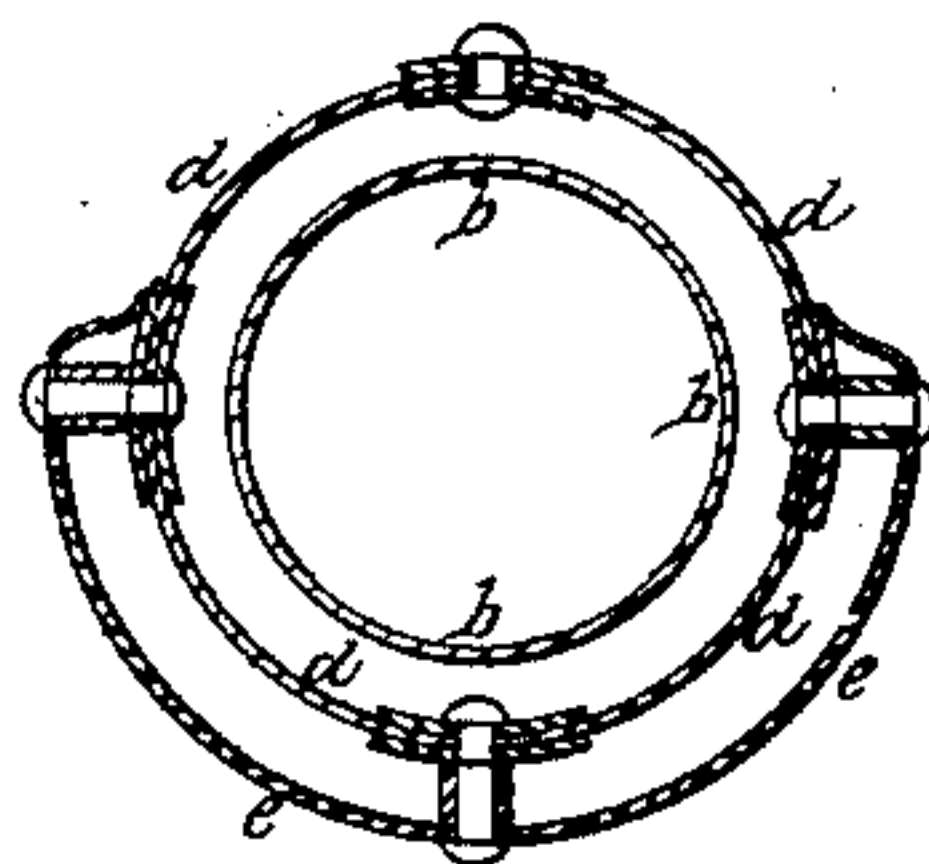


Fig. 2



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UNITED STATES PATENT OFFICE.

JOSEPH MARKS, OF BOSTON, MASSACHUSETTS.

SPARK-ARRESTER.

Specification of Letters Patent No. 21,687, dated October 5, 1858.

To all whom it may concern:

Be it known that I, JOSEPH MARKS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Spark-Arresters for Locomotive-Engines, and that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings, represent my improvements.

Figure 1 is a central vertical section of my improved spark-arrester. Fig. 2 is a transverse section taken in the plane of the line A, B.

In the ordinary smoke pipe of a locomotive the exhaust steam and sparks and other unconsumed products of combustion pass out together it being necessary however that the steam should be somewhat retarded in its passage in order to retain the sparks until they are partially consumed although it has been found impossible to successfully accomplish this result by the arrangement of smoke pipes usually employed. The retarding of the escape of steam of course produces a back pressure upon the piston of the engine and increases the consumption of fuel.

My invention consists in a peculiar arrangement of devices by which the sparks are entirely consumed and ground up as it were, before they can leave the smoke pipe and at the same time, the steam allowed a free passage every time the engine exhausts. The importance of thus providing for the removal of the sparks and also securing an unobstructed passage for the exhaust steam will be manifest to every person skilled in the construction and use of locomotive engines, and are results which have never before been successfully attained.

The arrangement of devices which I employ consists of what is termed by engineers, a "petticoat pipe" (communicating with the exhaust pipes,) formed of a series of short tapering pipes slightly overlapping each other but not in immediate contact, surrounded by a wire gauze or other similar

device, the whole being inclosed by a smoke pipe of enlarged diameter. By this combination of devices the steam has a clear passage out and the draft which is produced every time the engine exhausts, will lift the sparks and keep them in continual motion between the inside of the outer smoke-pipe and the rough surface of the wire-gauze, the passage of the steam upward through the petticoat pipe producing an intermittent draft which alternately draws the sparks to and releases them from the wire gauze which prevents their escape until they are ground up or mostly consumed.

a a in the drawings represents the outer smoke-pipe which incloses the whole spark-arresting apparatus. Within the pipe *a a* is a "petticoat pipe" composed of a series of tapering tubes *b b*, &c., overlapping each other and stayed together but leaving a space between their outer circumferences as shown in the drawings. The bottom of the tapering petticoat pipe is connected to the exhaust tubes of the engine by two openings *c c* so that the exhaust steam will pass without any obstruction whatever directly up through it and escape at the top.

The petticoat pipe is inclosed by a cylinder of wire gauze or meshes *d d* as shown in the drawings and the sparks and other unconsumed products of combustion pass between this wire net work and the outer smoke pipe *a a*. The upward passage of the exhaust steam partially exhausts the air in the petticoat pipe and thereby produces a varying or intermittent draft, which as before stated, first attracts the sparks, &c. against the wire net-work *d d* and then releases them, this alternate attracting and repelling of the sparks taking place every time the engine exhausts, until they are as it were entirely pulverized or else consumed. In consequence no sparks can escape into the atmosphere and no reaction of the exhaust steam can take place the importance of which results will be apparent as a greater amount of draft is produced with a given amount of steam.

In order to protect that portion of the wire net-work which is in front of the boiler flues from the force of the sparks striking upon it, I use a short, perforated metallic shield, *e*, which extends about half way around the base of the wire net-work so that the sparks will first strike this shield and then pass around the same until when

taken by the wire net-work as before explained.

Having thus described my improvements, I shall state my claim as follows:

5 What I claim as my invention and desire to have secured to me by Letters Patent, is—

The combination of the petticoat pipe, the surrounding wire net-work and the smoke pipe, whereby while a free exit pas-

sage is secured for the exhaust steam, an 10 intermittent draft is produced upon the outer surface of the wire net-work, which pulverizes the sparks and retains them until they are consumed, as set forth.

JOSEPH MARKS.

Witnesses:

JOSEPH GAVETT,
ALBERT W. BROWN.