(No Model.)

J. C. COURTNEY & J. W. NELSON.

SPARK ARRESTER.

No. 327,531. Patented Oct. 6, 1885.

Fig. 1.

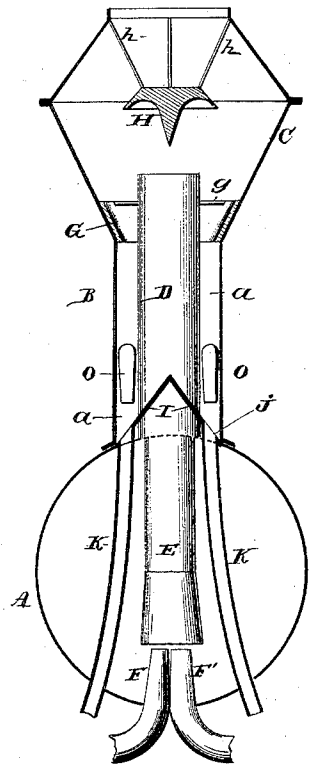


Fig. 2.

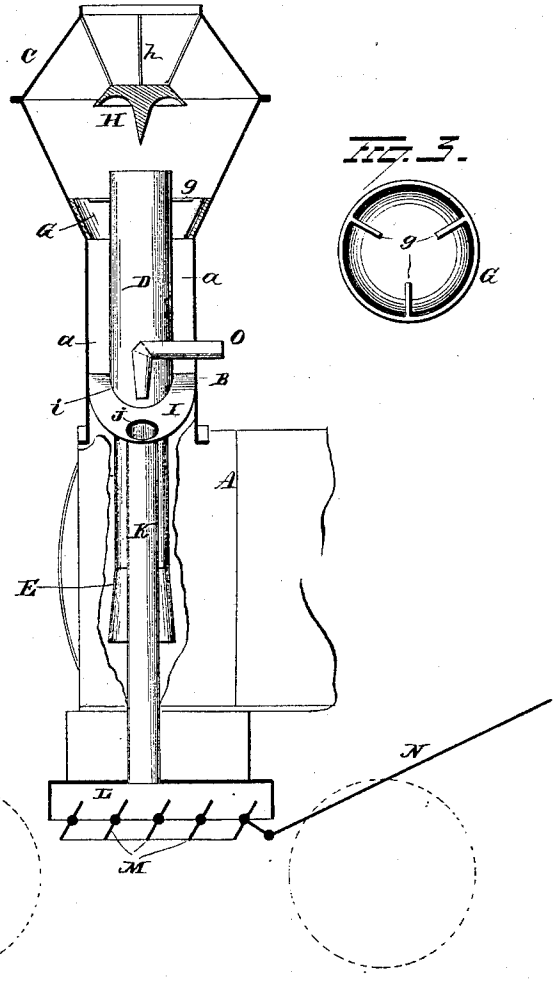


Fig. 3.

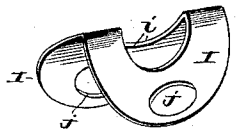


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN C. COURTNEY AND JAMES W. NELSON, OF STREATOR, ILLINOIS.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 327,531, dated October 6, 1885.

Application filed February 10, 1885. Serial No. 155,501. (No model.)

To all whom it may concern:

Be it known that we, JOHN C. COURTNEY and JAMES W. NELSON, of Streator, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Spark-Arresters; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in spark-arresters, the object of the invention being to provide the smoke-stack of a locomotive with improved means whereby the smoke and gases may have free escape from the upper and open end of the stack, while the cinders and solid unconsumed products of combustion shall be arrested within the smoke-stack and conveyed to a suitable receptacle, and from thence discharged at will.

With these ends in view our invention consists in certain features of construction and combination of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, partly in side elevation and partly in vertical section, of a locomotive smoke-stack provided with our invention. Fig. 2 is a front view, partly in vertical section, of the same. Fig. 3 is a detached view of an inclined guide, and Fig. 4 is a detached view of a deflector and centering-flange.

A is the front portion of a locomotive-boiler provided with the outer shell or stack, B, having the enlarged upper portion, C, secured thereto. Within the shell B is located a smaller tube or stack, D, which is seated on the boiler and connects with the petticoat-pipe E. Exhaust-nozzles F F′ are situated below the lower and open end of the petticoat-pipe and communicate with the steam-cylinders on opposite sides of the engine.

The parts thus far referred to are of ordinary construction.

The inner stack, D, is of sufficiently less diameter than the outer shell, B, to form an intervening annular space, *a*, between the two. The inner stack, D, is centered and is retained in place by means of the conical or tapered sleeve G, which is inserted within the upper and outwardly flaring portion of the stack and fits against the lower and inwardly-converging walls thereof, while its inwardly-projecting lugs *g* engage the inner stack, D, thus retaining the latter in a central position, and also serving another important function, as will hereinafter be explained.

Immediately above the stack D is suspended the inverted conical deflector H by the stays *h*, the latter being secured to the stack in any desired manner. Within the annular space *a* at the lower end of the shell B is inserted the reversely-inclined diaphragm or guide I, which is constructed with a central opening, *i*, for the reception of the stack D, while its opposite sides are each provided with a hole, *j*, with which registers the upper ends of pipes K K, their lower ends communicating with ash-pans L, constructed with a sectional bottom, M. By means of a connecting-rod, N, extending to the cab, the cinders accumulated in the ash-pan or cinder-box may be discharged at any time.

O is a steam jet or blower communicating with the boiler, and may be used to create a downward draft in the annular space *a* whenever desired.

Having described the construction and relative arrangement of parts of our improved spark-arrester, we will briefly describe its operation.

The exhaust-steam escaping from the exhaust-nozzles F F′ upwardly through the petticoat-pipe E forces the smoke, gases, sparks, and unconsumed products of combustion upwardly with great force through the pipe C. The smoke and gas will rise and have free escape from the top of the stack, while the cinders and unconsumed products will be impelled with considerable force against the conical deflector H, and be deflected thereby in a downward direction against the conical ring or sleeve G, which latter is preferably made of hard, tough cast-iron to resist the cutting and abrasive action of the cinders and sparks. The cinders are conveyed downwardly through the annular space *a*, and by the reversely-inclined guide or ring I conveyed to the pipes K K, no accumulation of the cinders between the stacks being permitted by reason of the shape of the guide or ring I.

From the ash-pan L the cinders may be

dumped, or, if desired, a spout may be connected with the ash-pan for delivering the cinders upon the tracks.

The several parts of our improvement are readily removable for repairs or renewal, and by reason of the simplicity of the arrangement and construction of parts they may be applied to either new or old locomotives without adding materially to their cost.

As it is evident that slight changes in the construction and relative arrangement of parts might be resorted to without departing from the spirit of our invention, we would have it understood that we do not restrict or limit ourselves to the exact construction and arrangement of parts shown and described; but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a spark-arrester, the combination, with the outer shell and inner stack, of a tapered or conical ring for supporting the upper end of the stack and an inclined diaphragm surrounding the lower end of said stack, substantially as set forth.

2. In a spark-arrester, the combination, with the outer shell and inner stack, of the conical ring or shell or sleeve provided with the inwardly-projecting lugs, substantially as set forth.

3. In a spark-arrester, the combination, with the outer shell and inner stack, of a deflector located within the shell above the stack, a device for supporting the upper end of the stack, an inclined diaphragm surrounding the stack near the lower end thereof and provided with one or more openings, and a pipe connected with said diaphragm.

4. In a spark-arrester, the combination, with the outer shell and inner stack, of a deflector located above the stack, a conical ring or sleeve provided with inwardly-projecting lugs for supporting the upper end of the stack, the double inclined diaphragm, an ash-pan having a dumping bottom, and pipes connecting the space between the shell and stack with the ash-pan, substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JOHN C. COURTNEY.
JAMES W. NELSON.

Witnesses:
D. M. BROWN,
S. SMITH.