

(No Model.)

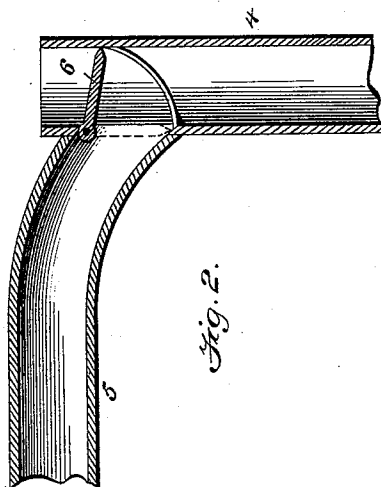
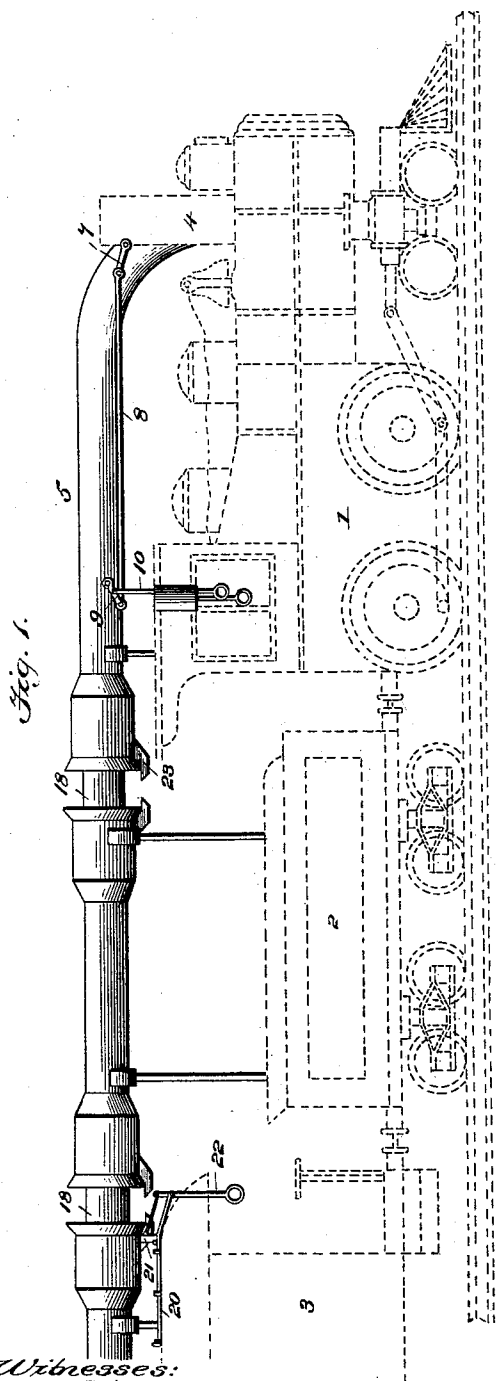
2 Sheets—Sheet 1.

I. J. HARTFORD.

SMOKE AND SPARK ARRESTER AND CONDUCTOR.

No. 469,969.

Patented Mar. 1, 1892.



Witnesses:
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

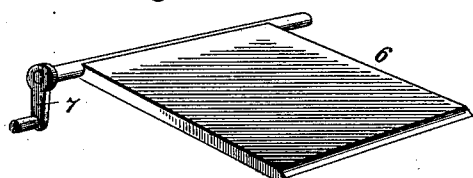


Fig. 4.

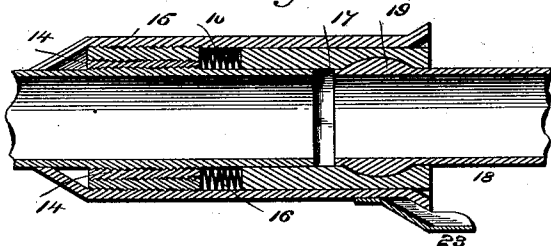


Fig. 5.

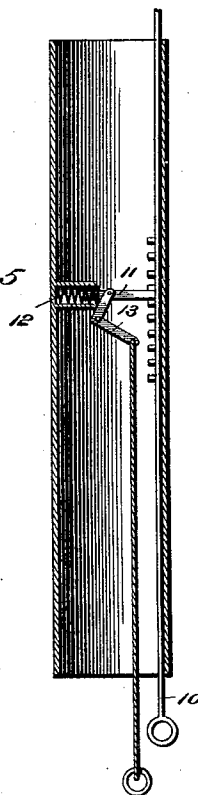
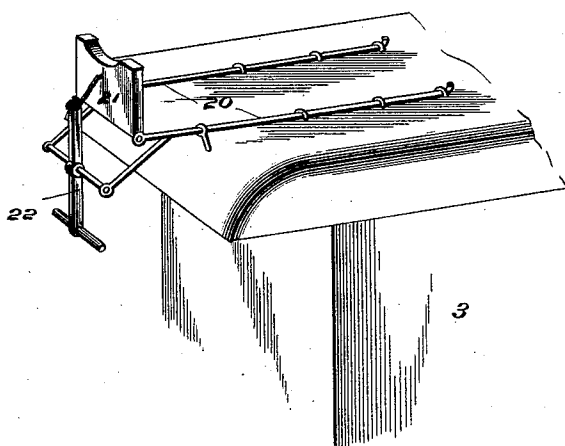


Fig. 6.



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UNITED STATES PATENT OFFICE.

ISAAC J. HARTFORD, OF QUEEN CITY, MISSOURI.

SMOKE AND SPARK ARRESTER AND CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 469,969, dated March 1, 1892.

Application filed November 21, 1891. Serial No. 412,652. (No model.)

To all whom it may concern:

Be it known that I, ISAAC J. HARTFORD, a citizen of the United States, residing at Queen City, in the county of Schuyler and State of Missouri, have invented certain new and useful Improvements in Smoke and Spark Arresters and Conductors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention is an improved smoke and spark arrester and conductor; and the object of the invention is to provide an improved means for conducting the sparks and smoke and other products of combustion back over the tops of the cars to the rear of the train.

To this end the invention consists in the improved construction hereinafter described, and particularly pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive, tender, and one car of the train, showing my smoke-conductor mounted thereon. Fig. 2 is an enlarged vertical section of the smoke-stack, showing the switch-door, which can be shifted to allow the smoke to pass either through the conductor or out through the top of the stack. Fig. 3 is a perspective view of the switch-door. Fig. 4 is a horizontal section through the coupling of the conducting-tubes between the adjacent cars, with dust-pans attached to the conducting-tubes. Fig. 5 is a perspective detail of the handle within the cab. Fig. 6 is a detail view of the device used in coupling and uncoupling the conducting-tubes.

In the drawings, 1 is the locomotive, having the tender 2 and car 3 in rear thereof, these parts representing any ordinary or preferred construction.

From the smoke-stack 4 of the locomotive the spark and smoke conducting tube or conduit 5 extends to the rear over the top of the engine, tender, and cars to the end of the train. The conduit is secured to the smoke-stack upon the rear side and just below the

upper edge thereof, a suitable opening being formed in the rear side of the stack at this point. This opening is provided with a door, which is adapted to shut off all communication between the interior of the stack and the conduit, but can also be swung outward to close the exit at the top of the stack and prevent the smoke from passing up through the stack and out at the top thereof in the usual manner, thus deflecting the smoke from its ordinary course and causing it to pass into and through the conduit to the rear of the train. The object of thus passing the smoke and sparks through the conduit to the rear of the train instead of directly from the mouth of the stack and the advantages derived therefrom are too obvious to render a statement thereof necessary.

The door 6 is pivoted to the rear side of the stack near the top thereof at the point of junction of the conduit, and is beveled upon both sides to adapt it to fit tightly the mouth of the conduit, and also to fit snugly against flanges (when opened) formed upon the inside of the stack. The pivot of the door is elongated to extend outside the stack, and is provided with a suitable crank 7, to which is attached a rod 8, leading along the conduit to another crank 9, placed on the conduit at a suitable position over the cab. This crank 9 is provided with a rod 10, extending down into the cab within reach of the engineer and terminating in a suitable handle. This handle (shown more clearly in Fig. 5) is designed to slide within a suitable support having a series of notches in one side, and these notches are adapted to be engaged by a projection or pin 11. This pin is pressed outwardly to engage the notches by a spring 12, and is secured to one arm of a bell-crank lever 13, pivoted upon the handle or rod 10. To the other end of the bell-crank lever is attached a cord or small chain or the like, extending down parallel to the rod 10, by means of which the bell-crank lever may be rocked to withdraw the pin from engagement with the notches, thus allowing the rod to be manipulated to adjust the switch-door.

Owing to the series of notches the engineer can set the switch-door in any desired position, either to allow the smoke to pass directly

from the upper end of the stack or deflect it into the conduit, or the door may be retained in an inclined intermediate position.

The coupling I prefer to use to connect the sections of the conduit at the point of junction between the cars is shown in Fig. 4.

14 is a band-ring formed upon or secured to the section of conduit at one end of a car in any suitable manner, preferably by being screw-threaded. This ring 14 is screw-threaded upon its exterior surface and adapted to support a ring for cylinder 15, which extends considerably beyond the end of the conduit. The conduit also extends slightly beyond the ring 14, thus providing a space or chamber surrounding the conduit between it and the cylinder 15. In this space are seated spiral springs 16, which carry upon their forward ends the ring 17, which has its front edge beveled from the inside outwardly.

18 is the coupling-section, which is adapted to be placed between the two sections of conduit carried upon the tops of adjacent car or cars to be coupled. This coupling-section carries upon each end a band-ring 19, which has its outer surface rounded or beveled to adapt it to fit the ring 17 snugly and form a tight joint. As the cars when in motion move somewhat in relation to each other, the spring in rear of the ring 17 will yield and allow the ring 17 to advance or recede within the outer ring as the distance between the ends of the sections varies, thus maintaining a close connection at all times and holding the coupling-section securely in place. The ends of the cylinder 15 are made to flare slightly outward to facilitate in coupling.

To facilitate in coupling and uncoupling the cars I have provided the device illustrated more clearly in Fig. 6, this device consisting of two rods 20, secured in suitable bearings upon the top of the car and adapted to slide longitudinally therein. Upon the ends of these rods is carried a supporting-bracket 21, which is hinged and adapted to be operated to change it from a horizontal to a vertical position, or vice versa. When the cars are to be uncoupled, the operator pulls upon the handle 21, drawing the supporting-rods horizontally toward the rear as far as possible. The handle is then drawn down upon, which causes the bracket to assume a vertical position and form a support for the end of the coupling-section. When this has been done, the adjacent car may be separated without necessitating any further change in the connecting-tube, the coupling-section remaining upon the supporting device and ready to be coupled to some other car. To do this it is only necessary to run the cars together in the usual

manner, when the end of the section of conduit carried by one car enters the end of the coupling-section and comes in contact with the flanged ring therein. After the cars are coupled the bracket may be folded down and the rods slid in out of the way.

I have provided a dust-pan under the ends of each section of conduit, as indicated at 23, Figs. 4 and 6, these pans serving to catch any sediment which may drop from the ends of the tubes or conduits in coupling and uncoupling.

Having thus described my invention, what I claim is—

1. In combination with the door governing the passage of smoke from the stack, the operating means consisting of the lever secured to the pivot of the door, a rod connecting said lever with one end of a bell-crank lever above the cab, a vertically-reciprocating rod connected to the other end of the bell-crank lever and sliding in a suitable notched support, a spring-pin carried by the rod for engaging the notches, and a supplemental handle for operating the pin, substantially as described.

2. The described coupling for smoke-conduits, consisting of a cylinder carried upon the ends of adjacent sections and projecting beyond said ends, an annular space surrounding the end of the conduit within the cylinder, a spring-actuated ring seated in said space, having a beveled front edge, and a coupling-section having its ends adapted to be inserted within the cylinder and beveled to fit the spring-ring, substantially as described.

3. The combination of the smoke-stack having the outlet, the door for opening and closing said outlet, devices for operating the door, the sectional conduit leading from the stack, having the sections flexibly and spring-yieldingly connected, the rods for supporting the sections, the bracket connected to the rods, and the handle, all adapted to serve for the purpose described.

4. The combination of the stack having an outlet, the door for controlling the outlet, the cranked rod connected to the door, the rod leading from the crank, the rod for operating said crank, the devices for retaining the latter rod, the sectional conduit having the dust-pans and having the flexible and yielding connections, and the rods for coupling and uncoupling said sections, substantially as described.

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

ISAAC J. HARTFORD.

Witnesses:

E. L. PATHROON,

F. M. MILLER.