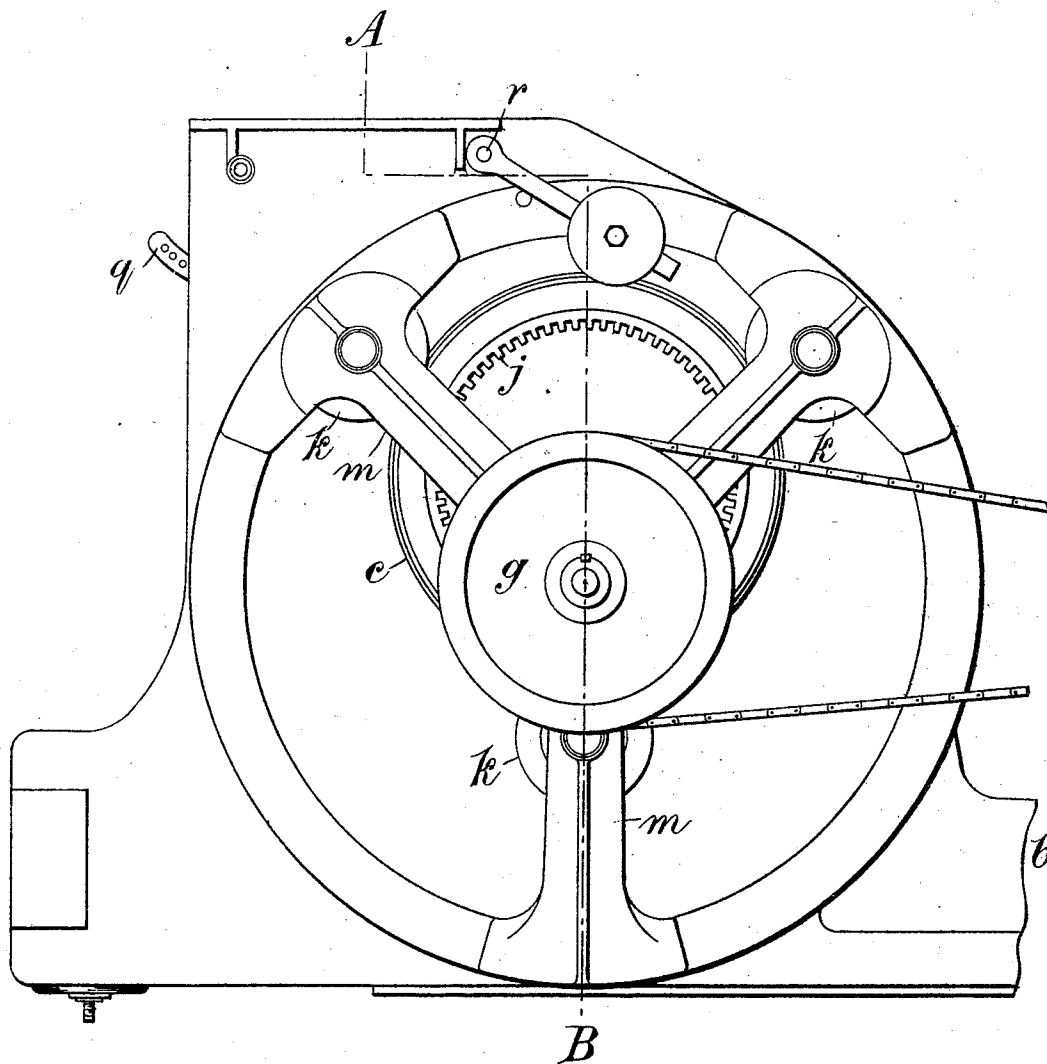


H. J. TOOGOOD.
CHARGING MACHINE FOR GAS RETORTS.
APPLICATION FILED MAR. 11, 1905.

6 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
J. O. M. G. P. P. P.
Robt. A. Cissel.

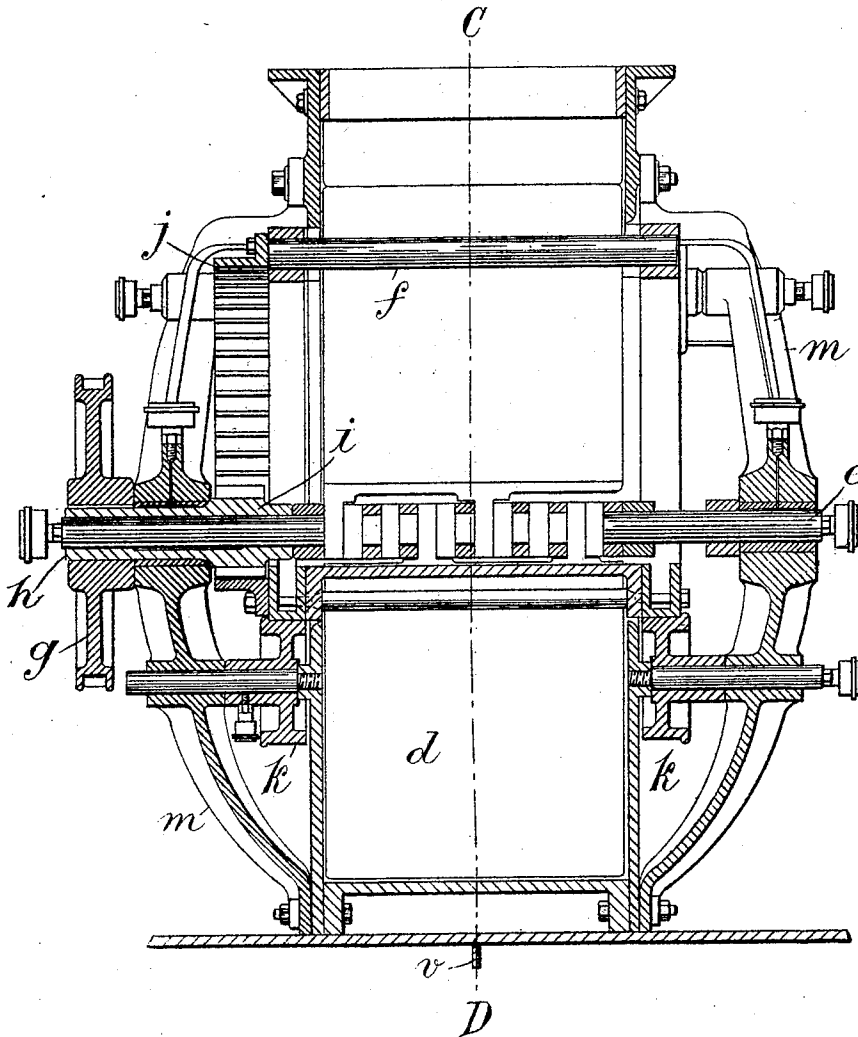
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APPLICATION FILED MAR. 11, 1905.

6 SHEETS—SHEET 2.

Fig. 2.



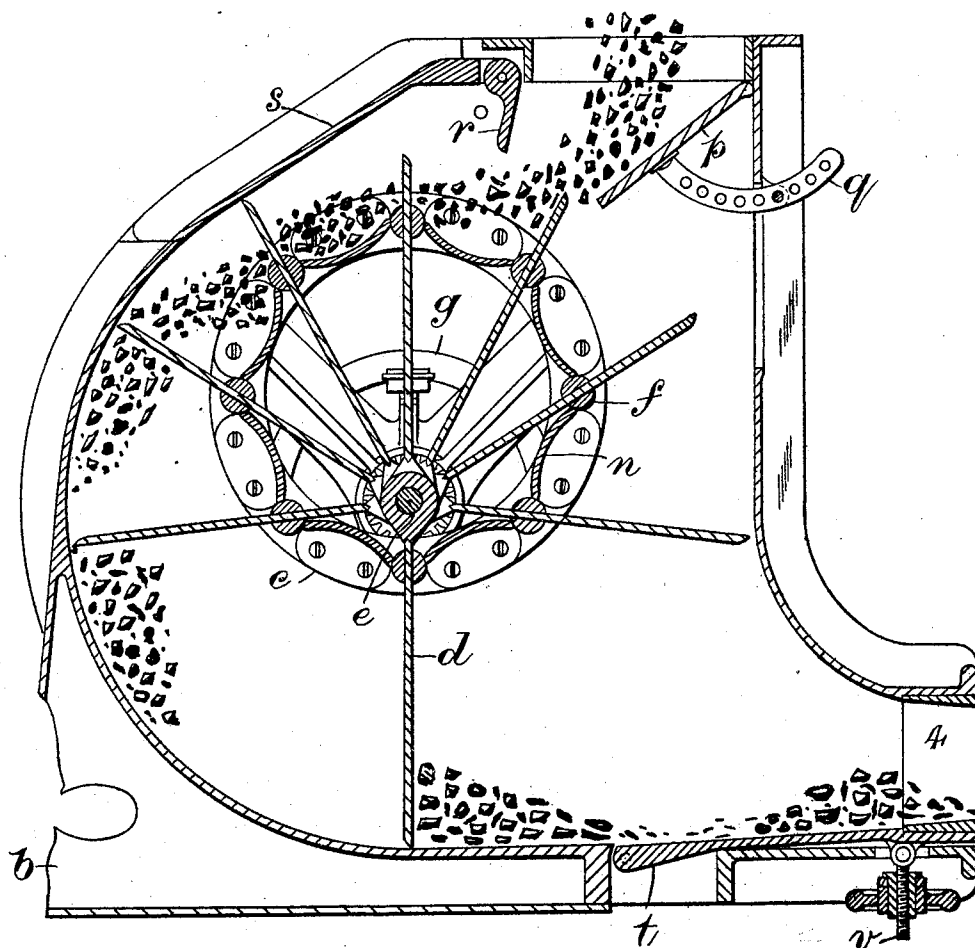
Witnesses:
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6 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
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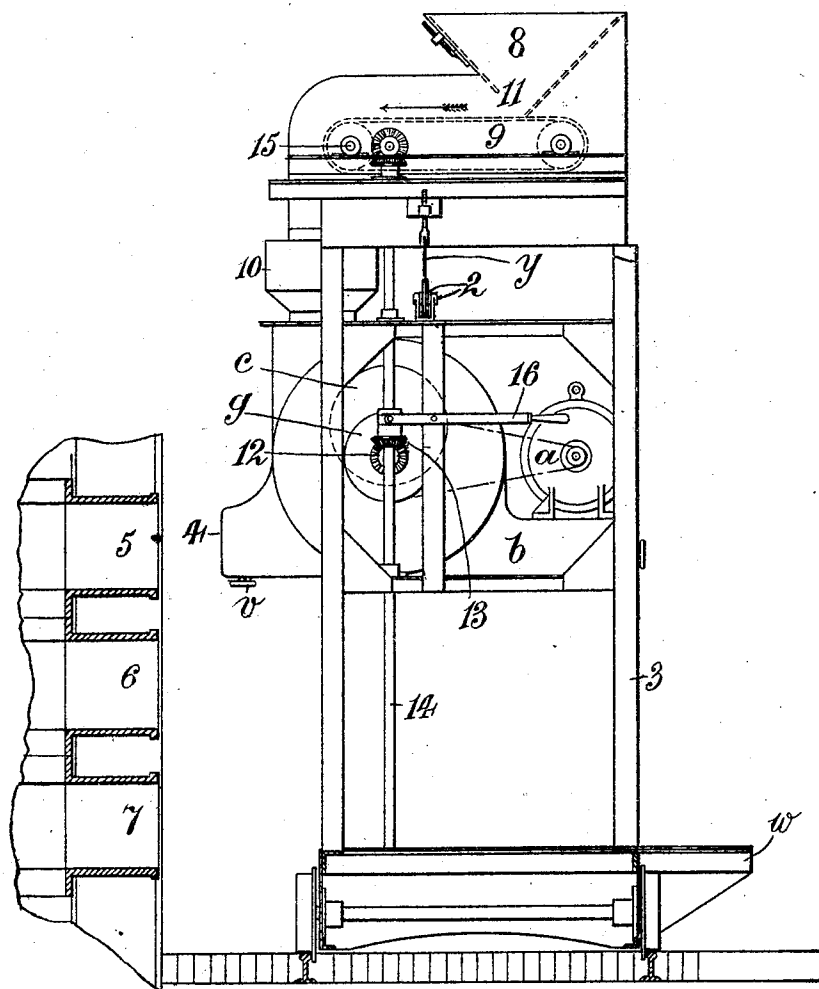
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6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

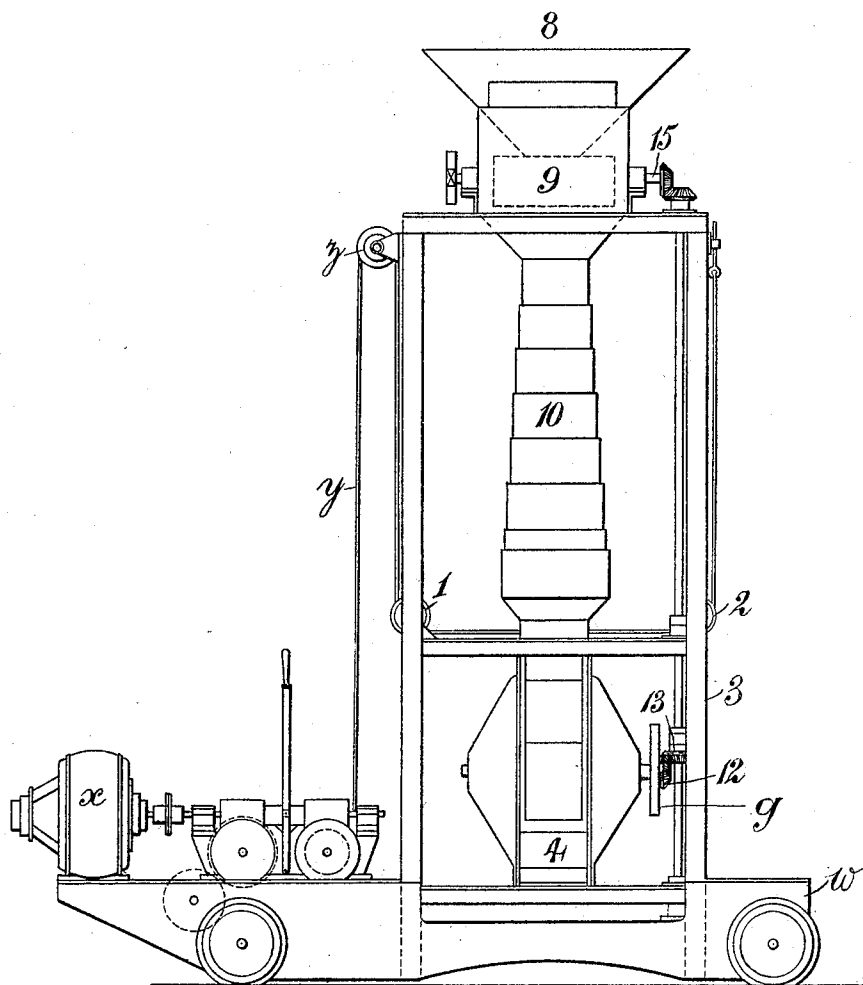


Fig. 5.

Witnesses:
J. Spragg Pooler
Robt. A. Cassel

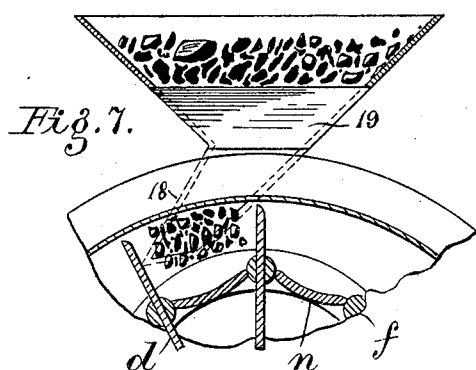
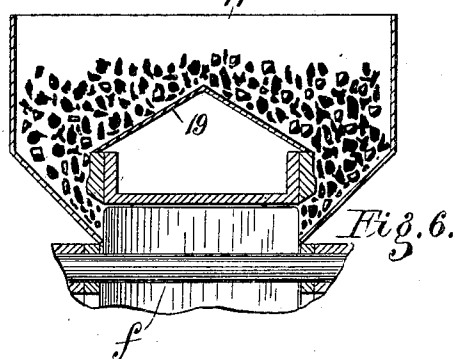
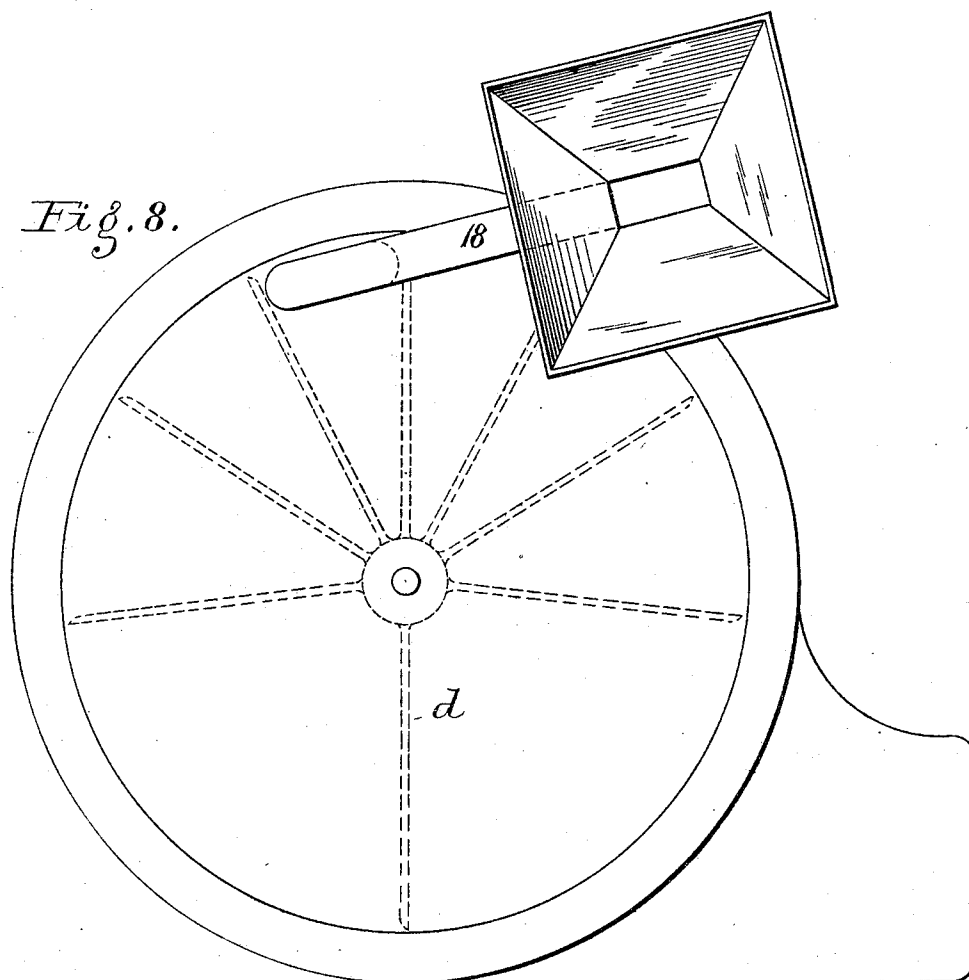
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No. 794,960.

PATENTED JULY 18, 1905.

H. J. TOOGOOD.
CHARGING MACHINE FOR GAS RETORTS.
APPLICATION FILED MAR. 11, 1905.

6 SHEETS—SHEET 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

HERBERT JOHN TOOGOOD, OF ELLAND, ENGLAND, ASSIGNOR TO ROBERT DEMPSTER AND SONS, LIMITED, OF ELLAND, ENGLAND.

CHARGING-MACHINE FOR GAS-RETORTS.

SPECIFICATION forming part of Letters Patent No. 794,960, dated July 18, 1905.

Application filed March 11, 1905. Serial No. 249,634.

To all whom it may concern:

Be it known that I, HERBERT JOHN TOOGOOD, residing at The Poplars, Elland, in the county of York, England, have invented certain new and useful Improvements in or Relating to Charging-Machines for Gas-Retorts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines used for charging gas-retorts in which the coal or other material is thrown or projected from the machine into the required position in the retort; and the principal objects of these improvements are to produce a machine which cannot be injuriously affected by the heat radiated from the retorts and which is absolutely positive in its action, thereby imparting to the coal, whether of large or small size, the required velocity to insure an even charge. By this means the coal is passed through the machine more steadily, its speed being gradually accelerated without breaking and grinding, less dust being caused, so that the said coal is more fully utilized for the production of gas and coke. Also an economy in the power required to drive the machine is effected, and the charge is placed in the retort in such a manner as to insure the best carbonizing results.

According to this invention the coal is received into a groove or track merging into a delivery-aperture along which a series of push or sling plates or receptacles travel at varying speeds, gradually accelerating the travel of the coal as it approaches the delivery-aperture, the accelerated speed being imparted to the push-plates or the like by the combination of two circular motions or by a series of rollers running at different speeds or other suitable arrangement. In this apparatus the coal is fed into the groove or track at or near the periphery of the moving push-plates or the like, so that centrifugal force is not required to bring the coal to the tips thereof, and therefore the machine need only be driven at a moderate speed—say eighty revolutions per minute—for charging a “through” retort

of twenty feet, (six meters,) and very little power is required to drive it, since there is only one push-plate moving at a high velocity at any given moment.

The machine may be mounted upon a carriage for traversing same along the retort-house, such carriage being provided with means for raising and lowering the charging-machine, so as to successively bring the delivery-aperture opposite retorts in different ranks or tiers with a telescopic chute for feeding coal to the machine at different altitudes and with a band conveyer or other suitable means for controlling the feed of coal to the said chute.

The annexed explanatory drawings illustrate by way of example certain means for carrying the invention into practical operation.

Figure 1 is a side elevation of the driving side of a machine in which the force of gravity is utilized to assist the travel of the coal, which passes around a curved track arranged in a vertical plane. Fig. 2 is a cross-section through the said machine, taken on the line A B in Fig. 1; and Fig. 3 is a longitudinal section, showing the essential parts of same, taken on the line C D in Fig. 2. Fig. 4 is a side elevation of the machine on its carriage in position for delivering coal to the highest retort. Fig. 5 is a front elevation of the machine and carriage, the charging-machine proper being here shown in its lowest position. Figs. 6 and 7 illustrate an arrangement of coal-inlet alternative to that shown in Figs. 2 and 3. Fig. 8 is a plan of a horizontally-working form of the machine.

The power to drive the machine may be obtained from any convenient source; but it is here represented as being derived from a motor *a*, bolted to the bed *b* of the machine and rising and falling with it. A belt or chain in connection with the motor imparts a rotary motion to a drum *c*, within which drum are a number of blades, push-plates, or sling-plates *d*, adapted to run loosely upon a mandrel *e* as a center, the said mandrel being below the axis of rotation of the drum. Each of these blades passes through a slot in a bar *f*, the

bars filling slots or openings in the drum *c*, in which openings the said bars are adapted to turn as required by the movements of the blades, which are of course eccentric in relation to the drum.

The drum *c* may be provided with a central stud or short shaft at one end thereof, a pulley or wheel thereon receiving the drive from the motor to rotate the said drum, or the rotation may be effected in the manner shown—that is, by a sprocket-wheel *g*, driven from the motor *a*, which sprocket-wheel is keyed upon a sleeve *h*, integral with a pinion *i*, running freely on the mandrel *e*. The pinion *i* engages teeth on the interior surface of a ring *j*, bolted to or formed integral with the drum *c*. The drum, in which the blades *d* work, is preferably open at both ends and may be retained in position by means of three guide pulleys or bowls *k* at each side, the studs on which these pulleys run being supported by arms *m*, secured to the framework or casing of the machine. Such studs may, if desired, be made adjustable by means of eccentric bearings or in other convenient manner.

The coal being fed in by gravity from a hopper or chute falls upon the drum *c*, the parts *n* of which between the bars are concave in order to increase their carrying capacity. The drum rotates, carrying with it the blades *d*, which act as push-plates or slings for the coal; but while the outer edge of each blade when at or near the feeding end of the machine is but a short distance from the center of movement of the drum, and therefore begins acting on the coal slowly and steadily, when the same blade approaches the discharging end its extremity is working at a much greater distance from the said center and is therefore traveling at a much greater speed—say five times as fast—so that such blade acts after the manner of a sling and shovels or projects the coal at a high velocity into the retort. Below and in front of the feeding-opening may be provided means for directing the falling coal onto the drum, such as an adjustable slide or a hinged directing-plate *p*, having a quadrant or tailpiece *q* perforated with holes for the insertion of a set-screw, by which means the angle of the plate *p* can be regulated.

A weighted flap *r* is so arranged that if a large piece of coal should enter the machine it will raise the flap *r* and also the hinged inspection-door *s* and fall out at the back of the machine, thus obviating any risk of bending the blades.

A baffle-plate *t* may be employed to reduce the delivery-opening and give an upward tendency to the stream of coal ejected, the raising of which baffle-plate may be accomplished by means of the screw *v*.

Suitable means may also be provided for raising, lowering, or inclining the delivery-opening, controlling the speed, and travers-

ing the machine. As example, on the carriage *w* is a motor *x*, driving suitable mechanism for hauling in and letting out a wire rope or chain *y*, passing around pulleys *z*, 1, and 2, the latter two pulleys being suitably connected to the upper part of the machine or to slides moving along with same in the up-rights 3, so that by hauling in the rope *y* the delivery-aperture 4 is raised until it comes opposite the retorts 5 or 6, and by letting out the said rope the charging-machine descends by its own weight until the said aperture 4 is opposite to the retort 7.

The coal may be supplied from a large bunker or other reservoir to the hopper 8, from which it may pass to a band conveyer 9 and thence to the telescopic chute 10, which delivers it to the drum *c*, as previously mentioned.

The hopper 8 may of course be adapted to measure or weigh the amount of coal passing through it; but if of the form shown its open outlet 11 may be closed by a sliding plate. This, however, will not usually be necessary, as when the band conveyer 9 comes to rest the accumulation of coal on the top thereof will quickly choke up the outlet of the hopper 8.

The amount of coal fed to the machine is regulated by the speed of the band conveyer 9, which is preferably proportionate to the speed of the machine, the conveyer being driven either directly from the motor *a* or preferably from the sleeve *h* on the shaft or mandrel *e*. For this purpose a bevel-pinion 12 may be keyed on the end of the said sleeve *h* outside the sprocket-wheel *g*, so as to engage a bevel-pinion 13, which can rise and fall on a long keyway in the vertical shaft 14. This shaft 14 by bevel-pinions imparts rotation to a cross-shaft 15, which by suitable gearing drives the band conveyer 9. To stop the feed without stopping the machine, the pinion 13 is lifted clear of the pinion 12 by the handle 16 or by like means.

By the interposition of the band conveyer or the like the caliber of the chute 10 may be safely made much larger than would be possible if the coal fell directly from the hopper 8 through the chute 10 to the drum *c*, as such a free feed of coal would probably choke up the charger, and the wideness of the chute 10, rendered practicable by reason of the control by the conveyer of the amount of coal passed to the said chute, reduces the risk of the chute itself becoming choked by the jamming together of large lumps of coal. Also whether the coal used be in the form of lumps or of dust practically the same amount or weight of coal will be fed onward by the conveyer 9.

Instead of having a directing plate or slide *p* the upper part of the machine may be provided with a hopper 17, (shown in Figs. 6 and 7,) the inlet or inlets 18 from which are inclined in the direction of the rotation of the push-plates *d*, so that the coal as it flows down

the said inlets moves in a direction approximating to that of the movements of the said plates d , its entry being thus facilitated. A bridge-plate 19 may be arranged to receive the impact of the falling coal.

In Fig. 8 the rotation of the plates d is in a horizontal plane, and the coal is fed down an inclined chute or inlet 18 in a similar manner to that described with reference to Figs. 6 and 7 of the vertical machine.

I claim as my invention—

1. In a retort-charger, the combination, with a charging-chamber provided with an inlet and an outlet, of movable feeding devices arranged in the said chamber, and means for accelerating the motion of the said feeding devices in their passage from the said inlet to the said outlet.

2. In a retort-charger, the combination, with a charging-chamber provided with an inlet and an outlet, of a revoluble feeding-drum provided with feeding-plates, and means for accelerating the motion of the said plates in their passage from the said inlet to the said outlet.

3. In a retort-charger, the combination, with a charging-chamber provided with an inlet and an outlet, of a feeding-drum supported in the said chamber and provided with guides, feeding-plates pivoted eccentrically of the said drum and sliding in the said guides, and means for revolving the said drum and plates.

4. In a retort-charger, the combination, with a charging-chamber provided with an inlet at its upper part and an outlet at its lower part, of a feeding-drum supported in the said chamber and provided with guides at its periphery,

feeding-plates pivoted below the axis of the said drum and sliding in its said guides, and means for revolving the said drum and plates.

5. In a retort-charger, the combination, with a charging-chamber provided with an inlet and an outlet, of a feeding-drum provided at its periphery with pivoted guide-bars and plates between the said bars, a series of feeding-plates pivoted eccentrically of the said drum and sliding in slots in the said bars, and means for revolving the said drum and plates.

6. In a retort-charger, the combination, with a receiving-hopper, and an endless conveyer arranged close below the said hopper; of a chute receiving the material from the said conveyer, a rotary discharging-machine receiving the material from the said chute, and driving devices coupling the said conveyer with the said discharging-machine.

7. In a retort-charger, the combination, with a carriage, and a receiving-hopper and an endless conveyer supported at the upper part of the said carriage; of a rotary discharging-machine slidable vertically in the said carriage, a telescopic delivery-chute between the said conveyer and discharging-machine, means for supporting and sliding the said discharging-machine in the said carriage, and driving devices coupling the said conveyer with the said discharging-machine.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT JOHN TOOGOOD.

Witnesses:

ERNEST PRIESTLEY NEWTON,
JOHN ERNEST SYKES LOCKWOOD.