W. E. Hayes,

Shark Arrester.

No. 97,636. Patented Dec. 7, 1869.

Fig. 1.

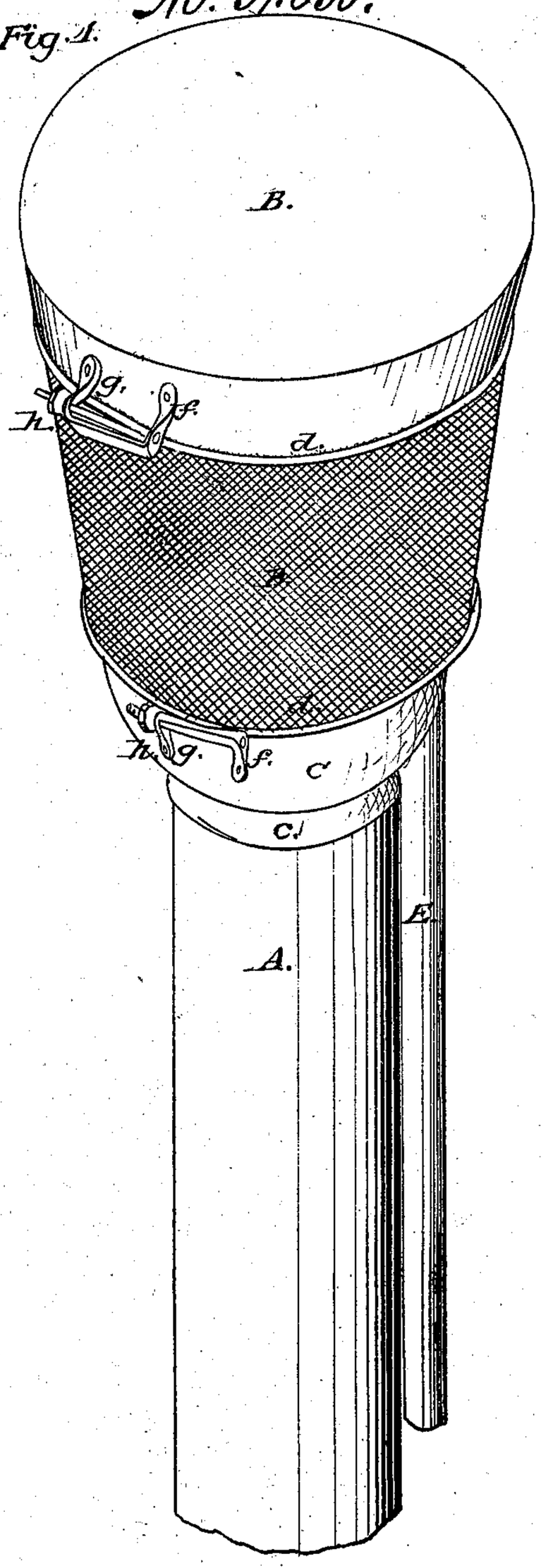
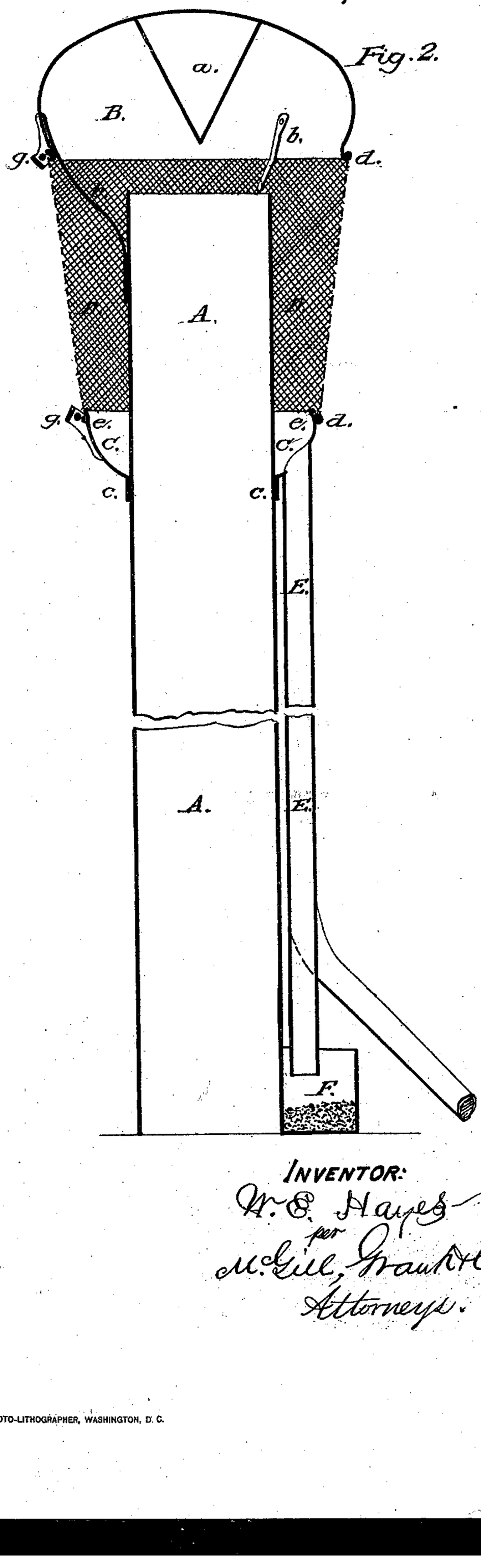


Fig. 2.



WITNESSES:

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per

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W. E. HAYES, OF DURAND, WISCONSIN.

Letters Patent No. 97,636, *dated December* 7, 1869.

IMPROVEMENT IN SPARK-ARRESTERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, W. E. HAYES, of Durand, in the county of Pepin, and State of Wisconsin, have invented a new and improved Spark-Annihilating Smoke-Stack for locomotive, steamboat, and other engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 represents a perspective view of the invention, and

Figure 2 represents a sectional view of the same.

Similar letters of reference indicate corresponding parts.

The nature of my invention consists in constructing a smoke-stack which will admit of its top being made open, so as to secure a full draught, and at the same time prevent anything but smoke and very fine particles of carbon escaping from it into the air, thus obviating the danger and annoyance of flying sparks and cinders.

To do this, I construct my smoke-stack with a metal cap, about twenty inches larger in diameter than the body of the stack, and provided, on its inside, with an inverted conical deflector.

I affix this cap over the top of the stack, and in such a position that the point of the deflector will come exactly over the centre of the top of the stack, and some distance above it.

Around the body of the stack, and about thirty inches from its top, I affix a flare, about ten inches wider in diameter than the stack, and I connect the cap and this flare together by a collar or casing of fine-mesh wire cloth, or other perforated material.

By this arrangement, the blast or draught of the stack forces the smoke and sparks in contact with the metal cap and its conical deflector, and thereby reverses the draught downward on the outside of the stack, driving the smoke and finer particles of carbon out through the perforated collar or casing, and the sparks and cinders down into the flare, from whence they are carried, by means of a pipe or sheet-iron casing, placed around the stack, and deposited in the furnace, or elsewhere.

In the accompanying drawings—

A represents the shank or body of the smoke-stack.

B represents the metal cap or hood, and *a*, its conical deflector.

b b are bars, holding the cap B in position, above the top of the stack A.

The sides of the cap B are made to centre in toward the stack A.

C is the iron flare or gutter surrounding the stack A, to which it is attached by the band *c*.

D represents the collar or casing of fine-mesh wire cloth, or other perforated material, connecting the cap B and flare C together, and enclosing the top of the stack A.

The perforated casing D is bound to the cap B and flare C, by reason of its edges being pressed into the annular grooves *e e*, by means of the adjustable metal straps *d d*, adapted to said grooves.

One end of each of these straps is secured to the lugs *f f*, while the other ends are run through the lugs *g g*, and are threaded, and provided with the nuts *h h*, for tightening and releasing the same.

A cam can be used for this purpose, however, if preferred.

E is a metal flue, about three inches in diameter, running from the flare C, into which it opens, down along the stack.

The invention operates as follows:

The blast or draught of the stack A forces the smoke and sparks in contact with the cap B, and its conical deflector *a*, and thereby reverses the draught downward on the outside of the stack A, driving the smoke and finer particles of carbon out through the perforated casing D, and the sparks and cinders down into the flare C, from whence they are carried through the tube E, down into the reservoir F, or into the furnace, or, if on a boat, into the wheel-houses, or any other suitable place.

The manner in which the cap B is made and fixed over and above the top of the stack A, with its sides centring in toward the same, reverses the draught, and drives it down on the outside of the stack, and at the same time increases the heat at the top of the stack, and rarefies the air and products of combustion to such a degree that the draught of the stack is very much increased thereby; and the arrangement of the perforated casing D around and nearly all below the top of the stack A, admits of the entire top of the same being left open, thereby securing a full draught, which, passing longitudinally across the surface of the casing D, precludes the possibility of its fouling or choking up, and permits nothing to pass from the stack into the air but smoke and the finer particles of carbon.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the adjustable straps or draw-bands *d d*, and their appurtenances *f g h*, arranged and operating substantially as set forth, with the cap B, flare C, and outer casing D, as specified.

2. The combination, with the stack A, of the perforated body of the outer casing surrounding the upper portion of the stack A, and the flare C, arranged as described.

3. The outer casing of the top of the stack A, consisting of the flare C, cap B, and wire-gauze or perforated body D, arranged as described.

In testimony that I claim the foregoing invention, I have hereunto set my hand, this 23d day of December, 1868.

W. E. HAYES.

Witnesses:

J. D. TIFFANY,

D. S. THOMPSON.