

R. HILL.
Spark-Arresters.

No. 152,375

Patented June 23, 1874.

FIG. 2

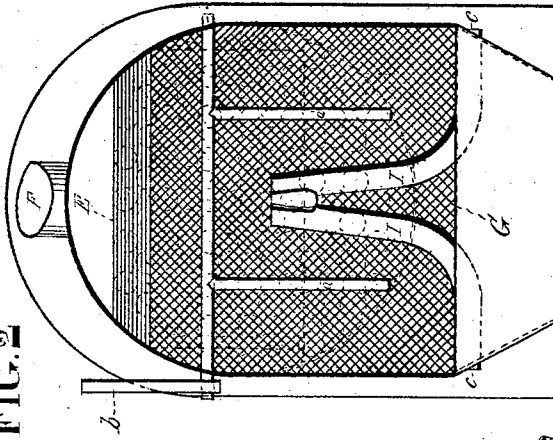


FIG. 1

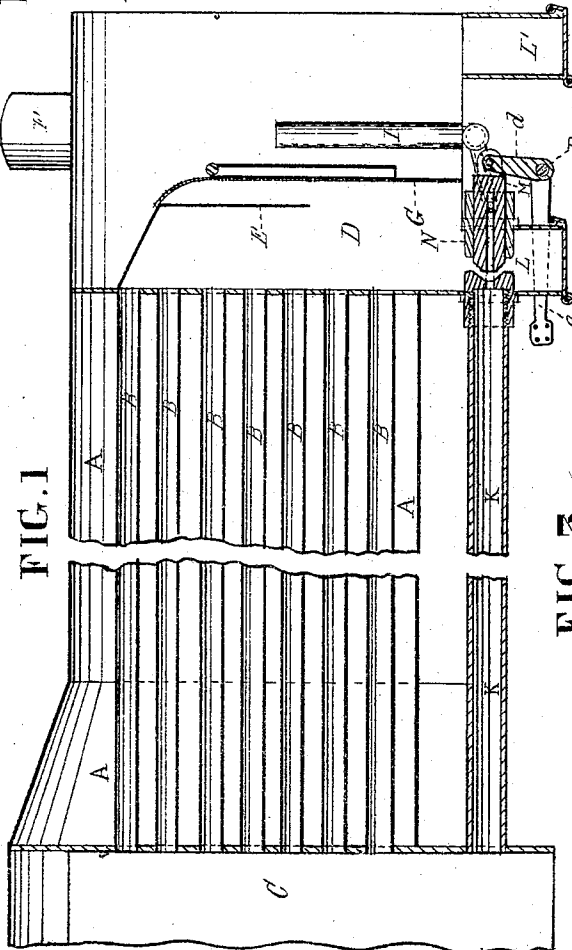
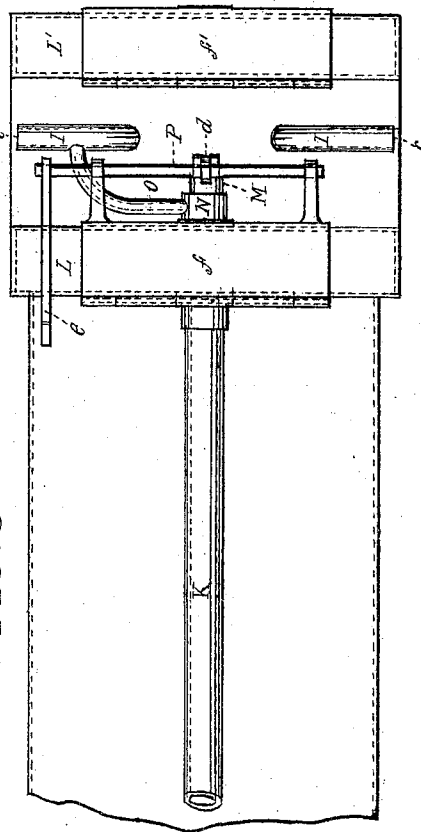


FIG. 3



Witnesses
Thomas J. Beuley
Isaac Kinsley

Inventor
Rufus Hill
By His Attorney
Stephen M. Stick

UNITED STATES PATENT OFFICE

RUFUS HILL, OF CAMDEN, ASSIGNOR OF ONE-HALF HIS RIGHT TO ANDREW K. HAY, OF WINSLOW, NEW JERSEY.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **152,375**, dated June 23, 1874; application filed April 23, 1874.

To all whom it may concern:

Be it known that I, RUFUS HILL, of the city and county of Camden, in the State of New Jersey, have invented an Improvement in Spark-Arresters, of which the following is a specification:

The invention relates, in the first place, to the combination of a deflecting-plate and screen with the discharging ends of the fire-flues, for turning the sparks and cinders to the bottom of the smoke-box, to prevent their escape through the smoke-pipe. In the second place it relates to the combination of a striker with said screen, to prevent the filling up of its meshes, and thus providing for the free passage of the smoke through to the smoke-pipe; and in the third place it relates to an injector, connected by means of pipes with the exhaust-pipe of the steam-engine, and with the fire-box, for conveying the sparks and cinders which are arrested by the above-mentioned check-plate and screen back to the fire-box, as hereinafter fully described.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of a locomotive-boiler with the improved spark-arrester in connection therewith. Fig. 2 is an end elevation. Fig. 3 is a reverse plan view of the front end and parts attached.

Like letters of reference in all the figures indicate the same parts.

A is the boiler-space, having tubes B, in the usual manner. C is the fire-box, and D the smoke-box. E is a check-plate, which turns the sparks and cinders as they pass out of the tubes B downward, to prevent their being carried up by the draft through the smoke-pipe F. The lower edge of the plate terminates some distance above the lower fire-flues, so as to admit of the free passage of the smoke to the smoke-pipe. G is a screen of wire-cloth outside of the check-plate, which checks the sparks which pass beneath the check-plate, and would otherwise be carried by the draft through the smoke-pipe, so that only fine dust can pass through the screen. If desired, a perforated plate may be used instead of the screen. As dust and dirt incline to fill the meshes of the screen, I provide a striker, H, having any desirable number of arms, *a*, for

loosening it, and causing it to drop from the screen. It has bearings in the vertical side plates of the smoke-box, being free to turn therein as it is moved by the operator, who, by means of the lever *b*, causes the arms *a* to strike against the screen with only sufficient force to free its meshes of the dust and dirt. I I are exhaust-pipes, which receive the exhaust-steam at their outer and lower ends C C, the principal part passing through the pipes and up into the smoke-pipe F, for increasing the draft through the same. For the purpose of creating a return draft to the fire-box, to draw the sparks and cinders back which have been carried forward by the draft through the fire-flues, I use the pipe K, which connects at one end with the fire-box C, and at its other end with the receptacle L, which is projected downward from the smoke-box D. With the front end of said pipe is combined the hollow valve or injector M in the hollow guide N, which has communication with one of the exhaust-pipes I by means of the bent pipe O, for the supply of exhaust-steam which rushes through the pipe K to the fire-box C at each back stroke of the engine-piston, and draws with it the cinders and sparks to the fire-box to be consumed. The valve M is operated by means of the rocking shaft P, having an arm, *d*, connecting with the stem of the valve, and an arm, *e*, with which is connected a rod or other device leading to the engine, to be operated by the engineer, who thereby controls the flow of the exhaust-steam through the pipe K. The receptacle L is provided with a hinged bottom, *f*, for the discharge of cinders, &c., which may collect therein, and the receptacle L', which collects dust which passes through the screen G, and is not carried up by the draft through the smoke-pipe, has a like hinged bottom, *f'*, for the removal of the dust.

The combination and arrangement of the parts above described, by effectually arresting the cinders, sparks, and dust, carrying the same back to the fire-box to be consumed, or lodging in the depressions or chambers L and L', supersedes the necessity of the lift-pipe used in other spark-arresters.

I claim as my invention—

1. The deflecting-plate E, in combination with the fire-flues B and screen G, substantially in the manner and for the purpose above described.

2. The striker H, in combination with the screen G, substantially in the manner and for the purpose described.

3. The hollow valve or injector M, in com-

bination with the depression or chamber L, draft-pipe K, exhaust-pipes I and O, and hollow guide N, substantially as and for the purpose set forth.

RUFUS HILL.

Witnesses:

THOMAS J. BEWLEY,
STEPHEN USTICK.