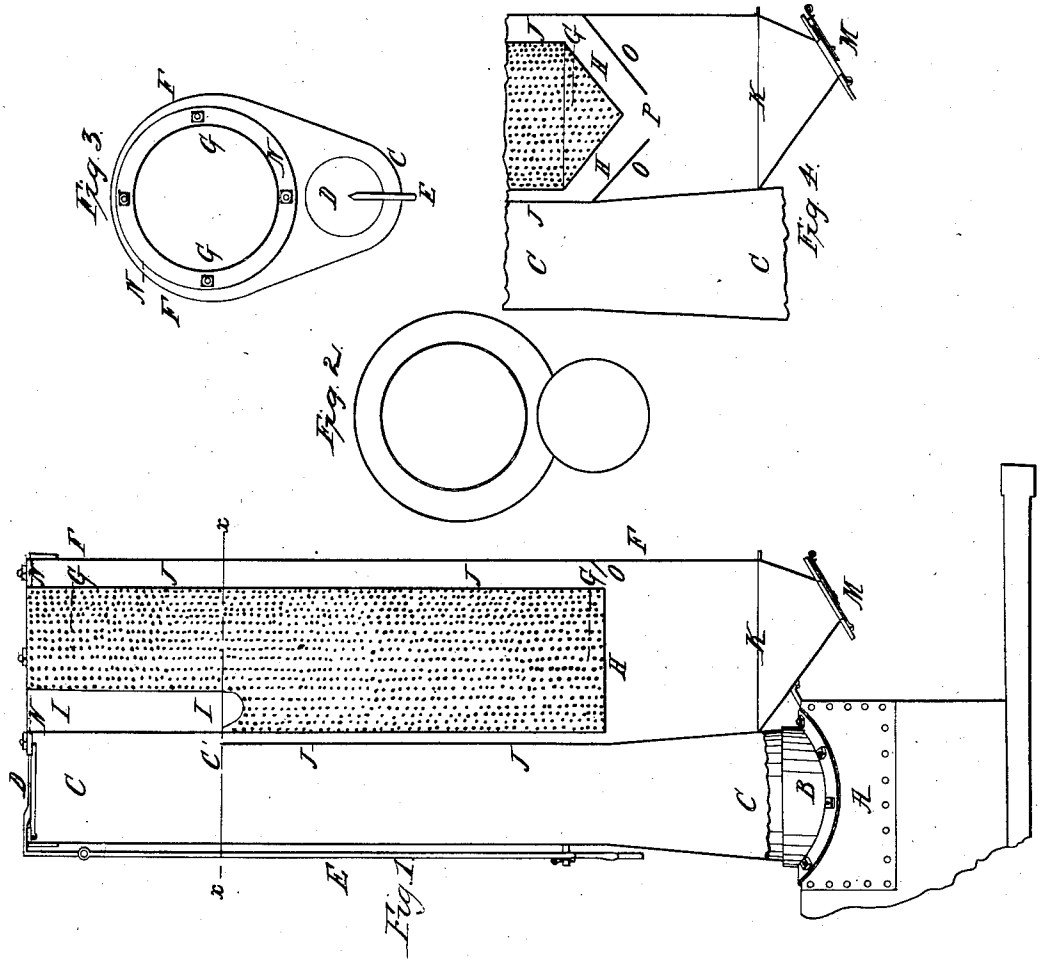
W. W. Hubbell,

Spark Arrester,

No. 2,141. Patented June 26, 1841.



UNITED STATES PATENT OFFICE.

WM. W. HUBBELL, OF MOYAMENSING, PENNSYLVANIA, ASSIGNOR TO LEONARD PHLEGER.

CONSTRUCTION OF APPARATUS FOR ARRESTING AND DEPOSITING SPARKS IN LOCOMOTIVE STEAM-ENGINES, &c.

Specification of Letters Patent No. 2,141, dated June 26, 1841.

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBELL, of Moyamensing, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful improvement in the manner of constructing spark arresters and depositors for preventing the escape of sparks from locomotive and other steam-engines and for depositing them in a receptacle prepared to contain them; and I do hereby declare that the following is a full and exact description thereof.

My spark arrester and depositor consists of a double cylinder which is attached to one side of the ordinary chimney, or smoke pipe, extending up to the same height with it, and being nearly, or quite, equal to it in length. The outer case of this double cylinder is considerably larger than the chimney, and may be double, or nearly double, its diameter. This outer cylinder, or case, of the arrester and depositor is not, in general, a complete cylinder, although it may be so made, if preferred, but I usually so form it as that it is intersected along its whole length by the smoke pipe, which is in part received within the body of it, say to the distance of three or four inches.

Within the case of the arrester is a second cylinder, made of wire gauze, or of perforated metal, which inner cylinder may be six, or eight inches less in diameter than the outer case, so as to leave an annular space between the two. The bottom of this inner cylinder may be in a continuous piece, or it may consist of a perforated plate, as may be preferred. The inner cylinder is attached to the exterior, or case, by means of a cap plate, which incloses the space between them. The inner cylinder is shorter than the outer, being about three fourths of its length, leaving a space below for the reception of the sparks, cinders and ashes. The cylinder constituting the chimney, or smoke pipe, is cut away at its upper end, on that side which is in contact with the arrester and depositor, in such manner as to admit of a free passage for the heated air, smoke and sparks—from said chimney into the space between the outer and inner cylinder of the arrester and depositor; and the part of the inner cylinder of the latter which is opposite to the opening in the side of the chimney is left solid, not being perforated like the other parts, or the perforations are covered by a continuous plate, in order to distribute the heated air and sparks around and within the space between the two cylinders. The chimney, or smoke pipe, is furnished with a cap, or cover, which is to be closed when the engine is in operation, but which may be opened at other times.

In the accompanying drawings, Figure 1, represents a part of the smoke box, and a longitudinal section of the chimney, and of the arrester and depositor A, is the smoke box, and B, the bottom of the chimney attached to it; the remaining part C, C, of the chimney, as well as the arrester and depositor, is shown in section D, is the cover of the chimney, which is shown as closed, but which may be opened at pleasure by means of the rod E. F, F, is the case, or outer cylinder, of the arrester and depositor, and G, G, the inner, or perforated cylinder, having its bottom at H. The part I, I, of this cylinder, against which the sparks and the draft from the chimney first impinge, is not perforated. C′, represents the termination of the cylindrical chimney on the side toward the plate I, I, it being there cut away to allow the draft to escape laterally from it into the space J, J. The space K, is the receptacle for sparks and ashes, and M, a door for their removal when necessary. N, is the annular cap which incloses the space J, J, and which connects the two cylinders; the upper end of the cylinder G, G, is left open for the free escape of the draft.

Fig. 2, is a horizontal section through the line X, X, Fig. 1, above which the part *a*, *a*, of the chimney is cut away.

Fig. 3, is a top view of the chimney, and of the arrester and depositor, the respective parts of which are designated by the same letters as in Fig. 1.

In Fig. 4, the lower end of the cylinder G, is shown as made in the form of an inverted cone, and as perforated. I, in general, place a plate of metal O, O, below the space J, J, which plate is funnel-formed, and has an opening P, at its center, to conduct the cinders and ashes in to the receptacle K. This device will tend to confine the action of the draft around the inner cylinder, and to leave the cinders and ashes in a quiescent state in the receptacle K. By this arrangement of the chimney and of the arrester and depositor, the former is not rendered top heavy, as is the case with most

other spark arresters and a less surface than usual is exposed to the action of the wind. Great advantage, also, is derived from the large surface of the casing F, F, which is exposed to the action of the external air, by which exposure it is made to condense a portion of the exhaust steam which is passed into the chimney as usual, and is forced along with the sparks, into the space J, J. These sparks being first forced against the imperforated part I, I, of the cylinder G, G, are carried by centrifugal force against the interior of the case F, F, instead of directly against the perforated cylinder, and there, by the aid of the condensed steam, they are in part extinguished, are increased in weight, and fall down into the receptacle, while a free and abundant space is presented for the escape of the draft through the perforated metal, or wire gauze.

Having thus, fully described the nature of my invention, and explained the manner in which the same operates, I will here remark that the form and arrangement of my apparatus may be varied without departing from the general principle upon which its operation is dependent. The chimney, for example, need not occupy a part of the space J, J, but both it and the case F, F, may be perfect cylinders, there being the necessary communication from one to the other at their upper ends. The perforated cylinder G, G, may be replaced by a square, polygonal, or oval, tube; and other variations might be pointed out which would still leave the instrument substantially the same in construction and operation, and I do not intend, therefore, to limit myself in these particulars; but

What I claim as constituting my invention, and desire to secure by Letters Patent is

The manner in which I have arranged and combined the chimney and the spark arrester and depositor; the chimney not being surrounded in any part by the arrester, but the two being placed side by side, and communicating with each other at their upper ends; and the arrester and depositor consisting of an outer case, an inner perforated, or wire-gauze, cylinder, or tube, with an imperforated part where the draft first strikes it; and having a receptacle for cinders and ashes at its lower end; the whole being constructed, arranged and combined substantially in the manner, and for the purpose, herein fully set forth and made known.

WM. W. HUBBELL.

Witnesses:
THOS. P. JONES,
JOHN C. JOHNSTON.