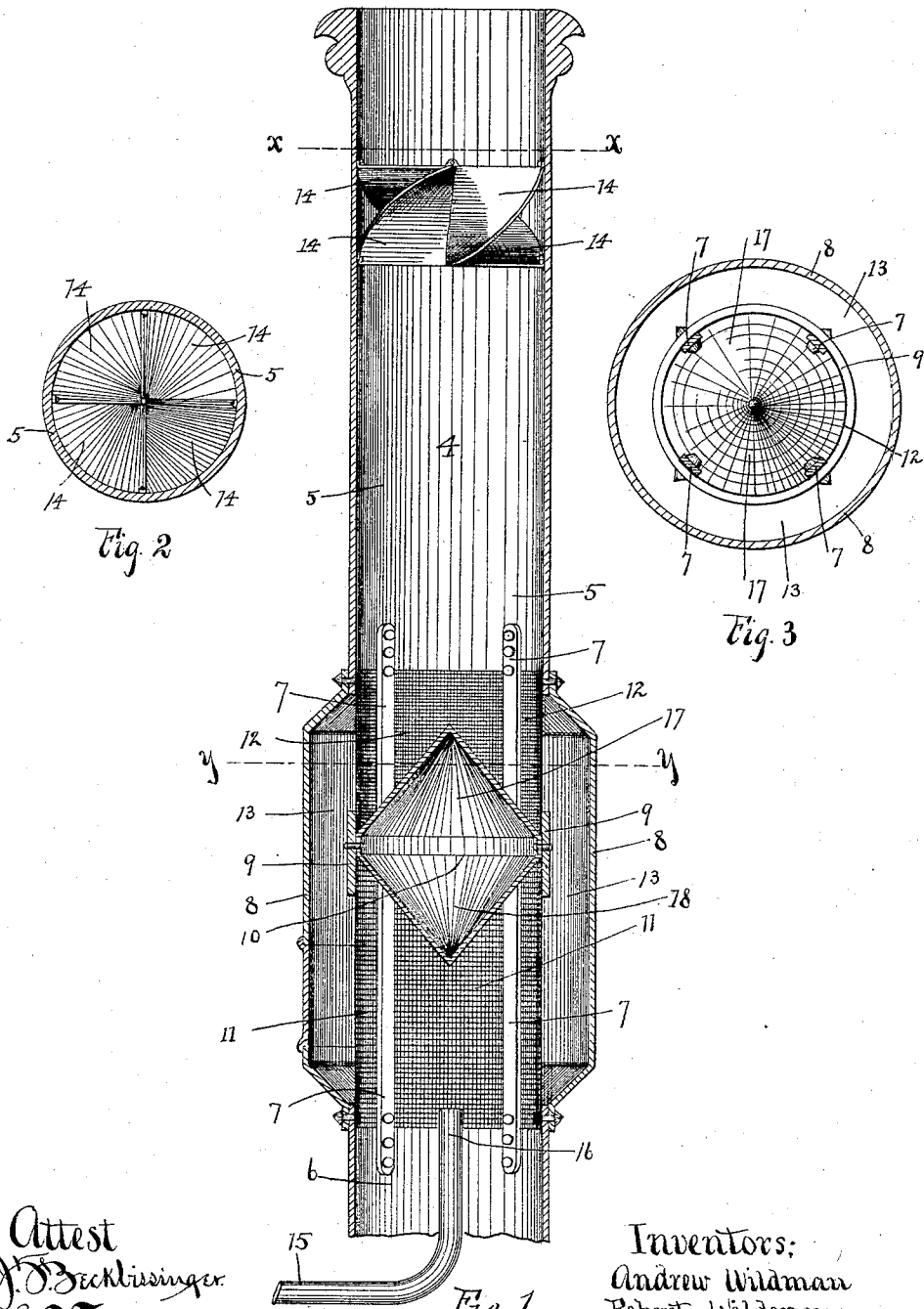


(No Model.)

A. & R. WILDMAN.
SPARK ARRESTER.

No. 469,530.

Patented Feb. 23, 1892.



Attest
J. D. Becklissinger.
G. P. Thomas.

Fig. 1

Inventors:
Andrew Wildman
Robert Wildman
By Jas. G. Thomas, Atty

UNITED STATES PATENT OFFICE.

ANDREW WILDMAN AND ROBERT WILDMAN, OF SAGINAW, MICHIGAN.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 469,530, dated February 23, 1892.

Application filed November 7, 1891. Serial No. 411,145. (No model.)

To all whom it may concern:

Be it known that we, ANDREW WILDMAN and ROBERT WILDMAN, citizens of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to improvements in spark-arresters for steam-boilers, and pertains to that class of spark-arresters which are attached to the smoke-stack and arranged for intercepting the passage of the sparks and cinders, while providing a substantially unobstructed passage for the smoke.

The object of the invention is to provide devices for arresting the sparks and cinders in a smoke-stack which can be easily and cheaply applied to the stack, and which will cover a comparatively small area, and which will be efficient and reliable in its operation; and the invention consists in the construction and combination of the several parts, together with the arrangement and operation thereof, as will be hereinafter specifically explained and delineated, and which will also be particularly defined in the claims of the following specification.

Our invention is illustrated in the accompanying drawings, in which the same figures of reference used in the following description will be found designating the same elements or parts throughout the several views.

Figure 1 is a vertical central section of a smoke-stack containing our improvement. Fig. 2 is a horizontal section of the same, taken at *x x*. Fig. 3 is a horizontal section of the device shown in Fig. 1, taken at *y y*.

4 represents a smoke-stack of the usual and common construction, divided, however, into an upper section 5 and a lower section 6, the two sections being held in proper relation to each other by vertical bars 7, which are secured at their ends to the stack-sections by suitable rivets or bolts, so as to leave an open space between the sections, around which is secured a jacket 8, arranged so as to form an enlargement of the pipe and an increase of its transverse area.

Near the middle of the bars 7 is secured a band or ring 9, and to this ring is secured a

deflector 10. This deflector has the form of two cones 17 and 18, the lower cone 18 being inverted and united to the other cone 17 by its base, the diameter of the middle of the deflector or base of the cones being arranged to extend over the area inclosed by the ring 9, so that its upper and lower apexes will be centrally located in the stack, and between the ring 9 and the lower section 6 of the stack is secured a wire-netting 11, which is usually provided with a coarse mesh, and the space between the upper section 5 and the ring 10 is covered with a wire-netting 12, having a finer mesh or series of openings, the upper and lower netting forming an annular chamber 13 within the jacket 8.

Within the upper section 5 of the stack is placed a series of curved and inclined deflecting-plates 14, which entirely fill the transverse area of the stack, but provide openings 1, having an upward incline. An exhaust-pipe 15 from the engine is led into the lower sections 6 and is arranged with its nozzle 16 directly beneath the deflector 10, so as to provide a strong current or draft for the stack.

The operation of the device is that when the smoke laden with sparks and cinders is carried upward the sparks strike the lower cone 18 of the deflector and are precipitated against the netting 11, while the smoke passes through the screens, and the coarsest and heavier sparks then fall below, while the smaller and lighter sparks pass through the netting into the annular chamber 13 and are again intercepted by the netting 12 and then drop within the lower area of the annular chamber, and should a small quantity of finer sparks pass through the netting 12 the smoke-current is given a whirling or twisted motion by the plates 14, so that a central eddy is formed in the stack above the plates, which causes the sparks by centrifugal action to move to the inner surface of the stack and become dead or free from ignition by whirling in contact with the surface of the stack, the sparks which have passed the screens being finer and not of sufficient caliber to support combustion when in contact with the surface of the stack. By the arrangement of the upper cone 17 within the area inclosed by the netting 12 the area of the space is re-

duced and the speed of the moving currents is thereby gradually increased and the smoke and gases of combustion coming from the chamber 13 on opposite sides of the upper cone are given an upward direction, so that as they intermingle in the stack-section 5 they are all moving in substantially the same direction, and a free and easy passage for the smoke and gases is thus provided and the liability of clogging or choking the draft by the intermingling of currents from opposite sides in the enlarged chamber above the deflector is avoided and a strong and unimpeded draft is provided for the furnace.

A great advantage is gained by the construction of the device, as the area of opening in the netting and the annular chamber greatly exceeds the area of opening in the stack, so that the contents are at that point spread out and of course are provided with a slower movement, so that the sparks and cinders have a chance to drop, while the gases of combustion pass on unimpeded and free, the speed being increased after the screens are passed and the upper portion of the stack is reached, so that any sparks or ignited cinders that may have passed the screens are hurled with great force against the plates 14 and are then brought in contact with the inner surface of the stack, which effectually destroys the process of combustion and completely extinguishes the sparks, so that they pass from the stack in the form of fine cinders or ashes.

It is well known that portable engines, on account of the limited length of the smoke-stack, are extremely liable to throw out sparks in great quantities, and as this class of engines are used many times in proximity to barns and other combustible and easily-inflammable property a great advantage and benefit is derived from the use of our improvement and the liability of accidental fires from sparks of traction and portable engines is reduced to a minimum.

Having explained the construction and operation of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the smoke-stack composed of the lower section 6 and the upper section 5, having an open space between

their adjacent ends, the vertical bars 7 across said space and with their ends secured to the said stack-sections, an annular ring 9, secured to the said bars midway of the space and carrying a conical deflector 10, the netting 11 around the open space below said ring, the netting 12, covering the space above said ring, and a jacket 8 around said open space and with its ends secured to the said upper and lower stack-sections and with an annular chamber 13 between the jacket and the wire-netting, substantially as set forth.

2. In a spark-arrester, the combination of the stack-sections 5 and 6, having a space between their adjacent ends, a jacket of greater diameter than the stack surrounding the said space and with its ends secured to the ends of said stack-sections, the vertical bars 7, extending across said space and secured by their ends to the stack-sections, the horizontal ring 9, centrally located in said space and secured to said bars and carrying a downwardly-extending conical deflector 10, the wire-netting 11 and 12 on the outside of said bars and covering the space, a series of inclined and curved deflecting-plates 14 in the upper stack-section, and the exhaust-nozzle 16 below the said conical deflector 10, substantially as set forth.

3. In a spark-arrester, the combination of the upper and lower stack-sections having a space between their adjacent ends inclosed by wire-netting, as described, the vertical bars extending across said space and with their ends secured to the adjacent ends of said sections, with the horizontal ring secured to the middle portions of said bars, the deflector 10, secured to said ring and provided with the downwardly-extending cone 18 and a jacket 8 for inclosing an annular chamber around said netting and with its ends reduced and secured to the adjacent ends of the stack-sections, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ANDREW WILDMAN.
ROBERT WILDMAN.

Witnesses:

GEORGE M. STEVENS,
JOSEPH ISLIN.