E. I. NEWELL.

Improvement in Spark-Arresters.

No. 130,066. Patented July 30, 1872.

Fig. 1.

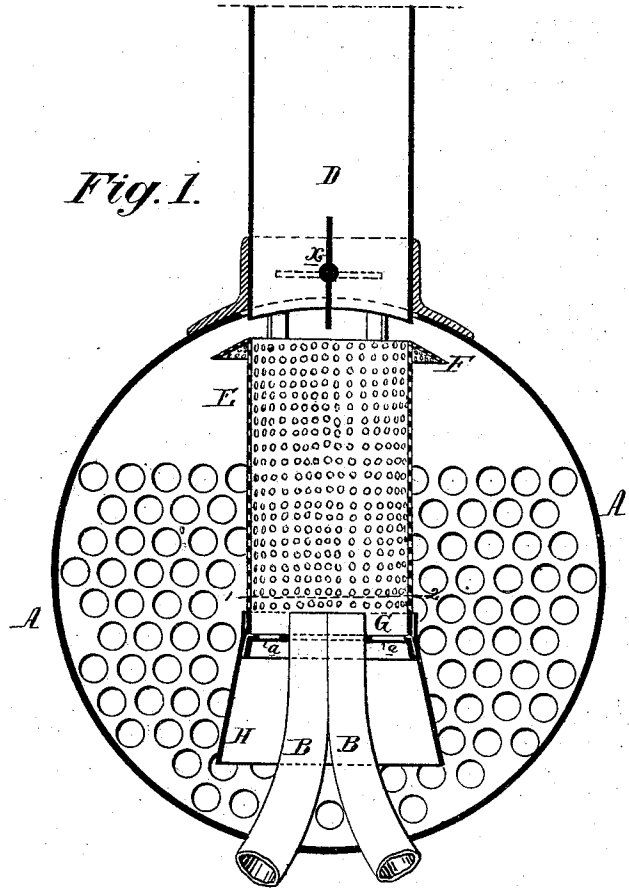
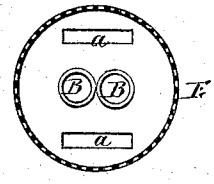


Fig. 2.



Witnesses. Thomas P. McIlvain
Harry Smith

Edward I. Newell
by his Attys
Howson and Sons

UNITED STATES PATENT OFFICE.

EDWARD I. NEWELL, OF BEARDSTOWN, ILLINOIS, ASSIGNOR TO HIMSELF AND JOSEPH ELDER, OF SAME PLACE.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **130,066**, dated July 30, 1872.

Specification describing an Improvement in Spark-Arresters, invented by EDWARD I. NEWELL, of Beardstown, Cass county, and State of Illinois.

Improvement in Spark-Arresters.

My invention consists of a cheap and simple device, too fully explained hereafter to need preliminary description, for arresting the sparks in a locomotive-engine, and for preventing particles of fuel from escaping through the chimney in an ignited condition.

Figure 1 is a vertical section of the smoke-chamber of a locomotive-engine with my improved spark-arrester; and Fig. 2, a sectional plan on the line 1 2, Fig. 1.

A represents the smoke-chamber of a locomotive, and B B the two exhaust-pipes communicating with the exhaust-ports of the cylinders. D is the chimney, which forms a continuation of the cylindrical perforated casing E, contained within the smoke-chambers. The perforated casing terminates a short distance below the base of the chimney, and is provided, at its upper end, with a perforated shield, F, the object of which and of the space above the same will be hereafter described. A partition, G, extends across the lower end of the casing, and in this partition the ends of the exhaust-pipes B B fit snugly, these pipes terminating within the perforated casing a short distance above the said partition, in which are two or more openings, *a a*, for a purpose rendered apparent hereafter. From the lower end of the perforated casing depends a tapering shield, H. The casing E is made of substantial plate-iron, and the perforations in the same are about three-eighths of an inch in diameter.

The particles of ignited fuel which pass through the tubes of the boiler into the smoke-chamber are, owing to the draft in the chimney caused by the exhaust steam, brought into violent contact with the perforated casing, where they are more or less broken, the small particles passing through the perforations and up through and out of the chimney, in a condition which render them incapable of injury to ignitible objects on or near the track, while the heavier particles fall in a mass to the bottom of the smoke-chamber, where they are extinguished prior to being drawn into the chimney through the slots *a* in the partition G, these heavy particles being extinguished before they reach the partition. The object of the space between the top of the perforated casing and the base of the chimney is to gain an increased draft, which might be checked to too great a degree if the said casing extended quite up to the chimney. Ignited particles are prevented from escaping through this space into the chimney by the shield F, on striking against which such particles are beaten down and broken. In some instances I propose to form an opening in the base of the smoke-box, through which the extinguished cinders can be withdrawn from time to time. When the cinders are thus withdrawn the openings *a a* in the partition G can be dispensed with; but the said partition might be perforated with small holes.

It will be evident that the above-described spark-arrester is of the most simple construction. As to its efficiency, I may remark that it has been tested for several months, and has effected the desired purpose without that deterioration which takes place in spark-arresters having screens of wire-gauze, and without interfering with the draft, which is one of the greatest objections to ordinary spark-arresters.

I hang at the base of the chimney a throttle or other suitable valve, *x*, which can be temporarily closed on starting the engine after it has been standing some time, the valve thus preventing the water of condensation from being forced through the chimney to the injury of the polished parts of the engine.

I claim as my invention—

1. The combination of the perforated casing E, the partition G, and exhaust-pipes B B, adapted to openings in the said partition, the whole being adapted to the smoke-box and chimney of a locomotive, as set forth.

2. The combination, substantially as described, of the perforated casing E, its shield

F, and the chimney D, between which and the upper end of the casing there is a space, for the purpose set forth.

3. The combination of the said perforated casing E, shield H, partition G, and its openings *a a*.

4. A throttle-valve, *x*, arranged within the chimney to partially close the same, as set forth, for the purposes specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

E. I. NEWELL.

Witnesses:
JOS. ELDER,
THOS. H. CARTER.