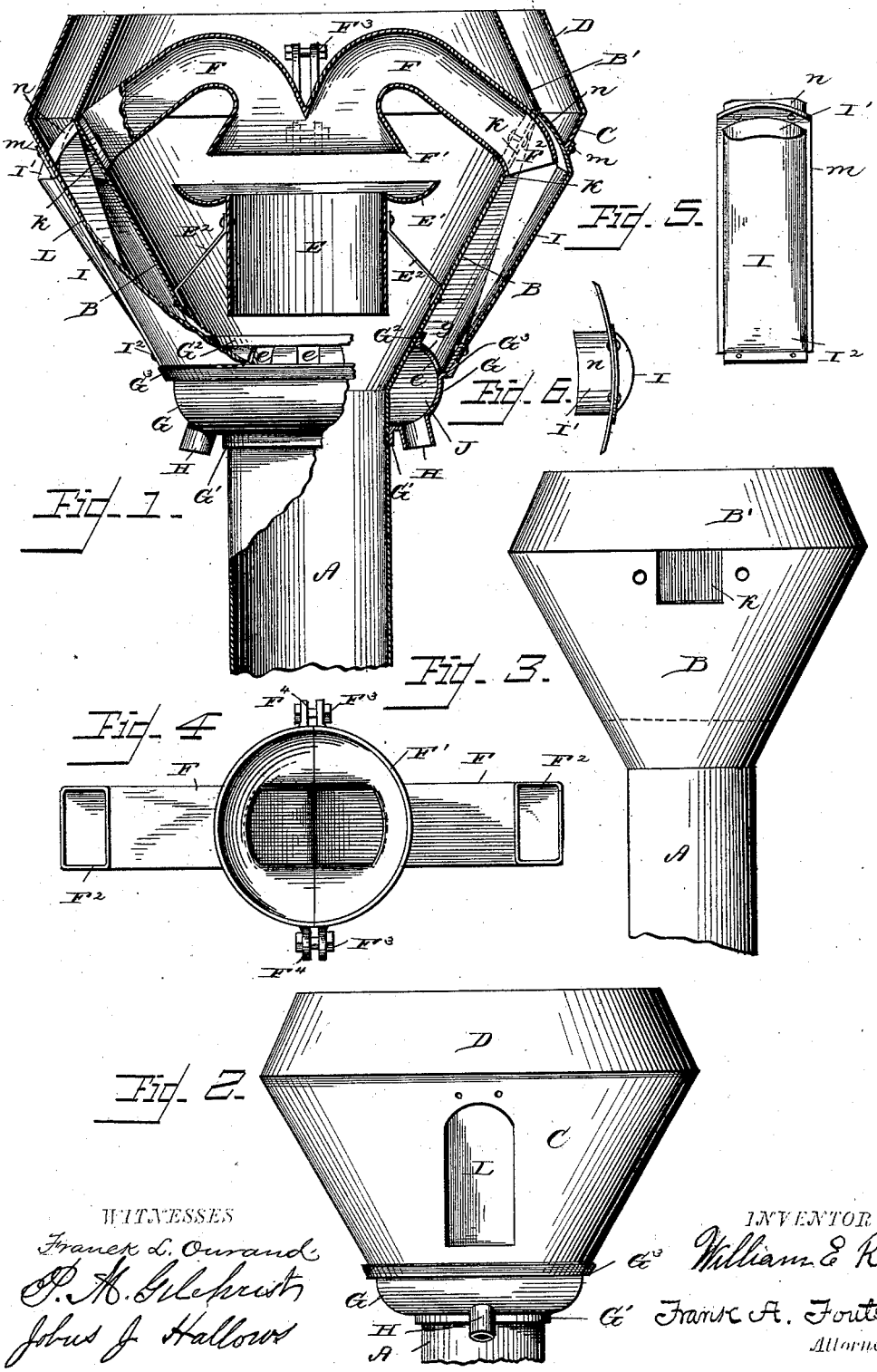
(No Model.)

W. E. REEVES.

SPARK ARRESTER.

No. 303,593. Patented Aug. 12, 1884.



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SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 303,593, dated August 12, 1884.

Application filed March 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, W. E. REEVES, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to spark-arresters for locomotives; and it consists in the parts which will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a locomotive-stack provided with my improvements, having parts broken away to show the inner construction. Fig. 2 is also an elevation of the exterior, showing a vertical slot in the lower frustum. A plate fits over this slot, as will be hereinafter specified. Fig. 3 represents the upper part of the stack, with the ordinary frustums. The opening in the lower frustum in this view is to admit the open end of one of the two branch pipes in the top of the stack. Fig. 4 is a bottom plan view of the two branch pipes united to a bell-shaped center piece. These branch pipes and bell are shown in Fig. 1 in the top of the stack in central longitudinal section. Fig. 5 is a plan view of one of the two plates that fit over the vertical opening or slot shown in the lower frustum in Fig. 2. Fig. 6 is a top plan view of a fragment of the outer lower frustum and the plate shown in Fig. 5.

Like letters indicate like parts throughout the several views.

A represents the cylindrical portion of an ordinary smoke-stack provided with the frustums B B′.

C and D are frustums of larger diameter than the frustums B B′. The frustums C D fit over the frustums B B′, leaving a flaring annular space between.

E is a cylinder having open ends vertically mounted in the frustum B, and secured thereto by a series of bolted stay-rods, E^2. This cylinder has a flaring mouth, E′, on top.

F F are two branch pipes fixed to a bell-shaped mouth, F′.

F^2 F^2 are the openings in the outer ends of the pipes F. These pipes and their mouth are made in two parts, the dividing-line being through the mouth, as shown in Fig. 4. The mouth is provided with lugs F^4 on each side of the dividing-line, and the two parts are united by bolts passing through openings in the lugs.

G is a ring or collar placed at the intersection of the pipe A and frustum C. This collar is provided with three flanges, G′, G^2, and G^3. The flanges G^2 G^3 are flaring upward. The base of the frustum C rests in the flange G^3. The inner flange, G^2, encircles the inner lower frustum, B, on the dotted line of Fig. 3. A portion of this flange is shown in Fig. 1.

H H are pipes on the ring G, opening into the annular chamber J.

g is the top part of the ring G, forming the bottom between the frustums B C. This top part *g* is provided with a row of openings, *e*, affording communication between the chamber J and the space between the frustums B C.

K K are openings in the top of the frustum B, to admit the open ends F^2 of the pipes F.

L represents the vertical openings in the frustum C covered by the cap-plates I. These plates are concaved from the inner side, the concave being deepest at the top I′, and tapering to almost a flat surface at the bottom I^2. The mouth of the pipe F fits into the top concaved portion, I′, and said pipe makes its discharge therein, the plate acting as a chute to conduct the sparks to the openings *e* in the ring G. The discharge-pipes H are immediately under the plates I, whereby the sparks are conveyed directly through to said pipes H.

m is a flange provided with bolt-openings extending around the sides, top, and bottom of the concaved plate I.

n represents that portion of the plate that passes through the opening L in the frustum C, and into which the pipes F discharge. The inner edge of the portion *n* rests against the outside of the inner frustum, B, immediately above the opening K. The discharge ends F^2 of the pipes F pass through the openings K. The flanges *m* are bolted or riveted to the frustum C.

The operation of the device is as follows: The exhaust vapors, gases, and sparks pass up through the stack A. On reaching the frustum B the vapors and gases will expand, and a portion will pass outside the cylinder E, and

thence out into the air through the mouth of the frustum B′; but the greater part thereof, together with the sparks pass through the cylinder E into the bell-shaped mouth F′, and thence into the pipes F F. The sparks and denser portion will pass through said pipes and into the plates I, and thence through the openings *e* and out the pipes H, while the lighter portions, not finding room to pass through the pipes F, will return, being guided outward by the mouth F′. When said lighter portions strike the flaring flange or mouth E′ on the cylinder E they will be deflected upward and out the top of the frustum. The vapors and gases which pass outside of the bell-mouth F^2 meet with no resistance.

Pipes (not shown in the drawings) are connected with the pipes H for the purpose of conducting the sparks to the track or reservoir.

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

1. In a spark-arrester, a bell-shaped mouth or cap having a series of pipes with open ends, the inner ends whereof opening into the top part of said mouth, said pipes branching outward, and a chute or passage leading from the outer ends of said pipes to a series of discharge-pipes projecting outside of the frustum or stack, the bell-shaped mouth aforesaid being mounted above the opening in the top part of the stack proper, substantially as described, and for the purposes set forth.

2. In a spark-arrester, a bell-shaped mouth or cap having a series of pipes with open ends, the inner ends whereof opening into the top part of said mouth, said pipes branching outward, and a chute or passage leading from the outer ends of said pipes to a series of discharge-pipes projecting outside of the frustum or stack, in combination with a cylinder having open ends, said cylinder being vertically mounted and interposed between the top of the stack proper and the under side of the bell-shaped mouth, substantially as described, and for the purposes set forth.

3. In a spark-arrester, a bell-shaped mouth or cap having a series of pipes with open ends, the inner ends whereof opening into the top part of said mouth, said pipes branching outward, and a chute or passage leading from the outer ends of said pipes to a series of discharge-pipes projecting outside of the frustum or stack, in combination with a cylinder having open ends and a deflecting top flange, said cylinder being vertically mounted and interposed between the top of the stack proper and the under side of the bell-shaped mouth, substantially as described, and for the purposes set forth.

4. In a spark-arrester, a bell-shaped mouth or cap provided with open-end branch pipes, as specified, and a chute or passage leading from the outer ends of said pipes to a series of discharge-pipes projecting outside of the frustum or stack, in combination with the double frustums B C, provided with the openings K L, substantially as described, and for the purposes set forth.

5. In a spark-arrester, the double frustums B C, provided with openings K L, as specified, the cap-plate I, and the branch pipes F, provided with bell-mouth F′, in combination with the ring G, provided with the openings *e*, flange G^3, and discharge-pipes H, substantially as described, and for the purposes set forth.

6. In a spark-arrester, the frustums B C, provided with the openings, as specified, the frustum C having plate I, and pipes F, provided with mouth F′, in combination with the ring G, having flanges G^2 G^3, openings *e*, and pipes H, as specified.

7. In a spark-arrester, the frustums B C, provided with openings, as specified, the frustum C having cap-plate I, and the branch pipes F, provided with mouth F′, in combination with the ring G, having flanges G′ G^2 G^3, openings *e*, and discharge-pipes H, substantially as described, and for the purposes set forth.

8. In a spark-arrester, the combination of the double frustums B C, having openings and plate I, as specified, of the cylinder E, and of the ring G, having the flanges and openings, as described, and for the purposes set forth.

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

WILLIAM E. REEVES.

Witnesses:
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