No. 890,993. PATENTED JUNE 16, 1908.

F. R. MINKLER.

SPARK ARRESTER.

APPLICATION FILED JULY 24, 1907.

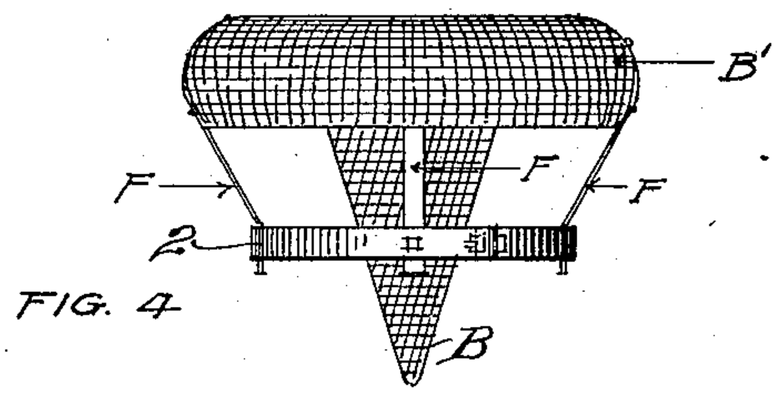

FIG. 4

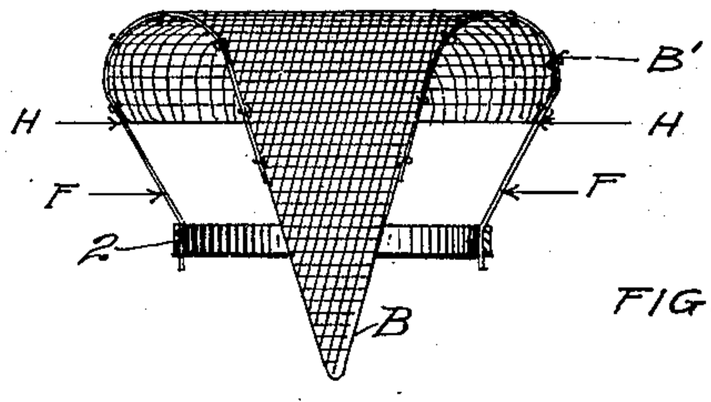

FIG. 5

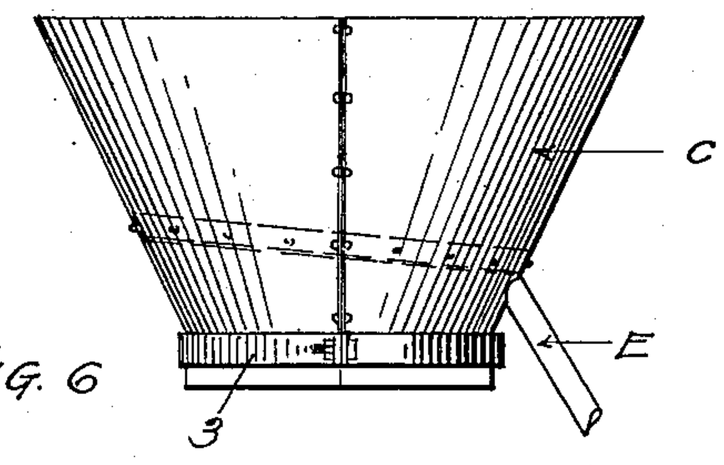

FIG. 6

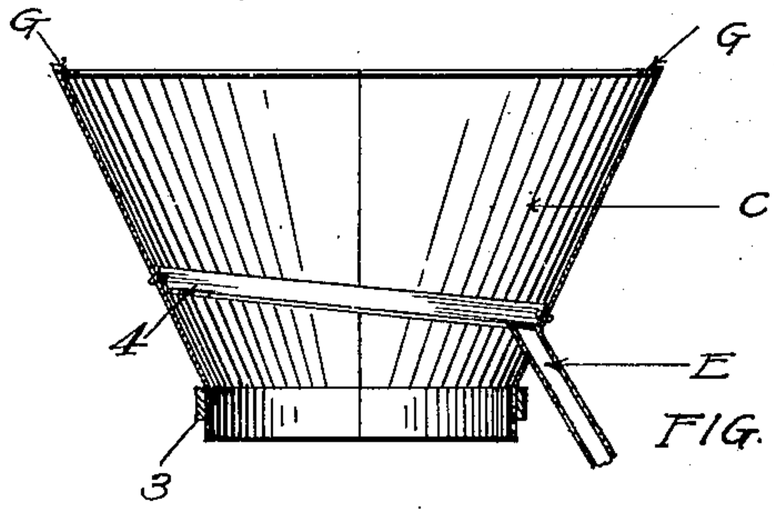

FIG. 7

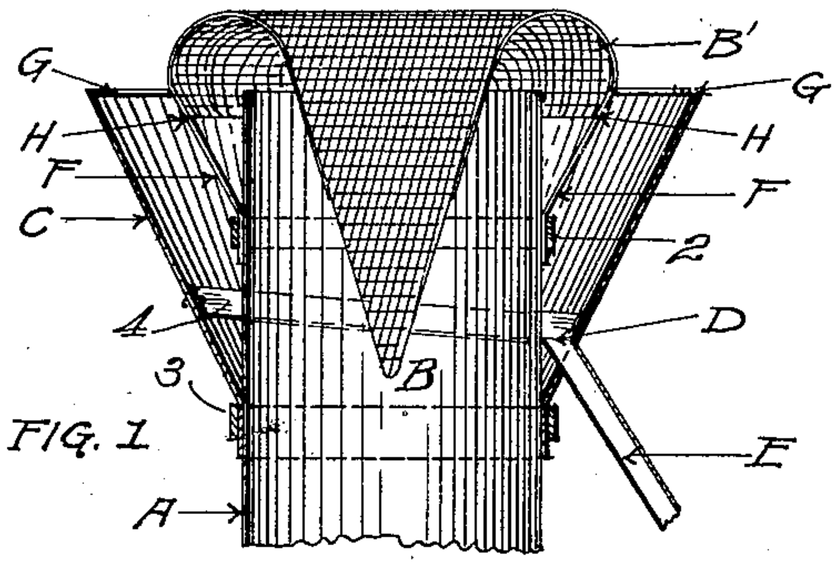

FIG. 1

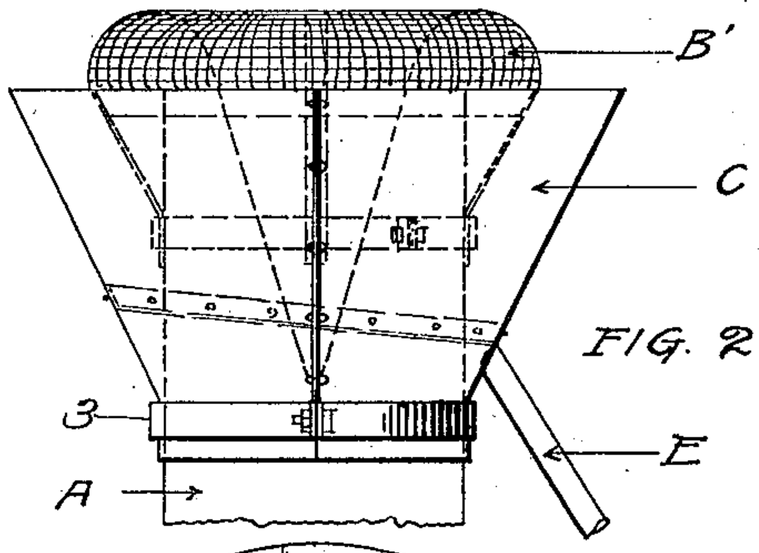

FIG. 2

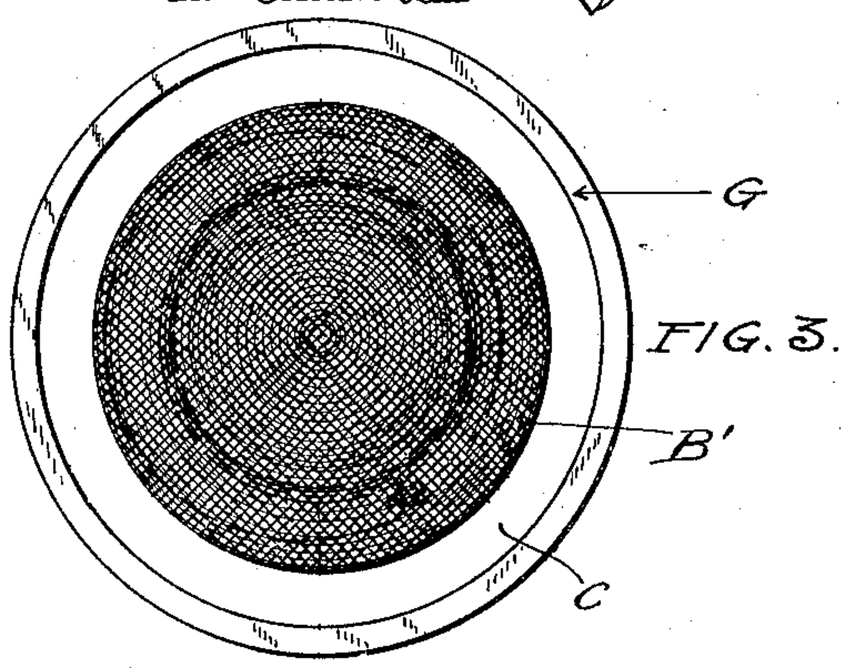

FIG. 3.

WITNESSES:

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FRANK RANSOME MINKLER, OF FRESNO, CALIFORNIA.

SPARK-ARRESTER.

No. 890,993. Specification of Letters Patent. Patented June 16, 1908.

Application filed July 24, 1907. Serial No. 385,333.

To all whom it may concern:

Be it known that I, FRANK RANSOME MINKLER, a citizen of the United States, residing at Fresno, in the county of Fresno and State of California, have invented a new and useful Improvement in Spark-Arresters, of which the following is a specification.

My invention relates to an apparatus which is designed as an attachment for the smoke-stacks or chimneys of boilers for engines, or like purposes, in which either an ordinary or a forced draft is employed, of such a nature as to tend to discharge sparks from the chimney.

The invention consists in the combination with the chimney, of the spark arresting devices, and their relation thereto, and also in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the entire device. Fig. 2 is an elevation showing the device as completed. Fig. 3 is a plan of the entire device. Fig. 4 is an elevation of the screen cone. Fig. 5 is a section of the screen cone. Fig. 6 is an elevation of the pan or spark reservoir. Fig. 7 is a section of the same pan.

A is a chimney or stack, so-called, through which products of combustion and sparks escape, and through which, particularly in locomotive, donkey, and other smaller engine boilers, a forced draft is applied, which tends to force the sparks out and scatter them; and when in proximity to combustible substances, they are a source of considerable danger.

In my invention, I employ a screen of wire cloth or similar mesh, which has a conical portion B designed to enter the upper part of the stack A, with the cone end presented downwardly. This cone is developed at the upper end into an inverted basin-shaped portion B′, the periphery of which is approximately level with, or below, the top of the stack, and is of such larger diameter than the stack, as to form an annular channel between the periphery of the stack and the rim of the screen.

Suitable brackets or arms F are secured to the screen, converging inwardly and downwardly, and connected to the collar or sleeve 2, which is clamped upon the stack at some distance below the top, so that the screen is firmly held with its rim or periphery H concentric with the top of the stack, as previously described.

Exterior to the stack and screen is a cone C, the upper edge of which is inturned, as shown at G. This cone converges downwardly, and by means of a clamp ring or other equivalent fastening 3, it is secured to the stack at some distance below the securing ring 2 of the screen; the adjustment being such that the top of the stack and the top of the cone are, approximately, upon the same level, while the arch of the screen extends a little above the two.

Sparks and small burning particles which are ejected from the chimney will strike the cone, be diverged outwardly, and following the curvature of the screen, will fall into the exterior cone. Within this cone is a floor 4 which is inclined slightly from one side to the other; and it fits between the exterior of the chimney and the interior of the cone, so that the sparks discharged downwardly from the screen cap will fall upon this floor. The inturned flange G largely prevents the escape of any sparks which might be thrown upward from the floor by the intensity of the draft, and they will fall back into the cone. This inclined floor connects at one side, as at D, with a discharge pipe or passage E, which conveys them to any suitable receptacle below. By this construction the rim of the screen is supported between the top of the smoke-stack and the top of the cone C, so that there will be a free passage beneath this rim for the escape of smoke in case the screen should become clogged, as such screens frequently do when the boilers prime, and considerable water is thrown out of the exhaust; so that if the screen was rigidly fastened to the upper portion of the stack or cone, without any free escape, there would be a great back pressure brought upon the interior parts, by the clogging of the screen.

I have heretofore designated the spark receiver or pan as a cone, by reason of the convenience of fixing such a form to the stack, but it will be manifest that its shape may be changed without altering the character of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. The combination with a smoke-stack, of a conical receiver having its smaller end inclosing and fixed to the stack below the top

and the upper and larger end concentrically inclosing the top of the stack at a distance therefrom, and a screen cone having its smaller end extending into the stack and having its upper and larger end turned outwardly and downwardly into the space between the stack and the receiver to form an inverted basin-shaped portion, arms secured to the down turned edge of said basin-shaped portion and extending inwardly towards the stack, and a collar or sleeve embracing the stack and the said arms and thereby securing the receiver in position.

2. The combination with a smoke-stack, of a conical receiver having its smaller end secured to the stack below the top, and the larger end substantially level with the top of the stack, said receiver having an inwardly turned flange surrounding its upper edge and forming an overhanging shelf, an inclined floor within the cone having a discharge pipe connecting with its lower side, and a screen cone having its apex projecting into the stack and having its upper end curved outwardly and downwardly into the space between the stack and the first named cone, and out of contact with both, and spaced arms secured to the lower edge of said down turned portion and extending downwardly and inwardly to the stack, and means for securing the lower ends of said arms to the stack.

3. The combination with a stack and a conical receiver secured thereto with its larger end projecting upwardly, of an inverted cone shaped screen having its larger end curved outwardly and downwardly to form an inverted basin-shaped portion, arms extending from said portion and converging downwardly and a clamp ring to which the lower ends of said arms are fixed, said ring, cone, and arms forming substantially a unitary structure and said ring adapted to be fitted to the stack so that the lower end of the screen cone will project into the stack while the lower edge of the basin-shaped portion will enter the space between the stack and the first named cone.

4. A spark arrester having in combination a chimney or stack, an exterior receiver, forming with the stack an annular chamber, and a screen cone having its smaller end entering the stack and its larger end extending above the stack and thence turned downwardly into the space between the receiver and stack and having its edge separated from both to provide a free escape downward into said space and under said edge and thence upwardly into the open air.

In testimony whereof, I have hereunto set my hand to this specification, this 16th day of July, 1907, in the presence of two subscribing witnesses.

FRANK RANSOME MINKLER.

Witnesses:

GEO. W. SMITH,

A. W. CLARK.