

(No Model.)

W. CASPAR.
SPARK ARRESTER.

No. 530,392.

Patented Dec. 4, 1894.

Fig. 1.

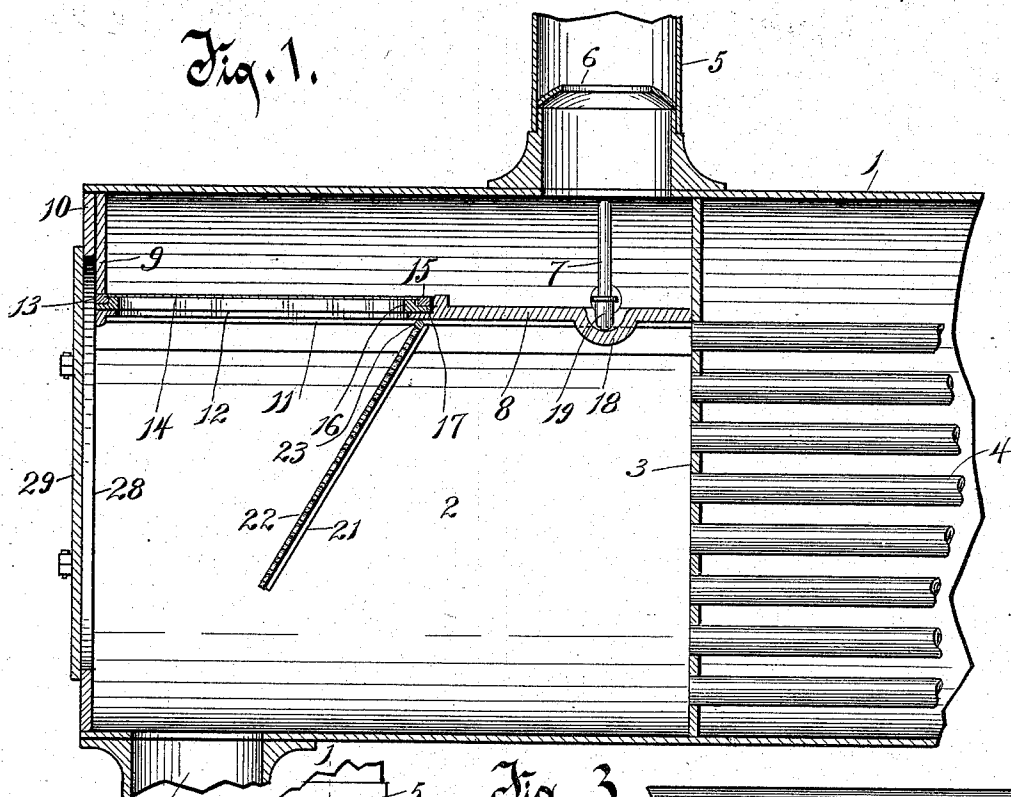


Fig. 2.

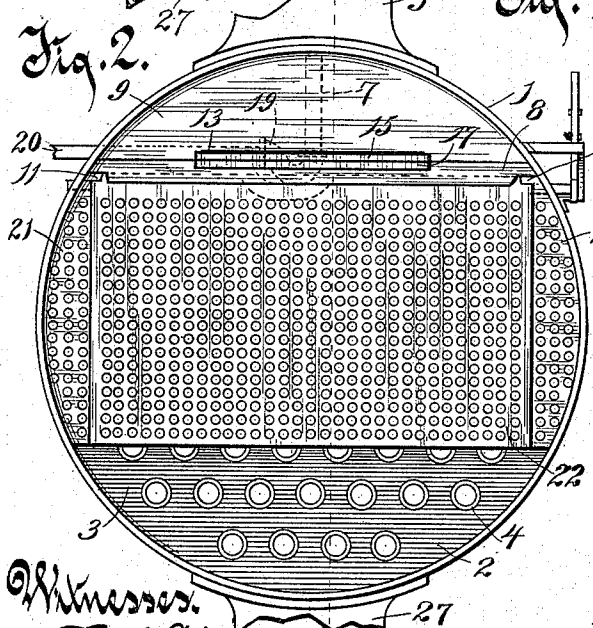


Fig. 3.

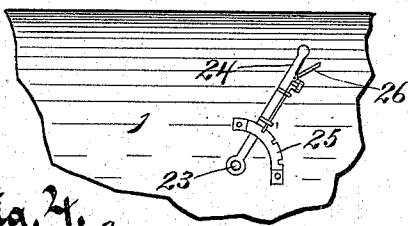
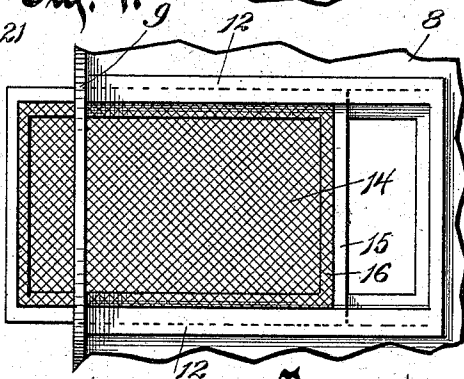


Fig. 4.



Witnesses.

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SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 530,392, dated December 4, 1894.

Application filed March 3, 1894. Serial No. 502,162. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CASPAR, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Spark-Arresters, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in spark arresters.

The object is to provide a most simple construction for effectually arresting the sparks, and preventing the escape thereof through the smoke-stack, in connection with a construction providing for the discharge of the arrested cinders and sparks with the least possible trouble and labor.

With the above primary object in view, the invention consists in the devices and parts, or their equivalents, as hereinafter more fully set forth and claimed.

In the accompanying drawings, Figure 1, is a longitudinal sectional view through the front end of a locomotive boiler. Fig. 2, is a front elevation, with the front of the boiler removed. Fig. 3, is a fragmentary detail; and Fig. 4, is a plan view showing a fragment of the upper partition, and the removable screen frame therein partly slid out.

Like numerals of reference denote like parts throughout the several views.

In the accompanying drawings, the numeral 1 indicates the extreme front portion of a locomotive boiler, and 2 the smoke-box separated therefrom by an apertured plate 3. Communicating with the apertures of this plate are the usual smoke flues 4. Extending up from the smoke-box is a smoke-stack 5, which is provided interiorly, near its base, with an upward-flaring ring or inverted funnel 6, the opening of which is in concentric vertical alignment with the discharge extremity of an exhaust pipe 7, so as to receive steam therefrom, and discharge it centrally within the stack.

The upper portion of the smoke-box 2 is divided into another compartment by means of a horizontal partition 8, said partition provided with a front plate 9, against which the front end 10 of the boiler bears. This partition is preferably supported by means of flanges or cleats 11, 11, projecting inward

from diametrically opposite points of the boiler lining. The horizontal partition 8 is provided with ways or grooves 12, 12, which extend to a front opening 13. Within these ways or grooves slides a screen frame, said frame consisting of two sections between which a wire screen 14 is held. The upper rectangular section 15 of the frame surrounds a rectangular inner flange or shoulder 16 of the lower frame 17. By providing the ways or grooves 12, in connection with a front opening 13, it is obvious that the screen frame can be readily removed, whenever a screen becomes worn, and it is necessary to replace the same with a new one. At a medial point of the rear of the horizontal partition 8 is provided a depression 18, which receives therein a curved elbow 19, said curved elbow joining the upright or vertical portion 7 of the exhaust pipe with the horizontal portion 20 thereof, which latter leads from the steam cylinder in the usual manner. By providing the depression 18, and a downward curved part of the exhaust pipe fitting therein, said exhaust pipe is held in a simple and convenient manner in a position to discharge the steam centrally within the smoke-stack.

Secured to the under side of the partition 8, near opposite edges thereof, are perforated arms 21, 21, which project forward at inclines. Resting upon these arms is a transverse perforated plate 22, said plate having secured at its upper edge rigidly a transverse shaft 23, said shaft having bearings at opposite points in the cylindrical casing of the boiler. One of the laterally projecting ends of the shaft has rigidly secured thereto an operating lever 24. This lever turns between the outer side of the cylindrical cover of the boiler and an outstanding segmental rack 25 secured to said cylindrical casing. Pivoted to the operating lever or handle is the usual dog or pawl 26, which is adapted to engage any of the notches of the segmental rack. Fig. 1 shows the normal position of the transverse perforated plate 22. In this position it rests against the perforated arms 21, 21, which arms therefore serve as a stop for the plate, and furthermore serve to close the openings which would otherwise be left between the ends of the plate and the inner sides of the cylindrical casing.

In the bottom of the fire-box is a discharge

opening 27. It will be noticed that when the perforated plate is in its normal position, its lower end will be in a line over the center of the discharge opening, so that any ashes or cinders caught by said plate will be discharged direct into the opening.

The front end of the boiler is provided with the usual opening 28, which is normally closed by means of a cover 29. In the operation of my invention, the heavy coals passing through the smoke flues 4 will first encounter the inclined perforated plate 22, and be deflected to the bottom of the smoke-box, and, if not directly into the discharge opening 27, in close enough proximity thereto to provide for readily drawing them to said discharge opening by means of a suitable scraper inserted through the front opening 28 of the fire box. Of course the exhaust pipe 7 discharging into the smoke-stack creates a strong draft or suction and hence the smoke and lighter particles are drawn through the apertures of the inclined plate 22, and thence ascend upward and through the wire screen 14, said screen acting to prevent any ashes or cinders which were fine enough to pass through the perforated plate 22 from entering the upper compartment and escaping through the smoke-stack, thus practically leaving nothing but clear smoke to pass to the exterior. The fine coal and cinders thus arrested by the wire screen fall on to the inclined plate 22, which plate discharges said coal and cinders directly into the opening 27. The fact that the wire screen 14 is removable provides, as before stated, for readily replacing one screen by another, when an old one becomes worn. Besides this, the construction possesses another advantage, inasmuch as when "firing up" it is essential that the draft should be as strong as possible. In that case the front cover 29 is removed and the screen slid out, after which the cover is replaced, and after the fire has become sufficiently intense the screen is again adjusted back into place to arrest the sparks. It will also be seen that from the fact that the upper end of the perforated plate 22 is secured rigidly to a transverse shaft, said shaft provided on its end with an operating handle or lever, the plate can be readily held at any desired degree of inclination by allowing the dog 26 to engage the proper notch of the segmental rack. The advantage of thus hinging the perforated plate 22 is to permit the same to be swung up so as to obtain free access to the flues 4, for cleaning the same.

I do not wish to be understood as confining myself to the application of my improved spark-arrester to the locomotive boiler herein shown and described as it is obvious it can be applied with equal facility to the fire-boxes of road-locomotives, thrashing machine engines, and the like.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. In a spark arrester, the combination, of a smoke-box with which the boiler flues communicate, said box provided with a lower discharge opening, and with a smoke-stack, a horizontal partition forming an upper compartment leading to the smoke-stack, said partition provided with an opening in advance of the smoke-stack, a plate hinged to the under-side of the partition, and means for turning said plate upon its hinges, and holding the same in its adjusted positions, substantially as set forth.

2. In a spark arrester, the combination, of a smoke-box with which the boiler flues communicate, a horizontal partition forming an upper compartment within the smoke-box, said partition provided with an opening having ways or grooves in the bordering edges thereof, and a removable screen sliding in the ways or grooves, substantially as set forth.

3. In a spark arrester, the combination, of a smoke-box with which the boiler flues communicate, said smoke-box provided with a smoke stack, a horizontal partition forming an upper compartment within the smoke-box, said partition provided with an opening, and also provided with a depression beneath the center of the smoke-stack, and an exhaust pipe extending through the smoke-box casing horizontally, and provided with a medial bend fitting the depression of the partition, and then extended upward to discharge into the smoke-stack, substantially as set forth.

4. In a spark arrester, the combination, of a smoke-box, a horizontal partition forming an upper compartment within the smoke-box, said partition provided with an opening having ways or grooves in the bordering edges thereof, and a removable screen sliding in the ways or grooves, said screen comprising two sections, the lower having an upward extending interior flange, and the upper section surrounding said flange, and clamping the screen, substantially as set forth.

5. In a spark arrester, the combination, of a smoke-box with which the boiler flues communicate, said box provided with a lower discharge opening, a horizontal partition forming an upper compartment within the smoke-box, said partition provided with an opening having its bordering edges formed into ways or grooves, a perforated plate pivoted to the under side of the partition, means for adjusting the inclination of said plate, and a screen frame sliding in the ways or grooves of the partition, substantially as set forth.

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

WILLIAM CASPAR.

Witnesses:

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