(No Model.)

B. W. SWEET.

SPARK AND CINDER ATTACHMENT FOR SMOKE STACKS.

No. 478,296. Patented July 5, 1892.

Fig. 1.

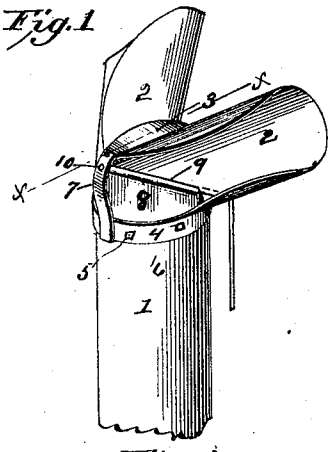


Fig. 2.

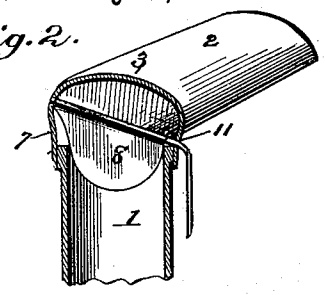


Fig. 3.

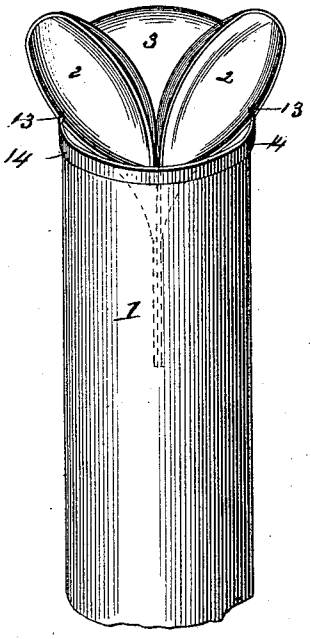


Fig. 4.

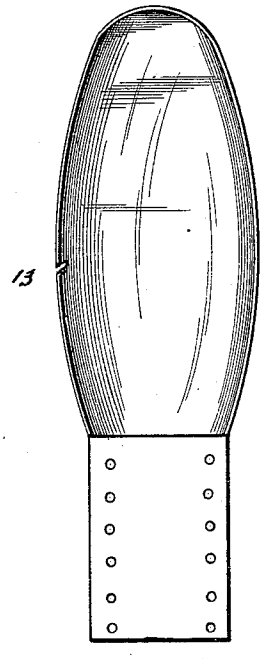


Fig. 5.

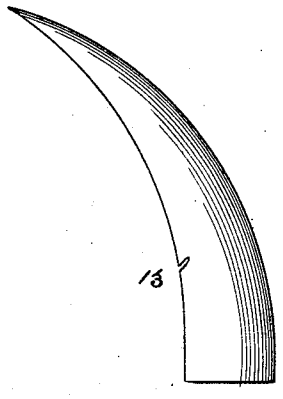
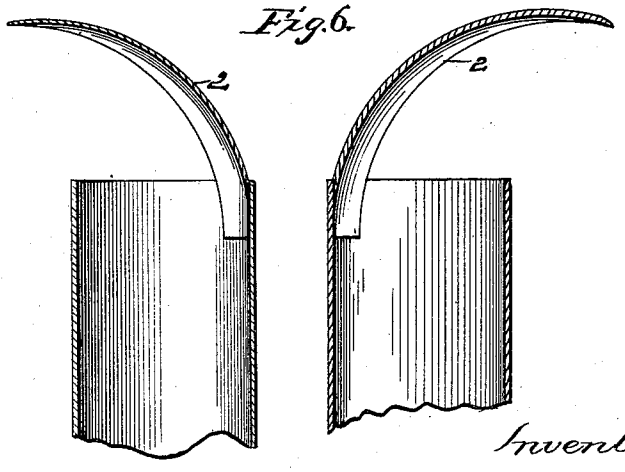


Fig. 6.



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UNITED STATES PATENT OFFICE.

BENJAMIN W. SWEET, OF PORTSMOUTH, OHIO.

SPARK AND CINDER ATTACHMENT FOR SMOKE-STACKS.

SPECIFICATION forming part of Letters Patent No. 478,296, dated July 5, 1892.

Application filed October 30, 1891. Serial No. 410,354. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN W. SWEET, a citizen of the United States, residing at Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Spark and Cinder Attachments for Smoke-Stacks; and I 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.

My invention relates to devices generally known as "spark and cinder arresters;" but it more particularly relates to a novel attachment which is to be employed on locomotives and other structures employing smoke-stacks for deflecting sparks and cinders to either side or both sides of said structures; and it consists in the peculiarities of construction and arrangements or combinations of parts hereinafter fully disclosed in the description, drawings, and claims.

The objects of my invention are, first, to provide a spark and cinder attachment for smoke-stacks which will offer the least possible resistance to the discharge or outward passage of smoke and other products of combustion and at the same time cause the sparks and cinders to be delivered in equal or unequal parts and directed to either side or both sides of a boat, locomotive, or other machine upon which the same may be employed, and, second, to provide a spark and cinder attachment which shall be simple in construction, strong, easily applied wherever its use may be desired, and comparatively inexpensive to manufacture. These objects are accomplished by the novel and improved construction and arrangement or combination of parts and features illustrated in the accompanying drawings, forming part of this specification, in which the same reference-numerals indicate the same or equivalent parts and features, and in which—

Figure 1 represents a perspective front view of the upper end of a smoke-stack provided with my preferred construction of spark and cinder attachment; Fig. 2, a vertical section of the same on the line *x x* of Fig. 1, the directing-valve being shown in side elevation; Fig. 3, a similar view to that shown in Fig. 1 of a modification of my invention; Fig. 4, a detail front view of one of the spoon-shaped deflectors of this form of my invention; Fig. 5, a detail side view of the hood thereof, and Fig. 6 a vertical section showing a different application of this form of my invention.

Referring to the drawings, the numeral 1 indicates the upper portion of the smoke-stack of a locomotive, boat, or other machine employing wood or coal as fuel.

In Figs. 1 and 2 the numeral 2 indicates the two curved upwardly-inclined and rearwardly-divergent deflectors, which are arranged upon and outside of the upper end of said smoke-stack, and which are oppositely-faced and held apart for a portion of their lengths by the hood 3, which is arranged intermediate thereof and bolted or riveted and shaped to conform thereto, the purpose of this hood being to prevent the upward escape of sparks and cinders between said deflectors. The band or collar 4 supports these deflectors and is secured to the upper end of the smoke-stack by the nutted bolts 5, so as to permit of ready removal of the attachment, when desired; also, the lower edge of this band or collar rests upon the annular flange or enlargement 6, which may be formed upon or bolted to the smoke-stack. To the band or collar 4 and the front end of the hood 3 is bolted the vertical brace 7.

Intermediate of the front portions of the deflectors 2 and beneath the hood 3 is arranged the downwardly-projecting directing-valve 8, which enters the upper end of the smoke-stack and is secured to the inclined shaft or rod 9, which is mounted or journaled at its front or upper end in the hole or bearing 10 in the vertical brace 7, and near its rear or lower end it is passed through the hole or bearing 11 in the rear lower portion of the hood, where it is provided with the arm or crank 12, which is turned or rocked by a lever (not shown) controlled by the engineer or fireman for adjusting the position of said valve. A spark and cinder attachment of this construction will direct the escaping material to either side or both sides of a railway-train, whether the wind be blowing transversely thereof or in a line therewith, and thus avoid the annoyance to which passengers are so commonly subjected. By moving the direct-

ing-valve to its full extent to the right or left all sparks and cinders will be discharged through the other or unobstructed deflector and away from the train, as when the wind is blowing transversely thereof in either direction; also, by adjusting said valve slightly out of its vertical position a greater discharge of sparks and cinders will take place through one of said deflectors than the other, as when the wind may be blowing at an angle to the line in which the train is running. The curved, upwardly-inclined, and rearwardly-diverging form and arrangement of these two deflectors cause them to discharge the sparks and cinders at a considerable distance from the train.

In the form or construction and arrangement of my attachment shown in Figs. 3, 4, 5, and 6 of the drawings the deflectors 2 are concaved or spoon-shaped, oppositely-faced, or placed with portions of their convexed surfaces against each other and formed with perfectly-straight lower ends or portions, which are riveted together and extend some distance down into the smoke-stack 1 and across the center thereof, so as to divide it equally, and thus direct the same amount of sparks and cinders to each side of the locomotive or other machine, and thus discharge the same beyond the body portions thereof. The hood 3 in this instance is also arranged intermediate of the deflectors 2 and shaped to conform thereto and to prevent the escape of sparks and cinders between the same, and it is secured to said deflectors by bolts or rivets. The outer edges of these deflectors, about midway of their length, are vertically slotted, as at 13, for firmly supporting them upon and permitting of their ready removal from the edge of the upper end of the smoke-stack, which is surrounded by the band or strap 14 for imparting strength thereto.

In the application of this form of my attachment, as shown in Fig. 6 of the drawings, a single deflector is illustrated as applied to each of two smoke-stacks, such as are employed on steamboats, and they operate to deflect the sparks and cinders in substantially the same way as the already-described deflectors entirely over the sides of the boats.

I am aware of the fact that spiral diaphragms or flanges have been arranged within locomotive-engine chimneys to lead to dust receiving and discharge passages and pockets formed in and upon the sides of the upper ends of said chimneys, whence the matter collected was conducted downward through passages or pipes on the outside of said chimneys to points for discharging the same; that inverted-cone-shaped deflectors have been supported above the tops of pipes; that rearwardly-diverging tubes connected to smoke-stacks are old; that shields in front of openings in caps are old, and that cylindrical bands mounted upon pipes provided with flaring or funnel-shaped flanges are old, and I do not claim the same.

Having thus fully described my invention and pointed out its differences in object, construction, advantages, and operation from the prior state of the art, what I claim as new is—

1. In a spark and cinder attachment, the combination, with curved, rearwardly-diverging, and oppositely-faced semi-open deflectors, of means for securing together their inner or intermediate surfaces, substantially as described.

2. In a spark and cinder attachment, the combination, with curved rearwardly-diverging semi-open deflectors, of an intermediate hood and means for securing said hood and deflectors together, substantially as described.

3. A spark and cinder attachment provided with curved rearwardly-diverging semi-open deflectors and an intermediate directing-valve, in combination with a smoke-stack and means for securing said attachment to the upper end of said smoke-stack, substantially as described.

4. A spark and cinder attachment provided with spoon-shaped, upwardly-inclined, and rearwardly-diverging deflectors with a downwardly-projecting directing valve or damper and means for adjusting said valve or damper at any desired angle, substantially as described.

5. A spark and cinder attachment provided with two spoon-shaped, upwardly-inclined, and rearwardly-diverging deflectors, with an intermediate hood, with a downwardly-projecting directing valve or damper, and means for adjusting said valve or damper at any desired angle, substantially as described.

6. A spark and cinder attachment provided with curved, rearwardly-diverging, and semi-open deflectors, substantially as described.

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

BENJAMIN W. SWEET.

Witnesses:
CHAS. BRENGARTNER,
EDWIN SWEET.