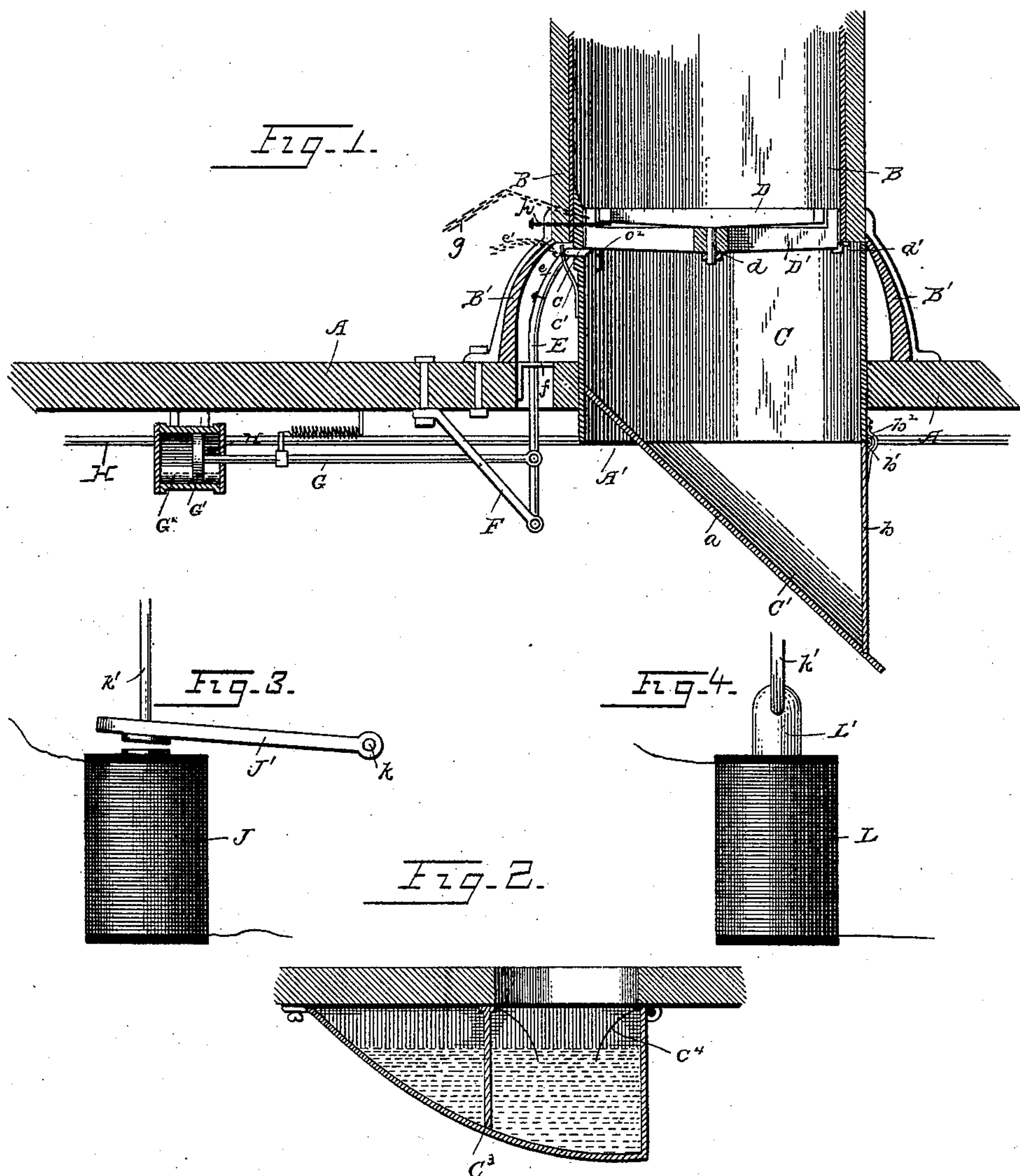


(No Model.)

S. R. SCHARF.
GRATE DUMPING APPARATUS.

No. 392,137.

Patented Oct. 30, 1888.



Witnesses.
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UNITED STATES PATENT OFFICE.

SAMUEL R. SCHARF, OF WASHINGTON, DISTRICT OF COLUMBIA.

GRATE-DUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 392,137, dated October 30, 1888.

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To all whom it may concern:

Be it known that I, SAMUEL R. SCHARF, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Grate-Dumping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a new and improved device by which the contents of the various stoves on a railway-train can be dumped simultaneously either into a water-tank carried under the car or directly onto the track-bed, these objects being accomplished by the engineer or fireman on the locomotive in the event of threatened danger by cheap, simple, and effective means when used on those trains in which an air-brake apparatus is utilized, said dumping apparatus not interfering in any way with the effectiveness of such air-brake apparatus, nor impairing the heating qualities of the stove or stoves to which it is attached.

The principal novelties of construction in my device consists of an air-tight cylinder, electro-magnet, or solenoid adapted to be placed under each stove, and whose piston, armature, or core, when moved by the compressed air from the main reservoir of the above-mentioned air-brake apparatus or when excited by an electric current, will, by suitable mechanical connections, instantly dump the grate of that stove to which it is attached, as well as in other minor details, all of which will be more fully hereinafter described and claimed, and which are illustrated in the accompanying drawings, wherein like letters of reference indicate corresponding parts in the several views, and in which—

Figure 1 is a vertical transverse section taken through the bottom of a car and through the lower portion of a heater, illustrating one device for dumping the grate and discharging the contents through a chute to the ground on one side of the car; Fig. 2, a section of a water-tank to be used instead of the chute for receiving and extinguishing the contents of the heater; Fig. 3, an elevation of an electro-magnet with the connections thereto, and Fig. 4 an elevation of a solenoid with its connections.

A denotes the bottom of the car, having an

opening, A', below the heater B, which heater is supported upon a suitable base, B', at a proper distance above the opening A', as shown in Fig. 1.

C is a cast or sheet iron cylinder, which extends from the bottom of the heater B down through the opening A' in the bottom of the car. This cylinder is open at both ends, and is provided at its lower end with a chute, C', composed of an inclined deflecting-plate, a, riveted or bolted to the cylinder C, and a door, b, hinged to the cylinder at b', which door is kept normally closed by a spring, b'', on the outside. Within the upper end of this cylinder C is placed the grate D, pivoted by a center pin, d, to the grate-frame D', which is hinged at one side, as shown at d'. On the opposite side this frame is supported by a sliding pin or bolt, c, which passes through the wall of the cylinder C, and is kept in place normally by a small leaf-spring, c', secured to the cylinder on the outside. This grate-frame is provided, as shown, with a depending pin or projection, c'', which, when the grate is dumped, strikes against and forces open the door b of the chute C' to allow the fuel to be discharged. To the outer end of this sliding pin or bolt c is connected the upper end of the lever E for drawing the pin or bolt to allow the grate to fall, which lever passes down through a radial slot, f, in the bottom of the car, and is pivoted at its lower end below the car to a bracket or other suitable support, F, bolted or otherwise secured to the bottom of the car. This lever may have a hinged upper end, e, with a chain or rope, e', attached to it, to enable a person in the car to dump the grate without disturbing the connections for operating all the grates simultaneously. At any suitable point on this lever E, between its fulcrum and the bottom of the car, is connected the piston-rod G from the piston G' in the steam or air cylinder G'', which is suspended from the bottom of the car by any suitable means.

Steam or compressed air is supplied to the cylinder G'' of each car by a pipe, H, running from the main reservoir of the engine and communicating with each cylinder by means of a short coupling, H', and the pipe H of each car should be connected to the pipe of the next car by means of flexible couplings, so as to make a continuous line of pipe. The section of pipe

belonging to each car should have a cut-off valve at each end. When the train is made up, all of these valves are to be opened, except the valve on the rear end of the pipe on the last car, which is to be closed, so that no air or steam can escape from the pipe H.

By means of a lever or the like located in the cab of the locomotive, and having suitable connections with a three-way cock, or any other suitable appliance or valve, steam or air can be admitted to the cylinder G' of each car, so as to operate the piston G' and its rod G, which is connected to the lever E. When the lever is drawn back, the sliding pin or bolt *c* is withdrawn, and the grate falls and dumps the contents of the stove into and through the chute onto the ground. When this is done, the engineer or fireman, by a similar operation, can exhaust the air or steam from each cylinder through the three-way cock, and by means of a spring, I, attached to the piston-rod and to the bottom of the car, the parts are reversed to their former position. This spring may of course be located in the back end of the cylinder G', behind the piston. The grate can be returned to its proper position again by means of a chain, *g*, attached to it at some convenient point and operated from the interior of the car, or by means of a poker, and it may be shaken independently of its frame to remove ashes, &c., by means of a shaker, *h*, inserted through a seat in the side of the stove or heater, as seen by dotted lines in Fig. 1.

It will be evident that the grates can be dumped equally as well and as cheaply and effectively by other agents besides compressed air or steam—for instance, electricity—and in Figs. 3 and 4 are shown two devices by which this latter force may be utilized for doing this.

J represents an electro-magnet adapted to be excited by an electric current from a battery stationed in the cab of the locomotive, where the circuit may be established by the engineer or fireman by pressing a push-button.

The armature J', pivoted at the point K, is connected by a rod, K', to the lever E, and when attracted by the magnet will, in its movement toward the same, draw the rod K', lever E, and latch *c* with it, and the unsupported grate will consequently fall and its contents will be discharged. Instead of this arrangement, a solenoid, L, may be employed, the core L' of which performing exactly the same results as the armature J'.

It will be evident that when the above electrical devices are employed the compressed air or steam conducting pipes may be dispensed with, and instead thereof suitable preferably insulated metallic wires substituted, provided with couplings at the end of each car.

It will be further apparent that to properly establish the circuit two sets of wires will be necessary, and that those on the rear end of the last car should be connected together.

The substitute for the chute C' in the form of a water-tank, as shown in Fig. 2, consists, preferably, of a scoop-shaped metallic vessel

hinged at one end to the bottom of the car under the cylinder C, and secured at the other end by any suitable fastening that will adapt it to be easily locked and unlocked for convenience in cleaning, &c. The upper edge of this vessel can be provided all around with an elastic packing to make an air-tight joint with the bottom of the car when in place, although this is not absolutely necessary. To prevent the water from blocking or "jamming," the free end of this tank under the influence of the movements of the car, and thereby tending to weaken the fastening to the car, I provide the partition C'', securely fastened to the bottom of the car and extending down into this tank, and for a similar purpose I provide the two downwardly-curved wings C''' C''', also fastened to the bottom of the car on each side of the opening for receiving the contents discharged from the heater. When the grate is dumped, the contents fall into the tank and are extinguished by the water contained therein, and which can be supplied in any convenient and suitable manner.

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

1. The combination, in a grate-dumping apparatus, of the heater B, located within the car, the pivoted grate D within said heater, the latch *c*, extending through the wall of the heater and supporting the otherwise unsupported end of the grate D, the jointed pivoted lever E, extending outside of the heater and attached at its upper end to the latch *c*, the movable rod G, located beneath the car and attached one end to the lever E, substantially as described, and for the purpose set forth.

2. The combination, in a grate-dumping apparatus, of the heater B, located within the car, the pivoted grate D within the heater, the latch *c*, extending through the wall of the heater and supporting the otherwise unsupported end of the grate D, the spring *c'*, bearing against the latch *c* and normally pressing the same inward toward the heater, the jointed pivoted lever E, extending outside of the heater and attached at its upper end to the latch *c*, the movable rod G, located beneath the car and attached one end to the lever E and at the other to the moving element of a device, substantially as described, and for the purposes set forth.

3. The combination, in a grate-dumping apparatus, of the heater B, located within the car, the pivoted grate D within the heater, the latch *c*, extending through the wall of the heater and supporting the otherwise unsupported end of the grate D, the spring *c'*, bearing against the latch *c* and normally pressing the same inward toward the heater, the retracting-chain *c'*, by means of which the latch *c* may be withdrawn from the interior of the car, the jointed pivoted lever E, extending outside of the heater and attached at its upper end to the latch *c*, and the movable rod G, located beneath the car and attached one end to the

lever E, substantially as described, and for the purpose set forth.

4. In a grate-dumping device, the combination, with the heater C and grate D, of a tank 5 pivoted to the bottom of the car, and immovable separate partition C'', and wings C''' C'', securely fastened to the bottom of the car, substantially as described, and for the purpose set forth.
- 10 5. The combination, in a grate-dumping apparatus, of the heater B, located within the car, the chute B', beneath the heater and entirely beneath the outside of the car, the pivoted grate D within the heater, the latch c, 15 extending through the heater and supporting the otherwise unsupported end of the grate D, the jointed lever E outside of the heater and attached at one end to the latch c, and movable rod G beneath the car and connected with 20 the lever E, all adapted to operate substantially as and for the purposes set forth.

6. The combination, in a grate-dumping apparatus, of the heater B, located within the car, pivoted grate D within the heater, latch c, extending through the walls of the heater 25 and supporting the otherwise unsupported end of the grate D, jointed lever E, extending down the outside of the heater and secured at one end to the latch c, movable rod G beneath the car and connected with the lever E, and a re- 30 tracting-spring attached to the rod G and tending to bear said rod and lever E in the direction of the heater, and thereby retain the latch c in position beneath the grate D, all combined and adapted to operate substantially as and for 35 the purposes set forth.

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

SAMUEL R. SCHARF.

Witnesses:

ALEX. H. JOHNSON,
F. E. PUFFER.