

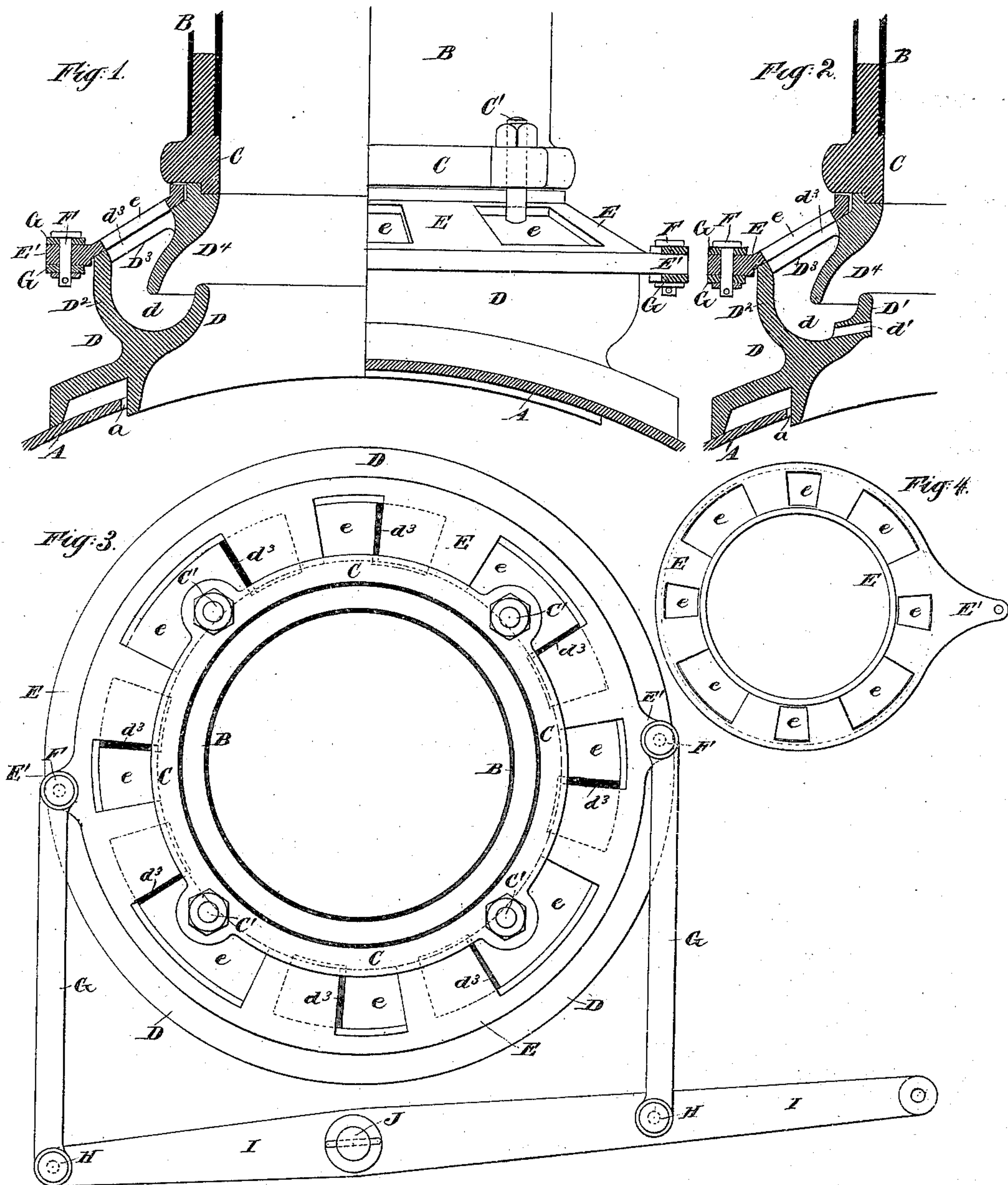
(No Model.)

H. A. LUTTGENS.

LOCOMOTIVE.

No. 330,340.

Patented Nov. 10, 1885.



Witnesses:

Charles R. Searle.
L. O. Smith.

Inventor:

My Henry A. Luttgens
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UNITED STATES PATENT OFFICE.

HENRY A. LUTTGENS, OF PATERSON, NEW JERSEY.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 330,340, dated November 10, 1885.

Application filed April 23, 1885. Serial No. 163,112. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. LUTTGENS, of Paterson, Passaic county, in the State of New Jersey, have invented certain new and useful Improvements in Locomotives, of which the following is a specification.

The improvements relate to provisions for admitting air to the stack to reduce the draft when desired, and to the construction and arrangement of parts in connection therewith, whereby the end is attained with greater perfection than heretofore and difficulties are avoided.

There are conditions in the working of a locomotive when it is highly desirable to suppress instead of increasing the fire, and yet it is necessary to use the steam and to discharge it in strong blasts up the stack. It has long been considered desirable to admit air into the smoke box or stack for this purpose; but the means heretofore proposed for that purpose have been open to serious objections. Some of the plans have been liable to eject smoke and sparks through the apertures. With others it was difficult or impossible to prevent the parts from working with too great looseness or tightness from difference of expansion. All are liable to eject water, which, with the soot washed out therewith from the stack, is unsightly, and, by disheartening the attendants, lowers the standard of neatness and efficiency in the work. I mount an annular damper-plate on a conical seat around the stack, which by partially rotating covers and uncovers apertures. These apertures admitting the air communicate with an annular channel which first descends then extends inward through a pocket or smoothly-curved base and then ascends to a less height on the inner side. The whole is a single casting just outside of the proper diameter of the chimney. The several surfaces are rounded and beveled to present a smooth channel to the air. The damper-plate may expand and contract freely on its conical seat, while always maintaining a tight contact therewith.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation, one-half in vertical section. Fig. 2 is a corresponding sec-

tion through a portion, taken in a different plane. Fig. 3 is a plan view and a horizontal section taken above the principal parts. This figure corresponds to Fig. 1. Fig. 4 is a plan view showing a modification.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is a portion of the barrel of the smoke-box. The hole *a* therein is a little larger than the interior of the stack.

B is the sheet-metal stack, formed in two thicknesses, riveted upon the outside and inside of C, the smoke-stack ring.

D is a casting located intermediately between the smoke-box A and the ring C.

Certain portions will be designated, when necessary, by additional marks, as D' D², &c.

The lower face of D is saddle-formed to correspond to the curve of A, and is flanged and bolted around the enlarged hole in A. The upper edge is rabbeted, and matches a corresponding rabbet on the surface of C.

D' is an internal lip curving upward. Its upper and inner edge corresponds nearly with the inner face of the stack proper.

D² is a lip extending upward exterior to D', and reaching considerably higher. The small holes *d'* extend inward through the casting from the bottom of the annular pocket *d* between the annular lips D' and D².

D³ is a conical portion of the casting extending upward and inward from the top of the lip D². It is provided with apertures *d*³.

D⁴ is a lip extending from the upper and inner edge of the conical portion D³ downward and slightly outward, as shown. Its lower edge terminates in the pocket *d*.

E is an annular ring, which I term a "damper-plate," of conical form, and fitting tightly and easily on the exterior of D³, and provided with apertures *e*, which when the damper-plate is in one position coincide with the apertures *d*³, and allow the air to enter the stack as desired and reduce the draft. The provisions for the exhaust may be of any ordinary or suitable character, and need not be particularly described. Their function is to send the exhaust-steam in vigorous jets into the interior of the stack. When the damper-plate E is partially turned around on its conical seat D³, the apertures are brought out of coinci-

dence and all ingress of air through the apertures is stopped. In various intermediate positions the air will be admitted in various quantities less than the full capacity of the apertures.

5 E' E' are short arms or lugs formed on the damper-plate E. They receive pins F, which connect with links G, which by pins H connect with a transverse lever, I, turning on a
10 center, J, fixed on the smoke-box. A link (not represented) jointed to one end of the lever I extends to a point in the vicinity of the foot-board, and is operated by the engineer or fireman at will to adjust the damper-plate E from
15 time to time, as required.

C' C' are bolts which connect the ring C with the casting D. Allowance is made for these bolts in proportioning and arranging the holes d^3 and e , as shown in Fig. 3.

20 I make the part D of cast-iron and the damper-plate E of brass. The difference in the expansion of these metals tends to balance the difference in temperature, so that there is little derangement of position due to the
25 expansion and contraction; but the conical form allows any required amount without involving mischief. Expansion of the damper-plate relatively to its seat simply allows the damper-plate to move downward on the seat.
30 Contraction simply draws it upward. The orifices are nevertheless presented in such position as to receive the air forcibly from the action of wind or from the motion of the locomotive. The inner lip, D' , deflects the
35 steam and gases inward, so that they are directed certainly and smoothly to a point well within the lips D^4 . The outer lip, D^2 , extends upward to such height that water thrown up by the exhaust-steam may be received in the
40 pocket d in quantities without possibility of flowing out through the damper-plate E. The drain-holes d' discharge water slowly from the pocket d , so that no accumulation can long remain to prevent the inward flow of air when
45 desired. All the parts of D being formed in one casting, gives great strength and simplicity.

The form and position of the damper-plate and its seat cause the parts to be held in contact by gravity. A strong draft due to the
50 action of the exhaust only holds the damper-plate to its seat the more tightly.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. The depths of the
55 several lips D' D^2 D^4 may be considerably increased or they may be somewhat reduced from the proportions shown. The conical form of the seat D^3 and the damper-plate E may be varied, being more upright or more
60 level than shown.

Parts of the invention may be used without the whole. I can turn the damper-plate by a single link connecting to one point only
65 on the damper-plate. Such an arrangement is shown in Fig. 4. I prefer the two links shown in Fig. 3. These two connections to the lever I enable the turning of the damper
70 to be effected without inducing any lateral strain on the valve or its seat. The pull on one of the links G is balanced by the thrust on the opposite link G; or the opening and
closing of the apertures for the admission of air may be effected by any of the various
75 methods in use for opening and closing orifices.

I claim as my invention—

1. In a locomotive, the apertures d , placed substantially in the position as shown and provided with means for closing and opening
80 the same, in combination with lips D' D^2 D^4 , arranged for joint operation relatively to each other and to the smoke-box A and stack B, as herein specified.

2. In a locomotive, the operating-lever I, turning on its center J, and two links, G, in
85 combination with the damper-plate E, having apertures e , seat D^3 , having apertures d^3 , and lips D' D^2 D^4 , arranged for joint operation relatively to each other and to the smoke-box A and stack B, as herein specified.

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Witnesses:

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