

Darius Davison, Imp^t in the Manufacture of Coal Gas.

No. 120,151.

Patented Oct. 24, 1871.

Fig. 1.

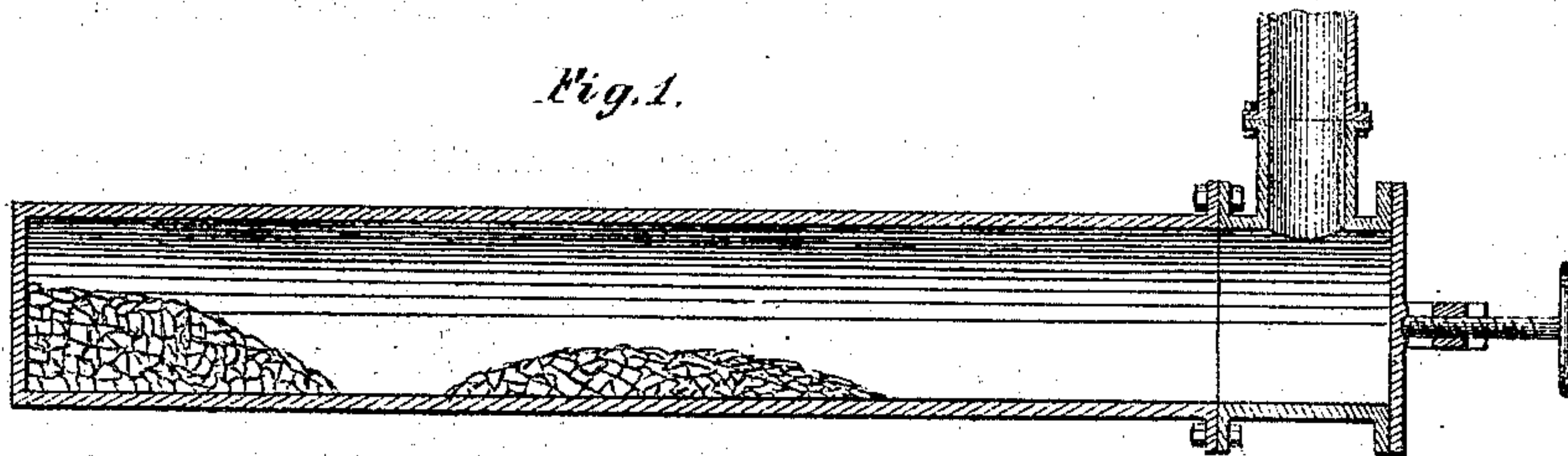


Fig. 2.

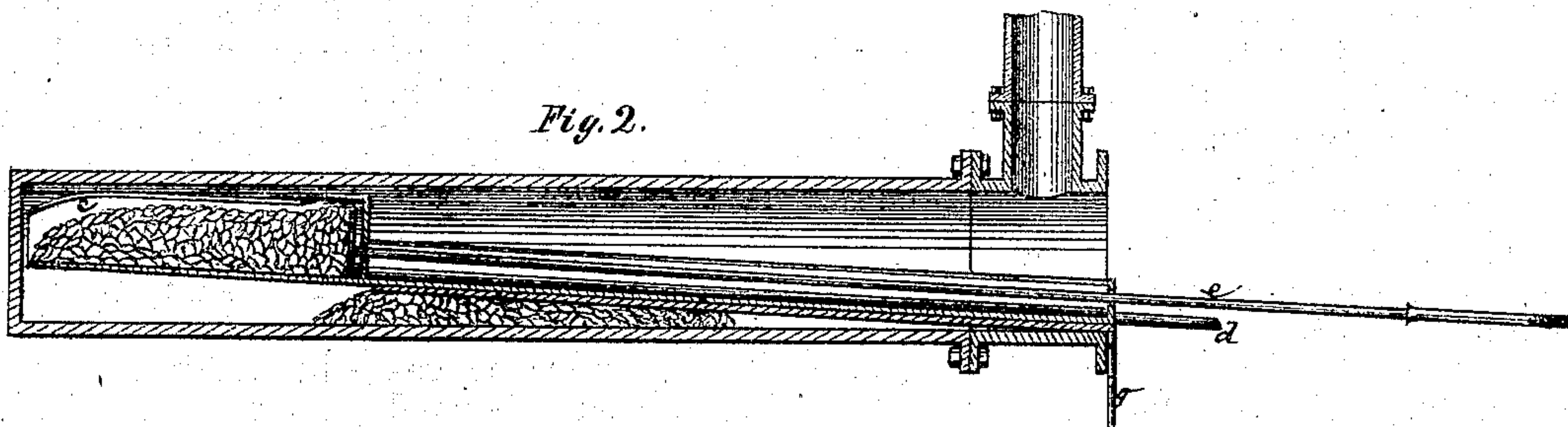


Fig. 3.

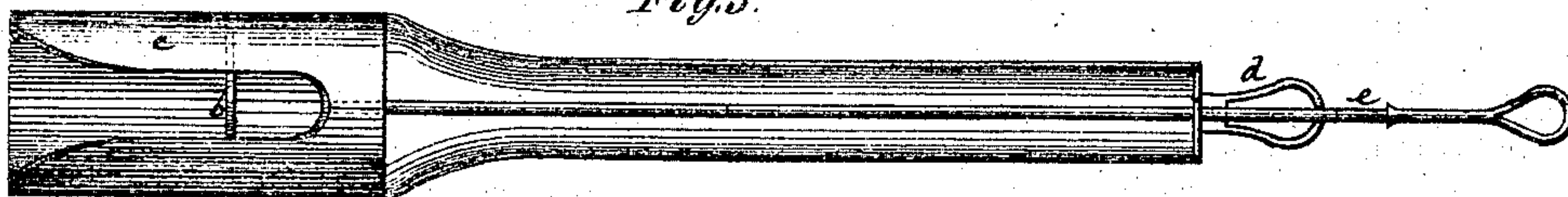
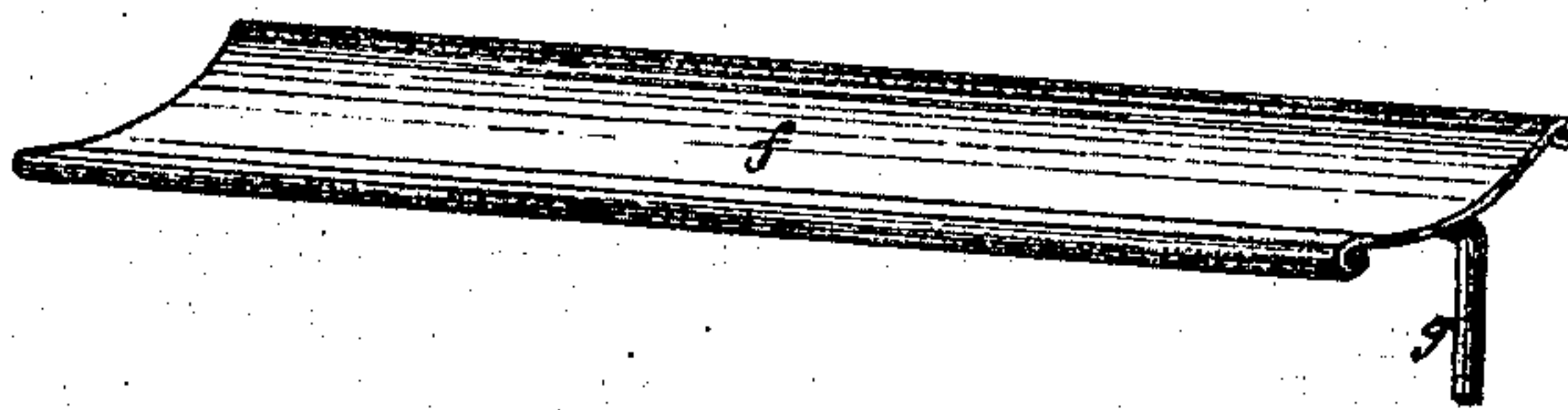


Fig. 4.



Witnesses.

*Fred. Horner
McCormick*

*Darius Davison
per Brown & Lombard
Attorneys*

UNITED STATES PATENT OFFICE.

DARIUS DAVISON, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MANUFACTURE OF COAL-GAS.

Specification forming part of Letters Patent No. 120,151, dated October 24, 1871; antedated October 6, 1871.

To all whom it may concern:

Be it known that I, DARIUS DAVISON, of the city, county, and State of New York, have invented a new and useful Improvement in the Manufacture of Coal-Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a longitudinal sectional elevation of an ordinary gas-retort charged with coal in accordance with the invention; Fig. 2, a similar view, showing the retort in the act of being charged; Fig. 3, a plan of an implement used to charge the retort; and Fig. 4, a view in perspective of a slide used in combination with said implement when charging the retort, as illustrated in Fig. 2.

Similar letters of reference indicate corresponding parts.

My invention consists in a novel introduction and distribution of the charge in the retort and manner of working the same, for the production of illuminating-gas by the destructive distillation of coal, the same causing a more equable exposure of the gas and vapor to the heated surfaces of the retort, whereby an increased quantity and improved quality of gas is produced; also, considerable economy effected in the production of it. To this end the usual whole charge is divided into two equal parts and each of such divided portions is deposited at the back end of the retort at certain successive intervals. The invention also includes a peculiarly-constructed charging implement, made up of a sliding scraper and hod for placing the charge or partial charge in the rear of the retort; also, a slide for facilitating the passage of a new charge or partial charge over and in the rear of a partly distilled one.

To clearly explain my improvement, it will be necessary, by way of pointing out the defects which it is the object of my invention to avoid, to refer briefly to the process heretofore adopted of charging and working the charge in a retort. Supposing the whole charge to be two hundred pounds of coal, which is about the usual amount, and will here, for the purpose of explaining the invention, be assumed throughout this description, the same is ordinarily put into the retort at one and the same time and spread over the entire bottom of the retort throughout its length, where it is allowed to remain for about four hours,

till the gas is exhausted from the charge. This mode of operation causes a large volume of vapor to be disengaged when the charge is introduced, and a gradually-diminishing volume afterward, till the operation is completed, so that the flow of gas from the retort is unequal throughout the distillation of the charge, the gas and vapor passing rapidly from the retort at first and gradually diminishing in velocity and volume to the end. This causes an unequal action on the gas and vapor in contact with the heated surfaces of the retort. Much of the vapor distilled from the coal at and near the mouth of the retort passes from the retort unconverted into gas, and is lost under the ordinary process of producing gas. The gas produced, too, from the coal during the latter part of the process of distilling it, under the method heretofore practiced, passes so slowly from the retort by reason of its reduced volume that part of the gas is burned in the retort and converted into fixed carbon or lampblack, thus further reducing the volume and illuminating quality of the gas produced.

To obviate these defects, instead of placing the entire charge at one feed, as described, I divide the amount of such one charge into two equal parts and introduce each part to the retort at about equal intervals of time. For instance, if the charge of two hundred pounds is divided into two equal parts, half thereof would be charred in the back end of the retort and allowed to distil about two hours, more or less, after which the retort is opened and such partially-distilled half charge hauled forward on the bottom of the retort, and the remaining half charge introduced over it to the rear of the retort. This method of charging is represented in Figs. 1 and 2 of the drawing. The two half charges are then allowed to distil for about two hours, making four hours in all, or thereabout, for the first half charge, from which latter the gas and vapor being all distilled, the same is then drawn from the retort and the remaining half of the charge at the back end hauled forward and a fresh half charge introduced over it in the rear, and a repetition of the process just described continued. By dividing and distributing the charge, as specified, then the reduced quantity of fresh coal introduced into the retort at a time yields a less voluminous amount of vapor, and consequently said vapor passes more slowly out of the retort and prolongs

its exposure to the hot surfaces of the latter. Likewise, the rich gas and vapor from the fresh coal has to pass over the heated partly-distilled pile of coal in front of it, and is consequently combined with the poorer gas being eliminated from the partly-distilled portion of coal drawn toward the mouth of the retort. Furthermore, dividing the entire charge and introducing the divided portions at successive intervals, as described, effects a nearly-uniform distillation in volume of vapor and gas, and consequently a more nearly uniform flow of gas in volume from the retort continually, thus obtaining a more nearly uniform action of the heat, both as regards time and space, and a thorough mixing of all the products of distillation, together with a very thorough conversion of all the vapors from the coal into permanent rich illuminating-gas. To facilitate the placing of the partial charge at the extreme back end of the retort, a charger, such as illustrated in Figs. 2 and 3, may be used, the same consisting of a sliding scraper, *b*, and a hod, *c*, within which latter the scraper is arranged, said hod having a rear extension provided with a handle, *d*, for pushing in or drawing out the whole implement. The scraper *b* is operated by a rod or handle, *e*, running sufficiently backward to allow of the scraper's operation from a position in front of the retort after the implement has been introduced its full length therein. To discharge the coal the scraper *b* is held stationary while the hod *c* is drawn outward, which deposits the coal as required, or said scraper may be pushed inward simultaneously with the drawing outward of the hod. To deposit a charge over a previous charge lying in the retort, as shown in Fig. 2, a stationary incline or slide, *f*, of a length to suit, and provided with a stop, *g*, at its back that strikes against the front of the retort, to gauge the position of the slide in the latter, is used. This slide, which is inserted at each open-

ing of the retort and withdrawn at each closing thereof, is projected within the retort till its front end rests on or overhangs the pile or partial charge drawn from its position in rear of the retort to make room for a fresh charge. Said slide may be made arched in its transverse section, to guide and steady the charger along and over it.

The improved implements for charging retorts and the process of manufacturing coal-gas herein described are designed to be applied to and used in connection with retorts at present in use in gas-works, as well as in new retorts, without any material change in the present plan of constructing retorts and without any change in the various apparatus and processes for manufacturing illuminating-gas after the same passes from the retort or retorts.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The process herein described of manufacturing coal-gas by dividing the usual whole charge into two equal parts, or thereabout, and depositing each fresh supply of a divided charge in rear of the retort and successively distributing a series of such partial whole charges within the retort at intervals in a progressive manner from the rear toward the mouth of the retort, essentially as herein set forth.

2. The slide *c*, constructed for operation within the retort, to pass the one charge or partial charge over and in rear of another, substantially as specified.

3. The charger, composed of a sliding scraper, *b*, and hod *c*, constructed and arranged for operation in relation with each other and the retort, essentially as shown and described.

DARIUS DAVISON.

Witnesses:

FRED. HAYNES,
R. E. RABEAU.

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