C. W. HUMPHREYS & J. S. McCLEARY.

Spark-Arrester.

No. 162,070. Patented April 13, 1875.

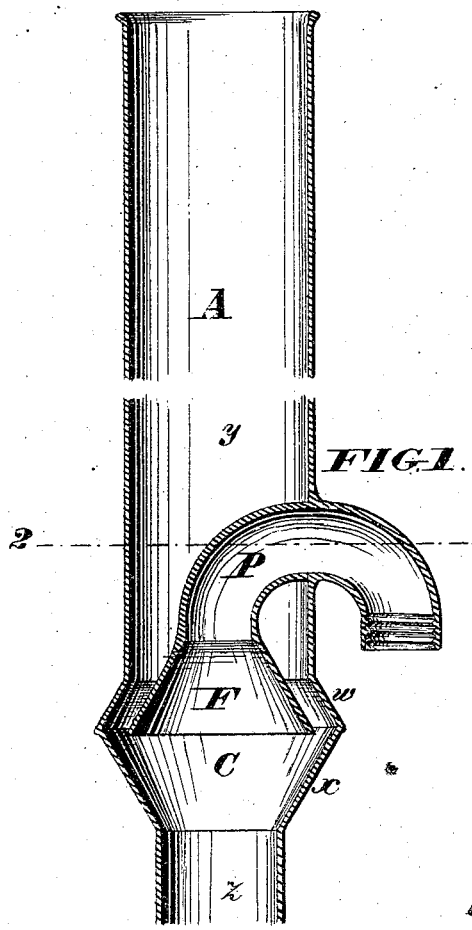


FIG. 1.

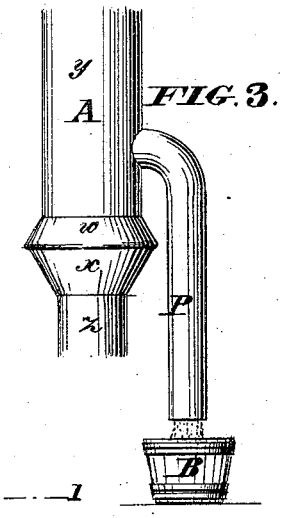
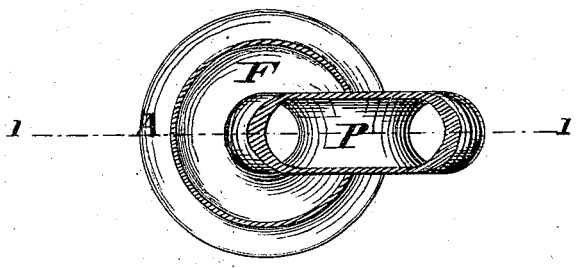


FIG. 3.

FIG. 2.



WITNESSES

F. E. Smith

Henry Tanner

INVENTORS

C. W. Humphreys

J. S. McCleary

By Dwight Bro Attorneys

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

CYRUS W. HUMPHREYS AND JAMES S. McCLEARY, OF HUNTSVILLE, OHIO.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **162,070**, dated April 13, 1875; application filed February 24, 1875.

To all whom it may concern:

Be it known that we, CYRUS W. HUMPHREYS and JAMES S. McCLEARY, of Huntsville, in the county of Logan and State of Ohio, have invented a new and useful Improvement in Spark-Arresters, of which the following is a specification:

A serious trouble in spark-arresters as heretofore constructed has been the difficulty of preserving or keeping in order the wire-gauze screens which have been commonly employed. These, when made of sufficiently small mesh to effectually stop sparks, soon become clogged, and obstruct the draft or escape of smoke, and by the accumulation of moisture in the soot, which adheres to the wire-gauze, the same is rapidly rusted, so as to break, and thus becoming inoperative.

The primary object of the present invention is to dispense entirely with wire gauze in smoke-stacks, and at the same time to preclude the escape of sparks.

Another object of the invention is to provide for arresting the sparks and conducting them to an extinguishing-bucket or other point of deposit without obstructing the draft or escape of smoke to any deleterious extent.

This invention consists in the combination of a stack enlarged to form a catch-chamber at or near its lower end, and contracted again above the same, a catch-funnel arranged within the catch-chamber, and a spark-pipe extending from the central apex of the catch-funnel by an easy curve, as hereinafter set forth.

Figure 1 represents a vertical longitudinal section of a smoke-stack provided with a spark-arrester illustrating this invention. Fig. 2 is a horizontal section on the line 2 2, Fig. 1. Fig. 3 is a side elevation, illustrating the employment of an extinguishing-bucket. The line 1 1, Fig. 2, indicates the plane of Fig. 1.

A stack, A, may be constructed, according to this invention, of any approved material or materials, and its shape and dimensions will be determined by the requirements of the furnace to which it is applied. It is preferably constructed with a lower section, *z*, of the required capacity, and an upper section, *y*, considerably larger. Between these sections the stack is enlarged and again contracted by two conical frustums, *x w*. A catch-chamber, C, is thus formed, and this is located at or near the lower end of the stack, as illustrated. A catch-funnel, F, is arranged axially within the catch-chamber, and is constructed of such area as to project beyond the upper end of the lower section, *z*, and, by preference, beyond the lower end of the upper section; but the latter is not essential. A spark-pipe, P, extends by an easy curve from the open central apex of the catch-funnel, through one side of the stack, to an extinguishing water-bucket, B, Fig. 3, or other place of deposit for the sparks.

The catch-funnel and spark-pipe may be constructed of plate-iron or heavy sheet-iron, or other suitable material.

The catch-funnel F, as applied to the stack of a locomotive or portable steam-engine, operates in connection with the common axial jet of exhaust steam at the bottom of the stack. The contracted current of mingled smoke, steam, and sparks, rushing through the lower section of the stack is directed against or toward the open mouth of the catch-funnel; but the latter offers sufficient obstruction to cause the light smoke to find an easy exit around the edge of the catch-funnel, and through the unobstructed upper section of the stack. The heavier sparks pass into the catch-funnel, and are discharged through the spark-pipe by the force of the jet of steam, which precludes their escape from the catch-funnel after they once pass within it. With an upper stack affording sufficient draft the operation would be substantially the same.

The effectual discharge of all the sparks at once through the catch-funnel and spark-pipe depends on the sufficiency of the force of the steam jet or draft.

The location of the catch-chamber and arrester at or near the lower end of the stack tends to preclude the escape of any sparks which may pass the funnel when the exhaust steam is cut off or the draft is lessened.

It will be observed that there is no wire-gauze about this spark-arrester, and that the

parts of the apparatus are few in number, and adapted to be made with facility, and of durable materials, while it is not liable to get out of order by the displacement of parts or the obstruction of passages.

The following is claimed as new in this invention, namely:

The combination of the stack A, having a catch-chamber at or near its lower end, and contracted above the same, the catch-funnel F, arranged within the catch-chamber, and the spark-pipe P, extending from the central apex of the catch-funnel by an easy curve, substantially as herein illustrated and described, for the purpose specified.

CYRUS W. HUMPHREYS.
JAMES S. McCLEARY.

Witnesses:
S. B. FOSTER,
WILSON PROCTOR.