(No Model.) 3 Sheets—Sheet 1.

D. HAWKSWORTH.

DEVICE FOR DESTROYING VEGETATION ALONG RAILWAY TRACKS.

No. 342,091. Patented May 18, 1886.

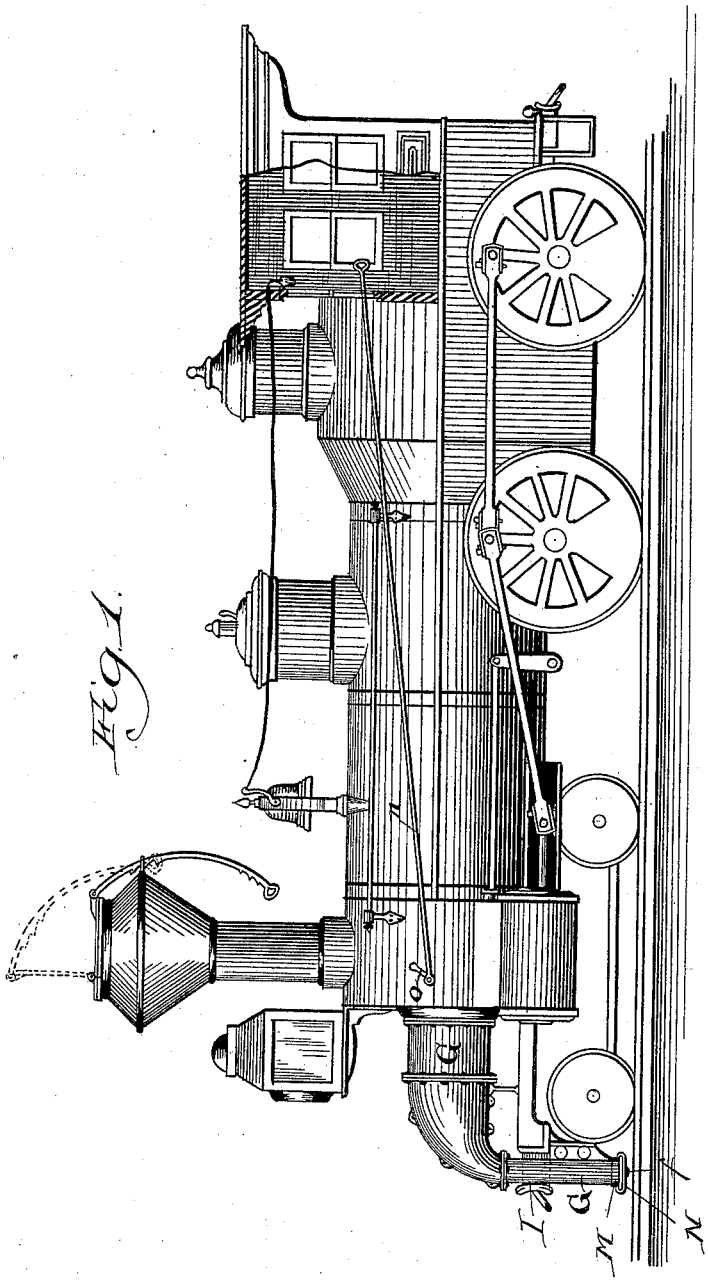

Fig. 1.

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Fig. 3.

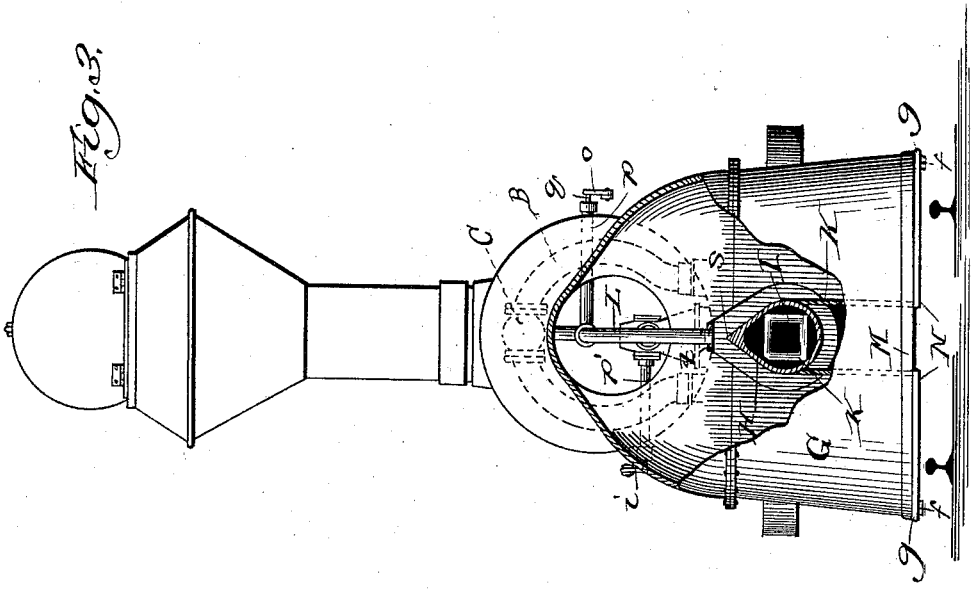

Fig. 2.

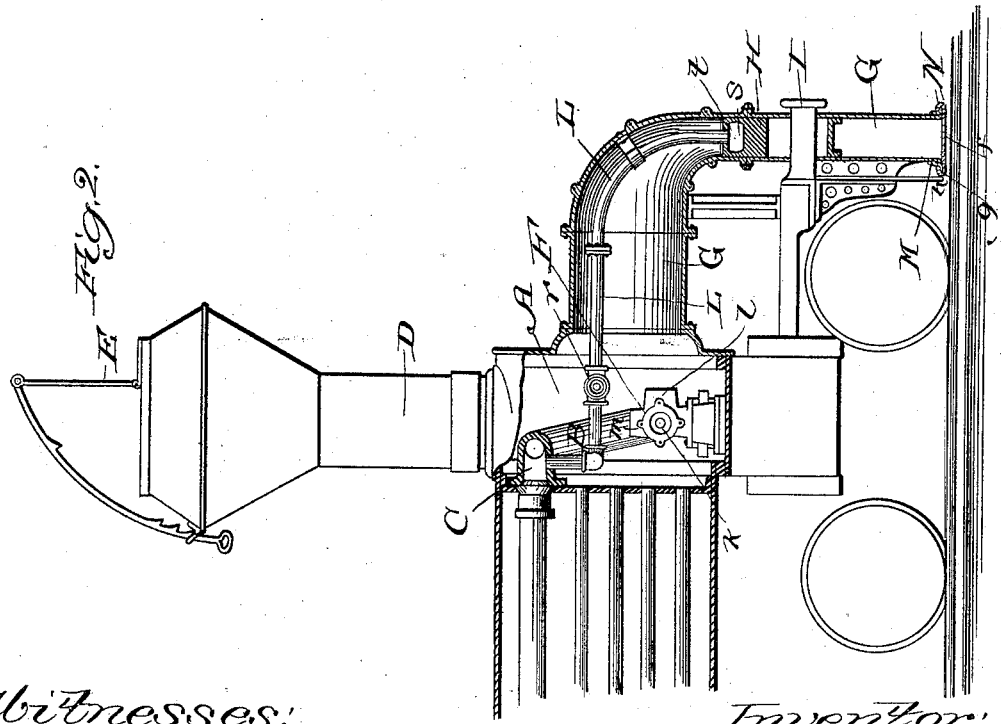

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Fig. 4.

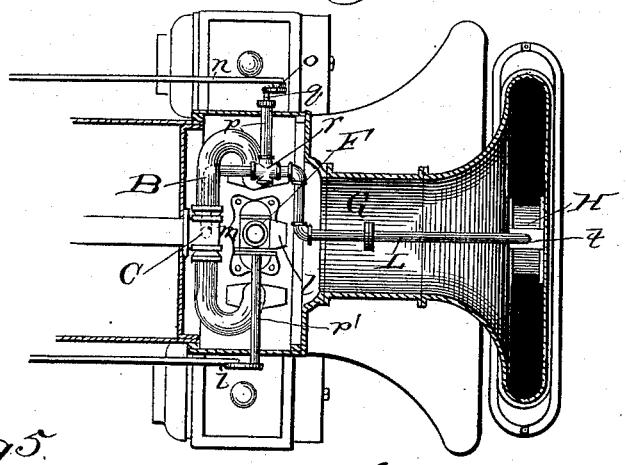


Fig. 5.

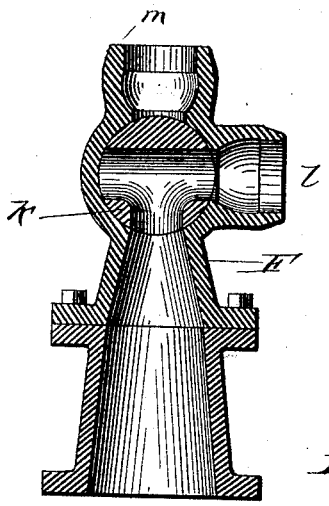


Fig. 6.

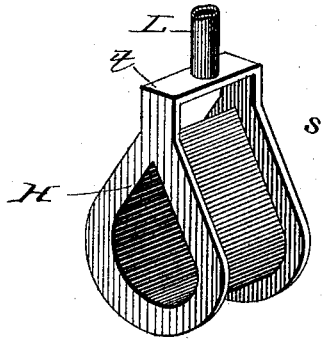


Fig. 7.

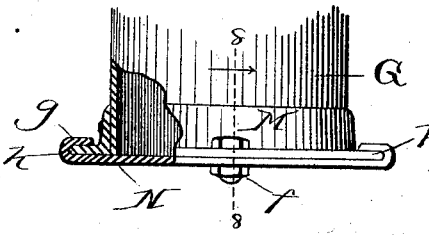
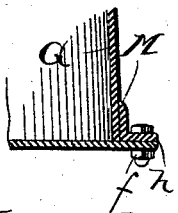


Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID HAWKSWORTH, OF PLATTSMOUTH, NEBRASKA.

DEVICE FOR DESTROYING VEGETATION ALONG RAILWAY-TRACKS.

SPECIFICATION forming part of Letters Patent No. 342,091, dated May 18, 1886.

Application filed March 1, 1886. Serial No. 193,618. (No model.)

To all whom it may concern:

Be it known that I, DAVID HAWKSWORTH, a citizen of the United States, residing at Plattsmouth, in the county of Cass and State of Nebraska, have invented certain new and useful Improvements in Devices for Destroying Vegetation Along Railway-Tracks; and I hereby declare the following to be a full, clear, and exact description of the same.

On the 17th day of November, 1885, Letters Patent of the United States, Nos. 330,700 and 330,701, were issued to me, the first for a new method of destroying grass, weeds, &c., on railway-tracks, and the second for apparatus adapted to carry the process or method into effect.

My present invention relates to certain improvements upon the apparatus originally employed by me, the object being to simplify and improve the construction, rendering it more compact and better suited to its purpose than that shown and described in my former Letters Patent above referred to.

As set forth in my Patent No. 330,700, my method consists, first, in directing and impelling downward upon the vegetation to be destroyed, hot products of combustion from a furnace commingled with steam; and, secondly, in directing and impelling downward upon the vegetation to be destroyed in a commingled state, hot products of combustion from a furnace, steam from a boiler, and exhaust-steam from an engine.

In order to carry the process into effect upon railways by means of a railway-locomotive, the products of combustion from the furnace are diverted from the smoke-stack to a flue leading to the ground, the impelling agent being steam under pressure directed into the downward flue, and this impelling agent may be either live steam or exhaust-steam, or (and preferably) both combined. Thus the combined blighting influences of the products of combustion and the hot steam are brought to bear upon the vegetation, producing a more effective and economical destroying agent than steam alone, and a far more desirable one than the hot products of combustion alone, since the steam, while destructive in itself, serves to modify the hot products of combustion and deprive them of their tendency to ignite the vegetation, and thereby endanger property.

As shown and described in my patent for the method, No. 330,700, and as shown, described, and claimed in my patent for the device, No. 330,701, the leading features of my apparatus as formerly constructed comprise two flues projecting forward from the smoke-arch and inclined downward to a point a little above the track, the flues being provided with flaring lower ends, and with dampers for opening and closing them, and also with steam-pipes leading into them from the dome, and additional steam-pipes leading into them from the exhaust, to create the necessary draft through these flues from the smoke-arch, and the smoke-stack being provided with a damper to permit it to be closed, so that all the hot products of combustion may, when desired, be directed to the ground. By my present construction a single flue projects horizontally forward from the smoke-arch, and then curves downward to a vertical position, extending nearly to the track. The vertical portion is made laterally flaring, and is divided into two passages in part by a casting angular upon its upper end, and in part by partitions below the casting. The steam, instead of being taken from the dome, is taken from the steam-pipe crotch within the smoke-arch by a pipe which terminates just above the angle of the casting which divides the flue, and this angle divides the steam, directing it equally into the passages. The steam-pipe is operated by a valve from the cab, and another valve, also operated from the cab, directs the exhaust-steam either vertically into the smoke-stack or horizontally into the ground-flue. The lower end of the ground-flue is provided with dampers in the form of removable sliding plates, which are wholly detached when the locomotive is in use as a weed-destroyer, and placed in position only when the locomotive is used for other purposes—such as switching and the like—in which latter case the damper of the smoke-stack is raised, as shown in Fig. 2.

In the drawings, Figure 1 is a side elevation of a locomotive-engine provided with my weed-destroying attachment in the form which constitutes the subject of my present

application; Fig. 2, a central vertical section of the forward portion of the same, showing certain parts in elevation; Fig. 3, a front elevation of the same with a portion of the ground-flue broken away to show the internal construction; Fig. 4, a sectional plan view of the forward portion; Fig. 5, a vertical section of the exhaust tube and valve; Fig. 6, a perspective view of the casting which divides the ground-flue; Fig. 7, an enlarged view in detail of the lower end of the ground-flue, showing the mode of attaching the damper, and Fig. 8 a section on the line 8 8 of Fig. 7.

A is the smoke-arch; B, the steam-pipes branching from the steam-pipe crotch C.

D is the smoke-stack, provided with a damper, E.

F is the exhaust-pipe, leading into the smoke-arch.

G is the ground-flue, projecting forward horizontally from the smoke-arch sufficiently to clear the trucks, and thence turning to a vertical position and terminating just above the track. At about the point where the ground-flue assumes a vertical direction it is divided into two passages by the casting H, which is made annular, as shown, for the passage through it of the draw-head I. Below the casting H are two partitions, K—one at each side of the center of the flue—which supplement the casting H in dividing the vertical portion of the flue into two passages.

L is a steam-pipe extending from the steam-pipe crotch downward to a point in line with the interior of the flue G, then horizontally and laterally to a point near the side of the smoke-arch, then forward to a point near the front wall of the smoke-arch, then laterally to a point in line with the lower end of the vertical portion leading from the steam-pipe crotch, then forward and down to a bearing, *t*, formed upon the upper end of the casting H to receive it. The end of the pipe L passes through an opening in the bearing *t*, just over the angle *s* of the casting, upon which the steam is discharged, and which diverts it both ways into the side passages. The bearing *t* is in the nature of a bridge across an open channel formed in and extending down each side of the casting H, and the portion of the casting constituting the bottom of the channel converges to an edge at the top, forming the dividing-angle *s*.

In the portion of the pipe L which lies nearest the side wall of the smoke-arch is a valve, *r*, operated by a rod, *q*, incased in a branch pipe, *p*, extending through the wall of the smoke-arch to the exterior of the same.

Upon the end of the rod *q* is a crank, *o*, to which a rod, *n*, is connected. The rod *n* leads back along the outside of the engine into the interior of the cab to bring it within convenient reach of the engineer.

The exhaust F is provided with a vertical discharge-orifice, *m*, and a horizontal discharge-orifice, *l*, the latter being in the direction of the ground-flue G. The exhaust-tube F contains a valve, *k*, by which the discharge of exhaust-steam may be caused to take place either through the port *l* or the port *m*, and this valve is operated in the same manner as the valve *r*, by a crank-rod, *i*, passing through a branch tube, *p'*, to the exterior of the engine, and a rod connected to the crank and extending into the interior of the cab.

Upon the lower end of the flue G is a collar, M, flanged outward upon its lower edge, as shown at *h*, to form the slide for the dampers N, which consist of metal plates flanged over upon their side edges, as shown at *g*, to fit upon the flange *h* of the collar M. Two such dampers are employed, and are slid into position from opposite sides. When the dampers are placed in position, they are each secured by a nut-bolt, *f*, passing through the end of the damper and the flange *h*.

The general operation of my device is similar to that of the device described in my former Letters Patent. When it is desired to use the locomotive as a weed-destroyer, the damper of the smoke-stack is closed, and the dampers at the bottom of the ground-flue are taken off, the valve *r* in the pipe L is opened, and this permits the steam from the boiler to flow against the angle *s* of the casting H, and thence by way of the side passages to the ground, the force of the flow serving to draw along the hot products of combustion as they accumulate in the smoke-arch. At the same time the valve *k* is so turned as to close the port *m* and open the port *l*, so that the exhaust-steam also flows into the flue G, and lends its impelling force to that of the live steam. The hot products of combustion, commingled with steam, striking upon the ground-vegetation effectually blight and destroy it. When it is desired to use the locomotive for ordinary purposes, it may readily be converted by opening the damper of the smoke-stack, fitting the dampers to the lower end of the flue G, shutting the valve *r*, and turning the valve *k* so that the port *l* will be closed and the port *m* open.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, a flue leading from the smoke-arch nearly to the track, a pipe leading from the steam-pipe crotch within the smoke-arch into the interior of the flue, and a valve in the said pipe operated from the exterior of the engine, whereby the hot products of combustion, commingled with steam, may be impelled to the ground, substantially as described.

2. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, the flue G, extending horizontally from the smoke-arch, and then vertically downward nearly to the track, and having its vertical portion laterally flaring and divided into two passages, and a steam-pipe conveying steam from the boiler into both vertical passages, said steam-pipe being provided with

a valve and means for opening and closing it from the exterior of the engine, substantially as described.

3. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, the flue G, casting H, dividing the flaring vertical portion of the flue G into two passages, and having the angle *s* for dividing the steam, and bearing *t* for the steam-pipe above the said angle, steam-pipe L, extending from the steam-pipe crotch around the side of the smoke-arch and along the flue G into the bearing *t*, valve *r* in the steam-pipe L, and tube *p*, and crank-rods *q o n*, for operating the same, substantially as described.

4. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, flue G, steam-pipe L, valve *r* in the said steam-pipe, and means for operating the said valve from the exterior of the locomotive, the casting H, provided with the angle *s* and bearing *t* above the same, for the steam-pipe, and made annular for the passage through it of the draw-head, and the partitions, K for continuing the passages below the casting H, substantially as described.

5. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, a flue extending from the smoke-arch nearly to the tracks, exhaust-pipe F, having the vertical port *m* and the horizontal port *l* in line with the ground-flue-valve *k*, for opening and closing the said ports alternately, and means for operating the valve from the exterior of the engine, substantially as described.

6. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, the flue G, having its vertical portion divided into two passages, pipe L, for conveying steam from the steam-pipe crotch into both passages, valve *r* in the steam-pipe L, exhaust-pipe F, having the vertical port *m* and the horizontal port *l*, in line with the flue G, valve *k* in the exhaust-pipe F, for opening and closing the ports *m* and *l* alternately, and means, substantially as described, for operating both the valve *r* and the valve *k* from the cab.

7. In combination with a locomotive-engine having its smoke-stack provided with a damper for closing it, the flue G, for conveying products of combustion, commingled with steam, to the ground, said flue being provided with removable dampers on its lower end, substantially as and for the purpose set forth.

8. The ground-flue G, projecting from the smoke-arch of a locomotive, in combination with the collar M, having the flange *h*, sliding dampers N, having the flanges *g* fitting the flanges *h* of the collar, and nut-bolt *f*, for securing the dampers in place, substantially as described.

DAVID HAWKSWORTH.

In presence of—
J. E. MORRIS,
R. D. GALLAGHER.