

No. 663,213.

Patented Dec. 4, 1900.

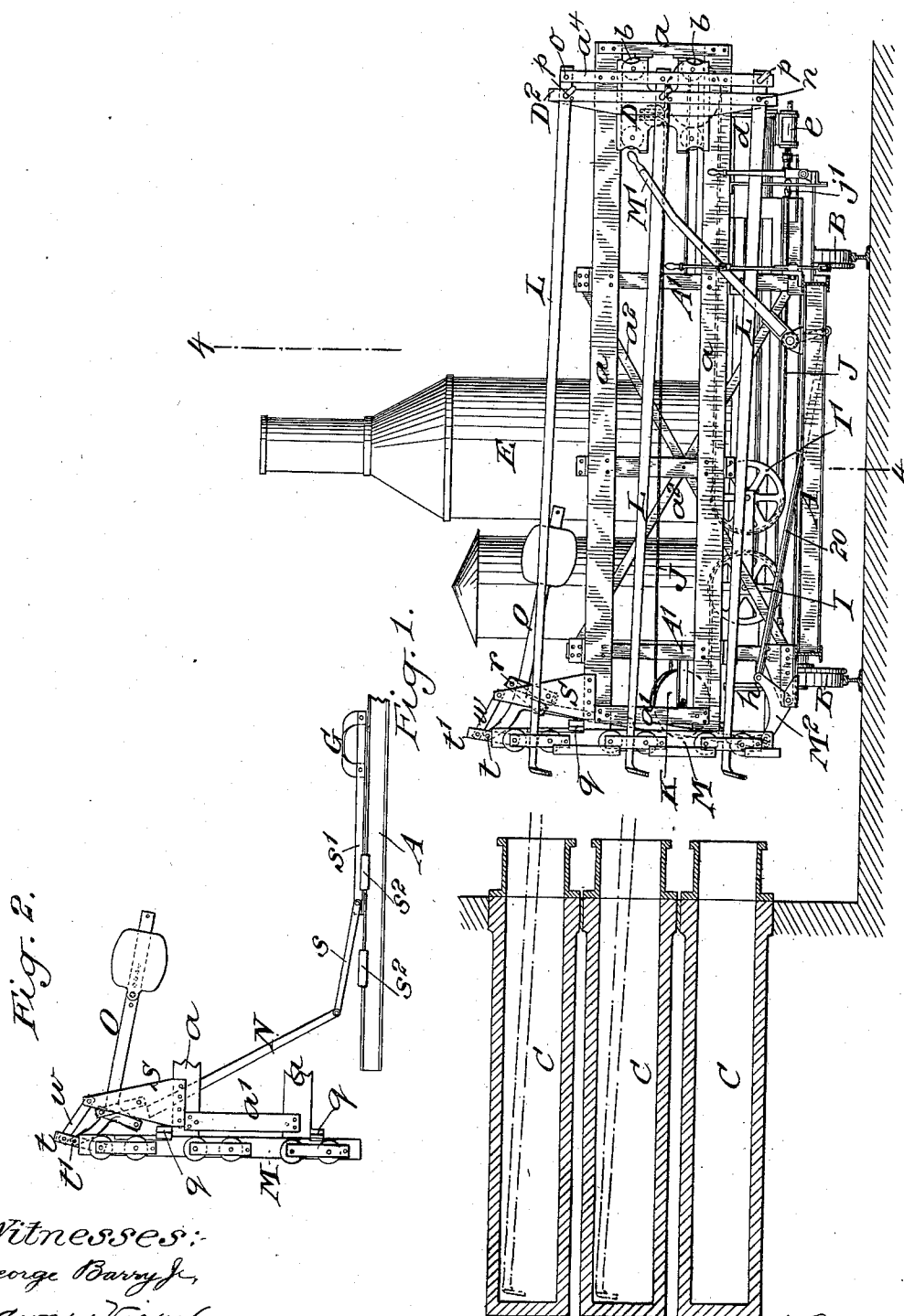
G. A. BRONDER.

MACHINERY FOR DISCHARGING GAS RETORTS.

(Application filed May 12, 1900.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
George Barry Jr.
Edward T. Viner.

Inventor: G. A. Bronder
By: J. H. Brown & Co. Attorneys

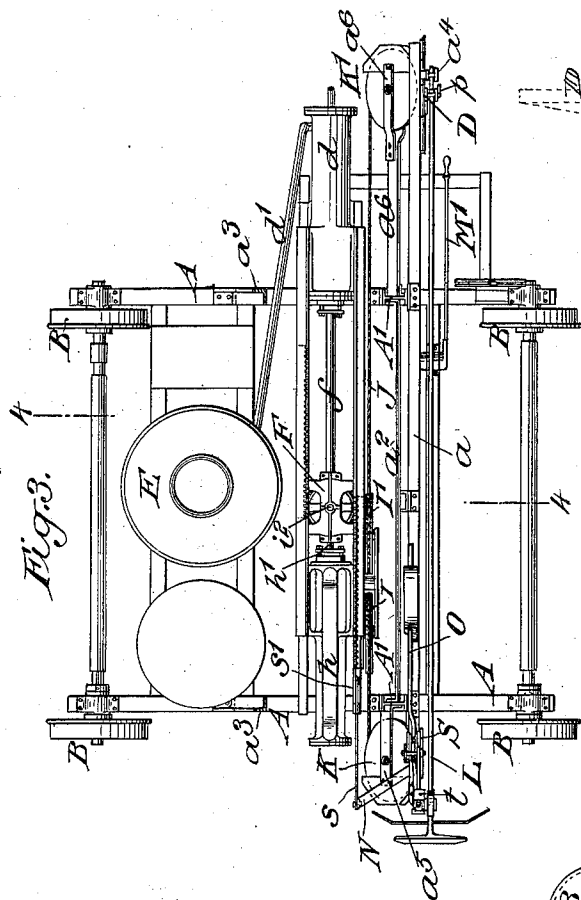
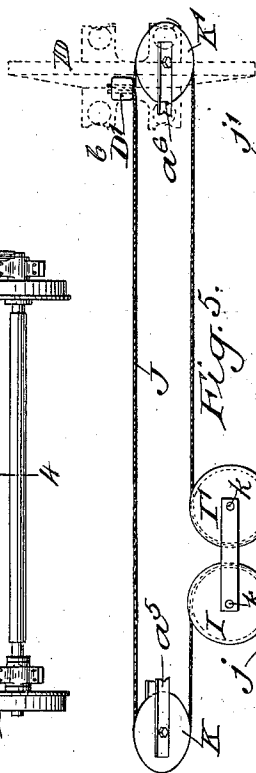
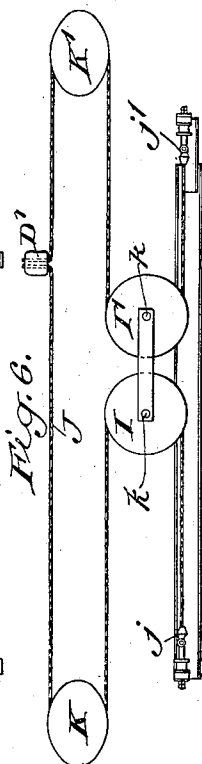
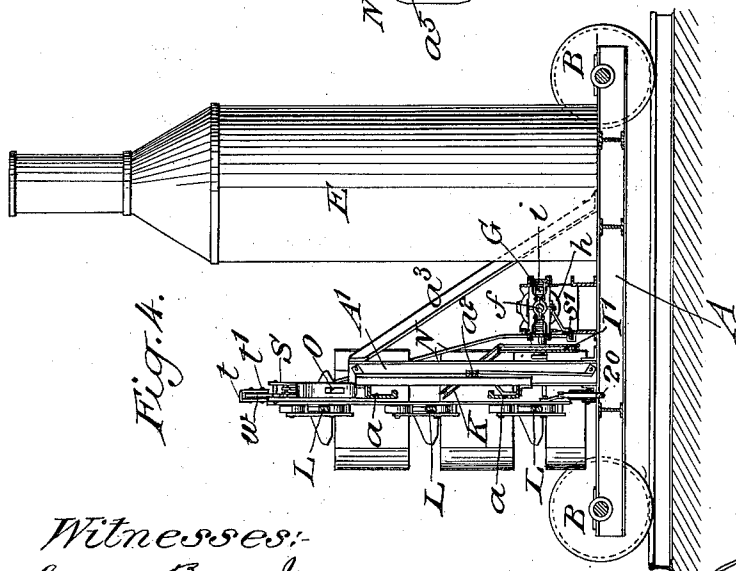
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(No Model.)

4 Sheets—Sheet 2.



Witnesses:-
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4 Sheets—Sheet 3.

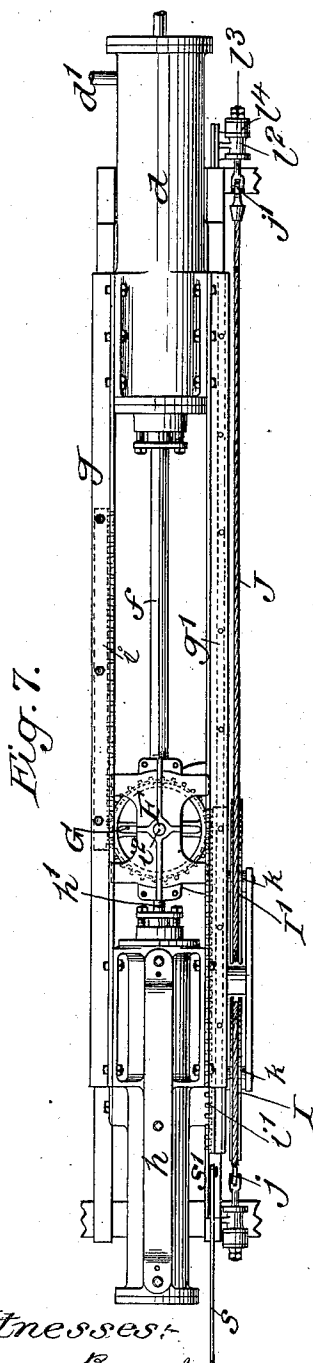


Fig. 7.

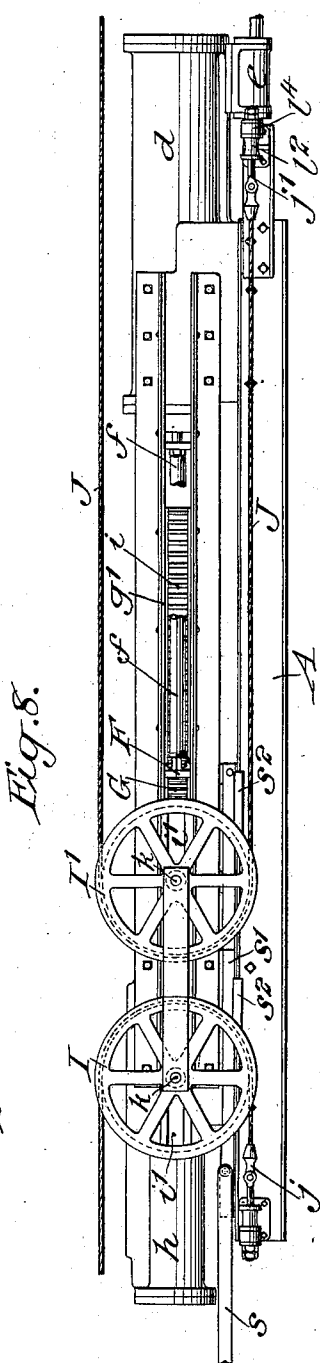


Fig. 8.



Fig. 12.

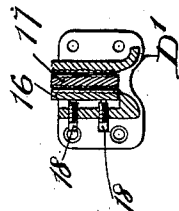
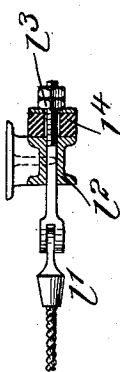


Fig. 11.



Witnesses:-
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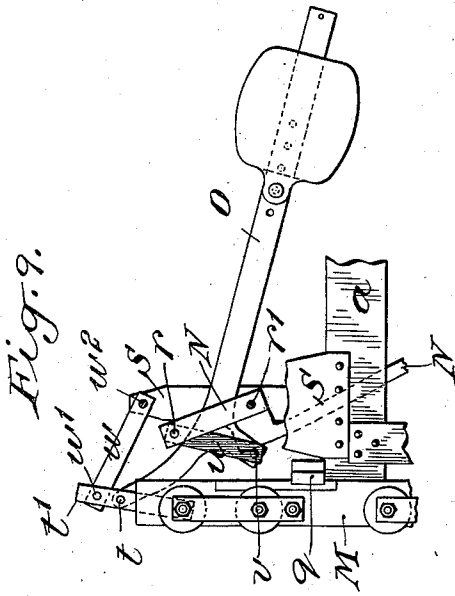
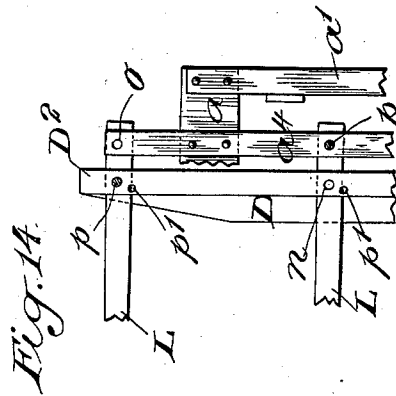
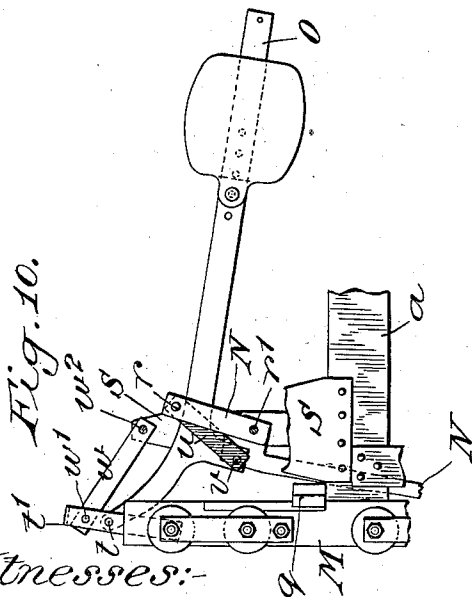
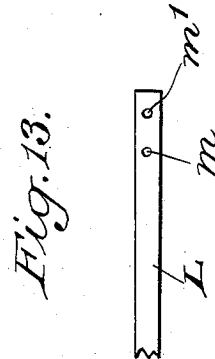
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MACHINERY FOR DISCHARGING GAS RETORTS.

(Application filed May 12, 1900.)

(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

GASTON A. BRONDER, OF NEW YORK, N. Y.

MACHINERY FOR DISCHARGING GAS-RETORTS.

SPECIFICATION forming part of Letters Patent No. 663,213, dated December 4, 1900.

Application filed May 12, 1900. Serial No. 16,452. (No model.)

To all whom it may concern:

Be it known that I, GASTON A. BRONDER, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York and State of New York, have invented a new and useful Improvement in Machinery for Discharging Gas-Retorts, of which the following is a specification.

This improvement relates to the means for moving the rake-carrier and also to the connections of the movably-fulcrumed counterbalance-lever from which the rake-lifter is suspended and which constitutes an important feature of my United States Patent No. 595,039; and it further relates to means for connecting the rakes either with the rake-carrier or with the main frame or carriage of the discharging-machine.

Figure 1 of the accompanying drawings represents a side elevation of a retort-discharging machine embodying my invention and a vertical section of one retort of each of three tiers; Fig. 2, a side view of the rake-lifting bar and its counterbalance-lever and the means for changing the position of the fulcrum of said lever; Fig. 3, a plan of the machine; Fig. 4, a transverse section taken approximately in the line 4-4 of Figs. 1 and 3; Figs. 5 and 6, side views of part of the mechanism for moving the rake-carrier, representing it in different positions; Fig. 7, a plan, and Fig. 8 a side view, of parts of the rake-carrier-operating mechanism on a larger scale than the preceding figures; Figs. 9 and 10, side views of the upper part of the rake-lifting bar, its counterbalance-lever, and the means for automatically adjusting the fulcrum of the latter. Figs. 11, 12, 13, and 14 are views of certain details, which will be hereinafter explained.

Similar characters of reference designate corresponding parts in all the figures.

A A^1 a^1 a^2 a^3 a^4 designate the main frame of the machine, A being the base or platform, having erected upon it the uprights A^1 , which support the horizontal guides a for the rake-carrier D and which are braced together by the uprights a^1 , the whole being braced by diagonal braces a^2 a^3 and constituting a carriage which is mounted on wheels B, running on tracks parallel with the front of the bench

or stack of retorts C, which are represented as in three tiers.

The rake-carrier D is represented as furnished with rollers b , which run, as is common, between the horizontal guides a in the main frame. The said carrier derives its motion, as is common in retort-discharging machines, from a piston working in a horizontal cylinder d of a direct-acting reciprocating motor which is mounted on the main frame or carriage and represented as supplied with steam through a pipe d' , under the control of a suitably-operated valve e , from a steam-boiler E on said carriage. The piston-rod f of this motor has connected with it a hollow cross-head F, which runs between horizontal guides g g' on the main framing, and to this cross-head is also connected the rod h' of a piston which works in a hydraulic cylinder h , arranged in line with the steam-cylinder d on the main framing. This hydraulic cylinder, which serves as a governor, may be organized in any suitable manner for controlling and checking the movement of the steam-piston—for example, like that described in my United States Patent No. 595,039. It is the mechanism which transmits motion from the piston-rod f through the cross-head F to the rake-carrier which constitutes one of the important features of the invention and which I will now proceed to describe.

In the cross-head F there is a pin i^2 , upon which there turns freely a gear G, which engages with a fixed rack i , secured to the guide g on one side of the cross-head and with a flying rack i' , which runs in or on the guide g' on the other side of the cross-head. The movement of the cross-head produced by the piston-rod f carries the gear G back and forth along the fixed rack and so causes the gear to turn on the pin i^2 and produce a longitudinal movement of the flying rack i' twice the length of that of the piston-rod and cross-head. The flying rack carries on two pins k , secured therein, two idler-sheaves I I'. A wire rope J, fastened at one end j to the forward part of the platform A or main frame, as shown in Figs. 5 and 6 and partly shown in Figs. 1, 7, and 8, passes around the sheave I, thence to an idler-sheave K, carried by an arm a^5 on the main frame at the front end of

the machine, thence backward to the rake-carrier D, with which it is connected, thence to and around an idler-sheave K', carried by an arm α^6 , projecting from the main frame at the rear end of the machine, thence forward to and around the idler-sheave I', and again backward to the rear end of the platform A or main frame, to which its other end j' is connected. The movement of the flying rack i' produced by the gear G pulling on the two parts of the rope running on its sheaves I I' imparts through the rope to the rake-carrier a movement equal to double the stroke of the said rack, and hence the rack having double the stroke of the steam-piston and cross-head the rake-carrier D has four times the stroke of the piston. This rope J is preferably made of two lengths united at the connection with the rake-carrier D by a clamp of any suitable kind on the carrier, as shown at D' in Figs. 5 and 6. The connections of the ends $j j'$ of the rope with the frame are represented as made each with a screw take-up, of which Fig. 11 is a longitudinal sectional view, consisting of a rod l' , to which the rope end is attached in any suitable manner and which passes through a box l^2 , bracketed on the machine-framing, and which is screw-threaded to receive a tightening-nut l^3 . Between this nut and the outer end of the box l^2 is a rubber cushion l^4 , against which the nut is screwed up to take up the slack of the rope, which in this way can be done quickly while the machine is in operation. The rubber cushions act as springs for preserving to a certain degree the tension of the rope. When by the stretching of the rope or from other cause the take-ups $l l'$ have operated to their available limit, the clamp D' is unfastened and one or both of the contiguous ends of the two lengths of the rope is or are drawn up through it and the rope thereby brought to proper tension. The clamp represented consists, as shown in section, Fig. 12, of a box D', in which are two clamping-pieces 16 17, which are caused to bite the rope by means of set-screws 18.

In retort-discharging machines heretofore used when one or more of the rakes were not required to be used and therefore were disconnected from the rake-carrier and connected with the main frame or carriage it was necessary, after unpinning them from the carrier, to pull back such rake or rakes by hand a considerable distance, which required great exercise of strength by an attendant. To obviate this, I make the bars of the rakes L long enough to extend rearward a sufficient distance beyond the pin-plate D² of the carrier D to enable them to be pinned to the pin-plate α^4 of the main frame or carriage, and I provide in each bar two holes $m m'$, one to receive the connecting-pin p when the said pin is inserted through the hole n provided for it in the pin-plate D² of the carrier, and the other to receive said pin when in-

serted through the hole o provided for it in the pin-plate α^4 of the main frame or carriage. This is illustrated in Fig. 1, but better, on a larger scale, in Figs. 13 and 14, Fig. 13 representing a side view of the rear end portion of a rake-bar and Fig. 14 a side view of portions of the rake-carrier and the pin-plate of the main frame or carriage, with the pins p in section. In Fig. 14 two rake-bars are shown, the upper one of said bars being attached to the rake-carrier by having its pin p inserted through its hole m and the hole n of the carrier, and the lower one of said bars being held back to the main frame or carriage by the insertion of its pin p through its hole m' and through the hole o of the pin-plate α^4 of the main frame or carriage. To provide for taking the weight of the rake-bar off the pin p when it is desired to withdraw the latter either from the carrier or the main frame or carriage, a hole p' is provided, as shown in Fig. 14, in the pin-plate D² under each hole n for the insertion under the rake-bar of a hand-lever with which to pry it up.

M is the rake-lifter, working vertically in guides $q q$ on the main frame or carriage. This lifter is worked, as shown in Fig. 1, by a hand-lever M' on the main frame or carriage, the lower end of the said lever being connected by a rod 20 with one arm of an elbow-lever M² on the forward portion of the frame or carriage, the other arm of the said lever being connected with the bottom of the lifter.

O is the counterbalance-lever, applied to counterbalance the weight of the lifter and as much of the weight of the rakes as comes upon the lifter and having a movable fulcrum consisting of a pin r , supported in the upper arm of a lever N, which may be termed the "fulcrum-shifting" lever and which has its own fulcrum r' in a standard S, which is rigidly supported on the main frame or carriage. The lower end of this lever N is connected by a rod s with a slide s' , which is affixed to the cross-head F and works in guides s^2 on the main frame or carriage. The said rod and slide and the cross-head form a direct connection between the said lever N and the piston-rod of the motor-cylinder, whereby the said piston-rod is made to operate the said lever for shifting the fulcrum r of the counterbalance-lever O nearer to or farther from the rake-lifter M, as illustrated by Figs. 9 and 10, as the rakes are moved forward and backward by the carrier D, and a greater or less portion of their weight is brought upon the lifter M.

The connections between the fulcrum-shifting lever and the counterbalance-lever, which are shown in Figs. 1 and 2, but better on the larger scale in Figs. 9 and 10, are substantially like those described in my United States Patent No. 595,039, the counterbalance-lever being suspended from its fulcrum-pin r by means of two links u , the upper ends of which

are pivoted to said pin and the lower ends of which are pivoted to the said lever by a pin v ; but the rake-lifter instead of being, as represented and described in said patent, directly pivoted to the counterbalance-lever is suspended therefrom by a link t' , which is pivoted to said lever by a pin t . This link t' is prolonged upward beyond the pin t , and its upward prolongation is pivoted by a pin w' to one end of a radius-bar w , the other end of which is pivoted by a pin w^2 to any suitable part of the main frame or carriage—the stand S , for example. By this link connection of the counterbalance-lever with the rake-lifter and the radius-bar applied to said link connection I am enabled to prevent almost entirely the production of any backward and forward thrust on the rake-lifter bar by the fulcrum-shifting lever and the counterbalance-lever and to substitute for the roller-guides heretofore used for the rake-lifter guides q of any simple form, in or against which it may slide freely.

It will be obvious that a chain may be substituted as an equivalent for the wire rope J . What I claim as my invention is—

1. In a machine for discharging gas-retorts, the combination with a carriage and a rake-carrier arranged to run therein, of a motor-cylinder and a fixed rack and a flying rack all on said carriage, a gear carried by the piston-rod of said motor-cylinder and engaging with both of said racks, sheaves pivotally attached to said carriage, sheaves pivotally attached to said flying rack, and a rope connected at two points with said carriage and also connected with the rake-carrier and running on said several sheaves, substantially as herein described.

2. In a machine for discharging gas-retorts, the combination with a carriage and a rake-carrier arranged to run therein, of a motor-cylinder and a fixed rack and a flying rack all on said carriage, a cross-head carried by the piston-rod of said motor-cylinder, guides on said carriage for said cross-head, a gear pivoted to said cross-head and engaging with both of said racks, sheaves pivotally attached to said carriage, sheaves pivotally attached to said flying rack, and a rope connected at two points with said carriage and also connected with the rake-carrier and running on said several sheaves, substantially as herein described.

3. In a machine for discharging gas-retorts, the combination with a carriage and a rake-carrier arranged to run therein, of mechanism including a fixed rack and a flying rack and a cross-head carrying a gear engaging with both of said racks and connections between said flying rack and the rake-carrier, a rake-lifter and a counterbalance-lever therefor on the carriage, a fulcrum-shifting lever on the carriage for shifting the fulcrum of the counterbalance-lever, a direct-acting motor on said carriage in connection with said cross-

head for operating the rake-carrier and a connection between said cross-head and the said fulcrum-shifting lever for working the latter, substantially as herein described.

4. In a machine for discharging gas-retorts, the combination of a carriage and a rake-carrier running therein, a direct-acting reciprocating motor on said carriage, sheaves on the carriage and sheaves carried by the motor, a rope connected with the rake-carrier and running on the several sheaves and connected at two points with the carriage, and a screw take-up at either connection of the rope with the carriage for taking up the slack of the rope, substantially as herein described.

5. In a machine for discharging gas-retorts, the combination of a carriage and a rake-carrier running therein, a direct-acting motor on said carriage, sheaves on the carriage and sheaves carried by the motor, a rope connected with the rake-carrier and running on the several sheaves and connected at two points with the carriage and a spring applied at either connection of the rope with the carriage for preserving the tension of the rope, substantially as herein described.

6. In a machine for discharging gas-retorts, the combination of a carriage and a rake-carrier running therein, a direct-acting motor on said carriage, sheaves on the carriage and sheaves carried by the motor, a rope in two lengths respectively connected at two points with the carriage, and a clamp in which either of the contiguous ends of the two lengths of rope is adjustable and by which the rope is connected with the rake-carrier, substantially as and for the purpose herein described.

7. In a machine for discharging gas-retorts, the combination of a carriage and a rake-carrier running therein, pins for attaching the rakes to the rake-carrier or to the carriage, a pin-plate having pin-holes on the carriage and a pin-plate having corresponding pin-holes on the rake-carrier, rake-bars having in each two holes which are at such distance apart lengthwise of the bar that on the carrier being brought back to a certain position in the carriage a pin may be inserted either into one hole in the rake-bar and a hole in the pin-plate of the rake-carrier or through the other hole in the rake-bar and a hole in the pin-plate of the carriage, substantially as and for the purpose herein described.

8. In a machine for discharging gas-retorts, the combination of the carriage, the rake-lifter, the counterbalance-lever for the rake-lifter, the fulcrum-shifting lever carrying the fulcrum of the counterbalance-lever, means for operating the fulcrum-shifting lever, a link connection between the counterbalance-lever and the rake-lifter, and a radius-bar pivoted to the said link connection and to a fixed point on the carriage, substantially as herein described.

9. In a machine for discharging gas-retorts, the combination of the carriage, the rake-

lifter, the counterbalance-lever for the rake-
lifter, the fulcrum-shifting lever carrying the
fulcrum of the counterbalance-lever, means
for operating the fulcrum-shifting lever, a
5 link pivotally connected with the counterbal-
ance-lever and with the rake-lifter and hav-
ing an upward extension beyond its pivotal
connection with the counterbalance-lever, and
a radius-bar pivoted to the upward extension

of said link and to a fixed point on the car-riage, substantially as herein described.

In testimony that I claim the foregoing as
my invention I have signed my name, in pres-
ence of two witnesses, this 3d day of May, 1900.

GASTON A. BRONDER.

Witnesses:

FREDK. HAYNES,
R. B. SEWARD.