

N. OLSON.
 DEVICE FOR CLEANING ASH PANS OF LOCOMOTIVES.
 APPLICATION FILED SEPT. 20, 1910.

987,591.

Patented Mar. 21, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

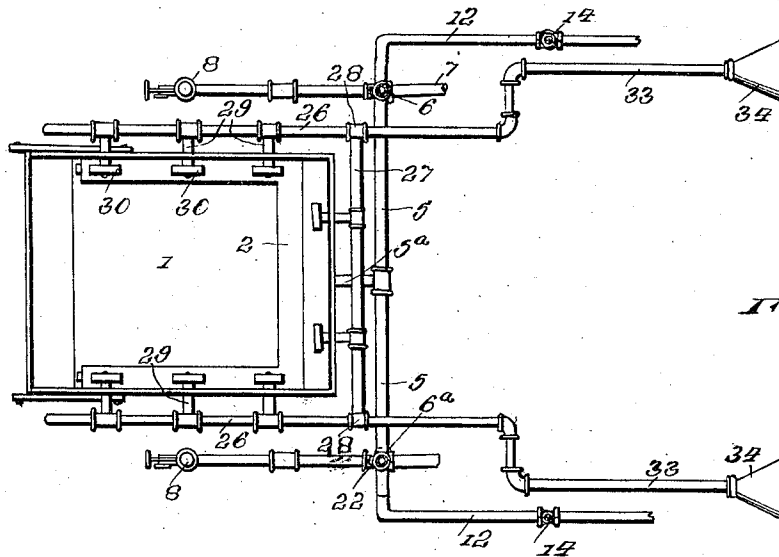
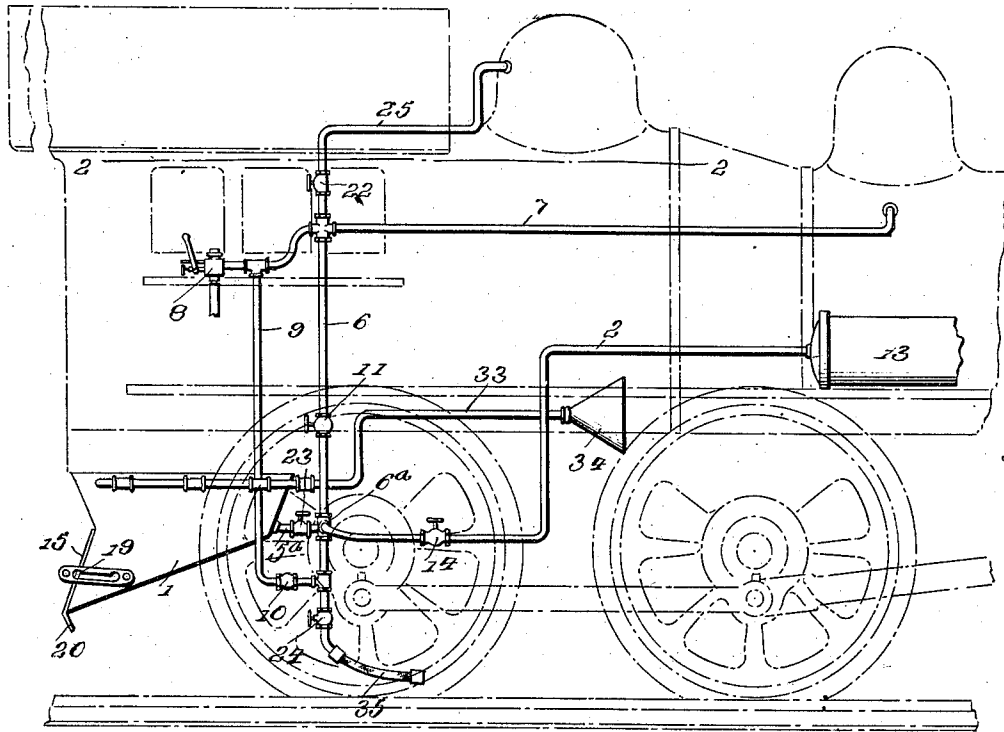


Fig. 2.

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By

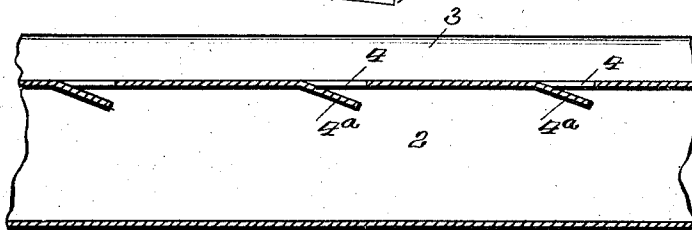
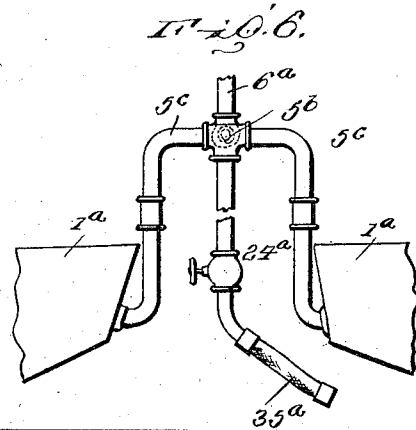
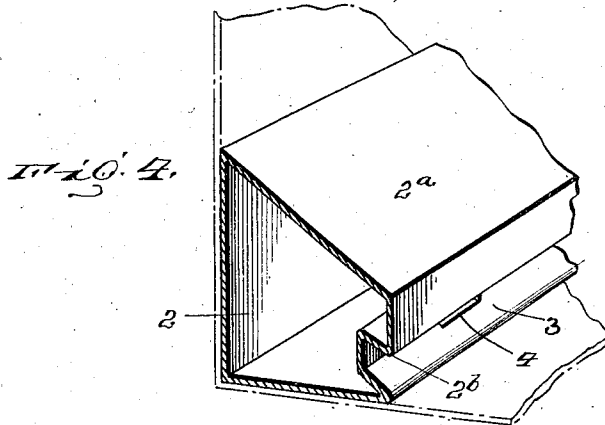
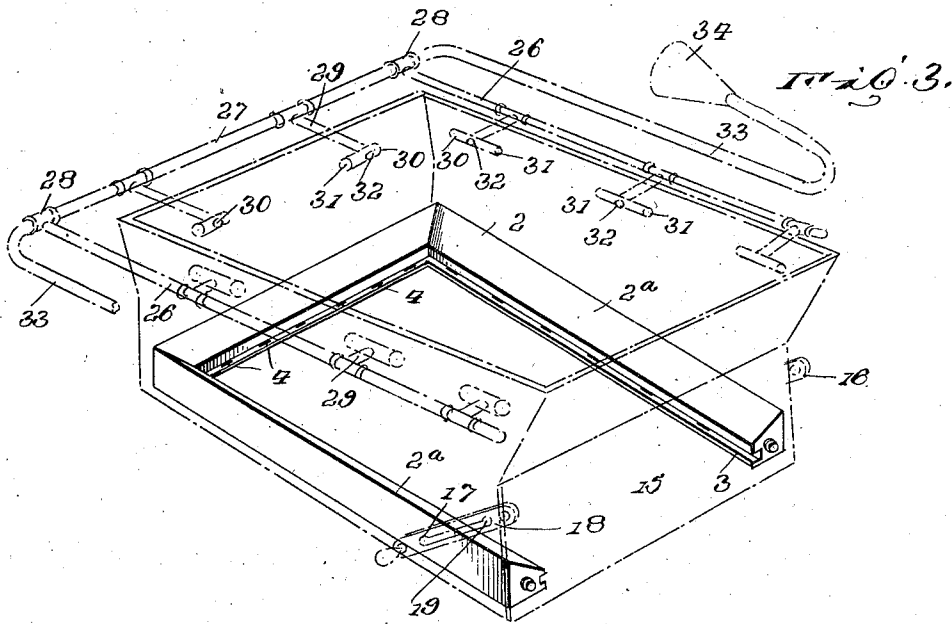
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2 SHEETS—SHEET 2.



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Fig. 5.

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UNITED STATES PATENT OFFICE.

NELS OLSON, OF BIRMINGHAM, ALABAMA.

DEVICE FOR CLEANING ASH-PANS OF LOCOMOTIVES.

987,591.

Specification of Letters Patent.

Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, NELS OLSON, citizen of the United States, residing at Avondale Station, Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Devices for Cleaning Ash-Pans of Locomotives, of which the following is a specification.

10 This invention relates to locomotives and more particularly to certain new and useful improvements in means for cleaning the ash pans of locomotives of the ashes therein and means for flooding the ash pans or thawing
15 them in case the ash pans become frozen.

The invention has for its primary object an improvement upon the construction shown in my Patent No. 942,737, and embodies in its general features improved
20 means whereby the ashes are dampened so as to quench any live coals that happen to be deposited in the ash pan, as well as means whereby the ash pans may be effectually
25 cleaned whenever desired by the use of water and steam led thereto from the injector or by air when the use of water is not desired, as in freezing weather. Provision is also
30 made whereby dry steam may be discharged upon the ash pan to thaw it when water has become frozen thereon and also whereby
the boiler may be connected either with a hose for discharging water, as in case of
35 fire, or with a plug whereby the boiler may be filled when there is no steam present in it. Other objects will more fully appear in the course of this description.

The invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

45 Figure 1 is a view showing the rear portion of a locomotive engine in dotted lines and my invention applied thereto in full lines; Fig. 2 is a plan view of the ash pan and the piping arrangement shown in Fig. 1; Fig. 3 is a perspective view showing an
50 ash pan in dotted lines with my improvements applied thereto, the header being shown in full lines; Fig. 4 is an enlarged detail sectional view of the header, whereby
55 water is deposited in the ash pan; Fig. 5 is a fragmentary longitudinal sectional view

of the header; and, Fig. 6 is a fragmentary elevation showing how my device is connected to a double ash pan.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the ash pan of a steam engine, 65 (a locomotive engine in this instance) and 2 designates a substantially U-shaped header or conduit which is mounted in the bottom of the ash pan which extends around three sides thereof as clearly illustrated in Fig. 3. 70

In my former patent, I showed a U-shaped pipe provided with Y-nozzles extending therefrom, this U-shaped pipe lying upon the bottom of the ash pan. I have found in practice that this pipe is liable
75 to burn out and to become clogged with ashes, hence in order to improve this portion of the apparatus, I provide in place of the pipe the U-shaped header 2 above referred to, which fits snugly on the bottom
80 of the ash pan against the sides thereof and which is substantially quadrilateral in cross section, as shown in Fig. 4. This header or conduit 2 has an inclined upper face 2^a which inclines downward and toward the
85 middle of the ash pan to a point an inch or so above the bottom of the ash pan. The inside face of the header descends directly toward the bottom of the ash pan and is formed with an upwardly and outwardly
90 extending recess 3. This recess extends along all three sides of the header and the top of the recess overhangs, as illustrated in Fig. 4, while the bottom face of the recess
95 is downwardly inclined. The inner wall of the recess is formed with a plurality of elongated slots or perforations 4 through which the water is ejected upon the ash pan, while the material forming the inside wall
100 of the header adjacent to the forward end of each slot, is rearwardly and inwardly bent as at 4^a, thus forming a deflecting tongue; whereby the water passing through the header is directed outward through the
105 slot 4 in the form of a jet. The water being suddenly turned in its course, is ejected from the slots 4 with considerable force, strikes the bottom of the ash pan and will under ordinary circumstances, entirely clean it, the
110 bottom of the ash pan being, of course, inclined as is usual in these constructions.

I find in practice that a water duct or

conduit of the character described which practically fills the corners of the ash pan, is a considerable improvement over the pipes described in my prior patents for the reason
 5 that the inclined upper face 2^a of the header prevents the lodgment of ashes thereon, while the overhang 2^b above the longitudinally extending recess 3 prevents the ashes clogging the perforations 4, thus keeping
 10 the perforations entirely clear and permitting the rapid ejection of the water upon the ash pan.

In the present embodiment of my invention, the U-shaped header 2 is connected by
 15 pipes 5 and 5^a to right and left hand vertically disposed pipes 6. The pipes 6 are respectively connected at their upper ends to the right and left hand feed water pipes 7, each leading to the water space of the boiler
 20 from an injector 8. Water pipes 9 are connected at one end to the usual water discharge or overflow ports of the respective injectors 8, as shown, and said pipes 9 are connected to the pipes 6 above the lower ends
 25 of the latter but below the connection of the pipes 6 to the pipe 5, as illustrated in Fig. 1. The pipes 9 are provided with check valves 10 which prevent any return of water through the pipes 9 and the injectors.

30 The pipes 6 are provided with valves 11 designed to be manually operated, these valves being mounted in the pipes 6 above the connection of the pipes 6 and the pipes 5. A three-way coupling 6^a is located in the
 35 pipe 6, the branches thereof being connected respectively to each of the pipes 5 and to pipes 12 which extend to the air drums 13 of the locomotive. It will be seen that the connection from the air drums is made above
 40 the junction of the pipe 9 with the pipe 6 and below the valve 11 in the pipe 6. Preferably, the pipes 12 are each provided with a globe valve 14 so that the passage of air through the pipes 12 may be controlled
 45 or completely shut off if desired. Only one of these pipes 12 or air drums 13 is shown in Fig. 1, but it is to be understood that the opposite side of the locomotive is similarly equipped.

50 The ash pan 1 is provided at its discharge end with a door 15 which is held in either open or closed position by means of any suitable device, such as the pivoted slotted struts 16 with the notches 17 and 18 for en-
 55 gaging the studs 19 secured to the sides of the pan. The doors 15 are preferably formed with curved free edges 20 designed to keep the ashes from coming up into the different parts of the machinery. So far,
 60 with the exception of the matter relating to the header and its particular form, I have described the arrangement of piping which is shown in my former patent above referred to.

65 My further improvements over the con-

struction shown in said patent are as follows: Each pipe 6 is extended downward below the connection to the ash pan and below the connection to the pipe 9 and is there provided with a valve 24. The lower end
 70 of the pipe 6 is open and the discharge of water through said pipe 6 is controlled by the valve 24. It is also to be noted that whereas in my former patent the pipe 9 connected to the pipe 6 above the connection of
 75 the pipe 6 with the ash pan, in this present application the pipe 9 joins the pipe 6 below the connection of the pipe 6 with the pipe 5. By means of the arrangement thus described, I can discharge the waste water
 80 from the pipe 9 either into the ash pan or on to the ground, or connect the pipe 6 to a hose whereby water from the boiler may be thrown upon a fire. Furthermore, the pipe
 85 6 is extended above its junction with the pipe 7 and is connected to a dry steam pipe 25 which extends to the boiler above the water level thereof. By means of this connection, dry steam may be taken from the boiler and directed into the ash pan to thaw
 90 it out in case that water in the ash pan has frozen therein. That portion of the pipe 6 above the junction of the pipe 7 is provided with a controlling valve 22 whereby the dry
 95 steam may be admitted or shut off, or its passage controlled. The pipe 5 is also, of course, provided with a controlling valve, designated 23, which is designed to be manually operated in any suitable manner,
 100 whereby the header 2 may be connected to the pipe 6 and through the pipe 6 to the water from the boiler, waste water from the injectors, to the dry steam or to the air drums.

In order to provide means to increase the
 105 draft of the engine and thus increase combustion, I provide the ash pan with a plurality of air discharge nozzles which are connected by pipes to certain open ended
 110 air receivers which are mounted in any suitable manner upon the engine below the running board thereof and which cause air to be forced into these discharge nozzles and out therethrough into the ash pit just below
 115 the grate of the locomotive. In the preferable embodiment of my invention, I support upon the sides and front end of the ash pan, the pipes 26 and 27, these pipes being connected to each other by elbows 28 at the corners. The pipes 26 and pipe 27 have nip-
 120 ples 29 projecting through the walls of the ash pit and these nipples are provided with T-couplings 30 open at their ends at 31 to permit the discharge of air. These couplings may also have a discharge opening
 125 32 in the middle if desired. The nozzles formed by the couplings 30 are located near the upper edge of the ash pan so that the air discharged therefrom will pass directly
 130 up through the grates. The elbows 28 are

connected to pipes 33 which extend outward and forward and beyond the rear end of the ash pan and are there connected to bell-shaped air receivers 34 which are open at the forward ends. Preferably there are two of these receivers located on the opposite sides of the engine and in any suitable position. As the locomotive moves forward a draft of air will be caused to enter the open mouths of the receivers 34 and the air will be forced along the pipes 33 into the pipes 26 and are thence discharged through the nozzles 30, as before described. If the air collectors 34 are mounted beneath the running board, they are out of the way, and it will be obvious that the faster the locomotive runs the more wind will pass into the pipes 33 and 26 and the greater the draft up through the ash pan.

The operations of the connections to the injectors, feed water pipe, air drums and steam pipes, is as follows: Under ordinary circumstances all the valves are, of course, closed. If it is desired to discharge the waste water from the injectors, but not to discharge this water into the ash pan, the valve 23 is closed, the valve 24 open and the valve 8 opened. All waste water from the injectors will, of course, be discharged on the ground under these circumstances. This is often necessary in cold weather in order that water may not be discharged through the ash pan and cause the ash pan to freeze up. If it is desired to put out a fire in the ash pan, the valve 24 is closed, the valve 23 opened, whereupon the waste water from the injectors will pass into the pan and be ejected from the openings 4 in the header 2. If the valve 8 is opened fully and the other valves are closed, the water from the injectors, of course, goes to the boiler, but if it is desired to clean the pan of ashes and clinkers, the valve 24 is closed, valves 23 and 11 are opened and water under full force from the injectors will be discharged into the ash pan and wash it out. If there is not force enough for this purpose, then the valves 14 are opened and air from the drums turned on. This compressed air will cause the water in the pipe 6 to be discharged with great force upon the ash pan, entirely clearing it. The valves 14, however, should not be opened more than fifteen seconds at the most. If the weather is very cold and it is therefore not desirable to use water to clear the ash pan and the valve 23 is open, the valves 11 and 24 are closed and the valve 14 opened, and air from the drums will be discharged upon the pan and blow out the ashes. If, after using water to clean the ash pan, the water should freeze as it sometimes does in very cold weather, and it is desired to thaw out the pan, the valve 24 is closed, the valve 23 opened, the valves 11 and 23 opened, whereupon dry steam will

be discharged through the pipe 6 on to the ash pan and this will act to melt the ice and snow therein.

It often happens in case of fire either on adjacent cars or in stations, that it is desirable to use the locomotive engine as a fire engine. To this end the engine can be brought close to the fire and the lower end of pipe 6 connected to a discharge hose 35. The injector is then fully opened, the valves 23 closed, the valves 24 opened and the valves 11 opened. This will cause the water from the boiler to pass with full force from the engine to the fire.

If the engine is in the round-house, my attachment permits it to be washed out with cold water by connecting the lower end of the pipe 6 with any suitable hydrant or plug, opening valves 23 and 24 and closing valve 11 and, of course, valve 14. The water from the plug will, of course, pass up through the lower end of pipe 6, through pipe 5 and be discharged through the header 2.

My attachment also permits the boiler to be filled with cold water where there is no steam on in the boiler. To this end the lower end of pipe 6 is connected to the hydrant or plug as before described by the pipe 35 and the valves 11 and 24 are opened, while the valves 23 are closed. The water will pass up through the pipe 6 into pipe 7 and from thence to the boiler. In order that the header may be cleaned whenever desired, the ends of the header are provided with plugs 21 which may be easily removed to permit the pipes to be blown out and thence freed from any accumulation of scale or other foreign matter.

While I have shown what I believe to be an entirely effective arrangement of pipes for the purpose described, it will be obvious that I do not wish to limit myself to any particular construction to this end, as the arrangement of pipes might be varied in many respects without departing from the spirit of the invention.

Fig. 6 shows the manner in which my improved pipe system may be applied to a double ash pan. In this figure 1^a—1^a designate the front and rear ash pans. 6^a is the pipe leading from the steam dome and provided with the valve 24^a and with the hose 35^a at its lower extremity. This pipe 6^a is connected to a transverse pipe 5^b which in turn is connected by pipes 5^c to the headers in the respective ash pans. It will be seen that this construction is the same as that previously described, the only difference being that there are two ash pans and two pipes connecting the pipe 6^a to the ash pans.

Having thus described the invention, what is claimed as new is:

1. The combination with the ash pan of a locomotive, of a header carried at the

junction of the bottom of the pan with the sides thereof, said header being connected to a source of water supply, the head being quadrilateral in section and having an upper face, downwardly inclined from the outer side of the header to the inner side thereof, the inner side of the header being longitudinally recessed, the inside wall of the recess being provided with a plurality of discharge perforations.

2. The combination with the ash pan of a locomotive, of a header carried upon the bottom of the ash pan at the junction of the sides with said bottom, said header being U-shaped in plan and connected to a source of water supply, the header being approximately quadrilateral in cross section and having its upper face downwardly inclined toward the middle of the ash pan, the inside face of the header being longitudinally recessed along its whole length, the recess having a downwardly inclined lower wall and overhanging upper wall, the lower face of said upper wall being downwardly inclined, the inside wall of the recess being provided with a plurality of discharge perforations, each of said perforations having at its forward end a deflecting tongue extending into the interior of the header.

3. The combination with a locomotive ash pan and an injector, of spraying nozzles in the ash pan, a supply pipe, a branch pipe connecting the supply pipe to said spraying nozzles, a feed water pipe leading from the injector to the boiler of the locomotive and connected to the upper portion of said supply pipe, a connection from the overflow port of the injector to said supply pipe below its connection with the spraying nozzles, a valve in the supply pipe between its connection with the spraying nozzles and the feed water pipe, a valve in the connection between the supply pipe and the spraying nozzles, a discharge connection open at its lower end and extending from said supply pipe below its point of connection with the overflow pipe from the injector, and a valve in said discharge connection between the connection of the overflow pipe therewith and the open end of the discharge connection.

4. The combination with the ash pan of a locomotive, and an injector, of spraying

nozzles in the ash pan, a supply pipe open at its lower end and discharging upon the ground, a connection from said supply pipe to the spraying nozzles, a manually operated valve in said connection, a feed water pipe leading from the injector to the boiler of the locomotive and connected to said supply pipe, a valve in the supply pipe between the feed water pipe and the connection to the spraying nozzles, a connection from the overflow port of the injector to said supply pipe between the discharge end of the supply pipe and the connection with the spraying nozzles, said overflow connection being provided with a check valve, a manually operated valve in the discharge connection below the junction of the overflow pipe, an air drum, a pipe connecting the air drum with the supply pipe intermediate the valve therein and the connection with the overflow pipe, and a manually operated valve in said air pipe for controlling the passage of air from the air drum.

5. The combination with the ash pan of a locomotive and an injector, of spraying nozzles in the ash pan, a supply pipe connected to said nozzles and also connected to a source of dry steam, a valve cutting off the supply pipe from the dry steam source, a feed water pipe extending from the injector to the boiler and connected to the supply pipe below said valve, a valve in the supply pipe above the connection of the supply pipe with the spraying nozzles, and an overflow pipe leading from the overflow port of the injector and opening into the supply pipe below its connection with the spraying nozzles, a check valve in the overflow pipe, a compressed air tank, a pipe leading from said tank, and provided with a valve, and a connection extending from the lower end of the supply pipe for discharging the water in the supply pipe upon the ground, the connection being provided with a coupling whereby it may be connected to a hose pipe.

In testimony whereof I affix my signature in presence of two witnesses.

NELS OLSON. [L.S.]

Witnesses:

E. W. HANNIL,
W. W. SILK.