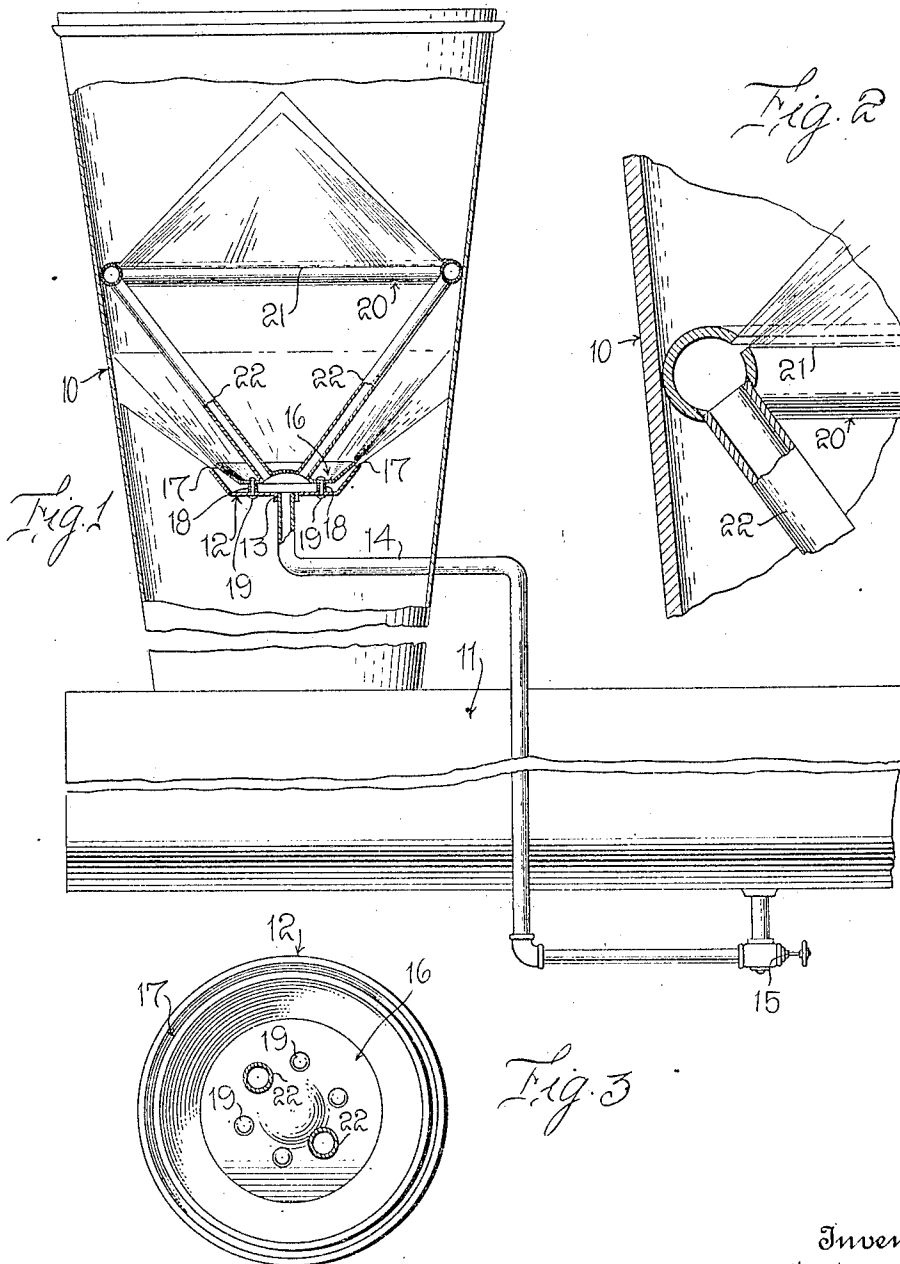


O. G. GRAN.
SPARK ARRESTER.
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1,291,840.

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Inventor
OTTO G. GRAN
Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

OTTO GILFORD GRAN, OF SPRING GROVE, MINNESOTA.

SPARK-ARRESTER.

1,291,840.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, OTTO G. GRAN, a citizen of the United States, residing at Spring Grove, in the county of Houston and State of Minnesota, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to spark arresters, and particularly to arresters designed to be disposed within a stack to impede the passage of live sparks therethrough and to dampen the live sparks so that they will do no damage when they are ejected from the stack.

15 The general object of the invention is to provide means for discharging jets of steam within the stack, thus assisting the draft of the stack and at the same time dampening any live sparks.

20 A further object in this connection is to provide a construction which will direct sheets of steam, as they may be called, in opposite directions so that a spark cannot pass upward through the stack without passing through one or the other or both of the sheets of steam.

25 A further object is to provide means disposed within a stack whereby an upwardly and outwardly diverging or inverted cone of steam may be provided in one portion of the stack and an upwardly converging cone of steam be provided in another portion of the stack, the cones having their greatest diameters approximately the diameter of the stack itself.

Other objects will appear in the course of the following description.

30 My invention is illustrated in the accompanying drawings, wherein:—

35 Figure 1 is a side elevation of a stack and boiler, the stack being broken away to show the spark arrester therein, the spark arrester being partly in section;

Fig. 2 is an enlarged vertical sectional view of a portion of the stack and of the annulus 20 and pipe 22;

40 Fig. 3 is a top plan view of the plates 12 and 16, the pipes 22 being in section.

Referring to these drawings, 10 designates a stack of any suitable form and 11 a steam boiler. It is not considered necessary to illustrate the connection of the stack to the furnace as this may be of any ordi-

nary and suitable construction and further because my invention does not lie in this.

45 Disposed within the stack is a circular plate 12 having a central aperture 13. This plate is connected by a pipe 14 to the boiler 11, the pipe being provided in its length with a valve 15 whereby the passage of steam from the boiler may be controlled. The outer margins of the plate 12 incline upward and outward and disposed above the plate 12, in spaced relation thereto, is a plate 16, whose outer margins extend upward and outward but converge toward the outer margins of the plate 12 so as to provide an annular steam nozzle 17. These two plates are held apart from each other by sleeves 18 through which bolts 19 pass. Any other suitable means for holding the plates apart, however, may be provided.

50 Disposed above the plate 12 is a hollow annulus 20 having a circumference substantially the same as the circumference of the stack 10, this hollow annulus being slitted on its inside face as at 21, said slit being directed upward so that steam directed from the slit will converge at a point in line with the vertical axis of the stack. The hollow ring 20 is connected by upwardly divergent pipes 22 to the space between the plate 16 and the plate 12, these pipes extending through the plate 16 and having screw-threaded engagement therewith or being otherwise attached thereto. These pipes at their upper ends discharge steam into the interior of the ring 21. The pipe 14 is preferably $\frac{1}{2}$ " in diameter in actual practice and discharges white steam from the boiler to the spark arrester. The steam passes up through the pipe 14 and is discharged into the chamber formed between the plates 12 and 16 and this steam is discharged in an annular jet upward and outward toward the wall of the stack, so as to form what may be termed a steam curtain defining an inverted cone. Steam also passes upward through the pipes 22 into the annulus 20 and is discharged upward and centrally so as to form a conical steam curtain and it will be seen that inasmuch as the lower steam curtain has its great diameter equal to the diameter of the stack and the upper steam curtain has its diameter equal to the diameter of the stack, that sparks passing upward through the stack must pass be-

tween these steam curtains so that the steam will wet the spark and quench it and thus no live sparks can pass out of the arrester. At the same time the steam jets act to increase or assist the draft of the stack. Of course the amount of steam which passes up through these stacks may be readily controlled.

While I have illustrated a construction which I believe to be thoroughly effective in practice and which is capable of being applied to any desired form of stack, yet it will be obvious that many changes may be made in the details of construction, without departing from the spirit of the invention as defined in the appended claims.

In Fig. 1 the stack and boiler shown are largely diagrammatic and merely illustrative of this invention, and I do not wish to be limited to any particular form of boiler or any particular form of stack.

Having described my invention, what I claim is:—

1. In a stack, a relatively small steam chamber disposed within the stack and having an annular steam ejecting opening, the opening being defined by upwardly and outwardly directed walls, means connecting said chamber with a source of steam, an

upper, hollow annulus disposed within and in approximate contact with the stack and having tubular connections to the first named chamber and having an annular slit formed to discharge steam upward and centrally.

2. A spark arrester including a circular plate having upwardly and outwardly directed marginal walls, a plate superimposed thereon and held in spaced relation thereto and having upwardly and outwardly directed margins, the margins of the two plates having convergent relation and the plates being held in spaced relation to each other, a steam pipe entering the center of the first named plate, outwardly and upwardly directed pipes leading from the second named plate, and an annular tubular member mounted upon the last named pipes and having communication therewith, said tubular member being formed with an annular slit directing an annular jet of steam upward and toward the center of the stack.

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

OTTO GILFORD GRAN.

Witnesses:

IDA BELINDA GRAN,
ARTHUR CLAUD GRAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."