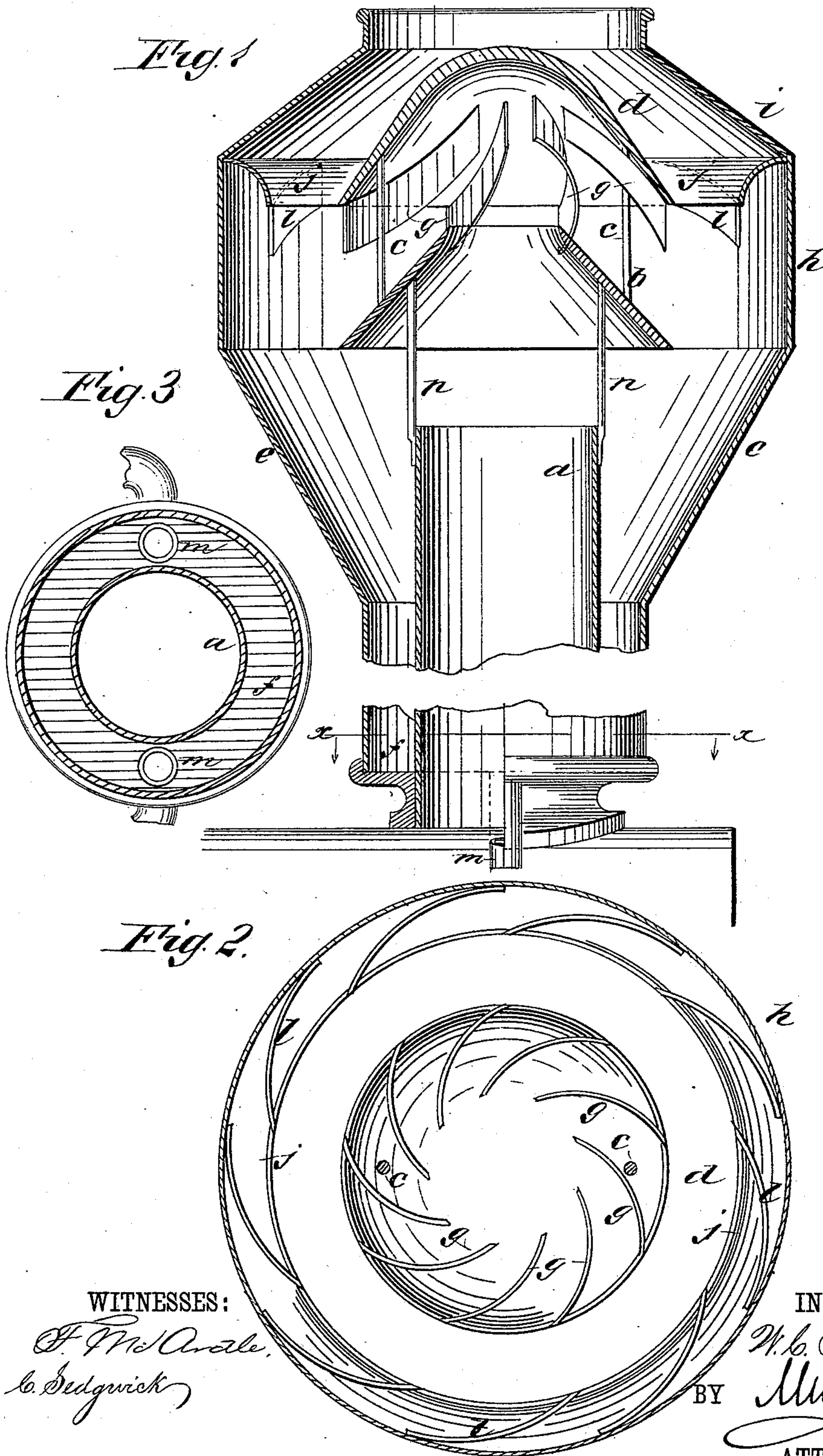


(No Model.)

W. C. BEAL.
SPARK ARRESTER.

No. 300,191.

Patented June 10, 1884.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM CONSTANTINE BEAL, OF FERNANDINA, FLORIDA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 390,191, dated June 10, 1884.

Application filed September 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BEAL, of Fernandina, in the county of Nassau and State of Florida, have invented a new and Improved Spark-Arrester, of which the following is a full, clear, and exact description.

The object of my invention is to provide an improved spark-arrester, more particularly adapted for wood-burning locomotives, but also useful for coal-burners.

The improvements consist of a hollow truncated cone located a suitable distance over the smoke-pipe, which concentrates the current of sparks at the center of a hollow cone a suitable distance above, in which they are deflected to the side of the stack, and at the same time given a whirling motion around the stack, together with a guard in the upper part of the stack for preventing the escape of any sparks that may turn upward along the shell from the place where they are deflected against the shell of the stack from the upper cone, all as herein-after fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a locomotive smoke-stack having my improved spark-arrester applied to it. Fig. 2 is a horizontal section between the cones, looking upward; and Fig. 3 is a horizontal section on the line *x x*, looking downward.

About a foot (more or less, as found best) above the top of the smoke-pipe *a*, I arrange a truncated hollow cone, *b*, the base of which is somewhat larger than the top of the smoke-pipe, and the opening through the top of it is smaller than said smoke-pipe, the latter being to contract the stream of ascending sparks and concentrate them in the top of the hollow cone *d*, located about as much above cone *b* as said cone is above the smoke-pipe, and the enlarged base of cone *b* is to prevent any sparks from falling back into the smoke-pipe; also to chute the sparks falling back from upper cone, *d*, onto the upwardly-flaring portion *e* of the shell of the smoke-stack, to be projected downward into the space *f* at the bottom. The cone *d* is to receive the sparks at the top of its cavity and deflect them back onto the side of the upper

portion of part *e* of the stack, and it has a series of curved chutes, *g*, attached to the inner surface, and extending from near the center, where the sparks strike the cone, to the lower edge, the object of which is to project the sparks in a spiral course down the smoke-stack, by which they rebound less, and do not fly back into the smoke-pipe, nor upward through the top of the smoke-stack, as they otherwise would.

At the junction of the cylindrical part *h* of the smoke-stack with the base of the conical top *i*, I have arranged an inwardly-projecting and downwardly-curved flange, *j*, for a guard to arrest any sparks that may be thrust upward along the smoke-stack, the inner and lower edge of said guard terminating about on the level of the base of the cone *d*, and this guard also has curved chutes *l*, said chutes being arranged in the same direction as chutes *g*, and being to facilitate the setting in motion of the sparks that may be caught by the guard, along with the rest thrown down from chutes *g* by the effect of the currents from said chutes *g*.

From the space *f* the cinders and ashes may be discharged through pipes *m* in any approved way.

The cone *b* is supported above the smoke-pipe *a* by the standards *n*, attached to the smoke-pipe, and cone *d* is supported on cone *b* by other standards, *c*.

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

1. The combination of the hollow truncated cone *b* and hollow cone *d* with the smoke-pipe *a* and the smoke-stack *e h*, the base of the cone *b* being larger and the top smaller than the smoke-pipe, and said cones being arranged one above the other and over the top of the smoke-pipe, substantially as described.

2. The combination of the hollow truncated cone *b*, hollow cone *d*, and the curved flanges *g* in said cone *d*, with the smoke-pipe *a* and the smoke-stack *e h*, said cones being arranged over the smoke-pipe, substantially as described.

3. In a spark-arrester, the combination, with the part *h*, of the part *i*, flange *j*, and cone *d*, as shown and described.

4. The inwardly and downwardly project-

ing guard *j* in combination with the cone *d*, curved chutes *g*, and the smoke-stack, substantially as described.

5 5. The inwardly and downwardly projecting guard *j* and curved chutes *l*, in combination with the smoke-stack, substantially as described.

6. The inwardly and downwardly projecting guard *j* and curved chutes *l*, in combination with cone *d*, chutes *g*, and the smoke-
10 stack, substantially as described.

7. The inwardly and downwardly project-

guard *j* and curved chutes *l*, in combination with cone *d*, chutes *g*, cone *b*, and the smoke-stack, substantially as described.

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8. The inwardly and downwardly projecting guard *j* and curved chutes *l*, in combination with the cone *d*, chutes *g*, cone *b*, smoke-pipe *a*, and the smoke-stack, substantially as described.

WILLIAM CONSTANTINE BEAL.

Witnesses:

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JOSEPH HIGGINS.