

No. 635,696.

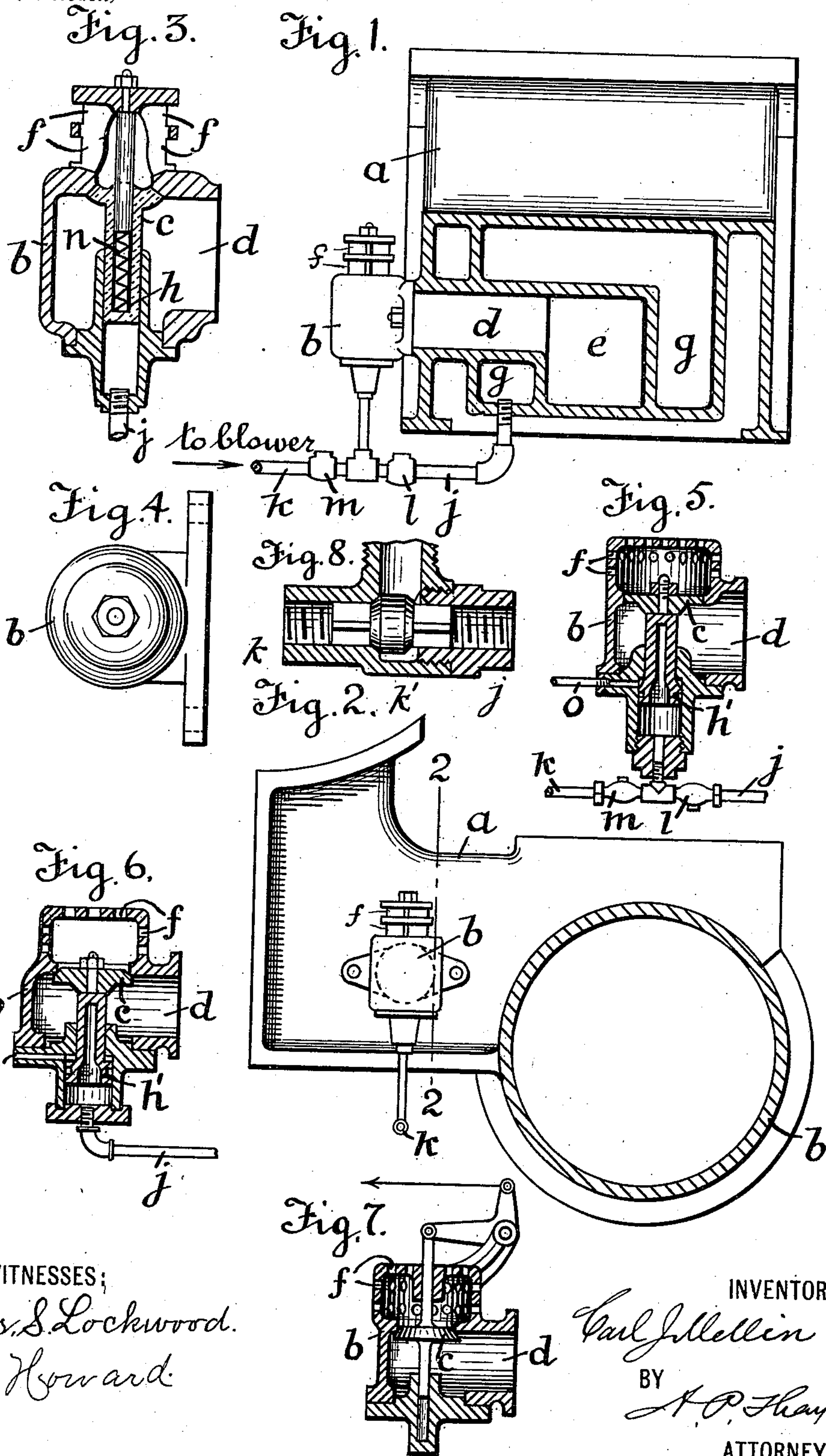
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C. J. MELLIN.

EXHAUST RELIEF FOR LOCOMOTIVE ENGINES.

(Application filed Dec. 29, 1897.)

(No Model.)



WITNESSES;

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EXHAUST-RELIEF FOR LOCOMOTIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 635,696, dated October 24, 1899.

Application filed December 29, 1897. Serial No. 664,168. (No model.)

To all whom it may concern:

Be it known that I, CARL J. MELLIN, a citizen of the United States, and a resident of Richmond, in the county of Henrico and State of Virginia, have invented a certain new and useful Improved Exhaust-Relief for Locomotive-Engines, of which the following is a specification.

My invention consists of an auxiliary air-passage in connection with the exhaust-passage in a locomotive-engine adapted to afford free circulation of air directly from and to the atmosphere when steam is shut off, thereby preventing undue effects upon the fire by the pumping of air through the exhaust-pipe when drifting, and also to avoid drawing hot gases charged with particles of coal and ashes into the cylinder, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional elevation of the saddle of a locomotive on line 2 2 of Fig. 2. Fig. 2 is a side elevation of a half portion of the saddle and a transverse section of a cylinder. Fig. 3 is a sectional elevation of the relief-valve. Fig. 4 is a top view of said valve. Figs. 5 and 6 are sectional elevations of the valve with modifications. Fig. 7 is a section of the valve with hand-gear for opening it. Fig. 8 is a sectional elevation of a double-acting check-valve that may be used in lieu of the independent check-valves in the pipe for closing the relief-valve.

On one side of the saddle *a* a check-valve, of which *b* is the case, is bolted.

c is the valve proper, and *d* is a lateral passage in the saddle communicating between the regular exhaust-passage *e* of the engine and the chamber of the check-valve in which the valve *c* closes communication with the atmosphere through the passages *f* when the engine is working with steam and the exhaust-steam escapes, as usual, through the regular course, said valve being so closed by steam admitted from the steam-space *g* under piston *h* of the valve by a pipe *j*, or it may be directly under the valve, as in Fig. 7. When the throttle-valve is closed and steam is shut off, valve *c* opens communication with the atmosphere, and thus the air pumped in and out of the cylinder while drifting will no longer exclusively be forced through the ex-

haust-nozzle, as usual, but will also be discharged to the atmosphere directly through the relief-valve, and will accordingly reduce the draft upon the fire, and the cylinders will not be charged with impurities from the smoke-box by suction occurring from the exhaust-passage. As this valve is always open when there is no steam in the steam-chest the open passage through it into the smoke-pipe hinders the draft considerably when firing up. Therefore in order to close the passage as soon as possible I have also provided a connection *k* between the chamber under piston *h* and the blower-pipe, with a check-valve *l* to close against the blower, whereby when the blower is turned on valve *c* will be closed and this obstruction to the draft will be prevented.

The check-valve *l* prevents steam from the blower from passing into the steam-chest, and the check-valve *m* prevents the steam from steam-chest from entering the blower-pipe. These checks can be placed upright or inverted, at will, but must open for pressure coming from the pipe in which they are located. A double-acting check-valve may be substituted for these two valves, as in Fig. 8. A double-acting check-valve, as *k'*, Fig. 8, may be used.

The invention is alike applicable to independent and compound engines. One or two valves can be used in simple or four-cylinder compound engines, but only one valve is required in two-cylinder compound engines. The valve *c* may be subject to gravitation and to a spring *n* or not, as desired, for opening it. It can also be operated by hand at will by suitable levers connected as indicated in Fig. 7 or in any other approved way.

I claim—

1. In a locomotive-engine the combination with the cylinder, piston, steam-chest, valve, exhaust-passage, exhaust-nozzle and smoke-pipe of a branch of the exhaust-passage to the atmosphere intermediate of the exhaust port and nozzle and exterior to the smoke-pipe, and a valve for opening and closing said branch passage to prevent pumping forcible jets through the nozzle when drifting with the steam shut off substantially as described.

2. In a locomotive-engine the combination with the cylinder, piston, steam-chest, valve, exhaust-passage, exhaust-nozzle and smoke-

pipe of a branch of the exhaust-passage to the atmosphere intermediate of the exhaust port and nozzle and exterior to the smoke-pipe, and an automatic check-valve adapted
5 to close said branch passage when steam is turned on the engine, and to open it by gravity when steam is shut off, to prevent pumping forcible jets through the exhaust-nozzle when drifting with the steam shut off substantially as described.
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3. In a locomotive-engine the combination with the cylinder, piston, steam-chest, valve, exhaust-passage, exhaust-nozzle and smoke-pipe of a branch of the exhaust-passage to
15 the atmosphere intermediate of the exhaust port and nozzle and exterior to the smoke-pipe, an automatic check-valve to close said branch passage when steam is turned on and to open it when steam is shut off, said valve
20 having a piston or plunger subject to valve-chest pressure for closing, and to valve-chest suction and a spring for opening when running with steam shut off to prevent pumping forcible jets through the exhaust-nozzle when
25 drifting with the steam shut off substantially as described.

4. In a locomotive-engine the combination with the cylinder, piston, steam-chest, valve, exhaust-passage, exhaust-nozzle, and smoke-
30 pipe, of a branch of the exhaust-passage to the atmosphere, intermediate of the exhaust port and nozzle and exterior to the smoke-pipe, a check-valve adapted to close said branch passage when steam is turned on the

engine and to open it when steam is shut off, 35
a live-steam connection with said valve for closing it, and a connection with the blower-pipe to close said valve thereby while the blower is in action substantially as described.
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5. In a steam-engine the combination with 40
the exhaust-passage, smoke-pipe and exhaust-nozzle, of a branch of said passage to the atmosphere intermediate of the cylinder and the regular exhaust-nozzle and independent of the smoke-pipe, and a valve with which to
45 open or close said branch passage at the will of the operator substantially as described.

6. In a locomotive-engine, the combination with the cylinder, piston, steam-chest, valve, exhaust-passage, exhaust-nozzle and smoke-
50 pipe, of a branch of the exhaust-passage to the atmosphere intermediate of the exhaust port and nozzle, and exterior to the smoke-pipe, a valve for opening and closing said branch passage to prevent pumping forcible
55 jets through the nozzle when drifting with the steam shut off, the blower-pipe, and a pipe connecting said valve and the blower-pipe so that the valve will be shut off by the blowing steam when the blower is opened
60 substantially as described.

Signed at Richmond, in the county of Henrico and State of Virginia, this 22d day of October, A. D. 1897.

CARL J. MELLIN.

Witnesses:

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