

(No Model.)

I. DEYELL.
SPARK EXTINGUISHER.

No. 310,565.

Patented Jan. 13, 1885.

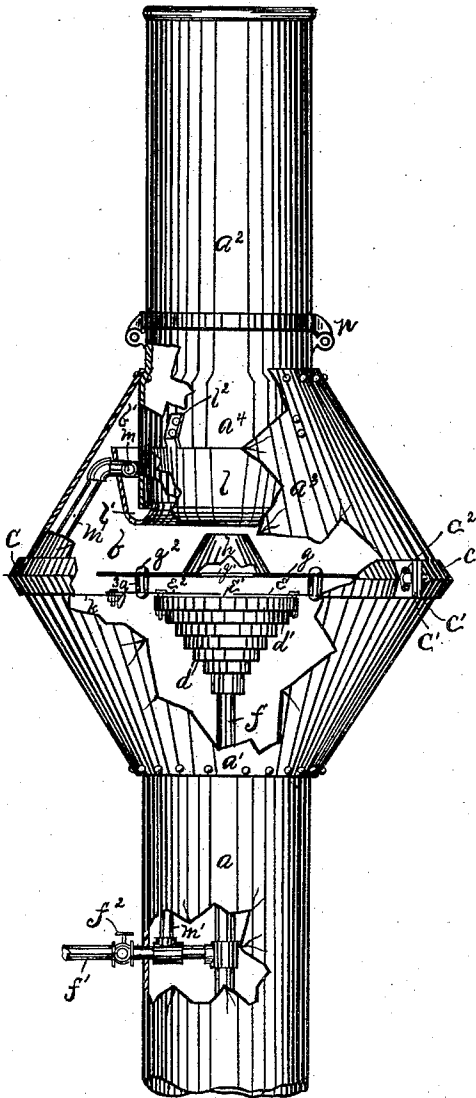


FIG. 1.

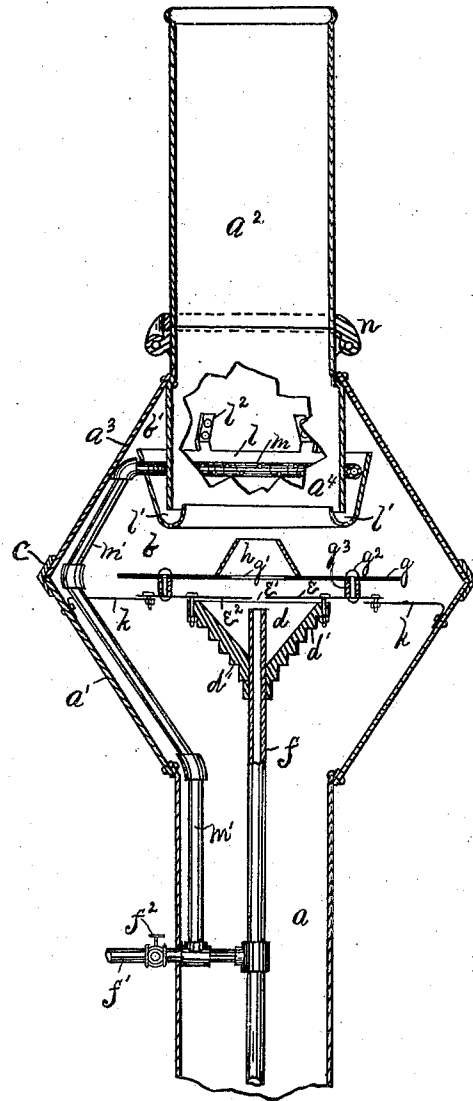


FIG. 2.

Witnesses:

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Att'y

UNITED STATES PATENT OFFICE.

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SPARK-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 310,565, dated January 13, 1885.

Application filed January 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, ISAAC DEYELL, a citizen of Canada, residing at St. Thomas, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Spark-Extinguishers; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates more particularly to certain improvements in the spark-extinguishers for which Letters Patent No. 254,122 were granted to me the 28th day of February, 1882; also, to certain improvements in the smoke-stack to be employed in connection with my improved spark-extinguisher.

To these ends my invention consists of certain arrangements and combinations, which will be particularly hereinafter described and claimed.

In the drawings, Figure 1 is an elevation of my improved smoke-stack and spark-extinguisher with portions broken away, and Fig. 2 is a central vertical section of Fig. 1.

Referring to the drawings, *a* is the lower cylindrical portion of the smoke-stack. To its upper edge is riveted the outwardly-flaring extension *a'*. The upper portion, *a''*, of the stack is, like the lower portion, *a*, cylindrical in form, and has secured to its lower end the outwardly-flaring extension *a'''*, similar in size and shape to the part *a'*. These parts, when put together, form a stack having an enlarged portion, *b*, at or near its center, in which the spark-extinguishing apparatus is located. It will be observed that the lower end, *a'*, of the portion *a''* of the stack extends downwardly within the chamber *b*, so as to form the annular space *b'*. The flaring portions *a'* and *a'''* are removably secured together by the circular and angular rim *c*, secured at its ends *c'* *c''* by the screw-bolt *c'''*. *d* is a hollow steam-receptacle provided with the annular steps or shoulders *d'*, which are arranged in a downwardly and inwardly converging direction, as clearly shown. This is the same construction as shown in my patent hereinbefore mentioned.

Over the steam-receptacle *d* is suitably secured the cap *e*, having the central opening, *e'*. An annular space, *e''*, is left between this cap and the receptacle *d* for the exit of steam from the receptacle *d*, which is mounted upon the pipe *f*. This pipe passes up through the center of receptacle *d* to a point near the cap *e*. *f'* is a steam-pipe leading from the boiler directly or from the steam-chest or exhaust-nozzle and connecting with the pipe *f*. The pipe *f'* is provided with the cock *f''* to regulate the quantity of steam.

Over the cap *e*, a short distance therefrom, is secured the disk *g*, of a size somewhat larger than the receptacle *d* and its cap *e*. This disk is provided with the central circular opening, *g'*, considerably larger than the opening *e'* in the cap *e*. Over this opening *g'*, and surrounding it, is the hollow frustumal passage *h*, secured to the upper surface of the disk *g*. The disk *g* is secured to extensions of the cap *e* by the bolts *g''* and short sections *g'''* of pipe, and both disk *g* and cap *e* are supported within the chamber *b* by the brackets *k*, bolted to the portion *a'* of the stack.

Upon the inner and upper face of the portion *a''* of the stack is secured the deflector *l*, having the downwardly-converging sides, whose lower edge is turned upwardly to form the annular curved bottom *l'*, into which projects the lower extension, *a'*, of the stack *a''*. The deflector *l* is secured to the sides of the portion *a''* of the stack by the strips *l''* (three or more) in such manner as to leave a space between the deflector and portion *a''* of the stack.

Between the extension *a'* of the stack and the upper part of the deflector *l* is placed the circular perforated steam-pipe *m*, connected by pipe *m'* with the pipe *f'*, leading to the boiler or steam-chest. The upper portion, *a''*, of the stack is hinged near its lower end at *n*, so that the upper portion can be lowered out of the way when necessary.

The operation of the apparatus just described is substantially as follows: When the engine with my improved apparatus attached thereto is set in motion, the exhaust-steam, preferably, is allowed to pass into the receptacle *d* through pipes *f'* and *f*. A portion of such steam escapes through the annular passage *e'* in the form of a horizontal wall, through

which the sparks are obliged to pass in their upward course in the stack. The rest of the steam from the pipe *f* passes out through the opening *e'* in the cap *e*, and escapes upwardly through the passage *h* and into the portion *a*² of the upper stack, and assists in maintaining the proper draft. The disk *g* serves to throw the ascending sparks and smoke into the annular space *b'*, from whence they pass downwardly along the inner wall of the deflector *l*, and pass the perforated pipe *m*, where they are again subjected to the quenching action of the escaping steam at that point. The curved lower portion, *l'*, of the deflector serves to direct the passing sparks upwardly and through the section *a*² of the stack, out of which they pass into the open air. It will readily be seen that it is practically impossible for any sparks to pass out of the stack unextinguished, while at the same time the draft is not weakened to the extent of materially affecting the proper amount of combustion in the fire-box. The exhaust-steam taken directly from the exhaust-nozzle or steam-chest is preferred; but it is apparent that live steam from the boiler could with proper regulations be employed instead.

I claim—

1. In a spark-extinguisher for smoke-stacks, the steam-receptacle *d*, and cap *e*, provided with the opening *e'*, the cap *e* so arranged thereon as to leave the annular space *e'*, the

disk *g*, provided with the central opening, *g'*, and the passage *h*, surrounding the opening *g'*, all combined and operating in connection with the steam-supply pipe *f*, substantially as shown and described.

2. In a spark-extinguisher, the deflector *l*, having the annular curved bottom and the perforated steam-pipe *m*, in combination with the extension *a*⁴ in the smoke-stack, substantially as and for the purpose stated.

3. In a spark-extinguisher, the disk *g*, in combination with the deflector *l l'*, the perforated steam-pipe *m*, and the extension *a*⁴ of the portion *a*² of the smoke-stack, substantially as and for the purpose stated.

4. The spark-extinguisher consisting of the steam-receptacle *d*, its pipe *f*, and its cap *e*, having the opening *e'*, the disk *g*, its central opening, *g'*, and its passage *h*, the deflector *l*, with its annular curved bottom *l'*, the perforated pipe *m*, with the supply-pipe *m'*, and the extension *a*⁴, the whole combined and arranged within the chamber *b* of the smoke-stack, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ISAAC DEYELL.

Witnesses:

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W. T. MILLER.