

No. 757,270:

PATENTED APR. 12, 1904.

W. S. CAVENDER.
SPARK AND CINDER ARRESTER.

APPLICATION FILED NOV. 12, 1903.

NO MODEL.

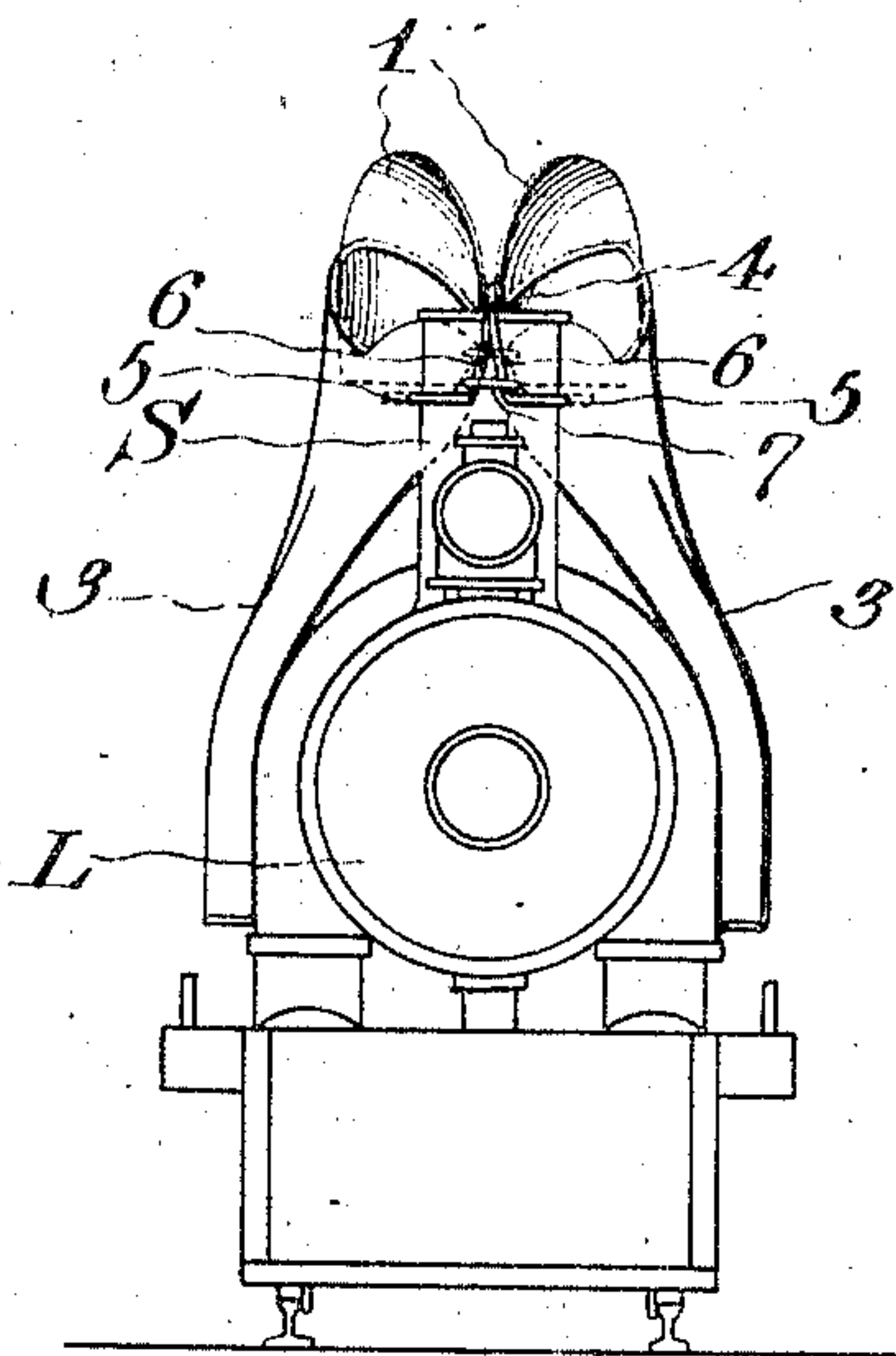
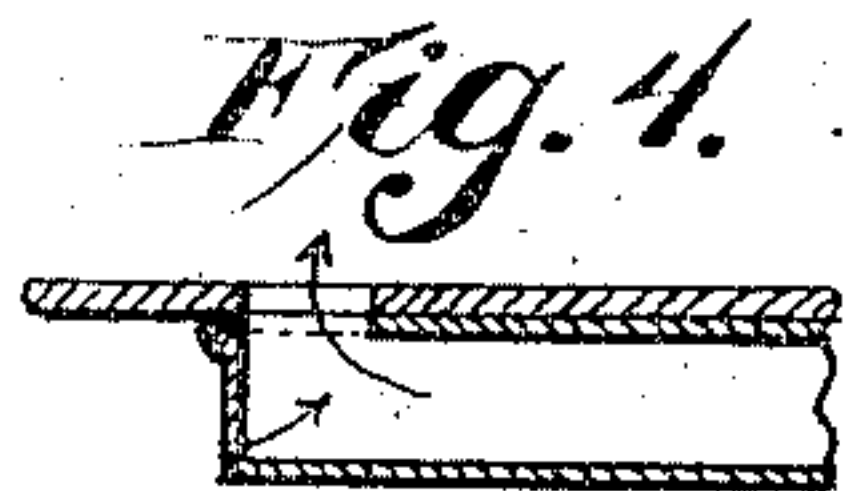
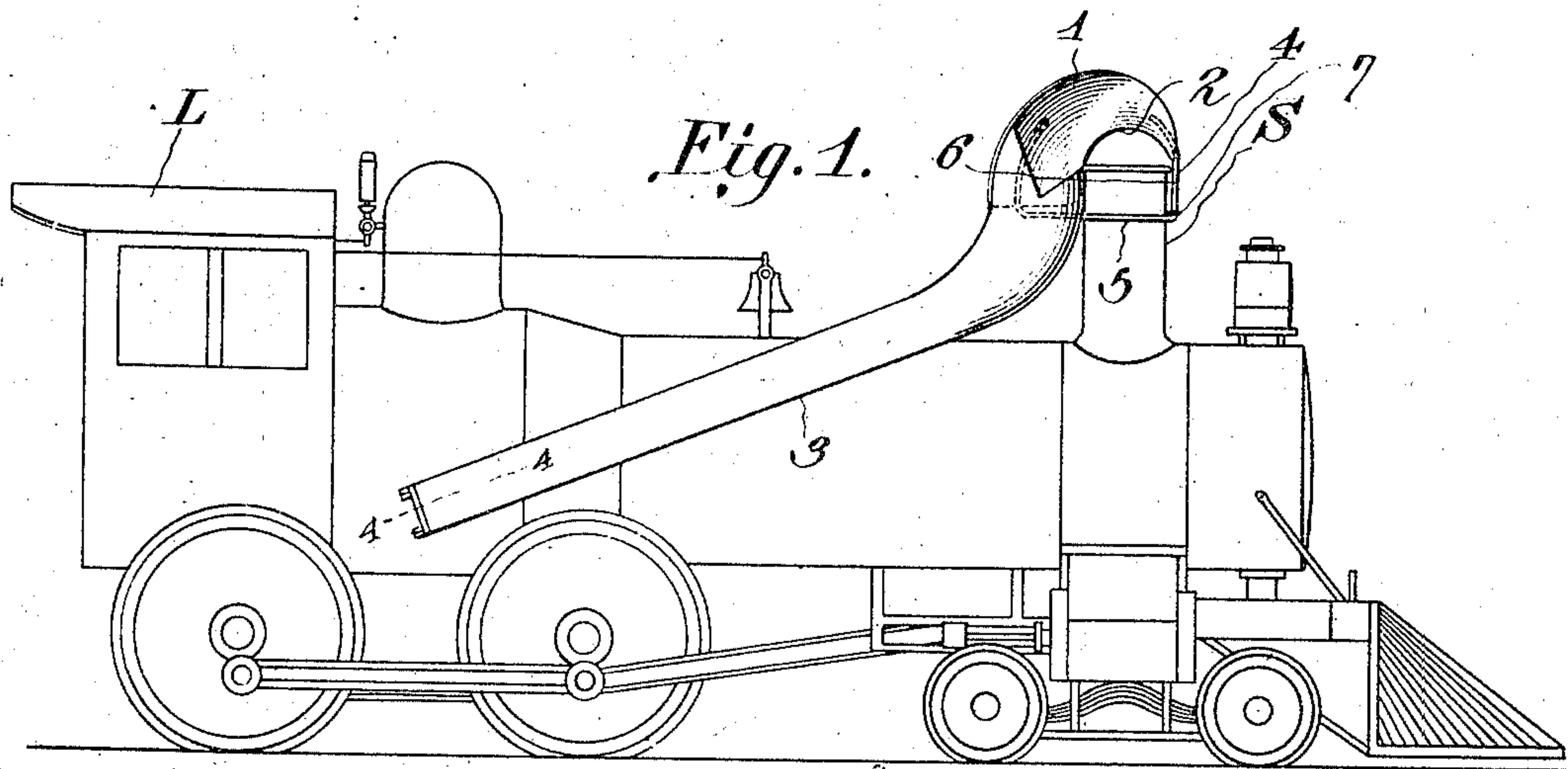


Fig. 2.

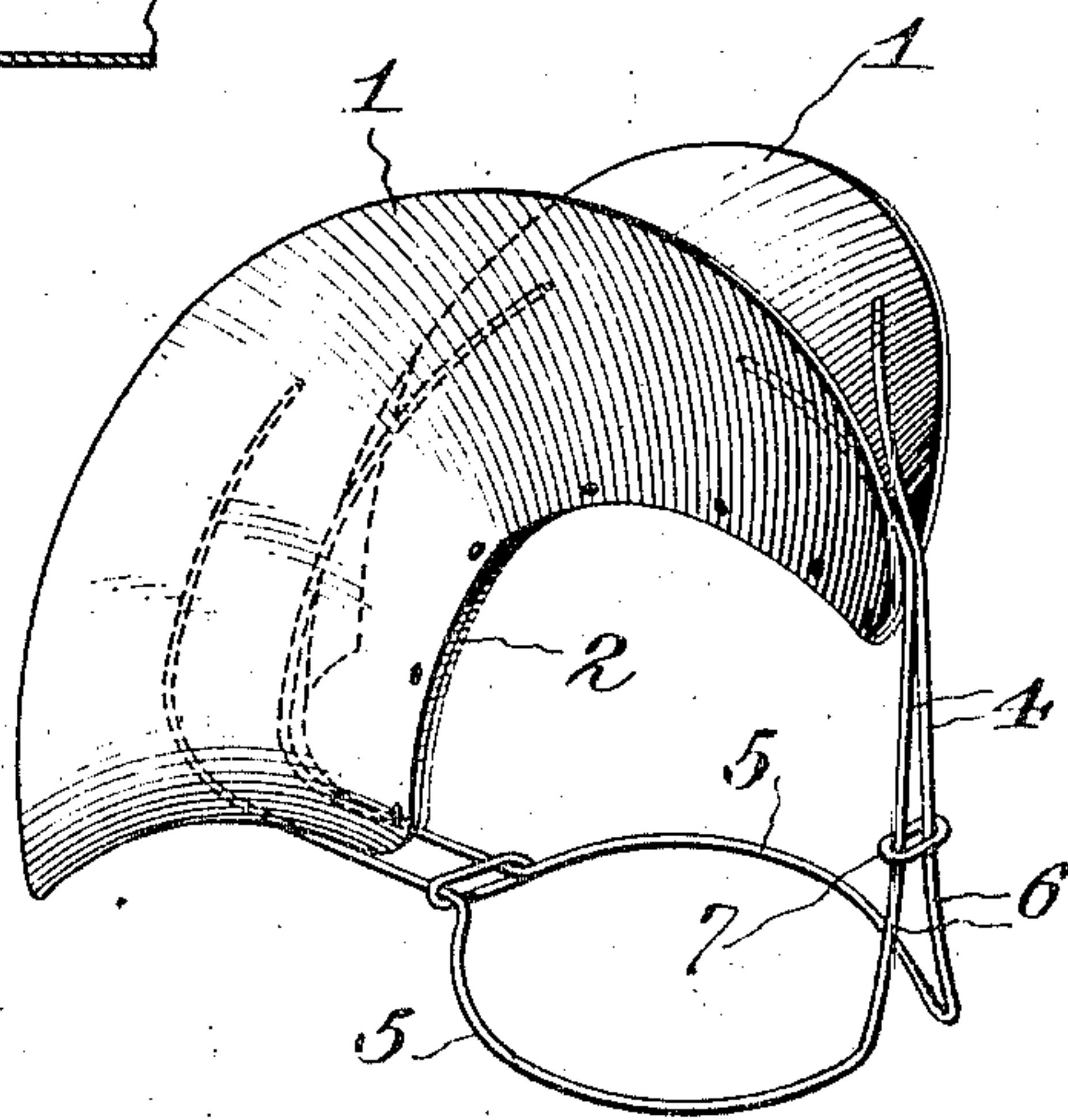


Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

WALDO S. CAVENDER, OF WILLARD, ILLINOIS.

SPARK AND CINDER ARRESTER.

SPECIFICATION forming part of Letters Patent No. 757,270, dated April 12, 1904.

Application filed November 12, 1903. Serial No. 180,931. (No model.)

To all whom it may concern:

Be it known that I, WALDO S. CAVENDER, a citizen of the United States, residing at Willard, in the county of Alexander and State of Illinois, have invented a new and useful Spark and Cinder Arrester, of which the following is a specification.

This invention relates to spark and cinder arresters for the smoke-stacks of locomotives, steamboats, and the like.

The principal object of the invention is to provide a simple device which may be readily attached to the smoke-stack of a locomotive or steamboat and which without interfering materially with the draft of the engine or steamboat will effectively arrest sparks and cinders passing upward through the smoke-stack and will convey them rearward and downward to suitable points of discharge.

Another object of the invention is to provide a cinder and spark arrester with improved clamping means for securing it to smoke-stacks of different sizes.

In describing the invention reference will be had to the accompanying drawings, in which the preferred form of embodiment of the invention is shown as applied to a locomotive, into the fire-box of which the sparks and cinders are discharged.

In the drawings, Figure 1 is a side elevation of a locomotive, showing the spark and cinder arrester applied thereto. Fig. 2 is a view in front elevation of the structure shown in Fig. 1. Fig. 3 is a perspective view of the spark and cinder arrester without the tubular conduits. Fig. 4 is a detail view in section on the line 4 4 of Fig. 1, showing the arrangement of the damper, by means of which the smoke and cinders may be directed into the fire-box or allowed to pass out into the open air.

Referring to the drawings, in which corresponding parts are designated by similar characters of reference L designates the locomotive, which has a smoke-stack S of cylindrical form. The spark and cinder arrester is shown as mounted upon the smoke-stack, and consists of a pair of wings 1 1 of volute form united along a concave curve 2. The wings

1 1 are formed, preferably, of sheet metal of suitable thickness and are of any desired or necessary dimensions, the size for the ordinary locomotive having a spread of about sixteen inches and rising above the top of the smoke-stack to a height of about eighteen inches. The line 2 upon which the two wings are joined is sharply curved, so that when the arrester is in operative position above the smoke-stack the line of juncture of the two wings extends across the top of the smoke-stack, as shown, and thence downward at the back. Each of the wings 1 1 is continuous with a tube 3 of suitable dimensions, whose end is flared to join onto the wing. The tubes 3 extend downward, outward, and rearward to the sides of the fire-box and may then be directed inward to discharge upon the fire. Each of the tubes 3 is provided at the point where it bends inward with a pivoted damper 3^a to direct the sparks into the fire-box or to allow them to pass directly out at the rear end of the tube. The preferred means of securing the arrester in position is a clamp consisting of resilient rods or heavy wires 4, attached at one end to the two wings, near the front of the upper surface thereof. The other ends of the members 4 are attached to the upper surface of the wings at the rear, and the two members are bent at 5 to present oppositely-disposed curves adapted to contact with the outer surface of the smoke-stack. At the front ends of the curves 5 the members 4 are bent sharply upward, and they present oppositely-disposed curves 6, as best seen in Fig. 2, in which the two members 4 are shown as drawn together by means of a slide 7, which is freely movable on the curved portions 6, which lie between the curves 5 and the forward ends of the members. When the slide 7 is raised, the members 4 may be separated, as shown in dotted lines in Fig. 2; and when so separated may be easily slipped over the top of a smoke-stack of ordinary size and design. When the arrester is in position above the smoke-stack, the slide 7 will be forced downward to the position shown in Fig. 2, and the curved portions 5 of the members 4 will be drawn into

close engagement with the sides of the smoke-stack, thereby securing the arrester in operative position on the stack.

The operation of the spark-arrester will be readily understood from the description and from an inspection of the drawings. The mixture of smoke, cinders, sparks, and gases formed in the fire-box of the engine will impinge upon the inclined concave under surfaces of the two wings and will be driven rearward by the current of air developed by the forward movement of the engine. The rearwardly-driven sparks and cinders will be deflected downward and outward by the wings, and the sparks will be extinguished by contact with the wings. At the same time the heavier sparks and cinders will be carried downward and rearward through the tubes 3. The tubes 3 will not only serve as conduits for the sparks and cinders, but a considerable quantity of air will be driven through the tubes along with the extinguished sparks and the cinders, so that the blast directed into the fire-box by means of the spark-arrester will be effective in increasing the draft in the fire-box, while at the same time the composition of the smoke and cinders is assured.

If the spark-arrester is designed for use upon a steamboat or under any circumstances which render it impracticable to direct the sparks and cinders into the fire-box to insure the destruction thereof, the tubes 3 may be dispensed with and the arrester used in the form illustrated in Fig. 3, in which the arrester is shown as consisting merely of the deflecting-wings and the means for clamping the wings in operative position above the smoke-stack.

While I have shown and described the preferred form of embodiment of my invention, it will be obvious that various changes in the form and proportions of the members, as well as in their mode of assemblage, may be made without departing from the spirit of the invention or sacrificing any of its advantages, and I do not limit myself to the exact structure shown, but reserve the right to make such changes therein as lie within the scope of the appended claims.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is--

1. The combination in a device of the class described, of a pair of deflecting-wings each presenting a deflecting-surface curved upward, outward, rearward, and downward, said

wings being united upon a curved line and having the rear ends thereof disposed at a lower level than the forward ends, and means for securing said wings in position above a smoke-stack, said securing means including a pair of resilient members each attached at one end to one of the deflecting-wings at its forward end, extending downward from said points of attachment to about the level of the rear ends of said wings, being bent at that point and extending rearwardly to be attached to the rear portion of the deflecting-wing to which its forward end is attached, the rearwardly-extending portions of said resilient members being curved to correspond to the dimensions of a smoke-stack, and means provided upon said resilient members for forcing them into clamping engagement with a smoke-stack.

2. The combination in a device of the class described, of a pair of curved deflecting-wings joined upon a curved line extending from above a smoke-stack rearward and downward behind the smoke-stack, and means for securing said deflecting-wings in position, said securing means including a pair of resilient members attached at their ends to said wings and each consisting of a downwardly-extending portion and a rearwardly-extending portion, said downwardly-extending portions being normally divergent and said rearwardly-extending portions being curved to correspond to the outside of a smoke-stack, and a slide permanently secured upon the downwardly-extending portions of said resilient members to force said resilient members into clamping engagement with the smoke-stack.

3. The combination with means at the top of a smoke-stack for deflecting the products of combustion downward and rearward, of conduits to convey said products of combustion rearward from said deflecting means, said conduits leading into the fire-box of the engine but having openings therein through which the products of combustion may be allowed to escape into the outer air, and dampers provided in said conduits to direct the products of combustion into the fire-box or allow them to pass into the open air.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WALDO S. CAVENDER.

Witnesses:

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B. F. UTLEY.