(No Model.) 2 Sheets—Sheet 1.

A. HICKENLOOPER.

GAS RETORT CHARGER.

No. 456,569. Patented July 28, 1891.

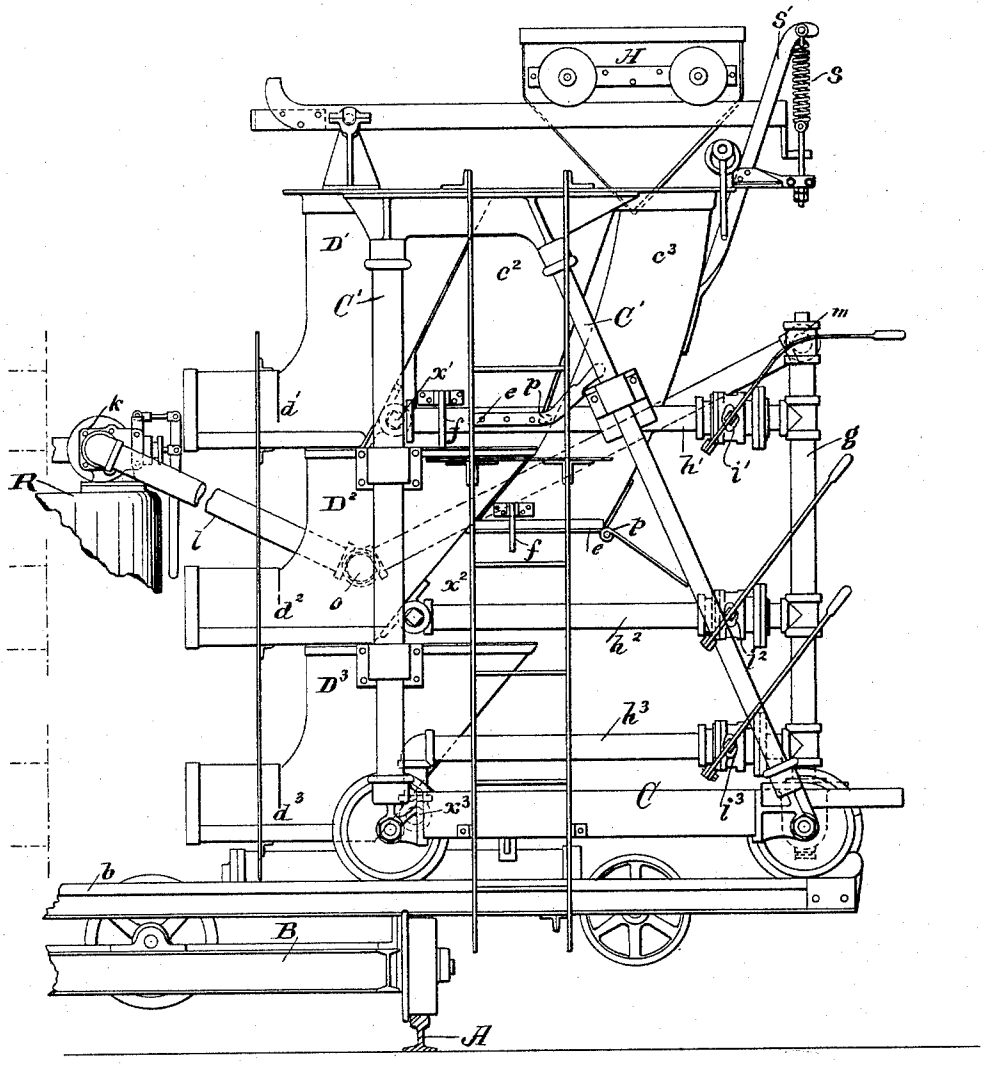


Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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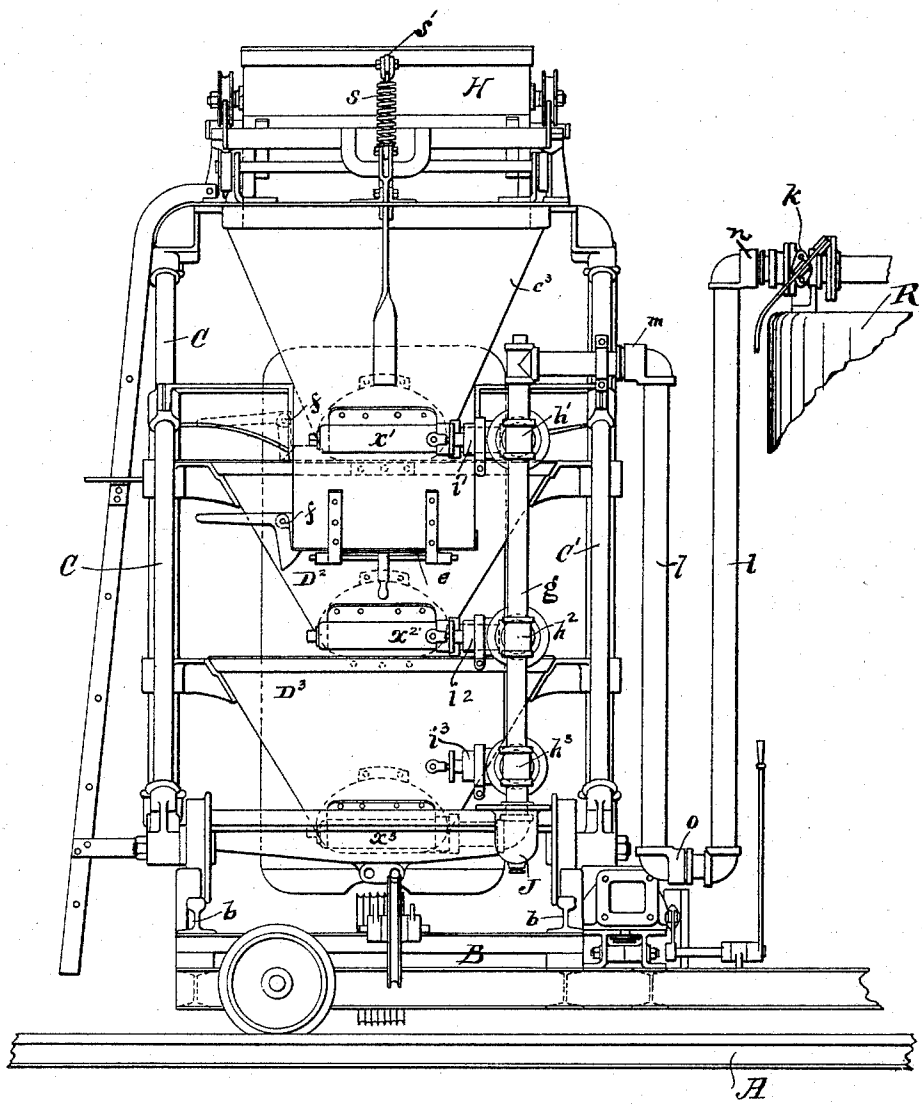


FIG. 2.

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UNITED STATES PATENT OFFICE.

ANDREW HICKENLOOPER, OF CINCINNATI, OHIO.

GAS-RETORT CHARGER.

SPECIFICATION forming part of Letters Patent No. 456,569, dated July 28, 1891.

Application filed November 17, 1890. Serial No. 371,623. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HICKENLOOPER, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Gas-Retort Chargers, of which the following is a specification.

My invention relates to gas-retort chargers, and is in the nature of an improvement upon those of the character described in Letters Patent Nos. 212,570, 212,572, and 212,573, granted to A. Q. Ross February 25, 1879; and it consists in the improved apparatus, constructed as hereinafter more fully set forth, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of so much of a gas-retort charger as shows my improvement complete; Fig. 2, a rear elevation of the same.

Said former patents describe a gas-retort charger embodying a wheeled platform adapted to run upon ways parallel with the system of retort-benches in gas-works, a steam boiler and reservoir for supply of steam used in charging, mounted on said platform, a supplemental carriage or supporting-frame adapted to run upon said platform to and from the face of the retort-benches, a vertically-adjustable charging-hopper mounted on said supplemental carriage, and the necessary connections and minor appliances for adjusting and utilizing the apparatus and its parts. In the use of said machines in gas-works but one retort of the vertical series of retorts in each bench (usually three in number) was charged while the main platform remained in one position. As the apparatus possessed but one charging-chamber and nozzle, it was necessary to adjust it to the level of the retorts successively. In practice, after charging a lower retort, for example, of a vertical series the supplemental carriage was withdrawn and the main platform (carrying the entire apparatus) moved aside to allow the coal in the retort to be leveled and the retort-lid closed. Meanwhile the charging-chamber was withdrawn and elevated to the level of the next retort and the main platform moved back into line and the supplemental carriage again moved forward to adjust the charging-nozzle to the retort. The same operations were performed for the third retort in series, each retort remaining open until charged. These operations involved much labor and loss of time, besides waste of heat in the retort-bench.

In my improved apparatus separate containing and charging devices are provided for each retort in vertical series, (two, three, or more, as the case may be,) mounted permanently upon the supplemental carriage in vertical series at levels corresponding with the several retorts. The containing-hoppers being separately filled or loaded while the entire machine is being shifted laterally from bench to bench, one adjustment of the supplemental carriage brings all the containing-hoppers and charging-nozzles into proper relations respectively with each retort of the vertical series of retorts of a bench, instead of requiring removal and readjustment for each separate retort, as formerly. Moreover, as each containing-hopper and charging-chamber is charged ready for action, no time is lost in admitting several charges successively to a common charging-chamber; but all being thus made ready prior to the one final adjustment of the apparatus to the retorts the charging of the entire vertical series occupies but a small portion of the time formerly required, thereby largely increasing the value and effective capacity of the charging apparatus. Thus in practice but five to fifteen seconds are consumed in charging an ordinary vertical series of three retorts, each taking about three hundred pounds of coal.

Referring now to the drawings, A A designate the guide-rails upon which the entire charging-machine is run parallel to the front face of the retorts, and B designates the wheeled platform upon which are mounted the boiler, reservoir, supplemental carriage or charger proper, and the necessary attachments, only such parts being herein shown and described as appertain to my invention.

The supplemental carriage C is mounted upon wheels *a*, running upon cross-rails *b*, laid upon the floor of the platform B, and propelled (by mechanism not shown) for the purpose of adjusting the apparatus toward or away from the retorts, as hereinafter indicated. Upon the triangular supporting-frames

formed by the upright braces C′ of the supplemental carriage C is secured a series of two or more—in the present case three—"hoppers" $D' D^2 D^3$ of the general form shown, terminating below in horizontal charging-conduits d' d^2 d^3, constituting charging-chambers, the forward ends of which project forward beyond the front of the supplemental carriage as "nozzles," each adapted in shape and size to enter the mouth of a retort.

At the rear of each charging-conduit, just behind its angle of junction with the hopper, of which it forms a part, is located the blast-distributers x' x^2 x^3, respectively, which may be constructed substantially as in said former patents described. The hoppers are arranged one above the other in vertical succession with their substantially vertical fronts in a common plane. Their rear walls flare rearwardly, and by the succession of the hoppers one above another each lower one is about half covered at the top by the next above. The remainder of the top opening, however, of each lower hopper is prolonged upwardly to the top of the carriage by an inclined chute, as $c^2 c^3$, respectively, the first or topmost hopper of the series requiring no chute. The uppermost hopper and the connecting-chutes of the lower hoppers open above in a common horizontal plane at the top of the frame, the three openings being arranged in rearward succession from front to rear of the carriage. This arrangement of the openings adjacent to each other in a common horizontal plane makes it extremely convenient to fill them at one time to a common measurement level. The chutes are each closed below by a lid or bottom e, hinged at the rear, as at p, and normally upheld by a gravity-catch f, swinging outward at the side. By this construction the chutes may be loaded with second charges before the hoppers are discharged of previous charges. These supplemental hoppers or chutes may be also so proportioned in size as to contain only the proper charge of coal for the charging-hoppers below.

The construction thus described dispenses entirely with the mechanism formerly employed in raising and lowering the discharge-conduit. In lieu, also, of the flexible steam-connection formerly used, which was on many accounts objectionable, I employ a vertical stand-pipe g at the rear of and on one side of the supplemental carriage with fixed horizontal steam-connections h' h^2 h^3, leading thence to the blast-distributers x' $x^2 x^3$, respectively. Controlling-valves i' $i^2 i^3$ are arranged in these connections near the stand-pipe with their operating-handles in convenient reach of the attendant. At its bottom the stand-pipe g terminates in a chamber j, having an opening in the bottom normally closed by a screw-plug or valve by which the water of condensation may be from time to time withdrawn. At the top of the stand-pipe is a rotating pipe-connection m, and at the reservoir a similar rotating pipe-connection n, these being connected across by two corresponding joints of pipe l l, united at their free extremities by a similar rotating connection o, forming a hinged pipe-connection, permitting the movements of the supplemental carriage to and fro, while preserving a proper steam-connection of the strength required to sustain the expansive shocks produced by the use of the steam in charging, and also durable in relation to injuries from external heat and abrasion. Moreover, as will be seen, this connection permits a wide range of movement of the supplemental carriage, while preserving a tight and durable steam-connection at all times. A controlling-valve K, governing the supply of steam through the jointed connection to the stand-pipe, is located at the reservoir R. In a practical use of the machine the valves i' i^2 i^3 of the stand-pipe connections may be left open and the charging done by the main valve K; but it is preferred to use the stand-pipe valves for charging, as these stand in similar relations to their blast-distributers, and the force applied is therefore more equal throughout the series.

Ordinarily when the coal used is approximately uniform in size and character the uppermost hopper and the chutes or supplemental hoppers are convenient measures of the quantity required when exactly filled up to the common level of their tops. In some cases, however, a weighing and distributing car H may be employed, running upon a trackway erected at the top of the carriage, so as to adjust the car to either of the hopper-openings. The trackway may be a pivoted frame upheld at one end upon a coiled spring s, suspended from a cleat s', secured to the frame, or otherwise provided with weighing devices.

I do not herein claim the distributing-car or weighing devices as of my invention, and therefore further or more detailed description of the same is unnecessary.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a retort-charger, a carriage adjustable to and from the face of the retort-bench, two or more fixed charging-hoppers arranged in vertical succession with discharge-nozzles in a common vertical plane adapted to enter the mouths of two or more retorts simultaneously, a blast-distributer to each hopper at the rear of the discharge-nozzle, a stand-pipe upon said carriage having an extensible connection with a reservoir of blast force, and connections between said stand-pipe and blast-distributers, combined and arranged substantially as set forth.

2. In a retort-charger, a carriage adjustable to and from the face of the retort-bench, two or more fixed charging-hoppers in vertical succession with discharge-nozzles in a common vertical plane adapted to enter the mouths of two or more retorts simultaneously, a blast-distributer to each hopper at the rear of the discharge-nozzle, a stand-pipe upon

said carriage having an extensible connection with a reservoir of blast force, connections between said stand-pipe and blast-distributers, and controlling-valves in each connection between the stand-pipe and blast-distributers, combined and arranged substantially as set forth.

3. In a retort-charger, the combination of a carriage adjustable to and from a retort-bench, a fixed vertical series of hoppers thereon, each having a discharge-nozzle and blast-distributer at the rear of said discharge-nozzle, a stand-pipe on the carriage, pipe connections thence to the blast-distributers, controlling-valves in said connections, a pipe connection between said stand-pipe and a reservoir of blast force, and a valve governing said connection and controlling the entire series of blast-distributers, substantially as set forth.

4. In a retort-charger of the character described, the combination of the hoppers arranged in fixed vertical succession, the blast-distributers attached thereto, the stand-pipe, the pipe connections thence to the blast-distributers, and the jointed-pipe connection, constructed and arranged as shown, between the head of the stand-pipe and the top of the reservoir, substantially as set forth.

5. In a retort-charger of the character described, the combination of the series of hoppers and their blast-distributers, the fixed vertical stand-pipe, the lateral pipe connections between the stand-pipe and the blast-distributers, the extensible pipe connection between the stand-pipe and the reservoir, and a drainage-chamber in the stand-pipe below the blast-connections, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ANDREW HICKENLOOPER.

Witnesses:
L. M. HOSEA,
ELLA HOSEA.