

J. W. GRAY.

Spark-Arresters and Extinguishers for Locomotives.

No. 139,002.

Patented May 20, 1873.

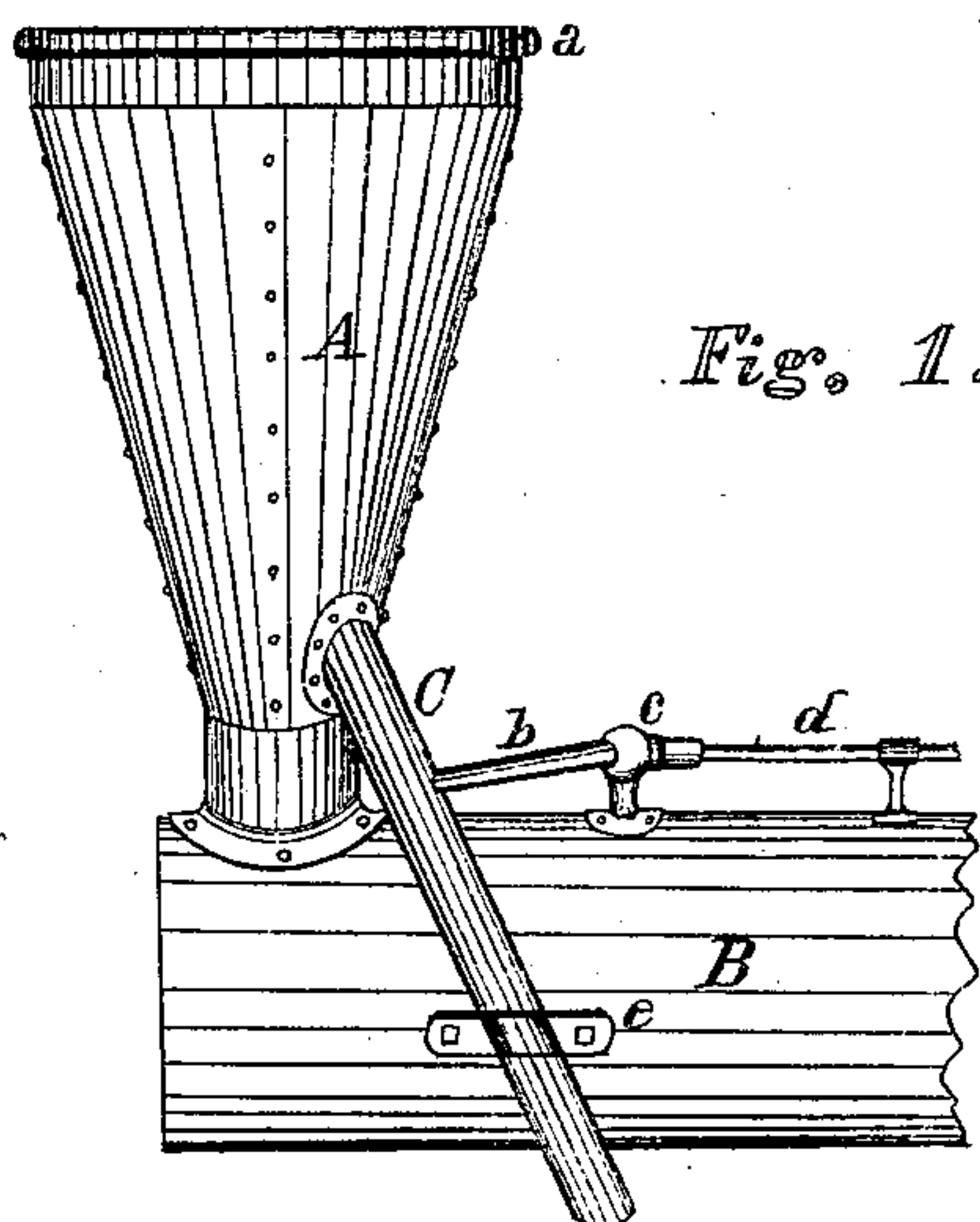


Fig. 1.

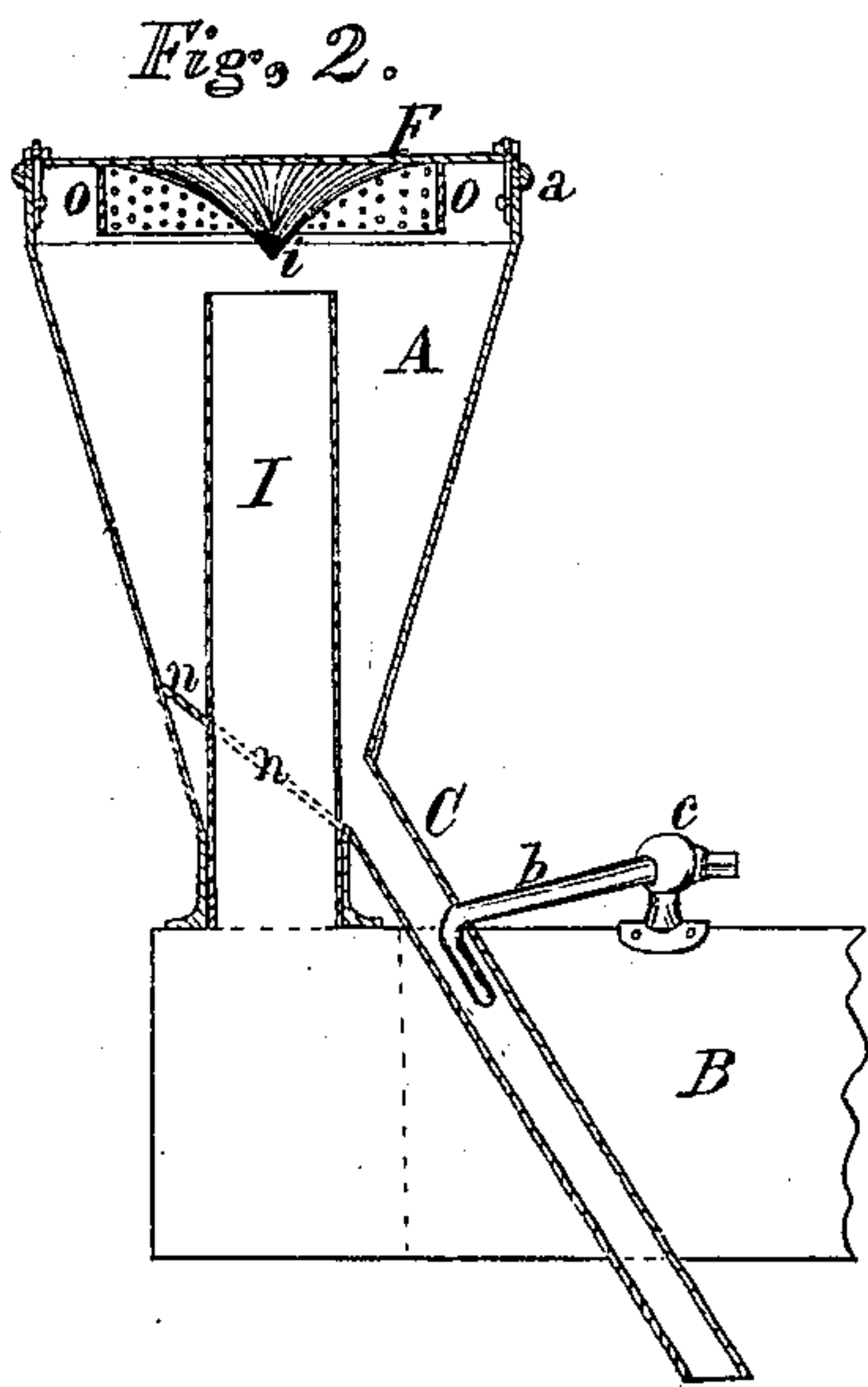


Fig. 2.

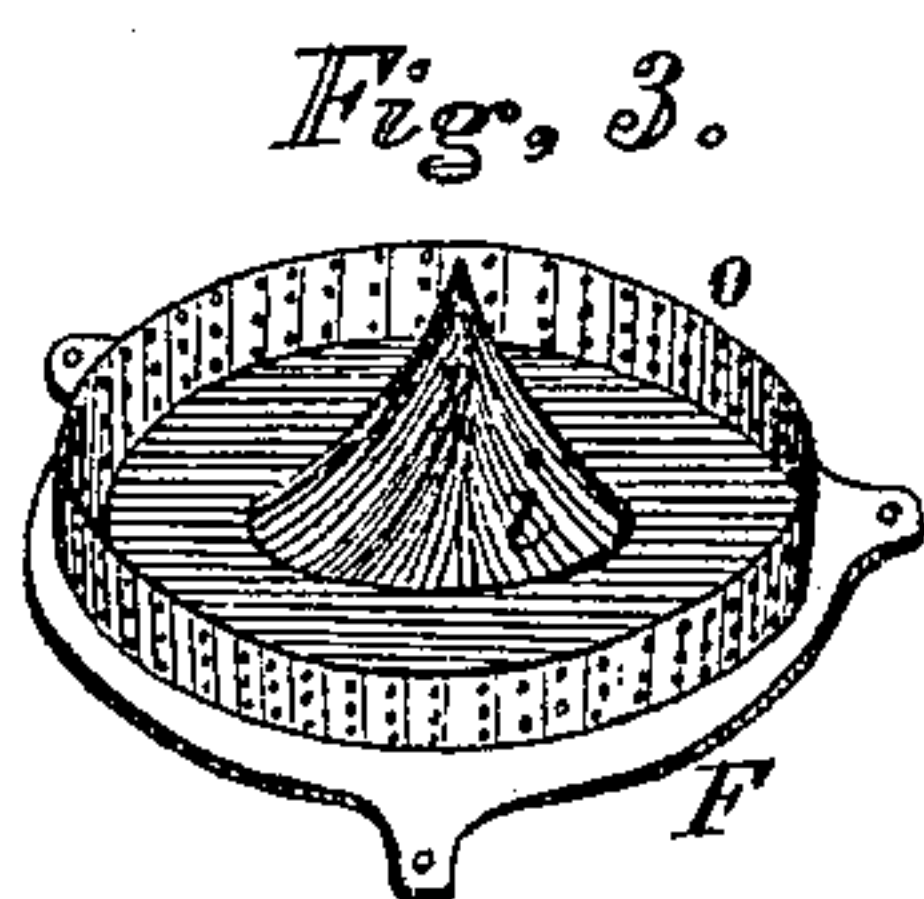


Fig. 3.

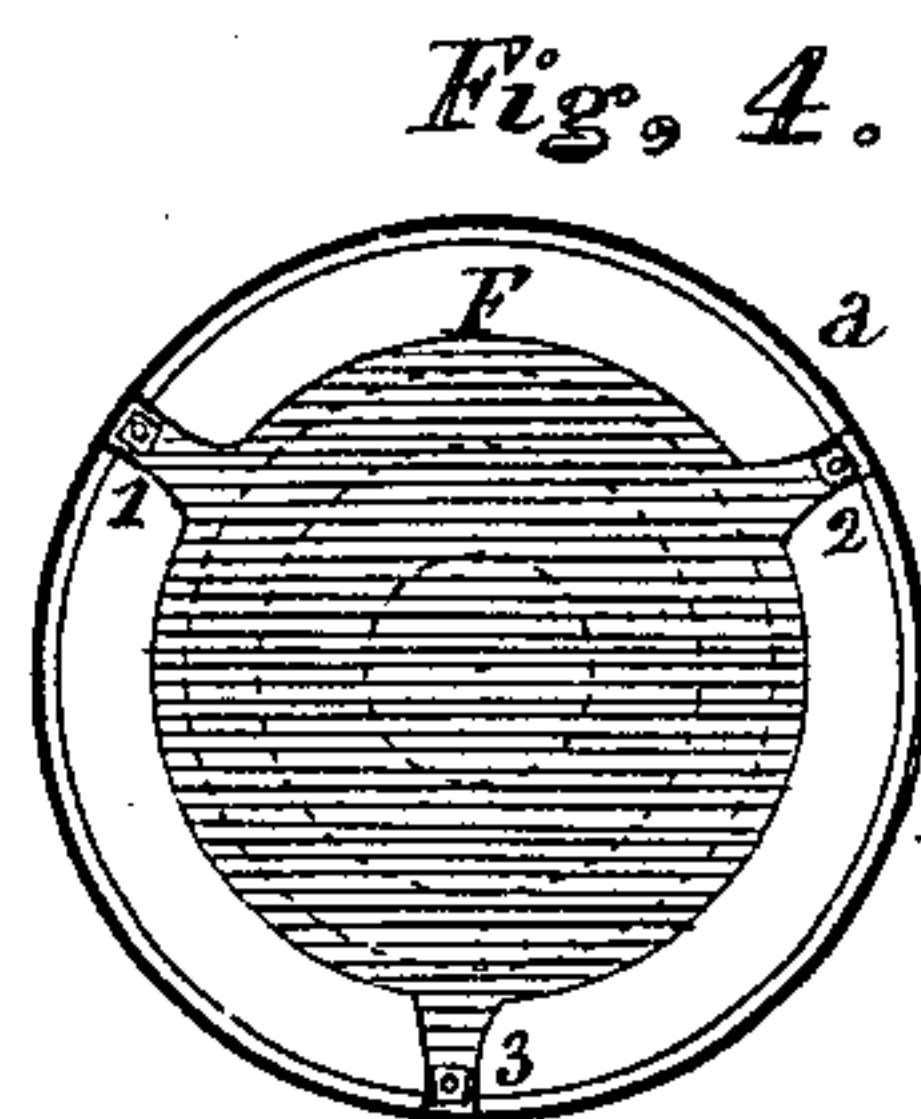


Fig. 4.

Witnesses.

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IMPROVEMENT IN SPARK ARRESTERS AND EXTINGUISHERS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **139,002**, dated May 20, 1873; application filed February 25, 1873.

To all whom it may concern:

Be it known that I, JOHN W. GRAY, of the city of Harrisburg, county of Dauphin and State of Pennsylvania, have invented a new and useful Improved Spark Arrester and Extinguisher for Locomotive-Engines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being made to the annexed drawing making a part of this specification and to the letters of reference marked thereon.

The nature of my invention consists in a peculiarly-constructed spark-arresting device, that is combined with a spark-discharging pipe, into which a jet of steam or water is introduced, so that the said sparks shall be continuously conveyed from the smoke-stack to the ground and thoroughly extinguished before reaching the same, substantially as is hereinafter set forth and described.

In the drawing, Figure 1 represents a side elevation, in perspective, of the smoke-stack, showing the position of the discharging-pipe in relation to it and the boiler of the engine. Fig. 2 is a side elevation in section of the smoke-stack and discharge-pipe. Fig. 3 is a perspective view of the bonnet or spark-arrester, representing it in a reversed position. Fig. 4 is a top view of the stack, showing the arrester in position.

In Figs. 1 and 2, A represents the body of the stack. In form it is similar to those in common use, being flared or widened from the base to the top, as is shown; it is surrounded by the spark-arrester F. (See Figs. 2, 3, and 4.) Said arrester is constructed as follows: A circular disk or plate of metal is furnished with the radial projections 1 2 3, that are intended to retain it in position upon the stack. Upon the under side of the disk and concentric with its outer edge a cone, *i*, is formed or fastened. (See Fig. 2.) Surrounding the cone, and at a proper distance from its base, an annular screen or sheet-metal ring, *o o*, perforated, as shown in Figs. 2 and 3, is rigidly fastened. The depth of the ring *o o* should be proportioned to that of the cone *i* and the width of the top of the stack, so that its function, the arresting of the sparks, will be properly per-

formed. The lift or draft pipe I is fastened by its lower end to the base of the stack in position concentric to the wall of the stack. It is made of sufficient length, in proportion to the height of the stack A, to properly direct the spark-blast against the point or apex of the cone *i*. Encircling the blast or draft pipe I, and near its lower end, an elliptic disk of metal, *n n*, is fastened, whose outer edge bears against the inner side of the stack A, and is secured thereto. At the lowest point of contact of said disk with the wall of the stack a perforation is made in said wall for the reception of the conveying-pipe C. (See Figs. 1 and 2.) This pipe C is intended to convey away or discharge the sparks as they are thrown down by the arrester F. At a proper point on the pipe C a perforation is made of sufficient size to receive the steam-pipe *b*. (See Figs. 1 and 2.) This pipe has its end that is inserted in the pipe C bent so as to take the direction of said pipe, as is shown in Fig. 2; its other end is secured in connection with a steam-cock, *c*, that is tapped into or otherwise properly secured to the boiler B. A rod, *d*, is provided that extends from the plug of the cock back to the cab, so that it can be operated and controlled by the engineer.

The operation of this spark arrester and extinguisher is as follows: During the running of the locomotive the sparks are forced by the draft and exhaust steam against the cone *i*, which deflects the stream and throws it against the screen-wall *o o*. The exhaust steam passes through the perforations of said wall and the sparks are arrested and thrown down into the stack between the draft-pipe I and the wall of the stack. They are then conveyed down the pipe C, and, coming in contact with the jet of steam or water, are extinguished perfectly before they are deposited upon the ground. The steam-cock *c* may be given such a position as to permit the use of both water and steam, if desired and found necessary.

I do not desire to broadly claim the use of a discharge-pipe C, as attached to the base of a stack, as I am aware that such a device has been employed to relieve the stack by attach-

ing it temporarily at stations. Neither do I claim the perforated wall *o o*, broadly; but

What I do claim as new of my invention, and desire to secure by Letters Patent of the United States, is—

The combination of the arrester *F*, constructed as set forth, in combination with the

draft-pipe *I*, inclined disk *n n*, discharge-pipe *C*, steam-pipe *b*, and cock *c*, as and for the purpose described.

JOHN W. GRAY. [L. S.]

Witnesses:

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WM. P. PATTON.