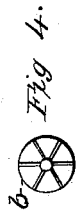
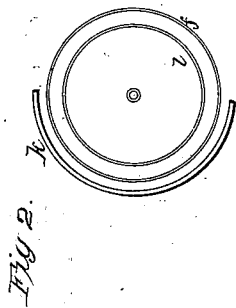


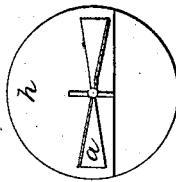
*J. Montgomery,*  
*Spark Arrester.*

*Nº 4,921.*

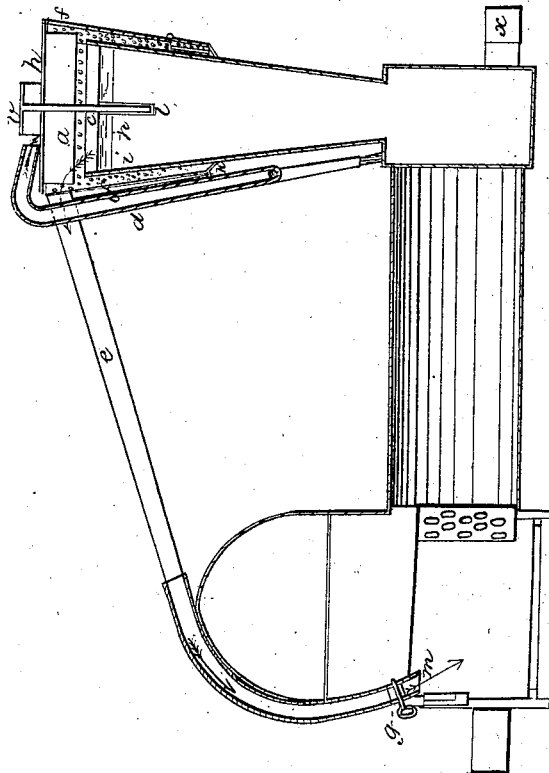
*Patented Jan. 7, 1847.*



*Fig 3.*



*Fig 1.*



# UNITED STATES PATENT OFFICE.

JAMES MONTGOMERY, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. 4,921, dated January 7, 1847.

*To all whom it may concern:*

Be it known that I, JAMES MONTGOMERY, of the city and county of Washington, and District of Columbia, have invented a new and useful Improvement for Arresting and Consuming Sparks and Creating Artificial Draft; and I do hereby declare that the following is a full and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a section of a locomotive-boiler; Fig. 2, plan of the top of the chimney, showing also the perforated casing and shield; Fig. 3, a bottom view of the screw and revolving plate; Fig. 4, a plan of the wheel.

The same letters indicate like parts in all the figures.

In the accompanying drawings, *a* represents a revolving screw having two or more arms, as may be desired, placed at the top of the chimney *i*, the screw being made to revolve by means of the waste steam which is thrown from steam-pipe *d* against the wheel *b*, thereby imparting a rotary motion to the screw-fan *a* and *h*, which is attached to and revolves with it, the object of the plate *h*, which covers the top of the casing *f*, being to prevent the air from entering the top of the chimney, and also to prevent the air from passing between the screw-fan and the revolving plate *h*, thereby producing an effectual exhaustion of the stack and at the same time economizing the power required to drive the screw-fan.

I can use the common fan for the purpose within described; but I am well assured that the screw-fan will be found best. I do not confine myself to the within-described method of driving my screw-fan.

I propose sometimes to use an uprightshaft, as represented in Fig. 1, passing downward through the center of the chimney, to which I attach an auxiliary engine or other analogous device. The screw in this case being poised upon a spindle *c*, the socket is shown at *l* and is supported by an iron bar placed at the top of the chimney, as shown at *n*. When the screw *a* is in motion, the smoke and sparks are thrown off in a lateral direction through a trunk *m* or tube *e*, fitted to a perforated casing *f*, said casing being permanently fastened on the outside of the chimney at the top. The tube or trunk *e* leads thence to the furnace *m*, into which it dis-

charges the sparks, the sparks being consumed in the furnace, and the gases which are forced into the furnace through the tube *e* by the centrifugal action of the screw-fan act to produce an economy of fuel.

*g* is a valve placed in said tube *e* to regulate the amount of gas that shall be admitted from the chimney to the furnace.

The object of the perforated casing *f*, as shown in the drawings, is to prevent the escape of sparks that rise from the chimney, as also to allow a portion of the smoke and gas to escape, a large part of the smoke being conducted with the sparks, as already described, into the furnace and there consumed by reason of its being made to pass over the burning fuel, together with the leakage of air from the furnace-doors. *k* is also edge views of Figs. 1 and 2 of a semicircular shield that extends down to the bottom of the perforated casing *f*, the object being to prevent the gases and smoke from annoying the engineer, &c. I also propose using this arrangement of machinery in the manufacture of iron for returning the heat, smoke, and gases through the furnace over the ores, metals, &c., thereby producing a great economy in the manufacture of iron. I intend sometimes to conduct the trunk or tube carrying the sparks, smoke, &c., into the wheel-house of paddle-wheel steamers in such a manner that the paddle-wheel in revolving will co-operate with the screw-fan in exhausting the tube of its contents.

It is obvious that the within-described machine will be useful for ventilation and many other purposes.

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

1. The mode herein described of creating draft in chimney-stacks by means of the screw-fan *a*, attached to the plate *h*, placed at the top of the stack, substantially in the manner described.

2. The above, in combination with the perforated casing *f* and shield *k*, and in combination therewith the tube or trunk *e* and valve *g*, placed within it, all in the manner and for the purpose described.

JAS. MONTGOMERY.

Witnesses:

J. J. GREENOUGH,  
A. P. BROWNE.