4 Sheets—Sheet 1.

T. F. ROWLAND.

RETORT CHARGING AND DISCHARGING APPARATUS.

No. 192,288. Patented June 19, 1877.

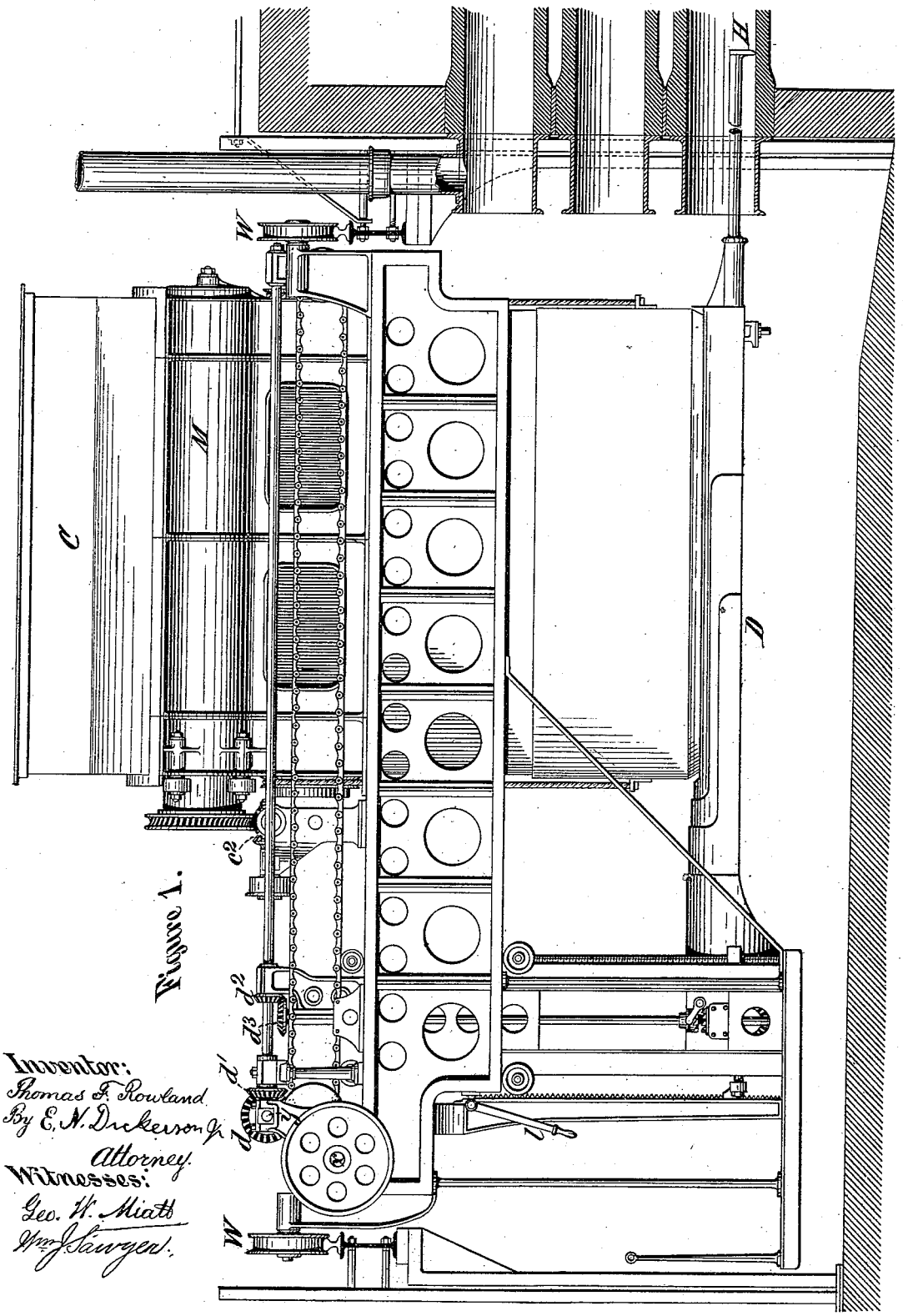

Figure 1.

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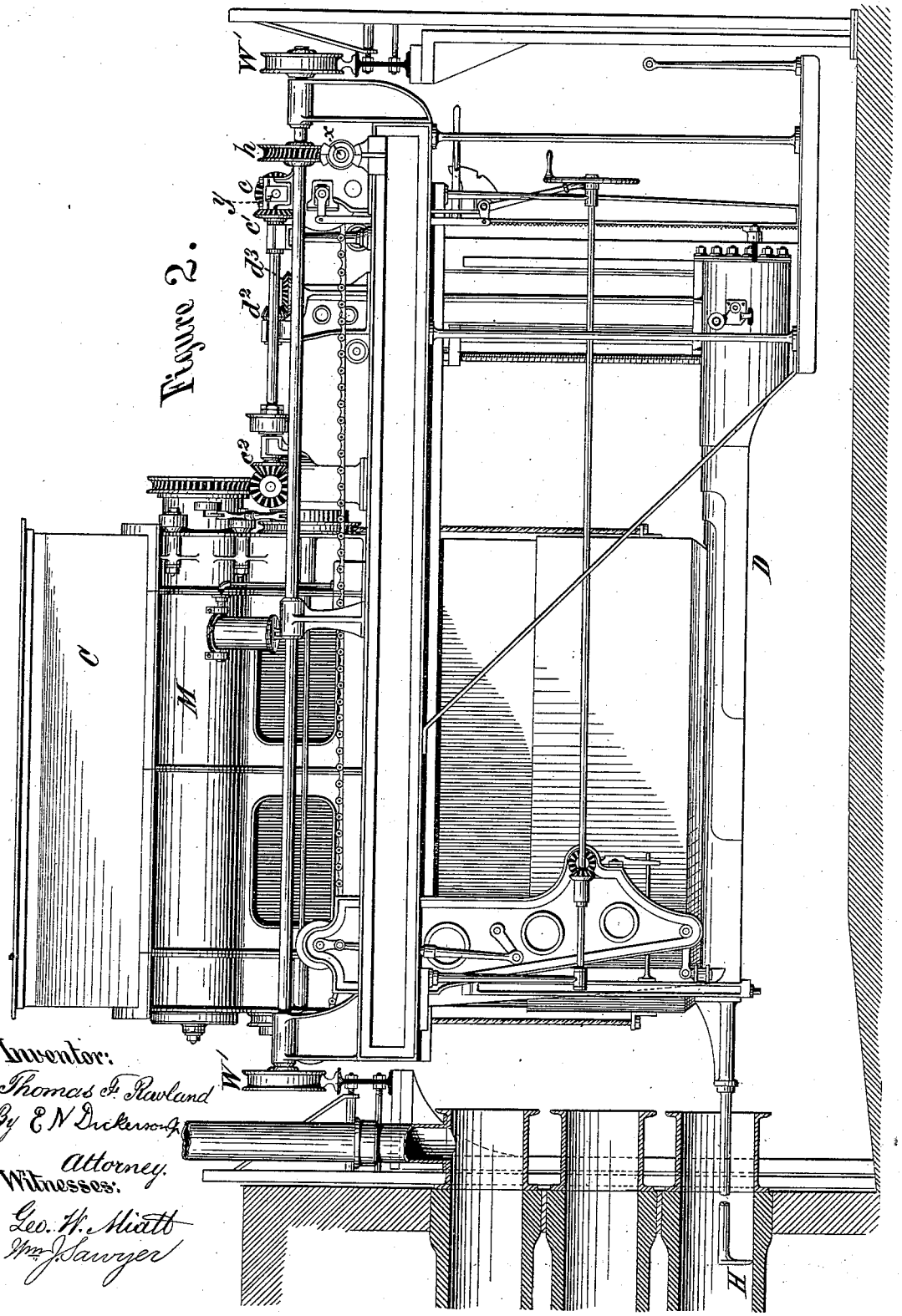
RETORT CHARGING AND DISCHARGING APPARATUS.

No. 192,288. Patented June 19, 1877.

Figure 2.



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4 Sheets—Sheet 3.

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RETORT CHARGING AND DISCHARGING APPARATUS.

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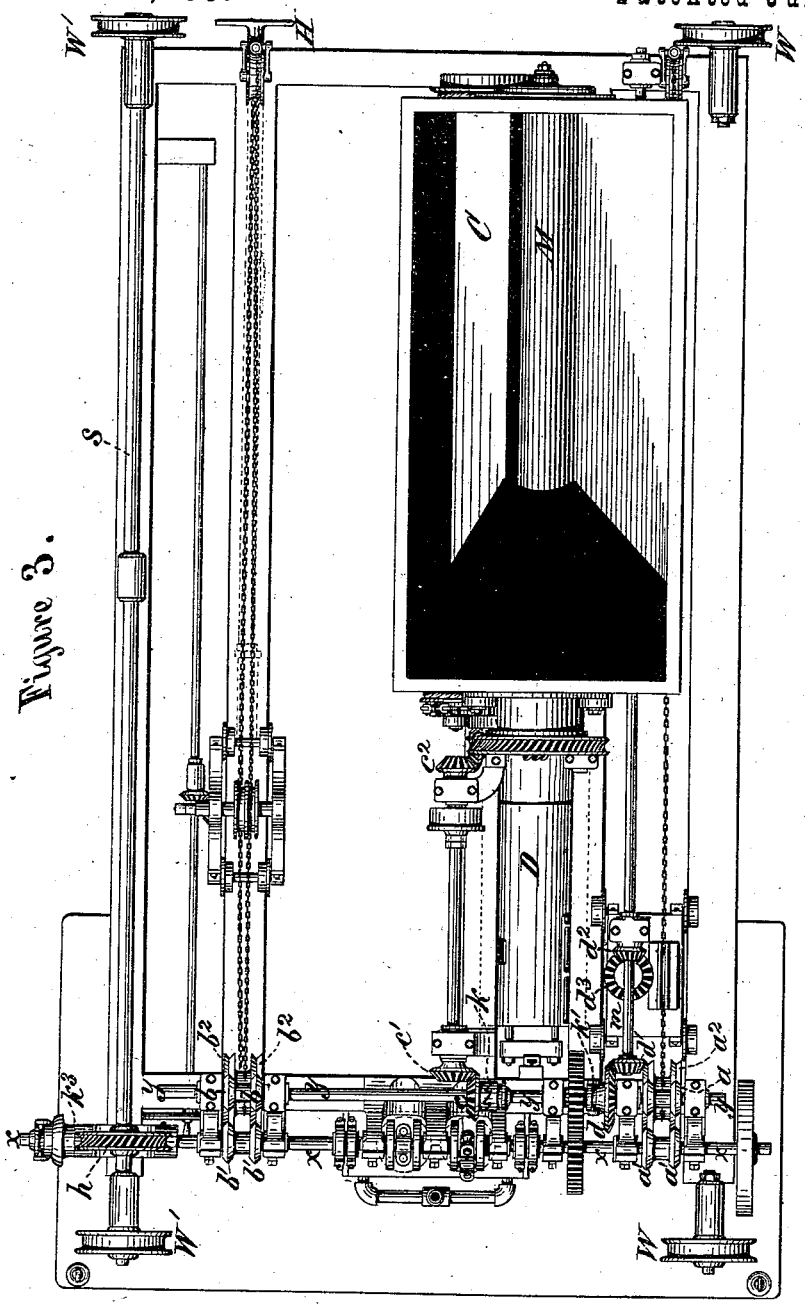
Figure 3.



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4 Sheets—Sheet 4.

T. F. ROWLAND.

RETORT CHARGING AND DISCHARGING APPARATUS.

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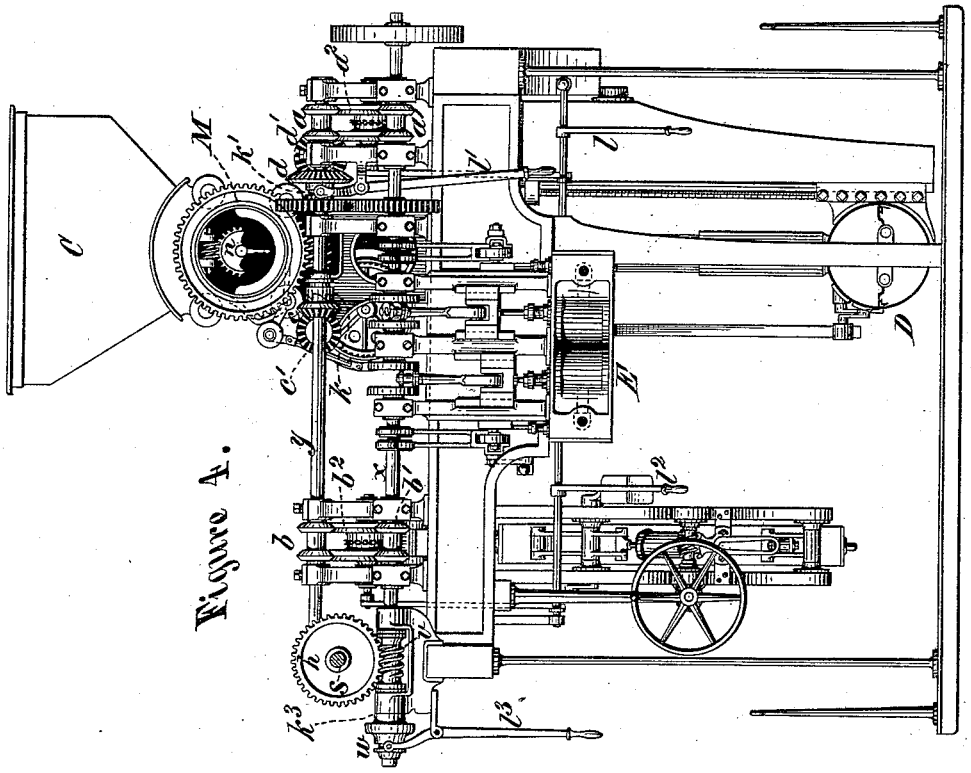

Figure 4.

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UNITED STATES PATENT OFFICE.

THOMAS F. ROWLAND, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN RETORT CHARGING AND DISCHARGING APPARATUS.

Specification forming part of Letters Patent No. **192,288**, dated June 19, 1877; application filed April 13, 1877.

To all whom it may concern:

Be it known that I, THOMAS F. ROWLAND, of Brooklyn, county of Kings and State of New York, have invented a certain new and useful Improvement in Retort Charging and Discharging Apparatus, which improvement is fully set forth in the following specification:

My invention relates to an improved machine for charging and discharging gas-retorts and for measuring the coal which is to be deposited in such retorts, and to the arrangement of the mechanical power for operating these contrivances.

I have heretofore filed three applications in the Patent Office, on February 8, 1877, one for an improvement in gas-retort chargers, one for an improvement in revolving coal-meters, and one for an improvement in retort-raking apparatus, the patents being granted, respectively, on the 19th day of June, 1877.

To these patents I refer all whom it may concern for further information in regard to the specific devices used in this machine which are not fully described in the ensuing specification.

These three inventions I have combined together and mounted upon one frame, and added thereto an engine for the separate or simultaneous operation of each, and also for the purpose of moving the entire apparatus and its supporting-frame. The meter M is, as will be observed, mounted directly over the scoop D, so that the coal passes directly and readily into it, and the rake H is mounted to the left at a distance from the scoop which is exactly equal to the distance between two retorts of a series.

It is obvious that several rakes could be mounted on this frame, and this is useful where the time required to discharge a retort is greater than the time required to charge it.

It is important in machines of this character that the operations of retort charging and discharging go on simultaneously, and it is convenient to charge one retort while the one next in advance is being discharged, so that no retort is kept open for a longer period than is absolutely necessary.

This machine consists of a combination of an engine, supplying the motive power to operate the several parts, with a retort-charging or retort-discharging and a coal-measuring apparatus, to each of which the power is applied from the same engine, and is so applied that it is unnecessary, in passing down the retort-house, to reverse the engine, which is kept continually in operation in one direction, while the different parts of the machine are either caused to revolve, to advance, or to retire, or are allowed to remain at rest. The entire mechanism is carried on bearing-wheels, which traverse rails parallel with the face of the retorts, whereby the machine is brought successively opposite the different series of retorts to be charged or discharged. Sufficient coal may be carried in this machine to charge a number of retorts, or a continual supply of coal may be deposited in the hopper by means of apparatus not shown or described in this specification, but which I have previously patented.

I will now describe my drawings.

Figure 1 represents a general view of my apparatus on the retort-charging or scoop side of it. Fig. 2 represents a general view of the same on the raking side. These views show some necessary connections for operating the scoop, the rake, and the meter.

Fig. 3 represents a top view or plan of my apparatus, showing more in detail the connections between the engine and the various parts of the apparatus, and the means for operating the same.

Fig. 4 is a rear elevation, showing very plainly the engine, the revolving shafts, whereby motion is communicated, and the different connections for operating the machine. The bearing-wheels W W W′ W′ are removed.

The engine, which is carried on the main frame of the apparatus, is represented at E, Fig. 4. This causes two shafts, *x* and *y*, to revolve.

Direct connections are made between the engine and the shaft *x*, while the shaft *y* is caused to revolve correspondingly, but in an opposite direction, by means of the gearing clearly shown in Figs. 3 and 4.

The shafts are caused to revolve continuously during the operation of the machine, and the engine is only reversed when the direction of travel of the entire apparatus is to be

reversed and the machine brought back to its place of starting.

On the shaft x is a worm-gear, v, which worm-gear is caused to revolve with this shaft by means of a pin-clutch or other suitable connection, marked k^3, and operated by means of a lever, l^3.

Whenever this clutch is closed the worm v is caused to rotate in either direction with the shaft x; but otherwise it is kept free from it. This worm v causes the gear-wheel h to revolve. This wheel, as shown clearly in Fig. 3, causes a shaft, S, to which the bearing-wheels W′ W′ are attached, to revolve, and the revolution of these wheels causes the machine to advance or retire on its rails, which are parallel with the face of the retorts. It is evident, therefore, that by reversing the direction of the engine, and by closing or opening the clutch k^3, the entire apparatus may be caused to travel forward or backward on the rails, or to remain at rest.

The connections necessary to operate the meter M will now be described.

The upper shaft y has connected to it a ratchet-clutch, p, which clutch causes the miter-gears c c^1 to revolve. These revolve the miter-gear c^2, and thereby revolve the meter M by means of the connections described in my previous patent. This clutch k is only occasionally thrown into gear, according as it is desired to revolve the meter or to allow it to remain at rest.

The rake H is caused to advance or retire by means of friction-clutches or equivalent mechanism. (Shown at b, b^1, and b^2.) The clutch b^2 may be brought in contact either with the revolving cutch b, rotated by the shaft y, or in contact with the clutch b^1, rotated by the shaft x, and thereby the rake is caused to advance or retire.

The scoop D is caused to advance or retire by means of similar mechanism, shown at the opposite end of the drawing at a a^1 a^2. The friction-clutch a is rotated by the shaft y, a^1 by the shaft x, and a^2 may be brought in contact with either of these clutches, which are revolving in opposite directions, whereby the scoop is caused to advance or retire.

It is also necessary to revolve the shaft m, Fig. 3, which operates the miter-gears d^2 d^3, whereby the bottom of the scoop is withdrawn.

This revolution is accomplished by means of the miter-gears d and d^1, which are revolved when a clutch (shown at k^1) is brought into operation, which is done by means of the handle l^1. The elevation or depression of the handle l causes the scoop to advance or retire, while the elevation or depression of the handle l^2 causes the rake to advance or retire, and it will be observed that all these motions can go on simultaneously without interfering with each other. The power to drive the engine E may be either derived from a steam-boiler carried on the machine, or compressed air may be used, compressed in a separate compressor, and carried to the machine by means of flexible pipes; which latter I find to be the more advantageous way.

The operation of the machine is as follows: The hopper C being filled with coal, the engine E is put in operation in the proper direction, then the clutch k^3 is put into operation by means of the lever l^3, the wheel h is revolved, and thereby the shaft s and the wheels W′ W′ are revolved, and the machine is brought opposite the first retorts. Then the ratchet-clutch k is closed by means of a lever not shown in the drawing, whereby the meter M is revolved, which deposits a definite quantity of coal in the scoop D, as is described in my previous application.

Then the scoop D is caused to advance into the open retort by means of the lever l.

When in its advanced condition, the bottom is withdrawn, by means of the lever l^1, which causes the miter-gears d, d^1, d^2, and d^3 to revolve, thereby depositing the coal in the retort; then, by a reverse movement of the lever l, the scoop is withdrawn. During this last series of operations another operator may have caused the rake h to advance into the retort by means of the lever l^2, and by means of the alternate movements of this lever the retort is discharged of the deposited carbon.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a revolving meter, M, and a coal-charging apparatus or scoop, D, upon one frame, with intermediate power mechanism whereby each may be operated independently of the other, substantially as described.

2. The combination of a revolving meter, M, a coal-charging apparatus, D, and a coal-discharging apparatus, A, carried upon the same frame, and adapted to be brought opposite the retort to be discharged, substantially as described.

3. The combination of a meter, a coal-charging apparatus, having a removable bottom, and a coal-discharging apparatus, and an engine carried upon the same frame and adapted to be brought opposite the retort to be discharged, substantially as described.

4. The combination of an engine, a coal-measuring, a coal-charging, and coal-discharging apparatus, and a frame carrying them, with apparatus whereby the power of the engine is utilized either in moving the entire apparatus upon supporting-rails into a position to charge or discharge retorts, or in operating the meter, the charging apparatus or the discharging apparatus, or either of them, without interfering with the operation of the others, substantially as described.

THOS. F. ROWLAND.

Witnesses:
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