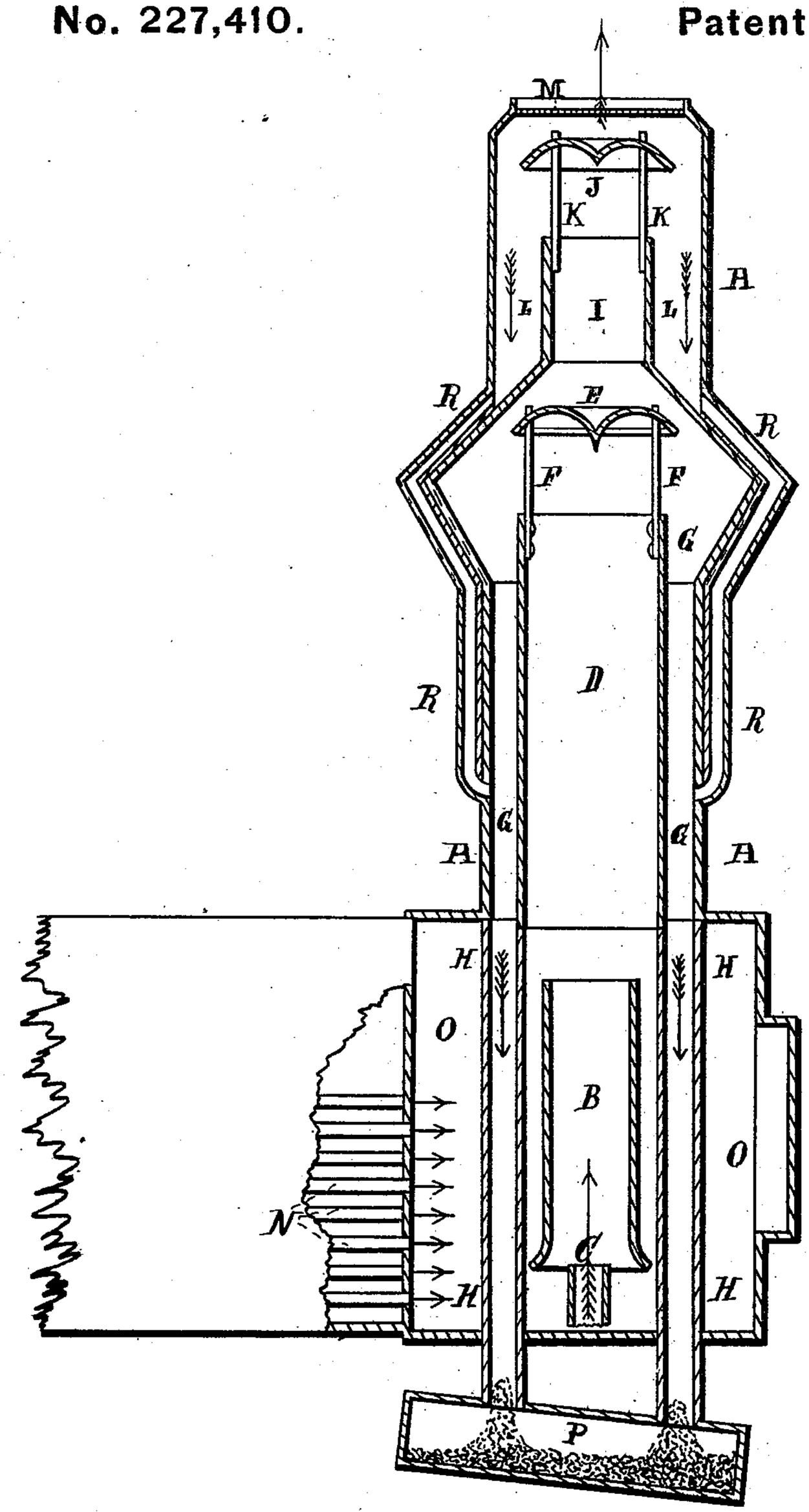
(No Model.)

J. D. BROWN.

Spark-Arrester.

No. 227,410. Patented May 11, 1880.



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Inventor:-
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by
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UNITED STATES PATENT OFFICE.

JOHN D. BROWN, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO MATTHEW L. HARNEY AND PETER J. VANDERBILT, OF SAME PLACE.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 227,410, dated May 11, 1880.

Application filed April 1, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN DUNWELL BROWN, of the city, county, and State of New York, have invented a certain new and useful Improvement in Spark-Arresters, of which the following is a specification.

My invention relates to improvements in spark-arresters for locomotives, and also to stationary engines where the draft is obtained by discharging the exhaust-steam into the stack or chimney; and the object of my improvement is, first, to prevent any sparks from passing outward through the top of the stack with the exhaust-steam; second, to arrest such sparks and deposit them in a receptacle outside of and away from the stack, from whence they may be readily removed at any time, thus keeping the stack clean and preventing the burning out of same.

I attain the above objects by the means illustrated in the accompanying drawing, forming a part of this specification, in which Figure I is an elevation of a smoke-stack and smoke-box of a locomotive or stationary engine.

A is the shell of the stack; B, a petticoat-pipe placed over the nozzle of the exhaust-pipe C; D, an uptake; E, a cone or disk placed over such uptake and fastened thereto by rods F F; G, a spark-chamber surrounding the uptake D. H H are tubes leading from the lower part of spark-chamber G through (or around) the smoke-box and into the receptacle P; I, a secondary uptake; J, a cone or disk placed over same and fastened thereto by the rods K K; L, a secondary spark-chamber surrounding the uptake I; M, a wire screen covering the top of the stack; N, the boiler-flues leading to fire-box; O, the smoke-box; R, pipes connecting the upper chamber, L, with receptacle P through chamber G and pipes H.

The operation of the draft and disposition of the sparks and cinders when the engines are in motion is as follows: The exhaust-steam passes from the cylinders, after each stroke, into the pipe C, and is discharged from thence into the petticoat-pipe B and into the uptake D, carrying with it the cinders from the fire-box, (drawn through the flues N,) when, striking against the cone or disk E, the greater portion of them are deflected into the chamber G out of the way of the draft, and, dropping through the pipes H, are deposited in the close receptacle P, which may be made of sufficient capacity and lined, so as to prevent burning, from whence they may be emptied at any time. The lighter cinders carried by the draft around the cone E pass through the uptake I, and, striking against the secondary cone or disk J, are deflected into the chamber L out of the way of the draft, and pass downward through as many pipes R as may be desired, placed within or without the stack, into the chamber G, where they drop through the pipes H into the receptacle P with the cinders deposited by the cone E. After the cinders have been thrown down by the cone J the exhaust-steam passes around same and into the open air through the netting M entirely freed from cinders. If the pipes H are made to pass around the outer shell of the smoke-box to reach the receptacle P, they may be continuous; but if brought through the smoke-box they should be provided with sleeves, which may be readily removed when it is necessary to gain access to the flues for repairing or cleaning same.

The pipes R may discharge into the chamber G, as shown in the drawing, or may connect directly with receptacle P, or at any intermediate point in G or H.

The notable advantage of this stack for locomotives is, that it does not allow the cinders to pass out over the road, to the destruction of property and annoyance of passengers, nor does it allow them to remain within the stack, where they would soon burn it out; but all of them pass downward into the receptacle P, which may be rendered indestructible by a fire-brick lining.

The pipes H leading from the chamber G into the receptacle P gives another advantage over a system now in general use of pounding and repounding the cinders against the cone as they drop (by that system) through an orifice at the base of G directly into the smoke-box, the exhaust-steam regathering them and pounding them against the cone until they are fine enough to pass around the same and out upon the road. The force of the steam in lifting

these cinders is necessarily retarded, and hence a contraction of the nozzle of the exhaust-pipe is resorted to, which not only tears the fire and carries up a large amount of cinders, but causes a considerable back-pressure on the piston, both of which must be compensated by a more frequent discharge of coal into the furnace. By dropping the cinders after contact with the cone directly into the receptacle P, the necessity of pounding same is obviated, and consequently the nozzle may be enlarged and a much smaller amount of fuel consumed.

The sum of the area of the two cones or disks is intended to be equal, or nearly so, to the area of a single cone as now in use. Thus, for the effectiveness of a single cone of sixteen (16) inches in diameter as now used, I would make the two cones of an area of eleven and a half ($11\frac{1}{2}$) inches each, which would present no greater obstruction to the draft than the obstruction which now exists.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the uptake D, cone E, and chamber G, the uptake I, cone J, chamber L, having passages R, leading to chamber G, pipes H, and receptacle P, all arranged substantially as described, and for the purpose herein described.

2. The combination of uptake I, cone J, chamber L, with pipes R, leading into G, pipes H, and receptacle P, all arranged substantially as described.

JOHN DUNWELL BROWN.

Witnesses:

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