A. D. CRESSLER.

APPARATUS FOR CHARGING AND DISCHARGING GAS RETORTS, SLOTS, AND CHAMBER OVENS.

APPLICATION FILED AUG. 28, 1917.

1,278,307.

Patented Sept. 10, 1918.

7 SHEETS—SHEET 1.

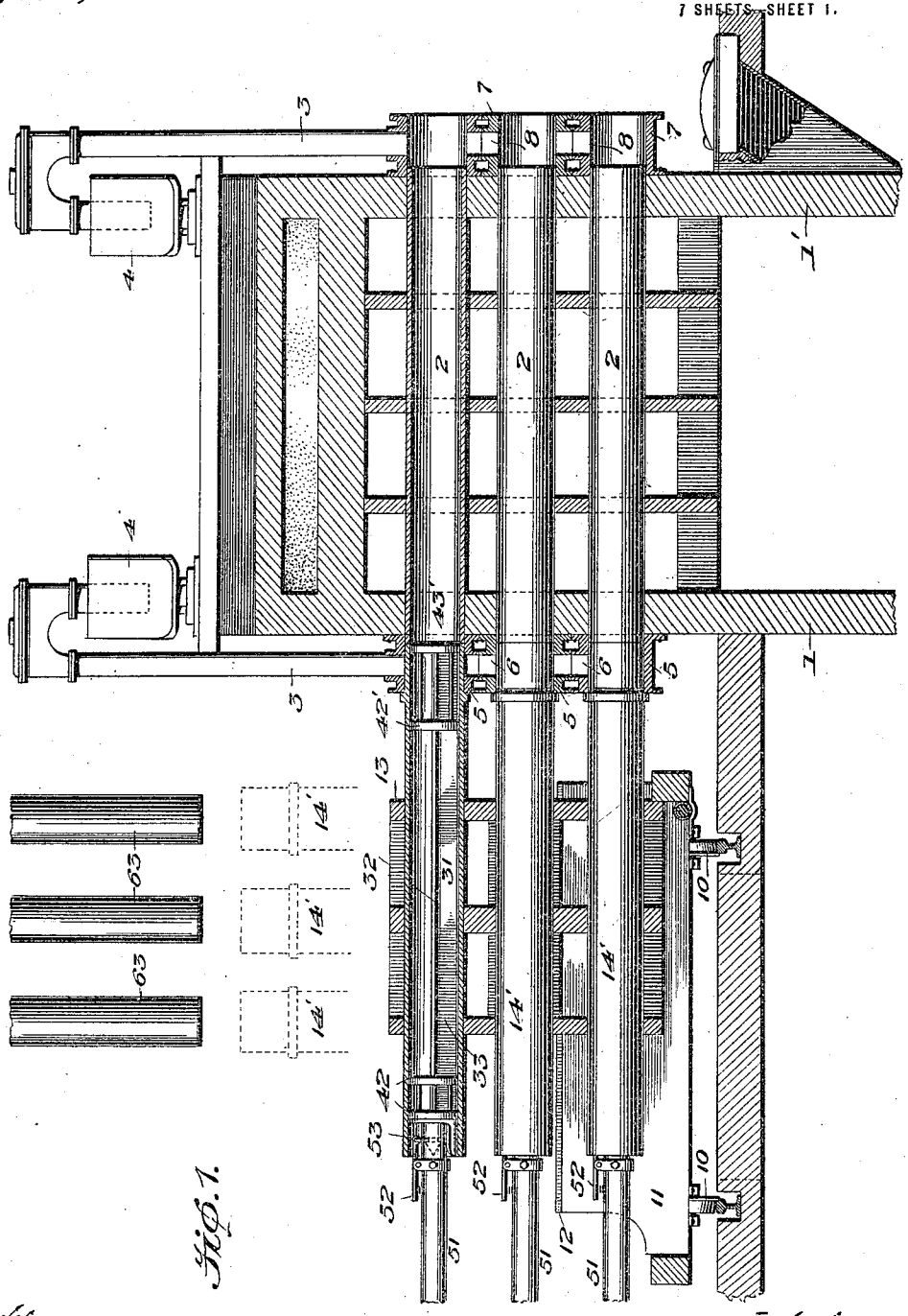


FIG. 1.

Witnesses

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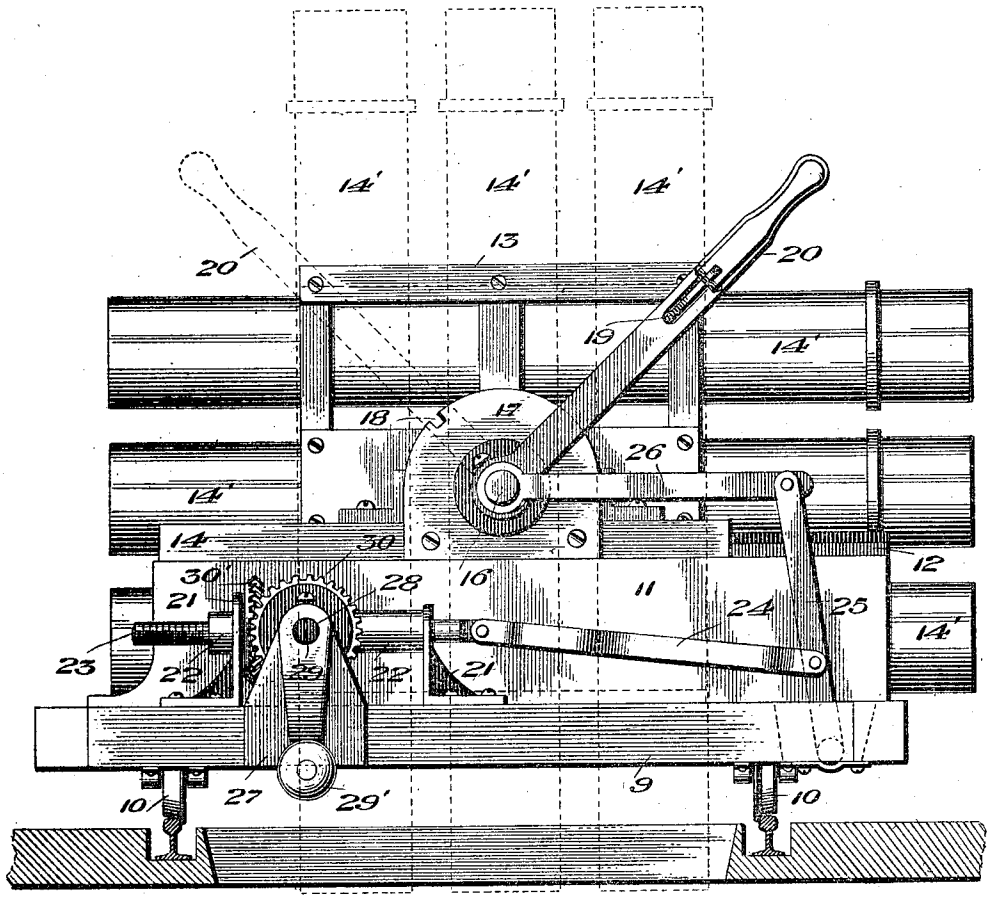
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7 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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7 SHEETS—SHEET 3.

Fig. 10.

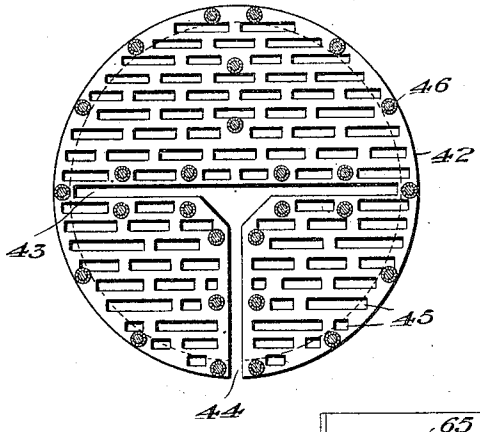
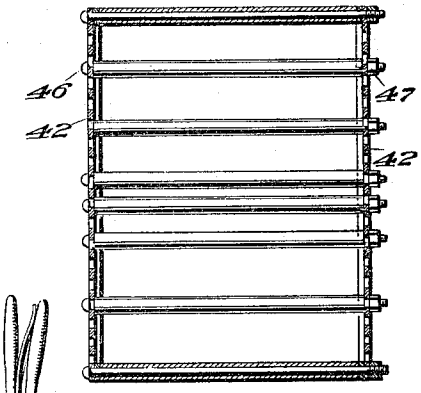


Fig. 11.



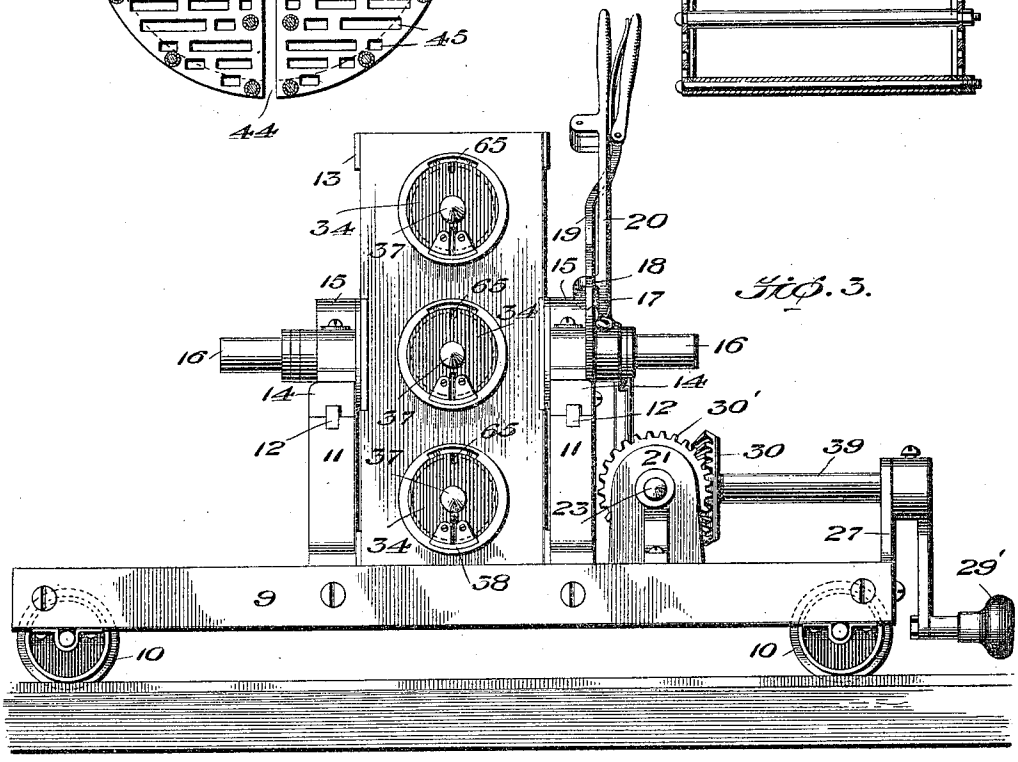
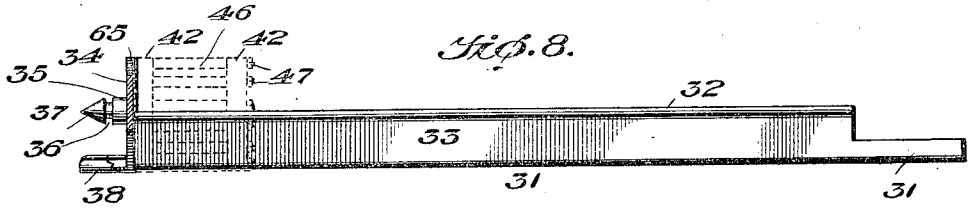


Fig. 3.

Fig. 8.



Witnesses

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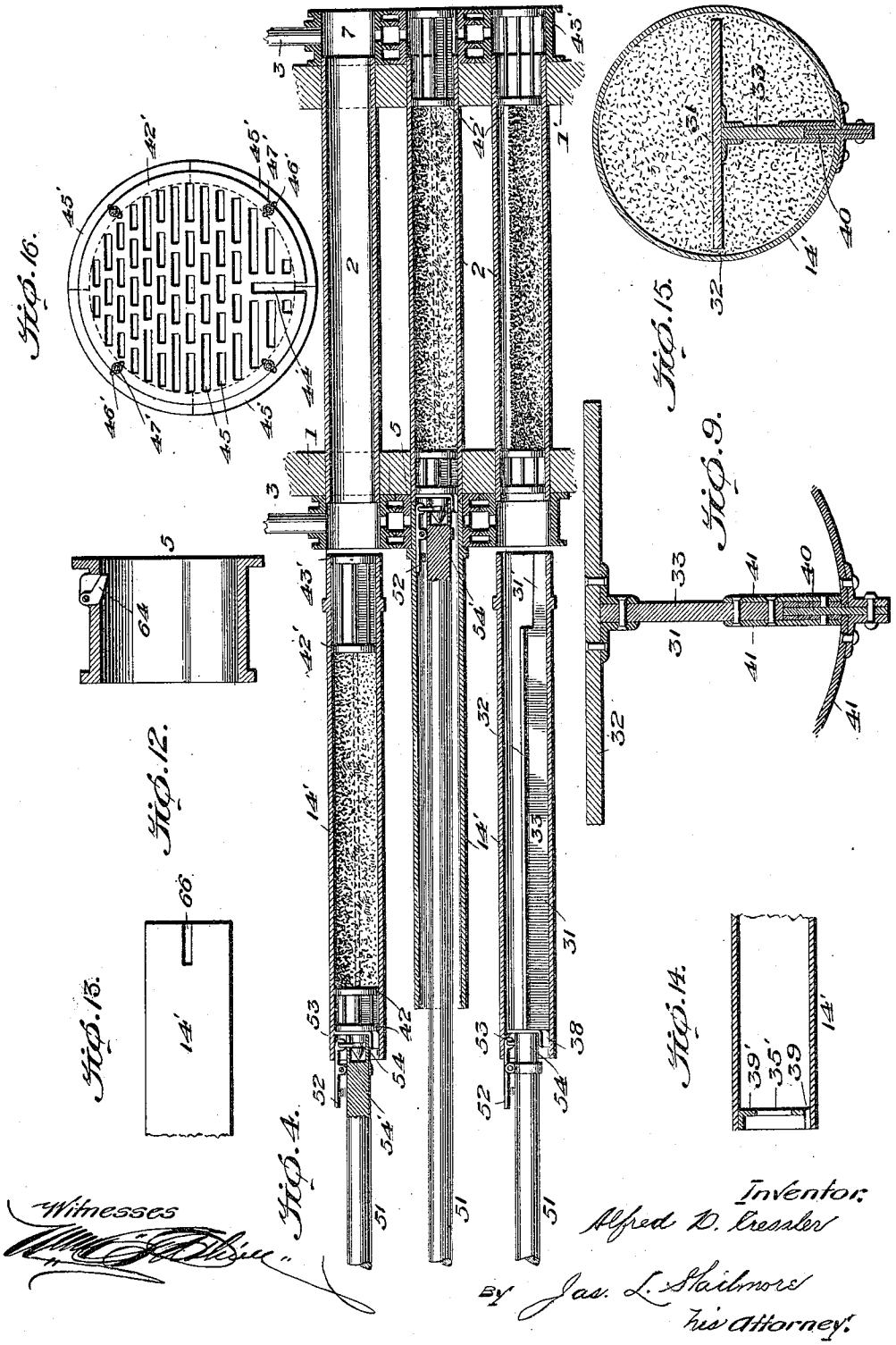
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7 SHEETS—SHEET 4.



Witnesses

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7 SHEETS—SHEET 5.

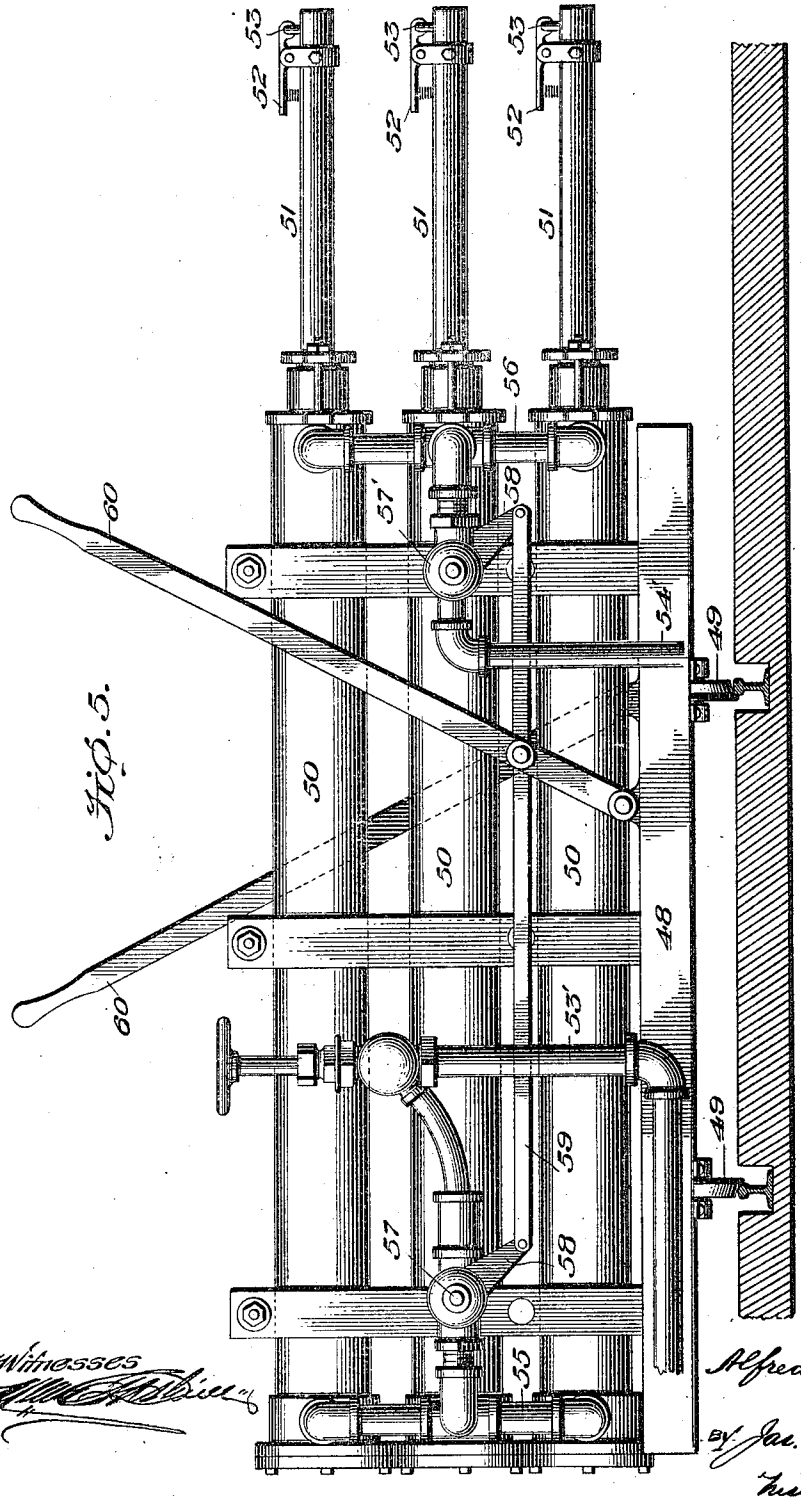


Fig. 5.

Witnesses

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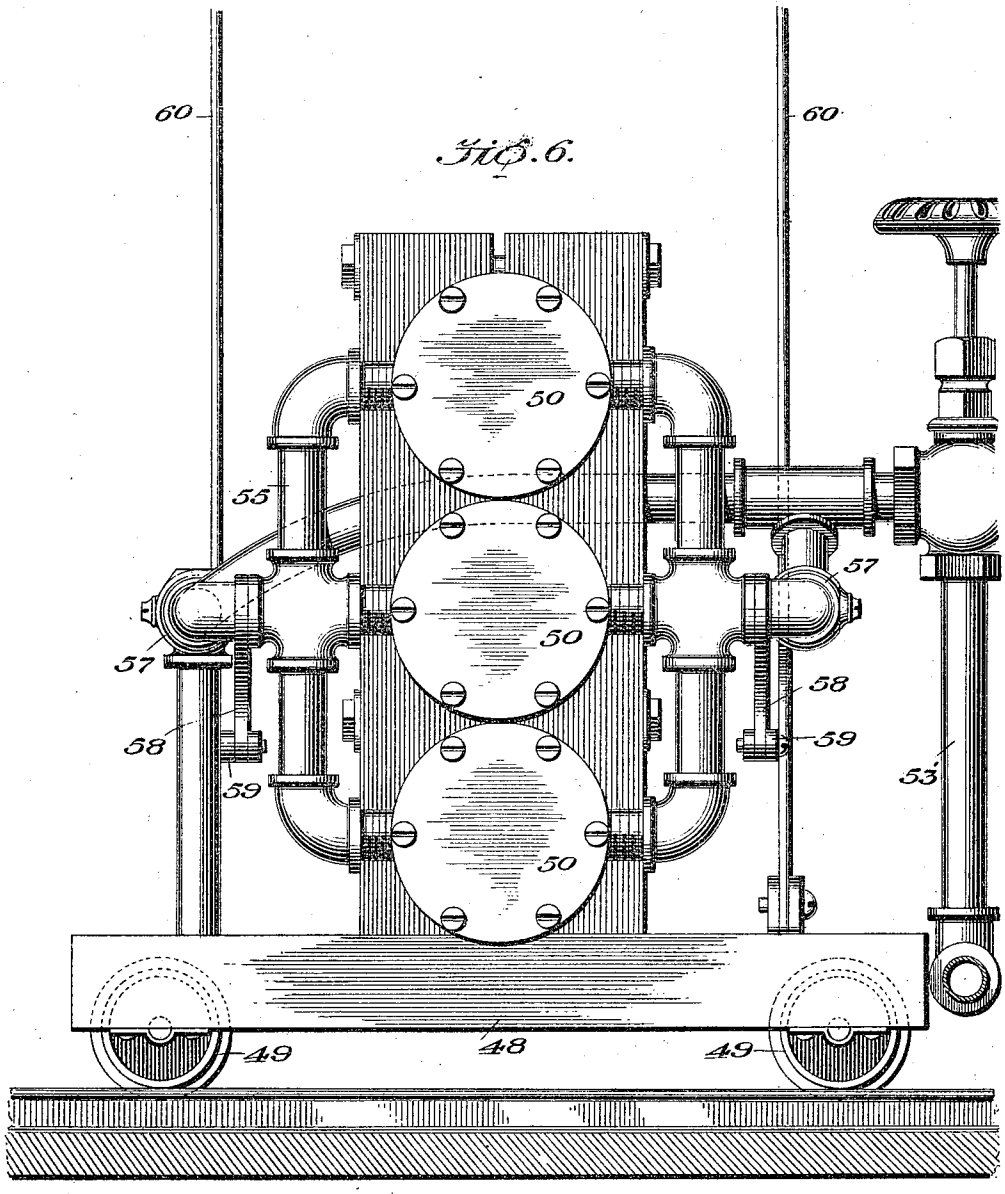
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7 SHEETS—SHEET 6.

Fig. 6.



Witnesses

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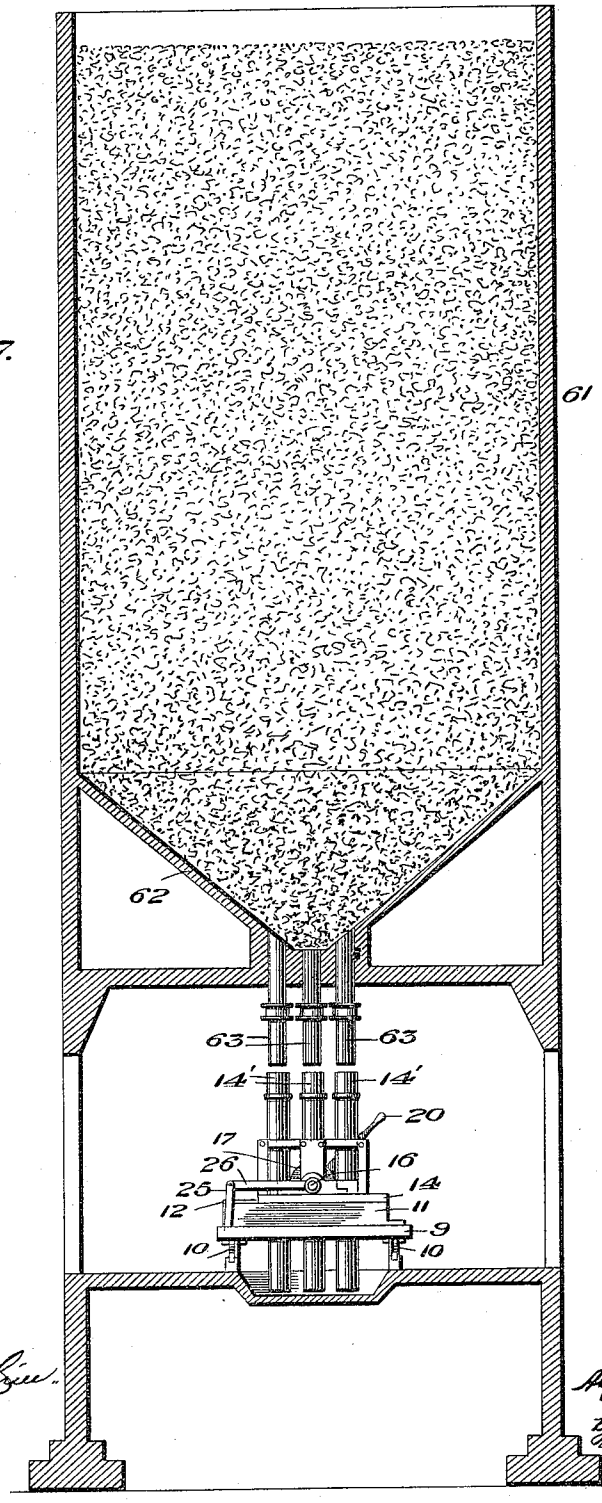
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7 SHEETS—SHEET 7.

Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

ALFRED D. CRESSLER, OF WASHINGTON, DISTRICT OF COLUMBIA.

APPARATUS FOR CHARGING AND DISCHARGING GAS-RETORTS, SLOTS, AND CHAMBER-OVENS.

1,278,307. Specification of Letters Patent. **Patented Sept. 10, 1918.**

Application filed August 28, 1917. Serial No. 188,613.

To all whom it may concern:

Be it known that I, ALFRED D. CRESSLER, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Apparatus for Charging and Discharging Gas-Retorts, Slots, and Chamber-Ovens, of which the following is a specification.

My invention relates to an improved and novel apparatus for charging and discharging gas retorts, slots, and chamber ovens, in the manufacture of coal-gas, coke and by-products.

The main object of this invention is to provide simple, strong, durable, economical, novel and thoroughly efficient devices for the charging and discharging of gas retorts, chamber ovens, slots and the like, when positioned horizontally or in an inclined position, said charging being performed simultaneously with the act of discharging, and the said retorts are charged and discharged in series.

A further object of the invention is to furnish means whereby the respective bench capacity is increased by filling substantially the entire area of each retort during the charging operation.

A further object of the invention is to furnish means whereby the respective bench capacity is regulated by charging each series of retorts with a predetermined quantity or weight of coal, uniform and level throughout the full length of each retort between the inside surfaces of the front and rear arch walls.

Another novel object of my invention is to increase the carbonizing capacity of each gas bench of a predetermined area over present standard carbonization methods by charging each retort with coal to substantially its full area by means of an equalizing and charge regulating core and plunger and pusher, which conveys the coal and pusher from a series of magazines into the retorts and by reversing the action of the plunger, the core is withdrawn from the retort, causing the coal to settle from the top providing ample area in each retort for outlet of gas and expansion of the coal during the process of carbonization, the charge of fresh coal being delivered in each retort of the series *en masse*, in one continuous uninterrupted operation and simultaneously with the discharge of coke.

Another object is to provide improved and novel devices which may be easily and readily manipulated by a minimum amount of labor, thereby constituting both a time and labor saving medium.

Another object of the invention is to furnish means whereby the act of charging and discharging of the retorts is performed in series and at the same time the charge in each retort is regulated to meet the required conditions.

A further object of the invention is to couple each series of retorts with a single stand-pipe, also hydraulic mains on both front and rear of the bench of retorts or chamber ovens, and so arranged that the rich gases passing off during the early hours of carbonization are discharged through the stand-pipe at one end of each series of retorts and the lean gas made and passing off the last hours of carbonization and during the time the charge is held in the retorts to harden the coke is conveyed through the stand-pipes at the opposite end of the series of retorts, the hydraulic main being connected with a separate exhausted, condensing, washing and stripping apparatus; also a storage holder.

Another novel object is to provide charging means for maintaining the coal in each retort in such position as to receive the full force of the heat of the furnace throughout the entire length of the retort during the period of carbonization.

Another object of the invention is to so construct my improved devices that all gases generated will be saved during the process of charging and discharging each series of retorts.

A still further object of this invention is to provide a novel magazine charging device arranged in series or singly, each magazine being filled or charged with crushed coal while in a vertical position, then tilted to the proper discharging position and the series of magazines manipulated to enter the cast-iron mouth-piece of the series of retorts, in combination with automatically operated means for discharging *en masse* the contents of the series of magazines within the series

of retorts, and simultaneously discharging the coke from and cleansing the inner surfaces of each retort of the series.

Another object of this invention is to provide a novel and simple horizontal coal-carrying and charge regulating core, fixed inside each magazine, with a portable discharging device on the forward end, and a portable charge pusher in the rear, whereby the hot coke is discharged and the fresh charge of coal delivered into the series of retorts or chambers without coming into contact with the coke, thereby preventing the making and wasting of gas during the process of discharging and charging the retorts or ovens.

Another useful and novel object of my invention is in the use of perforated steel disks, for the ends of the portable discharging device and each pushing device, allowing a free passage of the gas at either end of the retorts to the stand-pipe. One disk on each pusher is also fitted with an adjustable scraping and shaving device fitting against the inside surface of the retorts during the operation of each charge and discharge, and made of any suitable material, thereby preventing the accumulation of carbon in the retorts.

Another novel object of this invention is to adjust only the front end of the steel magazine charging device the distance of the cast-iron mouth-piece and not its full length, into the inside of the retorts, during the process of discharging the hot coke and charging the fresh coal, thereby preventing damage, or destruction of the steel magazine.

Still another object is to provide a device for simultaneously filling the series of magazines with coal while in a vertical position direct from overhead charging hopper tubes, then tilting the series of magazines to a suitable discharging position to deliver the charge into the series of retorts, the discharging device being inserted into the front end of each magazine preventing the spilling of coal during the operation of discharging or charging the retorts or ovens during the conveying of the series of magazines from the coal charging hopper tubes. When the retorts are charged with fresh coal the end of the magazines extending into the cast iron mouthpiece and the solid disk forming the front of the portable discharge pushers effectively close the ends of the retorts thus preventing the first made rich gases from escaping into the atmosphere, but forcing such gases to be conveyed to the hydraulic main through the rear stand pipes, thereby increasing both the quantity and quality of the gas made and preventing the escape of the vapors into the air.

The foregoing and such other objects as may appear from the ensuing description are attained by the novel features of construction, combination, location and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and particularly pointed out in the claims appended hereto, it being understood that slight changes in the form, proportions and minor details of the construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings which form a part of this specification it will be seen that:—

Figure 1 is a sectional view of the gas oven or furnace and the charging and discharging device showing parts in elevation and showing the series of discharge hopper tubes in full lines with the upper portion of the charging magazines in dotted lines and in inverted alinement with the said hopper tubes.

Fig. 2 is a side elevation of the portable magazine carriage for charging and discharging the coke oven retorts, showing in dotted lines the series of magazines in vertical position to receive the supply charge from the hopper tubes.

Fig. 3 is an end elevation of the portable magazine carriage.

Fig. 4 is a detail longitudinal sectional view taken through the magazine and one series of retorts, showing in elevation and partly in section a portion of the charging and discharging plungers.

Fig. 5 is a side elevation of the automatically operated device constituting a portable motor carriage carrying the charging and discharging plungers.

Fig. 6 is an end elevation of the device shown in Fig. 5.

Fig. 7 is a diagrammatical sectional view through the hopper in alinement with the portable magazine carriage, showing said carriage mounted on rails supported by the flooring, or a suitable platform, with the series of magazines positioned to be filled or charged through the depending hopper tubes.

Fig. 8 is an elevation of the equalizing or regulating core bar carried by each of the series of magazines showing in dotted lines the charge pusher on the inner end portion thereof.

Fig. 9 is an enlarged detail cross-sectional view of the core bar shown in Fig. 8, showing in section a portion of the magazine.

Fig. 10 is an end elevation showing one of the metallic plates of the charge pusher carried by the core bar, showing the connecting rods for the plates in cross-section.

Fig. 11 is a sectional view of the charge pusher shown in Fig. 10.

Fig. 12 is a detail sectional view taken through one of the mouth-pieces of one of the series of retorts, showing a retaining de-

vice for retaining the charge pusher in its proper position when the core bar is withdrawn from the charged retort.

Fig. 13 is a detail of the outer end portion of one of the charging magazines showing the slot in its end.

Fig. 14 is a detail sectional view of the inner end portion of one of the charging magazines.

Fig. 15 is a cross-sectional view through one of the charging magazines and core bar, and

Fig. 16 is an elevation of the inner end plate of the discharge pusher showing a plurality of adjustable scraping blades secured to the plate.

Similar numerals of reference are employed to designate corresponding parts throughout the several figures of the drawings.

In carrying out this invention as illustrated and which shows a preferred construction, the numeral 1 indicates the front wall and 1′ the rear wall of a coal gas oven, said oven being provided with a bench of nine horizontally arranged retorts or chambers 2, arranged in series consisting of three retorts or chambers to each series, each series being connected or coupled with a single upright stand-pipe or offtake 3 for conveying the gas to the hydraulic mains 4, at each end of the bench or stack of retorts, and being so arranged that the rich gases are carried away through the stand-pipe at one end of each series of retorts or chambers, and the lean gas is conveyed away by the stand-pipe at the opposite end of each series of retorts or chambers, as clearly shown in Fig. 1 of the drawings. While I have shown a bench of nine retorts or chambers arranged in series of three each coupled together in vertical alinement, each of the series of retorts being charged and discharged simultaneously, it will be understood that any suitable or desirable number of retorts or chambers may be utilized, and any suitable number of the retorts may be coupled in series or arranged singly for simultaneous charging and discharging, and if desired the retorts or chambers may be arranged in an inclined position instead of the horizontal position as shown.

Each of the retorts or chambers is provided at one end with a mouth-piece or entrance member 5 provided with a gas discharge opening 6 leading to the off-take or stand-pipe, and at the other end with a discharge or exit member 7, having a gas discharge opening 8 leading to the off-take 3, each retort or chamber being suitably supported in the gas oven, and provided at each end with any well-known construction of cover or lid.

Arranged parallel with the bench of retorts or chambers at their entrance ends, and movably supported on track rails supported by the flooring or a suitable platform, is a portable magazine charging and discharging carriage, comprising a truck member or frame 9, supported by wheels 10 said frame having secured thereto two upright transversely arranged members 11, each member having a centrally arranged recess in the upper longitudinal surface in which is secured a rail 12, adapted to slidably support a pivoted or swinging frame 13, provided with a member 14 at each side thereof adapted to be slidably supported on the rail 12. Suitably and rigidly secured in a horizontal position to said frame 13 in vertical alinement, is a suitable series of coal carrying magazines 14′ and centrally secured to the frame 13, at each side thereof, is a lateral extension 15 adapted to form a bearing socket for the frame pivotal pintles or stub shafts 16, which rest within and project beyond the said sockets. Suitably secured to one side of the frame 13 is a metallic plate 17, having a notch 18 formed in its peripheral portion adapted to receive and engage the locking member 19, carried by the hand lever 20 secured to the pivot pintle or shaft 16, and adapted to lock the series of magazines when tilted by the said lever into the vertical position, as shown by dotted lines Fig. 2.

Rigidly secured to the frame 9, are two upright brackets, in which is supported a tubular sleeve 22, provided with an internal screw-threaded end portion 22′ adapted to engage with a screw-threaded rod 23, which is secured at one end to a bar 24, the latter being pivotally secured to an upright lever bar 25, pivotally secured at its lower end to the frame 9, and at its upper end to a horizontally extended bar 26 secured to the pintle or shaft 16, and suitably secured to the frame 9 is a metallic upright member 27, provided with an opening 28 adapted to receive and support shaft 29 provided at one end with a bevel gear-wheel 30 engaging with a bevel gear wheel 30′ supported by the bracket 21, the other end of said shaft 29 being provided with an operating handle 29′, as shown in Figs. 2 and 3, which handle when manipulated to the right or left causes the frame with its series of magazines to slidingly advance and the magazines to enter the mouth-pieces of the series of retorts for the charging and discharging operation or to slidingly move away, respectively, and be disengaged from the retorts for the purpose of moving the magazine carriage into the proper position for another charge.

The magazines are each provided with a metallic equalizing or regulating core bar 31 for properly and suitably regulating the charge to be forced into the retorts or chambers, said core-bar consisting of a horizontal member 32 and a central depending member

33, and being provided at its outer end portion with an integral disk 34 adapted to snugly fit the interior surface of the magazine wall and close its outer end, which disk has rigidly secured thereto or integral therewith at its central portion an outwardly projecting annular solid metallic member 35, which passes through an opening 35′ formed in the inner end wall of the magazine, said member 35 having an annular notch 36 formed therein, and a cone-shaped outer end 37 for the purpose hereinafter described. Projecting outwardly from the peripheral portion of said disk 34 is a member 38 adapted to engage a recessed or slotted portion 39 formed in the inner end wall 39′ of the magazine which serves to prevent any rotary movement of the said core-bar, and each magazine is provided with an inwardly extending longitudinal metallic guide plate 40, suitably secured thereto, which plate 40 is straddled by the plates 41, one secured to each side of the central member 33 of the core-bar, thereby serving as a true guide for the core-bar in its reciprocating back and forth movement during the charging and discharging operation of the retorts and its withdrawal and preventing any wabbling or sidewise movement of said corebar.

A core-bar is normally secured in each magazine and when it is desired to fill the magazine a charge pusher is passed over the outer end portion and caused to assume a position against the disk 34, as shown in Fig. 4 and by dotted lines Fig. 8, said charge pusher comprising two perforated metallic plates 42, each provided with a horizontal slot 43, and a vertical slot 44, so that the pusher may be slid over the core-bar to the rear end-portion thereof, said plates being provided with a series of openings or perforations 45 therethrough to permit the escape of gas, and being secured at a suitable distance apart by suitable threaded bolts 46, and nuts 47, as clearly shown in Figs. 10 and 11. After each magazine of the series shall have been properly filled with the measured charge of coal, a portable discharge pusher consisting of two metallic plates 42′ and 43′ is inserted in the front end of each magazine in contact with the core bar and coal, said plates being connected together with suitable bolts and nuts such as are used in connection with the charge pusher hereinbefore described, the rear plate 42′ being provided with suitable openings or perforations for the escape of gas therethrough, and having a vertical slot 44′, to permit the discharge pusher to be slid over the reduced front end portion 31′ of the core-bar, as shown in Fig. 4, and the said rear plate 42′ is provided with a plurality of adjustable scraping blades 45′, each blade having an elongated slot 46′ therethrough adapted to receive a suitable adjusting device 47′, as shown in Fig. 16, whereby the said blades may be so adjusted as to scrape and clean the inner surface or wall of the retort as the discharge pusher is forced from the front to the rear thereof, while the front plate of the discharge pusher is made of a solid plate or disk 43′. Thus the front plate and scraping blades serve to push out the coke, and clear the gas retort or chamber simultaneously with the charging of the retorts or chambers with a fresh supply of coal.

Arranged parallel with and at one side of the magazine carriage, is a portable motor carriage supported on rails secured to the flooring or a suitable platform, said motor carriage comprising a frame 48, supported on wheels 49, and said frame supporting a series of cylinders 50, each cylinder being provided with a reciprocating plunger 51, and each plunger having secured to its forward end a spring-operated pivoted lever 52 provided with a catch or latch 53, adapted to engage the annular notched portion 36 of the member 35 carried by the rear end of the core-bar 31, with the end 37 of the member 35 resting within the tubular end portion 54, and against the solid end wall 54′ at the outer end portion of each plunger. Suitably connected to the frame 48 at each side thereof is properly arranged a compressed air supply pipe 53′ and an exhaust pipe 54′, each supply pipe and exhaust being connected to the said cylinders by the manifolds 55 and 56 at each end of the cylinders, a shut-off valve 57 being arranged in each supply pipe, and a valve 57′ in each exhaust pipe, each valve being provided with an arm 58, to which arm is pivotally connected a bar 59 to which bar is secured an operating lever 60, the precise construction and arrangement of the parts being the same at each side of the carriage and by the proper manipulation of said lever the air supply to the cylinders is controlled and the series of reciprocating plungers moved into proper alinement with the filled or charged magazines and coupled with the outer end of each core-bar, the outer solid end portion of each plunger engaging with the cone-shaped projecting portion of said core-bar and the plungers automatically projected forward, thereby discharging the series of filled magazines into the series of retorts and simultaneously discharging and cleaning out the series of retorts or chambers, after which the withdrawal or return movement of the series of plungers simultaneously withdraws and returns each core-bar to its normal position within each magazine to continue the charging and discharging operation, as is clearly shown in Figs. 4 and 5 of the drawings.

Referring to Fig. 7 will be seen a storage bin or bunker 61 having a hopper-shaped bottom portion 62, provided with a series of depending discharge tubes 63, which tubes

are adapted to measure and discharge into the magazines supported on the magazine carriage and arranged in vertical alinement with said discharge tubes, a suitable and predetermined quantity of coal to constitute the most desirable and effective charge for properly filling or charging each of the gas retorts or chambers.

It will be seen by reference to Fig. 12 that the mouth-piece of each retort is provided with a gravity catch or retaining latch 64 which serves to prevent the accidental withdrawal of the charge pusher from the retort during the withdrawal of the core by the operating plunger 51, the disk 34 being provided with a slotted portion 65 which permits the core to freely pass the said catch, and the outer end of each magazine is provided with a suitable slot 66 to prevent in any manner the engagement of the ends of the magazine with the said catch or latch 64.

While I prefer to utilize my improved charging, discharging and cleaning apparatus in connection with cylindrical or tubular retorts or chambers, it will be readily obvious that by making slight changes in the shape or contour of the several members employed the apparatus may be readily utilized for the charging, discharging and cleaning of any shape of retort or chamber now in use in the manufacture of coal gas, coke and by-products.

It will be perceived by reference to Figs. 1 and 4, that the charge pusher provided with its perforated end plates is so positioned in the retort as to occupy only the space which is surrounded by the front oven wall 1, while the discharge pusher and cleaner provided with a perforated rear end portion and a solid front portion occupies a space in the retort surrounded by the rear wall 1 and the discharge or exit member 7, the entire charge of coal being held intact between the outer end of the charge pusher and the inner end of the discharge pusher in such position as to subject the full charge of coal to the entire heat of the oven, the end of the magazine being entered into the mouth-piece of the retort. The gas generated from the fresh charge of coal is carried off through the rear stand pipe thus preventing the wasting of the same into the atmosphere as is now customary by the preseut methods employed, thereby increasing both the quantity and quality of the gas.

I desire it to be understood that the charge is equalized and regulated by the size of the core employed in connection with each charging magazine, since a core of predetermined dimensions may be utilized so as to fill each retort to its full capacity and at the same time allow for the expansion of the coal within the retort, and sufficient space for the escape of the gases at each end of the retort when the core is withdrawn from the loaded retort back into the empty magazine.

Further, it will be understood that any suitable motive power may be employed for operating the plungers carried by the portable motor carriage, as well as the tilting and slidable frame carried by the portable magazine carriage.

The operation of my improved apparatus briefly described is as follows:—

Each of the coal carrying magazines which are pivotally supported and carried by a movable carriage, contains the movable equalizing and charge regulating core bar 31, and said carriage is moved to a position directly beneath the coal supply and said magazines tilted to an upright position the charge pusher is inserted into each magazine; the magazines are then properly filled with a measured supply of coal by means of the coal supply tubes shown in Fig. 7, and a discharge pusher is inserted into the end of each magazine with its inner end plate in contact with the coal; the said carriage is then moved into alinement with the retorts to be charged; the magazines being tilted into a horizontal position they are adjusted inwardly within the mouth-piece of each retort by the operating mechanism carried by the said carriage until the end of each magazine contacts with the end of each retort, when the motor carriage carrying the operating plungers is moved into proper alinement with the magazine carriage, and the outer end portion of each plunger is connected to the rear extension formed on each of the equalizing and charge regulating cores; the motive power being then applied the said plungers will be caused to move forwardly in unison thereby causing the discharge pushers, the charges of coal and the charge pushers to move in unison into the position shown within the middle retort illustrated in Fig. 4 of the drawings, whereby the coke in the retort will be discharged simultaneously with the entrance of another charge of fresh coal into the retort; the motive power being then reversed the plungers are withdrawn carrying back with them the equalizing and regulating cores into their proper position within the magazine, and leaving the charge of coal within the retort, and the charge and discharge pushers in the position shown in the bottom retort as illustrated in Fig. 4.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A charging and discharging apparatus for retorts, comprising means for simultaneously loading a series of magazines in a vertical position, means for tilting the series of loaded magazines into a horizontal position, and means for simultaneously charging a series of retorts.

2. A charging and discharging apparatus for retorts, comprising means for simultaneously loading a series of magazines in a vertical position, means for tilting the series of loaded magazines into a horizontal position, and means for simultaneously charging and discharging a series of retorts.

3. A charging and discharging apparatus for retorts, comprising means for simultaneously loading a series of magazines in a vertical position, means for tilting the series of loaded magazines into a horizontal position, means for simultaneously charging a series of retorts, and means carried by the magazines and projected therefrom for simultaneously charging, discharging and cleaning a series of retorts.

4. A charging and discharging apparatus for retorts, comprising means for simultaneously loading a series of magazines in a vertical position, means for tilting the series of loaded magazines into a horizontal position, means carried within the magazines and projected therefrom for simultaneously charging a series of retorts, and means carried by the magazines and projected therefrom for simultaneously discharging and cleaning a series of retorts.

5. A charging and discharging apparatus for retorts, comprising a series of charging magazines loaded while in vertical position, means for tilting the series of magazines into a horizontal position, a longitudinal core carried by each magazine, a combined pusher and retort cleaner carried at the outer end of each core, and a charge pusher carried at the inner end portion of each core.

6. A charging and discharging apparatus for retorts, comprising a series of charging magazines simultaneously loaded while in a vertical position, means for tilting the series of magazines into a horizontal position, means for slidably moving the discharge end of the magazines into the mouth-piece of a series of retorts, and a reciprocating equalizing and charge regulating core carried by each of said magazines.

7. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in a vertical position, means for tilting the series of charged magazines into a horizontal position, and a reciprocating equalizing and charge regulating core carried by each magazine for simultaneously charging and discharging a series of retorts.

8. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in a vertical position, means for tilting the series of magazines into a horizontal position, means for slidably moving the discharge end of the magazines into the mouth-piece of a series of retorts, and a reciprocating equalizing and charge regulating core carried by each magazine for simultaneously charging and discharging said series of retorts.

9. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means for tilting the series of magazines into a horizontal position, a longitudinal reciprocating equalizing and charge regulating core carried by each magazine, and a combined pusher and retort cleaner carried at the outer end portion of each core.

10. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means for tilting the series of charged magazines into a horizontal position, a longitudinal reciprocating equalizing and charge regulating core carried by each magazine, a combined pusher and retort cleaner secured to the outer end of each core, and a charge pusher carried at the inner end of each core.

11. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means for tilting the series of charged magazines into a horizontal position, means for slidably moving the forward end of the magazines into the mouth-piece of a series of retorts, a longitudinal reciprocating equalizing and charge regulating core carried by each magazine, a combined discharge pusher and retort cleaner secured to the outer end of each core bar, and a charge pusher or follower secured to the inner end of each core.

12. A charging and discharging apparatus for retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means for tilting the charged magazines into a suitable discharging position, an equalizing and charge regulating core carried by each magazine and means for manipulating said cores to simultaneously charge and discharge a series of retorts.

13. A charging and discharging apparatus for a series of retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means for tilting the charged magazines into a suitable discharging position, an equalizing and charge regulating core carried by each magazine, a combined discharging pusher and retort cleaner secured to the outer end of each core, and means for manipulating said cores to simultaneously charge and discharge said series of retorts.

14. A charging and discharging apparatus for a series of retorts, comprising means for simultaneously charging a series of magazines while in vertical position, means

for tilting the charged magazines into a suitable discharging position, an equalizing and charge regulating core carried by each magazine, a combined discharging pusher and retort cleaner secured to the outer end of each core, a charge pusher secured to the inner end of each core, and means for manipulating said cores to simultaneously charge and discharge said series of retorts.

15. A charging and discharging apparatus for a series of retorts, comprising means for charging a series of magazines while in vertical position, means for tilting the charged magazines into a suitable discharging position, an equalizing and charge regulating core carried by each magazine, and means for manipulating said cores to simultaneously charge, discharge and clean said series of retorts.

16. A charging and discharging apparatus for a series of retorts, comprising means for loading a series of magazines while in vertical position, means for tilting the series of charged magazines into discharging position, means for slidably moving the ends of the magazines into the mouth-pieces of the series of retorts, an equalizing and charge regulating core carried within each magazine, and means for manipulating the series of cores to simultaneously charge and discharge the series of retorts.

17. A charging and discharging apparatus for a series of retorts, comprising a portable carriage arranged parallel with said retorts and carrying a series of magazines which are charged while in a vertical position, means carried by said carriage for tilting the series of magazines into suitable discharging position, means secured to the carriage for slidably moving the discharge end of the series of magazines into the mouth-pieces of the series of retorts, an equalizing and charge regulating core secured within each magazine, and means for manipulating said cores to simultaneously charge, discharge and clean said series of retorts.

18. A charging and discharging apparatus for a series of retorts, comprising a portable charging carriage carrying a series of magazines which are charged while in a vertical position, means secured to the carriage for tilting the series of magazines into discharging position, an equalizing charge regulating core secured within each magazine, and means for manipulating said cores to simultaneously and automatically charge and discharge the said series of retorts.

19. A charging and discharging apparatus for a series of retorts, comprising a portable charging carriage carrying a series of magazines which are charged while in vertical position, means secured to the carriage for tilting the series of magazines into discharging position, an equalizing and charge regulating core secured within each magazine, and a portable carriage adjacent said charging carriage carrying means for manipulating said cores to simultaneously and automatically charge and discharge the said series of retorts.

20. A charging and discharging apparatus for a series of retorts, comprising a portable charging carriage carrying a series of magazines which are charged while in vertical position, means secured to the carriage for tilting the series of magazines into discharging position, means secured to the carriage for slidably adjusting the discharge end of the series of magazines within the mouth-pieces of the series of retorts, an equalizing and charge regulating core carried by each magazine, and a portable carriage adjacent said charging carriage provided with means for manipulating said cores to simultaneously and automatically charge and discharge the said series of retorts.

21. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, means secured to the carriage for tilting said magazines into the charging position, means carried by the carriage for tilting the series of magazines into discharging position, an equalizing and charge regulating core carried within each magazine, and a portable carriage provided with a series of plungers for manipulating said cores to simultaneously charge and discharge the said series of retorts.

22. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, means secured to the carriage for tilting the series of magazines into the charging position, means carried by the carriage for tilting the magazines into discharging position, an equalizing and charge regulating core carried within each magazine, means for discharging and cleaning said retorts carried by the core, and a portable carriage carrying a series of plungers for manipulating said cores to simultaneously and automatically charge and discharge the said series of retorts.

23. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, an equalizing and charge regulating core carried within each magazine, said core consisting of a longitudinal metallic T-shaped bar carrying a retort discharging pusher and cleaner at one end, and a charge pushing device at its other end, and means connected to each core for so manipulating the cores as to simultaneously charge and discharge the said series of retorts.

24. A charging and discharging apparatus for a series of retorts, comprising a port-

able carriage carrying a series of charging magazines, an equalizing and charge regulating core carried within each magazine, said core consisting of a longitudinal T-shaped bar carrying a retort discharging and cleaning device at one end, and a charge pusher at its other end, and means detachably connected to the outer end of each core for so manipulating the cores as to simultaneously charge, discharge and clean the series of retorts.

25. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, a guide plate extending within each magazine extending throughout the length of the magazine, an equalizing and charge regulating core carried within each magazine adapted to slidingly straddle the said guide plate, and means detachably connected to the inner end of each core for so manipulating the cores as to simultaneously charge and discharge the series of retorts.

26. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of tiltable charging magazines, a guide plate secured to and projecting within each magazine, an equalizing and charge regulating core carried within each magazine, said core consisting of a horizontal plate with a depending central member secured thereto and adapted to slidingly straddle the said guide plate, and means detachably connected to the inner end of each core for so manipulating the cores as to simultaneously charge and discharge the series of retorts.

27. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, a guide plate projecting within each magazine, an equalizing and charge regulating core carried within each magazine, said core consisting of a horizontal plate with a depending central member secured thereto and provided with a reduced outer end portion adapted to engage a retort discharging pusher and cleaner, and means connected to the inner end of each core for so manipulating the cores as to simultaneously charge, discharge and clean the series of retorts.

28. A charging and discharging apparatus for a series of retorts, comprising a portable carriage carrying a series of charging magazines, a guide plate projecting within each magazine, an equalizing and charge regulating core carried within each magazine, said core consisting of a horizontal plate with a central depending member secured thereto adapted to slidingly straddle said guide plate, and provided with a reduced outer end portion to engage a retort discharging and cleaning device, and having a closed inner end portion adapted to engage the charge pusher, and means connected to the inner end portion of each core for so manipulating the cores as to charge, discharge and clean the series of retorts in unity.

29. A charging and discharging device for a series of retorts, comprising a portable carriage carrying a series of charging magazines, each magazine being provided with an equalizing and charge regulating core, said core consisting of a horizontal metallic plate with a central member depending therefrom reduced at its outer end portion to receive a retort discharging and cleaning device, a closed inner end portion adapted to contact with a charge pushing device, and a projecting outer end portion, and means connected to said outer end portion of each core to so manipulate the cores as to charge, discharge and clean the series of retorts in unity.

30. A charging and discharging device for a series of retorts, comprising a portable carriage carrying a series of charging magazines, a guide plate projecting within each magazine, an equalizing and charge regulating core carried within each magazine, each core consisting of a horizontal metallic plate with a central member depending therefrom adapted to straddle said guide plate and reduced at its outer end portion to engage a retort discharging and cleaning device, a closed inner end portion adapted to contact with a charge pushing device, and a projecting outer end portion, and means detachably connected to said outer end portion to so manipulate the cores as to automatically charge, discharge and clean the series of retorts in unity.

31. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position, means for tilting the magazine into a suitable discharging position, and means for simultaneously charging and discharging the retort.

32. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position, means for tilting the charged magazine into a horizontal position, and means carried by the magazine for simultaneously charging, discharging and cleaning the retort.

33. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position, means for tilting the charged magazine into a horizontal position, a reciprocating core carried within the magazine, and means secured to said core for simultaneously charging, discharging and cleaning the said retort.

34. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position,

means for tilting the charged magazine into a suitable discharging position, a guide plate projecting within the magazine and secured thereto, a reciprocating core carried within the magazine, and means secured to the said core for simultaneously charging, discharging and cleaning the said retort.

35. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position, means for tilting the magazine into a suitable discharging position, a guide plate secured to the magazine projecting therein, a reciprocating core straddling said guide plate, and means carried by the said core for charging, discharging and cleaning the retort.

36. A charging and discharging device for a retort, comprising means for charging a magazine while in its vertical position, means for tilting the magazine into a horizontal position, a reciprocating core carried by the magazine provided with a rear extension, and means connected to the said rear extension of the core for projecting the contents of the charged magazine into the retort, and simultaneously charging, discharging and cleaning the retort.

37. A charging and discharging device for a series of retorts, comprising a series of charged magazines, means for tilting the said magazines into a suitable discharging position, a reciprocating core carried by each magazine, a guide plate secured within each magazine adapted to guide said core, a portable discharge pusher carried by the reduced outer end of each core, said pusher being provided at one end with a plurality of scraping blades, and means carried by each core for charging and discharging the series of retorts in unity.

38. A charging and discharging device for a series of retorts, comprising a series of charged magazines, means for tilting the magazines into a suitable discharging position, a guide plate secured to each magazine and projecting within said magazine, a reciprocating core within each magazine having a reduced outer end portion, and a slotted disk at its inner end adapted to straddle the guide plate, and an outward extending cylindrical rear end portion provided with an annular notch, and means detachably connected to said annular notch for ejecting the contents of the charged magazines into the retorts, and simultaneously charging, discharging and cleaning each retort of the series.

39. A charging and discharging device for a series of retorts, comprising a series of charged magazines, means for tilting the series of magazines into a horizontal discharging position, a guide plate secured to each magazine and projecting therein, a reciprocating core carried within each magazine adapted to straddle said guide plate and reciprocate thereon, a portable discharge pusher secured to the outer end of the core, a portable charge pusher carried at the inner end of the core, and means for simultaneously charging, discharging and cleaning each retort of the series.

40. A charging and discharging device for a series of retorts, comprising a series of charged magazines, means for tilting the charged magazines into discharging position, a reciprocating core carried by each magazine, a portable discharge pusher secured to the outer end of each core having a plurality of scraping blades secured at one end thereof, a portable charge pusher carried at the inner end portion of said core, and means detachably connected to the rear extension of said core for ejecting the contents of the magazines into the retorts, whereby the series of retorts are simultaneously charged, discharged and cleaned.

41. A charging and discharging device for a series of retorts, comprising a series of charging magazines, a guide plate secured to each magazine, a reciprocating core carried within each magazine adapted to straddle said guide plate and reciprocate thereon, a portable discharge pusher and retort cleaner carried at the outer end of the core, a portable charge pusher carried at the inner end of the core, and means connected to each core for simultaneously charging, discharging and cleaning the said series of retorts.

ALFRED D. CRESSLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."