

(No Model.)

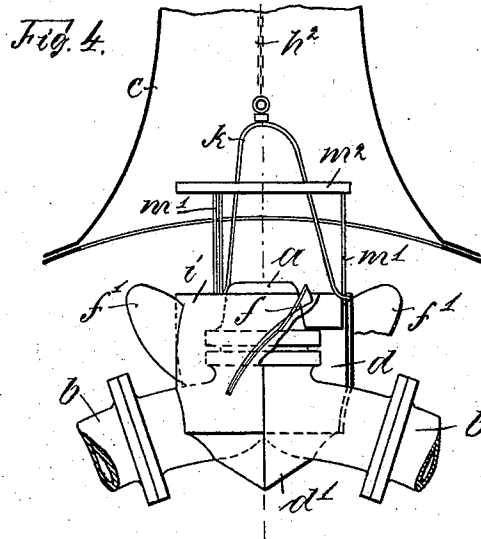
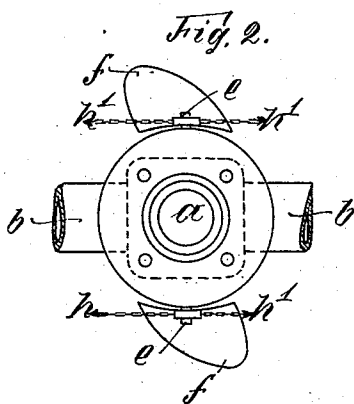
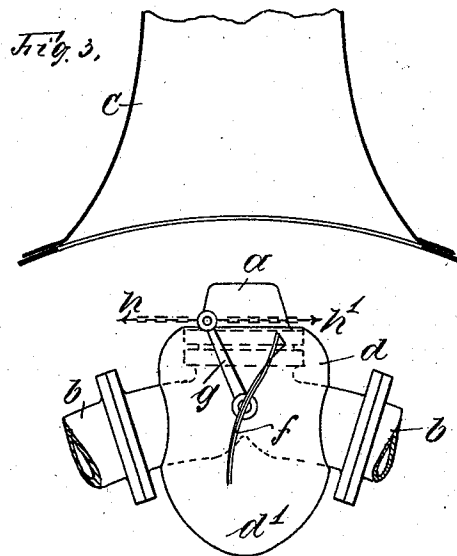
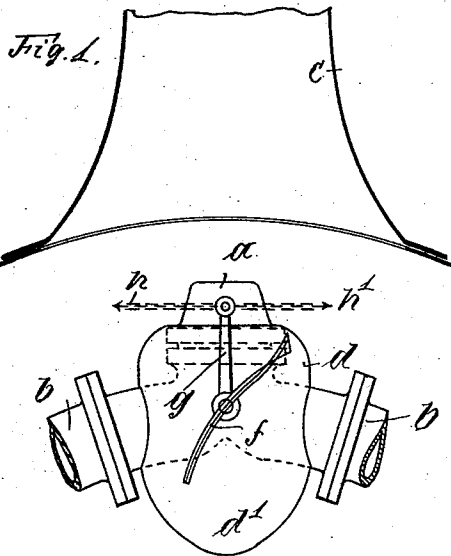
2 Sheets—Sheet 1.

R. DEISSLER.

COMBINED DRAFT REGULATOR AND SPARK ARRESTER.

No. 570,985.

Patented Nov. 10, 1896.



Witnesses:

Emil Kayser.

Max Lohr.

Inventor:

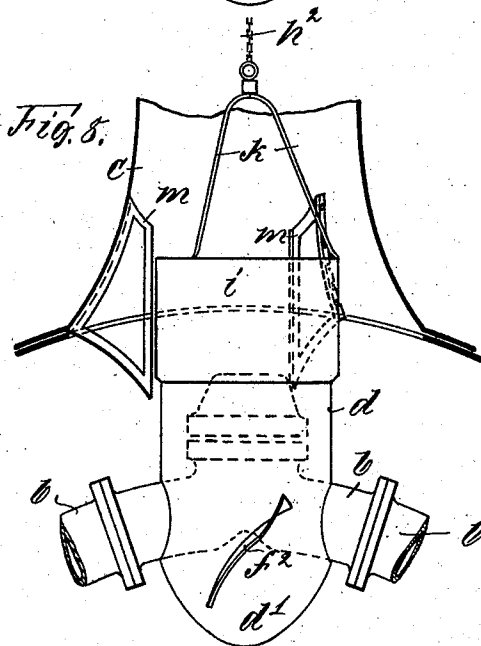
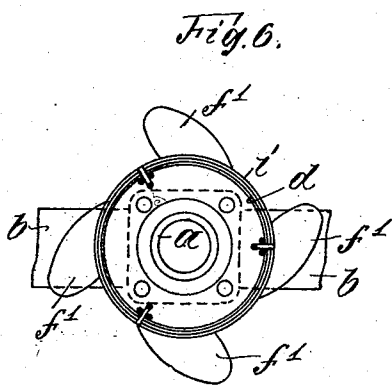
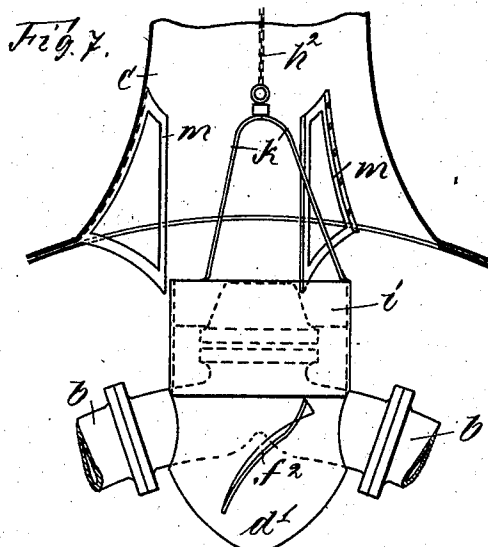
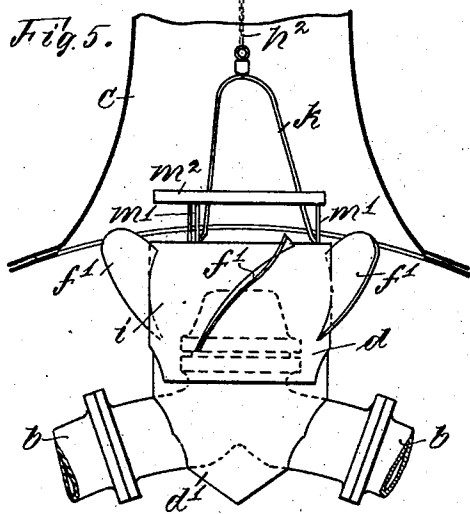
Robert Deissler

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UNITED STATES PATENT OFFICE.

ROBERT DEISSLER, OF TREPTOW, GERMANY.

COMBINED DRAFT-REGULATOR AND SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 570,985, dated November 10, 1896.

Application filed April 9, 1896. Serial No. 586,864. (No model.)

To all whom it may concern:

Be it known that I, ROBERT DEISSLER, a subject of the King of Prussia, German Emperor, and a resident of Treptow, near Berlin, in the Kingdom of Prussia, German Empire, have invented a Combined Draft-Regulator and Spark-Arrester for Locomotive-Engines, of which the following is an exact specification.

The ejection of sparks out from the chimney of a locomotive-engine is generally the greatest when the cylinders are charged with somewhat great quantities of live steam at each stroke of their respective pistons. The enormous quantities of expanded steam then ejected by the blast-nozzle cause, first, the air to pass with very great velocity through the grate into the fire-box, and cause, second, the fire-gases to stream with a still greater velocity from the fire-box through the small fire-tubes into the chimney. There are thus particles of coal carried forth from the grate and ejected out of the chimney in a burning state. Said particles represent not only a danger for the woods and forests, but a direct loss of coal because this latter has not been fully exhausted.

The objects of my invention are, first, to cause a better combustion or exhaustion of the coal, so as to reduce the arising of sparks as much as possible, and, second, to hinder even the few sparks arising from leaving the chimney. I attain said objects by arranging an inclined wing or wings near to the blast-nozzle in such a manner and in such a position that said wing or wings may be regarded as a part or parts of the plane of a screw and is or are normally situated below the plane of the opening of the nozzle. Said wings may be either stationary (with regard to the nozzle) or movable; but if stationary I combine them or the blast-nozzle or a casing surrounding said nozzle and carrying the said wing or wings with a slide that also surrounds said nozzle and may be moved in a vertical direction. The wing or wings may, if desired, be secured to said slide so as also to be movable in a vertical direction; but I may make said wing or wings movable in such a way by attaching them to a suitable frame that may or may not be combined with a special slide. In fact, if employing a movable wing or

wings, I need not make use of a special slide, although I prefer to do so; but I make use of such a slide in all cases in which perfectly stationary wings are employed.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 is a front view of the first form of construction of my novel draft-regulating and spark-arresting device, the chimney being shown in vertical section. Fig. 2 is a plan of said device, the chimney being left away. Fig. 3 is a front view similar to Fig. 1, the wing being shown in another position. Fig. 4 is a front view of a modified form of construction. Fig. 5 is a similar view, the wings being in another position. Fig. 6 is a plan of the modification shown in Figs. 4 and 5, the chimney being left away. Fig. 7 is a front view of a second modification, and Fig. 8 is a similar view showing the slide in another position.

Referring to Figs. 1, 2, and 3, *a* designates the blast-nozzle, *b* the tubes leading the waste steam from the cylinders to said nozzle, and *c* the chimney. The lower portion of the blast-nozzle is surrounded by a casing *d*, that takes around the tubes *b*, and is provided with a somewhat conical bottom *d'*. Said casing *d* holds or supports pivots *e*, Fig. 2, that are arranged radially with regard to the nozzle *a*, and serve each as a bearing for a wing *f*, that is firmly connected with a lever *g*. Said levers extend upward and are each connected by chains *h h'* with any desired means for operating the wings *f*. The wings *f* are thus arranged directly below the chimney *c* or within the way of the waste gases of the furnace, respectively. Said gases (or a certain portion thereof) when flowing from the fire-tubes into the chimney are thus compelled to push upon said wings, which are inclined, and are arranged in such a manner as to represent parts of the plane of a screw. The degree of inclination of the said wings may be altered by means of the levers *g* and the chains *h h'*, (or their equivalents,) according to any requirement or according to the quantity of the live steam with which the cylinders are charged at each stroke of their pis-

tons, respectively. As long as said charge is the normally low one, (two-tenths or three-tenths,) the position of the wings f is about that shown in Fig. 3, in which the resistance offered to the rising furnace-gases by said wings is but small. The gases pushing upon the wings are deflected by the same, and the few small particles of unburned coal that are carried forth by said gases are deflected to the walls of the chimney, so that their further motion is stopped by said walls and they are caused to fall down upon the bottom of the smoke-box. If, however, greater charges of live steam are requisite for the cylinders, and if thus the draft caused by the escaping waste steam is increased, the inclination of the wings f (with regard to a horizontal plane) is correspondingly decreased. (Compare Fig. 1.) The pitch of the deflected fire-gases becomes then a considerably greater one, and owing to the resistance offered by the wings to said gases the action of the blast-steam upon the latter is greatly reduced, so that the air cannot flow with undue force into the fire-box and cannot therefore tear particles of coal away from the grate in a greater measure than was the case up to then. The few sparks still arising are again thrown against the walls of the chimney, and are thus caused to fall down, as aforescribed.

I wish it to be understood that I do not lay in this specification any claim upon the casing d d' aforesaid. The wings f need not be arranged at the side or mantle of such a casing, but may be situated as near as possible to the nozzle a , and I prefer to arrange the inclined wings in such a manner with regard to said nozzle that they do not project beyond the plane of the opening of the said nozzle.

Instead of arranging the movable wings in the manner shown in Figs. 1, 2, and 3 I may arrange them in the manner shown in Figs. 4, 5, and 6, in which the wings may be moved in a vertical direction without undergoing an alteration in their degree of inclination. In the form of construction shown the wings f' are secured to an annular slide i , that normally takes about the casing d . This latter surrounds the nozzle a , as well as the adjacent portions of the exhaust-tubes b , and is reduced toward its lower end or closed at said end by a bottom d' , respectively, that terminates into an edge or point. A double-armed or three-armed bow k connects the slide i with a chain l , by means of which the slide and the wings may be raised, as shown as an example in Fig. 5. The fire-gases are thus in this form of construction throttled, not by a greater inclination of the wings with regard to the direction of the fire-gases, but by the higher position of the slide i . The annular space remaining between the upper edge of said slide and the opposite portion of the chimney c is more and more diminished with the increasing higher position of the slide i , and the fire-gases that are compelled to pass through

said annular space are thus throttled in a corresponding degree.

The slide i , with the wings f' , is raised when the cylinders are to be fed with greater charges of live steam than are normally requisite, *i. e.*, when the draft produced by the large quantities of the waste steam streaming forth from the nozzle into the chimney becomes as great as to hinder the coal from being fully exhausted. The fire-gases are then not only throttled, but are again caused to make a screw-like way, as already described with regard to Figs. 1 to 3. The few sparks still arising are thrown against the lower portion of the chimney, and are thus caused to fall down into the smoke-box, as aforescribed. The throttling of the fire-gases is, however, due not entirely to the higher position of the slide i , but also to the higher position of the wings f' , and I may in some cases attach said wings not to a true slide, such as i , Figs. 4, 5, and 6, but I may secure them to a frame of any desired description, provided the wings can be raised and lowered by the mediation of said frame. On the other hand, I may make use of a slide, such as i , without attaching the wings f' to said slide. The latter are then preferably arranged below the slide, as shown as an example in Figs. 7 and 8. In this mode of construction the wings f^2 are secured to the lower portion of the casing d d' . The upper portion of said casing serves again as a guide for the slide i . I do not confine myself, however, to guiding the slide i by a casing, such as d , or merely by such a casing, but I may employ other means, maybe together with the casing d .

In the form of construction shown in Figs. 7 and 8 I have secured frames m to the lower portion of the chimney c , but I wish it strictly to be understood that I do not confine myself to guides of this description, as it will be clear to every expert that the slide i may be guided in a great variety of ways. Another example therefor is shown in Figs. 4 and 5, in which three vertical rods m' , secured with their lower ends to the upper portion of the casing d , serve as a guide or guides for the slide i . The upper ends of said rods are rigidly connected by a ring m^2 .

The manner of the coöperation of the slide i and the wings f^2 is very similar to that aforescribed, and I have therefore dispensed with giving the same explanations a second time.

If employing other means than a casing, such as d , for guiding the slide i , I may attach the wings f^2 directly to the exhaust-pipes b , or to suitable projections thereof, respectively. This applies also to the form of construction first described, Figs. 1, 2, and 3, and also the means for operating the movable wings of said first form of construction may be greatly varied, as will also be clear to every expert without a further explanation. Also the chains h h' , Figs. 1, 2, and 3, and the chain h^2 , Figs. 4, 5, 7, and 8, may be replaced by

other means—for instance, by a rope or rod; but instead of operating the wings of the slide from above (through the chimney) I may operate them from below, or from one or the other side in a compulsory manner, just as best suited for the particular type of locomotive-engine which my novel device is to be attached to.

Having thus fully described the nature of my said invention, what I desire to secure by Letters Patent of the United States is—

1. In a locomotive-engine, the combination with the blast-nozzle, of a movable inclined wing or wings situated near to said nozzle, and arranged similar to a part or parts of the plane of a screw, for the purpose as described.

2. In a locomotive-engine, the combination with the blast-nozzle, of a movable inclined wing or wings situated near to said nozzle below the plane of the opening of the same, and arranged similar to a part or parts of the plane of a screw, for the purpose as described.

3. In a locomotive-engine, the combination

with the blast-nozzle, of a slide surrounding said nozzle, and adapted to be moved in a vertical direction; an inclined wing or wings situated near to said slide, and arranged similar to a part or parts of the plane of a screw; and a guide or guides for the said slide, for the purpose as described.

4. In a locomotive-engine, the combination with the blast-nozzle, of a slide surrounding said nozzle, and adapted to be moved in a vertical direction; an inclined wing or wings attached to said slide, and arranged similar to a part or parts of the plane of a screw; and a guide or guides for the said slide, for the purpose as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ROBERT DEISSLER.

Witnesses:

W. HAUPT,
HENRY HASPER.