

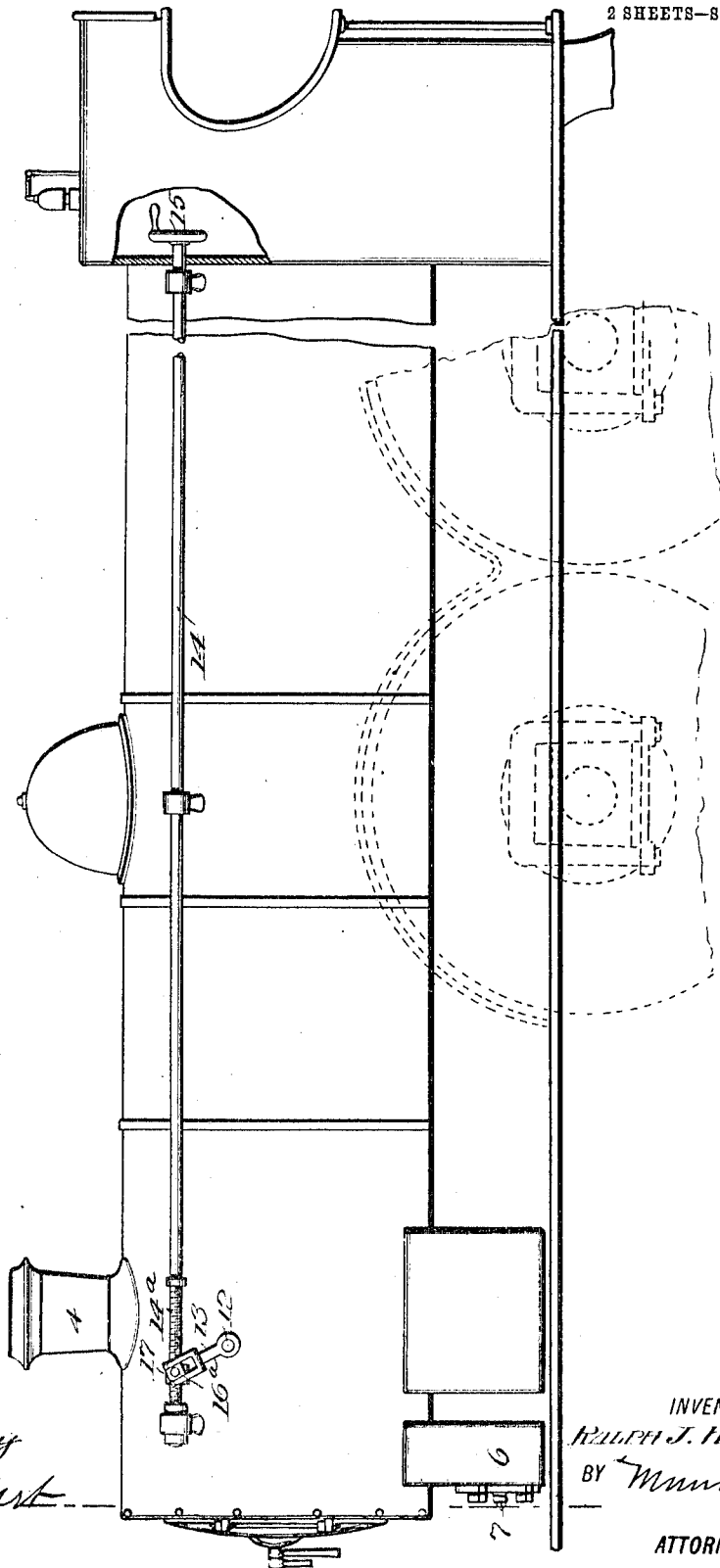
R. J. HARLE.
SPARK ARRESTER AND DRAFT REGULATOR FOR LOCOMOTIVES.
APPLICATION FILED JULY 2, 1909.

950,447.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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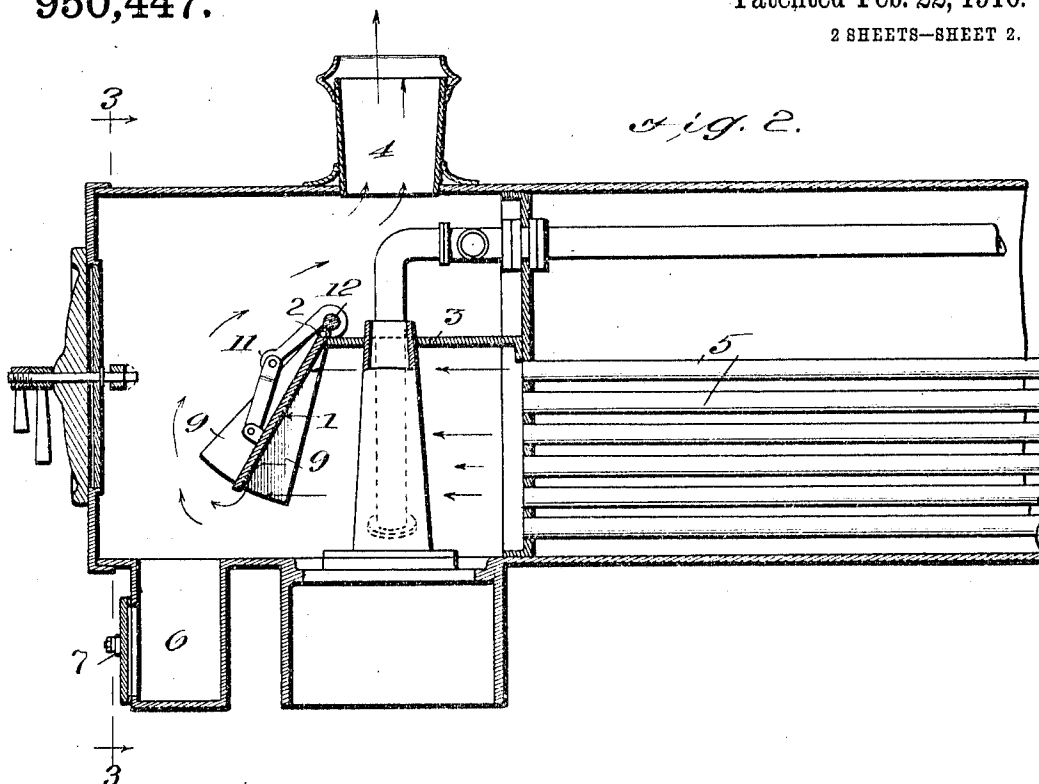
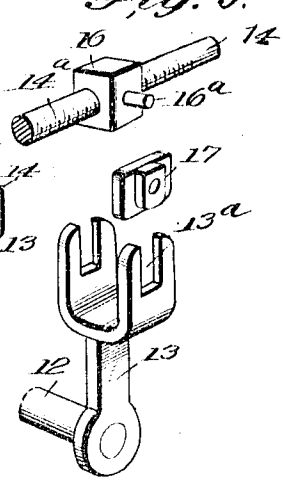
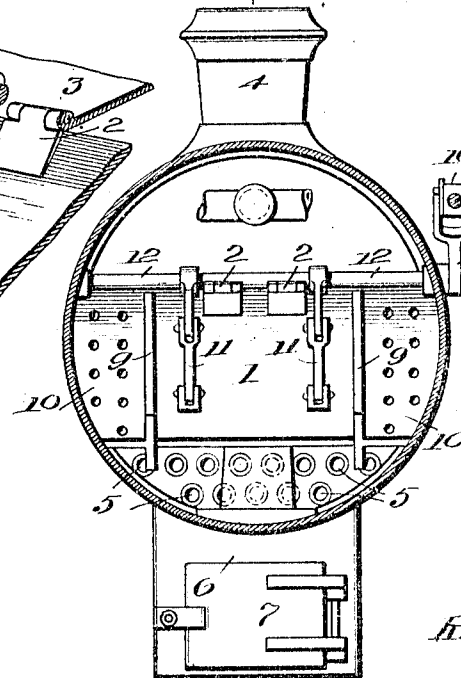
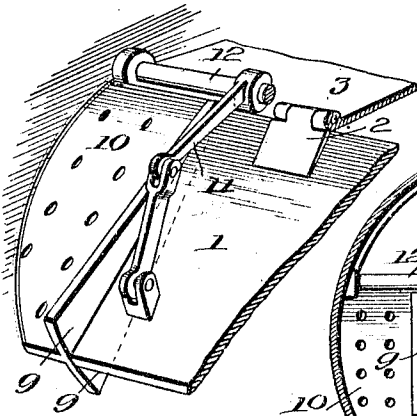


Fig. 4.

Fig. 3.

Fig. 5.



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RALPH JOHN HARLE, OF TANTA, EGYPT.

SPARK-ARRESTER AND DRAFT-REGULATOR FOR LOCOMOTIVES.

950,447.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed July 2, 1909. Serial No. 505,714.

To all whom it may concern:

Be it known that I, RALPH JOHN HARLE, a subject of the King of Great Britain, and resident of Tanta, in Egypt, have invented an Improvement in Spark-Arresters and Draft-Regulators for Locomotives, of which the following is a specification.

In steam generators of the flue type, especially in the boilers of locomotives, the products of combustion pass chiefly through the upper tubes or flues of the boiler.

The object of my invention is to provide an improved attachment for distributing products of combustion more evenly, or causing them to pass through the lower flues as well as the upper, and also for arresting the sparks, which, under other circumstances, would reach the smoke-stack and be discharged therefrom. My improved attachment also effects a considerable economy in the consumption of coal.

The details of construction, arrangement, and combination of parts are as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation—part being broken away to show the interior construction—of a locomotive boiler provided with my improved attachment. Fig. 2 is a longitudinal section of the locomotive boiler and smoke-box, on the line 2—2 of Fig. 3. Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 2. Fig. 4 is a detail perspective illustrating the means for operating the deflecting plate forming a principal element of my attachment. Fig. 5 is a perspective view of various parts disassociated and which co-operate with a hand-operated shaft for adjusting the deflecting plate.

Referring in the first instance to Figs. 2, 3, 4, the numeral 1 indicates the deflecting plate which is hinged at 2 to a horizontal plate 3 arranged in the smoke-box, directly below the smoke-stack 4. 5 indicates the tubes or flues of the locomotive boiler. The plate 1 may be adjusted at different angles for the purpose of hindering the passage of products of combustion through the upper flues of the series and causing a greater discharge through the lower flue. In other words, it may be adjusted, or lowered, on the hinge 2 so as to deflect the course of the current of the hot gases and other products of combustion as indicated by arrows Fig. 2, the products of combustion passing through the several flues being directed first mainly

against the plate 1 and then downward beneath it, and thence upward to the smoke-stack 4. The plate 1, by hindering the direct passage upward to the smoke-stack, of hot gases and other products of combustion from the upper flues of the series of flues, causes an accelerated flow of the products of combustion through the lower flues of the series, which results in driving forward the ashes which tend to deposit at the bottom of the smoke-box, such ashes being for the most part carried forward and deposited in the ash-box 6, which is pendent from the forward portion of the smoke-box and provided with a door 7, as shown in Figs. 2 and 3. It is further apparent that the deflector 1 serves as a spark-arrester, the sparks striking against it being for the most part broken up and extinguished and turned downward and received into the smoke-box. The main value of my invention is, however, its capacity for inducing a freer circulation of hot gases and other products of combustion in the lower portions of the series of flues 5, and thus a freer circulation or passage of such products through the series taken as a whole. The final result is a more equal distribution of heat in the boiler, with a consequently more rapid generation of steam. It is obvious that this regulation of distribution of the draft and the products of combustion in the flues of the boiler has for its final effect or result an economy of fuel, which is of much importance.

A special feature of my invention is the arrangement of the deflecting plate 1 between the sector- or fan-shaped plates 9, which are fixed in position, being attached as shown in Figs. 3 and 4 to side plates 10 that are provided with perforations to allow the passage of products of combustion to a certain degree. The plates are fixed at a forward and downward inclination of about 30° and form practically a continuation of the horizontal or roof plate 3. The fan-shaped plates 9 serve as guards, preventing passage of products of combustion over the side edges of the deflector 1; and, their broader ends being downward, it is obvious that the plate 1 has a considerable range of upward movement.

My preferred means for adjusting the plate 1 at a greater or less angle to the vertical, consist of links 11 pivoted together and to the plate 1 and fixed at their upper

ends on a rock-shaft 12, which extends transversely of the smoke-box as illustrated best in Figs. 3 and 4. This shaft projects through one side of the smoke box, and a bifurcated lever arm 13 is fixed thereon as shown in Figs. 1 and 3, and in detail in Fig. 5. A rotatable shaft 14 extends along the boiler longitudinally and is provided within the cab of the locomotive with a hand-wheel 15 for rotating it. Its forward end is screw-threaded, as shown at 14^a Figs. 1 and 5, and works in a nut 16 provided with trunnions 16^a that project through side plates 17 having squared projections which are adapted to fit and slide in the open slots 13^a of the lever arm 13.

It is apparent that, by rotating the screw-threaded shaft 14, the shaft 12 will be rocked in one direction or the other, and that the deflector plate 1 will be thereby adjusted higher or lower between the sector-guards

9 and that the draft of the locomotive will be regulated accordingly. The said shaft is not movable longitudinally in its bearings, and consequently it holds the deflector fixed in any position to which it may be adjusted by rotation of the shaft.

What I claim is:

The combination with locomotive boiler flues, of a deflector plate arranged in front of them within the smoke-box and hinged and adapted to swing in a vertical plane, side guards which are fan-shaped and between which the deflector plate is adapted to work, and downwardly inclined perforated deflectors fixed to said fan-shaped guards and arranged exteriorly thereof, substantially as described.

RALPH JOHN HARLE.

Witnesses:

AMEEN ABADER,
ABDU ALME.