

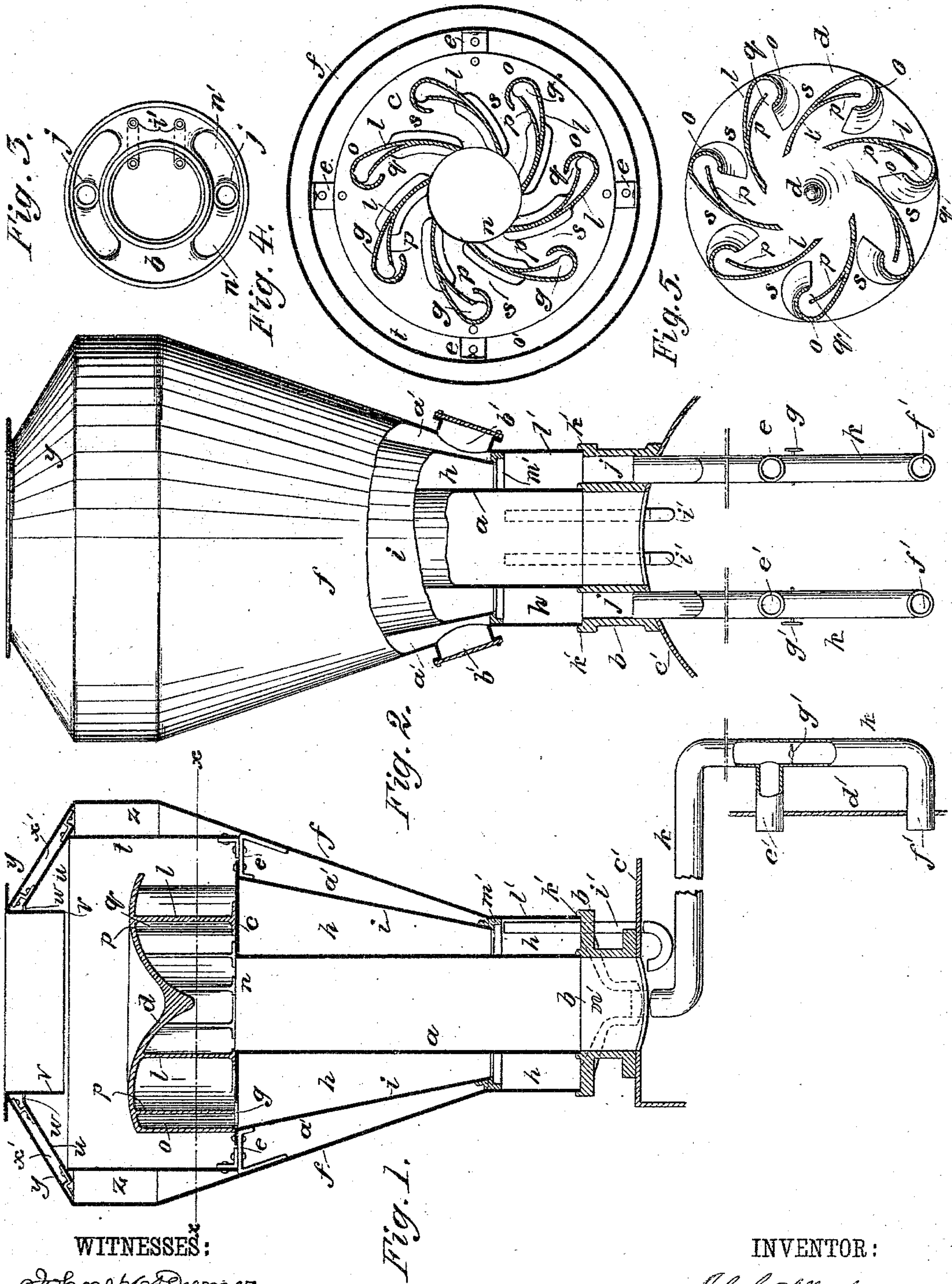
(No Model.)

J. C. ALBRECHT.

SPARK ARRESTER.

No. 295,322.

Patented Mar. 18, 1884.



WITNESSES:

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JOHN COLUMBUS ALBRECHT, OF COLUMBUS, GEORGIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 295,322, dated March 18, 1884.

Application filed November 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ALBRECHT, of Columbus, in the county of Moscokee and State of Georgia, have invented a new and Improved Spark-Arrester, of which the following is a full, clear, and exact description.

My invention consists of contrivances, in connection with the cone of the smoke-stack of a locomotive, for more effectually separating the cinders from the smoke than is usually accomplished, and for forcing them back into the fire for consuming them, and at the same time increasing the draft of the fire by means of the hot-blast from the smoke-stack, by which the cinders are carried back to the fire-box, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of the smoke-stack provided with my improved spark-arresting and draft-accelerating apparatus, the section being taken in the longitudinal plane of the boiler. Fig. 2 is partly a front elevation and partly a transverse section. Fig. 3 is a plan view of the saddle by which the smoke-stack is connected to the top of the boiler. Fig. 4 is a horizontal section of Fig. 1 on the line $x x$; and Fig. 5 is a horizontal section of the cone attachments, looking upward from the line $x x$, Fig. 1.

I extend the draft-pipe a from the top of the saddle b to a horizontal partition, c , located a short distance below the inverted cone d , and supported by brackets e , attached to the outer flaring shell, f , of the smoke-stack a little below the top of said shell, said plate having a series of holes, g , through which the sparks and cinders are to be discharged to the space h between the draft-pipe a and the inner flaring pipe, i , to be conducted through the two side passages, j , in the saddle b to the pipes k , by which they are to be returned to the fire-box either through or outside of the boiler.

For effectually separating the sparks and cinders from the smoke and causing them to be delivered through passages g of the plate c , I have arranged the volute partitions l between the plate c and the under surface of the cone, said partitions beginning at the opening n in the center of said plate, where the draft-pipe

a discharges, and extending tangentially and in a slightly-curved line therefrom nearly to the outer edge of plate c , where they terminate in a scroll, o , around the larger ends of the openings g , the scrolls forming a turn-bend, opening in the direction of the center of the plate, which opening is about half closed or a little more by a curved branch partition, p , springing from the middle of the concave side of partition l , and terminating at the mouth of the scroll, where a narrow passage, q , admits the cinders within the scroll, to which they are directly forced along the inner sides of the partitions l and p , while the smoke mainly escapes through the passages s , so as to ascend between the outer edge of the cone and the surrounding vertical pipe t . Within the scroll o the cinders are forced down through the openings g , which are nearly inclosed by said scrolls and the partitions l and p . Any cinders escaping through the passages s along with the smoke, and being forced up along pipe t , and the inner dome, u , are to be caught by the drop-tube v , so as to be forced by the blast through the openings at w , through said inner dome to the space, x' , between said inner dome and the outer dome, y , where they fall through space z to the space a' , from which they are to be removed from time to time through hand-holes b' .

The pipes k , into which the cinders are forced through the passages j , are to be extended back to the cab, either through the boiler above the tubes or outside of the boiler-shell c' and down along the front plate, d' , of the fire-box, with two or more branches, $e' f'$, discharging into the fire-box at different heights, and with a valve or gate, g' , to direct the discharge through the upper or lower branch, as may be preferred or found best, according to the condition of the fire, which may be best effected by discharging the blast low down for a time after replenishing the fire with fresh fuel, and afterward by discharging the same higher up.

It is designed that the issues at s , between the scrolls o and the partitions l , shall be sufficiently contracted to cause back-pressure enough to effect such forcible discharges from these pipe-branches e' or f' as to blow the fire effectually, and it is believed that the hot-blasts delivered from them will have better effect on

the fire than if cold. Besides these return-blasts through the fire, I have provided for other blasts into the lower end of the smoke-pipe *a* by means of the pipes *i'*, extending from the space *h* above the top plate of the saddle *b*, through the same and through the boiler-plate *c'*, and upward into the lower end of said pipe *a*, through which it is expected that the pressure of smoke and hot gases returning from space *h* into the smoke-pipe will have a beneficial effect in accelerating the draft through the fire.

The saddle *b* is, for the purpose of my improved spark arresting and consuming attachment, provided with the outer annular flange, *k'*, for the support of the base section *l'* of the flaring pipe *f*, and for the support of the ring *m'*, by which the base of inner flaring pipe, *i*, is connected to the base of outer flaring pipe, *f*, to support said pipe *i* and to make a tight joint between spaces *a'* and *h*. The top plate of the saddle is suitably flared at *n'*, each side of the holes *j*, for gathering the cinders in from the annular space receiving the cinders from above. The horizontal partition *c*, on which the volute partitions rest for conducting the cinders through the passages *g*, is made sufficiently smaller than the pipe *t* to provide an annular space, *o'*, through which any cinders escaping through passages *s* and falling back along pipe *t* may drop into the space *a'*, along with those carried up through the passages *w*, and falling through space *z* and between the lower end of pipe *t* and the outer flaring pipe, *f*, where sufficient space is provided for the purpose.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

40 1. The combination of the volute partitions *l*, having branches *p* and scrolls *o*, and horizontal partitions *c*, having passages *g*, with the cone *d* and smoke-pipe *a*, substantially as described.

45 2. The volute partitions *l*, having branches *p* and scrolls *o*, arranged between plate *c* and cone *d*, with passages *s* for the smoke, and with passages *g* for the cinders, said passages *g* discharging through the openings *g* of the plate *c* into the space *h* below, and the smoke-passages *s* discharging upward for the escape of the smoke, substantially as described.

50 3. The combination of return-pipes *k*, leading into the fire-box through the front plate, with the smoke-pipe *a*, cone *d*, and the volute partitions *l p*, scrolls *o* and plate *c*, arranged to arrest the cinders and project them down into space *h* outside of pipe *a*, and into which

said return-pipes connect, substantially as described.

60 4. The pipe *t*, inner dome, *u*, drop-pipe *v*, and the inner flaring pipe, *i*, combined with the cone *d* and outer flaring pipe, *f*, substantially as described.

5. The pipe *t*, inner dome, *u*, drop-pipe *v*, and the inner flaring pipe, *i*, combined with the cone *d*, volute partitions *l p*, scrolls *o*, plate *c*, having passages *g*, smoke-pipe *a*, and the outer flaring pipes, *f* and *y*, substantially as described.

70 6. The pipe *t*, inner dome, *u*, having passages *w*, drop-pipe *v*, outer dome, *y*, and outer flaring pipe, *f*, combined with the cone *d*, said cone having means for mainly projecting the cinders down into the space *h*, substantially as described.

7. The combination of the blower-pipes *i'* with the smoke-pipe *a* and the cone *d*, and partitions arranged for causing a return-blast in the space *h*, said pipes *i'* connecting with said space *h* and returning into the smoke-pipe, substantially as described.

8. The return-pipes *k*, in combination with a smoke-stack having means for causing a return-blast in the space *h*, and being connected with the fire-box through the front plate by branches *e' f'*, and having a regulating-valve, *g'*, substantially as described.

9. The saddle *b*, having the flange *k'*, supporting the base-pipe *l'* of the pipe *i*, for inclosing an annular space, *h*, having connection with the return-pipes *k*, in combination with the return-blast pipes *i' i'*, adapted to conduct said blast from said space to the lower end of the smoke-pipe *a*, whereby the blast is utilized to accelerate the draft, substantially as set forth.

10. The saddle *b*, having the flange *k'*, supporting the base-pipe *l'* of the outer flaring pipe, *f*; also the inner flaring pipe, *i*, in combination with the smoke-pipe *a* and cone *d*, said cone *d* having means for projecting the cinders mainly into space *h* and partly into space *a'*, substantially as described.

11. The cone *d*, having partitions *l p* and scrolls *o*, in combination with smoke-pipe *a* and partition-plate *c*, and said plate having passages *g*, communicating with space *h* for the discharge of the cinders, and arranged with relation to pipe *t* for producing the space *o'*, for enabling the cinders escaping through passages *s* to fall into space *a'*, substantially as described.

JOHN COLUMBUS ALBRECHT.

Witnesses:

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