H. V. FARIES.

Smoke-Stack for Locomotives.

No. 163,172. Patented May 11, 1875.

Fig. 1.

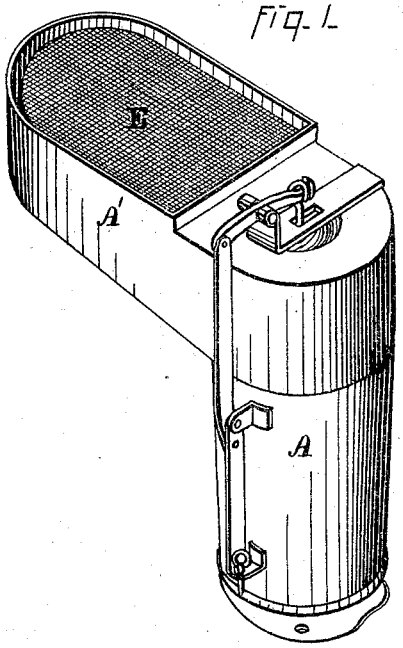


Fig. 2.

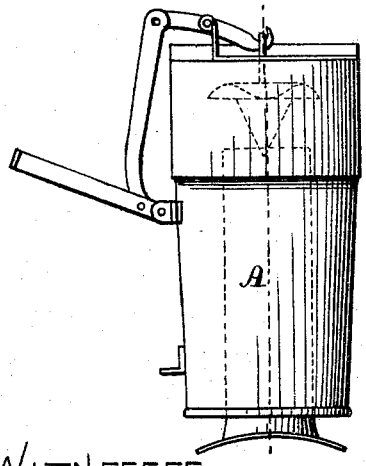
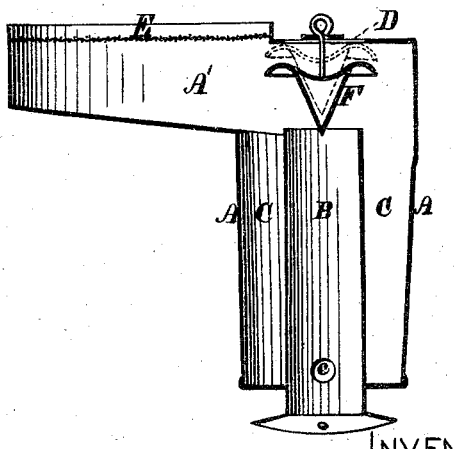


Fig. 3.



WITNESSES=

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UNITED STATES PATENT OFFICE.

HENRY V. FARIES, OF TOPEKA, KANSAS.

IMPROVEMENT IN SMOKE-STACKS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **163,172**, dated May 11, 1875; application filed December 17, 1874.

To all whom it may concern:

Be it known that I, HENRY V. FARIES, of Topeka, in the county of Shawnee and in the State of Kansas, have invented certain new and useful Improvements in Smoke-Stacks for Locomotives; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view of my improved smoke-stack detached from the boiler. Fig. 2 is a front elevation of the same, and Fig. 3 is a vertical central section of the same upon a line extending from front to rear.

Letters of like name and kind refer to like parts in each of the figures.

In the use of locomotives much injury and annoyance are produced by cinders which escape from the smoke-stack, and although many appliances have been used for obviating these difficulties, none have thus far proved successful, those devices which succeeded in arresting the sparks being liable to become clogged, while others which operated with freedom permitted too large sparks to pass outward.

My invention is based upon the theory that if the cinders are finely pulverized before being permitted to escape in the open air their capacity for annoyance and injury will be destroyed, as no very small cinder can retain fire for a sufficient length of time to render it possible to communicate the same to surrounding objects, while very fine cinders will be carried to a great height by the draft, and will remain suspended in the air a sufficient length of time to enable any ordinary train of cars to pass beneath. The design of my invention, then, is to enable the sparks from the furnace of a locomotive to be prevented from leaving the smoke-stack until they have been extinguished and pulverized so finely as to prevent them from being a source of either danger or annoyance; and to this end it consists in the means employed for preventing the escape of cinders from the upper end of the smoke-stack, and for returning the same to the lower end of the same, substantially as and for the purpose hereinafter specified.

In the annexed drawings, A represents the outer pipe or casing of my smoke-stack, and B the inner pipe, which parts are connected together at their lower ends, and have between their walls an annular space, C, of any desired capacity. As seen in Fig. 3, the inner pipe B extends below the lower end of the casing A, and rests upon and is connected to a boiler, while the upper end of said casing extends upward to some distance above said pipe, and at said end is inclosed, except at its radial center, where is provided an opening, D, which coincides with said pipe B, and has substantially the same horizontal dimensions. The upper portion of the casing A is extended rearward, as shown, and is made close at its sides and bottom, while its upper side is left open, and is covered by wire-gauze E. The lower side of said extended part A′ inclines forward and downward, so as to cause any cinders resting thereon to move forward and fall into the space C whenever the engine is in motion, so as to shake or jar the smoke-stack, from the lower end of which space C one or more openings, *c*, provided in and through the pipe B, permit said cinders to pass into the latter. The opening D is closed, when desired, by means of a deflecting-cone, F, which has the usual shape, and is arranged to be moved vertically by suitable appliances that are conveniently accessible to the engineer. When lowered to the position shown by the full lines of Fig. 3, said cone uncovers said opening, and permits the heated escaping products of combustion to pass directly outward; but when raised to the position shown by the dotted lines said cone closes said opening, and causes the said heated gases to pass rearward, and to escape through the gauze E.

The apparatus is now complete, and its operation is as follows: When the fire is first lighted within the furnace the cone is lowered, so as to afford more ready escape for the smoke; but after the boiler has become heated, and before the engine is started, said cone is raised, so as to close its opening. The draft carries most of the cinders against the cone, by which they are deflected into the space between the inner and outer pipes, and from said space pass into said inner pipe, where they are caught by the upward current and again thrown against said cone, each impact

having the effect to break said cinders and reduce their size until they are so small and light as to continue rearward into the chamber A′, where, if too large to pass through the wire-gauze, they fall upon the inclined bottom of said chamber, and, by the jarring of the engine, are caused to pass again into the chamber C, said operations being automatically continued until said cinders will pass outward with the smoke.

In consequence of the large area of the chamber A′, the covering-gauze can have meshes which are many times smaller than would be practicable with an ordinary smoke-stack without obstructing the outward passage of the smoke.

The advantages named render this smoke-stack desirable for use with the engines of passenger-trains, as no cinders would pass into the cars and annoy their inmates, while for use with freight-engines, where, in consequence of the large loads hauled, the steam is worked less expansively and the force of the exhaust is materially greater than with passenger-engines, it removes a great source of loss from fires that are occasioned along lines of railroads by live cinders thrown from the smoke-stacks.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

In combination with the smoke-stack of a locomotive, a rearward-extending chamber, covered upon its upper side by means of wire-gauze, and having its lower side inclined forward and downward, so as to enable cinders to pass, by the force of gravity, directly from the same into the outer pipe of said stack, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of December, 1874.

HENRY V. FARIES.

Witnesses:

ROBT. MOOD,

R. C. HAWLEY.