

(No Model.)

H. R. WALKER.

LOCOMOTIVE ASH PAN.

No. 522,540.

Patented July 3, 1894.

Fig. 1.

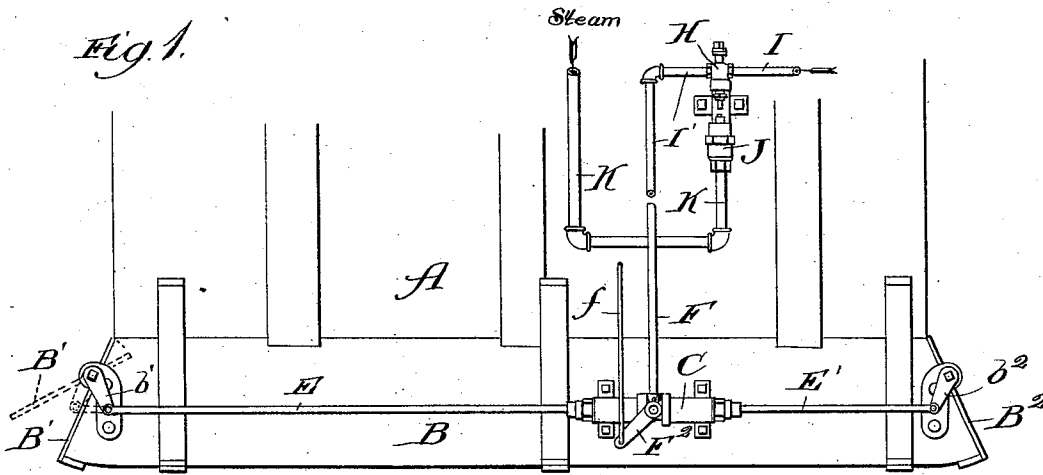


Fig. 2.

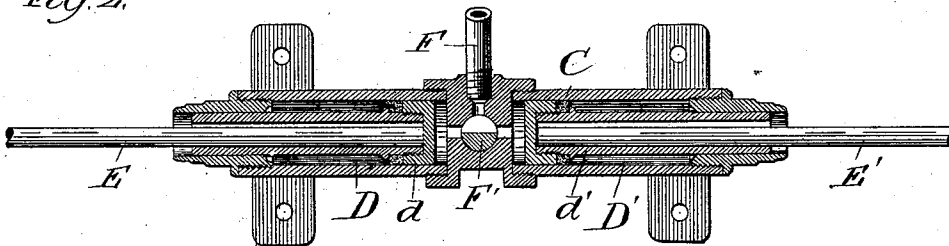
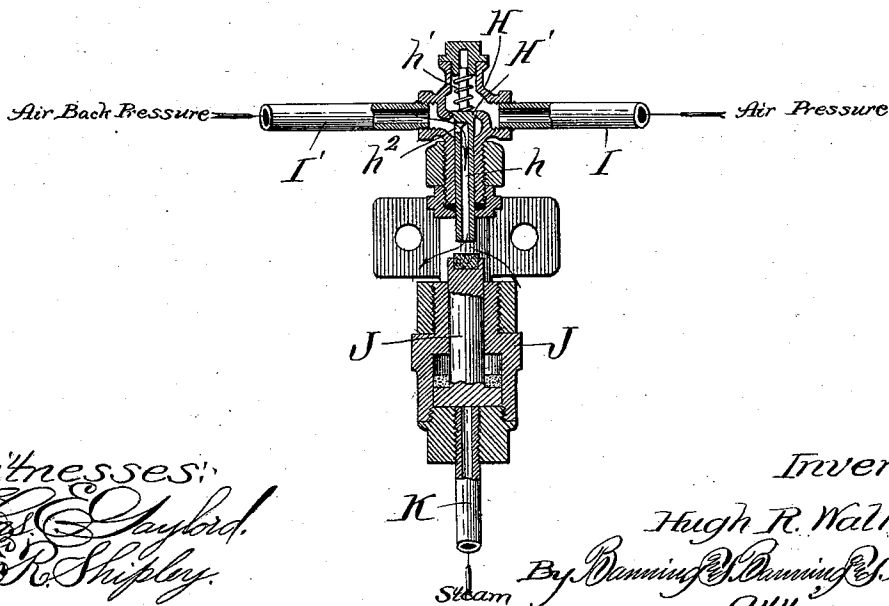


Fig. 3.



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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE ASH-PAN.

SPECIFICATION forming part of Letters Patent No. 522,540, dated July 3, 1894.

Application filed August 10, 1893. Serial No. 482,816. (No model.)

To all whom it may concern:

Be it known that I, HUGH R. WALKER, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Locomotive Ash-Pans, of which the following is a specification.

As is well known, the doors which are located at the front and rear ends of these ash pans are opened either separately or together for the purpose of admitting air to the ash pan, and, consequently, to the fire for the purpose of combustion. When the locomotive is standing still, the admission of air to the ash pan is objectionable, since it greatly increases the amount of coal consumed, this increase being of course both unnecessary and undesirable.

The object of my invention is to provide a suitable mechanism operated by fluid pressure for opening and closing the ash pan doors or either of them. This mechanism is preferably so arranged that no extra work is thrown upon the engineer or fireman by its operation.

My invention consists in the features, details of construction and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation and a diagrammatic view of my invention applied to a locomotive ash pan; Fig. 2 a longitudinal vertical section of the opening mechanism; and Fig. 3 a similar section of the valve mechanism for controlling the admission of the fluid to the opening mechanism.

A is the fire box; and B the ash pan, provided with doors B', B². The other parts of the locomotive are not shown, since they perform no particular function in connection with this device.

Attached to the ash pan, or to the locomotive at any suitable point adjacent to such pan, is a casing C, shown more particularly in Fig. 2. Within this casing I form two cylinders, D D', which are open at the outer ends, or the ends away from the center of the casing. Within these cylinders travel pistons d d', the rods of which are preferably hollow or tubular as shown, moving in and out through stuffing boxes or collars formed on the outer ends of the cylinders. Each of the doors is provided with a suitable crank arm b', b², and to these cranks are attached rods, E, E', the

other ends of the rods entering into the piston rods. From this, it results that as the pistons are moved outward or away from each other in any suitable manner, the doors will be opened to a greater or less extent, depending upon the movements of the pistons, and as indicated in the dotted lines at the left end of Fig. 1. To control this outward movement, I provide the casing, C, with a pipe F, preferably connecting with the dry pipe of the locomotive at a point beyond the throttle, so that as the steam is admitted to or shut off from the dry pipe, it will be simultaneously admitted to or shut off from the casing. The casing is also provided with ports leading to each cylinder, and a port leading from the pipe F.

The passage of steam or other fluids into the cylinders is controlled by a cock, F', operated by means of a handle F², and a rod f, the latter leading to the cab or any other suitable place. With the cock in the position shown in Fig. 2, fluid entering from the pipe F would pass to both cylinders and open both doors. The cock, however, may be rotated either to the right or left, so as to admit fluid to operate one cylinder only, or it may be closed, so as to shut off the entrance of fluid from pipe F. The operation of this portion of my invention will be evident, I think, from the above description, but may be summarized here for convenience,—supposing the cock F' is in the position shown in the drawings. If now, the throttle valve be opened, steam will pass into the dry pipe and then into the pipe F, forcing the two pistons out and opening both doors. As long as the steam is on, the doors will be held open, but when the steam is shut off the weight of the doors will cause them to close, restoring the pistons to their normal position. When the throttle valve is closed and the steam shut off, the pressure in the cylinder will be relieved through the cylinders of the engine and the exhaust pipe.

Thus far, I have described the device as operated by steam, which may be used if desired, but in some cases it may be objectionable to use steam, since it is liable to freeze and thereby prevent the efficient operation of the device. To obviate this difficulty, I may under some circumstances prefer to use air

or some other fluid to operate the opening mechanism; and, in this event, in order to render the device automatic, so that the opening and closing of the throttle may still cause the doors to open and close, I prefer to make use of the valve mechanism shown more particularly in Fig. 3; this valve mechanism being controlled by the steam pressure from the locomotive, and the opening mechanism being in this case actuated by air or other fluid pressure. Placed in the cab or in any other suitable place is a valve shell or chamber H, into which leads a pipe, I, connected to the air reservoir on the locomotive, and out of which leads a pipe, I', intended to connect with the pipe F, which leads to the casing C—in fact, the pipe F is simply connected to the valve casing H.

The spindle which carries the valve is preferably made hollow, as shown, to act as an exhaust as hereinafter described, and is provided with a spring, h' , to return the valve to its normal position after it has been removed therefrom. It carries the valve H', and is provided with a port h^2 . Placed beneath this valve casing, and forming a portion of what I term the "valve mechanism" is a cylinder J, within which moves a piston J', shown in Fig. 3 in its normal position. Into this cylinder enters a pipe K, which leads preferably from the dry pipe, so that the opening and closing of the throttle shall admit steam thereto and shut it off therefrom; though, if desired, this pipe may lead to any suitable point and be controlled by a separate valve. But this latter method of communication is objectionable in that it throws additional labor upon the engineer or fireman. As shown in the drawings, and as it is in the normal position, the piston rod J' is slightly separated from the hollow valve spindle H. The device, with the addition of this valve mechanism, operates as follows, supposing the parts to be in the position indicated. If now the throttle be opened, steam from the dry pipe will enter the pipe K and pass thus to the cylinder J, moving the piston J'. As this rises, its rod comes in contact with the valve spindle, and raises the valve H' off its seat, allowing air to pass from the tube, I, through the shell H, and enters the pipe or tube I'. Thus it passes to the casing C, and operates the piston or pistons to open the door or doors as already described when speaking of the operation when steam was employed. When the throttle is closed shutting off the steam pressure from the dry pipe, the piston J' will fall through its own weight or be restored by a spring to its normal position shown in the drawings. As soon as this piston falls, the spring will act to seat the valve H', shutting off the supply of air through the pipes I, I'. The weight of the doors B', B² will then cause them to close, the air from the cylinder escaping through the pipe I', the port h^2 , and the spindle, as indicated by the arrows.

By this means I provide a simple and effi-

cient device which can be operated automatically to open one or both of the ash pan doors by the opening and closing of the throttle, or which, if desired, can be operated by hand independent of the throttle; and while I have described more or less precise forms and locations, I do not intend to unduly limit myself thereto, but contemplate all proper changes in form and proportion, and the substitution of equivalents. For example, although the valve casing, H, and cylinder, J, are shown in vertical alignment, this is not essential, since, if desired, they might be placed horizontally and operate in precisely the same manner.

I claim—

1. In a locomotive ash-pan, the combination of an ash-pan provided with a door, an actuating cylinder and a movable piston therein, mechanism connecting such piston to the door, a pipe supplying steam to the operative parts of the locomotive, a throttle valve arranged therein and a pipe communicating between the cylinder and said steam supply pipe, whereby as the throttle valve is opened and closed the steam is simultaneously furnished to or cut off from said cylinder, substantially as described.

2. In a locomotive ash pan, the combination of an ash pan provided with two or more doors, actuating cylinders, pistons in such cylinders adapted to be operated by fluid pressure, mechanism connecting such pistons to such doors, whereby as the pistons are operated the doors are opened and closed, and means for connecting such cylinders with a source of fluid pressure, so that as the throttle valve of the engine is opened or closed, the fluid pressure is adapted to be automatically furnished to or cut off from said cylinders, substantially as described.

3. The combination of an ash pan provided with one or more doors, mechanism operated by fluid pressure to open such doors, and a valve mechanism also operated by fluid pressure to control the opening mechanism, substantially as described.

4. The combination of an ash pan provided with a door, a cylinder, a piston moving in such cylinder and connected with the door, a pipe leading to such cylinder to convey fluid thereto, and a valve in such pipe operated by fluid pressure to control the admission of fluid to the cylinder, substantially as described.

5. In a locomotive ash pan, the combination of opening mechanism operated by fluid pressure, and valve mechanism operated automatically by fluid pressure to control the admission of fluid to the opening mechanism, substantially as described.

6. The combination of an ash pan provided with one or more doors, a casing containing one or more cylinders, one or more pistons connected to the door or doors, a pipe for admitting fluid to either or both of the cylinders, a valve in such pipe for controlling the admission of the fluid to the casing, a cylin-

der placed adjacent to the valve and connected with a source of steam supply, and a piston in such cylinder adapted as it is moved to contact with the valve spindle, whereby as
5 steam is admitted to the cylinder, the valve will be opened to admit fluid to the casing to open the door or doors, substantially as described.

7. In a locomotive ash pan, the combination
10 of a valve casing, a valve therein provided with a hollow spindle extending out of the casing, pipes for leading fluid to and from such casing, a cylinder placed adjacent thereto, and a piston in such cylinder, the rod
15 whereof contacts as it moves out of the cylinder with the valve spindle to open the valve, such spindle being provided with a suitable

spring to return the valve to its normal position, substantially as described.

8. In a device of the class described, the
20 combination of an ash pan provided with doors, a casing secured adjacent to such ash pan and containing cylinders, pistons traveling in such cylinders, rods connected to the doors
25 respectively, a pipe connecting the casing with the dry pipe of the locomotive, and a cock in the casing to control the admission of steam to the cylinders, substantially as described.

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