D. HARRIGAN.

Adjustable Exhaust for Locomotives.

No. 210,941. Patented Dec. 17, 1878.

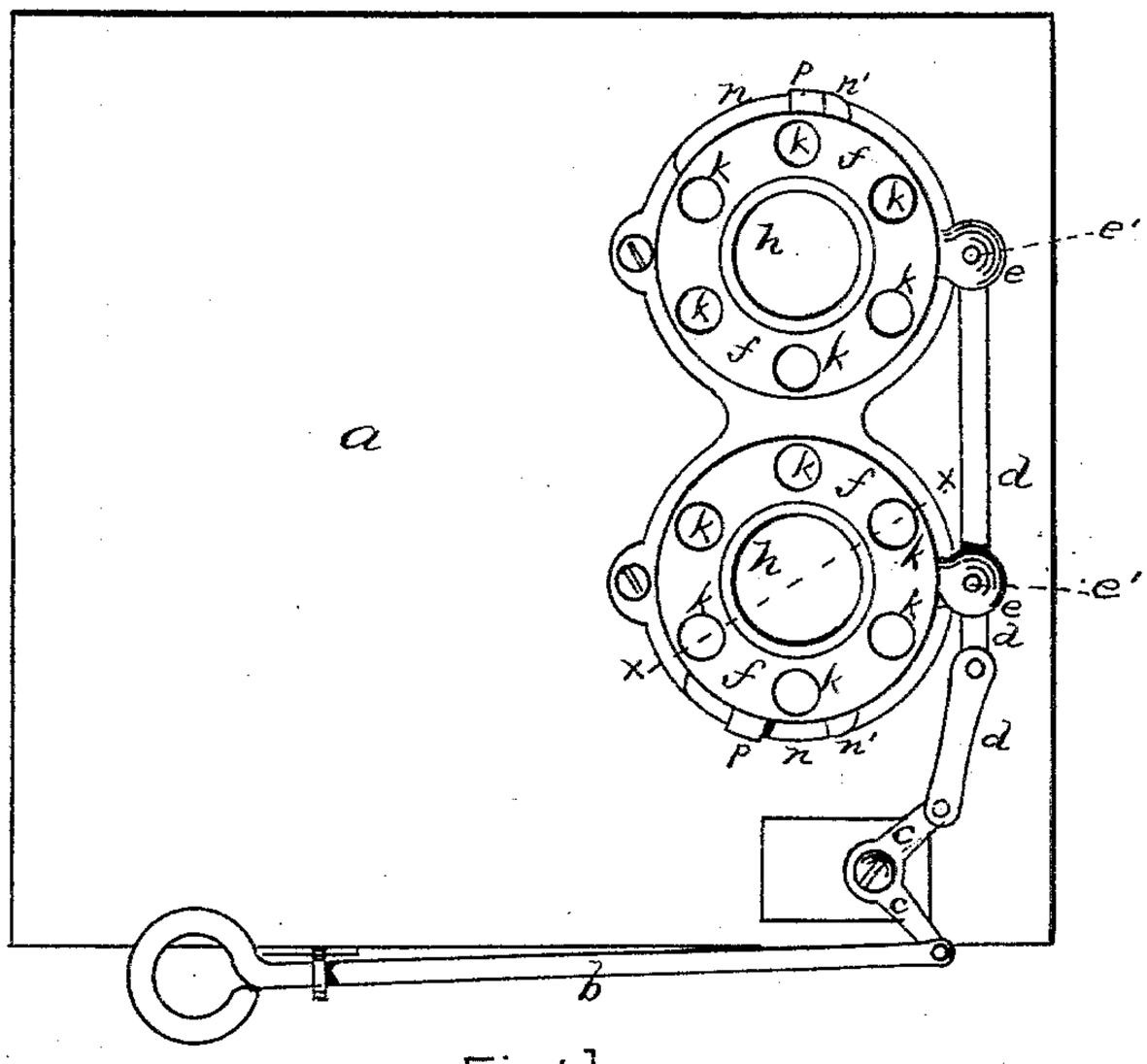

Fig. 1.

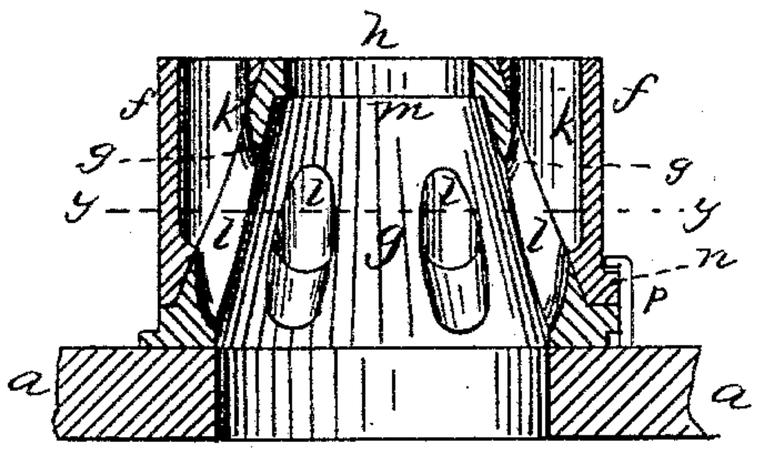

Fig. 2

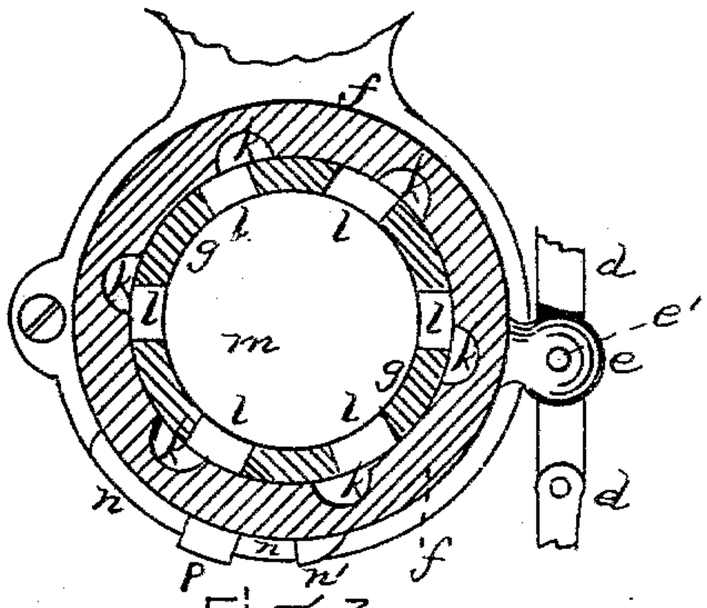

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

DENNIS HARRIGAN, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN F. CRACKETT, OF LACONIA, N. H.

IMPROVEMENT IN ADJUSTABLE EXHAUSTS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **210,941**, dated December 17, 1878; application filed May 11, 1878.

To all whom it may concern:

Be it known that I, DENNIS HARRIGAN, of Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Adjustable Tip for the Exhaust for Locomotive-Engines, of which the following is a specification:

The object of this improvement is, in utilizing the exhaust or dead steam by conducting it to the smoke-stack for the purpose of improving the draft, to provide a cheap and efficient device by means of which the blast may be regulated and adjusted as occasion may require.

By means of the invention or improvement below described expense and space are saved, as compared with inventions for a similar purpose before invented or introduced, a vertical draft through the ports is produced, a great saving in wear is accomplished, an even distribution of the draft is attained, and the device is easily freed from cinders and deposit.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a plan view of a pair of exhaust-tips embodying my improvement. Fig. 2 is a cross vertical section upon line *x x*, Fig. 1. Fig. 3 is a horizontal section upon line *y y*, Fig. 2.

In Figs. 1 and 2 the ports are open, or coincide, and in Fig. 3 they are partially closed.

a represents the base. *b* is a rod extending to the cab, to be actuated by the engineer, and connected by means of the bell-crank *c* with the jointed lever *d*. This jointed lever is attached, by means of pins *e' e'*, to the projections *e e*, extending from the sleeves or caps *f f*, which, by means of the ports above named, are partially rotated upon the cones *g g*, at the will of the engineer. These caps or sleeves *f*, which are, of course, situated within the smoke-arch, are of the shape shown in the drawing, their upper surfaces round, their sides perpendicular upon the outside, and upon the inside at the proper angle and shape to exactly fit over and upon the cones *g*. Both the cones and the caps are of brass or some other compound or metal. *h h* are the central openings or passages in the caps *f*, and *m m* similar openings in the cones *g*. *k k* are ports in the caps *f*, and *l l* corresponding vertical ports in the cones *g*. Horizontal ribs or raised portions or strips *n n*, provided with and terminating in stops *n' n'* upon the sides of the caps *f*, fit into and slide in grooves in the upright projections or posts *p p*, extending from the lower edges of the cones *g*, thus keeping the caps and cones in their proper relative positions.

When a strong blast is desired, so as to drive the fire by creating a strong draft in the smoke-stack of the locomotive, the cap or sleeve is rotated by the engineer until the ports *k* in the cap and *l* in the cone do not coincide or connect with each other, thus closing all passages save the central openings *h m*. When the blast is to be lessened, the cap is rotated until the stop *n'* strikes the post *p*, when the ports *k l* will coincide and form vertical, or nearly vertical, passages for the steam, thus lessening the pressure in the passage *h*, and consequently lessening the draft and blast. Of course, the blast is susceptible of being regulated by a partial opening of the ports, as in Fig. 3.

There are several advantages peculiar to this invention. The ports are so placed as when open to produce a nearly or quite vertical draft, which, of course, is much stronger than a curved or tortuous draft, which takes the force out of the current of steam.

Again, the ports in the cap and also in the cone are placed in a true circle, thus insuring an even distribution of the draft, and preventing the fire from burning unevenly, as is apt to be the case.

On account of the shape of the cone and the corresponding shape of the cap the wear is slight and not noticed, as the cap, when it wears, is inclined to settle down upon the cone and fit, notwithstanding the wear. Were their sides vertical the wear would be more apparent, and they would soon become loose; also, the shape allows the cinders and deposit to free themselves.

The device takes up but little room in the smoke-arch, as the diameter of the cap is not greater than the extreme diameter of the cone. Of course, one or two cones may be used, as desired.

A variation of the invention would be to set the cap or sleeve directly upon the base *a;* but the position shown is considered better.

The device is now in practical use, and operates as well as could be desired.

The device is easy of access, and being both small and simple is readily repaired.

Having thus fully described my improvement, what I claim, and desire to secure by Letters Patent, is—

The hereinbefore-described adjustable tip for locomotive-exhausts, consisting of the cone *g*, provided with the vertical, or nearly vertical, ports *l* and passage *m*, and the cap *f*, provided with the corresponding vertical, or nearly vertical, ports *k* and passage *h*, said parts being constructed and arranged substantially as and for the purpose set forth.

DENNIS HARRIGAN.

Witnesses:

HENRY W. WILLIAMS,

JOHN E. FRUMING.